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Attitudes and perceptions of Canadian youth towards careers in the trades: Results from the 2012 Programme for International Student Assessment (PISA)

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Executive Summary

Given the reported skills shortages in select skilled trade occupations, it is important to understand how youth perceive careers in the trades. Their career choices will play a crucial role in determining the extent to which shortages can be addressed within the country. The Canadian Council of Directors of Apprenticeship (CCDA) and Statistics Canada, with the support of the Council of Ministers of Education Canada (CMEC) and Employment and Social Development Canada (ESDC), developed a module which probed youth awareness and attitudes towards the trades as a national option in the 2012 Programme for International Student Assessment (PISA) (see Box 2). More specifically, the module provides information on the opinions held by **15**-year olds about pursuing a career in trade-based occupations, the level of awareness they possess about these types of occupations and the sources of that awareness. PISA is an international study carried out every three years designed to provide policy-oriented international indicators of the skills and knowledge of 15-year-old students near the end of their compulsory education. In Canada, approximately 21,000 15-year-olds from about 900 schools participated across the ten provinces[1].

Overall, Canadian students had a positive perception of jobs in the trades. Nevertheless, there was a limited level of interest among them to pursue a career in the trades.

Close to two-thirds of Canadian students believed that a career in the trades pays well and close to half reported that they would enjoy the physical nature of work associated with jobs in the trades. Furthermore, six out of ten students saw good job opportunities for themselves in the trades. Nevertheless, less than one-third of students held positive views about the salaries jobs in the trades provide, the type of work they entail and opportunities for employment that are available in the trades, of which 46% had no intentions of pursuing a career in the trades.

Overall, across Canada, less than 1 in 10 students planned on pursuing a job in the trades and around 6 in 10 indicated that they were definitely not interested by such a career. Provincially, students from Saskatchewan were more likely to be interested in pursuing a job in the trades relative to students in Ontario, while no significant differences were seen with the remaining provinces.

The resources provided by the school to inform students about careers in the trades were associated with student perceptions of jobs in the trades.

Students who talked to a counsellor about pursuing a career in the trades were more likely to have negative perceptions of the trades. As well, they were less likely to agree that a career in the trades pays well and that a job in the trades requires a combination of knowledge and hands-on activity. However, students who talked to a teacher about a career in the trades were more likely to believe that there are good job opportunities for them in the trades.

Despite high numeracy and literacy skills required to complete many apprenticeship programs, Canadian students interested in pursuing a career in the trades were students with lower mathematics and reading skills.

[1] No data were collected in the three territories and in First Nations schools. Further information on sampling procedures, response rates and sample sizes for Canada and its provinces can be found in Appendix A of Measuring up: Canadian results for the OECD PISA study. The performance of Canada's Youth in mathematics, reading, science and problem solving. 2012

Canadian students who were not planning to pursue a job in the trades outperformed those who were interested in pursuing a job in the trades by 45 points on the PISA mathematics assessment, equivalent to slightly more than one full year of formal schooling. On the PISA reading assessment, the score point difference between the two groups of students was 85 points, equivalent to more than two full years of formal schooling.

Canadian students interested in pursuing a career in the trades were less engaged in school relative to their peers not interested in a career in the trades.

Relative to their peers who were not planning a career in the trades, a higher proportion of students planning a career in the trades arrived late for school, skipped classes and had a lower sense of belonging in terms of how connected they felt to their school and peers. They also had poorer attitudes toward school.

Parental influence was an important factor in a student's decision to pursue a future career in the trades.

Students who were encouraged by their parents to pursue a career in the trades were more likely to have positive perceptions of careers in the trades and were more likely to be planning in a career in the trades while the opposite was true for students who reported that their parents did not want them to pursue a career in the trades. Furthermore, a family member (which includes parents) was the only source of information about jobs in the trades that was correlated with whether the student was definitely interested in pursuing a job in the trades or not.

Parent attitudes towards the trades were associated with the education and certain occupations held by the parents of the student.

The higher the education level of the father, the lower the odds of a student reporting being encouraged to pursue a career in the trades. Students were also less likely to report that their parents encouraged them to pursue a career in the trades if their parents worked in 'professional occupations'.

Parents were more likely to encourage students with lower skills to pursue a career in the trades.

Results show that students with higher PISA scores were less likely to be encouraged to pursue a career in the trades by their parents and more likely to have parents who did not want them to pursue a career in the trades compared to their peers with lower PISA scores. Students were also more likely to have parents encouraging them to pursue a career in the trades if they were non-immigrants or boys.

Introduction

Every sector needs to recruit the next generation of workers. In some regions in Canada, there are reported skills shortages or mismatches[2] in select skilled trades occupations (e.g., Morency 2014). In fact, in 2012, there were 24 Red Seal trades with projected labour shortages, including welders, pipefitters, electricians, millwrights, crane operators, mechanics, and motorcycle repair persons (CIT 2014). Shortages are linked in part to demographic change (an ageing workforce) and the need to hire new workers to replace retiring ones, as well as increased demand driven by the expansion of trades-heavy sectors, particularly in Western Canada.

Projected hiring by sector in the next decade in Canada:

- Oil & gas 125,000
- Mining 145,000
- Construction 300,000
- Automotive 77,000

Sources: TAD 2014, CIT 2014

Apprenticeship training (see box 1) is a key part of building a well-educated and highly skilled workforce and represents an important part of postsecondary education (PSE) in Canada. However, in Canada the uptake of apprenticeship is low: university and college students account for the vast majority of the PSE population. From the 2011 National Household Survey, about 12% of Canadians hold a trade's certificate as their highest level of education (Statistics Canada 2013). Registration in apprenticeship programs has increased markedly in recent years: 92% between 2002 and 2012; however completion rates remain an issue: only about half of apprentices complete their programs and attain a certificate of qualification (Desjardins & Paquin 2010).

Box 1: What is apprenticeship training?

Apprenticeship is an industry-based model that combines workplace training under the direction of a qualified journeyperson, and in-class technical training. Technical training is delivered at a number of different types of training institutions including public colleges, private colleges and union training institutions. In order to participate in apprenticeship, a prospective apprentice must first find an employer who will:

1. enter into an apprenticeship agreement, which is registered with the provincial/territorial (P/T) apprenticeship authority; and
2. provide the required workplace training under the guidance of a qualified journeyperson to train and mentor the apprentice.

While most trades training is delivered through Apprenticeship, not all trades training is done this way (e.g. college pre-employment programs). Furthermore, the apprenticeship training model can be and is used for some occupations other than trade related ones.

Stakeholders have supported greater efforts to promote apprenticeship as a postsecondary pathway that can lead to highly valued, satisfying and well-paying careers (CAF 2013:4). It is important to note that such benefits accrue to some trades occupations, but not all of them. Despite this and the apparent demand for new trades' workers, Canadian youth continue to pursue PSE options that may not

[2] It is important to note that evidence for skills and labour shortages in the trades is mixed, with some sources indicating current or projected shortages and others suggesting that there is likely to be a balance or surplus (CCDA 2014). Shortages and mismatches can vary immensely by region, sector, and occupation as well as business cycles, and can change quickly over time; thus it is challenging to project workforce numbers and distribution accurately.

necessarily lead to higher salaries or full-time employment[3] (CAF 2013). Reasons for this reticence have been documented and both empirical and anecdotal evidence point to attitudes towards the trades (e.g., CAF 2013; Skills Canada & CAF 2004). More specifically, the Canadian Apprenticeship Forum (CAF) (2013:4), which identifies some of the main challenges associated with attracting young people to careers in the trades, maintain that youth do not have access to accurate information and as a result, they hold negative misperceptions of the trades. Further, they charge that educators and counsellors are reluctant to pass on information about trades to students and their families. Finally, they also single out the general public and media for perpetuating negative impressions and stereotypes and not valuing the contributions tradespeople make to the economy and society.

In recent years, there have been various initiatives to improve perceptions, correct myths, and market skilled trades and apprenticeship to young people in Canada. For example, the "Skilled trades: a career you can build on" campaign (see Skills Canada & CAF 2004) and the 2012 revamping of the Careers in Trades website aim to ensure that Canadian youth have access to up-to-date and reliable information on skilled trades careers. There are also many programs and resources that target specific groups, such as women (e.g., Women in Trades Training, Women Building Futures) and Aboriginal people (e.g., British Columbia's ACCESS/Aboriginal Community Career Employment Services Society).

Young people need to be aware of the full suite of possible educational pathways and opportunities in order to seek them out and develop requisite skills, knowledge and orientations to make informed career choices. Thus, it is important to understand how youth perceive skilled trades work as well as factors that contribute to the likelihood of choosing a career in the trades. Moreover, there is a need to better understand the relationship between students' academic performance in high school and enrolment in apprenticeship.

In 2010, the Canadian Council of Directors of Apprenticeship (CCDA) identified youth apprenticeship and entry level issues, including awareness and interest in a career in the trades, as a key knowledge gap and research topic of interest in its Multi-Year Research Plan. The research plan outlined a number of questions aimed at improving understanding of the relatively low enrolment by youth in apprenticeships following high school and examining whether and how earlier entry to the trades could be encouraged to a greater degree than at present.

With the support of the Council of Ministers of Education Canada (CMEC), Employment and Social Development Canada (ESDC) worked with the CCDA and Statistics Canada to develop a module on Youth Attitudes towards the Trades in the 2012 Programme for International Student Assessment (PISA) (see Box 2). PISA is a tri-annual survey used to assess the reading, mathematics, science and problem solving skills of 15 year-old students. Given that strong skills are important not only to the completion of apprenticeship programs but also when working in the trades (for example, to understand, apply, and interpret codes and legislation), this report is uniquely placed as it can provide a skills dimension to the relatively low enrolment by youth in apprenticeships following high school.

More specifically, this report analyses the findings and identifies issues for consideration based on three sets of overarching questions:

[3] Although this is changing, relatively few academic majors are able to bestow specific, technical skills that lead directly to a career path (Baird et al. 2008:954). Moreover, the structure of secondary education in Canada is premised on the notion of keeping postsecondary and occupational options open for as long as possible; thus, streaming students into trade-oriented programs too early will tend to close off the university pathway, while the converse is not the case.

1. What level of interest to pursue an apprenticeship exists among high school students?
2. How do students learn about apprenticeship? By whom, and how are they influenced?
3. What are the characteristics of youth who are planning a career in the trades?

Box 2: Youth Attitudes towards the Trades

The Youth Attitudes towards the Trades (YATT) module was a national component to the 2012 PISA which was unique to Canada. It included six questions that were added to the PISA study[4] of about 21,000 Canadian 15-year-old high school students (with the exception of students in three territories and in First Nations schools). Questions were developed around five themes related to careers in the trades. These include aspirations, perceptions, awareness, exposure and other. Questions were implemented in the spring of 2012 with the support of the CMEC and funding support from ESDC.

In the YATT module, jobs in the trades were referenced as "jobs such as an electrician, crane operator, plumber or mechanic". These occupations were chosen as examples because they are skilled trades occupations with projected labour shortages. These questions were focus-tested by Statistics Canada confirming that this definition was understood by all students regardless of their socio-demographic background and in both official languages. Nevertheless, there are some potential limitations in using a select list of occupation examples as student responses could have been different had a different list been used.

The remainder of the report is structured as follows: the next section provides a literature review on youth attitudes towards skilled trades and decision making processes regarding learning choices. This is followed by some descriptive facts surrounding the interest of 15 year-old Canadian students in pursuing a career in the trades, sources of information they consulted to gain information about careers in the trades, their perceptions of the skilled trades and parental influence. Econometric results are then presented identifying: 1) the factors associated with student aspirations to pursue a career in the trades; 2) the factors associated with different student perceptions of the trades; and 3) the factors linked to parents encouraging or dissuading the student from pursuing a job in the trades. A conclusion and some considerations are then presented in the final section.

Literature Review

Today, young people are forging educational and career pathways against a backdrop of change, with longer periods of time spent in school and young adulthood extending, for many, into their 30s. These circumstances impact decision-making around school and work, with particular bearing on apprenticeship in Canada. This section, which proceeds in two parts, is intended to provide additional context for the introduction and the findings that follow. The first part looks at other studies of attitudes towards skilled trades while the second part provides an overview of career intentions and decision-making processes, including the interplay of skills, abilities and interests with performance in school, the role of information and influencers, and the origin of early interest in fields such as the trades. This discussion also takes into account ways in which socio-demographic characteristics help to shape

[4] OECD. (2013). *PISA 2012 Assessment and analytical framework: Mathematics, reading, science, problem solving and financial literacy*, Paris: Author. Retrieved from http://www.oecd.org/pisa/pisaproducts/PISA%202012%20framework%20e-book_final.pdf

experiences and choices. The section wraps up by raising some outstanding and understudied issues that are addressed in this report.

Attitudes towards skilled trades

Perceptions of skilled trades

CAF recently published a report about youth perceptions of careers in the trades in which they compared results from an earlier survey of students in 2004 with findings from 2013 (CAF 2013; see also Skills Canada & CAF 2005). In 2004 (n=490) and 2013 (n=873), an online survey was administered to young people aged 13 to 17 with questions that assessed attitudes toward careers in the skilled trades. A significant flaw in the survey methodology is that respondents did not provide personal information, such as gender, which renders the representativeness of the sample impossible to assess and makes it difficult to properly interpret and contextualize responses[5].

Nonetheless, results in 2013 were generally more encouraging or at least consistent with those from 2004. Both groups of students viewed tradespeople and careers in the skilled trades positively, and similar proportions had family members working in the trades and self-identified as "average" or "above average" students. A solid majority in both years (61% in 2013) had at least some idea of what they wanted to do in terms of their future careers, with more than half (53%) still identifying a university degree as their top postsecondary choice, followed by college (25%); apprenticeship was selected by less than 20% of students. This finding is in line with other studies citing high educational aims among Canadian youth (e.g., Looker & Thiessen 2004; Bibby 2001).

Compared with 2004, a higher proportion of youth in 2013 reported that they sought out and found information about apprenticeship, that they understood the apprenticeship process, and that they were open to at least considering a career in the trades. More saw trades as "better" than a career in law, business or accounting: 25% in 2013 versus 13% in 2004. However, youth in 2013 were less likely to believe that tradespeople would always be in demand. Although there were small gains made between 2004 and 2013, youth in this study generally did not feel their parents, guidance counselors or friends encouraged them to consider skilled trades. The study concludes that progress has been made with respect to youth perceptions of the trades; however, there is still room for improvement with outreach perhaps better targeting specific groups of influencers, such as parents and counsellors.

The Pan-Canadian Assessment Program (PCAP) released a report that looked at achievement in mathematics across Canada in 2010 (CMEC 2012). Part of this study focused on student aspirations, and results show that most Canadian students have aspirations to attend university. Very few aspire for a career in the trades. More than half aspired to graduate from university while about 4% hoped to get a trades or vocational certificate. Similarly, more students (30%) aspired to professional occupations requiring university degrees; relatively few (8%) hoped to work in the trades (CMEC 2012:32).

A number of other, smaller studies also point to a general lack of interest among youth in pursuing a career in the skilled trades, especially among women[6]. From Skills Canada (Spence 2012), just over one-quarter of young people aged 13 to 24 plans to consider a career in the trades, with 59% reporting that

[5] For example, in 2004, 8% of respondents reported working in the trades, whereas this number was 36% in 2013. This could skew findings regarding perceptions of trades.

[6] It is worth noting that many of the surveys, including the YATT module in this report, focus (intentionally or otherwise) on a select group of 'traditional' trades occupations, which are also male-dominated, such as carpenters, plumbers, mechanics, and electricians.

their parents have not encouraged them to consider trades as a career option. Nova Scotia's Youth Decision Survey, administered in 2000, 2004, and most recently, 2009 (n=924 students), reports a lack of interest in trades and apprenticeship training and more students aspiring to go to university (NS 2010). This is particularly the case for young women: 15% would consider a career in the trades, compared with 47% of young men. The lack of interest in some cases can be attributed to a lack of knowledge. For example, in another small survey conducted by Women's Enterprise Skills Training of Windsor, more than half of the young respondents did not know what skilled trades were (WEST 2014).

These perspectives on skilled trades extend to considering apprenticeship training as a PSE option. A forum hosted by Skills4BC (2013) asked residents of British Columbia to weigh in on perceptions of skilled trades and technical careers. Respondents suggested that university is still seen as a 'higher' calling, and that university-educated teachers and counsellors subconsciously nudge students towards further education. As well, they see trades as defined by images of people in dirty coveralls rather than clean, high-tech environments. Finally, there has been anecdotal evidence reported by tradespeople regarding challenging working conditions and the letdown of being an apprentice in real life (hard to get a position, unstable work, unscrupulous employers, etc.), which may undermine any gains in positive perceptions stakeholders are trying to promote.

The tool company Rigid recently sponsored a survey in the United States that revealed that a scant 6% of high school students hope to have a future career in trades such as plumbing, carpentry, electrical, and HVAC (Noria 2014). This small study also delved into reasons why students are not interested in trades. More than half reported a lack of interest or aptitude, while almost one-quarter felt they did not know enough about it. 11% of students were not interested because they do not think trades are 'cool.'

Fields that interest American high school seniors the most:

1) 25% computers/internet
2) 16% business
3) 15% engineering
4) 15% health care
5) 15% entertainment/arts

Source: Noria 2014

When coupled with other findings from the same study—for example, 54% believe there is a better future in computers, 37% felt working in an office was more respected, and 25% thought skilled trades jobs are 'old-fashioned'[7]—it becomes clear that the trades may still have an image problem. At the same time, the students in this study were not entirely ungrounded in their preferences and most expressed interest in high-growth fields with good career prospects, such as information technology, business, and health care.

Youth career aspirations and decision-making

There tends to be a 'normative' timing and sequence for many life transitions and these give people a sense of what lies ahead in their lives. The school-to-work transition represents a critical time for young people. It sets them on a particular path and those who do not make this transition relatively quickly or smoothly are at greater risk of poor labour market outcomes over the longer term (Staff et al. 2010; Taylor 2005). While many young people experience periods of 'floundering' in the labour market, those without postsecondary credentials tend to lack marketable skills and frequently move between a

[7] The finding about trades being 'old-fashioned' is not limited to youth: another study (Rubec 2014) reports that more than three-quarters of Canadian workers felt that this perception has led to less interest for Canadians desiring these types of roles versus 'white collar' work.

number of unappealing jobs as they attempt to seek sustainable employment (Baird et al. 2008; Millar 2014).

Which individuals follow which trajectories is determined by an intersection of individual and social or institutional actions (e.g., Taylor 2008). Social structure[8] and people's beliefs about their capabilities to exercise control over events that affect their lives influence choices, opportunities, and constraints, particularly when it comes to career aspirations and expectations, and educational pathways. Institutions, such as school systems, can predetermine and regulate pathways from school to work and shape the degree to which individuals can personally influence their experiences (e.g., Heckhausen 2002).

In systems with a high degree of institutional structure and strong links between education and the labour market (e.g., German's dual system[9]), students are streamed or tracked early on and more likely to understand the boundaries and regulations that frame their options (Lehmann 2005:117). In more open, market-based approaches, such as Canada's, the pathways between school and work are less direct. Students may have more leeway in their options, but these are often constrained by social factors. An individual's class, gender, age, race/ethnicity, etc. are thus transformed into differential aspirations, expectations, and opportunities, all within a given historical circumstance (e.g., location, economy, etc.).

Education → work → retirement represents a traditional and common view of the economic life course, one that is seen as standardized, with relatively universal and uniform patterns in the order and timing of key life events. These stages and transitions are linked loosely to age and tend to be well-supported by institutions and policy; however, these do not always keep pace with changes in individual lives. In recent years, scholars have documented greater volatility in the timing and sequence of events, including, for example, longer periods of schooling, later marriage and family formation, and moving back and forth between school and work (e.g., Staff et al. 2010; Lehmann 2005). These phenomena, while not universal, form the context in which today's young people are making education and career decisions.

Social background and the formation of career perceptions

The formation of views on careers and occupations is based on ideas, perceptions, and images that begin to form very early on and carry on across the life course (e.g., Baird et al. 2008; Taylor 2005; Thiessen & Blasius 2002). Over time, these images are filtered and reworked as life experience adds up in the form of personal observations, opinions of family and friends, and encounters with people in various occupations. Young people combine these views with images of the self, their strengths and aptitudes, and the prestige or value placed on various educational and occupational paths.

[8] Social structure refers to "relatively long-lasting, patterned relationships among elements of society" and these arrangements contribute to the variable distribution of advantage and disadvantage (McMullin 2010:7). Structured social relations (gender, class, race/ethnicity, age, etc.) and social institutions (e.g., work, education, family, etc.) are integral parts of the overall context in which a person's biography unfolds. These structures, which privilege certain groups of people over others, comprise a large part of the context within which people make decisions, take action, and live their lives.

[9] For more information about the German dual system, please visit Germany's Dual Vocational Education System - Young Germany

There are various schools of thought that attempt to account for how achievement expectations work in terms of shaping educational and occupational paths by putting differential emphasis on the social and the individual. This interplay is perhaps best captured in Pierre Bourdieu's concept of 'habitus' (e.g., Baird et al. 2008; Schoon & Parsons 2002). This refers to a mental conception of the world and an understanding of where one 'fits'. By adolescence, most youth have determined a set or range of occupations they consider acceptable, which reflects their view of where they fit in society. These understandings are distinct, but nonetheless malleable and subject to ongoing adjustments.

Students tend to have some awareness of their position in the school system (i.e., grades) and evaluate their options and make decisions that are consistent with their views of their skills and abilities, and what constitutes an 'acceptable' field or job in their social context, which includes family, friends, peers and community (e.g., Taylor 2008; Schoon & Parsons 2002). As a result, many tend to choose a path and future they feel 'fits' their backgrounds. For example, those aspiring to become tradespeople may not feel they need to go to university to achieve what they want. Similarly, students with lower achievement in school or with financial constraints or other barriers may simply aspire to fields or programs with fewer or lower entry requirements.

The ability to envision oneself as 'right' for a given job or an educational path can be more difficult for some people. Gender and socioeconomic status (SES) are particularly salient in this regard. SES accounts for a significant component of the association among aspirations, expectations, and outcomes (e.g., Sewell & Hauser 1975; Schnabel et al. 2002). Youth from more privileged backgrounds may have more educational opportunities, greater access to financial resources, role models, occupational knowledge and informal/kinship networks (e.g., Staff et al. 2010; Scherger & Savage 2010; Schoon & Parsons 2002). Their families often confer clearer career direction, more resources, social capital (networks and role models), and enriched experiences to support the cultural and intellectual capital needed for a given pathway—which is often one with higher expectations (i.e., university, professional work). Moreover, all of these advantages accumulate over the life course and can allow higher SES youth to explore various paths, prolong their education, and delay the transition into full-time work. As a result, these young people may be less likely to select a direct-entry pathway such as apprenticeship. On the other hand, if they do enter apprenticeship training, they may be better equipped to weather some of the challenges such as sporadic work, finding transportation, dealing with exploitative employers, etc. (e.g., Taylor 2008; Lehmann 2005).

At the same time, disadvantages can also accumulate over time and may prevent lower SES youth from accessing PSE in any form, even earn-as-you-learn modes such as apprenticeship. Although one should not underestimate working-class parents' ambitions for their children, without the benefits of lifelong support in school, some youth may be unprepared for the academic requirements of apprenticeship programs, even if they come through secondary programs that support the development of hands-on, trades-related skills. Although trades are often characterized as working-class occupations, "apprenticeship training ironically does not necessarily favour working-class youth" (Taylor 2008:409).

Immigrant status also seems to play a role. Immigrants make up about 8% of the respondents who took part in the 2007 National Apprenticeship Survey (NAS). According to the 2006 Census figure, immigrants

constitute approximately 20% of the overall Canadian population. Immigrant youth are thus strongly underrepresented in the skilled trades sector[10].
Gender also plays a role when youth consider the work they would like to do. Both cultural beliefs about gender and institutional constraints shape career-relevant decisions for women and men (e.g., McMullin 2010; Baird et al. 2008; Thiessen & Blasius 2002). This includes beliefs regarding skills and competence in relevant tasks as well as differences in preferences and intentions linked to family formation and lifestyle (Staff et al. 2010). For example, from a small sample of 292 young women, the following perspectives emerged related to skilled trades (WEST 2014:7):

- 25% think that women are not welcomed in the manufacturing sector
- 33% feel there are specific jobs in construction and manufacturing that only men can do
- 63% believe manufacturing is dirty and requires a lot of physical strength
- 45% had been told they should not do a certain job because it is a 'man's' job

There is evidence that those who start with a strong self-image as a tradesperson—an orientation arguably more likely to be found among young, white men—may have more positive training and employment outcomes (e.g., Taylor 2008). For young females in male-dominated fields, a lack of female role models can contribute to doubts and uncertainty that interfere with a self-image as a 'good' worker or student. Young female and visible minority youth may receive 'lip service' regarding equality; however, the reality of the workplace culture can be quite different. For example, the lone, young, women carpenter in Taylor's small, qualitative study was told to expect to perform better than 'the boys' and to roll with sexist comments and attitudes (2008:403). Without parents, allies, and role models, these situations can be difficult for young people to navigate and may contribute to attrition from apprenticeship programs.

An individual can express an interest in becoming a tradesperson, but his or her understanding of what this actually means, usually gained through family, school, and work, can vary immensely. When faced with 'real life' experience, they have to modify their expectations accordingly. This experience is influenced by socioeconomic status (SES), gender, and race/ethnicity, among other factors (e.g., McMullin 2010; Baird et al. 2008), which impact the ability to explore educational and career pathways, the receipt of guidance, and availability of opportunities (jobs as well as prolonged education and delaying school-to-work transitions).

Influences and influencers

There are direct influencers that young people turn to for advice and guidance on educational and occupational matters. This includes personal sources such as family (especially parents) or friends and economic sources like employers or coworkers, as well as teachers and guidance counsellors (e.g., CCDA 2010; NS 2010; Taylor 2008; Schnabel et al. 2002; Kracke 2002). The dispositions and perspectives of these individuals, also conditioned by cultural and institutional factors, contribute to the formation of youth interests and the constellation of their aspirations, expectations, and outcomes. For example, youth with family members in the trades may be more inclined to consider a career in the field than those who lack that kind of exposure.

[10] Laryea, Samuel A., and Medu, Kemi . (2011). *National Apprenticeship Survey: Participation of Women, Immigrants, and Aboriginal People in Apprenticeship Programs*. Ottawa: Canadian Council of Directors of Apprenticeship.http://www.red-seal.ca/docms/nas_participation_eng.pdf

At the same time, these influencers require reliable information about skilled trades in order to provide adequate guidance and support. There are indications that, although improving, myths and misinformation about trades and apprenticeship persist:

Myth	Reality
The skilled trades are not for students with good grades.	If you like to work with your hands and are creative, the skilled trades are a good choice. These careers require people with strong skills in reading and writing, math and science.
Jobs in the trades are dead-end jobs.	Apprenticeship is only the first step to a career in the trades. Once certified you can expect opportunities to advance to supervisory roles, management or even open your own business. There are many possible interesting choices that the trades support.
Women don't have the physical strength to perform skilled trades.	Skilled trades require dexterity, stamina, good hand-eye coordination and balance—not just physical strength. Women make excellent tradespeople.

Source: CIT/Careers in Trades (2014)

In the broader context of the skilled trades, parents, teachers and friends tend to have a poor image of trades and do not encourage young people to pursue this pathway (Watts-Rynard 2014). For example, in a small survey of parents and high school students in Nova Scotia, 47% of parents selected community college and 45% university as their most preferred option for their child after high school, while just 3% chose apprenticeship training (NS 2010).

Importantly, influencers are often those who can provide or facilitate relevant exposure and experiences. Early exposure to tasks or technologies related to a particular occupational field can contribute to an interest in and affinity for related work (e.g., McMullin et al., 2007). Similarly, a student's decision to become an apprentice may be influenced by early exposure to trade-related work made possible via family or other connections (e.g., Taylor 2008). 34% of respondents in the 2007 NAS took high school programs that were vocational in nature, while 28% indicated previous work experience and 25% reported a hobby as a source of influence (CCDA 2010). Similarly, a small survey of high school students found that interest in the trades was influenced by whether or not their high school offered vocational classes and whether the student knew someone working in the trades (Noria 2014). Youth often do not have an opportunity to get a 'feel' for working with tools, which can contribute to disinterest by way of unfamiliarity or discomfort.

