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THINKING ABOUT THE FUTURE: CAREER READINESS INSIGHTS FROM NATIONAL LONGITUDINAL SURVEYS AND FROM PRACTICE

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This working paper has been authorised by Andreas Schleicher, Director of the Directorate for Education and Skills, OECD.

Cancel and replace version includes corrections to Table 5 (page 24), to Table 31 (pages 50-51), to a paragraph that refers to Table 31 (page 70) and to four references.

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This working paper has been authorised by Andreas Schleicher, Director of the Directorate for Education and Skills, OECD.

Abstract

This paper explores how teenage thinking about jobs and careers relates to adulthood labour market outcomes. The OECD working paper *Career Ready? How schools can better prepare young people for working life in the era of COVID-19* identifies career certainty, alignment and ambition as relevant indicators related to career thinking. This paper extends analysis of these indicators to new longitudinal datasets from Australia, Denmark, and Switzerland, and incorporates two new indicators, instrumental motivation and career concentration. The findings provide further evidence that teenage career ambition, certainty, alignment, instrumental motivation and broad occupational expectations relate to positive employment outcomes, including in periods of economic turbulence. However, this is not always the case and on some occasions, this association is found only in specific subgroups. Finally, the paper presents evidence from the academic literature, analysis of OECD PISA data and accounts from practitioners, which focus on ways in which schools can foster students' career thinking.

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Introduction

As this working paper is published, governments around the world are turning their attention from handling healthcare emergencies to dealing with economic crises, commonly characterised by sharply rising youth unemployment (OECD, 2020[1]). Even before the pandemic, young people were facing difficulties in their transitions into the world of work, struggling to compete for available employment. During the COVID-19 emergency, young people commonly found themselves disproportionately affected by lay-offs and recruitment freezes. Now, as is commonly the case in periods of economic turbulence, as business activity resumes they are finding themselves particularly vulnerable in the search for work (Mann, Denis and Percy, 2020[2]).

However, it is possible to help young people become better prepared for the difficult labour markets that they will face. Youth unemployment is commonly higher than adult unemployment because even though they may be more qualified than their older peers, young people commonly compete on the basis of less work experience, weaker job hunting knowledge and fewer useful contacts than older workers (Pastore, 2018[3]). In secondary education, it is the role of career education and guidance to help young people prepare for work. Through career education and guidance, young people are helped to explore and confirm their career ambitions, to develop the skills required to begin managing their career journeys and to gain first-hand experience of the working world. Unfortunately, historically evidence on the long-term impact of such careers support activities has been weak. This is for a number of reasons. Research into career education and/or career guidance is unusually fragmented and found in many academic fields such as studies in education policy, economics, sociology, psychology, human resource management. Academic studies are also often supplemented by reviews commissioned by governments and other non-academic bodies (Hughes et al., 2016[4]). The subject itself is also fragmented and includes a wide range of interventions that are commonly studied in isolation, but delivered in combination: career counselling, career exploration, work-related learning, work-based learning, mentoring, career management skills, recruitment skills. With young people delaying entry into the labour market, it is necessary to track individuals for many years after the conclusion of their secondary education to test if school-managed interventions served a positive purpose. Such studies can be experimental (such as a Randomised Controlled Trial) or quasi-experimental (such as a cohort or longitudinal study). Such studies are expensive and comparatively rare. Consequently, literature reviews into the efficacy of career education and career guidance have a tendency to lament the paucity of robust evidence. It is not that reliable studies have been undertake and failed to find evidence of impact (although on occasion this is the case), but much more commonly that studies have not been undertaken at all (Hughes et al., 2016[4]; Creager, 2011[5]; Collins and Barnes, 2017[6]; Mackay et al., 2015[7]; Neary et al., 2015[8]; Weber et al., 2018[9]; Barnes et al., 2020[10]).

This working paper was developed within the OECD Career Readiness project, which aims to improve global practice in enhancing the career readiness of young people by systematically bringing relevant evidence of "what works" to the attention of practitioners and policy makers during a period of global economic turbulence and growing youth unemployment. It does so by presenting insights from available longitudinal studies from around the world. Consequently, it substantially increases understanding of 'what works' in career education and career.

The project has three elements: introducing new indicators of career readiness into the public domain, making it easy for practitioners and policy makers to access new evidence, and creating institutional and national data-driven tools for policy and practice.

This paper is the second of three working papers that introduce new evidence into the public domain and work towards identifying universal teenage indicators of good employment outcomes. This paper builds on and further develops the analysis presented in the first working paper "Career Ready? How schools can better prepare young people for working life in the era of COVID-19" (hereon, "Career Ready?") (Mann, Denis and Percy, 2020[2]). That paper focused on how secondary schools can optimise young people's preparation for adult employment at a time of labour market turbulence. Conducting an extensive review of existing academic analyses of national longitudinal surveys primarily from Australia, the United Kingdom and the United States, "Career Ready?" identified indicators of better than expected employment outcomes in adulthood. In "Career Ready?", the authors identify nine teenage career-related attitudes or experiences which are linked with three adult employment outcomes (related to earnings, likelihood of being in education or employment and/or satisfaction with career progression) that are better than would be anticipated of individuals with comparable academic qualifications, personal characteristics and social backgrounds. Initial indicators (appearing in at least three national surveys) were grouped in the paper into three areas:

i) how teenagers think about their futures in work, in such areas as:

- career certainty: ability to name a job expected at age 30
- career ambition: interest in progressing to higher education or professional/managerial employment
- career alignment: matching of occupational and educational expectations

ii) the extent to which teenagers actively explore potential futures through:

- career conversations: speaking to an adult about a career of interest
- occupational preparation: participation in short occupationally-specific courses within general programmes of education
- school-mediated work exploration: participation in job fairs, job shadowing and workplace visits.

iii) whether teenagers gain workplace experience while still in school, through:.

- part-time employment: participation in paid part-time or seasonal work
- internships: participation in school-mediated work placements
- volunteering: participation in community-based volunteering

Data from the 2018 round of the OECD Programme of International Student Assessment (PISA) was then used in the working paper to show substantial variation between and within countries on the extent to which 15-year-olds meet these indicators.

A crucial concept underlying the theory of change put forward in "Career Ready?" and developed in this working paper is that of personal agency. Collectively, the indicators identified in "Career Ready?" reveal student capacity to develop (or perhaps deploy) greater agency in approaching school-to-work transitions (Mann, Denis and Percy, 2020[2]). In line with the OECD Future of Education and Skills 2030 project, which highlights the

significance of learners' attitudes to their wider success in education and life, agency means young people developing the ability and determination to influence their lives and environment through their own development. Agency is not something an individual can develop on his or her own, but is achieved in co-operation with teachers, families and wider communities (OECD, 2019[11]). Concepts such as self-efficacy and growth mind-set, that underline the concept of student agency, have become highly influential within educational debates. When young people believe in their ability to succeed educationally or that intelligence is something that can be trained and developed rather than being fixed, positive consequences can be expected (OECD, 2019[12]). In a similar way, young people who think about, explore and experience the world of work are seen as being better placed to exert a greater sense of control over their transitions into it.

This study recognises of course that agency is constrained by social and economic background. Earlier studies by the OECD and other researchers have shown that young people's career aspirations are deeply affected by gender, ethnicity/migrant background and socio-economic status. Young people's ambitions moreover are not consistently linked to their academic abilities. PISA 2018 data show for example that among students who performed most strongly on the academic assessment across the OECD, socially advantaged students were twice as likely as disadvantaged students as to plan on attending tertiary education (Mann et al., 2020[13]; Musset and Kureková Mýtna, 2018[14]). The concept of the "capacity to aspire" helps make sense of such evidence. Developed by the Indian sociologist Arjun Appadurai (Appadurai, 2004[15]), the concept explores the relationship between the occupational aspirations of young people and adult outcomes, and identifies unnecessarily low or confused aspirations as a symptom, more than a cause, of inequality. Young people routinely do not lack ambition, but they often lack the capacity to make a reality of their ambitions. Young people have very different access to the information, support and resources that will allow them to visualise and plan their career aspirations (Archer, 2013[16]). Understanding how background shapes how young people think about themselves and their futures is essential to both the effective design of career guidance activities and the identification of those young people in need of more support from their schools in developing their career readiness.

This working paper has two sections, which consider how teenagers think about their future in a complementary way.

Section 1 presents the results of new analyses of longitudinal datasets from Australia, Denmark and Switzerland, focusing on indicators related to career thinking. [1] It aims at deepening the understanding of the three indicators (Career certainty, career alignment and career ambition) identified in "Career Ready?" In that paper, only results from already published studies of national data surveys are given. In this paper, new evidence is presented with OECD analysts going beyond existing literature to identify two potential additional indicators linked to teenage career thinking:

- Instrumental motivation: defined as the ability to see the value of education to adult employment;

[1] In the project's third working paper, further new analyses of a wider range national longitudinal datasets in relation to all the indicators of teenage career readiness will be presented.

- Career concentration[2]: based on what can be called the originality of a career aspiration, defined in terms of whether young people expect to work in the ten most popular jobs in a country or not. This is an exploratory indicator that is hardly present in the existing literature.

This paper is written in the context of rising concern over youth unemployment and brings together the results of new and existing analysis of indicators related to teenage career thinking, highlighting relationships, which are found in both periods of youth unemployment both higher and lower than long-term averages.

Section 2 of this paper focuses on how schools can help young people influence the way they think about the future. Informed by the research literature as well as drawing on practitioner perspectives, it provides examples of effective practice that can be expected to help students in their process of thinking about their future, enhancing their sense of agency and ultimately their expectations of more positive labour market outcomes. The types of career practices that are described are career counselling[3], employer engagement, and simulated recruitment activities.

[2] A more detailed definition of how career concentration is being understood is presented at page 42 and in the Readers' Guide available in Annex A.

[3] Throughout this document, the terms career guidance, career counselling and careers advising are used interchangeably and refer to any career-related activity performed by a trained professional in a school setting.

Section 1. Insights from longitudinal PISA datasets

Research aim and questions

How young people think about their future matters. The OECD working paper "Career Ready? How schools can better prepare young people for working life in the era of COVID-19", reviewed existing analyses of national longitudinal surveys to show that better than anticipated adult employment outcomes are consistently associated with teenage indicators of career readiness. A number of these indicators can be grouped under the category of what students think about their future.

Building on the literature review and data evidence collected in "Career Ready?", the aim of this section is to look for new evidence of adult-life outcomes of career-related indicators related to how teenagers think about their futures. This is approached in two ways. Firstly, analyses of the key indicators related with thinking about the future are broadened to include a wider set of national longitudinal datasets. As reported in "Career Ready?", existing research into the long-term consequences of teenage career attitudes is overwhelmingly drawn from analysis of datasets in three English-speaking countries; Australia, the United Kingdom and the United States. In the current paper, further evidence is gathered from Australia, but in addition analysis is presented from two European countries, Denmark and Switzerland. As well as being non-Anglophone, evidence from Denmark and Switzerland is of particular interest, because both countries have notably strong vocational education and training (VET) systems and are representative of two distinct traditions in education, that of Nordic and German-speaking countries. Secondly, the datasets offer opportunity (due to the questions asked of teenagers) to explore two new indicators: instrumental motivation (young people's perception that schooling relates to their future plans) and career concentration (young people expecting to work in the most popular jobs).

Specifically therefore, the research questions that guide this paper are:

- What further evidence do the three national longitudinal datasets from Australia, Denmark and Switzerland provide of the relationship between career certainty, career alignment, career ambition, and three adult employment-related outcomes: earnings if in full-time employment; likelihood of being not in education, employment or training (NEET) status; and job/career satisfaction?
- What evidence do the three national longitudinal datasets provide of the relationship between instrumental motivation and career concentration with three adult employment-related outcomes: earnings if in full-time employment; likelihood of being not in education, employment or training (NEET) status; and job satisfaction.

The overarching aim of the OECD Career Readiness project is to uncover patterns of attitudes and activities than are associated with better transitions into employment from an unprecedented analysis of multiple national longitudinal datasets. In this paper, data is considered from a wider range of countries, providing a more international overview of the link between teenage career thinking and adult career outcome. Tests are also undertaken to confirm the relevance of the relationship during periods of higher than usual youth unemployment. Further analysis, to be presented in the third working paper in this series,

will present analysis from a still wider range of countries and longitudinal surveys with regard to the full range of indicators initially identified in "Career Ready?"

The results for each indicator are presented separately. Before presenting the new findings, a definition of the indicator is given.

Career readiness in a recession

As well as providing evidence from a wider range of countries, this paper takes advantage of the timing of the Australian, Danish and Swiss longitudinal surveys to assess the value of indicators during periods of economic challenge. Each dataset combines results from two surveys: initial surveys of young people at age 15 undertaken within the PISA studies of either 2000 or 2003 and follow-up surveys, ten years later. Consequently, studies cover the period of significant economic turbulence and rising youth unemployment that followed the Great Financial Crisis of 2007 and 2008 (OECD, 2021[17]; State Secretariat for Economic Affairs, 2021[18]).

Table A B.4 in Annex B compares youth unemployment in the 10-year period after the first data collection, when respondents were 15-16 years old, compared to the wider 1980-2020 time-period. Australia, Denmark and Switzerland and finds that all had higher than average youth employment during the 10-year periods.

Methodology

Datasets and sample

Using longitudinal data

The analyses in this working paper are based on analysis of longitudinal data from Australia, Denmark and Switzerland, accessed by the OECD Secretariat in raw form. Longitudinal studies collect large datasets over extended periods of time. The three datasets provide longitudinal cohort data, meaning data has been collected from the same individuals over a period of time. Working with longitudinal data allows researchers to identify changes and trends that short-time studies cannot, to establish causality more easily, and to identify long-term effects (Cohen, Manion and Morrison, 2007[19]). This is because studies gather considerable amounts of information about the factors that commonly shape and distort adult life outcomes such as gender, academic achievement, socio-economic status, migrant background and educational pathways. Statisticians can take such factors into account in determining whether a specific aspect of teenage life can be reasonably concluded to link with better or worse employment outcomes years later. They can use such techniques moreover to determine if impacts associated with particular social groups are greater or smaller than on average, providing more nuanced understanding of the interrelation between career interventions and complex personal lives.

Cohort studies, such as are analysed in this paper, also allow for the identification of patterns both at the level of each respondent and for the whole population represented that are only possible to assess in data collected over a long time-period (Cohen, Manion and Morrison, 2007[19]). Furthermore, sampling error is reduced as studies remain with the same sample over the years (Antonius, 2013[20]). However, there are also limitations, the main ones being that analyses are constrained by the questions chosen by research teams many years ago, that the data may be contextually outdated and it is not clear to what extent the findings apply to today's world, and that cohort studies often encounter attrition issues, meaning that respondents drop out of the study over time and the representativeness of the

sample is reduced. In such cases, weighting can be applied to ensure representativeness. However, if numbers are too small, which is particularly a challenge when subsamples are considered, no confidence can be had in the results.

Initial baseline surveys

Each of the datasets collected answers to initial questionnaires through PISA, the OECD Programme for International Student Assessment.[4] PISA surveys nationally representative samples of students at the age of 15 years (see the definition of the PISA target population in Box 1). The datasets use PISA 2000 as the baseline in the case of Denmark and Switzerland, and PISA 2003 in the case of Australia. Using initial PISA datasets provides manly advantages, not least the availability of a rich set of information about teenagers' social backgrounds and academic abilities, but are limited in the extent to which questions explore career-related attitudes and experiences.

Box 1. PISA target population

PISA covers students who are aged between 15 years 3 months and 16 years 2 months at the time of assessment and who are enrolled in school and have completed at least six years of formal schooling, regardless of the type of institution in which they are enrolled, and whether they are in full-time or part-time education, whether they attend academic or vocational programmes, and whether they attend public or private schools or foreign schools within the country or economy.

Follow-up surveys

Databases

The national surveys used in this working paper followed the transition of teenagers who completed PISA surveys in 2000 or 2003 into adulthood. By following large numbers of young people into their twenties, it becomes possible to identify evidence of the impact of teenage career-related activities and experiences in the adult labour market.

Data for Denmark, owned by the Danish Ministry of Children and Education, are derived from the Survey of Adult Skills (OECD Programme for the International Assessment of Adult Competencies [PIAAC]). Participants in the PISA 2000 cycle were tested and interviewed again in the first round of the Survey of Adult Skills (PIAAC)[5] that was implemented between 2011 and 2012.

In Switzerland, the data come from the Transitions from Education to Employment (TREE 1) survey, the country's first longitudinal study at the national level to explore post-secondary education and labour market pathways of students. TREE 1 was primarily funded by the Swiss National Science Foundation (SNF) and is located at the University of

[4] https://www.oecd.org/pisa/

[5] More information is available on: https://www.uvm.dk/-/media/filer/uvm/udd/folke/pdf15/jan/150115-datavejledning-pisa-piaac-og-pisa-piaac.pdf?la=da

Bern. TREE 1, the project's first cohort, is based on a sample of students who participated in PISA 2000. The sample was tracked for follow-up surveys annually from 2001 to 2007, and twice more, in 2010 and 2014. Although the final survey for Switzerland was conducted in 2014, when participants were 29, the wave conducted in 2010 was used for this analysis in order to obtain information on participants at the age of 25, consistent with other national studies.[6]

In Australia, data are based on the Longitudinal Surveys of Australian Youth (LSAY), a study that tracks students annually for a period of 10 years after the age of 15 as they move from school into further study, work and other destinations. While the first surveys began in 1995, participants have been recruited from Australian schools that have taken part in PISA since 2003 (Y03). LSAY is managed by the National Centre for Vocational Education Research and conducted by Wallis Social Research on behalf of the Australian Government Department of Education, Skills and Employment.[7]

The OECD Secretariat was granted access to the longitudinal data from Australia, Denmark and Switzerland for the analyses included in this publication.

Age of the sample

While the frequency and timing of follow-up surveys varies by country, the datasets all collect information on young adults when they are approximately 25 years old (26- or 27-years-olds in the case of Denmark). The samples are further described in the Table 1 below.

Table 1. Samples of the national longitudinal datasets

	Australia	Denmark	Switzerland
Data source (surveys)	Longitudinal Surveys of Australian Youth (LSAY)	PISA - PIAAC	Transitions from Education to Employment (TREE1)
Baseline data collection	PISA 2003	PISA 2000	PISA 2000
	February – October 2003	February - October 2000	February – October 2000
Follow-up data collection	2013	August 2011 - March 2012	2010
Age of students at last follow-up survey	25	26-27	25[1]
Baseline sample	10 370	4 235	6 343
Sample at last follow-up	3 741	1 881	3 423

Note: 1. The final survey for Switzerland was conducted in 2014, when participants were 29. However, the previous survey, conducted in 2010, was used for this analysis in order to obtain information on participants at the age of 25.
Sources: LSAY Y03 Database – more information is available at https://www.lsay.edu.au/research/about (accessed on 26 May 2021); TREE 1 Database – more information is available at https://www.tree.unibe.ch/data/index_eng.html (accessed on 26 May 2021); Danish Ministry of Children and Education, PISA-PIAAC Database – more information available on https://www.uvm.dk/-/media/filer/uvm/udd/folke/pdf15/jan/150115-datavejledning-pisa-piaac-og-pisa-piaac.pdf?la=da (accessed on 26 May 2021); OECD PISA 2000 and 2003 Databases - https://www.oecd.org/pisa/data/database-pisa2000.htm (accessed on 26 May 2021) and https://www.oecd.org/pisa/data/database-pisa2003.htm (accessed on 26 May 2021).

[6] More information is available at: https://www.tree.unibe.ch/data/index_eng.html

[7] More information is available at: https://www.lsay.edu.au/research/about

Attrition

One weakness of longitudinal data comes from attrition, the challenge of original participants dropping out of follow-up studies. Attrition is problematic for two primary reasons. First, attrition reduces the size of the sample, and if the sample becomes too small, this can jeopardise statistical power. Second, if attrition is not random, it can lead to non-response bias. Attrition is not random if certain subgroups within the initial sample are more likely to drop out or not respond to a follow-up survey. If such is the case, this can mean that the sample no longer remains representative of the original population being studied, and so can affect the validity of statistical findings (OECD, 2018[21]).

For example, within the TREE 1 sample, the return rate among respondents with higher education levels, women and Swiss natives was substantially higher compared to respondents with low reading proficiency, men or respondents from an immigrant background (TREE, 2016[22]). A bias resulting from survey attrition is also documented for the 2003 LSAY Cohort (NCVER, 2014[23]).

Two approaches are typically adopted to deal with this type of missing data: weighting survey responses to re-balance the data (performing calculations to compensate the differences between the sample that responded the follow-up surveys and the population that the sample should represent) or imputing values for the missing information. In this publication, the first approach is used, and country- and cycle-specific survey weights are used to correct for non-random attrition that occurred over the course of these longitudinal studies. The weighting method adopted in this publication places greater weight on individuals who may be under-represented in the final survey, based on a series of observable characteristics, in order to produce estimates from nationally representative samples (OECD, 2018[21]). The weights were computed for each survey by its national agency.

Variables used in the analyses

Teenage career-related indicators

The analyses in this section focus on five indicators related to the thematic area of how young people think about their futures. Three of the indicators (career certainty, career alignment and career ambition) were described in detail in "Career Ready?" (Mann, Denis and Percy, 2020[2]). Each indicator has been the subject of analyses from multiple studies using longitudinal datasets in Australia, the United Kingdom and the United States. This paper builds on such research literature and explores two further potential indicators related with thinking about the future: instrumental motivations towards school and career concentration. These are indicators that have been the subject of substantially less analysis in the research literature. A description of these five indicators is available in the Readers' guide in Annex A.