Parents in particular have a very strong influence not only on views of occupations and careers, but also on educational options and choices, in part through the resources they can provide. Supportive parental behaviours have been found to promote information-seeking behaviours in children, which is relevant to career and education related decision-making (e.g., Kracke 2002). Furthermore, young people tend to share their parents' views and values on major life issues, including work and education, and also turn to them for guidance (Otto 2000). Parents also impart a more subtle influence in establishing a sense of hierarchy when it comes to both educational pathways and the reputation of postsecondary institutions (e.g., Diamond et al. 2013) as well as vocational habitus (the habits, values, dispositions and expectations of occupational groups).

Research also suggests there may be a gendered aspect to parental influence, with mothers apparently playing a more prominent role than fathers. In an American study (Otto 2000), not only were mothers

most aware of their children's career interests and abilities, they also communicated more frequently with their children about educational requirements and held higher educational expectations. Both young men and young women felt their parents held expectations that they would attain a postsecondary education degree, with young women in particular reporting the highest perceived expectations-attaining a graduate or professional degree (2000:115). Despite fathers perhaps more frequently being the role models for hands-on, trades-related work, it is mothers who have pointed career discussions and set expectations (e.g., Taylor 2008; Otto 2000). Given the central role of mothers in supporting the career-related decisions of their offspring and the fact that many skilled trades are male-dominated, there may be implications for the dissemination of information to foster greater interest in the trades.

The review of select literature has provided context for the analysis to follow and this concluding section summarizes key findings from the literature and raises some outstanding questions and challenges. Despite the presumed lack of awareness of skilled trades' careers, many people seem to recognize that trades jobs are 'good' jobs and this perception has been improving over time. However, there is some evidence that this perception is not necessarily influencing the advice given to youth by career influences, such as parents and teachers. It may very well be that it is too soon to tell.

As Goyder (2009) notes, there seems to be renewed prestige and dignity being assigned to manual work. Eventually, this perspective, alongside labour market information and return-on-investment facts, trickles down and can better appeal to any 'rational' elements of career decision-making, influencing behaviour and choices more directly. The Nova Scotia Youth Decision Survey reports a noteworthy shift in parents' perceptions of PSE options in just five years. In 2004, 55% chose university as the preferred choice for their children; by 2009, the largest proportion (47%) selected college. Unfortunately, apprenticeship still lags considerably as a preferred choice (NS 2010).

Both individual and social factors contribute to youth orientations towards various educational and career options. Earlier exposure to trades-related work is particularly salient: positive perceptions about the trades and exposure to trades-related work are correlated. For example, in the Rigid study (Noria 2014), 14% of those who had taken a vocational course hoped to have a future career in the trades and 77% would consider it, compared with the respective 6% and 39% of students in general. Respondents in the Skills4BC forum (2013) also encouraged earlier exposure to hands-on, trades-related work as well as updating equipment in schools, providing more experiences for younger children, and using positive role models and community resources to help young people develop relevant skills as further strategies to promote interest in the trades. Of course, better labour market information and the use of targeted labour market programming to create opportunities for under-represented groups is another important strategy.

One of the reported challenges with mixed empirical support is an apparent lack of clarity when it comes to apprenticeship as a training pathway. The CAF study (2013) indicates that most students "understand the apprenticeship process" while other reports suggest there may be confusion. For example, only about a third of parents and teachers in the Nova Scotia study reported knowing what a student would have to do to become an apprentice (NS 2010:11). In North America, there are generally weaker links between school and work. As it currently stands in Canada, university and college represent more structured pathways, with clear entry requirements and relatively straight-forward application processes. Canada's apprenticeship systems do not have as strong an institutionalized structure and there is relatively weak employer involvement. Thus, would-be apprentices are often left to their own

devices to secure an employer. Compared with other PSE options, this may be less appealing for youth who are seeking more established educational pathways.

Apprentices may need to build networks and contacts as well as related experience in order to secure a spot with an employer, thus contributing to later entries. The earn-as-you-learn model may simply be more appealing to older entrants. One of the attractive features of apprenticeship and other vocationally-oriented institutional pathways is that they are, in theory at least, seamless, moving people from school to work. However, in the Canadian context, are many youth ready for full-time work at age 18 or younger? Attending PSE is becoming ubiquitous as graduating from high school, and youth need to be sufficiently informed about the various PSE pathways and their related labour market opportunities.

While many stakeholders argue that apprenticeship is a 'first-choice' postsecondary option, simply saying so does not make it so. In fact, among youth and influences, there is considerable evidence to the contrary. Postsecondary education in Canada is hierarchical insofar as entry requirements are stratified by option, with university at the top demanding the highest grades, followed by college. However, career decisions are not made solely on the basis of performance in school nor in a vacuum; young people weigh individual strengths and preferences against external influences. Thus, campaigns to win hearts and minds may need to be more sophisticated, appealing to non-rational as well as rational elements of decision-making processes. Some proponents support greater push-back against an education establishment that assumes the best and brightest must go to university (e.g., Spence 2012; Côté & Allahar 2007). This reflects another important challenge that has also been understated and understudied, relating to the skill levels of youth entering apprenticeship. Yet, relatively high numeracy and literacy skills are required to complete many apprenticeship programs. This current analysis of the Youth Attitudes towards the Trades module from PISA will examine these factors in greater detail.

Data and Results

This report makes use of data from the 2012 PISA to examine the intentions of 15-year-old students to pursue a career in the trades (referred to as jobs such as an electrician, crane operator, plumber or mechanic in the questionnaire), their perceptions about careers in the trades and possible influencers (for more information, the questionnaire can be found in Annex C). PISA is an international survey designed to provide policy-oriented international indicators of the skills and knowledge of 15-year-old students and shed light on a range of factors that contribute to successful students, schools, education systems and learning environments. In 2012, approximately 470,000 students in 65 countries and economies participated in PISA. In Canada, approximately 21,000 15-year-olds from about 1,000 schools across the 10 provinces participated.

PISA 2012 was the fifth cycle of PISA to be completed, and it focused on mathematical literacy. With an emphasis on mathematics, PISA 2012 included information on general mathematics as well as four content knowledge areas (Change and Relationships, Space and Shape, Quantity and Uncertainty and Data) and three process areas (Formulating situations mathematically; Employing mathematical concepts, facts, procedures, and reasoning; and Interpreting, applying, and evaluating mathematical outcomes). PISA 2012 also reported on reading, science and problem solving performance but as minor domains, with results only measured at an overall, rather than a detailed, level.

The assessment was performed in schools in April and May 2012. All students completed a two-hour paper and pencil test, a 30-minute background questionnaire providing information about themselves

and their homes, while school principals completed a 20-minute questionnaire about their schools. In addition, an 80-minute computer-based assessment was administered to a subset of students in mathematics, reading and problem solving.

As part of PISA 2012, national options could also be implemented. Canada chose to add a ten-minute questionnaire as a national component to collect more information on students' attitudes toward jobs in the trades. This questionnaire, developed by Employment and Social Development Canada (ESDC) jointly with the Canadian Council of Directors of Apprenticeships (CCDA), was unique to Canada and the first to be able to link youth skills to their awareness and attitudes of the trades. It provides information on the opinions held by 15-year olds about pursuing a career in trade-type occupations, the level of awareness they possess about these types of occupations and the sources of that awareness.

Students included in the final PISA sample for a given country were chosen randomly. However, the selection probabilities of the students vary and as a result, survey weights are incorporated into the analysis to ensure that each sampled student represents the appropriate number of students in the full PISA population. As well, a replication methodology was employed to estimate the sampling variances of PISA parameter estimates. This methodology, known as the Balanced Repeated Replication (BRR) and which uses the particular variant known as Fay's method, was used to account for the complex sampling design used by the survey. More specifically, the method developed is a general bootstrap methodology for two-stage stratified sampling[11].

The first part of this section provides some descriptive results on student intentions to pursue a career in the trades, sources of information consulted by students to gather information about careers in the trades, perceptions held by students of a career in the trades and parent attitudes about careers in the trades. In particular, this part provides information on how these variables differ[12] across different student and school characteristics, such as location of the school, gender, family socio-economic status and immigrant status. Furthermore, while tables and graphs are included in the main body of the report, more comprehensive tables with main results and standard errors can be found in Appendix A at the end. The second part of this section provides results from our econometric analysis which looks at which factors are associated with a) a student's intention to pursue a career in the trades, b) a student's perception of a career in the trades and c) parent attitudes about careers in the trades.

Descriptive Analysis

Future education and career aspirations of Canadian 15-year-old students

When asked about their future education aspirations, the majority of students reported that they would like to go to university, with slightly more than 40% aspiring to more than one university degree. 5% of students reported that the highest level of education to which they aspire is an apprenticeship or some trade or vocational diploma or certificate. There are marked variations across provinces, with the

[11] More information on survey weighting in PISA can be found in: OECD (2013) *PISA 2012 Technical Report*, PISA, OECD Publishing.

[12] When comparing results across population subgroups, a degree of uncertainty is considered in order to determine if differences truly exist. Standard errors and confidence intervals are used as the basis for the comparative statistical test (t-test) used in this report. This test identifies, with a known probability, whether actual differences are likely to be observed in the populations being compared. Only statistically significant differences at the .05 level are reported in this report, which implies that the probability is less than .05 that the observed difference could have occurred because of sampling or measurement error.

proportion of students aspiring to a trade or vocational diploma or certificate, or an apprenticeship varying from 2% in Ontario to 10% in Newfoundland and Labrador and Saskatchewan, while the proportion of students aspiring to more than one university degree ranged from 25% in Quebec to over 50% in Newfoundland and Labrador and Ontario (Table 1).

Table 1: Education aspirations, by province

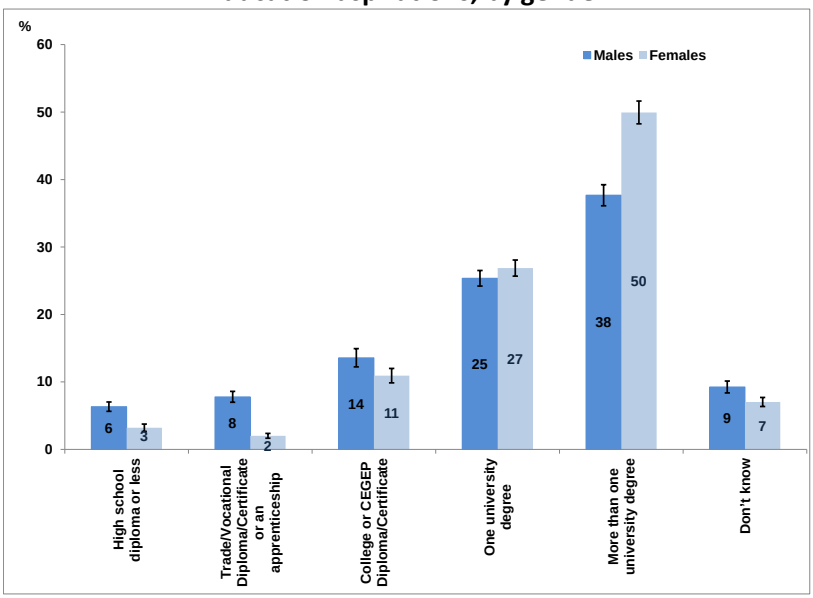
Canada and provinces	Highest level of education student would like to get				
	High school or less	Trade/Vocational Diploma/Certificate or an apprenticeship	College or CEGEP	One university degree	More than one university degree
	(%)				
Canada	**5**	**5**	**12**	**26**	**44**
Newfoundland and Labrador	5	10*	9*	17*	51*
Prince Edward Island	6*	4	12	18*	48*
Nova Scotia	6*	8*	12	21*	41
New Brunswick	6	6*	9*	25	43
Quebec	6*	8*	15*	39*	25*
Ontario	3*	2*	14	21*	52*
Manitoba	8*	5	9*	20*	46
Saskatchewan	7*	10*	7*	23*	42
Alberta	6	6	9*	24*	46
British Columbia	4	5	8*	25	49*

Source: PISA 2012, Youth Attitudes towards the Trades
*Statistically significantly different from the Canadian average at the 0.05 level.

There are also significant variations across genders (Figure 1), with a higher proportion of boys (8%) than girls (2%) reporting that they would like to obtain an apprenticeship or some trade or vocational diploma or certificate while a higher proportion of girls (50%) than boys (38%) aspired to more than one university degree.

Around 80% of students were able to identify work or a career they would be interested in at 30 years old (see table A.2 in appendix A). Slightly more than two-thirds of these students reported wanting a professional career, mainly in the health, legal, social and cultural areas and science and engineering. Results by gender show that a higher proportion of girls were interested in professional careers in the health care and legal, social and cultural areas, while a higher proportion of boys were interested in professional careers in science and engineering, followed by careers in craft and related trades.

Figure 1
Education aspirations, by gender

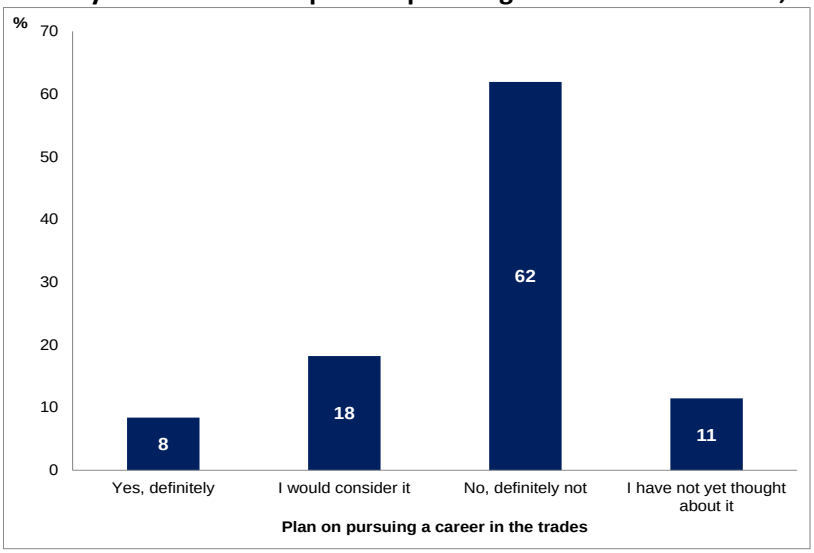


Source: PISA 2012, Youth Attitudes towards the Trades
Note: Error bars represent confidence intervals.

Pursuing a career in the trades

When asked more specifically whether they are planning to pursue a job in the trades, results point to a small level of interest among 15-year-old Canadian students (Figure 2; Table A.3). Overall, 8% of students reported that they definitely plan on pursuing a job in the trades while 62% reported they are definitely not planning on pursuing a job in the trades. Close to 30% of students were undecided, with about 18% of students reporting that, although they were not definitely planning on pursuing a job in the trades, they would nevertheless consider it and 11% reporting that they didn't know whether they planned on pursuing a career in the trades.

Figure 2
Canadian 15-year-old students plan on pursuing a career in the trades, Canada



Source: PISA 2012, Youth attitudes towards the trades

Location

Across provinces, the proportion of students planning a career in the trades varied from 7% in British Columbia to 12% in Newfoundland and Labrador and Saskatchewan while the proportion not planning a career in the trades varied between 51% in Saskatchewan and 66% in Quebec (table A.4).

A further breakdown by major urban and non-major urban center reveals that across Canada, a higher proportion of students attending schools in non-major urban centers were planning a career in the trades compared to their peer attending schools in major urban centers (table 2). For those provinces in which the sample was sufficiently large to allow for separate reporting by major and non-major urban breakdown, a statistically higher proportion of students attending schools in non-major urban centers in Quebec, Ontario, Saskatchewan, Alberta and British Columbia were definitely interested in a career in the trades relative to their peers attending schools in major urban centers.

Table 2: Proportion of student's interested in pursuing a career in the trades, by urban setting of the school and gender of the student, Canada and provinces

Canada and provinces	Overall	Urban setting of the school		Gender	
		Major (100k+) (reference)	Non-major (<100k)	Boys (reference)	Girls
	Proportion				
Canada	**8**	**6**	**11***	**14**	**2***
Newfoundland and Labrador	12	c	14	22	c
Prince Edward Island	10	--	--	17	c
Nova Scotia	10	c	10	18	c
New Brunswick	11	10	11	19	c
Quebec	8	6	9*	14	2*
Ontario	8	6	10*	13	3*
Manitoba	11	10	13	20	c
Saskatchewan	12	8	14*	21	c
Alberta	10	7	15*	17	3*
British Columbia	7	5	9*	12	c

* Statistically significant differences compared to the reference category at the 0.05 level.
c There are too few observations or no observation to provide reliable estimates (i.e. there are fewer than 30 students).
Source: PISA 2012, Youth attitudes towards the trades

Gender

Close to 80% of girls reported definitely not planning to pursue a job in the trades while 2% of girls were definitely planning on pursuing a job in the trades (table 3). For boys, the proportions were 45% and close to 14%, respectively. Jobs in the trades were referenced as jobs such as an electrician, crane operator, plumber or mechanic, which are predominantly 'male-dominated' trades that may have not resonated with female respondents and could explain some of the gender bias in the responses to this question.

Table 3: Student interest in pursuing a career in the trades by gender, Canada

Plan on pursuing a career in the trades	Boys	Girls	Difference (B-G)
	Proportion		
yes, definitely	14	2	12*
would consider it	28	8	20*
no, definitely not	45	79	-34*
not yet thought about it	13	10	2*

* Statistically significant differences at the 0.05 level.

More boys than girls were undecided, with 28% of boys indicating they would consider a career in the trades and 13% reporting that they had not yet thought about it. Less than 1 in 5 girls had either not yet thought about whether they were planning to pursue a career in the trades or reported that they may consider it.

Across provinces, British Columbia (12%) had the smallest proportion of boys definitely planning a career in the trades while Newfoundland and Labrador (22%) had the largest proportion. There was not much variation in the proportion of girls definitely planning a career in the trades across the provinces (Table 2). More variation was observed among students that would consider pursuing a job in the trades, with the proportion ranging between 20% in Quebec and 40% in Saskatchewan among boys, while the proportion varied between 4% in Quebec and 15% in Newfoundland and Labrador for girls (Table 4).

Table 4: Proportion of students that would consider pursuing a career in the trades by gender, Canada and provinces

Canada and provinces	Boys	Girls	Difference (B-G)
	Proportion		
Canada	**28**	**8**	**20***
Newfoundland and Labrador	32	15	18*
Prince Edward Island	28	7	21*
Nova Scotia	36	10	26*
New Brunswick	30	8	22*
Quebec	20	4	16*
Ontario	29	9	20*
Manitoba	30	11	19*
Saskatchewan	40	12	27*
Alberta	28	11	17*
British Columbia	32	9	23*

* Statistically significant differences at the 0.05 level.

Language of the school system

In 7 Canadian provinces (Nova Scotia, New Brunswick, Quebec, Ontario, Manitoba, Alberta and British Columbia), the sample was sufficiently large to allow for separate reporting for students in the Anglophone and Francophone school systems. For Canada, excluding Quebec, the proportion of

students interested in the trades in the Anglophone school system was not statistically different from the proportion in the Francophone system (table 5) although a higher proportion of students in the Francophone school system than in the Anglophone school system reported definitely not planning on pursuing a career in the trades. In Quebec, a higher proportion of students in the Francophone school system were interested in pursuing a career in the trades relative to students in the Anglophone school system, while no statistical difference existed in the proportion of students definitely not planning a career in the trades between the two language school systems. In both Quebec and the rest of Canada, a higher proportion of students in the Anglophone school system reported being open to considering a career in the trades relative to their peers in the Francophone school system.

Table 5: Interest in pursuing a career in the trades by language of the school system, Quebec and the Rest of Canada

Plan on pursuing a career in the trades	Quebec			rest of Canada		
	School system language			School system language		
	English	French	Difference (E-F)	English	French	Difference (E-F)
	(%)					
yes, definitely	6	8	-3*	8	10	-1
would consider it	17	11	6*	20	14	6*
no, definitely not	63	66	-3	61	64	-3*
not yet thought about it	14	14	0	11	12	-2*

* Statistically significant differences at the 0.05 level.

Family background

Overall, a higher proportion of socio-economically disadvantaged students planned on pursuing a career in the trades relative to their more socio-economically advantaged peers (table A.7). As well, a higher proportion of non-immigrant students definitely planned on pursuing a career in the trades relative to first- and second-generation immigrant students[13] (table A.8).

Skills

The willingness of students to pursue a career in the trades also varied according to their PISA scores (Figure 3). 15-year-old students planning on pursuing a career in the trades had an average mathematics score of 473, which was 58 points lower than the average mathematics score of 531 held by students definitely not interested in a career in the trades, equivalent to more than one full year of formal schooling[14]. At the provincial level, in mathematics, students not planning a career in the trades outperformed their peers who were definitely planning a career in the trades by anywhere between 26 points in Saskatchewan to 77 points in Newfoundland (equivalent to nearly two full years of formal schooling) (table A.9).

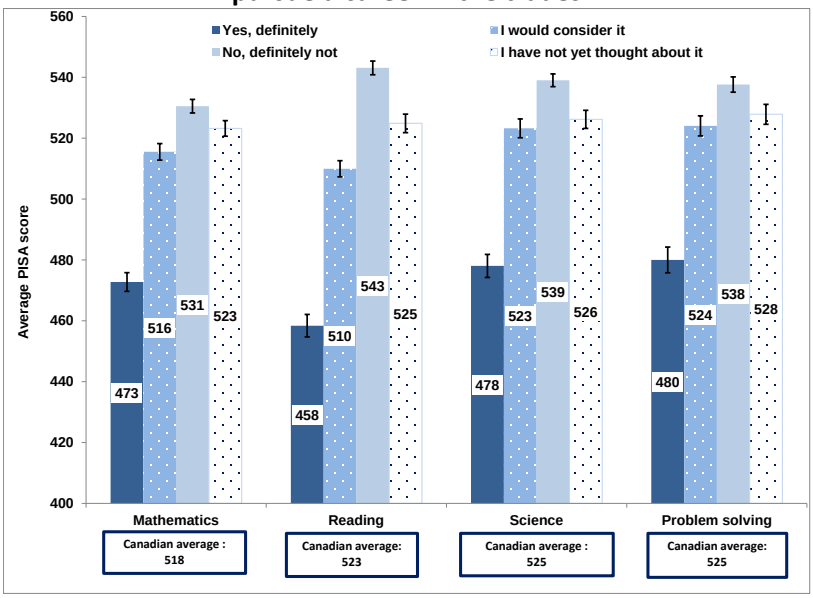
[13] PISA distinguishes three types of students according to their immigrant status: i) native students: students born in the country of assessment with at least one parent born in the country of assessment or foreign-born students with at least one parent born in the country of assessment; ii) second-generation students: students born in the country of assessment with both parents foreign-born; and iii) first-generation students: foreign-born students with both parents also foreign-born. Students with an immigrant background include second- and first-generation students.

[14] 41 points is equivalent to one full year of formal schooling. For more information, please see Table A1.2 in OECD. (2013). *PISA 2012 Results: What students know and can do: Student performance in mathematics, reading and science*. Volume I. Paris: Author. Retrieved from http://www.oecd.org/pisa/keyfindings/pisa-2012-results-volume-I.pdf

There was an especially large disparity in reading performance between students who were definitely planning a career in the trades and those who were not. Students who were definitely planning a career in the trades had an average reading score 85 points below that of their peers who were not, which is equivalent to more than two full years of formal schooling. Across the provinces, the difference between the two groups ranged from 66 points in Saskatchewan and British Columbia to 113 points in Newfoundland and Labrador (equivalent to close to three full years of formal schooling) (table A.10).

In problem solving, students planning a career in the trades scored 58 points below the average of their peers not planning a career in the trades. Across provinces, the difference ranged from 19 points in Prince Edward Island to 98 points in Newfoundland and Labrador (table A.11). Similar results were observed for science at the national level (table A.12), with the difference in performance ranging from 38 points in Saskatchewan to 80 points in Newfoundland and Labrador.

Figure 3
Average PISA scores in mathematics, reading, science and problem solving, by a student's plan to pursue a career in the trades



Note: Errors bars represent confidence intervals.
Source: PISA 2012, Youth attitudes towards the trades

It is worth noting that while there is a quite significant gap in performance between students who are 'definitely planning' and those that are 'definitely not planning' a career in the trades, those that responded that 'they would consider it' are much closer in terms of their performance to those saying that they would 'definitely **not**' pursue a career in the trades than they are to those who would 'definitely pursue' such a career.

PISA developed useful benchmarks relating a range of scores to levels of knowledge and skills measured by the assessment. Although these levels are not linked directly to any specific program of study, they provide an overall picture of students' accumulated proficiency at age 15. A summary description of the proficiency levels can be found in volume 1 of the OECD report on PISA 2012 Results[15] . In PISA 2012,

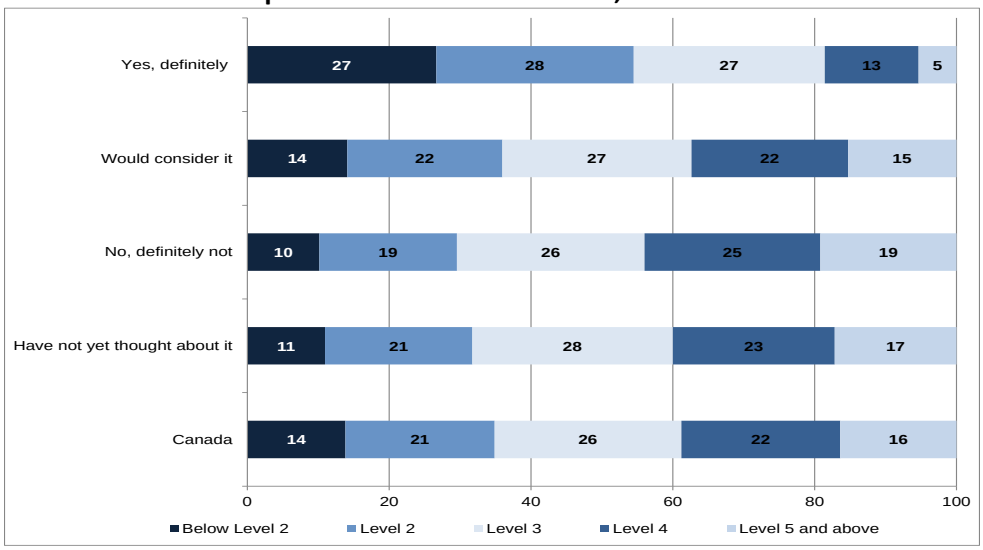
[15] OECD. (2013). *PISA 2012 Results: What students know and can do: Student performance in mathematics, reading and science*. Volume I. Paris: Author. Retrieved from http://www.oecd.org/pisa/keyfindings/pisa-2012-results-volume-I.pdf

mathematical literacy was assessed on a six-level scale, with Level 1 being the lowest proficiency level assessed by PISA and Level 6 being the highest. Furthermore, Level 2 is considered the baseline level of proficiency that is required to participate fully in modern society.

Across Canada, a significantly higher proportion of students planning a career in the trades scored below Level 2 in mathematics when compared to their peers not planning a career in the trades (Figure 4; Table A.13). More specifically, slightly more than a quarter of students planning a career in the trades performed below Level 2 in mathematics compared to 10% among students not planning a career in the trades. Across provinces, among students planning a career in the trades, the proportion of students performing below Level 2 in mathematics ranged from 20% in Quebec and Saskatchewan to 45% of students in Newfoundland and Labrador and Prince Edward Island, while among students not planning a career in the trades, this proportion ranged from 8% in Quebec to 21% in Prince Edward Island (table A.14).

As well, a significantly lower proportion of students planning a career in the trades (5%) scored at Level 5 and above in mathematics, relative to their peers not planning a career in the trades (19%). Across the provinces, the proportion of students planning a career in the trades reaching level 5 or above was too small to report for all provinces, while among students not planning a career in the trades, the proportion ranged from 7% in Prince Edward Island to 26% in Quebec (table A.14).