Career-related outcomes

The analyses focus on three important career-related outcomes:

- Earnings if in full-time employment. As is common practice in the OECD literature, earnings were computed and expressed by purchasing power parity (PPP), a popular metric in macroeconomic analysis used to compare standards of living between countries.

- Likelihood of an individual not being in education, employment or training (NEET). NEET, an acronym for "Neither in Employment, nor in Education or Training", is defined as a person who is unemployed and not in education or receiving vocational training. Young people who are NEET are at risk of incurring long-term "scarring" due to their status, with studies showing that early experiences of youth unemployment are linked with lower than anticipated employment outcomes and psychological well-being through adult life (OECD, 2016[24]; Bell and Blanchflower, 2011[25]; Andrews et al., 2020[26]).
- Levels of satisfaction with current employment. Ideally, analysis would focus on satisfaction with career progression in early adulthood. However, the questions available in the three follow-up questionnaires only allowed assessment of satisfaction with the respondents' employment at the time of the survey (their job satisfaction). A description of these variables is also available in the Readers' guide.

Background variables

- In this study, relationships are looked for between teenage attitudes and better than expected adult employment outcomes, focusing on what happens after account is taken of background characteristics such as gender, socio-economic status (as measured by the PISA index for socio-economic status), academic achievement in mathematics), immigrant status, and study program (vocational education and training – VET – programme or not), that can be expected to influence the character of school-to-work transitions[8]. Such controls give analysts confidence that a career attitude is not a mask for another characteristic that better explains adult economic success. The analyses also allow assessments to be made of how student attitudes and experiences of long-term value vary across different subgroups of the whole sample and how the outcomes vary between different subgroups. Differences by completed educational level were also tested. A description of these variables is provided in the Readers' guide in Annex A.

Analytical techniques and reporting of results

The main statistical tools used in this paper are inferential statistics (t-tests, two-tailed tests) and ordinary least square regression. The latter was mostly used to determine differences between categories of respondents after accounting for the control variables: gender, the PISA index of economic, social and cultural status (ESCS), academic achievement in mathematics, immigrant status, and study programme (vocational education and training –VET– programme or not).

In line with much of the academic literature in this field, this paper reports results that are significant[9] at *P*-values lower than .1 (or 10%), which are signalled in the tables with a different numbers of asterisks (* = $P < .1$; ** = $P < .05$; *** = $P < .01$). Statistical

[8] These were chosen as they were all the background variables available in the three initial PISA longitudinal datasets.

[9] Associations between variables are considered statistically significant when they are unlikely to be observed in the data in the absence of an association in the real world/in the wider population from which the sample is drawn.

significance depends among other things on the sample size (the number of respondents): the larger the sample, the more likely it is to have strong statistical significance.

Results

Career certainty

What is career certainty

Career certainty – being able to articulate as a teenager a career ambition or occupational expectation for adult life – is linked to adult employment outcomes in Australian, UK and US studies, even after accounting for control variables. This commonly manifests as adult economic penalties linked to teenage career uncertainty – or the inability as a teenager to name an expected adult occupation (Mann, Denis and Percy, 2020[2]). Uncertain young people can be seen as approaching their transitions from school to work in a comparatively aimless fashion (Sikora, 2018[27]; Staff et al., 2010[28]; Vuolo, 2012[29]).

What does PISA tell us about career certainty

PISA has been providing international data on teenage career certainty since 2000, by routinely asking representative samples of 15-year-olds a simple open-ended question to which they are invited to write in a response: "What kind of job do you expect to have when you are about 30 years old?"

PISA data shows that that uncertainty has become substantially more common. In PISA 2000, 14% of 15-year-olds across the OECD were unable to name a job that they expected to do at age 30. By PISA 2018, the most recent PISA cycle, this had increased by 81% to an average of 25% of students across OECD countries (OECD, 2019[30]).

In PISA 2018, there were substantial variations in career certainty between the participating countries and economies. At one extreme, more than one in three young people expressed uncertainty in Bulgaria, Denmark, Dominican Republic, Germany, Israel, Lebanon, Panama, and Belgium where, remarkably, 67% of respondents were unable to name an occupational expectation. Conversely, fewer than one in ten participants expressed uncertainty in Albania, Indonesia, Turkey and Viet Nam (Mann, Denis and Percy, 2020[2]). There were also substantial variations according to student characteristics. In almost all countries and economies, there was more uncertainty among: disadvantaged students than advantaged students; boys than girls; lower academic performers than higher performers; and foreign-born students than native-born classmates. Notably, students in schools described by their principals as offering no formal career guidance were the most likely subgroup of all in PISA 2018 to be uncertain of their career ambitions (28.4% of such students) (Mann, Denis and Percy, 2020[2]).

Uncertainty has grown among all social groups and demographics, with increases particularly rapid among young people from the highest socio-economic backgrounds and the highest quartile of academic performers. However, PISA 2018 shows that disadvantaged and low-performing youth remain the most likely to be uncertain. Two groups showed particularly high levels of uncertainty: low-performing boys and low-performers from the highest socio-economic status background (Mann, Denis and Percy, 2020[2]).

What the literature says about career certainty and adult employment outcomes

"Career Ready?" identified 11 discrete studies based on longitudinal surveys in Australia, the United Kingdom and the United States that looked for evidence of relationships between teenage career certainty and adult employment outcomes. Ten of these studies found a relationship between teenage career certainty and better than anticipated adult employment outcomes (Mann, Denis and Percy, 2020[2]). The results of these studies are summarised in the table below.

Table 2. Analyses that look for evidence of adult employment outcomes having a relation with teenage occupational uncertainty

Country	Study	Database and sample	Associations
Australia	(Sikora and Saha, 2011[31]), *Lost talent? The occupational ambitions and attainments of young Australians.*	Longitudinal Surveys of Australian Youth (LSAY) 1998 (age 15) to 2008 (age 25)	Teenagers who are certain at age 15 about their career plans enjoy higher levels of "occupational status" at age 25 (effects greater for young women than young men).
Australia	(Sikora, 2018[27]), "Aimless or flexible? Does uncertainty in adolescent occupational expectations matter in young adulthood?"	Longitudinal Surveys of Australian Youth 2006 (age 15) to 2016 (age 25)	Teenagers who are uncertain at age 15 about their career plans can expect to earn 6% less over their lifetimes than comparable peers (effects greatest for young people going into professional employment).
Australia	(Thomson and Hillman, 2010[32]), *Against the odds: influences on the post-school success of "low performers".*	Longitudinal Surveys of Australian Youth 2003 (age 15) to 2007 (age 19)	Low achieving teenagers who are certain at age 15 about career plans are more likely to be in education or employment and happier with their lives at 19 than comparable peers.
United Kingdom	(Gutman, Sabates and Schoon, 2014[33]), "Uncertainty in educational and career aspirations: gender differences in young people" in Schoon, I. and Eccles, J. S. (eds), *Gender differences in aspirations and attainment – a life course perspective.*	British Cohort Study 1986 (age 16) to 1988 (age 18)	Teenagers who are uncertain about career plans at age 16 are three times more likely to not be in education, employment or training (NEET) for at least six months between the ages of 16 and 18 (effects stronger for young men).
		Longitudinal Study of Young People in England (LSYPE) 2004 (age 13/14) to 2008 (age 17/18)	Teenagers who are uncertain about career plans at ages 13/14 are at the same risk of being not in education, employment or training (NEET) at ages 16/17 and 17/18 as comparable peers.
United Kingdom	(Gutman and Schoon, 2018[34]), "Aiming high, aiming low, not knowing where to go: Career aspirations and later outcomes of adolescents with special educational needs."	Longitudinal Study of Young People in England 2004 (age 14) to 2010 (age 20)	Teenagers requiring high levels of support due to learning difficulties, physical disabilities or behavioural problems who are uncertain about career plans at age 14 spend more time not in education, employment or training (NEET) by the age of 20 than peers.
United Kingdom	(Sabates, Harris and Staff, 2010[35]), "Ambition gone awry: the long-term socioeconomic consequences of misaligned and uncertain ambitions in adolescence."	British Cohort Study (BCS70) 1986 (age 16) to 2004 (age 34)	Teenagers who are uncertain about career plans earn up to 17% less at age 34 than comparable peers (uncertain women also spend more time unemployed than peers with high occupational and educational ambitions).
United Kingdom	(Sabates, Gutman and Schoon, 2017[36]), "Is there a wage penalty associated with degree of indecision in career aspirations? Evidence from the BCS70."	British Cohort Study (BCS70) 1986 (age 16) to 2004 (age 34)	Teenagers who are uncertain about their career plans at age 16 earn less than comparable peers at age 34 (effect reduced among the highest academic achievers by age 34).

United Kingdom	(Yates et al., 2010[37]), "Early Occupational Aspirations and Fractured Transitions: A Study of Entry into 'NEET' Status in the UK."	British Cohort Study (BCS) 1986 (age 16) to 1988 (age 18)	Teenagers who are uncertain about career plans at age 16 are three times more likely to not be in education, employment or training (NEET) for at least six months by the age of 18 (effect greatest for low-SES young men).
United States	(Staff et al., 2010[28]), "Uncertainty in early occupational aspirations: role exploration or aimlessness?"	National Education Longitudinal Study (NELS) 1990 (age 16) to 2000 (age 26)	Teenagers who are uncertain about career plans at age 16 earn less at age 26 than comparable peers with professional ambitions (men and women) and certain peers with non-professional ambitions (women only).
United States	(Mortimer, Rolando and Zierman, 2017[38]), "Understanding Youth Resilience by Leveraging the Youth Development Study Archive".	Youth Development Study 1988 (age 14-15) to 2000 (age 26-27)	Teenagers who are certain about their career plans at 14-15 can expect greater success in transitions into adulthood (combining outcomes linked to employment, educational attainment, career progression, job satisfaction, economic self-sufficiency and physical and emotional well-being).

As summarised in Table 2 teenage uncertainty is linked with lower lifetime earnings in Australia (Sikora, 2018[27]); with lower wages in the United States (Staff et al., 2010[28]; Vuolo, 2012[29]); and with lower than anticipated earnings at age 34 in the United Kingdom (Sabates, Gutman and Schoon, 2017[36]; Sabates, Harris and Staff, 2010[35]).

In addition, teenage uncertainty is linked with greater difficulty in school-to-work transitions in the United States (Mortimer, Rolando and Zierman, 2017[38]; Morgan, 2012[39]), and in the United Kingdom (Gutman, Sabates and Schoon, 2014[33]).

Individual circumstances are important in understanding the relationship between uncertainty and labour market outcomes. Research echoes PISA data and shows that teenage uncertainty is more commonly associated with low academic performance (Gore, 2015[40]; Gutman and Schoon, 2012[41]; Gutman, Sabates and Schoon, 2014[33]; Schoon, 2012[42]; Morgan, 2012[39]) and with low socio-economic status (Gore, 2015[40]; Gutman and Schoon, 2012[41]; Gutman, Sabates and Schoon, 2014[33]; Schoon, 2012[42]; Yates et al., 2010[37]). And in some studies, as highlighted above, it is certain types of young people (such as girls or lower academic achievers) who are most likely to experience labour market penalties linked to school-age uncertainty.

What the new data adds to the knowledge on career certainty

The data about career certainty analysed in this section is based on PISA 2000 for Denmark and Switzerland and on PISA 2003 for Australia. In all studies, 15-year-olds were asked to name the job they expected to have at age 30. Overall, 14.6% of students in Australia, 12.5% of students in Switzerland and 12% of students in Denmark were uncertain about their careers. Boys were significantly more uncertain than girls, both in Switzerland and in Denmark, with a difference of 5.3 percentage points in Switzerland, and of 10.2 percentage points in Denmark. In Australia, while the difference in uncertainty by gender is not statistically significant, boys were also more uncertain than girls. There were no significant differences found in the distribution of uncertainty among other subgroups (socio-economic status, migrant status, academic performance, and general or vocational school track).

Table 3. Teenage career uncertainty

	Teenage career uncertainty					
	Australia (2003)		Denmark (2000)		Switzerland (2000)	
	%	S.E.	%	S.E.	%	S.E.
All respondents	14.6	(1.7)	12.0	(1.2)	12.5	(1.0)
Boys	18.7	(2.8)	15.5	(1.9)	15.0	(1.6)
Girls	10.5	(3.9)	5.3	(1.2)	9.7	(1.4)
Difference	8.2	(5.9)	**10.2*** **	(2.3)	**5.3** **	(2.2)
Bottom 25% ESCS	14.4	(6.5)	10.8	(2.7)	11.7	(1.9)
Top 25% ESCS	11.8	(3.0)	9.2	(2.6)	13.5	(2.1)
Difference	2.6	(4.1)	1.5	(4.2)	-1.8	(3.0)
Native	15.0	(1.1)	m		13.0	(1.3)
Immigrant	13.5	(4.3)	m		11.8	(1.9)
Difference	1.5	(3.6)			1.2	(2.3)
Low achievers in mathematics	14.1	(1.9)	7.3	(3.4)	10.8	(2.4)
High achievers in mathematics	14.6	(2.7)	11.4	(3.3)	15.0	(3.6)
Difference	-0.5	(3.2)	-4.2	(4.7)	-4.3	(4.6)
Upper secondary VET education	14.8	(2.9)	m		10.2	(1.6)
Upper secondary general education	15.0	(2.3)	m		12.4	(1.8)
Difference	-0.2	(3.2)			-2.3	(2.7)

Notes: The differences indicated in bold are statistically significant (* = $p < .1$; ** = $p < .05$; *** = $p < .01$).
"m" denotes missing data: there was no observation in the sample.
The socio-economic status is measured by the PISA index of economic, social and cultural status (ESCS).
Information on immigrant status and upper-secondary educational orientation was not available for Denmark.
Sources: LSAY Y03 Database – more information is available at https://www.lsay.edu.au/research/about (accessed on 26 May 2021); TREE 1 Database – more information is available at https://www.tree.unibe.ch/data/index_eng.html (accessed on 26 May 2021); Danish Ministry of Children and Education, PISA-PIAAC Database – more information available on https://www.uvm.dk/-/media/filer/uvm/udd/folke/pdf15/jan/150115-datavejledning-pisa-piaac-og-pisa-piaac.pdf?la=da (accessed on 26 May 2021); OECD PISA 2000 and 2003 Databases - https://www.oecd.org/pisa/data/database-pisa2000.htm (accessed on 26 May 2021) and https://www.oecd.org/pisa/data/database-pisa2003.htm (accessed on 26 May 2021).

Analysis of the three datasets failed to find significant relationships between teenage uncertainty and higher likelihood of an adult not being in education, employment or training (NEET) or being more dissatisfied about their job. However, some relationships with adult earnings were identified.

Association between career uncertainty and adult earnings in Denmark and Switzerland

While on average a statistically significant relationship between uncertainty and wages was not found for the whole population, teenage career uncertainty was associated with worse than expected labour market outcomes for high-performing youth. In both Switzerland and in Denmark, at ages 25 and 26/27, an academically high-performing[10] respondent who was uncertain about his or her career expectations at 15, earned less than a comparable respondent who was not uncertain about career expectations at 15. The expected financial penalties are around -11% for Switzerland (n=212) and around -20% for Denmark (n=65).

[10] High-performing respondents are those who, at age 15, obtained a proficiency level 5 or 6 in the PISA assessments in mathematics.

In both countries, characterised by strong systems of Vocational Education and Training (VET), career uncertainty appears as a greater problem for learners likely to be on a more academic track within general education.

Table 4. Do uncertain high-performers earn less as adults than their non-uncertain peers? (Denmark and Switzerland)

Reported hourly earnings (USD PPP) in full-time employment at 25, among high performers in mathematics Controls: socio-economic status and gender		S.E.	*P*-value	Interpretation
Denmark n = 65, R2 = .19				
Coefficient (B)	**-5.1*** **	(1.5)	0.001	At 25, an academically high-performing respondent, who was uncertain about his career expectations at 15, earns around 20% less than a comparable respondent who was not uncertain about his career expectations at 15, in Denmark.
Constant	23.0	(1.5)	0.000	
Switzerland n = 212, R2 = .11				
Coefficient (B)	**-2.4** **	(1.1)	0.035	The same holds true in Switzerland (penalty of about -11%).
Constant	21.3	(0.7)	0.000	

Notes: Coefficients with a *P*-value < .1 are indicated in bold (* = $p < .1$; ** = $p < .05$; *** = $p < .01$).
Only respondents for which information on gender, socio-economic status, and achievement in mathematics were included in the analyses.
The socio-economic status is measured by the PISA index of economic, social and cultural status (ESCS).
Sources: TREE 1 Database – more information is available at https://www.tree.unibe.ch/data/index_eng.html (accessed on 26 May 2021); Danish Ministry of Children and Education, PISA-PIAAC Database – more information available on https://www.uvm.dk/-/media/filer/uvm/udd/folke/pdf15/jan/150115-datavejledning-pisa-piaac-og-pisa-piaac.pdf?la=da (accessed on 26 May 2021); OECD PISA 2000 Database - https://www.oecd.org/pisa/data/database-pisa2000.htm (accessed on 26 May 2021)

Career alignment

What is career alignment

Career alignment in this study refers to young people having educational plans that are aligned with their occupational ambitions. Misalignment is taken to refer to teenagers who underestimate the level of education required to secure their career expectation. Studies using data from Australia, United Kingdom and United States show that misaligned young people can expect to do worse in the adult labour market than their comparable peers, even after accounting for control variables (Mann, Denis and Percy, 2020[2]).

What does PISA tell us about career alignment

PISA asks 15-year-olds to name the type of job they expect to have at age 30 as well as the educational level they plan to complete. A measure of career certainty is built by comparing the answers to these two questions. In this study, teenage career misalignment is defined as

expecting to work in a job classified as managerial or professional in ISCO[11] (4-digit codes beginning with 1 and 2) and not expecting to complete tertiary education.

PISA 2018 data show that across the OECD, on average one young person in five is misaligned, rising to one in the three among the most disadvantaged quartile of students (Mann et al., 2020[13]; OECD, 2019[30]). Misalignment and the extent to which it is linked to social background varies considerably between countries. Across the OECD, boys, students with lower socio-economic status, students with rural domicile, students of foreign birth, and most notably, students with low academic performance, are more likely to underestimate the education required to achieve their career goals. Misalignment is also more common in students who lack access to career guidance through school (OECD, 2019[30]). Misalignment can be conceived as confusion about the labour market and specifically the levels of education and qualifications that are typically required to access desired employment.

What the literature says about career alignment and adult employment outcomes

Schneider (1999[43]) first identified career misalignment as an indicator of long-term employment outcomes (Schneider, 1999[43]). "Career Ready?" confirms the insight, drawing on analysis of longitudinal datasets from Australia, United Kingdom and the United States undertaken since 2000 (Kim, Klager and Schneider, 2019[44]; Sabates, Harris and Staff, 2010[35]; Sikora and Saha, 2011[31]; Yates et al., 2010[37]). These studies, summarised in the table below, show that misaligned teenage secondary school students are likely to experience more time out of education, employment or training (NEET) between the ages of 16 and 18, to be less likely to go into higher status jobs and to earn less in their thirties than peers with aligned plans. Misalignment has also been linked with poorer academic attainment than would otherwise be expected (Croll, 2008[45]; Morgan, 2012[39]; Sabates, Harris and Staff, 2010[35]; Schneider, 1999[43]), and over-alignment (where young people overestimate the education required to achieve their ambitions) with better education outcomes. Mann et al (2020[2]) summarise the results of six discrete studies from three different countries that find adult employment penalties related to confusion about the levels of education relevant to career ambitions.

Table 5. Analyses that look for evidence of adult employment outcomes linked to teenage career misalignment

Country	Study	Database and sample	Associations
Australia	(Sikora and Saha, 2011[31]), *Lost talent? The occupational ambitions and attainments of young Australians*	Longitudinal Surveys of Australian Youth 1998 (age 15) to 2008 (age 25)	Teenagers whose educational and occupational objectives are inconsistent experience lower levels of occupational attainment.
United Kingdom	(Sabates, Harris and Staff, 2010[35]), "Ambition Gone Awry: The Long-Term Socioeconomic Consequences of Misaligned and Uncertain Ambitions in Adolescence"	British Cohort Study 1986 (age 16) to 2004 (age 34)	Teenage career mis/alignment at age 16 explains approximately 8 percent of the variation in wages for women and 7 percent of the variation in men's earnings at age 34.
United Kingdom	(Yates et al., 2010[37]), "Early Occupational Aspirations and Fractured Transitions: A Study of Entry into 'NEET' Status in the UK"	British Cohort Study	Teenage young men who have misaligned career plans at age 16 are 90% more likely to be not in education,

[11] For more information on ISCO, see the Readers' guide in Annex A.

		1986 (age 16) to 1988 (age 18)	employment or training (NEET) for at least six months by the age of 18.
United States	(Kim, Klager and Schneider, 2019[44]), "The Effects of Alignment of Educational Expectations and Occupational Aspirations on Labor Market Outcomes: Evidence from NLSY79"	National Longitudinal Survey of Youth 1979 (NLSY79) 1979 (age 14) to 2012 (age 42)	Teenagers who overestimate the education required for their occupational ambition go on to earn an average of 11% more during the mid-career than under-aligned individuals (who underestimate the education needed to secure job ambitions). Over-aligned high school students are predicted to have an hourly wage 8% above that of under-aligned individuals at age 26. The wage gap between over-aligned and under-aligned increases up to 14% by the end of the 30s and then steadily decreases to 11% at age 42 and to 7% at age 46.
United States	(Schmitt-Wilson and Faas, 2016[46]), "Alignment of Educational and Occupational Expectations Influences on Young Adult Educational Attainment, Income, and Underemployment"	National Education Longitudinal Study of 1988 (NELS:88) 1998 (age 14) to 2000 (age 26)	Teenagers who overestimate the education required for their occupational ambition earn higher salaries in young adulthood compared to those who are either aligned or under-aligned.