Figure 4
Distribution of students by proficiency level on the overall mathematics scale, by a student's plan to pursue a career in the trades, Canada



Source: PISA 2012, Youth attitudes towards the trades

Engagement with school

Student engagement with school also seems to be associated with a student's plan in pursuing a career in the trades. Close to 50% of students definitely planning a career in the trades had arrived late for school in the two weeks prior to the PISA assessment, compared to the Canadian average of 43% and the average of 40% among students definitely not planning a career in the trade (table A.15). As well, close to 42% of students who reported definitely planning to pursue a future career in the trades had

skipped classes or days of school without authorisation, compared to the Canadian average of 35% and the average of 34% among students who were definitely not planning a career in the trades. In terms of students willing to consider a career in the trades, relative to their peers definitely planning a career in the trades, they were as likely to report arriving late for school and less likely to report skipping classes or days of school without authorisation. However, they were more likely to lack punctuality and skip classes than their counterparts who were definitely not interested in pursuing a career in the trades.

Students definitely planning in a career in the trades also had a lower sense of belonging at school, in terms of how connected they feel with their school and peers, than students definitely not planning a career in the trades (Table A.16). Indeed, they were more likely to report that at school they feel like outsiders and lonely and they were less likely to report feeling like they belong at school, happy at school and satisfied with their school. On the other hand, students willing to maybe consider a career in the trades shared a similar sense of belonging at school with their peers that were definitely not planning in a career in the trades.

Students definitely planning a career in the trades also had poorer attitudes toward school relative to their peers definitely not planning a career in the trades, with close to 40% reporting that school has done little to prepare them for adult life and 22% reporting that school has been a waste of time, compared to 22% and 9% of students not planning a career in the trades, respectively (table A.17). Students willing to consider a career in the trades were less likely than their peers definitely planning a career in the trades and more likely than those definitely not planning a career in the trades to agree with these 2 statements. As well, relative to students definitely not planning a career in the trades, students definitely planning a career in the trades were less likely to agree that trying hard at school will help them get a good job, that trying hard at school will help them get into a good college and that trying hard at school is important and they were also less likely to agree that they enjoyed receiving good grades (table A.18). Students willing to consider a career in the trades were as likely as those not planning a career in the trades to agree with these statements, although they were less likely to agree that trying hard at school is important.

Internship programs

Early exposure to trades-related work has been shown to be an important factor in shaping student perceptions of the trades (Noria 2014). In the 2012 PISA, slightly more than 9% of 15-year-old students reported having done an internship[16], with the proportion ranging from 5% in Ontario to 21% in Quebec (table A.19).

Students who reported having done an internship had lower PISA scores that those who did not (table A.20). In Canada, students who did not do an internship outperformed their peers who had by 13 points in mathematics, 33 points in reading and science and 26 points in problem solving, and this was true for all provinces, with the exception of Quebec. In Quebec, no significant difference in performance was observed between those who had done an internship and those who had not.

Among the students who had done an internship, twice as many students (16%) reported that they would definitely pursue a career in the trades compared to students who had not done an internship (8%) (table A.19). Across the provinces, the difference in the proportion of students who were

[16] In the PISA 2012 questionnaire on educational career, students were asked "Have you done any of the following to find out about future study or types of work?", with one of the choices being *an internship*. Possible responses were "*yes*" or "*no, never*".

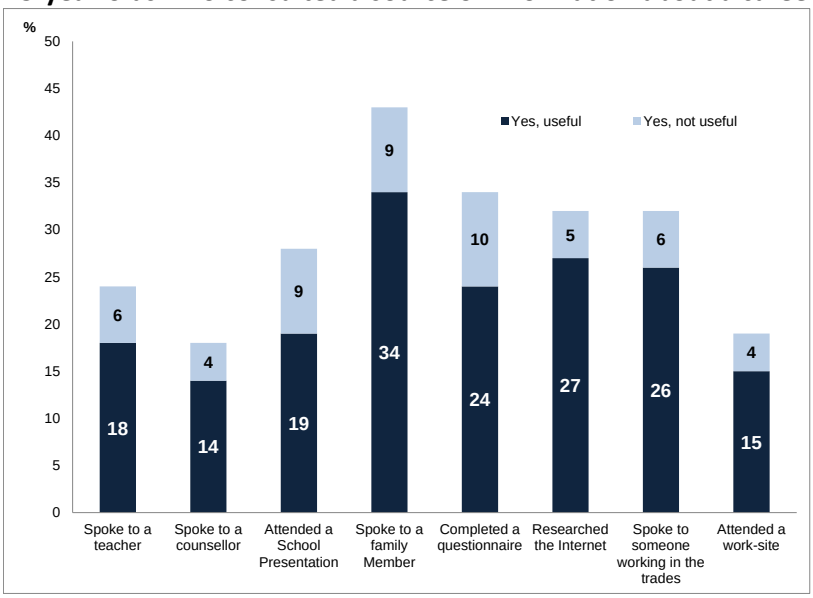
interested in a career in the trades between students who had done an internship and those who had not ranged from 2 percentage points in Quebec to over 20 percentage points in the Atlantic provinces and Manitoba.

Sources of information about a career in the trades

In the 2012 PISA, students were asked a series of questions about whether they had consulted different sources of information about a future career or job in the trades. Furthermore, if they had, they were asked whether it was useful or not. The choices of source of information included a teacher, a counsellor, a family member, a questionnaire about interests and abilities, the internet, someone working in the trades, attending a worksite, and attending a school presentation or course about the trades.

Overall, close to 62% of Canadian students reported looking for career information about the trades, with the majority finding the information useful (table A.21 and table A.22). Furthermore, as can be seen in figure 5, results show that the most popular source of information consulted by 15-year-old Canadian students was a family member (44%). Students also completed a questionnaire (34%) to find out about their interests and abilities in a career in the trade and this was the second most popular mechanism used by students, followed by the internet (33%) and talking to someone working in the trades (32%). In terms of resources provided by the school, 28% of students attended a school presentation or course about jobs in the trades, 24% spoke to a teacher about a career in the trades while 18% spoke to a career counsellor. In terms of the usefulness of the information obtained, the internet was found to be the most useful source of information, with 83% of students who used it as a source of information reporting it was useful, while the least useful source of information were school presentations or a course about jobs in the trades (68%).

Figure 5
Proportion of 15-year-olds who consulted a source of information about a career in the trades



Source: PISA 2012, Youth attitudes towards the trades

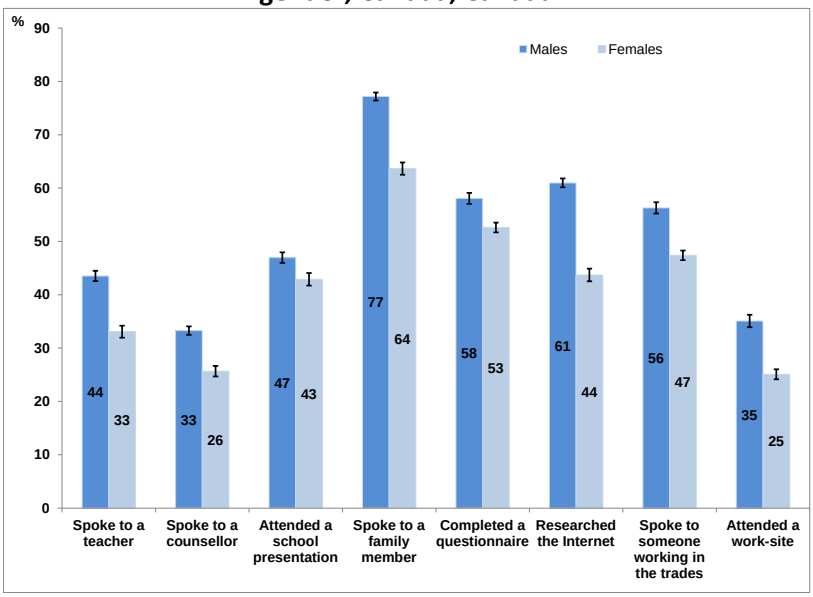
Location

Provincially, the proportion of students who consulted at least one source of information about the trades varied between 57% in New Brunswick and 65% in Newfoundland and Labrador (table A.21). There were no significant differences in the proportion of students consulting information about the trades between major (61%) and non-major urban centers (62%) (table A.23).

Gender

In Canada, 72% of boys consulted at least one source of information about a career in the trades compared to 52% of girls (table A.24). Across the provinces, the proportion of boys looking for information about a career in the trades ranged from 70% in Prince Edward Island and Ontario to 76% in Saskatchewan. For girls, the proportion varied between 41% in Prince Edward Island and 55% in Quebec. Among those who researched information about careers in the trades, the most cited source of information consulted was a family member for both boys (77%) and girls (64%), followed by the internet (61%) for boys and filling out a questionnaire about interests and abilities in a future career in the trades (53%) for girls (table A.25; Figure 6). For boys (around one-third) and girls (around 1 in 4), the least cited source of information was a counsellor and attending a work-site visit with someone working in the trades.

Figure 6
Source of information consulted by students who are looking for information about the trades, by gender, Canada, Canada



Note: Error bars represent confidence intervals.
Source: PISA 2012, Youth attitudes towards the trades

Language of the school system

In both Quebec and the rest of Canada, 64% of students in the Francophone school systems reported consulting at least one source of information about a career or job in the trades, compared to 58% of students in the Anglophone school systems in Quebec and 61% of students in the Anglophone school systems in the rest of Canada (table A.26). At the provincial level, differences in the proportion of students consulting information about the trades between Francophone and Anglophone school

systems were significant in Ontario and Alberta, all in favour of the Francophone school system (table A.27).

For those students that consulted a source of information about a career or job in the trades, in both Quebec and the rest of Canada, a higher proportion of students in the Francophone school system consulted a counsellor relative to their peers in the Anglophone system, while a higher proportion of students in the Anglophone school system than students in the Francophone school system researched the internet or talked to a family member (table A.26). As well, in Quebec, relative to their peers in the Francophone school system, a higher proportion of students in the Anglophone school system talked to a teacher about a career in the trades or attended a work-site. In the rest of Canada, relative to students in the Anglophone school system, a higher proportion of students in the Francophone school system attended a school presentation or took a course about the trades and a higher proportion spoke to someone working in the trades.

Family background

The proportion of students looking for information about the trades varied across their socio-economic status (table 6). Across Canada, two-third of students belonging to the bottom quarter of the PISA socio, economic and cultural index consulted at least one source of information about a career in the trades compared to slightly more than 50% of students belonging to the top quarter of the index. In all provinces, with the exception of Prince Edward Island and New Brunswick, more students belonging to the bottom quarter of the PISA socio, economic and cultural index looked for information about the trades compared to their peer in the top quarter, and the difference ranged from 7% in Quebec to 14% in Newfoundland and Labrador. In both Prince Edward Island and New Brunswick, relative to other provinces, a smaller proportion of students from both the bottom and top quarter of the PISA socio, economic and cultural index looked for information about the trades, with the difference between the two quarters insignificant in both provinces.

Table 6: Proportion of students that consulted at least one source of information about a future career in the trades, by socio-economic status, Canada and provinces

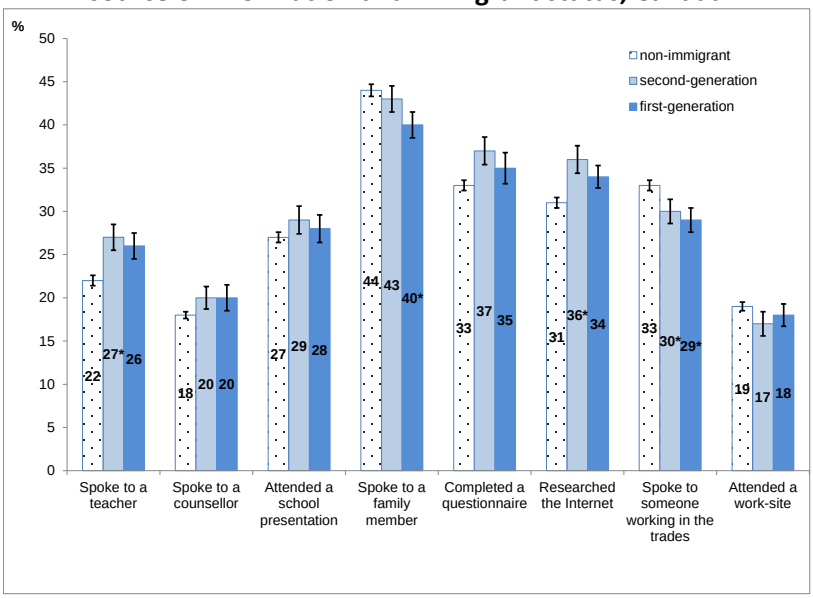
	PISA index of economic, social and cultural status (ESCS)				
Canada and provinces	**Bottom quarter**	**Second quarter**	**Third quarter**	**Top quarter**	**Difference (Top-Bottom)**
	Proportion				
Canada	**66**	**65**	**61**	**55**	**-11***
Newfoundland and Labrador	72	66	59	58	-14*
Prince Edward Island	56	59	57	50	-6
Nova Scotia	66	65	51	53	-13*
New Brunswick	60	56	59	51	-9
Quebec	67	65	62	59	-7*
Ontario	64	66	61	54	-11*
Manitoba	65	62	56	52	-13*
Saskatchewan	69	63	63	56	-13*
Alberta	68	66	64	55	-12*
British Columbia	66	62	62	54	-12*

* Statistically significant differences at the 0.05 level.
Source: PISA 2012, Youth attitudes towards the trades

As well, among students that consulted a source of information about the trades, relative to students in the top quarter of the PISA socio, economic and cultural index, a higher proportion of students in the bottom quarter consulted a teacher, a counsellor, a family member, the internet and someone working in the trades to obtain information about a future career in the trades. For both groups, the most cited source of information about the trades was a family member (table A.36).

While there was a lower proportion of immigrant students' definitely planning on pursuing a career in the trades relative to non-immigrant students, no differences were seen in terms of the proportion of students researching information about careers in the trades across Canada. Provincially, Ontario was the only province to observe a significant difference in the proportion of students consulting at least one source of information on a career or job in the trades between non-immigrant (60%) and second generation immigrant students (65%), and Manitoba was the only province to observe a significant difference between non-immigrant (57%) and first-generation immigrant students (70%) . Nevertheless, among students who were looking for information on careers in the trades, there were some differences between the different immigrant groups with respect to the different sources of information consulted. For example, relative to non-immigrant students, a higher proportion of immigrant students spoke to a teacher or researched the internet about a career in the trades (Figure 7). As well, a lower proportion of immigrant students spoke to a family member about a career in the trades (most likely due to a lack of family members with trades' experience) or spoke to someone working in the trades, relative to their non-immigrant peers.

Figure 7
Proportion of students who consulted a source of information about a future career in the trades, by source of information and immigrant status, Canada



Source: PISA 2012, Youth attitudes towards the trades
Note: *Statistically significantly different from non-immigrants at the 0.05 level. Error bars represent confidence intervals.

Skills

Students who had searched for information about the trades had an average reading score of 516, 30 points lower than the average reading score of 546 observed among students who had not searched for information about the trades (table 7). In mathematics, science and problem solving, the average score

point difference was around 20 points between the two groups in favor of those who hadn't looked for information about the trades.

In terms of the different sources of information consulted, the greatest disparity in PISA scores was observed between students who had spoken to a teacher or counsellor and those who had not. For example, among students who had spoken to a teacher about a career in the trades, the average reading score was 489, 51 points below the average score of students who had not spoken to a teacher about a career in the trades while the average score of students who had spoken to a career counsellor was 483, 55 points below that of students who had not spoken to a career counsellor. In mathematics and problem solving, the score point difference between students who had spoken to a teacher or counsellor and their peers who had not was around 40 points. These findings suggest that the discussions about careers in the trades between teachers and counsellors and students are happening in large part with students who have lower skill sets.

Table 7: Average PISA scores of 15-year-old students looking for information about the trades, by source of information, Canada

		Average PISA scores			
Source of Information		**Mathematics**	**Problem Solving**	**Reading**	**Science**
Spoke to a teacher	Yes	491	500	489	497
	No	532*	539*	540*	540*
Spoke to a counsellor	Yes	490	495	483	490
	No	530*	537*	538*	539*
Attended a school presentation/course	Yes	510	517	510	515
	No	527*	534*	535*	535*
Spoke to a family Member	Yes	508	515	507	514
	No	533*	541*	544*	542*
Completed a Questionnaire	Yes	511	520	511	516
	No	528*	535*	537*	537*
Researched the Internet	Yes	502	510	500	507
	No	532*	539*	541*	540*
Spoke to someone working in the trades	Yes	503	511	501	508
	No	531*	538*	541*	540*
Attended a work-site	Yes	489	496	484	495
	No	530*	537*	538*	538*
At least one source	Yes	515	523	516	521
	No	533*	540*	546*	543*

Source: PISA 2012, Youth attitudes towards the trades.
*Average PISA scores of 15-year-old students that responded 'No' are statistically significantly different from those that responded 'Yes' at the 0.05 level.

Source of information and interest in a career in the trades

Across Canada, 13% of 15-year-old students who consulted at least one source of information on the trades reported that they were definitely planning to pursue a career in the trades (table A.41). Across the different sources of information, the proportion of students planning a career in the trades varied from 15% of students who filled out a questionnaire or attended a presentation or course about the

trades to slightly more than 20% of students who consulted a teacher or counsellor or attended a worksite.

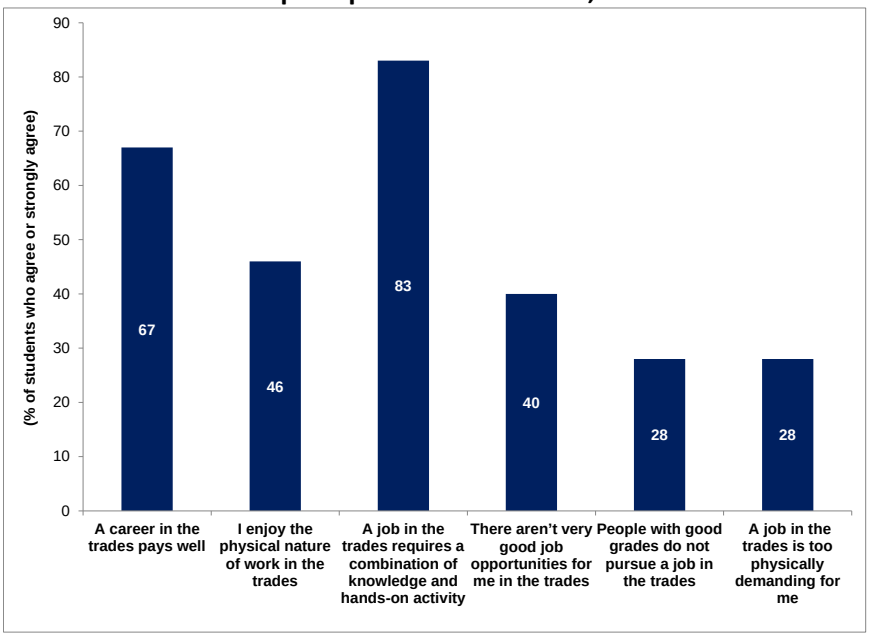
Close to 30% of students who had consulted a source of information about the trades reported that they would consider a career in the trades, compared to 5% of students who had not consulted any source of information about the trades. Nevertheless, among the students who had looked for information about a future career in the trades, close to 50% still reported that they were definitely not planning a future career in the trades.

Attitudes towards the trades

Youth perceptions of careers in the trades were evaluated as part of the PISA 2012 survey. More specifically, students were given the option to express their agreement with a number of statements about pay, educational requirements, available opportunities and the nature of skills trade work.

Across Canada, slightly more than two-third of students agreed that a career in the trades pays well, close to half would enjoy the physical nature of work in the trades and slightly more than 80% agreed that a job in the trades requires a combination of knowledge and hands-on activity (table A.42; Figure 8). On the other hand, four out of ten students did not see good job opportunities for themselves in the trades, while slightly more than a quarter of students believed that people with good grades do not pursue a job in the trades. As well, slightly more than a quarter of students found a job in the trades too physically demanding for them (table A.43; Figure 8). Interestingly, less than one-third of students saw a job in the trades as one with high pay potential, one they would enjoy and one with good job opportunities. Of these students, 46% reported definitely planning on pursuing a career in the trades.

Figure 8
Student perceptions of the trades, Canada



Source: PISA 2012, Youth attitudes towards the trades

Location

Provincially, a higher proportion of students in Saskatchewan generally agreed with the positive statements about the trades. On the other hand, a lower proportion of students in Prince Edward Island agreed that a career in the trades pays well or that a job in the trades requires a combination of knowledge and hands-on activity and a lower proportion of students in Quebec agreed that they would enjoy the physical nature of work in the trades (table A.42). A higher proportion of students in Quebec also believed that there aren't very good job opportunities for them in the trades and that people with good grades do not pursue a job in the trades (table A.43).

Student perceptions also seemed to differ depending on the urban setting of the school (table A.44). In general, relative to students attending schools in non-major urban centers, a higher proportion of students attending schools in major urban centers saw a career in the trades in a less positive light, with a higher proportion of the opinion that there aren't very good job opportunities for them in the trades, that people with good grades do not pursue a job in the trades and that a job in the trades is too physically demanding. As well, relative to their peers from non-major urban center schools, a smaller proportion of students attending major urban schools agreed that a career in the trades pays well or that they would enjoy the physical nature of work in the trades.

Gender

Across genders, in general, compared to girls, boys had a more positive perception of the trades (table A.46). However, close to a third of boys agreed that people with good grades do not pursue a job in the trades, 11 percentage points more than girls.

Language of the school system

Across the different language-school systems, results were mixed (table A.45). In Quebec, in general, relative to their peers in the Anglophone school system, students in the Francophone school system seemed to have a more positive perception of the trades. Indeed, a higher proportion of students in the Francophone school system than in the Anglophone system agreed that a career in the trades pays well and that a job in the trades requires a combination of knowledge and hands-on activity while a lower proportion agreed that a job in the trades is too physically demanding for them.

In the rest of Canada, students in the Anglophone school system seemed to have a more positive perception of a job in the trades relative to their peers in the Francophone system. More specifically, a higher proportion of students in the Anglophone school system agreed that they enjoy the physical nature of work in the trades and that a job in the trades requires a combination of knowledge and hands-on activity and a lower proportion agreed that that there aren't very good job opportunities for them in the trades and that people with good grades do not pursue a job in the trades.

Family background

Student perceptions of the trades also varied by some family background characteristics. Relative to non-immigrant students, a higher proportion of first- and second-generation immigrant students had a less positive perception of the trades (table A.48). As well, students from lower socio-economic status families had a more positive perception of the trades relative to their peers from higher socio-economic status families (table A.49).

Skills

Student perceptions of the trades were also correlated with their PISA scores. In general, students with more negative perceptions of the trades had higher average PISA scores than those with more positive perceptions (Table 8). However, there were a few exceptions. For example, students who agreed that people with good grades do not pursue a career in the trades and that a job in the trades is too physically demanding had lower average PISA scores in problem solving, reading and science relative to those that disagreed with these statements. As well, students who agreed that a job in the trades requires a combination of knowledge and hands-on activity had higher average PISA scores than those who disagreed with this statement.

Table 8: Student perceptions of the trade and average PISA scores of 15-year-old students, Canada

Statement		Average PISA scores			
		Mathematics	Problem Solving	Reading	Science
A career in the trades pays well	Yes	519	527	523	526
	No	532*	537*	541*	539*
I enjoy the physical nature of work in the trades	Yes	514	524	513	523
	No	534*	539*	548*	542*
A job in the trades requires a combination of knowledge and hands-on activity	Yes	529	537	535	537
	No	488*	494*	494*	494*
There are good opportunities for women to work in the trades	Yes	519	529	526	529
	No	530*	532	534*	531
There aren't very good job opportunities for me in the trades	Yes	525	531	535	531
	No	521	528	523*	529
People with good grades do not pursue a job in the trades	Yes	524	526	523	527
	No	524	533*	533*	533*
A job in the trades is too physically demanding for me	Yes	511	518	524	518
	No	530*	538*	533*	538*

* Statistically significant differences between students that responded 'No' and those that responded 'Yes' at the 0.05 level.
Source: PISA 2012, Youth attitudes towards the trades

Women and jobs in the trades

To evaluate whether a stereotype exists in the mind of today's youth, students were asked whether they believe that there are good job opportunities for women in the trades. In general, 62% of Canadian 15-year-old students agreed with this statement, with the proportion ranging from slightly less than 50% in Quebec to around 75% in Nova Scotia and Newfoundland and Labrador (table A.42). More students in the Anglophone school system than in the Francophone school system believed that there are good job opportunities for women in the trades and a higher proportion of boys than girls also agreed with this statement (table A.45 and table A.46, respectively). Non-immigrant students were also more likely to agree that good job opportunities existed for women in the trades relative to first generation students, although the difference was insignificant relative to their second generation immigrant peers (table A.48). No differences were observed between the different urban settings of the schools and the socio-economic status of the students (table A.44 and table A.49, respectively).

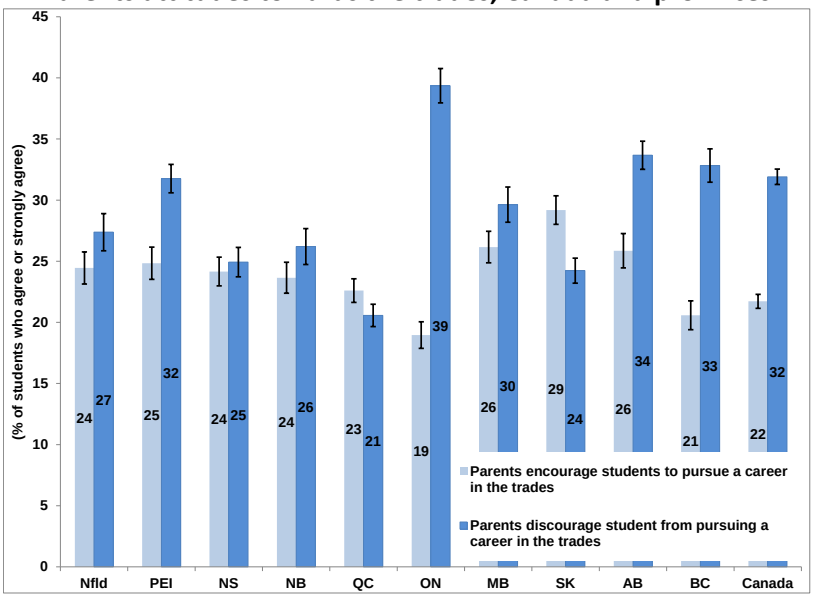
Parents as a source of influence

In order to ascertain the role of parents in influencing their children to pursue a career in the trades, students were asked whether their parents had encouraged them to pursue a career in the trades and whether their parents did not want them to pursue a career in the trades. Overall, students did not feel that their parents encouraged them to consider the skilled trades, with roughly 1 in 5 agreeing and 70% disagreeing that their parents encouraged them to pursue the trades (table A.50). These findings suggest that parents may be unconvinced that careers in the trades are a good choice for their children, either due to negative misperceptions or a lack of knowledge. Nevertheless, around half of the students did not believe that their parents did not want them to pursue a career in the trades, 1 in 5 did not know and only one-third reported that their parents did not want them to pursue such a career (table A.50). This suggests that while parents may be unconvinced that a career in the trades is a best choice for their children, they do not necessarily believe that it is a bad one.

Location

Across the provinces, a higher proportion of students felt that their parents encouraged them to pursue a career in the trades in Saskatchewan while a lower proportion felt this way in Ontario (Figure 9). As well, close to 40% of students in Ontario reported that their parents did not want them to pursue a career in the trades, the highest proportion across all the provinces, while the smallest proportion was observed in Quebec, with slightly more than one student in five reporting that their parents did not want them to pursue a career in the trades (table A.50). The urban setting of the school also seemed to matter as a higher proportion of students from schools in non-major urban centers had parents who encouraged them to pursue a career in the trades and a lower proportion had parents who did not want them to pursue a career in the trades, relative to their peers from schools in major urban centers (table A.51).