What the new data adds to the knowledge on career alignment

The data about career alignment analysed in this section is based solely on PISA 2003, where 15-year-olds were asked to name the job expected to be employed in at age 30 as well as the educational level they planned to complete. Teenage career misalignment was defined as expecting to work in a job classified as managerial or professional in ISCO-88 (4-digit codes beginning with 1 and 2) and not expecting to complete tertiary education (ISCED levels 5 and 6). Data on career alignment was only available for Australia, as the data being used for Denmark and Switzerland comes from the PISA 2000 questionnaire that did not include a question on educational plans.

Misalignment in Australia

Overall, 11% of youth were misaligned in Australia at age 15 in 2003. Significant differences in the distribution of misalignment were found by academic achievement levels, gender, and vocational or general school track. Low academic achievers were 17.7 percentage points more misaligned than high achievers, boys were 6.3 percentage points more misaligned than girls, and youth who followed the vocational education and training (VET) track were 17 percentage points more misaligned than youth in general education. No significant differences were found by SES and immigrant status.

Table 6. Misalignment in Australia

	Youth that were misaligned at 15 in Australia (2003)	
	%	S.E.
All respondents	10.7	(1.2)
Low achievers in mathematics	20.9	(9.9)
High achievers in mathematics	3.1	(0.4)
Difference	**17.7***	(10.0)
Boys	14.2	(1.0)
Girls	7.9	(2.1)
Difference	**6.3****	(2.5)
Bottom 25% ESCS	15.7	(12.3)
Top 25% ESCS	4.0	(0.7)
Difference	11.8	(12.0)

Native	11.3	(2.7)
Immigrant	9.0	(3.5)
Difference	2.3	(6.1)
Upper secondary VET education	25.9	(13.9)
Upper secondary general education	8.9	(5.2)
Difference	**17.0***	(9.1)

Notes: The differences indicated in bold are statistically significant (* = $p < .1$; ** = $p < .05$; *** = $p < .01$). The socio-economic status is measured by the PISA index of economic, social and cultural status (ESCS). Information on misalignment was only available for Australia, as a question on educational expectations at 15 was included in PISA 2003 but not in PISA 2000.
Sources: LSAY Y03 Database – more information is available at https://www.lsay.edu.au/research/about (accessed on 26 May 2021); OECD PISA 2003 Database - https://www.oecd.org/pisa/data/database-pisa2003.htm (accessed on 26 May 2021).

No significant associations were found between misalignment and job satisfaction and between misalignment and earnings. With a *P*-value (11%) marginally higher than what is being reported in this paper, it is noteworthy that Australian youth who were not in education, employment or training (NEET) at 25 tended to be more misaligned at 15 than those who were not NEET at 25[12] (see Table A B.1) and youth who were aligned at 15 earned more per hour at 25 than those who were misaligned at 15[13] (see Table A B.2).

Career ambition

What is career ambition

Career ambition – which is typically defined in the research literature as the expectation of working in a job classified as managerial or professional and/or expecting to attend tertiary education – is associated in studies from Australia, United Kingdom and United States with better employment outcomes, even after controlling for background variables (Mann, Denis and Percy, 2020[2]).

What does PISA tell us about career ambition

PISA data from 2018 shows that across the OECD, on average three-quarters of 15-year-olds expect to complete an undergraduate degree (OECD, 2019[30]).[14] Ambitions to work in professional or managerial roles are also high. In most OECD countries, strong majorities of young people of all backgrounds anticipate working in managerial or professional occupations by the age of 30, a trend which has risen since 2000 (Mann, Denis and Percy, 2020[2]).

[12] P-value of 0.146.

[13] P-value of 0.114.

[14] Over the last generation, the career aspirations of young people have risen considerably (Musset and Kureková Mýtna, 2018[14]). While in many ways this is a positive phenomenon, it also raises concerns. Many young people fix their ambitions on achieving a level of education that they will struggle to achieve, running higher risk of dropping out and preventing consideration of other education and training pathways (OECD, 2019[30]). While employment boosts are in generally associated with higher education, this is not always the case (Cellini, 2018[99]; ILO, 2020[100]) and there is some evidence that returns to university degrees have flattened (Musset and Kureková Mýtna, 2018[14]).

However, not all young people with the ability to study at university are planning to do so, and these plans are influenced by socio-economic status and gender. Across the OECD in PISA 2018, 14.6% of students who achieved results in proficiency tests indicating ability to progress to tertiary education, did not expect to complete such a level of education. The percentage is nearly double for young people from the most disadvantaged quartile. Variation in occupational expectations by gender is also substantial: 18% of high-performing girls do not expect to work in managerial or professional roles, compared to 29% of comparable boys (Mann, Denis and Percy, 2020[2]).

The strong influence of socio-economic background and parental expectations on young people's educational and occupational plans has been extensively found in analysis of PISA 2015 data (Musset and Kureková Mýtna, 2018[14]) as well as in studies of national longitudinal datasets (Ashby and Schoon, 2010[47]; Croll, 2008[45]; Gemici, 2014[48]; Gore, 2015[40]; Marjoribanks, 2003[49]; Schoon and Polek, 2011[50]; Pasquier-Doumer, 2015[51]; Sheng, 2014[52]). For example, data from longitudinal surveys[15] shows that half of the children whose parents are in the managerial class become managers themselves, while less than a quarter of children of manual workers are likely to become managers (OECD, 2018[53]).

Many young people develop aspirations for the future on the basis of assumptions and constraints which are linked to their social backgrounds that may rule out progression to tertiary education, disfavour vocational education or lead a young person never to question the family expectation that they would follow a specific educational pathway, regardless of ability or suitability (Grodksy, 2010[54]; Archer, 2005[55]; Archer, 2014[56]; Musset and Kureková Mýtna, 2018[14]; Irwin, 2013[57]). Lower ambitions in some groups of students can, in part, be explained by a lack of academic confidence (Guyon, 2016[58]; Bandura, 2001[59]). In addition, for families lacking cultural familiarity and social networks relevant to tertiary education, decision-making about the relative costs and benefits of attending university is difficult, and the capacity of their children to aspire is constrained by the lack of access to sources of trusted and relevant information (Mann, Denis and Percy, 2020[2]). For others of course, the financial and opportunity costs of higher education are simply too great.

What the literature says about career ambition and adult employment outcomes

"Career Ready?" identified eleven different studies that used longitudinal data to assess the long-term economic consequences of teenage career ambition in adult employment. All found evidence that teenage ambition influences adult employment outcomes, if on occasion only among subgroups. In every study, controls were used for actual levels of academic achievement. Results are summarised in the table below.

[15] OECD calculations based on the ESS all seven waves for European countries (2002-14), the PSID for the United States (1999-2013), CNEF for Australia and Korea (2000-14) and the GSS cycle 15 for Canada.

Table 7. Analyses that look for evidence of adult employment outcomes linked to levels of teenage career ambition

Country	Study	Database and sample	Associations
Australia	(Sikora and Saha, 2011[31]), *Lost talent? The occupational ambitions and attainment of young Australians*	Longitudinal Surveys of Australian Youth age 15 (1998) to age 25 (2008)	Having ambitious career plans in high school is a good predictor of gaining higher-status employment in young adulthood.
United Kingdom	(Ashby and Schoon, 2010[47]), "Career success: The role of teenage career aspirations, ambition value and gender in predicting adult social status and earnings."	British Cohort Study age 16 (1986) and age 34 (2004)	Higher levels of teenage career aspiration and ambition (desire to work in a challenging job with prospects of promotion) are associated with higher adult earnings and social status attainment (combining occupational status and highest qualification) at age 34.
United Kingdom	(Croll, 2008[45]), "Occupational choice, socio-economic status and educational attainment: a study of the occupational choices and destinations of young people in the British Household Panel Survey."	British Household Panel Survey (BHPS) - Young Person's Survey age 15 (1994-99) to age 20-24 (2004)	Teenagers at age 15 with higher levels of career ambition (expecting to achieve a professional or managerial job) are more likely to be working in such a profession in their early twenties than comparable peers. High levels of career ambition can compensate for social disadvantage.
United Kingdom	(Green et al., 2017[60]), "Dreaming big? Self-valuations, aspirations, networks and the private-school earnings premium"	British Cohort Study age 16 (1986) to age 42 (2012)	Teenage job-quality aspirations (combining teenage views on the quality of future employment in terms of earnings, interesting and challenging work, job security etc.) for males and occupational aspirations (interest in professional or managerial professions for girls) have a significant if small effects on earnings at age 42.
United Kingdom	(Gutman and Schoon, 2018[34]), "Aiming high, aiming low, not knowing where to go: Career aspirations and later outcomes of adolescents with special educational needs"	Longitudinal Study of Young People (LSYPE) in England age 14 (2004) and ages 16 to 20 (2006 to 2010)	Teenagers (aged 14) with learning and/or physical disabilities who aspire to a professional/managerial adult occupation experience fewer months of being NEET between the ages of 16 and 20 than peers aspiring to skilled jobs, unskilled jobs or who were uncertain. Only a negligible difference is found in the number of months being NEET for those without learning and/or physical difficulties.
United Kingdom	(Schoon and Parsons, 2002[61]), "Teenage Aspirations for Future Careers and Occupational Outcomes"	National Child Development Study age 16 (1974) to age 33 (1991) British Cohort Study age 16 (1986) to age 26 (1996)	The findings show that in both cohorts teenage career aspirations are a good predictor of adult occupational attainment: young people with high aspirations are more likely than their less ambitious peers to enter a professional or managerial career.
United Kingdom	(Schoon and Polek, 2011[50]), "Teenage career aspirations and adult career attainment: The role of gender, social background and general cognitive ability"	National Child Development Study age 16 (1974) to age 33 (1991) British Cohort Study age 16 (1986) to age 34 (2004)	For both cohorts, compared to their less ambitious peers, teenagers aspiring to professional jobs are more likely to participate in continuing education, and are more likely to achieve a professional career in their adult years.
United States	(Mello, 2008[62]), "Gender Variation in Developmental Trajectories of Educational and Occupational Expectations and Attainment From Adolescence to Adulthood"	National Education Longitudinal Study age 14 (1988) to age 26 (2000)	Teenage boys reporting high occupational expectations in adolescence had higher occupational attainment in adulthood compared to males with low occupational expectations, whereas females' adult occupational attainment did not vary by their adolescent occupational expectations.

United States	(Mortimer, Rolando and Zierman, 2017[38]), "Understanding Youth Resilience by Leveraging the Youth Development Study Archive"	*Youth Development Study* age 14-15 (1988) to age 26-27 (2000)	High teenage occupational expectations are associated with more successful adult outcomes (combining adult employment status, career progression, job satisfaction, presence of physical/emotional problems).

Research based on longitudinal studies in Australia and the United Kingdom shows that a teenage student who expects to work as a professional or manager has a greater chance of becoming one than a less ambitious but otherwise comparable peer. This holds even after taking into account factors which strongly influence outcomes, such as social background and academic attainment (Sikora, 2018[27]; Sikora and Saha, 2011[31]; Croll, 2008[45]; Green et al., 2017[60]; Schoon and Parsons, 2002[61]; Schoon and Polek, 2011[50]; Schoon, 2012[42]). This relationship has also been found in the United States (Vuolo, 2012[29]).

As illustrated in Table 7, consistently positive relationships have also been found between higher teenage occupational expectations and better than expected adult employment outcomes, such as higher earnings, reduced unemployment, and greater career satisfaction (Green et al., 2017[60]; Schoon and Polek, 2011[50]). Significant statistical links have also been found between higher student occupational ambitions and ultimate academic achievement in different countries (Guyon, 2016[58]; Pasquier-Doumer, 2015[51]; Heckhausen, 2009[63]).

Possible explanations for this relationship are that highly ambitious youth are more likely to stay in education longer and to progress to tertiary education, participation in which is generally associated with higher earnings. As noted, it has also been found that people who overestimate the education required to secure their occupational ambition tend to go on to earn more in adulthood than comparable peers (Kim, Klager and Schneider, 2019[44]; Schmitt-Wilson and Faas, 2016[46]).

What the new data adds to the knowledge on career ambition

Distribution of career ambition

The data about career ambition analysed in this section is based on PISA 2000 for Denmark and Switzerland and on PISA 2003 for Australia. Fifteen-year-olds were asked to name the job they expected to have at age 30. Their responses were classified as ambitious if they expect to work in a job classified as managerial or professional according to ISCO 88 (4-digit codes beginning with 1 and 2).

The data shows that ambition is not equally distributed among the population of 15-year-olds.

In Australia, 51.5% of teenagers expressing career aspirations can be classified as ambitious, in Denmark, 44.2% and in Switzerland 24.6%. In all three countries, high achievers in mathematics are significantly more ambitious than low achievers, with percentage point differences of 29.1 (Australia), 34.7 (Denmark) and 22.6 (Switzerland).

In Australia and Denmark, girls are significantly more ambitious than boys, by 11.5 and 19 percentage points respectively.

In Australia and Denmark teenagers in the top 25% of the PISA index of economic, social and cultural status (ESCS) – an indicator of socio-economic status – are significantly more ambitious than those in the lowest 25% ESCS, by 22.5 and 37.5 percentage points, respectively.

Significant differences were not found according to immigrant status.

In Australia and Switzerland, students following general secondary education were found to be significantly more ambitious than those who followed an upper secondary vocational education and training (VET) track. In Australia, this difference is of 9.3 percentage points and in Switzerland of 34.2 percentage points. There is no data available for Denmark.

Table 8. Distribution of teenage career ambition

	Teenage career ambition[1]					
	Australia (2003)		Denmark (2000)		Switzerland (2000)	
	%	S.E.	%	S.E.	%	S.E.
All respondents	51.8	(1.1)	44.2	(2.4)	24.6	(1.6)
Low achievers in mathematics	38.7	(3.2)	23.4	(4.1)	15.3	(4.3)
High achievers in mathematics	67.8	(1.8)	58.1	(5.5)	37.9	(5.4)
Difference	**-29.1*** **	(2.3)	**-34.7*** **	(7.1)	**-22.6*** **	(6.9)
Boys	45.9	(2.7)	35.2	(3.0)	23.5	(2.3)
Girls	57.4	(1.3)	54.2	(3.4)	25.7	(2.2)
Difference	**-11.5*** **	(3.7)	**-19*** **	(4.2)	-2.2	(3.1)
Bottom 25% ESCS	40.4	(1.5)	28.5	(3.2)	22.7	(2.2)
Top 25% ESCS	62.9	(1.4)	66.0	(3.9)	26.9	(3.5)
Difference	**-22.5*** **	(2.2)	**-37.5*** **	(4.9)	-4.2	(4.0)
Native	49.6	(2.3)	m		25.5	(1.9)
Immigrant	58.3	(5.6)	m		22.3	(3.5)
Difference	-8.7	(7.7)			3.2	(4.1)
Upper secondary VET education	44.5	(13.7)	m		16.2	(1.5)
Upper secondary general education	53.8	(13.9)	m		50.4	(3.1)
Difference	**-9.3** **	(4.1)			**-34.2*** **	(3.4)

Notes: 1. "Career ambition" is defined as expecting, at 15, to have a managerial or professional job at age 30.
The differences indicated in bold are statistically significant (* = $p < .1$; ** = $p < .05$; *** = $p < .01$).
"m" denotes missing data: there was no observation in the sample.
The socio-economic status is measured by the PISA index of economic, social and cultural status (ESCS).
Information on immigrant status was not available for Denmark.
Sources: LSAY Y03 Database – more information is available at https://www.lsay.edu.au/research/about (accessed on 26 May 2021); TREE 1 Database – more information is available at https://www.tree.unibe.ch/data/index_eng.html (accessed on 26 May 2021); Danish Ministry of Children and Education, PISA-PIAAC Database – more information available on https://www.uvm.dk/-/media/filer/uvm/udd/folke/pdf15/jan/150115-datavejledning-pisa-piaac-og-pisa-piaac.pdf?la=da (accessed on 26 May 2021); OECD PISA 2000 and 2003 Databases - https://www.oecd.org/pisa/data/database-pisa2000.htm (accessed on 26 May 2021) and https://www.oecd.org/pisa/data/database-pisa2003.htm (accessed on 26 May 2021).

Career ambition and young adults not in education, employment or training (NEET) in Australia

After taking account of gender, socio-economic status (measured as the PISA index of economic, social and cultural status ESCS), and achievement in mathematics, a significant association was found between career ambition as a teenager and being NEET later on in Australia. Youth with higher levels of career ambition are seen to be 1.2 percentage points less likely to be NEET as adults compared to their less ambitious peers. No such relationships were identified for young people in Denmark or Switzerland.

Table 9. Teenage career ambition and not in education, employment or training (NEET) at 25 in Australia: regression

NEET at 25 N = 3437 R2 = 0.03	B	S.E.	*P*-value	Interpretation
Teenage career ambition[1]	**-0.012***	(0.01)	0.076	A 1.2 percentage-point difference in NEET status at 25 is significantly negatively associated to teenage career ambition at 15, in Australia (p <.1).
Achievement in mathematics (higher achievers - lower achievers)	-0.016	(0.03)	0.586	
Gender (girls - boys)	0.059	(0.05)	0.212	
Socio-economic status (more advantaged - less advantaged)	-0.016	(0.01)	0.162	
Constant	0.038	(0.02)	0.045	

Notes: 1. Youth who reported to aspire to a professional or managerial job requiring academic qualifications, at age 15.
Coefficients with a *P*-value < .1 are indicated in bold (* = p < .1; ** = p <.05; *** = p < .01).
Only respondents for which information on gender, socio-economic status, and achievement in mathematics were included in the analyses.
The socio-economic status is measured by the PISA index of economic, social and cultural status (ESCS).
Sources: LSAY Y03 Database – more information is available at https://www.lsay.edu.au/research/about (accessed on 26 May 2021); OECD PISA 2003 Database - https://www.oecd.org/pisa/data/database-pisa2003.htm (accessed on 26 May 2021).

Career ambition and job satisfaction in Switzerland

After accounting for gender, socio-economic status (measured as the PISA index of economic, social and cultural status, ESCS), a significant association between career ambition and later job satisfaction is seen in Switzerland. Job satisfaction at age 25 is 5.6 percentage-point higher in those workers who were ambitious at 15 than in those who were not. No such relationships were identified for young people in Australia or Denmark.

Table 10. Teenage career ambition and job satisfaction at 25 in Switzerland: regression

Satisfied with their job at 25 N = 1593 R2 = 0.01	B	S.E.	*P*-value	Interpretation
Teenage career ambition[1]	**0.056***	(0.03)	0.099	A 5.6 percentage-point difference in job satisfaction at 25 is significantly positively associated to teenage career ambition at 15, in Switzerland (p <.1).
Achievement in mathematics (higher achievers - lower achievers)	-0.052	(0.05)	0.307	
Gender (girls - boys)	-0.045	(0.04)	0.232	
Socio-economic status (more advantaged - less advantaged)	-0.004	(0.05)	0.931	
Constant	0.869	(0.06)	0.000	

Notes: 1. Youth who reported to aspire to a professional or managerial job requiring academic qualifications, at age 15.
Coefficients with a *P*-value < .1 are indicated in bold (* = $p < .1$; ** = $p < .05$; *** = $p < .01$).
Only respondents for which information on gender, socio-economic status, and achievement in mathematics were included in the analyses.
The socio-economic status is measured by the PISA index of economic, social and cultural status (ESCS).
Sources: TREE 1 Database – more information is available at https://www.tree.unibe.ch/data/index_eng.html (accessed on 26 May 2021); OECD PISA 2000 Database - https://www.oecd.org/pisa/data/database-pisa2000.htm (accessed on 26 May 2021)

Career ambition and earnings in Switzerland

After taking account of gender, socio-economic status (measured as the PISA index of economic, social and cultural status, ESCS), and achievement in mathematics, statistically significant associations between higher levels of teenage ambition and adult earnings are seen in Swiss data. No such relationships were identified for young people in Australia or Denmark.

In Switzerland, on average, ambitious individuals earn 14% more than their comparable peers at 25. And after accounting for socio-economic status and achievement in mathematics, on average, ambitious men earn 7% more than ambitious females.

Table 11. Earnings in full-time employment and teenage career ambition in Switzerland: regression

Reported hourly earnings (USD PPP) in full-time employment at 25 N = 1246 R2 = 0.072	B	S.E.	*P*-value	Interpretation
Teenage career ambition[1]	**2.7*** **	(0.73)	0.000	On average, ambitious individuals in Switzerland earn 14% more than their comparable peers at 25.
Achievement in mathematics (higher achievers - lower achievers)	0.6	(0.78)	0.439	
Gender (girls - boys)	**-1.3****	(0.41)	0.002	In Switzerland, a woman of age 25 earns 7% less than a man who's as ambitious, as socio-economically advantaged, and as proficient in mathematics as her.
Socio-economic status (more advantaged - less advantaged)	-0.3	(0.55)	0.550	
Constant	18.7	(1.00)	0.000	

Notes: 1. Youth who reported to aspire to a professional or managerial job requiring academic qualifications, at age 15.
Coefficients with a $p < .1$ are indicated in bold ($p < .1$; ** = $p < .05$; *** = $p < .01$).
Only respondents for which information on gender, socio-economic status, and achievement in mathematics were included in the analyses.
The socio-economic status is measured by the PISA index of economic, social and cultural status (ESCS).
Sources: TREE 1 Database – more information is available at https://www.tree.unibe.ch/data/index_eng.html (accessed on 26 May 2021); OECD PISA 2000 Database - https://www.oecd.org/pisa/data/database-pisa2000.htm (accessed on 26 May 2021).