Figure 9
Parents attitudes towards the trades, Canada and provinces



Source: PISA 2012, Youth attitudes towards the trades
Note: Error bars represent confidence intervals.

Gender

Relative to their boys, a higher proportion of girls had parents who did not want them to pursue a career

in the trades and a lower proportion had parents who encouraged them to pursue a career in the trades (table A.51).

Language of the school system

Across the different language school systems, in both Quebec and the rest of Canada, a higher proportion of students from the Anglophone school system had parents who did not want them to pursue a career in the trades relative to their peers in the Francophone school system. As well, compared to students in the Anglophone school system, a higher proportion of students in the Francophone school system reported that their parents had encouraged them to pursue a career in the trades (table A.51).

Family background

Immigrant parents were almost twice as likely to discourage their children from pursuing a career in the trades as non-immigrant parents. They were also less likely to encourage their children from pursuing a career in the trades. (table A.51). Socio-economic status also seemed to matter. Relative to their peers belonging to the bottom quarter of the PISA index of economic, social and cultural status, more students belonging to the top quarter reported that their parents did not want them to pursue a career in the trades while fewer reported that their parents had encouraged them to pursue a career in the trades (table A.51).

Skills

Students whose parents had encouraged them to pursue a career in the trades also had lower PISA scores than those whose parents did not encourage them, with the difference ranging from 42 points in mathematics to 60 points in reading (Table 9). Students who agreed that their parents did not want them to pursue a career in the trades also outperformed those who disagreed with this statement, but the difference was smaller, ranging from 8 points in problem solving to 16 points in reading mainly because students whose parents did not dissuade them from pursuing the trades had higher PISA scores relative to students whose parents encouraged them to pursue the trades. This suggests that parents encourage their children to pursue a career in the trades when they are not succeeding academically but do not necessarily discourage them if they are academically successful.

Table 9: Average PISA scores of 15-year-old students and parents attitudes towards the trades, Canada

	My parents encouraged me to pursue a career in the trades			**My parents do not want me to pursue a career in the trades**		
	Yes	**No**	**Difference (Yes-No)**	**Yes**	**No**	**Difference (Yes-No)**
Domain	average score	average score	Score point difference	average score	average score	Score point difference
Mathematics	491	534	-42*	531	521	11*
Reading	484	544	-60*	540	524	16*
Science	496	542	-46*	539	527	11*
Problem Solving	498	541	-43*	536	528	8*

* Statistically significant differences at the 0.05 level.
Source: PISA 2012, Youth attitudes towards the trades

Parent influence and interest in the trades

As discussed previously, the primary source of information about the trades consulted by students is a family member. Among students who consulted a family member, 43% reported that their parents had encouraged them to pursue a career in the trades and 28% reported that their parents did not want them to pursue a career in the trades (table A.52). This compares to 8% and 47%, respectively, among students who did not consult a family member.

Econometric results

Several regressions were carried out to try to determine a) what factors are associated with a student's intention to pursue a career in the trades, b) what factors shape a student's perceptions of a career in the trades and c) what factors are associated with parent attitudes about careers in the trades.

Student's interest in pursuing a career in the trades

A binary logistic regression was carried out to examine the relationship between a student's plan to pursue a future job in the trades and factors such as those describing student characteristics (i.e. skills, immigrant status, gender), student engagement with school, the family environment (socio-demographic characteristics), source of information about the trades consulted, and student and parent attitudes towards the trades. As well, given that peers have been shown to play an important role in the decision-making process of youth, whether the student had a friend that planned on pursuing a career in the trades was also a variable included in the analysis. The outcome variable was a dummy variable equal to 1 if the student definitely planned on pursuing a career in the trades and 0 if the student definitely did not plan a career in the trades. While a binary logistic model was used in this report, a future avenue that may be worth investigating would be to conduct an ordinal logistic regression to examine factors that are associated with a student's plan to pursue a future job in the trades, with the outcome variable also including the responses "*I would consider a career in the trades*" and "*I have not yet thought about my future career or type or work*".

While PISA 2012 provides information on the skills of 15-year-old students in mathematics, reading, science and problem solving, these four skills were not included together in the model in order to avoid multicollinearity as these skills were highly correlated with each other[17]. Instead, separate logistic regressions were carried out for each skill domain. As well, a separate regression was performed in which the mathematics proficiency level was included rather than the mathematics score.

Furthermore, in examining student engagement with and at school, PISA 2012 created an index for sense of belonging and two indices of attitudes towards school (learning activities and learning outcomes) based on information gathered from the student questionnaire, with each index standardised to have a mean of 0 and a standard deviation of 1 across OECD countries. Before the regression models were carried out, correlations between these variables were examined and revealed that a medium strength correlation existed between the index of attitudes towards school (learning outcomes) and a) the index of sense of belonging (0.48) and b) the index of attitudes towards school (learning activities) (0.49). As a result, to avoid the chances of multicollinearity, only the index of attitudes towards school (learning outcomes) was included.

[17] CMEC (2014) Assessment Matters 6: How good are Canadian 15-year-olds at solving problems? Further results from PISA 2012. p. 12. Retrieved from http://www.cmec.ca/Publications/Lists/Publications/Attachments/324/AMatters_No6_EN_Web.pdf

The results are presented in terms of odds ratios. Odds ratios are interpreted in a fashion similar to multiple regression coefficients: they denote the ratio of the odds of an event occurring after a one-unit change in the independent variable, compared to what it was previously, controlling for all other factors in the analysis. The odds of an event occurring is the probability of the event occurring divided by the probability of the event not occurring.

Regardless of the domain examined, students with lower scores on the PISA assessments had an increased odd[18] of definitely planning on pursuing a career in the trades, holding all other variables constant (table B.1-B.4). Looking across mathematic proficiency levels, relative to students who performed at Level 5 or above in mathematics, students that performed below Level 1[19] were 5 times more likely to be definitely planning a career in the trades (table B.5).

Gender also played a role in a student's plan to pursue a career in the trades. Boys were at higher odds of reporting that they were definitely planning a career in the trades compared to girls. As well, students belonging to the lowest quarter of the PISA socio, economic and cultural index were more likely to be planning a career in the trades relative to their peers in the top quarter. There were no significant differences in the likelihood of planning a career in the trades across students from different immigrant backgrounds once other factors were taken into account.

Across provinces, with the exception of Saskatchewan and Manitoba, there were no significant differences in the likelihood of students planning a career in the trades between Ontario[20] and the other provinces. Students in Saskatchewan and Manitoba were more likely to be planning a career in the trades than students in Ontario. As well, students attending schools in non-major urban setting (less than 100,000 people) had a higher likelihood of planning a career in the trades relative to students in major urban settings (100,000 or more people).

Parents also seemed to have an influence on a student's plan of pursuing a career in the trades. Students whose parents had encouraged them to pursue a career in the trades were close to 8 times more likely to report definitely planning a career in the trades than students whose parents had not encouraged them. Furthermore, relative to students who had parents who did not want them to pursue a career in the trades, those who didn't were around 2 times more likely to plan a career in the trades.

Student attitudes towards school were also associated with whether they planned on pursuing a career in the trades or not. In fact, the less engaged with school the student was, the more likely the student was to plan a career in the trades.

In general, with the exception of having consulted a family member, consulting different resources to gain more information about the trades did not seem to be associated with a student's plan of pursuing

[18] The odds ratio values for the PISA score variables are very close to 1, suggesting that this variable has little effect on the outcome, despite being statistically significant. However, the PISA score scale is continuous with a unit change in the score representing only a very small change in performance. In fact, the scale for the PISA score is quite different from the scales of any of the other independent variables, making the PISA score odds ratios look unusual compared to those for the other variables in the model.

[19] Level 2 is considered the baseline level of mathematical proficiency that is required to participate fully in modern society.

[20] Since odds ratio is the ratio of the odds of something happening for one category divided by the odds of something happening in another category, we need a province of reference, which we chose as Ontario.

a career in the trades. Students who consulted a family member were close to 2 times more likely to report definitely planning a career in the trades than those who had not.

Student perceptions of the trades also were associated with a student's plan of pursuing a career in the trades. More specifically, compared to students who disagreed, those who agreed that a career in the trades pays well were close to 6 times more likely to report definitely planning a career in the trades while students that agreed that they would enjoy the physical (hands on) nature of work in the trades were almost 4 times more likely to do so. On the other hand, students who did not believe that there were good job opportunities for them in the trades were 2 times less likely to report definitely planning a career in the trades than those who did.

Student Perceptions of the trades

Several logistic regressions were carried out to examine the relationship between students perceptions of the trades and factors such as those describing student characteristics (i.e. skills, immigrant status, gender), student engagement with school, the family environment (socio-demographic characteristics), the source of information about the trades consulted, and parents and friend attitudes towards the trades. Student perceptions of jobs in the trades were captured by several statements in the questionnaire, four of which examined positive perceptions while three examined more negative perceptions. The dependent variables were equal to 1 if the student agreed or strongly agreed with a statement reflecting their views of the trades and 0 if the student disagreed or strongly disagreed. Results can be found in Appendix B, tables B.6A to B.10B.

Findings suggest that in general, students PISA scores were not related to the more positive perception of the trades, although students with higher PISA scores were more likely to agree that a job in the trades requires a combination of knowledge and hands-on activity. On the other hand, higher PISA scores were associated with a lower likelihood of agreeing with the statements reflecting negative perceptions of the trades. More specifically, students with higher PISA score were less likely to agree that there aren't very good job opportunities for them in the trades, they were less likely to agree that people with good grades do not pursue a job in the trades and they were less likely to agree that a job in the trades is too physically demanding for them.

Other student characteristics were also related to a student's perception of a job in the trades. More specifically, boys were less likely to agree that a career in the trades pays well, that a job in the trades requires a combination of knowledge and hands-on activity, and that there are good job opportunities for women to work in the trades. On the other hand, relative to girls, boys were more likely to agree that they enjoy the physical nature of work associated with jobs in the trades. Boys were also less likely to agree that there aren't very good job opportunities for them in the trades and that a job in the trades is too physically demanding for them and more likely to agree that people with good grades do not pursue a job in the trades, relative to girls.

Immigrant students were as likely as non-immigrant students to agree with most of the positive statements related to perceptions of the trades, although they were less likely to agree that they would enjoy the physical nature of work associated with the trades. As well, immigrant students were more likely than their non-immigrant peers to agree that there aren't very good job opportunities for them in the trades, that people with good grades do not pursue a job in the trades and that a job in the trades is too physically demanding for them.

Socio-economic status also was associated with student perceptions of the trades. In particular, students from lower socio-economic status families were more likely to agree that a career in the trades pays well and more likely to enjoy the physical nature of work in the trades, while they were less likely to agree that people with good grades do not pursue a job in the trades.

Across provinces, relative to students in Ontario, students in Quebec stand out as having lower perceptions of the trades. More specifically, they are more likely to believe that there aren't very good job opportunities for them in the trades and that those with good grades do not pursue a job in the trades. They were also less likely to enjoy the physical nature of work associated with jobs in the trades and less likely to believe that there are good job opportunities for women in the trades. In the remaining provinces, no significant differences were seen in terms of the negative perceptions held by their students and those in Ontario although some differences were seen in terms of the questions assessing positive perceptions of the trades. In particular, relative to students in Ontario, students in Newfoundland and Labrador, Prince Edward Island, New Brunswick, and British Columbia were less likely to enjoy the hands-on nature of work in the trades, while students in Nova Scotia and New Brunswick were more likely to agree that a job in the trades requires a combination of knowledge and hands-on activity. Furthermore, students in Nova Scotia and Saskatchewan were more likely to agree that a career in the trades pays well and that there are good opportunities for women to work in the trades relative to their peers in Ontario. Students in Newfoundland and Labrador and Alberta were also more likely to agree that there are good opportunities for women to work in the trades, relative to their peers in Ontario, while students in New Brunswick were less likely to agree with this.

Parents and peers also had an influence on student perceptions of the trades. Relative to students with parents who did not encourage them to pursue a career in the trades, students who reported that their parents had encouraged them to pursue a career in the trades were more likely to agree with statements probing student positive perceptions of the trades. However, relative to those who weren't encouraged to pursue a career in the trades, students who reported being encouraged by their parents to pursue a career in the trades were more likely to report that a job in the trades was too physically demanding for them. Students who reported that their parents did not discourage them from pursuing a career in the trades also had a better perception of the trades relative to their peers who reported that their parents did not want them to pursue a career in the trades. More specifically, they were more likely to agree that a career in the trades pays well, that they would enjoy the hands-on nature of work in the trades and that there are good job opportunities for women to work in the trades. They were also less likely to agree that there aren't very good job opportunities for them in the trades, that people with good grades do not pursue a job in the trades and that a job in the trades is too physically demanding for them. Students who reported that they had a friend that planned on pursuing a career in the trades also had a more favourable perception of the trades as they were more likely to agree with statements reflecting positive perceptions and less likely to agree with statements reflecting more negative perceptions.

Different sources of information were also found to be associated with certain student perceptions of the trades. Students who consulted a family member about a career in the trades were more likely to agree that a career in the trades pays well and that they would enjoy the hands-on nature of work in the trades and were less likely to agree that there aren't very good job opportunities for them in the trades and that people with good grades do not pursue a job in the trades. Students who filled out a questionnaire to find out about their interests and abilities in a career in the trade were more likely to agree that a job in the trades pays well and less likely to agree that there aren't very good job opportunities for them in the trades and less likely to agree that people with good grades do not pursue

a job in the trades. Students who consulted the internet or talked to someone working in the trades were more likely to report that they would enjoy the physical nature of work in the trades and students who consulted the internet were also less likely to agree that there aren't very good job opportunities for them in the trades. School resources were also associated with student perceptions of the trades as students who consulted a counsellor about a career in the trades were less likely to agree that a career in the trades pays well or that a job in the trades requires a combination of knowledge and hands-on activity and were more likely to agree that there aren't very good job opportunities for them in the trades, that people with good grades do not pursue a job in the trades and that a job in the trades is too physically demanding for them. As well, students who consulted a teacher were less likely to agree that there aren't very good job opportunities for them in the trades. Student engagement with school also was related with student perceptions of jobs in the trades. In particular, students who were more engaged with school were more likely to agree that a job in the trades requires a combination of knowledge and hands-on activity and that there are good opportunities for women to work in the trades and were less likely to agree that aren't very good job opportunities for them in the trades and that a job in the trades is too physically demanding for them.

Parents attitudes towards careers in the trades

Given that parents were found to play an important role in whether or not the student planned to pursue a career in the trades, this section will analyse the factors associated with whether the student was encouraged or discouraged by their parents from pursuing a job in the trades. Two different models were carried out. In the first model, the dependent variable was a dummy variable equal to one if the student reported being encouraged by his/her parents to pursue a career in the trades, and zero otherwise. In the second model the dependent variable was a dummy variable equal to one if the student reported that his/her parents did not want him/her to pursue a career in the trades and equal to 0 otherwise. Both models examined the association of the dependent variables with factors such as gender and immigrant status of the student, student PISA scores in mathematics, reading, science and problem solving (separate models were run for each domain assessed), province and urban setting of the school, education of the mother and father and occupation of the mother and father. As the dependent variables in both cases were dummy variables with 0 and 1 values, the results are presented in terms of odds ratios. Results can be found in tables B.11 to B.15.

Results show that students with higher PISA scores were less likely to be encouraged to pursue a career in the trades by their parents and more likely to have parents that did not want them to pursue a career in the trades compared to their peers with lower PISA scores. Across the different mathematics proficiency levels, compared to students performing at Level 5 and above in mathematics, those performing at the lower levels were more likely to be encouraged to pursue a career in the trades by their parents. For example, students below Level 1 had 7 times the odds of being encouraged by their parents to pursue a career in the trades relative to their peers performing at Level 5 or above (table B.14). As well, students performing at Levels 5 and above were more likely to have parents who did not want them to pursue a career in the trades relative to their peers performing at Levels 2, 3 and 4.

Gender and immigrant status of the student were also associated with whether parents were encouraging or discouraging the student from pursuing a career in the trades. Relative to girls, boys were at higher odds of being encouraged to pursue a career in the trades by their parents and were at lower odds of being discouraged by their parents from pursuing a career in the trades. Non-immigrant students were more likely to be encouraged by their parents to pursue a career in the trades and were

less likely to have parents that did not want them to pursue a career in the trades, relative to their immigrant peers.

Students in Quebec, Manitoba, Saskatchewan and Alberta were also more likely to have parents who encouraged them to pursue a career in the trades relative to students in Ontario. As well, when controlling for the science skills of students, students in British Columbia were more likely than students in Ontario to have parents who encouraged them to pursue a career in the trades. Furthermore, relative to students in Ontario, students in Prince Edward Island were more likely to have parents who did not want them to pursue a career in the trades while students in in Nova Scotia, Quebec, Saskatchewan and British Columbia were less likely to have parents who did not want them to pursue a career in the trades. Students attending schools in non-major urban settings (less than 100,000 people) were also at higher odds of having parents who encouraged them to pursue a career in the trades and at lower odds of having parents who did not want them to pursue a career in the trades relative to students in major urban settings (100,000 or more people).

Mother and father characteristics were also associated with whether parents encouraged or discouraged the trades as a career option for their child. More specifically, the higher the education level of the father, the lower the odds of a student reporting being encouraged to pursue a career in the trades while the mother's level of education did not have a significant impact. The education level of either the father or mother was not linked to the student reporting that his parents did not want him to pursue a career in the trades.

Certain occupations[21] held by the mother and father of the student were also found to be associated with whether the student's parents encouraged or discouraged a career in the trades. In particular, relative to students with a mother working in a professional occupation, those with a mother working as a clerical support worker, a plant and machine operator, and assembler or with an elementary occupation were more likely to report being encouraged by their parents to pursue a career in the trades. Students with a mother working as a technician and associate professional, a plant and machine operator, and assembler or with an elementary occupation were also at lower odds of being discouraged to pursue a career in the trades by their parents, relative to their peers with a mother working in a professional occupation. Students with a father working in services and sales, in the craft and related trades, or as a skilled agricultural, forestry and fishery worker, plant and machine operator and assembler or with an elementary occupation were also at higher odds of reporting that they were encouraged to pursue a career in the trades by their parents, relative to students with a father with a professional occupation. Students with a father who was a skilled agricultural, forestry and fishery worker, a craft and related trades worker and a plant and machine operator and assembler were also at lower odds of reporting being discouraged from pursuing a career in the trades by their parents than students with a father who had a professional occupation.

Conclusion

In 2012, in Canada only, PISA included for the first time a ten-minute questionnaire which probed youth awareness and attitudes towards the trades. Given that PISA 2012, which surveyed approximately 21,000 Canadian 15-year-olds, measures the skills of 15-year-old students in mathematics, reading, science and problem solving, this report was unique in that it was able to link student skills and socio-

[21] In PISA 2012, occupational data for both a student's father and a student's mother were obtained by asking open-ended questions in the student questionnaire. The responses were coded to four-digit ISCO codes (ILO, 1990).

demographic characteristics with their perceptions of the trades as well as their intentions of pursuing a career in the trades.

Similar to findings from the Canadian Apprenticeship Forum (CAF) report[22], results suggest that overall, students had a favourable perception of the trades. Slightly more than two-thirds of students believed that a career in the trades pays well, close to half reported that they would enjoy the physical nature of work in the trades and 6 out of 10 students saw good job opportunities for themselves in the trades. Nevertheless, less than a third of students held positive views of these 3 aspects of jobs in the trades (good pay, liking the type of job and good job opportunities) and of these, less than half definitely plan on pursuing a career in the trades. There were differences in perceptions about jobs in the trades between genders. While boys were more likely to enjoy the physical nature of work in the trades and less likely to agree that there aren't very good job opportunities for them in the trades, they were less likely than girls to agree that a career in the trades pays well, that a job in the trades requires not only hands-on activity but also some background knowledge and that there are good job opportunities for women in the trades. They were also more likely to agree that people with good grades do not pursue a job in the trades. Differences in perceptions were also observed between students with different immigrant backgrounds, with immigrant students having a less favorable perception of jobs in the trades than their non-immigrant peers. Students with lower PISA scores were also more likely to hold negative perceptions of the trades. More specifically, they were more likely to agree that there aren't very good job opportunities for them in the trades, that people with good grades do not pursue a job in the trades and that a job in the trades was too physically demanding.

Resources consulted by students to obtain information about career in the trades were also linked to their perceptions of the trades. For example, more favorable perceptions of the trades were held by students who had consulted a family member, someone working in the trades, the internet or who had filled out a questionnaire about their interest and abilities, while the opposite was true for students who had consulted a counsellor or had attended a school presentation or course about jobs in the trades.

Although students in general held positive perceptions about jobs in the trades, findings point to a small level of interest among 15-year-old students to pursue a career in the trades. While trade occupations made up about 17% of all jobs in 2014[23], less than 10% of 15-year-old students reported that they definitely plan on pursuing a career in the trades and 62% reported definitely not planning a career in the trades. Similarly, CAF(2005)[24] found that less than a third of youth (32%) aged 13 to 17 would be likely to consider a career in the skilled trades, and only 22% have actually considered this option while CAF (2013)[25] found that an apprenticeship program was the first choice of only 20% of students.

Perceptions were nevertheless linked to a student's plan in pursuing a career in the trades. For example, those who agreed that a career in the trades pays well were 6 times more likely to definitely plan a career in the trades, those that would enjoy the physical (hands on) nature of work in the trades were almost 4 times more likely to definitely plan a career in the trades while those who did not believe that there were good job opportunities for them in the trades were 2 times less likely to report

[22] CAF. (2013) *Youth Perceptions of Careers in the Skilled Trades,* CAF-FCA Member Research Series Apprenticeship Analysis,. Ottawa: CAF.
[23] Source: Statistics Canada.
[24] "Skilled Trades and Apprenticeship Awareness and Perception Study" Canadian Apprenticeship Forum, 2005.
[25] "Apprenticeship Analysis: Youth Perceptions of Careers in the Skilled Trades" Canadian Apprenticeship Forum, August, 2013.

definitely planning a career in the trades than those who did. Boys, students with lower PISA scores and students with lower levels of engagement with school were also more likely to definitely be planning a career in the trades.

Family members played an important role in a student's plan of pursuing a career in the trades. In particular, students that consulted a family member about jobs in the trades were twice as likely to definitely plan a career in the trades as students who had not consulted a family member. Furthermore, students whose parents had encouraged them to pursue a career in the trades were close to 8 times more likely to definitely plan a career in the trades relative to their peers whose parents had not encouraged them. On the other hand, students who reported that their parents did not want them to pursue a job in the trades were 2 times less likely to definitely plan a career in the trades compared to students who reported that their parents had not discouraged them from pursuing such a career.

Parents were more likely to encourage the student to pursue a career in the trades if the student had lower PISA scores, was a boy, and was a non-immigrant while they were more likely to dissuade the student from pursuing a career in the trade if the opposite was true. Moreover, the higher the education level of the father, the lower the likelihood the student reported being encouraged to pursue a career in the trades. Mother's level of education, however, was not linked to parents encouraging the student to pursue a career in the trades and parental education was not associated with parents dissuading the student from pursuing a job in the trades. Parental occupation also played a role. More specifically, students were less likely to report being encouraged by their parents to pursue a career in the trades and more likely to report that their parents did not want them to pursue a career in the trades if their mother or father held a professional occupation compared to occupations like plant and machine operator and assembler, craft and related trades worker or elementary occupations.

A group that was touched upon in this report but that would warrant further investigation are those 18% of students that reported that they would possibly consider pursuing a career in the trades. These students scored higher on the PISA assessment than their counterparts that are definitely interested in a career in the trades, being much closer in terms of their performance to those saying that they would 'definitely not' pursue a career in the trades. However, at the same time, they were less engaged with school and had some less favourable attitudes towards school than their counterparts who were definitely not interested in pursuing a career in the trades.

Considerations

The results shed light on a number of important issues with respect to youth's interest in careers in the skilled trades, the availability of accurate labour market information regarding such career opportunities, and the essential skills required for a successful career.
First and foremost is the parity of esteem between different forms of education and different occupations: a certificate in a skilled trade should have as much social esteem and status as a university degree or college diploma. There is room to encourage more secondary school students to consider apprenticeship training and careers in the skilled trades.

As well, timely and relevant labour market information will allow young people and their parents, teachers, and their secondary school councillors to make decisions based on objective outcomes such as job prospects and earnings in the skilled trades. Canadian students need to be aware of the wide range of rewarding career opportunities in the skilled trades. Trade-type occupations make up about 1 out of every 6 Canadian jobs – or 17% – offering opportunities in a broad range of industries and regions.

Skilled trades occupations demand high levels of numeracy, literacy and other essential skills. However, the PISA assessments demonstrated that students planning to pursue a job in the trades often have significantly lower mathematics, reading, problem solving, and science scores. In addition, those performing at the lower levels of mathematics proficiency were more likely to be encouraged to pursue a career in the trades by their parents. Essential skills training and other supports can help ensure those who choose careers in the skilled trades are able to succeed in an apprenticeship program.

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Annex A: Descriptive Results

Table A.1: Highest level of education desired, by gender

Highest level of education student would like to get	Boys		Girls		Overall	
	Col. %	S.E.	Col. %	S.E.	Col.%	S.E.
High school diploma or less	6	(0.4)	3*	(0.3)	5	(0.2)
Trade/Vocational Diploma/Certificate or an apprenticeship	8	(0.4)	2*	(0.2)	5	(0.2)
College or CEGEP Diploma/Certificate	14	(0.7)	11*	(0.5)	12	(0.5)
One university degree	25	(0.6)	27	(0.6)	26	(0.4)
More than one university degree	38	(0.8)	50*	(0.9)	44	(0.7)
Don't know	9	(0.5)	7*	(0.3)	8	(0.3)

*statistically significantly different relative to boys at the 0.05 level.

Table A.2: Future careers of interest, by gender

What kind of career or work would you be interested in having when you are about 30 years old	Boys		Girls		Overall	
	Col. %	S.E.	Col. %	S.E.	Col.%	S.E.
Chose the following occupation:						
Armed Forces	2	(0.3)	0	(0.1)	1	(0.1)
Managers	2	(0.2)	1	(0.2)	1	(0.2)
Professionals						
Science and Engineering Professionals	23	(0.7)	10	(0.5)	16	(0.5)
Health Professionals	12	(0.7)	33	(0.8)	23	(0.6)
Teaching Professionals	3	(0.3)	10	(0.5)	7	(0.3)
Business and Administration Professionals	4	(0.4)	2	(0.2)	3	(0.2)
ICT Professionals	4	(0.4)	0	(0.2)	2	(0.2)
Legal, Social and Cultural Professionals	12	(0.6)	22	(0.6)	18	(0.4)
Technicians and Associate Professionals						
Science and Engineering Professionals	3	(0.3)	1	(0.1)	2	(0.1)
Health Professionals	1	(0.2)	5	(0.4)	3	(0.2)
Business and Administration Professionals	2	(0.2)	1	(0.2)	2	(0.1)
Legal, Social and Cultural Professionals	6	(0.4)	5	(0.4)	5	(0.3)
ICT Professionals	1	(0.2)	0	(0.0)	0	(0.0)
Service and Sales	8	(0.6)	7	(0.4)	7	(0.3)
Skilled agricultural, forestry and fishery workers	1	(0.2)	0	(0.1)	1	(0.0)
Craft and related trades workers	16	(0.6)	2	(0.2)	8	(0.3)
Plant and machine operators, and	2	(0.2)	0	(0.0)	1	(0.1)

assemblers						
Elementary occupation	1	(0.2)	0	(0.0)	0	(0.0)
Did not choose an occupation:						
Hopes to stay at home and care for family full-time	1	(0.1)	1	(0.1)	1	(0.1)
Thought about a future career but not yet found one interested in	14	(0.5)	13	(0.5)	13	(0.4)
Not yet thought about a future career or type of work	5	(0.4)	3	(0.3)	4	(0.2)

Table A.3: Student interest in pursuing a career in the trades, Canada

Plan on pursuing a career in the trades	proportion	standard error	confidence interval – 95% lower limit	confidence interval – 95% upper limit
yes, definitely	8	(0.4)	8	9
would consider it	18	(0.4)	17	19
no, definitely not	62	(0.6)	61	63
not yet thought about it	11	(0.3)	11	12

Table A.4: Student interest in pursuing a career in the trades, by province

Canada and provinces	Plan on Pursuing a Career in the trades							
	Yes, definitely		Would consider it		No, definitely not		Not yet thought about it	
	%	standard error	%	standard error	%	standard error	%	standard error
Canada	**8**	**(0.4)**	**18**	**(0.4)**	**62**	**(6.3)**	**11**	**(0.3)**
Newfoundland and Labrador	12*	(0.7)	23*	(1.3)	56	(1.3)	9*	(1.2)
Prince Edward Island	10	(0.9)	18	(1.1)	65	(1.1)	8*	(0.7)
Nova Scotia	10	(0.8)	23*	(2.1)	57	(2.5)	10	(0.9)
New Brunswick	11*	(0.9)	19	(1.3)	61	(1.5)	10	(1.0)
Quebec	8	(0.6)	12*	(0.6)	66	(0.9)	14*	(0.7)
Ontario	8	(0.7)	19	(1.0)	63	(1.1)	11	(0.7)
Manitoba	11*	(1.3)	21*	(1.0)	55	(1.8)	13	(0.7)
Saskatchewan	12*	(1.1)	27*	(1.3)	51	(1.3)	11	(0.9)
Alberta	10*	(0.7)	20	(1.1)	56	(1.4)	13*	(0.7)
British Columbia	7	(0.6)	20	(1.1)	64	(1.1)	9*	(0.6)

*statistically significantly different than the Canadian average at the 0.05 level.