Table 12 compares the effect sizes for different subgroups in Switzerland and shows how these vary. Six subgroups are analysed: boy and girls, high performers in mathematics and low performers in mathematics, socio-economically advantaged and socio-economically disadvantaged.

- Observations from gender subgroups (boys only and girls only): While both females and males benefit from being ambitious, males benefit relatively more. Ambitious girls earn about 8% more per hour more than non-ambitious girls, after accounting for performance and socio-economic status, while ambitious boys make around 20% more per hour more than non-ambitious boys, after accounting for performance and socio-economic status.
- Observations from academic achievement subgroups (high performers and low performers in mathematics): High performers in mathematics do not benefit from being ambitious, while low performers do. No significant association was observed between ambition and wages among high performers. However, low performers who were ambitious as teenagers earn around 25% more per hour than those who were not ambitious, after accounting for gender and socio-economic status.
- Observations from socio-economic status subgroups (socio-economically advantaged and less socio-economically advantaged): both individuals from the top and the bottom quarter of the PISA index of economic, social and cultural status (ESCS) benefit from being ambitious in a similar way. Ambition was associated to gains of around 20% in reported hourly earnings both in the top and bottom ESCS subgroups.

Table 12. Career teenage ambition and earnings by subgroups, in Switzerland

Reported hourly earnings (USD PPP[1]) in full-time employment at 25	**Relationship between teenage career ambition at 15 and hourly earnings at 25 by subgroups**			**Interpretation**
Subgroups:[2]	B	S.E.	*P*-value	
Girls n=771	**1.3****	(0.6)	0.024	Those who benefit the most from being ambitious at 15 in Switzerland, in terms of earnings at 25, are the males (compared to girls) and the low-performers (compared to the high-performers). Those who are less advantaged socio-economically seem to benefit similarly from teenage career ambition as those who are more advantaged.
Boys n=475	**3.9*****	(1.0)	0.000	
High performers (mathematics) n=212	0.2	(1.0)	0.841	
Low performers (mathematics) n=104	**5.6*****	(2.0)	0.004	
ESCS: Top quarter n=301	**4.2*****	(1.1)	0.000	
ESCS: Bottom quarter n=356	**3.9*****	(1.4)	0.007	

Notes: 1. As explained in the methodology section, purchasing power parity (PPP) is a popular metric in macroeconomic analysis used to compare standards of living between countries.
2. Each coefficient is controlled for the remaining main respondent's characteristics (gender, achievement in mathematics, ESCS).
Coefficients with a *P*-value < .1 are indicated in bold (* = $p < .1$; ** = $p < .05$; *** = $p < .01$).
Only respondents for which information on gender, socio-economic status, and achievement in mathematics were included in the analyses.
The socio-economic status is measured by the PISA index of economic, social and cultural status (ESCS).
Sources: TREE 1 Database – more information is available at https://www.tree.unibe.ch/data/index_eng.html (accessed on 26 May 2021); OECD PISA 2000 Database - https://www.oecd.org/pisa/data/database-pisa2000.htm (accessed on 26 May 2021).

In Switzerland, ambition is associated with higher earnings in youth who follow a vocational education and training (VET) track, but not in those who followed a general track. On average, ambitious VET students earn 16% more than their comparable peers at 25, after accounting for gender, socio-economic status, and achievement in mathematics.

Table 13. Earnings and teenage career ambition by subgroups. In Switzerland

Reported hourly earnings (USD PPP) in full-time employment at 25	Relationship between teenage career ambition at 15 and hourly earnings at 25 by subgroups			Interpretation
Subgroups:[1]	B	S.E.	*P*-value	
Girls n=771	**1.3****	(0.6)	0.024	Those who benefit the most from being ambitious at 15 in Switzerland, in terms of earnings at 25, are the males (compared to girls) and the low achievers (compared to the high achievers). Those who are less advantaged socio-economically seem to benefit similarly from teenage career ambition as those who are more advantaged.
Boys n=475	**3.9*****	(1.0)	0.000	
High performers (mathematics) n=212	0.2	(1.0)	0.841	
Low performers (mathematics) n=104	**5.6*****	(2.0)	0.004	
ESCS: Top quarter n=301	**4.2*****	(1.1)	0.000	
ESCS: Bottom quarter n=356	**3.9*****	(1.4)	0.007	

Notes: 1. Each coefficient is controlled for the remaining main respondent's characteristics (gender, achievement in mathematics, ESCS).
Coefficients with a *P*-value < .1 are indicated in bold (* = p < .1; ** = p <.05; *** = p < .01).
Only respondents for which information on gender, socio-economic status, and achievement in mathematics were included in the analyses.
The socio-economic status is measured by the PISA index of economic, social and cultural status (ESCS).
Sources: TREE 1 Database – more information is available at https://www.tree.unibe.ch/data/index_eng.html (accessed on 26 May 2021); OECD PISA 2000 Database - https://www.oecd.org/pisa/data/database-pisa2000.htm (accessed on 26 May 2021).

Table 14. Teenage career ambition, earnings and secondary level educational orientation in Switzerland

Reported hourly earnings (USD PPP) in full-time employment at 25	Completed upper secondary general education N = 342 R^2 = 0.073			Completed upper secondary VET education N = 810 R^2 = 0.116			Interpretation
	B	S.E.	*P*-value	B	S.E.	*P*-value	
Teenage career ambition, controlling for achievement in mathematics, socio-economic status and gender	0.3	(1.0)	0.745	**3.0*****	(0.9)	0.001	**VET orientation**: On average, the ambitious earn 16% more than their comparable peers at 25. **General orientation**: The difference in earnings in full-time employment at 25 associated to teenage career ambition is not significant.
Constant	22.8	(1.8)	0.000	18.9	(1.1)	0.000	

Notes: Coefficients with a *P*-value < .1 are indicated in bold (* = p < .1; ** = p <.05; *** = p < .01).
Only respondents for which information on gender, socio-economic status, and achievement in mathematics were included in the analyses.
The socio-economic status is measured by the PISA index of economic, social and cultural status (ESCS).

Sources: TREE 1 Database – more information is available at https://www.tree.unibe.ch/data/index_eng.html (accessed on 26 May 2021); OECD PISA 2000 Database - https://www.oecd.org/pisa/data/database-pisa2000.htm (accessed on 26 May 2021).

Both in Australia and in Switzerland, ambition is associated with earnings in individuals who completed only upper secondary education, but not for those who completed tertiary education. Data show that, on average, ambitious students who completed upper secondary and did not complete tertiary education earn 12% more in Switzerland and 11% more in Australia than their comparable peers at 25, after accounting for gender, socio-economic status, and achievement in mathematics.

Table 15. Teenage career ambition and earnings in Australia by level of educational attainment

Reported hourly earnings (USD PPP) in full-time employment at 25	Completed university N = 1415 R^2 = 0.02			Completed upper secondary education, but did not complete university N = 2723 R^2 = 0.01			Interpretation
	B	S.E.	*P*-value	B	S.E.	*P*-value	
Teenage career ambition, controlling for achievement in mathematics, socio-economic status and gender	0.7	(0.7)	0.330	**1.9*** **	(0.7)	0.009	**Completed upper secondary**: On average, the ambitious earn about 11% more than their comparable peers at 25. **Completed university**: The difference in earnings in full-time employment at 25 associated to teenage career ambition is not significant.
Constant	19.2	(1.4)	0.000	17.7	(0.8)	0.000	

Notes: Coefficients with a *P*-value < .1 are indicated in bold (* = p < .1; ** = p < .05; *** = p < .01).
Only respondents for which information on gender, socio-economic status, and achievement in mathematics were included in the analyses.
The socio-economic status is measured by the PISA index of economic, social and cultural status (ESCS).
Sources: LSAY Y03 Database – more information is available at https://www.lsay.edu.au/research/about (accessed on 26 May 2021); OECD PISA 2003 Database - https://www.oecd.org/pisa/data/database-pisa2003.htm (accessed on 26 May 2021).

Table 16. Teenage career ambition and earnings in Switzerland by level of educational attainment

Reported hourly earnings (USD PPP) in full-time employment at 25	Completed university N = 448 R^2 = 0.07			Completed upper secondary education, but did not complete university N = 1286 R^2 = 0.04			Interpretation
	B	S.E.	*P*-value	B	S.E.	*P*-value	
Teenage career ambition, controlling for achievement in mathematics, socio-economic status and gender	-0.9	(2.1)	0.687	**2.2*** **	(0.8)	0.007	**Completed upper secondary:** On average, the ambitious earn 12% more than their comparable peers at 25. **Completed university:** The difference in earnings in full-time employment at 25 associated to teenage career ambition is not significant.
Constant	22.4	(1.8)	0.000	18.7	(1.2)	0.000	

Notes: Coefficients with a *P*-value < .1 are indicated in bold (* = p < .1; ** = p <.05; *** = p < .01).
Only respondents for which information on gender, socio-economic status, and achievement in mathematics were included in the analyses.
The socio-economic status is measured by the PISA index of economic, social and cultural status (ESCS).

Sources: TREE 1 Database – more information is available at https://www.tree.unibe.ch/data/index_eng.html (accessed on 26 May 2021); OECD PISA 2000 Database - https://www.oecd.org/pisa/data/database-pisa2000.htm (accessed on 26 May 2021).

Instrumental motivation

What is instrumental motivation?

Students' motivations, attitudes, beliefs and behaviours are important precursors of, and predictors for, scholastic performance, educational attainment and labour-market success (OECD, 2019[64]). Academic motivation (also referred to as school motivation (Duckworth and Schoon, 2012[65]) or student motivation (Thomson and Hillman, 2010[32]) refers to the extent to which students view their schooling as being of long-term benefit, as opposed to being a "waste of time" (Legault, Green-Demers and Pelletier, 2006, p. 568[66]). Motivation towards school is important as it can be considered the driving force behind learning (OECD, 2003[67]). The absence of academic motivation, "academic amotivation", is a cause for concern and has been associated with boredom, poor concentration in class, higher perceived stress at school, low involvement in studying, non-attendance, and ultimately with a higher rate of dropping out of school (Legault, Green-Demers and Pelletier, 2006, p. 568[66]).

Student motivation can be divided into i) internal motivation, that comes from rewards inherent to schooling itself (OECD, 2013[68]) and is based on interest and enjoyment, for example interest in specific subject areas (OECD, 2003[67]; OECD, 2017[69]); and ii) external/instrumental motivation, which refers to student motivation to learn being influenced by expected external rewards for good performance, for example, praise or future prospects, such as employment prospects (OECD, 2003[67]; Cresswell and Underwood, 2004[70]). Instrumental motivation is an important predictor of course selection, career choice and academic performance (OECD, 2003[67]; OECD, 2017[69]).

What does PISA tell us about instrumental motivation?