Table A.5: Proportion of students that definitely plan on pursuing a career in the trades, by language of the school system, by province

Canada and provinces	Anglophone school system		Francophone school system		Difference between systems (A-F)	
	proportion	standard error	proportion	standard error	difference	standard error
Nova Scotia	10	(0.8)	13	(2.6)	-3	(2.1)
New Brunswick	11	(1.2)	11	(1.1)	-1	(1.6)
Quebec	6	(0.8)	8	(0.6)	-3*	(1.0)
Ontario	8	(0.7)	9	(0.9)	-2	(1.2)
Manitoba	11	(1.3)	9	(1.9)	2	(2.3)
Alberta	10	(0.7)	12	(1.6)	-2	(1.7)
British Columbia	7	(0.6)	c		c	
Canada	**8**	**(0.4)**	**8**	**(0.6)**	**0**	**(0.6)**

* Statistically significant differences at the 0.05 level.
c There are too few observations or no observation to provide reliable estimates (i.e. there are fewer than 30 students).

Table A.6: Proportion of students that would consider pursuing a career in the trades, by language of the school system, by province

Canada and provinces	Anglophone school system		Francophone school system		Difference between systems (A-F)	
	proportion	standard error	proportion	standard error	difference	standard error
Canada	**20**	**(0.5)**	**12**	**(0.6)**	**8***	**(0.8)**
Nova Scotia	24	(2.2)	17	(2.0)	7*	(2.9)
New Brunswick	21	(1.6)	12	(1.2)	9*	(2.0)
Quebec	17	(1.1)	11	(0.7)	6*	(1.3)
Ontario	19	(1.0)	14	(1.0)	5*	(1.4)
Manitoba	21	(1.0)	17	(2.9)	4	(3.1)
Alberta	20	(1.1)	15	(3.0)	5	(3.2)
British Columbia	20	(1.1)	8	(1.7)	12*	(2.0)

* Statistically significant differences at the 0.05 level.

Table A.7: Proportion of students that definitely plan on pursuing a career in the trades by socio-economic status, Canada and provinces

Plan on pursuing a career in the trades	PISA index of economic, social and cultural status (ESCS)				
	Bottom quarter	Second quarter	Third quarter	Top quarter	Difference (Top-Bottom)
	proportion	proportion	proportion	proportion	difference
yes, definitely	13	9	7	4	-8*
would consider it	20	20	18	14	-6*
no, definitely not	54	58	64	72	18*
not yet thought about it	13	12	10	10	-3*

* Statistically significant differences at the 0.05 level.

Table A.8: Interest in pursuing a career in the trades by immigrant status, Canada

Plan on pursuing a career in the trades	Non-immigrant		Immigrant			
			Second generation		First generation	
	proportion	standard error	proportion	standard error	proportion	standard error
yes, definitely	9	(0.4)	5*	(0.7)	6*	(0.8)
would consider it	19	(0.5)	18	(1.1)	16	(1.2)
no, definitely not	61	(0.5)	64*	(1.4)	65*	(1.6)
not yet thought about it	11	(0.4)	12	(1.0)	12	(0.9)

* Statistically significantly different from non-immigrant at the 0.05 level.

Table A.9: Average mathematics scores and student interest in pursuing a career in the trades, Canada and provinces

Canada and provinces	Overall average score	Plan on Pursuing a Career in the trades				Difference (Yes-No)
		Yes, definitely	Would consider it	No, definitely not	Not yet thought about it	
		(Estimated average mathematics score)				Score point difference
Canada	**518**	**473**	**516**	**531**	**523**	**-58***
Newfoundland and Labrador	490	432	498	509	490	-77*
Prince Edward Island	479	433	477	489	486	-56*
Nova Scotia	497	459	498	510	491	-51*
New Brunswick	502	457	497	514	510	-57*
Quebec	536	493	531	549	540	-56*
Ontario	514	463	515	526	520	-63*
Manitoba	492	455	494	509	487	-54*
Saskatchewan	506	490	510	516	515	-26*
Alberta	517	469	514	532	522	-63*
British Columbia	522	488	523	529	526	-41*

* Statistically significant differences at the 0.05 level.

Table A.10: Average reading scores and student interest in pursuing a career in the trades, Canada and provinces

Canada and provinces	Overall average score	Plan on Pursuing a Career in the trades				Difference (Yes-No)
		Yes, definitely	Would consider it	No, definitely not	Not yet thought about it	
		(Estimated average reading score)				Score point difference
Canada	**523**	**458**	**510**	**543**	**525**	**-85***
Newfoundland and Labrador	503	421	501	533	505	-113*
Prince Edward Island	490	414	472	509	487	-95*
Nova Scotia	508	452	496	533	500	-81*
New Brunswick	497	430	480	517	503	-87*
Quebec	520	460	503	540	519	-79*
Ontario	528	456	514	548	533	-91*
Manitoba	495	431	485	524	490	-92*
Saskatchewan	505	461	498	527	519	-66*
Alberta	525	464	513	547	530	-83*
British Columbia	535	483	524	549	536	-66*

* Statistically significant differences at the 0.05 level.

Table A.11: Average problem solving scores and student interest in pursuing a career in the trades, Canada and provinces

Canada and provinces	Overall average score	Plan on Pursuing a Career in the trades				Difference (Yes-No)
		Yes, definitely	Would consider it	No, definitely not	Not yet thought about it	
		(Estimated average problem solving score)				Score point difference
Canada	**526**	**480**	**524**	**538**	**528**	**-58***
Newfoundland and Labrador	504	426	501	524	510	-98*
Prince Edward Island	493	480	486	499	480	-19*
Nova Scotia	512	463	520	525	513	-62*
New Brunswick	515	463	509	528	526	-65*
Quebec	525	490	518	538	526	-48*
Ontario	528	484	528	539	532	-55*
Manitoba	504	458	507	519	501	-62*
Saskatchewan	515	482	517	526	521	-44*
Alberta	531	475	527	544	533	-70*
British Columbia	535	483	531	543	531	-61*

* Statistically significant differences at the 0.05 level.

Table A.12: Average science scores and student interest in pursuing a career in the trades, Canada and provinces

Canada and provinces	Overall average score	Plan on Pursuing a Career in the trades				Difference (Yes-No)
		Yes, definitely	Would consider it	No, definitely not	Not yet thought about it	
		(Estimated average science score)				Score point difference
Canada	**525**	**478**	**523**	**539**	**526**	**-61***
Newfoundland and Labrador	514	457	524	537	516	-80*
Prince Edward Island	490	429	484	504	495	-75*
Nova Scotia	516	475	520	531	507	-57*
New Brunswick	507	461	507	519	513	-58*
Quebec	516	475	508	529	516	-55*
Ontario	527	468	524	540	529	-72*
Manitoba	503	460	502	522	492	-61*
Saskatchewan	516	492	520	530	523	-38*
Alberta	539	493	534	556	541	-63*
British Columbia	544	514	539	554	547	-40*

* Statistically significant differences at the 0.05 level.

Table A.13: Proportion of Canadian students at each proficiency level by interest in pursuing a career in the trades, MATHEMATICS

Plan on pursuing a career in the trades	Proficiency Levels in mathematics						
	Below Level 1	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
	(%)						
Yes, definitely	9	18	28	27	13	5	1
I would consider it	4	11	22	27	22	11	4
No, definitely not	2	8	19	26	25	14	5
I have not yet thought about it	3	8	21	28	23	13	4
Canadian average	**4**	**10**	**21**	**26**	**22**	**12**	**4**

Table A.14: Proportion of Canadian students below Level 2 and at Level 5 or above in mathematics by interest in pursuing a career in the trades, Canada and provinces

Canada and provinces	Definitely planning a career in the trade				Definitely not planning a career in the trades			
	Below Level 2		Level 5 or above		Below Level 2		Level 5 or above	
	%	S.E.	%	S.E.	%	S.E.	%	S.E.
Canada	**27**	**(1.9)**	**5**	**(0.8)**	**10**	**(0.6)**	**19**	**(0.8)**
Atlantic provinces	37	(2.8)	c		13	(1.0)	12	(1.1)
Quebec	20	(4.6)	8	(2.3)	8	(0.8)	26	(1.8)
Ontario	30	(3.5)	c		10	(1.2)	17	(1.6)
Manitoba/Saskatchewan	27	(3.1)	6	(1.9)	13	(1.0)	13	(1.1)
Western provinces	24	(3.1)	6	(1.4)	11	(1.0)	19	(1.3)

c There are too few observations or no observation to provide reliable estimates (i.e. there are fewer than 30 students).

Table A.15: Students' interest in pursuing a career in the trades and arriving late for school or skipping classes/days of school in the two weeks prior to the PISA test

Plan on pursuing a career in the trades	Arrived late for school		Skipped a class/days of school	
	%	S.E.	%	S.E.
Yes, definitely	48*	(1.9)	42*	(2.0)
I would consider it	49*	(1.5)	37	(1.2)
No, definitely not	40*	(0.7)	34	(0.6)
I have not yet thought about it	45	(1.6)	34	(1.3)
Canadian average	**43**	**(0.7)**	**35**	**(0.6)**

* Statistically significantly different from the Canadian average at the 0.05 level.

Table A.16: Students' sense of belonging and interest in pursuing a career in the trades

Plan on pursuing a career in the trades	I feel like an outsider at school	I feel like I belong at school	I feel awkward and out of place in my school	Other students seem to like me	I feel lonely at school	I feel happy at school	I am satisfied with my school
	(% of students who agree or strongly agree)						
Yes, definitely	21*	72*	18	91	15*	76*	73*
I would consider it	13	79	16	94	12	80	83*
No, definitely not	12	80	14	94	10	82	80
I have not yet thought about it	12	77	14	92	11	80	78
Canadian average	**13**	**78**	**15**	**93**	**11**	**81**	**80**

* Statistically significantly different from the Canadian average at the 0.05 level.

Table A.17: Students' attitudes towards school (learning outcomes) and interest in pursuing a career in the trades

Plan on pursuing a career in the trades	School has done little to prepare me for adult life when I leave school	School has been a waste of time	School has helped give me confidence to make decisions	School has taught me things which could be useful in a job
	(% of students who agree or strongly agree)			
Yes, definitely	38*	22*	78	86
I would consider it	27	13	78	89
No, definitely not	22*	9*	78	90
I have not yet thought about it	31*	14	72*	88
Canadian average	**26**	**11**	**77**	**89**

* Statistically significantly different from the Canadian average at the 0.05 level.

Table A.18: Students' attitudes towards school (learning activities) and interest in pursuing a career in the trades

Plan on pursuing a career in the trades	Trying hard at school will help me get a good job	Trying hard at school will help me get into a good college	I enjoy receiving good grades	Trying hard at school is important
	(% of students who agree or strongly agree)			
Yes, definitely	91*	93*	94*	90*
I would consider it	93	97	98	93
No, definitely not	95	98*	99*	96*
I have not yet thought about it	92	96	97	94
Canadian average	**93**	**97**	**98**	**95**

* Statistically significantly different from the Canadian average at the 0.05 level.

Table A.19: Interest in pursuing a career in the trades among students that did an internship, Canada and provinces

Canada and provinces	Students that have done an internship		Students that have not done an internship		Difference in proportion of students that definitely plan on pursuing the trades between students that did an internship and those that did not
	Proportion	Definitely plan on pursuing the trades	Proportion	Definitely plan on pursuing the trades	
	(%)				
Canada	**9**	**16**	**91**	**8**	**8**
Atlantic provinces	7	29	93	9	20*
Quebec	21	10	79	8	3
Ontario	5	21	95	7	15*
Manitoba	7	31	93	10	21*
Saskatchewan	7	28	93	11	18*
Western provinces	7	18	93	8	10*

*Statistically significant difference at the 0.05 level.
Note: numbers may not add up due to rounding

Table A.20: Average PISA scores of 15-year-old students that did an internship, Canada and provinces

Canada and provinces	Done internship?	Average PISA scores			
		Mathematics	Problem Solving	Reading	Science
Canada	**Yes**	**510**	**505**	**498**	**499**
	No	**523***	**531***	**531***	**532***
Newfoundland and Labrador	Yes	451	441	445	469
	No	497*	509*	511*	522*
Prince Edward Island	Yes	455	455	441	451
	No	484*	496*	496*	496*
Nova Scotia	Yes	460	459	452	464
	No	505*	521*	519*	526*
New Brunswick	Yes	478	479	456	468
	No	506*	520*	502*	513*
Quebec	Yes	541	526	522	514
	No	540	530	525	521
Ontario	Yes	479	486	474	480
	No	520*	534*	536*	532*
Manitoba	Yes	458	460	443	458
	No	500*	512*	505*	511*
Saskatchewan	Yes	482	480	465	481
	No	512*	518*	512*	523*
Alberta	Yes	478	478	475	495
	No	525*	536*	535*	548*
British Columbia	Yes	500	506	501	508
	No	527*	537*	541*	550*

*Statistically significant differences in average score points between students that responded they did an internship and those that did not at the 0.05 level.

Table A.21: Proportion of students that consulted a source of information about a future career in the trades, Canada and provinces

Canada and provinces	Proportion of students that consulted a source of information about the trades	
	proportion	standard error
Canada	**62**	**(0.5)**
Newfoundland and Labrador	65	(1.7)
Prince Edward Island	56*	(1.5)
Nova Scotia	60	(1.5)
New Brunswick	57*	(1.5)
Quebec	63	(1.1)
Ontario	61	(1.0)
Manitoba	60	(1.6)
Saskatchewan	63	(1.5)
Alberta	63	(1.4)
British Columbia	61	(1.4)

*statistically significantly different from the Canadian average at the 0.05 level.

Table A.22: Proportion of students that consulted a source of information about a future career in the trades by source and usefulness of the information, Canada

Source of information	Have you done any of the following to find out about a future career in the trades?	
	Yes, it was useful	Yes, it was not useful
	Proportion	
Spoke to a teacher	18	6
Spoke to a counsellor	14	4
Attended a school presentation/course	19	9
Spoke to a family member	34	9
Completed a questionnaire	24	10
Researched the internet	27	5
Spoke to someone working in the trades	26	6
Attended a work-site	15	4

Table A.23: Proportion of students that consulted a source of information about a future career in the trades, by urban setting of the school, Canada and provinces

Canada and provinces	Major urban centre (100k+)		Non-major urban centre (<100k)		Difference (Major-(Non-Major))	
	proportion	standard error	proportion	standard error	difference	standard error
Canada	**61**	**(0.8)**	**62**	**(0.7)**	**-2**	**(1.1)**
Newfoundland and Labrador	59	(3.8)	66	(1.9)	-6	(4.2)
Nova Scotia	60	(3.1)	60	(1.6)	1	(3.5)
New Brunswick	56	(3.6)	57	(1.7)	-2	(3.9)
Quebec	62	(1.6)	64	(1.5)	-2	(2.2)
Ontario	61	(1.3)	62	(2.2)	-1	(2.5)
Manitoba	59	(1.8)	62	(3.6)	-3	(4.0)
Saskatchewan	61	(2.0)	65	(1.8)	-4	(2.7)
Alberta	62	(2.0)	64	(2.2)	-2	(3.0)
British Columbia	60	(2.0)	61	(1.2)	-1	(2.4)

* Statistically significant differences at the 0.05 level.

Table A.24: Proportion of students that consulted a source of information about a future career in the trades, by gender, Canada and provinces

Canada and provinces	Boys		Girls		Difference (B-G)	
	proportion	standard error	proportion	standard error	difference	standard error
Canada	**72**	**(0.7)**	**52**	**(0.8)**	**20***	**(1.0)**
Newfoundland and Labrador	72	(1.9)	57	(2.4)	15*	(3.1)
Prince Edward Island	70	(2.0)	41	(2.0)	29*	(2.8)
Nova Scotia	72	(2.2)	46	(3.4)	26*	(4.1)
New Brunswick	70	(1.9)	43	(2.0)	27*	(2.8)
Quebec	72	(1.2)	55	(1.5)	17*	(1.9)
Ontario	70	(1.3)	52	(1.5)	18*	(2.0)
Manitoba	74	(1.8)	46	(2.1)	28*	(2.8)
Saskatchewan	76	(1.6)	49	(2.1)	27*	(2.7)
Alberta	73	(1.7)	52	(1.9)	21*	(2.6)
British Columbia	72	(1.6)	49	(2.0)	23*	(2.6)

* Statistically significant differences at the 0.05 level.

Table A.25: Sources of information consulted by students who are looking for information on the trades, by gender, Canada

Source of information	Boys		Girls		Difference (B-G)	
	proportion	S.E.	proportion	S.E.	difference	S.E.
Spoke to a teacher	44	(1.0)	33	(1.1)	10*	(1.4)
Spoke to a counsellor	33	(0.8)	26	(1.0)	8*	(1.1)
Attended a school presentation/course	47	(1.0)	43	(1.2)	4*	(1.7)
Spoke to a family member	77	(0.7)	64	(1.1)	14*	(1.2)
Completed a questionnaire	58	(1.0)	53	(0.9)	5*	(1.3)
Researched the internet	61	(0.8)	44	(1.2)	17*	(1.4)
Spoke to someone working in the trades	56	(1.1)	47	(0.9)	9*	(1.3)
Attended a work-site	35	(1.2)	25	(0.9)	10*	(1.5)

* Statistically significant differences at the 0.05 level.

Table A.26: Sources of information consulted by students who are looking for information on the trades, by language of the school system, Quebec and Rest of Canada

Source of Information	Quebec			Rest of Canada		
	School system language			School system language		
	English	French	Difference (E-F)	English	French	Difference (E-F)
	Percent					
Spoke to a teacher	34	27	7*	42	42	0
Spoke to a counsellor	26	34	-8*	29	36	-7*
Attended a school presentation/course	41	41	-1	46	51	-4*
Spoke to a family member	74	68	5*	72	69	3*
Completed a questionnaire	50	52	-2	57	58	-1
Researched the internet	59	45	14*	56	49	8*
Spoke to someone working in the trades	55	54	0	52	59	-7*
Attended a work-site	31	25	6*	32	34	-1

*Statistically significant differences at the 0.05 level.

Table A.27: Proportion of students that consulted a source of information about a future career in the trades, by language of the school system, by province

Canada and provinces	Anglophone school system		Francophone school system		Difference between systems (A-F)	
	proportion	standard error	proportion	standard error	difference	standard error
Nova Scotia	59	(1.5)	65	(2.6)	-5	(3.1)
New Brunswick	56	(1.9)	58	(1.8)	-2	(2.5)
Quebec	58	(1.3)	64	(1.2)	-6*	(1.6)
Ontario	61	(1.1)	66	(1.5)	-5*	(1.8)
Manitoba	60	(1.6)	61	(3.2)	-1	(3.8)
Alberta	63	(1.4)	70	(2.5)	-7*	(2.9)
British Columbia	61	(1.4)	61	(5.0)	0	(5.2)
Canada	**61**	**(0.6)**	**64**	**(1.1)**	**-3***	**(1.2)**

* Statistically significant differences at the 0.05 level.

Table A.28: Proportion of students that consulted a teacher about a future career in the trades, Canada and provinces

Canada and provinces	Source of Information: teacher						
	All students	Urban setting (ref. non-major urban)		Gender (ref. boys)		Language of the school (ref. Anglophone)	
		Non-major (<100k)	Major (100k+)	Boys	Girls	Anglophone	Francophone
	Proportion of students that consulted a teacher						
Newfoundland and Labrador	20	22	c	26	14*	--	--
Prince Edward Island	25	--	--	35	16*	--	--
Nova Scotia	24	24	26	33	14*	24	24
New Brunswick	23	22	24	32	13*	22	24
Quebec	18	18	17	24	12*	19	17
Ontario	28	28	28	35	21*	28	29
Manitoba	22	24	21	28	16*	22	20
Saskatchewan	23	25	21	33	13*	23	c
Alberta	23	28	20*	30	17*	23	30*
British Columbia	23	23	24	31	16*	23	20
Canada	**24**	**23**	**24**	**31**	**17***	**25**	**18***

c There are too few observations or no observation to provide reliable estimates (i.e. there are fewer than 30 students).
* Statistically significantly different at the 0.05 level from the reference category which is highlighted in grey.

Table A.29: Proportion of students that consulted a counsellor about a future career in the trades, Canada and provinces

Canada and provinces	Source of Information: counsellor						
	All students	Urban setting (ref. non-major urban)		Gender (ref. boys)		Language of the school (ref. Anglophone)	
		Non-major (<100k)	Major (100k+)	Boys	Girls	Anglophone	Francophone
	Proportion of students that consulted a counsellor						
Newfoundland and Labrador	12	13	c	18	7*	--	--
Prince Edward Island	16	--	--	21	10*	--	--
Nova Scotia	15	13	21*	20	9*	14	20
New Brunswick	15	15	15	22	8*	13	23*
Quebec	21	21	20	26	15*	15	21*
Ontario	19	20	19	25	14*	19	23*
Manitoba	15	16	14	18	11*	15	18
Saskatchewan	15	15	14	20	8*	15	c
Alberta	17	19	16	21	12*	17	22
British Columbia	16	17	16	21	12*	16	c
Canada	**18**	**18**	**18**	**24**	**13***	**17**	**22***

c There are too few observations or no observation to provide reliable estimates (i.e. there are < 30 students).
* Statistically significantly different from the reference category which is highlighted in grey.

Table A.30: Proportion of students that consulted a family member about a future career in the trades, Canada and provinces

Canada and provinces	Source of Information: family member						
	All students	Urban setting (ref. non-major urban)		Gender (ref. boys)		Language of the school system (ref. Anglophone)	
		Non-major (<100k)	Major (100k+)	Boys	Girls	Anglophone	Francophone
	Proportion of students that consulted a family member						
Newfoundland and Labrador	46	48	36*	58	35*	c	c
Prince Edward Island	41	--	--	56	26*	c	c
Nova Scotia	45	45	43	58	30*	45	44
New Brunswick	42	42	41	55	28*	42	40
Quebec	43	45	41	53	34*	42	43
Ontario	43	46	42	53	33*	43	45
Manitoba	44	45	44	58	30*	44	41
Saskatchewan	47	48	46	62	32*	47	c
Alberta	46	49	44	58	33*	46	48
British Columbia	43	45	40	56	30*	43	34
Canada	**44**	**45**	**42***	**55**	**33***	**44**	**43**

c There are too few observations or no observation to provide reliable estimates (i.e. there are < 30 students).
* Statistically significantly different at the 0.05 level from the reference category which is highlighted in grey.

Table A.31: Proportion of students that completed a questionnaire about interests and abilities in a future career in the trades, Canada and provinces

Canada and provinces	Source of Information: Questionnaire						
	All students	Urban setting (ref. non-major urban)		Gender (ref. boys)		Language of the school system (ref. Anglophone)	
		Non-major (<100k)	Major (100k+)	Boys	Girls	Anglophone	Francophone
	Proportion of students that completed a questionnaire						
Newfoundland and Labrador	30	31	25	37	23*	c	c
Prince Edward Island	34	--	--	44	24*	c	c
Nova Scotia	26	25	31	35	17*	26	36*
New Brunswick	30	30	29	38	22*	30	31
Quebec	33	34	31	39	26*	29	33*
Ontario	38	39	37	45	31*	37	39
Manitoba	27	28	27	35	19*	27	28
Saskatchewan	36	36	35	46	25*	36	c
Alberta	31	34	29*	38	24*	31	39*
British Columbia	33	33	32	41	25*	33	c
Canada	**34**	**34**	**34**	**41**	**27***	**34**	**33**

c There are too few observations or no observation to provide reliable estimates (i.e. there are < 30 students).
* Statistically significantly different at the 0.05 level from the reference category which is highlighted in grey

Table A.32: Proportion of students that consulted the internet about a future career in the trades, Canada and provinces

Canada and provinces	Source of Information: Internet						
	All students	Urban setting (ref. non-major urban)		Gender (ref. boys)		Language of the school system (ref. Anglophone)	
		Non-major (<100k)	Major (100k+)	Boys	Girls	Anglophone	Francophone
	Proportion of students that consulted the internet						
Newfoundland and Labrador	33	34	26*	44	22*	--	--
Prince Edward Island	33	--	--	45	21*	--	--
Nova Scotia	32	32	29	44	19*	32	32
New Brunswick	31	30	33	42	20*	32	29
Quebec	29	30	28	39	20*	34	29*
Ontario	34	36	34	45	24*	35	31
Manitoba	30	28	31	40	20*	30	30
Saskatchewan	37	38	34	50	22*	37	c
Alberta	34	39	30*	44	23*	34	38
British Columbia	33	33	33	44	23*	33	c
Canada	**33**	**33**	**32**	**43**	**22***	**34**	**29***

c There are too few observations or no observation to provide reliable estimates (i.e. there are <30 students).
* Statistically significantly different at the 0.05 level from the reference category which is highlighted in grey.

Table A.33: Proportion of students that spoke to someone working in a job in the trades about a future career in the trades, Canada and provinces

Canada and provinces	Source of Information: someone working in the trades						
	All students	Urban setting (ref. non-major urban)		Gender (ref. boys)		Language of the school system (ref. Anglophone)	
		Non-major (<100k)	Major (100k+)	Boys	Girls	Anglophone	Francophone
	Proportion of students that spoke to someone working in the trades						
Newfoundland and Labrador	38	40	28*	46	30*	c	c
Prince Edward Island	31	--	--	41	20*	c	c
Nova Scotia	34	33	37	45	22*	34	40
New Brunswick	35	34	38	47	23*	34	37
Quebec	34	35	32	41	28*	31	34*
Ontario	31	34	29	38	24*	30	38*
Manitoba	31	35	28	41	20*	31	32
Saskatchewan	34	36	30*	46	21*	34	c
Alberta	34	37	31	42	25*	34	38
British Columbia	30	31	29	38	22*	30	c
Canada	**32**	**34**	**30***	**40**	**24***	**31**	**35***

c There are too few observations or no observation to provide reliable estimates (i.e. there are fewer than 30 students).
* Statistically significantly different at the 0.05 level from the reference category which is highlighted in grey.

Table A.34: Proportion of students that attended a work-site visit with someone working in the trades, Canada and provinces

Canada and provinces	Source of Information: worksite visit with someone working in the trades						
	All students	Urban setting (ref. non-major urban)		Gender (ref. boys)		Language of the school system (ref. Anglophone)	
		Non-major (<100k)	Major (100k+)	Boys	Girls	Anglophone	Francophone
	Proportion of students that attended a work-site visit						
Newfoundland and Labrador	22	23	c	26	19*	--	--
Prince Edward Island	23	--	--	31	14*	--	--
Nova Scotia	24	24	23	36	11*	24	26
New Brunswick	24	24	23	33	14*	24	24
Quebec	16	17	15	22	11*	18	16
Ontario	18	21	17	24	13*	18	20
Manitoba	21	25	19*	28	14*	21	20
Saskatchewan	20	21	18	28	11*	20	c
Alberta	22	26	19*	28	16*	22	23
British Columbia	19	20	17	25	13*	19	19
Canada	**19**	**21**	**17***	**25**	**13***	**20**	**16***

c There are too few observations or no observation to provide reliable estimates (i.e. there are fewer than 30 students).
* Statistically significantly different at the 0.05 level from the reference category which is highlighted in grey.

Table A.35: Proportion of students that attended a school presentation or a course about jobs in the trades, Canada and provinces

Canada and provinces	Source of Information: school presentation or a course						
	All students	Urban setting (ref. non-major urban)		Gender (ref. boys)		Language of the school system (ref. Anglophone)	
		Non-major (<100k)	Major (100k+)	Boys	Girls	Anglophone	Francophone
	Proportion of students that attended a school presentation or course						
Newfoundland and Labrador	36	35	41	37	35	--	--
Prince Edward Island	30	--	--	39	21*	--	--
Nova Scotia	31	32	28	38	23*	31	35
New Brunswick	23	25	18*	28	17*	20	32*
Quebec	26	27	25	31	21*	23	26*
Ontario	29	30	28	35	23*	29	31
Manitoba	30	33	28	38	22*	30	36
Saskatchewan	25	26	23	30	18*	24	c
Alberta	29	30	29	35	24*	29	43*
British Columbia	25	26	23	30	20*	25	31
Canada	**28**	**28**	**27**	**33**	**22***	**28**	**27**

c There are too few observations or no observation to provide reliable estimates (i.e. there are fewer than 30 students).
* Statistically significantly different at the 0.05 level from the reference category.

Table A.36: Sources of information consulted by students who are looking for information on the trades, by socio-economic status, Canada

Source of information	PISA index of economic, social and cultural status (ESCS)				
	Bottom quarter	Second quarter	Third quarter	Top quarter	Difference (Top-Bottom)
	Proportion				
Spoke to a teacher	44	40	38	34	-10*
Spoke to a counsellor	34	30	29	27	-6*
Attended a school presentation/course	44	46	44	46	2
Spoke to a family member	76	72	71	67	-9*
Completed a questionnaire	55	56	56	56	1
Researched the Internet	58	54	55	48	-10*
Spoke to someone working in the trades	54	55	53	48	-7*
Attended a work-site	32	32	30	28	-4

* Statistically significant differences between top and bottom quartiles of the PISA index of economic, social and cultural status (ESCS) at the 0.05 level.

Table A.37: Proportion of students that consulted at least one source of information about a future career in the trades, by immigrant status, Canada and provinces

Canada and Provinces	Non-immigrant		Immigrant			
			Second generation		First generation	
	proportion	standard error	proportion	standard error	proportion	standard error
Canada	**61**	**(0.6)**	**64**	**(1.4)**	**60**	**(1.7)**
Atlantic provinces	65	(1.8)	c		c	
Quebec	64	(1.2)	62	(2.9)	58	(3.5)
Ontario	60	(1.3)	65*	(2.1)	58	(2.8)
Manitoba	57	(1.8)	60	(4.2)	70*	(3.6)
Saskatchewan	63	(1.5)	c		59	(5.5)
Alberta	62	(1.5)	63	(3.2)	64	(3.5)
British Columbia	60	(1.3)	61	(2.0)	65	(3.9)

c There are too few observations or no observation to provide reliable estimates (i.e. there are fewer than 30 students).
* Statistically significant different at the 0.05 level relative to non-immigrant students.

Table A.38: Sources of information consulted by students who are looking for information about the trades, by immigrant status, Canada

Source of information	Non-immigrant		Immigrant			
			Second generation		First generation	
	proportion	standard error	proportion	standard error	proportion	standard error
Spoke to a teacher	37	(0.8)	43*	(1.9)	43*	(2.2)
Spoke to a counsellor	29	(0.6)	31	(1.8)	33	(2.4)
Attended a school presentation/course	44	(0.9)	46	(2.2)	47	(2.1)
Spoke to a family member	73	(0.8)	68*	(1.8)	67*	(1.7)
Completed a questionnaire	55	(0.9)	58	(1.9)	59	(2.3)
Researched the Internet	52	(0.8)	58*	(2.1)	57*	(1.9)
Spoke to someone working in the trades	54	(0.8)	47*	(2.1)	48*	(1.8)
Attended a work-site	31	(0.8)	27	(2.2)	30	(2.1)

* Statistically significant difference at the 0.05 level compared to non-immigrant students.

Table A.39: Average PISA scores of 15-year-old students looking for information about the trades, by province, MATHEMATICS

Canada and provinces	Consulted a source of information				Difference (Yes-No)	
	Yes		No			
	Average math score	standard error	Average math score	standard error	Score point difference	standard error
Canada	**515**	**(1.9)**	**533**	**(2.3)**	**-18***	**(2.0)**
Newfoundland and Labrador	487	(3.8)	512	(6.0)	-25*	(5.4)
Prince Edward Island	470	(3.7)	497	(3.5)	-27*	(5.3)
Nova Scotia	492	(2.8)	516	(6.5)	-25*	(6.6)
New Brunswick	496	(3.5)	516	(4.2)	-20*	(5.8)
Quebec	535	(3.2)	551	(4.1)	-16*	(3.2)
Ontario	511	(4.5)	529	(4.5)	-18*	(3.9)
Manitoba	486	(3.5)	512	(4.5)	-26*	(5.6)
Saskatchewan	504	(3.7)	521	(4.0)	-16*	(5.1)
Alberta	511	(4.4)	536	(6.1)	-25*	(5.0)
British Columbia	521	(4.7)	532	(5.3)	-12*	(5.1)

* Statistically significant differences at the 0.05 level.

Table A.40: Average PISA scores of 15-year-old students that spoke to a teacher or a counsellor about a career in the trades, MATHEMATICS

Canada and provinces	Spoke to a teacher			Spoke to a counsellor		
	Yes	No	Difference (Yes-No)	Yes	No	Difference (Yes-No)
	average score	average score	Score point difference	average score	average score	Score point difference
Canada	**491**	**532**	**-41***	**490**	**530**	**-40***
Newfoundland and Labrador	463	504	-41*	453	502	-49*
Prince Edward Island	457	490	-33*	440	490	-50*
Nova Scotia	469	510	-41*	458	509	-51*
New Brunswick	473	514	-41*	474	510	-37*
Quebec	506	549	-43*	522	546	-24*
Ontario	490	530	-40*	479	528	-49*
Manitoba	454	509	-55*	447	505	-58*
Saskatchewan	483	518	-36*	474	516	-42*
Alberta	489	530	-41*	477	530	-53*
British Columbia	501	533	-31*	497	531	-34*

* Statistically significant differences at the 0.05 level.

Table A.41: Proportion of students planning on pursuing a career in the trades, by source of information consulted, Canada

Source of Information		Plan on Pursuing a Career in the trades			
		Yes, definitely	Would consider it	No, definitely not	Not yet thought about it
		(Proportion)			
Spoke to a teacher	Yes	21	31	38	10
	No	4*	14*	69*	12*
Spoke to a counsellor	Yes	22	28	40	10
	No	5*	16*	67*	12*
Attended a school presentation/course	Yes	15	26	47	12
	No	6*	15*	68*	11
Spoke to a family Member	Yes	17	31	40	12
	No	2*	8*	79*	11
Completed a Questionnaire	Yes	15	29	43	12
	No	5*	13*	72*	11
Researched the Internet	Yes	18	32	38	11
	No	3*	11*	73*	12
Spoke to someone working in the trades	Yes	19	30	41	11
	No	3*	13*	72*	12
Attended a work-site	Yes	22	29	39	10
	No	5*	16*	67*	12*
At least one source	Yes	13	27	48	13
	No	1*	5*	84*	10*

*statistically significant different between students that consulted the source of information and those that did not at the 0.05 level.

Table A.42: Student positive perceptions of the trades, Canada and provinces

Canada and provinces	A career in the trades pays well	I enjoy the physical nature of work in the trades	A job in the trades requires a combination of knowledge and hands-on activity	There are good opportunities for women to work in the trades
	(% of students who agree or strongly agree)			
Canada	**67**	**46**	**83**	**62**
Newfoundland and Labrador	69	51*	87*	76*
Prince Edward Island	63*	48	74*	64*
Nova Scotia	72*	54*	86*	75*
New Brunswick	67	45	82	64
Quebec	71*	40*	84*	48*
Ontario	65*	47	81*	63*
Manitoba	70*	50*	81	67*
Saskatchewan	75*	55*	85*	72*
Alberta	64*	51*	81	68*
British Columbia	66	44	84	65*

*statistically significantly different from the Canadian average at the 0.05 level.

Table A.43: Student negative perceptions of the trades, Canada and provinces

Canada and provinces	There aren't very good job opportunities for me in the trades	People with good grades do not pursue a job in the trades	A job in the trades is too physically demanding for me
	(% of students who agree or strongly agree)		
Canada	**40**	**28**	**28**
Newfoundland and Labrador	35*	24*	23*
Prince Edward Island	35*	26	27
Nova Scotia	31*	22*	23*
New Brunswick	36*	23*	24*
Quebec	43*	31*	24*
Ontario	42*	29	31*
Manitoba	38	27	28
Saskatchewan	31*	21*	22*
Alberta	39	30	26
British Columbia	40	25*	30

*Statistically significantly different from the Canadian average at the 0.05 level.

Table A.44: Student perceptions of the trades, by urban setting of the school, Canada

Statement reflecting perceptions of the trades	Major urban centre (100k+)	Non-major urban centre (<100k)	Difference (Major-Non-major)
	(% of students who agree or strongly agree)		
A career in the trades pays well	65	70	-5*
I enjoy the physical nature of work in the trades	43	50	-6*
A job in the trades requires a combination of knowledge and hands-on activity	82	83	-2
There are good opportunities for women to work in the trades	61	63	-2
There aren't very good job opportunities for me in the trades	43	37	5*
People with good grades do not pursue a job in the trades	30	26	4*
A job in the trades is too physically demanding for me	31	24	7*

* Statistically significant difference at the 0.05 level.

Table A.45: Student perceptions of the trades, by language of the school system, Canada

Statement reflecting perceptions of the trades	Quebec			Rest of Canada		
	School system language			School system language		
	English	French	Diff. (E-F)	English	French	Diff. (E-F)
	(% of students who agree or strongly agree)					
A career in the trades pays well	72	82	-9*	74	75	-1
I enjoy the physical nature of work in the trades	46	44	2	52	43	9*
A job in the trades requires a combination of knowledge and hands-on activity	89	93	-4*	89	86	3*
There are good opportunities for women to work in the trades	68	55	14*	75	59	16*
There aren't very good job opportunities for me in the trades	47	50	-3*	46	51	-5*
People with good grades do not pursue a job in the trades	32	35	-3	30	36	-6*
A job in the trades is too physically demanding for me	31	25	5*	32	29	3

* Statistically significant difference at the 0.05 level.

Table A.46: Student perceptions of the trades, by gender, Canada

Statement reflecting perceptions of the trades	Boys	Girls	Difference (B-G)
	(% of students who agree or strongly agree)		
A career in the trades pays well	72	62	10*
I enjoy the physical nature of work in the trades	62	31	31*
A job in the trades requires a combination of knowledge and hands-on activity	84	81	3*
There are good opportunities for women to work in the trades	65	59	6*
There aren't very good job opportunities for me in the trades	32	49	-17*
People with good grades do not pursue a job in the trades	34	23	11*
A job in the trades is too physically demanding for me	19	36	-17*

* Statistically significant differences at the 0.05 level.

Table A.47: Student perceptions of the trade and average PISA scores of 15-year-old students, Canada

Statement reflecting perceptions of the trades		Average PISA scores			
		Mathematics	Problem Solving	Reading	Science
A career in the trades pays well	Yes	519	527	523	526
	No	532*	537*	541*	539*
I enjoy the physical nature of work in the trades	Yes	514	524	513	523
	No	534*	539*	548*	542*
A job in the trades requires a combination of knowledge and hands-on activity	Yes	529	537	535	537
	No	488*	494*	494*	494*
There are good opportunities for women to work in the trades	Yes	519	529	526	529
	No	530*	532	534*	531
There aren't very good job opportunities for me in the trades	Yes	525	531	535	531
	No	521	528	523*	529
People with good grades do not pursue a job in the trades	Yes	524	526	523	527
	No	524	533*	533*	533*
A job in the trades is too physically demanding for me	Yes	511	518	524	518
	No	530*	538*	533*	538*

* Statistically significant difference between Yes and No at the 0.05 level.

Table A.48: Student perceptions of the trades, by student immigrant status, Canada

Statement reflecting perceptions of the trades		Immigrant	
	Non-immigrant	Second generation	First generation
	(% of students who agree or strongly agree)		
A career in the trades pays well	70	64*	57*
I enjoy the physical nature of work in the trades	49	42*	35*
A job in the trades requires a combination of knowledge and hands-on activity	84	82	78*
There are good opportunities for women to work in the trades	63	61	55*
There aren't very good job opportunities for me in the trades	37	46*	49*
People with good grades do not pursue a job in the trades	26	33*	36*
A job in the trades is too physically demanding for me	23	38*	40*

* Statistically significantly different from non-immigrant at the 0.05 level.

Table A.49: Student perceptions of the trades, by top and bottom quarter of the PISA economic, social and cultural index, Canada

Statement reflecting perceptions of the trades	PISA index of economic, social and cultural status (ESCS)			
	Bottom quarter	Second quarter	Third quarter	Top quarter
	(% of students who agree or strongly agree)			
A career in the trades pays well	73	71	68*	57*
I enjoy the physical nature of work in the trades	53	45*	47*	40*
A job in the trades requires a combination of knowledge and hands-on activity	80	82*	85*	84*
There are good opportunities for women to work in the trades	61	63	62	59
There aren't very good job opportunities for me in the trades	37	39	40	45*
People with good grades do not pursue a job in the trades	24	26	30*	32*
A job in the trades is too physically demanding for me	28	29	27	26

* Statistically significantly different from the bottom quarter of the PISA index of economic, social and cultural status at the 0.05 level.

Table A.50: Parents attitudes towards the trades, Canada and provinces

Canada and provinces	My parents encouraged me to pursue a career in the trades		My parents do not want me to pursue a career in the trades	
	Strongly Agree/Agree	Strongly Disagree/Disagree	Strongly Agree/Agree	Strongly Disagree/Disagree
	(%)			
Canada	**22**	**70**	**32**	**51**
Newfoundland and Labrador	24*	68	27*	54*
Prince Edward Island	25*	67*	32	50
Nova Scotia	24	69	25*	53
New Brunswick	24	67*	26*	54*
Quebec	23	68*	21*	62*
Ontario	19*	74*	39*	44*
Manitoba	26*	65*	30	50
Saskatchewan	29*	64*	24*	57*
Alberta	26*	67*	34	48*
British Columbia	21	73	33	51

*Statistically significantly different from the Canadian average at the 0.05 level.

Table A.51: Parents attitudes towards the trades by student and school characteristics, Canada

Canada and provinces	My parents encouraged me to pursue a career in the trades		My parents do not want me to pursue a career in the trades	
	Strongly Agree/Agree	Strongly Disagree/Disagree	Strongly Agree/Agree	Strongly Disagree/Disagree
	(%)			
Gender				
Boys	32	59	29	54
Girls	12*	81*	35*	47*
School urban setting				
Non major (<100k)	25	67	25	57
Major (100k+)	19*	73*	38*	45*
Language of the school system				
Rest of Canada				
English	21	71	35	47
French	24*	66*	27*	54*
Quebec				
English	19	74	33	49
French	23*	67*	19*	64*
Immigrant status				
Non-immigrant	23	69	26	56
Second generation	18*	74*	47*	38*
First generation	18*	76*	46*	38*
Socio-economic status				
Bottom quarter	28	62	26	53
Second quarter	24*	68*	30*	52
Third quarter	20	73*	33*	51
Top quarter	15*	79*	39*	47*

Reference category highlighted in grey
*statistically significant difference relative to the reference category at the 0.05 level.

Table A.52: Parents attitudes towards the trades among students that consulted a family member as a source of information about the trades, Canada

Consulted a family member as a source of information	My parents encouraged me to pursue a career in the trades		My parents do not want me to pursue a career in the trades	
	Yes	No	Yes	No
	(%)			
Yes	40	52	25	62
No	8*	85*	38*	42*

*statistically significant difference between those that consulted a family member and those that did not at the 0.05 level.

Annex B: Econometric Results

Table B.1: Multivariate model of a student's interest in pursuing a job in the trades and mathematics skills

Odds Ratios[1]	
PISA mathematics score	**0.995**[2]
Gender	
Girls (ref.)	
Boys	**7.49**
Family socio-economic status	
Top quarter (ref.)	
Third quarter	n.s.
Second quarter	n.s.
Bottom quarter	n.s.
Immigrant Status	
Non-immigrant (ref.)	
Second generation immigrant	n.s
First generation immigrant	n.s
Province	
Ontario (ref.)	
Newfoundland and Labrador	n.s
Prince Edward Island	n.s
Nova Scotia	n.s.
New Brunswick	n.s.
Quebec	n.s.
Manitoba	**2.13**
Saskatchewan	**1.90**
Alberta	n.s.
British Columbia	n.s.
School urban setting	
Major (100k+) (ref.)	
Non Major (<100k)	**1.62**
Language of the school system	
Majority-language (ref.)	
Minority-language	n.s.
Parents' attitude towards the trades	
Do not encourage (ref.)	
Encourage	**7.84**
Discourage (ref.)	
Do not discourage	**1.90**
Student did an internship	
No (ref.)	
Yes	**1.75**

Student consulted a source of information	
No (ref.)	
Family member	**2.00**
Questionnaire	n.s.
Internet	n.s.
Talked to someone working in the trades	n.s.
Visited a work-site	n.s.
Teacher	n.s.
Counsellor	n.s.
Attended a presentation/course	n.s.
Index of student attitude towards school: Learning outcomes (scale: -2.99 to 2.35)	**0.79**
Friend plans on pursuing a career in the trades	
No (ref.)	
Yes	n.s.
Student attitudes towards the trades	
A career in the trades pays well	
No (ref.)	
Yes	**6.01**
I would enjoy the physical nature of work in the trades	
No (ref.)	
Yes	**3.61**
There aren't very good job opportunities for me in the trades	
No (ref.)	
Yes	**0.50**

[1] Values in bold type are significantly different from the reference group at a significance level of 5% or greater.

[2] The odds ratio values for the PISA score variables are very close to 1, suggesting that this variable has little effect on the outcome, despite being statistically significant. However, this is due to the fact that the PISA score scale is continuous with a unit change in the score representing only a small change in performance. In fact, the scale for the PISA score is quite different from the scales of any of the other independent variables, making the PISA score odds ratios look unusual compared to those for the other variables in the model.

n. s. = not significant

The bootstrap weights were used to estimate standard errors in order to take into account the complex sampling scheme of the PISA.

Source: PISA 2012

Table B.2: Multivariate model of a student's interest in pursuing a job in the trades and reading skills

Odds Ratios[1]	
PISA reading score	**0.995**[2]
Gender	
Girls (ref.)	
Boys	**5.92**
Family socio-economic status	
Top quarter (ref.)	
Third quarter	n.s.
Second quarter	n.s
Bottom quarter	**2.43**
Immigrant Status	
Non-immigrant (ref.)	
Second generation immigrant	n.s
First generation immigrant	n.s
Province	
Ontario (ref.)	
Newfoundland and Labrador	n.s
Prince Edward Island	n.s.
Nova Scotia	n.s.
New Brunswick	n.s.
Quebec	n.s.
Manitoba	**2.00**
Saskatchewan	n.s.
Alberta	n.s.
British Columbia	n.s.
School urban setting	
Major (100k+) (ref.)	
Non Major (<100k)	**1.61**
Language of the school system	
Majority-language (ref.)	
Minority-language	n.s.
Parents' attitude towards the trades	
Do not encourage (ref.)	
Encourage	**7.86**
Discourage (ref.)	
Do not discourage	**1.94**
Student did an internship	
No (ref.)	
Yes	n.s.
Student consulted a source of information	
No (ref.)	
Family member	**1.99**

Questionnaire	n.s.
Internet	n.s.
Talked to someone working in the trades	n.s.
Visited a work-site	n.s.
Teacher	n.s.
Counsellor	n.s.
Attended a presentation/course	n.s.
Index of student attitude towards school: Learning outcome (scale: -2.99 to 2.35)	**0.80**
Friend plans on pursuing a career in the trades	
No (ref.)	
Yes	**1.63**
Student attitudes towards the trades	
A career in the trades pays well	
No (ref.)	
Yes	**6.08**
I would enjoy the physical nature of work in the trades	
No (ref.)	
Yes	**3.64**
There aren't very good job opportunities for me in the trades	
No (ref.)	
Yes	**0.48**

[1] Values in bold type are significantly different from the reference group at a significance level of 5% or greater

[2] The odds ratio values for the PISA score variables are very close to 1, suggesting that this variable has little effect on the outcome, despite being statistically significant. However, this is due to the fact that the PISA score scale is continuous with a unit change in the score representing only a small change in performance. In fact, the scale for the PISA score is quite different from the scales of any of the other independent variables, making the PISA score odds ratios look unusual compared to those for the other variables in the model.

n. s. = not significant

The bootstrap weights were used to estimate standard errors in order to take into account the complex sampling scheme of the PISA.

Source: PISA 2012

Table B.3: Multivariate model of a student's interest in pursuing a job in the trades and science skills

Odds Ratios[1]	
PISA science score	**0.996**[2]
Gender	
Girls (ref.)	
Boys	**7.03**
Family Socio-economic status	
Top quarter (ref.)	
Third quarter	n.s.
Second quarter	n.s.
Bottom quarter	**2.16**
Immigrant Status	
Non-immigrant (ref.)	
Second generation immigrant	n.s
First generation immigrant	n.s
Province	
Ontario (ref.)	
Newfoundland and Labrador	n.s
Prince Edward Island	n.s
Nova Scotia	n.s.
New Brunswick	n.s.
Quebec	n.s.
Manitoba	**2.11**
Saskatchewan	n.s.
Alberta	n.s.
British Columbia	n.s.
School urban setting	
Major (100k+) (ref.)	
Non Major (<100k)	**1.61**
Language of the school system	
Majority-language (ref.)	
Minority-language	n.s.
Parents' attitude towards the trades	
Do not encourage (ref.)	
Encourage	**7.95**
Discourage (ref.)	
Do not discourage	**1.90**
Student did an internship	
No (ref.)	
Yes	n.s.
Student consulted a source of information	
No (ref.)	
Family member	**1.98**

Questionnaire	n.s.
Internet	n.s.
Talked to someone working in the trades	**1.67**
Visited a work-site	n.s.
Teacher	n.s.
Counsellor	n.s.
Attended a presentation/course	n.s.
Index of student attitude towards school: Learning outcomes (scale: -2.99 to 2.35)	**0.79**
Friend plans on pursuing a career in the trades	
No (ref.)	
Yes	n.s.
Student attitudes towards the trades	
A career in the trades pays well	
No (ref.)	
Yes	**5.88**
I would enjoy the physical nature of work in the trades	
No (ref.)	
Yes	**3.73**
There aren't very good job opportunities for me in the trades	
No (ref.)	
Yes	**0.49**

[1] Values in bold type are significantly different from the reference group at a significance level of 5% or greater.

[2] The odds ratio values for the PISA score variables are very close to 1, suggesting that this variable has little effect on the outcome, despite being statistically significant. However, this is due to the fact that the PISA score scale is continuous with a unit change in the score representing only a small change in performance. In fact, the scale for the PISA score is quite different from the scales of any of the other independent variables, making the PISA score odds ratios look unusual compared to those for the other variables in the model.

n. s. = not significant

The bootstrap weights were used to estimate standard errors in order to take into account the complex sampling scheme of the PISA.

Source: PISA 2012

Table B.4: Multivariate model of a student's interest in pursuing a job in the trades and problem solving skills

Odds Ratios[1]	
PISA problem solving score	**0.996**[2]
Gender	
Girls (ref.)	
Boys	**7.21**
Family socio-economic status	
Top quarter (ref.)	
Third quarter	n.s.
Second quarter	n.s.
Bottom quarter	**2.37**
Immigrant Status	
Non-immigrant (ref.)	
Second generation immigrant	n.s
First generation immigrant	n.s
Province	
Ontario (ref.)	
Newfoundland and Labrador	n.s
Prince Edward Island	n.s
Nova Scotia	n.s.
New Brunswick	n.s.
Quebec	n.s.
Manitoba	**2.00**
Saskatchewan	n.s.
Alberta	n.s.
British Columbia	n.s.
School urban setting	
Major (100k+) (ref.)	
Non Major (<100k)	**1.62**
Language of the school system	
Majority-language (ref.)	
Minority-language	n.s.
Parents' attitude towards the trades	
Do not encourage (ref.)	
Encourage	**8.04**
Discourage (ref.)	
Do not discourage	**1.85**
Student did an internship	
No (ref.)	
Yes	**1.76**
Student consulted a source of information	
No (ref.)	
Family member	**1.98**

Questionnaire	n.s.
Internet	n.s.
Talked to someone working in the trades	n.s.
Visited a work-site	n.s.
Teacher	n.s.
Counsellor	n.s.
Attended a presentation/course	n.s.
Index of student attitude towards school: Learning outcomes (scale: -2.99 to 2.35)	**0.81**
Friend plans on pursuing a career in the trades	
No (ref.)	
Yes	n.s.
Student attitudes towards the trades	
A career in the trades pays well	
No (ref.)	
Yes	**6.01**
I would enjoy the physical nature of work in the trades	
No (ref.)	
Yes	**3.58**
There aren't very good job opportunities for me in the trades	
No (ref.)	
Yes	**0.50**

[1] Values in bold type are significantly different from the reference group at a significance level of 5% or greater.

[2] The odds ratio values for the PISA score variables are very close to 1, suggesting that this variable has little effect on the outcome, despite being statistically significant. However, this is due to the fact that the PISA score scale is continuous with a unit change in the score representing only a small change in performance. In fact, the scale for the PISA score is quite different from the scales of any of the other independent variables, making the PISA score odds ratios look unusual compared to those for the other variables in the model.

n. s. = not significant

The bootstrap weights were used to estimate standard errors in order to take into account the complex sampling scheme of the PISA.

Source: PISA 2012

Table B.5: Multivariate model of a student's interest in pursuing a job in the trades and mathematics proficiency levels

Odds Ratios[1]	
Gender	
Girls (ref.)	
Boys	**7.54**
Mathematics proficiency level	
Level 5 and above (ref.)	
Below Level 1	**5.05**
Level 1	n.s.
Level 2	n.s.
Level 3	n.s.
Level 4	n.s.
Family socio-economic status	
Top quarter (ref.)	
Third quarter	n.s.
Second quarter	n.s.
Bottom quarter	**2.17**
Immigrant Status	
Non-immigrant (ref.)	
Second generation immigrant	n.s
First generation immigrant	n.s
Province	
Ontario (ref.)	
Newfoundland and Labrador	n.s
Prince Edward Island	n.s
Nova Scotia	n.s.
New Brunswick	n.s.
Quebec	n.s.
Manitoba	**2.16**
Saskatchewan	**1.96**
Alberta	n.s.
British Columbia	n.s.
School urban setting	
Major (100k+) (ref.)	
Non Major (<100k)	**1.64**
Language of the school system	
Majority-language (ref.)	
Minority-language	n.s.
Parents' attitude towards the trades	
Do not encourage (ref.)	
Encourage	**7.91**
Discourage (ref.)	
Do not discourage	**1.96**

Student did an internship	
No (ref.)	
Yes	**1.74**
Student consulted a source of information	
No (ref.)	
Family member	**2.01**
Questionnaire	n.s.
Internet	n.s.
Talked to someone working in the trades	n.s.
Visited a work-site	n.s.
Teacher	n.s.
Counsellor	n.s.
Attended a presentation/course	n.s.
Index of student attitude towards school: Learning outcomes (scale: -2.99 to 2.35)	**0.79**
Friend plans on pursuing a career in the trades	
No (ref.)	
Yes	n.s.
Student attitudes towards the trades	
A career in the trades pays well	
No (ref.)	
Yes	**5.98**
I would enjoy the physical nature of work in the trades	
No (ref.)	
Yes	**3.68**
There aren't very good job opportunities for me in the trades	
No (ref.)	
Yes	**0.50**

[1]Values in bold type are significantly different from the reference group at a significance level of 5% or greater.
n. s. = not significant
The bootstrap weights were used to estimate standard errors in order to take into account the complex sampling scheme of the PISA.
Source: PISA 2012

Table B.6A: Association between mathematics skills and student positive perceptions of the trades

Odds Ratio[1]	A career in the trades pays well	I enjoy the (hands-on) nature of work associated with jobs in the trades	A job in the trades requires a combination of knowledge and hands-on activity	There are good opportunities for women to work in the trades
PISA mathematics score	n.s.	n.s.	**1.006**[2]	n.s.
Gender				
Girls (ref.)				
Boys	**0.816**	**2.641**	**0.747**	**0.844**
Family Socio-economic status				
Top quarter (ref.)				
Third quarter	**1.732**	**1.434**	n.s.	n.s.
Second quarter	**2.179**	n.s.	n.s.	n.s.
Bottom quarter	**2.377**	**1.955**	n.s.	n.s.
Immigrant Status				
Non-immigrant (ref.)				
Second generation immigrant	n.s.	**0.660**	n.s.	n.s.
First generation immigrant	n.s.	**0.573**	n.s.	n.s.
Province				
Ontario (ref.)				
Newfoundland and Labrador	n.s	**0.663**	n.s.	**1.772**
Prince Edward Island	n.s	**0.765**	n.s.	n.s
Nova Scotia	**1.599**	n.s.	**1.864**	**2.110**
New Brunswick	n.s.	**0.637**	**1.794**	n.s.
Quebec	n.s.	**0.473**	**1.567**	**0.407**
Manitoba	n.s.	n.s.	n.s.	n.s.
Saskatchewan	**1.480**	n.s.	n.s.	**1.313**
Alberta	n.s.	n.s.	n.s.	**1.526**
British Columbia	n.s.	**0.693**	n.s.	n.s.
School urban setting				
Major (100k+) (ref.)				
Non Major (<100k)	n.s.	n.s.	n.s.	n.s.
Language of the school system				
Majority-language (ref.)				
Minority-language	n.s.	n.s.	**1.487**	n.s.
Parents' attitude towards the trades				
Do not encourage (ref.)				
Encourage	**2.812**	**3.785**	**2.888**	**1.877**
Discourage (ref.)				
Do not discourage	**2.458**	**1.405**	**0.803**	**1.570**

Student did an internship				
No (ref.)				
Yes	n.s.	n.s.	n.s.	**0.678**
Student consulted a source of information				
No (ref.)				
Family member	**1.346**	**1.412**	n.s.	n.s.
Questionnaire	**1.280**	n.s.	n.s.	n.s.
Internet	n.s.	**1.288**	n.s.	n.s.
Talked to someone working in the trades	n.s.	**1.473**	n.s.	n.s.
Visited a work-site	n.s.	n.s.	n.s.	n.s.
Teacher	n.s.	n.s.	n.s.	n.s.
Counsellor	**0.583**	n.s.	**0.493**	n.s.
Attended a presentation/course	n.s.	n.s.	n.s.	n.s.
Index of student attitude towards school: Learning outcomes	n.s.	n.s.	**1.221**	**1.096**
Friend plans on pursuing a career in the trades				
No (ref.)				
Yes	**2.043**	**1.726**	**2.016**	**1.698**
Constant	**0.283**	**0.230**	**0.150**	n.s.

[1]Values in bold type are significantly different from the reference group at a significance level of 5% or greater.

[2] The odds ratio values for the PISA score variables are very close to 1, suggesting that this variable has little effect on the outcome, despite being statistically significant. However, this is due to the fact that the PISA score scale is continuous with a unit change in the score representing only a small change in performance. In fact, the scale for the PISA score is quite different from the scales of any of the other independent variables, making the PISA score odds ratios look unusual compared to those for the other variables in the model.

n. s. = not significant

The bootstrap weights were used to estimate standard errors in order to take into account the complex sampling scheme of the PISA.

Source: PISA 2012

Table B.6B: Student negative perceptions of the trades and mathematics skills

Odds Ratio[1]	There aren't very good job opportunities for me in the trades	People with good grades do not pursue a job in the trades	A job in the trades is too physically demanding for me
PISA mathematics score	**0.998**[2]	**0.998**[2]	**0.997**[2]
Gender			
Girls (ref.)			
Boys	**0.608**	**2.407**	**0.460**
Family Socio-economic status			
Top quarter (ref.)			
Third quarter	n.s.	**1.434**	n.s.
Second quarter	n.s.	n.s.	n.s.
Bottom quarter	n.s.	**0.722**	n.s.
Immigrant Status			
Non-immigrant (ref.)			
Second generation immigrant	n.s.	**1.410**	**1.839**
First generation immigrant	**1.471**	**1.296**	**2.329**
Province			
Ontario (ref.)			
Newfoundland and Labrador	n.s.	n.s.	n.s.
Prince Edward Island	n.s.	n.s.	n.s.
Nova Scotia	n.s.	n.s.	n.s.
New Brunswick	n.s.	n.s.	n.s.
Quebec	**1.700**	**1.635**	n.s.
Manitoba	n.s.	n.s.	n.s.
Saskatchewan	n.s.	n.s.	n.s.
Alberta	n.s.	n.s.	n.s.
British Columbia	n.s.	n.s.	n.s.
School urban setting			
Major (100k+) (ref.)			
Non Major (<100k)	n.s.	n.s.	n.s.
Language of the school system			
Majority-language (ref.)			
Minority-language	n.s.	n.s.	n.s.
Parents' attitude towards the trades			
Do not encourage (ref.)			
Encourage	n.s.	n.s.	**1.296**
Discourage (ref.)			
Do not discourage	**0.189**	**0.285**	**0.450**
Student did an internship			
No (ref.)			
Yes	n.s.	n.s.	n.s.

Student consulted a source of information			
No (ref.)			
Family member	**0.695**	**0.773**	**0.592**
Questionnaire	**0.813**	**0.760**	n.s.
Internet	**0.786**	n.s.	**0.780**
Talked to someone working in the trades	n.s.	n.s.	n.s.
Visited a work-site	n.s.	n.s.	n.s.
Teacher	**0.748**	n.s.	n.s.
Counsellor	**1.302**	**1.431**	**1.368**
Attended a presentation/course	n.s.	n.s.	**1.351**
Index of student attitude towards school: Learning outcomes	**1.095**	n.s.	**0.893**
Friend plans on pursuing a career in the trades			
No (ref.)			
Yes	n.s.	**0.554**	**0.819**
Constant	**11.534**	**2.460**	**4.625**

[1] Values in bold type are significantly different from the reference group at a significance level of 5% or greater.

[2] The odds ratio values for the PISA score variables are very close to 1, suggesting that this variable has little effect on the outcome, despite being statistically significant. However, this is due to the fact that the PISA score scale is continuous with a unit change in the score representing only a small change in performance. In fact, the scale for the PISA score is quite different from the scales of any of the other independent variables, making the PISA score odds ratios look unusual compared to those for the other variables in the model.

n. s. = not significant

The bootstrap weights were used to estimate standard errors in order to take into account the complex sampling scheme of the PISA.

Source: PISA 2012

Table B.7A: Student positive perceptions of the trades and reading skills

Odds Ratio[1]	A career in the trades pays well	I enjoy the (hands-on) nature of work associated with jobs in the trades	A job in the trades requires a combination of knowledge and hands-on activity	There are good opportunities for women to work in the trades
PISA reading score	n.s.	n.s.	**1.006**[2]	n.s.
Gender				
Girls (ref.)				
Boys	n.s.	**2.575**	n.s.	n.s.
Family Socio-economic status				
Top quarter (ref.)				
Third quarter	**1.726**	**1.425**	n.s.	n.s.
Second quarter	**2.169**	n.s.	n.s.	n.s.
Bottom quarter	**2.369**	**1.929**	n.s.	n.s.
Immigrant Status				
Non-immigrant (ref.)				
Second generation immigrant	n.s.	**0.660**	n.s.	n.s.
First generation immigrant	n.s.	**0.569**	n.s.	n.s.
Province				
Ontario (ref.)				
Newfoundland and Labrador	n.s	**0.659**	n.s.	**1.776**
Prince Edward Island	n.s	**0.755**	n.s.	n.s
Nova Scotia	**1.601**	n.s.	**1.861**	**2.112**
New Brunswick	n.s.	**0.628**	**1.984**	n.s.
Quebec	n.s.	**0.466**	**1.832**	**0.416**
Manitoba	n.s.	n.s.	n.s.	n.s.
Saskatchewan	**1.491**	n.s.	n.s.	**1.329**
Alberta	n.s.	n.s.	n.s.	**1.532**
British Columbia	n.s.	**0.694**	n.s.	n.s.
School urban setting				
Major (100k+) (ref.)				
Non Major (<100k)	n.s.	n.s.	n.s.	n.s.
Language of the school system				
Majority-language (ref.)				
Minority-language	n.s.	n.s.	**1.421**	n.s.
Parents' attitude towards the trades				
Do not encourage (ref.)				
Encourage	**2.812**	**3.752**	**2.910**	**1.884**
Discourage (ref.)				
Do not discourage	**2.455**	**1.404**	**0.787**	**1.569**

Student did an internship				
No (ref.)				
Yes	n.s.	n.s.	n.s.	**0.683**
Student consulted a source of information				
No (ref.)				
Family member	**1.347**	**1.412**	n.s.	n.s.
Questionnaire	**1.283**	n.s.	n.s.	n.s.
Internet	n.s.	**1.289**	n.s.	n.s.
Talked to someone working in the trades	n.s.	**1.471**	n.s.	n.s.
Visited a work-site	n.s.	n.s.	n.s.	n.s.
Teacher	n.s.	n.s.	n.s.	n.s.
Counsellor	**0.584**	n.s.	**0.504**	n.s.
Attended a presentation/course	n.s.	n.s.	n.s.	n.s.
Index of student attitude towards school: Learning outcomes	n.s.	n.s.	**1.217**	**1.094**
Friend plans on pursuing a career in the trades				
No (ref.)				
Yes	**2.041**	**1.727**	**2.003**	**1.698**
Constant	**0.280**	**0.280**	**0.124**	n.s.

[1]Values in bold type are significantly different from the reference group at a significance level of 5% or greater.

[2] The odds ratio values for the PISA score variables are very close to 1, suggesting that this variable has little effect on the outcome, despite being statistically significant. However, this is due to the fact that the PISA score scale is continuous with a unit change in the score representing only a small change in performance. In fact, the scale for the PISA score is quite different from the scales of any of the other independent variables, making the PISA score odds ratios look unusual compared to those for the other variables in the model.

n. s. = not significant

The bootstrap weights were used to estimate standard errors in order to take into account the complex sampling scheme of the PISA.

Source: PISA 2012

Table B.7B: Student negative perceptions of the trades and reading skills

Odds Ratio[1]	There aren't very good job opportunities for me in the trades	People with good grades do not pursue a job in the trades	A job in the trades is too physically demanding for me
PISA reading score	**0.998**[2]	**0.998**[2]	**0.997**[2]
Gender			
Girls (ref.)			
Boys	**0.566**	**2.245**	**0.409**
Family Socio-economic status			
Top quarter (ref.)			
Third quarter	n.s.	n.s.	n.s.
Second quarter	n.s.	n.s.	n.s.
Bottom quarter	n.s.	**0.734**	n.s.
Immigrant Status			
Non-immigrant (ref.)			
Second generation immigrant	n.s.	**1.418**	**1.856**
First generation immigrant	**1.451**	**1.279**	**2.280**
Province			
Ontario (ref.)			
Newfoundland and Labrador	n.s.	n.s.	n.s.
Prince Edward Island	n.s.	n.s.	n.s.
Nova Scotia	n.s.	n.s.	n.s.
New Brunswick	n.s.	n.s.	n.s.
Quebec	**1.606**	**1.553**	n.s.
Manitoba	n.s.	n.s.	n.s.
Saskatchewan	n.s.	n.s.	n.s.
Alberta	n.s.	n.s.	n.s.
British Columbia	n.s.	n.s.	n.s.
School urban setting			
Major (100k+) (ref.)			
Non Major (<100k)	n.s.	n.s.	n.s.
Language of the school system			
Majority-language (ref.)			
Minority-language	n.s.	n.s.	n.s.
Parents' attitude towards the trades			
Do not encourage (ref.)			
Encourage	n.s.	n.s.	**1.293**
Discourage (ref.)			
Do not discourage	**0.190**	**0.287**	**0.454**
Student did an internship			
No (ref.)			
Yes	n.s.	n.s.	n.s.

Student consulted a source of information			
No (ref.)			
Family member	**0.691**	**0.769**	**0.588**
Questionnaire	**0.808**	**0.757**	n.s.
Internet	**0.793**	n.s.	n.s.
Talked to someone working in the trades	n.s.	n.s.	n.s.
Visited a work-site	n.s.	n.s.	n.s.
Teacher	**0.750**	n.s.	n.s.
Counsellor	**1.300**	**1.424**	**1.352**
Attended a presentation/course	n.s.	n.s.	**1.362**
Index of student attitude towards school: Learning outcomes	**1.094**	n.s.	**0.896**
Friend plans on pursuing a career in the trades			
No (ref.)			
Yes	n.s.	**0.556**	**0.821**
Constant	**10.456**	**2.398**	**5.024**

[1] Values in bold type are significantly different from the reference group at a significance level of 5% or greater.

[2] The odds ratio values for the PISA score variables are very close to 1, suggesting that this variable has little effect on the outcome, despite being statistically significant. However, this is due to the fact that the PISA score scale is continuous with a unit change in the score representing only a small change in performance. In fact, the scale for the PISA score is quite different from the scales of any of the other independent variables, making the PISA score odds ratios look unusual compared to those for the other variables in the model.

n. s. = not significant

The bootstrap weights were used to estimate standard errors in order to take into account the complex sampling scheme of the PISA.

Source: PISA 2012

Table B.8A: Student positive perceptions of the trades and science skills

Odds Ratio[1]	A career in the trades pays well	I enjoy the (hands-on) nature of work associated with jobs in the trades	A job in the trades requires a combination of knowledge and hands-on activity	There are good opportunities for women to work in the trades
PISA science score	n.s.	n.s.	**1.006**[2]	n.s.
Gender				
Girls (ref.)				
Boys	**0.819**	**2.626**	n.s.	**0.846**
Family Socio-economic status				
Top quarter (ref.)				
Third quarter	**1.729**	**1.437**	n.s.	n.s.
Second quarter	**2.172**	n.s.	n.s.	n.s.
Bottom quarter	**2.367**	**1.969**	n.s.	n.s.
Immigrant Status				
Non-immigrant (ref.)				
Second generation immigrant	n.s.	**0.658**	n.s.	n.s.
First generation immigrant	n.s.	**0.570**	n.s.	n.s.
Province				
Ontario (ref.)				
Newfoundland and Labrador	n.s	**0.665**	n.s.	**1.767**
Prince Edward Island	n.s	**0.765**	n.s.	n.s
Nova Scotia	**1.599**	n.s.	**1.826**	**2.110**
New Brunswick	n.s.	**0.635**	**1.936**	n.s.
Quebec	n.s.	**0.464**	**1.902**	**0.418**
Manitoba	n.s.	n.s.	n.s.	n.s.
Saskatchewan	**1.486**	n.s.	n.s.	**1.322**
Alberta	n.s.	n.s.	n.s.	**1.516**
British Columbia	n.s.	**0.695**	n.s.	n.s.
School urban setting				
Major (100k+) (ref.)				
Non Major (<100k)	n.s.	n.s.	n.s.	n.s.
Language of the school system				
Majority-language (ref.)				
Minority-language	n.s.	n.s.	**1.425**	n.s.
Parents' attitude towards the trades				
Do not encourage (ref.)				
Encourage	**2.814**	**3.793**	**2.952**	**1.886**
Discourage (ref.)				
Do not discourage	**2.455**	**1.407**	**0.794**	**1.568**

Student did an internship				
No (ref.)				
Yes	n.s.	n.s.	n.s.	**0.683**
Student consulted a source of information				
No (ref.)				
Family member	**1.347**	**1.410**	n.s.	n.s.
Questionnaire	**1.282**	n.s.	n.s.	n.s.
Internet	n.s.	**1.289**	n.s.	n.s.
Talked to someone working in the trades	n.s.	**1.475**	n.s.	n.s.
Visited a work-site	n.s.	n.s.	n.s.	n.s.
Teacher	n.s.	n.s.	n.s.	n.s.
Counsellor	**0.586**	n.s.	**0.523**	n.s.
Attended a presentation/course	n.s.	n.s.	n.s.	n.s.
Index of student attitude towards school: Learning outcomes	n.s.	n.s.	**1.211**	**1.094**
Friend plans on pursuing a career in the trades				
No (ref.)				
Yes	**2.041**	**1.727**	**2.006**	**1.698**
Constant	**0.283**	**0.220**	**0.136**	n.s.

[1]Values in bold type are significantly different from the reference group at a significance level of 5% or greater.

[2] The odds ratio values for the PISA score variables are very close to 1, suggesting that this variable has little effect on the outcome, despite being statistically significant. However, this is due to the fact that the PISA score scale is continuous with a unit change in the score representing only a small change in performance. In fact, the scale for the PISA score is quite different from the scales of any of the other independent variables, making the PISA score odds ratios look unusual compared to those for the other variables in the model.

n. s. = not significant

The bootstrap weights were used to estimate standard errors in order to take into account the complex sampling scheme of the PISA.

Source: PISA 2012

Table B.8B: Student negative perceptions of the trades and science skills

Odds Ratio[1]	There aren't very good job opportunities for me in the trades	People with good grades do not pursue a job in the trades	A job in the trades is too physically demanding for me
PISA science score	**0.998**[2]	**0.998**[2]	**0.997**[2]
Gender			
Girls (ref.)			
Boys	**0.603**	**2.381**	**0.452**
Family Socio-economic status			
Top quarter (ref.)			
Third quarter	n.s.	n.s.	n.s.
Second quarter	n.s.	n.s.	n.s.
Bottom quarter	n.s.	**0.729**	n.s.
Immigrant Status			
Non-immigrant (ref.)			
Second generation immigrant	n.s.	**1.388**	**1.790**
First generation immigrant	**1.431**	n.s.	**2.236**
Province			
Ontario (ref.)			
Newfoundland and Labrador	n.s.	n.s.	n.s.
Prince Edward Island	n.s.	n.s.	n.s.
Nova Scotia	n.s.	n.s.	n.s.
New Brunswick	n.s.	n.s.	n.s.
Quebec	**1.587**	**1.532**	n.s.
Manitoba	n.s.	n.s.	n.s.
Saskatchewan	n.s.	n.s.	n.s.
Alberta	n.s.	n.s.	n.s.
British Columbia	n.s.	n.s.	n.s.
School urban setting			
Major (100k+) (ref.)			
Non Major (<100k)	n.s.	n.s.	n.s.
Language of the school system			
Majority-language (ref.)			
Minority-language	n.s.	n.s.	n.s.
Parents' attitude towards the trades			
Do not encourage (ref.)			
Encourage	n.s.	n.s.	**1.282**
Discourage (ref.)			
Do not discourage	**0.190**	**0.287**	**0.454**
Student did an internship			
No (ref.)			
Yes	n.s.	n.s.	n.s.

Student consulted a source of information			
No (ref.)			
Family member	**0.694**	**0.771**	**0.590**
Questionnaire	**0.808**	**0.756**	n.s.
Internet	**0.787**	n.s.	n.s.
Talked to someone working in the trades	n.s.	n.s.	n.s.
Visited a work-site	n.s.	n.s.	n.s.
Teacher	**0.750**	n.s.	n.s.
Counsellor	n.s.	**1.411**	**1.334**
Attended a presentation/course	n.s.	n.s.	**1.354**
Index of student attitude towards school: Learning outcomes	**1.099**	n.s.	**0.896**
Friend plans on pursuing a career in the trades			
No (ref.)			
Yes	n.s.	**0.556**	**0.822**
Constant	**13.095**	**2.525**	**5.041**

[1] Values in bold type are significantly different from the reference group at a significance level of 5% or greater.

[2] The odds ratio values for the PISA score variables are very close to 1, suggesting that this variable has little effect on the outcome, despite being statistically significant. However, this is due to the fact that the PISA score scale is continuous with a unit change in the score representing only a small change in performance. In fact, the scale for the PISA score is quite different from the scales of any of the other independent variables, making the PISA score odds ratios look unusual compared to those for the other variables in the model.

n. s. = not significant

The bootstrap weights were used to estimate standard errors in order to take into account the complex sampling scheme of the PISA.

Source: PISA 2012

Table B.9A: Student positive perceptions of the trades and problem solving skills

Odds Ratio[1]	A career in the trades pays well	I enjoy the (hands-on) nature of work associated with jobs in the trades	A job in the trades requires a combination of knowledge and hands-on activity	There are good opportunities for women to work in the trades
PISA problem solving score	n.s.	n.s.	**1.004**[2]	n.s.
Gender				
Girls (ref.)				
Boys	**0.825**	**2.635**	n.s.	**0.845**
Family Socio-economic status				
Top quarter (ref.)				
Third quarter	**1.708**	**1.438**	n.s.	n.s.
Second quarter	**2.137**	n.s.	n.s.	n.s.
Bottom quarter	**2.315**	**1.972**	n.s.	n.s.
Immigrant Status				
Non-immigrant (ref.)				
Second generation immigrant	n.s.	**0.656**	n.s.	n.s.
First generation immigrant	n.s.	**0.568**	n.s.	n.s.
Province				
Ontario (ref.)				
Newfoundland and Labrador	n.s	**0.659**	n.s.	**1.790**
Prince Edward Island	n.s	**0.756**	n.s.	n.s
Nova Scotia	**1.596**	n.s.	**1.886**	**2.119**
New Brunswick	n.s.	**0.634**	**1.820**	n.s.
Quebec	n.s.	**0.465**	**1.873**	**0.416**
Manitoba	n.s.	n.s.	n.s.	n.s.
Saskatchewan	**1.480**	n.s.	n.s.	**1.325**
Alberta	n.s.	n.s.	n.s.	**1.528**
British Columbia	n.s.	**0.692**	n.s.	n.s.
School urban setting				
Major (100k+) (ref.)				
Non Major (<100k)	n.s.	n.s.	n.s.	n.s.
Language of the school system				
Majority-language (ref.)				
Minority-language	**1.229**	n.s.	**1.489**	n.s.
Parents' attitude towards the trades				
Do not encourage (ref.)				
Encourage	**2.771**	**3.785**	**2.782**	**1.880**
Discourage (ref.)				
Do not discourage	**2.449**	**1.404**	**0.791**	**1.572**

Student did an internship				
No (ref.)				
Yes	n.s.	n.s.	n.s.	**0.681**
Student consulted a source of information				
No (ref.)				
Family member	**1.350**	**1.408**	n.s.	n.s.
Questionnaire	**1.283**	n.s.	n.s.	n.s.
Internet	n.s.	**1.291**	n.s.	n.s.
Talked to someone working in the trades	n.s.	**1.473**	n.s.	n.s.
Visited a work-site	n.s.	n.s.	n.s.	n.s.
Teacher	n.s.	n.s.	n.s.	n.s.
Counsellor	**0.579**	n.s.	**0.474**	n.s.
Attended a presentation/course	n.s.	n.s.	n.s.	n.s.
Index of student attitude towards school: Learning outcomes	n.s.	n.s.	**1.226**	**1.092**
Friend plans on pursuing a career in the trades				
No (ref.)				
Yes	**2.038**	**1.730**	**1.989**	**1.694**
Constant	**0.357**	**0.231**	**0.354**	n.s.

[1]Values in bold type are significantly different from the reference group at a significance level of 5% or greater.

[2] The odds ratio values for the PISA score variables are very close to 1, suggesting that this variable has little effect on the outcome, despite being statistically significant. However, this is due to the fact that the PISA score scale is continuous with a unit change in the score representing only a small change in performance. In fact, the scale for the PISA score is quite different from the scales of any of the other independent variables, making the PISA score odds ratios look unusual compared to those for the other variables in the model.

n. s. = not significant

The bootstrap weights were used to estimate standard errors in order to take into account the complex sampling scheme of the PISA.

Source: PISA 2012

Table B.9B: Student negative perceptions of the trades and problem solving skills

Odds Ratio[1]	There aren't very good job opportunities for me in the trades	People with good grades do not pursue a job in the trades	A job in the trades is too physically demanding for me
PISA problem solving score	**0.999**[2]	**0.999**[2]	**0.999**[2]
Gender			
Girls (ref.)			
Boys	**0.592**	**2.377**	**0.444**
Family Socio-economic status			
Top quarter (ref.)			
Third quarter	n.s.	n.s.	n.s.
Second quarter	n.s.	n.s.	n.s.
Bottom quarter	n.s.	**0.754**	n.s.
Immigrant Status			
Non-immigrant (ref.)			
Second generation immigrant	n.s.	**1.395**	**1.811**
First generation immigrant	**1.434**	n.s.	**2.230**
Province			
Ontario (ref.)			
Newfoundland and Labrador	n.s.	n.s.	n.s.
Prince Edward Island	n.s.	n.s.	n.s.
Nova Scotia	n.s.	n.s.	n.s.
New Brunswick	n.s.	n.s.	n.s.
Quebec	**1.560**	**1.549**	n.s.
Manitoba	n.s.	n.s.	n.s.
Saskatchewan	n.s.	n.s.	n.s.
Alberta	n.s.	n.s.	n.s.
British Columbia	n.s.	n.s.	n.s.
School urban setting			
Major (100k+) (ref.)			
Non Major (<100k)	n.s.	n.s.	n.s.
Language of the school system			
Majority-language (ref.)			
Minority-language	n.s.	n.s.	n.s.
Parents' attitude towards the trades			
Do not encourage (ref.)			
Encourage	n.s.	n.s.	**1.336**
Discourage (ref.)			
Do not discourage	**0.190**	**0.285**	**0.452**
Student did an internship			
No (ref.)			
Yes	n.s.	n.s.	n.s.

Student consulted a source of information			
No (ref.)			
Family member	**0.687**	**0.767**	**0.582**
Questionnaire	**0.812**	**0.762**	n.s.
Internet	**0.794**	n.s.	n.s.
Talked to someone working in the trades	n.s.	n.s.	n.s.
Visited a work-site	n.s.	n.s.	n.s.
Teacher	**0.756**	n.s.	n.s.
Counsellor	**1.318**	**1.435**	**1.385**
Attended a presentation/course	n.s.	n.s.	**1.349**
Index of student attitude towards school: Learning outcomes	**1.091**	n.s.	**0.888**
Friend plans on pursuing a career in the trades			
No (ref.)			
Yes	n.s.	**0.559**	**0.832**
Constant	**7.463**	**2.073**	**2.507**

[1] Values in bold type are significantly different from the reference group at a significance level of 5% or greater.

[2] The odds ratio values for the PISA score variables are very close to 1, suggesting that this variable has little effect on the outcome, despite being statistically significant. However, this is due to the fact that the PISA score scale is continuous with a unit change in the score representing only a small change in performance. In fact, the scale for the PISA score is quite different from the scales of any of the other independent variables, making the PISA score odds ratios look unusual compared to those for the other variables in the model.

n. s. = not significant

The bootstrap weights were used to estimate standard errors in order to take into account the complex sampling scheme of the PISA.

Source: PISA 2012.

Table B.10A: Student positive perceptions of the trades and mathematics proficiency levels

Odds Ratio[1]	A career in the trades pays well	I enjoy the (hands-on) nature of work associated with jobs in the trades	A job in the trades requires a combination of knowledge and hands-on activity	There are good opportunities for women to work in the trades
Mathematics proficiency levels				
Level 5 and above (ref.)				
Below Level 1	n.s.	n.s.	**0.164**	n.s.
Level 1	n.s.	n.s.	**0.269**	n.s.
Level 2	n.s.	n.s.	**0.416**	n.s.
Level 3	n.s.	n.s.	n.s.	n.s.
Level 4	n.s.	n.s.	n.s.	n.s.
Gender				
Girls (ref.)				
Boys	**0.824**	**2.641**	**0.760**	**0.845**
Family Socio-economic status				
Top quarter (ref.)				
Third quarter	**1.724**	**1.434**	n.s.	n.s.
Second quarter	**2.193**	n.s.	n.s.	n.s.
Bottom quarter	**2.411**	**1.970**	n.s.	n.s.
Immigrant Status				
Non-immigrant (ref.)				
Second generation immigrant	n.s.	**0.661**	n.s.	n.s.
First generation immigrant	n.s.	**0.575**	n.s.	n.s.
Province				
Ontario (ref.)				
Newfoundland and Labrador	n.s	**0.664**	n.s.	**1.766**
Prince Edward Island	n.s	**0.769**	n.s.	n.s
Nova Scotia	**1.614**	n.s.	**1.858**	**2.114**
New Brunswick	n.s.	**0.640**	**1.819**	n.s.
Quebec	n.s.	**0.472**	**1.599**	**0.406**
Manitoba	n.s.	n.s.	n.s.	n.s.
Saskatchewan	**1.493**	n.s.	n.s.	**1.315**
Alberta	n.s.	n.s.	n.s.	**1.532**
British Columbia	n.s.	**0.689**	n.s.	n.s.
School urban setting				
Major (100k+) (ref.)				
Non Major (<100k)	n.s.	n.s.	n.s.	n.s.
Language of the school system				
Majority-language (ref.)				
Minority-language	n.s.	n.s.	**1.516**	n.s.

Parents' attitude towards the trades				
Do not encourage (ref.)				
Encourage	**2.862**	**3.837**	**2.906**	**1.866**
Discourage (ref.)				
Do not discourage	**2.468**	**1.400**	**0.801**	**1.579**
Student did an internship				
No (ref.)				
Yes	n.s.	n.s.	n.s.	**0.676**
Student consulted a source of information				
No (ref.)				
Family member	**1.339**	**1.412**	n.s.	n.s.
Questionnaire	**1.293**	n.s.	n.s.	n.s.
Internet	n.s.	**1.290**	n.s.	n.s.
Talked to someone working in the trades	n.s.	**1.478**	n.s.	n.s.
Visited a work-site	n.s.	n.s.	n.s.	n.s.
Teacher	n.s.	n.s.	n.s.	n.s.
Counsellor	**0.589**	n.s.	**0.494**	n.s.
Attended a presentation/course	n.s.	n.s.	n.s.	n.s.
Index of student attitude towards school: Learning outcomes	n.s.	n.s.	**1.221**	**1.096**
Friend plans on pursuing a career in the trades				
No (ref.)				
Yes	**2.014**	**1.723**	**1.987**	**1.703**
Constant	**0.342**	**0.162**	**5.065**	n.s.

[1] Values in bold type are significantly different from the reference group at a significance level of 5% or greater.

n. s. = not significant

The bootstrap weights were used to estimate standard errors in order to take into account the complex sampling scheme of the PISA.

Source: PISA 2012

Table B.10B: Student negative perceptions of the trades and mathematics proficiency levels

Odds Ratio[1]	There aren't very good job opportunities for me in the trades	People with good grades do not pursue a job in the trades	A job in the trades is too physically demanding for me
Mathematics proficiency levels			
Level 5 and above (ref.)			
Below Level 1	n.s.	**2.053**	**2.940**
Level 1	**1.567**	**1.525**	**1.911**
Level 2	**1.581**	n.s.	**1.442**
Level 3	**1.422**	n.s.	n.s.
Level 4	**1.341**	n.s.	n.s.
Gender			
Girls (ref.)			
Boys	**0.609**	**2.386**	**0.453**
Family Socio-economic status			
Top quarter (ref.)			
Third quarter	n.s.	n.s.	n.s.
Second quarter	n.s.	n.s.	n.s.
Bottom quarter	n.s.	**0.720**	n.s.
Immigrant Status			
Non-immigrant (ref.)			
Second generation immigrant	n.s.	**1.411**	**1.844**
First generation immigrant	**1.472**	**1.291**	**2.318**
Province			
Ontario (ref.)			
Newfoundland and Labrador	n.s.	n.s.	n.s.
Prince Edward Island	n.s.	n.s.	n.s.
Nova Scotia	n.s.	n.s.	n.s.
New Brunswick	n.s.	n.s.	n.s.
Quebec	**1.700**	**1.623**	n.s.
Manitoba	n.s.	n.s.	n.s.
Saskatchewan	n.s.	n.s.	n.s.
Alberta	n.s.	n.s.	n.s.
British Columbia	n.s.	n.s.	n.s.
School urban setting			
Major (100k+) (ref.)			
Non Major (<100k)	n.s.	n.s.	n.s.
Language of the school system			
Majority-language (ref.)			
Minority-language	n.s.	n.s.	n.s.

Parents' attitude towards the trades			
Do not encourage (ref.)			
Encourage	n.s.	n.s.	**1.285**
Discourage (ref.)			
Do not discourage	**0.188**	**0.286**	**0.452**
Student did an internship			
No (ref.)			
Yes	n.s.	n.s.	n.s.
Student consulted a source of information			
No (ref.)			
Family member	**0.692**	**0.778**	**0.593**
Questionnaire	**0.815**	**0.752**	n.s.
Internet	**0.783**	n.s.	n.s.
Talked to someone working in the trades	n.s.	n.s.	n.s.
Visited a work-site	n.s.	n.s.	n.s.
Teacher	**0.748**	n.s.	n.s.
Counsellor	**1.307**	**1.412**	**1.353**
Attended a presentation/course	n.s.	n.s.	**1.343**
Index of student attitude towards school: Learning outcomes	**1.094**	n.s.	**0.895**
Friend plans on pursuing a career in the trades			
No (ref.)			
Yes	n.s.	**0.564**	**0.832**
Constant	**3.322**	n.s.	n.s.

[1] Values in bold type are significantly different from the reference group at a significance level of 5% or greater.
n. s. = not significant
The bootstrap weights were used to estimate standard errors in order to take into account the complex sampling scheme of the PISA.
Source: PISA 2012

Table B.11: Factors influencing parents in their advice to the student about pursuing a career in the trades, Mathematics

Odds Ratio[1]	Parents encourage a career in the trades	Parents discourage a career in the trades
PISA mathematics score	**0.994**[2]	**1.001**[2]
Gender		
Girls (ref.)		
Boys	**4.531**	**0.680**
Immigrant Status		
Non-immigrant (ref.)		
Second generation immigrant	**0.711**	**2.430**
First generation immigrant	n.s.	**2.063**
Province		
Ontario (ref.)		
Newfoundland and Labrador	n.s	n.s
Prince Edward Island	n.s	**1.228**
Nova Scotia	n.s.	**0.829**
New Brunswick	n.s.	n.s.
Quebec	**1.475**	**0.457**
Manitoba	**1.399**	n.s.
Saskatchewan	**1.569**	**0.704**
Alberta	**1.503**	n.s.
British Columbia	n.s.	**0.779**
School urban setting		
Major (100k+) (ref.)		
Non Major (<100k)	**1.183**	**0.876**
Mother's highest level of education		
ISCED 0 (less than primary) (ref.)		
ISCED 1 (primary)	n.s.	n.s.
ISCED 2 (high school)	n.s.	n.s.
ISCED 4 (trades certificate/diploma)	n.s.	n.s.
ISCED 5 (college/university undergrad and Masters)	n.s.	n.s.
ISCED 6 (doctoral/post-doctoral)	n.s.	n.s.
Father's highest level of education		
ISCED 0 (less than primary) (ref.)		
ISCED 1 (primary)	n.s.	n.s.
ISCED 2 (high school)	**0.499**	n.s.
ISCED 4 (trades certificate/diploma)	**0.470**	n.s.
ISCED 5 (college/university undergrad and Masters)	**0.441**	n.s.
ISCED 6 (doctoral/post-doctoral)	**0.401**	n.s.
Mother's Occupation		
Professionals (ref.)		
Armed Forces	x	x

Managers	n.s.	n.s.
Technicians and Associate Professionals	n.s.	**0.822**
Clerical Support	**1.301**	n.s.
Service and Sales	n.s.	n.s.
Skilled agricultural, forestry and fishery workers	n.s.	n.s.
Craft and related trades workers	n.s.	n.s.
Plant and machine operators, and assemblers	**1.634**	**0.541**
Elementary occupations	**1.220**	**0.769**
Father's Occupation		
Professionals (ref.)		
Armed Forces	n.s.	n.s.
Managers	n.s.	n.s.
Technicians and Associate Professionals	n.s.	n.s.
Clerical Support	n.s.	n.s.
Service and Sales	**1.334**	n.s.
Skilled agricultural, forestry and fishery workers	**1.894**	**0.649**
Craft and related trades workers	**1.876**	**0.831**
Plant and machine operators, and assemblers	**1.981**	**0.790**
Elementary occupations	**1.476**	n.s.

[1] Values in bold type are significantly different from the reference group at a significance level of 5% or greater.

[2] The odds ratio values for the PISA score variables are very close to 1, suggesting that this variable has little effect on the outcome, despite being statistically significant. However, this is due to the fact that the PISA score scale is continuous with a unit change in the score representing only a small change in performance. In fact, the scale for the PISA score is quite different from the scales of any of the other independent variables, making the PISA score odds ratios look unusual compared to those for the other variables in the model.

n. s. = not significant

x there are too few observations to provide reliable estimates.

The bootstrap weights were used to estimate standard errors in order to take into account the complex sampling scheme of the PISA.

Source: PISA 2012

Table B.12: Factors influencing parents in their advice to the student about pursuing a career in the trades, Reading

Odds Ratio[1]	Parents encourage a career in the trades	Parents discourage a career in the trades
PISA reading score	**0.994**[2]	**1.001**[2]
Gender		
Girls (ref.)		
Boys	**3.453**	**0.714**
Immigrant Status		
Non-immigrant (ref.)		
Second generation immigrant	**0.727**	**2.423**
First generation immigrant	n.s.	**2.078**
Province		
Ontario (ref.)		
Newfoundland and Labrador	n.s	n.s
Prince Edward Island	n.s	**1.214**
Nova Scotia	n.s.	**0.826**
New Brunswick	n.s.	n.s.
Quebec	**1.234**	**0.477**
Manitoba	**1.319**	n.s.
Saskatchewan	**1.445**	**0.713**
Alberta	**1.469**	n.s.
British Columbia	n.s.	**0.782**
School urban setting		
Major (100k+) (ref.)		
Non Major (<100k)	**1.160**	**0.876**
Mother's highest level of education		
ISCED 0 (less than primary) (ref.)		
ISCED 1 (primary)	n.s.	n.s.
ISCED 2 (high school)	n.s.	n.s.
ISCED 4 (trades certificate/diploma)	n.s.	n.s.
ISCED 5 (college/university undergrad and Masters)	n.s.	n.s.
ISCED 6 (doctoral/post-doctoral)	n.s.	n.s.
Father's highest level of education		
ISCED 0 (less than primary) (ref.)		
ISCED 1 (primary)	n.s.	n.s.
ISCED 2 (high school)	n.s.	n.s.
ISCED 4 (trades certificate/diploma)	**0.466**	n.s.
ISCED 5 (college/university undergrad and Masters)	**0.444**	n.s.
ISCED 6 (doctoral/post-doctoral)	**0.405**	n.s.
Mother's Occupation		
Professionals (ref.)		
Armed Forces	x	x
Managers	n.s.	n.s.
Technicians and Associate Professionals	n.s.	**0.820**

Clerical Support	**1.321**	n.s.
Service and Sales	n.s.	n.s.
Skilled agricultural, forestry and fishery workers	n.s.	n.s.
Craft and related trades workers	n.s.	n.s.
Plant and machine operators, and assemblers	**1.692**	**0.530**
Elementary occupations	**1.215**	**0.763**
Father's Occupation		
Professionals (ref.)		
Armed Forces	n.s.	n.s.
Managers	n.s.	n.s.
Technicians and Associate Professionals	n.s.	n.s.
Clerical Support	n.s.	n.s.
Service and Sales	n.s.	n.s.
Skilled agricultural, forestry and fishery workers	**1.833**	**0.649**
Craft and related trades workers	**1.871**	**0.821**
Plant and machine operators, and assemblers	**1.982**	**0.778**
Elementary occupations	**1.463**	n.s.

[1] Values in bold type are significantly different from the reference group at a significance level of 5% or greater.

[2] The odds ratio values for the PISA score variables are very close to 1, suggesting that this variable has little effect on the outcome, despite being statistically significant. However, this is due to the fact that the PISA score scale is continuous with a unit change in the score representing only a small change in performance. In fact, the scale for the PISA score is quite different from the scales of any of the other independent variables, making the PISA score odds ratios look unusual compared to those for the other variables in the model.

n. s. = not significant

x there are too few observations to provide reliable estimates.

The bootstrap weights were used to estimate standard errors in order to take into account the complex sampling scheme of the PISA.

Source: PISA 2012

Table B.13: Factors influencing parents in their advice to the student about pursuing a career in the trades, Science

Odds Ratio[1]	Parents encourage a career in the trades	Parents discourage a career in the trades
PISA science score	**0.994**[2]	**1.001**[2]
Gender		
Girls (ref.)		
Boys	**4.356**	**0.688**
Immigrant Status		
Non-immigrant (ref.)		
Second generation immigrant	**0.663**	**2.462**
First generation immigrant	**0.787**	**2.098**
Province		
Ontario (ref.)		
Newfoundland and Labrador	n.s	n.s
Prince Edward Island	n.s	**1.225**
Nova Scotia	n.s.	**0.825**
New Brunswick	n.s.	n.s.
Quebec	**1.193**	**0.480**
Manitoba	**1.379**	n.s.
Saskatchewan	**1.514**	**0.707**
Alberta	**1.595**	n.s.
British Columbia	**1.222**	**0.772**
School urban setting		
Major (100k+) (ref.)		
Non Major (<100k)	**1.179**	**0.875**
Mother's highest level of education		
ISCED 0 (less than primary) (ref.)		
ISCED 1 (primary)	n.s.	n.s.
ISCED 2 (high school)	n.s.	n.s.
ISCED 4 (trades certificate/diploma)	n.s.	n.s.
ISCED 5 (college/university undergrad and Masters)	n.s.	n.s.
ISCED 6 (doctoral/post-doctoral)	n.s.	n.s.
Father's highest level of education		
ISCED 0 (less than primary) (ref.)		
ISCED 1 (primary)	n.s.	n.s.
ISCED 2 (high school)	**0.510**	n.s.
ISCED 4 (trades certificate/diploma)	**0.469**	n.s.
ISCED 5 (college/university undergrad and Masters)	**0.440**	n.s.
ISCED 6 (doctoral/post-doctoral)	**0.396**	n.s.
Mother's Occupation		
Professionals (ref.)		
Armed Forces	x	x
Managers	n.s.	n.s.
Technicians and Associate Professionals	n.s.	**0.820**

Clerical Support	**1.301**	n.s.
Service and Sales	n.s.	n.s.
Skilled agricultural, forestry and fishery workers	n.s.	n.s.
Craft and related trades workers	n.s.	n.s.
Plant and machine operators, and assemblers	**1.684**	**0.534**
Elementary occupations	**1.234**	**0.763**
Father's Occupation		
Professionals (ref.)		
Armed Forces	n.s.	n.s.
Managers	n.s.	n.s.
Technicians and Associate Professionals	n.s.	n.s.
Clerical Support	n.s.	n.s.
Service and Sales	**1.380**	n.s.
Skilled agricultural, forestry and fishery workers	**1.917**	**0.644**
Craft and related trades workers	**1.923**	**0.820**
Plant and machine operators, and assemblers	**2.049**	**0.777**
Elementary occupations	**1.498**	n.s.

[1] Values in bold type are significantly different from the reference group at a significance level of 5% or greater.

[2] The odds ratio values for the PISA score variables are very close to 1, suggesting that this variable has little effect on the outcome, despite being statistically significant. However, this is due to the fact that the PISA score scale is continuous with a unit change in the score representing only a small change in performance. In fact, the scale for the PISA score is quite different from the scales of any of the other independent variables, making the PISA score odds ratios look unusual compared to those for the other variables in the model.

n. s. = not significant

x there are too few observations to provide reliable estimates.

The bootstrap weights were used to estimate standard errors in order to take into account the complex sampling scheme of the PISA.

Source: PISA 2012

Table B.14: Factors influencing parents in their advice to the student about pursuing a career in the trades, Problem Solving

Odds Ratio[1]	Parents encourage a career in the trades	Parents discourage a career in the trades
PISA problem solving score	**0.995**[2]	**1.001**[2]
Gender		
Girls (ref.)		
Boys	**4.341**	**0.686**
Immigrant Status		
Non-immigrant (ref.)		
Second generation immigrant	**0.677**	**2.447**
First generation immigrant	**0.799**	**2.092**
Province		
Ontario (ref.)		
Newfoundland and Labrador	n.s	n.s
Prince Edward Island	n.s	**1.214**
Nova Scotia	n.s.	**0.825**
New Brunswick	n.s.	n.s.
Quebec	**1.227**	**0.475**
Manitoba	**1.374**	n.s.
Saskatchewan	**1.465**	**0.707**
Alberta	**1.438**	n.s.
British Columbia	n.s.	**0.784**
School urban setting		
Major (100k+) (ref.)		
Non Major (<100k)	**1.200**	**0.871**
Mother's highest level of education		
ISCED 0 (less than primary) (ref.)		
ISCED 1 (primary)	n.s.	n.s.
ISCED 2 (high school)	n.s.	n.s.
ISCED 4 (trades certificate/diploma)	n.s.	n.s.
ISCED 5 (college/university undergrad and Masters)	n.s.	n.s.
ISCED 6 (doctoral/post-doctoral)	n.s.	n.s.
Father's highest level of education		
ISCED 0 (less than primary) (ref.)		
ISCED 1 (primary)	n.s.	n.s.
ISCED 2 (high school)	**0.505**	n.s.
ISCED 4 (trades certificate/diploma)	**0.441**	n.s.
ISCED 5 (college/university undergrad and Masters)	**0.422**	n.s.
ISCED 6 (doctoral/post-doctoral)	**0.361**	n.s.
Mother's Occupation		
Professionals (ref.)		
Armed Forces	x	x
Managers	n.s.	n.s.
Technicians and Associate Professionals	n.s.	**0.820**

Clerical Support	**1.340**	n.s.
Service and Sales	n.s.	n.s.
Skilled agricultural, forestry and fishery workers	n.s.	n.s.
Craft and related trades workers	n.s.	n.s.
Plant and machine operators, and assemblers	**1.772**	**0.527**
Elementary occupations	**1.260**	**0.759**
Father's Occupation		
Professionals (ref.)		
Armed Forces	n.s.	n.s.
Managers	n.s.	n.s.
Technicians and Associate Professionals	**1.294**	n.s.
Clerical Support	n.s.	n.s.
Service and Sales	**1.472**	n.s.
Skilled agricultural, forestry and fishery workers	**1.894**	**0.644**
Craft and related trades workers	**1.996**	**0.813**
Plant and machine operators, and assemblers	**2.166**	**0.766**
Elementary occupations	**1.653**	**0.833**

[1] Values in bold type are significantly different from the reference group at a significance level of 5% or greater.

[2] The odds ratio values for the PISA score variables are very close to 1, suggesting that this variable has little effect on the outcome, despite being statistically significant. However, this is due to the fact that the PISA score scale is continuous with a unit change in the score representing only a small change in performance. In fact, the scale for the PISA score is quite different from the scales of any of the other independent variables, making the PISA score odds ratios look unusual compared to those for the other variables in the model.

n. s. = not significant

x there are too few observations to provide reliable estimates.

The bootstrap weights were used to estimate standard errors in order to take into account the complex sampling scheme of the PISA.

Source: PISA 2012

Table B.15: Factors influencing parents in their advice to the student about pursuing a career in the trades, Mathematics proficiency levels

Odds Ratio[1]	Parents encourage a career in the trades	Parents discourage a career in the trades
Mathematics Proficiency Levels		
Level 5 and above (ref.)		
Below Level 1	**7.254**	n.s.
Level 1	**4.687**	**0.652**
Level 2	**2.989**	**0.697**
Level 3	**2.235**	**0.817**
Level 4	**1.569**	n.s.
Gender		
Girls (ref.)		
Boys	**4.494**	**0.678**
Immigrant Status		
Non-immigrant (ref.)		
Second generation immigrant	**0.713**	**2.435**
First generation immigrant	n.s.	**2.056**
Province		
Ontario (ref.)		
Newfoundland and Labrador	n.s	n.s
Prince Edward Island	n.s	**1.225**
Nova Scotia	n.s.	**0.829**
New Brunswick	n.s.	n.s.
Quebec	**1.454**	**0.456**
Manitoba	**1.406**	n.s.
Saskatchewan	**1.576**	**0.705**
Alberta	**1.501**	n.s.
British Columbia	n.s.	**0.780**
School urban setting		
Major (100k+) (ref.)		
Non Major (<100k)	**1.187**	**0.875**
Mother's highest level of education		
ISCED 0 (less than primary) (ref.)		
ISCED 1 (primary)	n.s.	n.s.
ISCED 2 (high school)	n.s.	n.s.
ISCED 4 (trades certificate/diploma)	n.s.	n.s.
ISCED 5 (college/university undergrad and Masters)	n.s.	n.s.
ISCED 6 (doctoral/post-doctoral)	n.s.	n.s.
Father's highest level of education		
ISCED 0 (less than primary) (ref.)		
ISCED 1 (primary)	n.s.	n.s.
ISCED 2 (high school)	**0.498**	n.s.
ISCED 4 (trades certificate/diploma)	**0.465**	n.s.

ISCED 5 (college/university undergrad and Masters)	**0.437**	n.s.
ISCED 6 (doctoral/post-doctoral)	**0.395**	n.s.
Mother's Occupation		
Professionals (ref.)		
Armed Forces	x	x
Managers	n.s.	n.s.
Technicians and Associate Professionals	n.s.	**0.820**
Clerical Support	**1.302**	n.s.
Service and Sales	n.s.	n.s.
Skilled agricultural, forestry and fishery workers	n.s.	n.s.
Craft and related trades workers	n.s.	n.s.
Plant and machine operators, and assemblers	**1.646**	**0.541**
Elementary occupations	**1.233**	**0.766**
Father's Occupation		
Professionals (ref.)		
Armed Forces	n.s.	n.s.
Managers	n.s.	n.s.
Technicians and Associate Professionals	n.s.	n.s.
Clerical Support	n.s.	n.s.
Service and Sales	**1.352**	n.s.
Skilled agricultural, forestry and fishery workers	**1.907**	**0.647**
Craft and related trades workers	**1.903**	**0.830**
Plant and machine operators, and assemblers	**2.012**	**0.790**
Elementary occupations	**1.498**	n.s.

[1]Values in bold type are significantly different from the reference group at a significance level of 5% or greater.
n. s. = not significant
x there are too few observations to provide reliable estimates.
The bootstrap weights were used to estimate standard errors in order to take into account the complex sampling scheme of the PISA.
Source: PISA 2012

Annex C: Questionnaire

Q01 Thinking about jobs such as an <u>electrician, crane operator, plumber or mechanic</u>, to what extent do you agree with the following statements?

(Please mark only one box in each row.)

	Strongly agree	*Agree*	*Disagree*	*Strongly disagree*	*Don't know*
a) **A career** such as an electrician, crane operator, plumber or mechanic **pays well**	☐ 01	☐ 02	☐ 03	☐ 04	☐ 05
b) **My parents have encouraged me to pursue a career** such as an electrician, crane operator, plumber or mechanic	☐ 01	☐ 02	☐ 03	☐ 04	☐ 05
c) **My parents do not want me to pursue a career** such as an electrician, crane operator, plumber or mechanic	☐ 01	☐ 02	☐ 03	☐ 04	☐ 05
d) **There aren't very good opportunities for me in a job** such as an electrician, crane operator, plumber or mechanic	☐ 01	☐ 02	☐ 03	☐ 04	☐ 05
e) **I enjoy the physical (hands-on) nature of work** associated with jobs such as an electrician, crane operator, plumber or mechanic	☐ 01	☐ 02	☐ 03	☐ 04	☐ 05
f) **A job** such as an as an electrician, crane operator, plumber or mechanic **requires a combination of knowledge and hands-on activity**	☐ 01	☐ 02	☐ 03	☐ 04	☐ 05

	Strongly agree	*Agree*	*Disagree*	*Strongly disagree*	*Don't know*
g) **People with good grades do not pursue a job** such as an as an electrician, crane operator, plumber or mechanic	☐01	☐02	☐03	☐04	☐05
h) **There are good opportunities for women to work in jobs** such as an electrician, crane operator, plumber or mechanic	☐01	☐02	☐03	☐04	☐05
i) **A job** such as an electrician, crane operator, plumber or mechanic **is too physically demanding for me**	☐01	☐02	☐03	☐04	☐05
j) **I have friends who plan on pursuing a career** such as an electrician, crane operator, plumber or mechanic	☐01	☐02	☐03	☐04	☐05

Q02 Have you done any of the following to find out about a future career or a job such as an as an electrician, crane operator, plumber or mechanic? Please select the most appropriate response option for each of the following.

(Please mark only one box in each row.)

	No, never	*Yes, and it was useful*	*Yes, but it was not useful*
a) **I spoke to a teacher about a career** such as an electrician, crane operator, plumber or mechanic	☐ 1	☐ 2	☐ 3
b) **I spoke to a career counsellor** about a career such as an electrician, crane operator, plumber or mechanic	☐ 1	☐ 2	☐ 3
c) **I spoke to family members** about a career such as an electrician, crane operator, plumber or mechanic	☐ 1	☐ 2	☐ 3
d) **I completed a questionnaire to find out about my interests and abilities** in a career such as an electrician, crane operator, plumber or mechanic	☐ 1	☐ 2	☐ 3
e) **I researched the Internet** about a career such as an electrician, crane operator, plumber or mechanic	☐ 1	☐ 2	☐ 3
f) **I spoke to someone working** in a job such as an electrician, crane operator, plumber or mechanic **to see if I might like a job like that**	☐ 1	☐ 2	☐ 3
g) **I attended a work-site visit with someone** such as an electrician, crane operator, plumber or mechanic	☐ 1	☐ 2	☐ 3
h) **I attended a school presentation or a course about jobs** such as an electrician, crane operator, plumber or mechanic	☐ 1	☐ 2	☐ 3

Q03 Do you plan on pursuing a job such as an electrician, crane operator, plumber or mechanic?

(Please mark only one box.)

Yes, definitely ☐ 1

I would consider it ☐ 2

No, definitely not ☐ 3

I have not yet thought about my future career or type of work. ☐ 4

Q04 What kind of career or work would you be interested in having when you are about 30 years old?

_____

_____

OR

I hope to stay home and care for my family full time. ☐ 2

I have thought about my future career but have not yet found one I am interested in. ☐ 3

I have not yet thought about my future career or type of work. ☐ 4

Q05 What is the highest level of education you would like to get?

(Please mark all that apply.)

- Less than a high school diploma ☐ 01
- High school diploma or graduation equivalency ☐ 02
- Trade/ Vocational Diploma/Certificate or an apprenticeship ☐ 03
- College or CEGEP (Québec) Diploma/Certificate ☐ 04
- One university degree ☐ 05
- More than one university degree ☐ 06
- I don’t know ☐ 07

Q06 What is the highest level of education your parents or guardians would like you to get?

(Please mark all that apply.)

- Less than a high school diploma ☐ 01
- High school diploma or graduation equivalency ☐ 02
- Trade/Vocational Diploma/Certificate or an apprenticeship ☐ 03
- College or CEGEP (Québec) Diploma/Certificate ☐ 04
- One university degree ☐ 05
- More than one university degree ☐ 06
- I don’t know ☐ 07