PISA has traditionally included questions related with students' instrumental motivation. In PISA 2018, students were asked to determine to what extent they agreed or not with affirmations such as "Trying hard at school will help me get a good job". On average in OECD countries, 85.2% of students agreed with this statement (see Table 17). The distribution varied according to student's background characteristics, with students from the top quarter of the PISA index of economic, social and cultural status (ESCS) more likely to agree than those from the bottom quarter by 0.9 percentage points, girls more likely to agree than boys by 4.2 percentage points, high achievers in mathematics more likely to agree than low achievers by 1.3 percentage points, and native students more likely to agree than immigrant ones by 2.3 percentage points.

Table 17. Agreement with "Trying hard at school will help me get a good job" in PISA 2018

	Youth who agreed or strongly agreed with the following statement: "Trying hard at school will help me get a good job."			
	OECD average		Non-OECD average	
	%	*P*-value	%	*P*-value
All respondents	85.2		86.3	
Low achievers in mathematics	83.9		87.2	
High achievers in	85.2		84.8	

mathematics				
Difference	**-1.3*** **	0.00	**2.4*** **	0.00
Boys	83.1		84.2	
Girls	87.3		88.3	
Difference	**-4.2*** **	0.00	**-4.1*** **	0.00
Bottom 25% ESCS	84.0		87.5	
Top 25% ESCS	84.9		84.5	
Difference	**-0.9*** **	0.01	**3.0*** **	0.00
Native	85.1		86.4	
Immigrant	82.5		83.0	
Difference	**2.7*** **	0.00	**3.4*** **	0.00

Notes: The differences indicated in bold are statistically significant (* = $p < .1$; ** = $p < .05$; *** = $p < .01$). The socio-economic status is measured by the PISA index of economic, social and cultural status (ESCS).
Source: OECD PISA 2018 Database - https://www.oecd.org/pisa/data/2018database/ (accessed on 26 May 2021).

PISA 2012 asked students whether "school is a waste of time". On average in OECD countries, 11.4% of students agreed with this statement. The distribution varied according to background characteristics of young people, with students from the bottom quarter ESCS more likely to agree than those from the top quarter by 6.8 percentage points, boys more likely to agree than girls by 8.2 percentage points, low achievers more likely to agree than high achievers by 13.5 percentage points, and immigrant students more likely to agree than native ones by 2.3 percentage points (see Table 18).

Table 18. Agreement with "School has been a waste of time" in PISA 2012

	Youth who agreed or strongly agreed with the following statement: "School has been a waste of time."			
	OECD average		Non-OECD average	
	%	*P*-value	%	*P*-value
All respondents	11.4		13.5	
Low achievers in mathematics	21.0		19.4	
High achievers in mathematics	7.5		7.6	
Difference	**13.5*** **	0.00	**11.7*** **	0.00
Boys	15.5		18.6	
Girls	7.3		8.7	
Difference	**8.2*** **	0.00	**9.8*** **	0.00
Bottom 25% ESCS	15.8		15.6	
Top 25% ESCS	9.0		11.1	
Difference	**6.8*** **	0.00	**4.5*** **	0.00
Native	11.3		13.9	
Immigrant	13.6		16.2	
Difference	**-2.3*** **	0.01	**-2.3*** **	0.01

Notes: The differences indicated in bold are statistically significant (* = $p < .1$; ** = $p < .05$; *** = $p < .01$). The socio-economic status is measured by the PISA index of economic, social and cultural status (ESCS).
Source: OECD PISA 2018 Database - https://www.oecd.org/pisa/data/2018database/ (accessed on 26 May 2021).

What the literature says about instrumental motivation and adult employment outcomes

A small number of longitudinal studies in Australia and the United Kingdom have looked for associations between teenage expressions of instrumental motivation and adult employment outcomes. In all, five studies of three different datasets have been identified and all find some evidence of negative outcomes linked to students struggling to see the connection between their education and later employment.

Table 19. Analyses that look for evidence of adult employment outcomes linked to instrumental motivation

Country	Study	Database and sample	Association
Australia	(Thomson and Hillman, 2010[32]), Against the odds: influences on the post-school success of 'low performers'	2003 cohort of the Longitudinal Surveys of Australian Youth (LSAY), age 15 in 2003, age 19 in 2007.	The study considers a large sample of lower achieving 15-year-old students. Students who responded positively to a series of statements highlighting the value of the study of mathematics to future success, including in employment, were found to be significantly more likely to be successful at age 19 (defined in terms of satisfaction across difference aspects of their lives, including "career prospects").
United Kingdom	(Duckworth and Schoon, 2012[65]), "Beating the Odds: Exploring the Impact of Social Risk on Young People's School-to-Work Transitions during Recession in the UK."	British Cohort Study 1970 (BCS1970), age 16 in 1986, age 18 in 1988.	Young people, at 16, who have a positive view of the effectiveness of schooling (e.g. disagreeing that "school was largely a waste of time") are 25% less likely to be NEET at age 18.
	(Duckworth and Schoon, 2012[65]), "Beating the Odds: Exploring the Impact of Social Risk on Young People's School-to-Work Transitions during Recession in the UK"	Analysis of Longitudinal Study of Young People in England (LSYPE), age 16 in 2005-06, age 18 on 2007-08.	Young people, at 16, who have a positive view on the effectiveness of schooling (e.g. disagreeing with "school was largely a waste of time") are 30% less likely to be NEET at age 18
United Kingdom	(Mann, Kashefpakdel and Rehill, 2017[71]), *Indicators of successful transitions: Teenage attitudes and experiences related to the world of work*	British Cohort Study 1970 (BCS1970), age 16 in 1986, age 26 in 1996.	Teenagers, at age 16, who agree that "school is largely a waste of time" earn, on average 16% less at age 26 than comparable peers who disagreed with the statement.
		Longitudinal Study of Young People in England (LSYPE). Sample: approx. 8,400 individuals, age 14-15 in 2004, age 19-20 in 2009.	Teenagers, at age 14-15, who agree that "school is a waste of time for me" are two times more likely to be NEET at age 19-20 than those who disagreed.

Evidence from the Australia shows that individuals who had an instrumental motivation towards school as 15-year-olds were more likely to be happy with many aspects of their life and career prospects at age 19 (Thomson and Hillman, 2010, p. 8[32]). Data from the UK shows that teenagers with instrumental motivation towards school are less likely to be NEET later on (Duckworth and Schoon, 2012, p. R46[65]; Mann, Kashefpakdel and Rehill, 2017[71]), and to earn higher salaries as adults (Mann, Kashefpakdel and Rehill, 2017, p. 14[71]).

What the new data adds

The data about instrumental motivation analysed in this section is based two items from the PISA questionnaires. The results for each are presented separately.

In PISA 2000 and PISA 2003 15-year-olds were asked to what extent they agreed with the statement "school is a waste of time". The possible responses were strongly agree, agree, disagree or strongly disagree. This data is available for all three countries.

In addition, in PISA 2000 15-year-olds were asked to what extent they agreed with the statement "I study to get a good job". The possible responses were strongly agree, agree, disagree or strongly disagree. This data is available for Denmark and Switzerland, but not for Australia, as this question was not included in PISA 2003.

Distribution of the belief that "school is a waste of time"

There are differences between the three countries in how many students agreed that school had been a waste of time. In Australia, only 5.8% of the students agreed or strongly agreed with this statement, while in Switzerland, 29.5% of the students did, and in Denmark, 25.1%.

In some of the countries, student responses also varied depending on their background characteristics, in particular gender, socio-economic status, achievement, and general or vocational school track.

- Boys agreed or strongly agreed more than girls that "School is a waste of time" in Denmark and Switzerland. In Switzerland, 41% of the boys agreed or strongly with the statement while only 17% of the girls did (a difference of 23.4 percentage points), and in Denmark, 37% of the boys agreed or strongly with the statement while only 12% of the girls did (a difference of 24.1 percentage points).
- Students from the bottom 25% ESCS also agreed or strongly agreed more often that "School is a waste of time" than teenagers from the top 25% ESCS in Australia and Denmark. In Australia, 8% of students from the bottom 25% ESCS agreed or strongly with the statement while only 4% of the of students from the top 25% ESCS did so, and in Denmark 36% of students from the bottom 25% ESCS agreed or strongly with the statement while only 17% of the students from the top 25% ESCS did (a difference of 19 percentage points).
- Low achievers in mathematics in Denmark and Switzerland agreed or strongly agreed more with this statement than high achievers. In Denmark, 38% of low achieving students in mathematics agreed or strongly with the statement while only 18% of the top achieving students did (a difference of 20.5 percentage points). In Switzerland, 35% of low achieving students in mathematics agreed or strongly with the statement while only 19% of the top achieving students did (difference of 16.4 percentage points). No statistically significant differences were observed according to students' migrant background.
- In Switzerland, 33% of teenagers who followed the vocational education and training (VET) track agreed or strongly agreed more with this statement than students in a general education track, with a difference of 23 percentage points.

Table 20. Youth who agreed that school has been a waste of time

	Youth who agreed or strongly agreed that "School has been a waste of time" at age 15					
	Australia (2003)		Denmark (2000)		Switzerland (2000)	
	%	S.E.	%	S.E.	%	S.E.
All respondents	5.8	(0.8)	25.1	(1.3)	29.5	(1.6)
Boys	6.8	(1.0)	37.0	(1.9)	40.5	(2.2)

Girls	4.8	(2.3)	12.9	(1.3)	17.1	(2.4)
Difference	2.0	(3.2)	**24.1*** **	(2.1)	**23.4*** **	(3.2)
Bottom 25% ESCS	7.8	(0.8)	35.8	(2.7)	27.7	(2.9)
Top 25% ESCS	3.7	(0.7)	17.1	(1.8)	30.5	(2.9)
Difference	**4.0*** **	(1.3)	**18.7*** **	(3.5)	-2.8	(3.9)
Low achievers in mathematics	13.5	(5.8)	38.0	(4.0)	35.2	(4.1)
High achievers in mathematics	2.2	(1.1)	17.5	(2.0)	18.8	(4.0)
Difference	11.4	(6.9)	**20.5*** **	(4.4)	**16.4*** **	(6.2)
Native	5.4	(0.3)	m		29.6	(1.9)
Immigrant	7.0	(3.5)	m		29.1	(2.7)
Difference	-1.6	(3.7)			0.4	(3.3)
Upper secondary VET education	6.6	(6.7)	m		32.8	(2.5)
Upper secondary general education	5.2	(3.1)	m		9.8	(2.1)
Difference	1.5	(3.7)			**23.0*** **	(3.0)

Notes: The differences indicated in bold are statistically significant (* = $p < .1$; ** = $p < .05$; *** = $p < .01$).
"m" denotes missing data: there was no observation in the sample.
The socio-economic status is measured by the PISA index of economic, social and cultural status (ESCS).
Information on immigrant status and upper-secondary educational orientation was not available for Denmark.
Sources: LSAY Y03 Database – more information is available at https://www.lsay.edu.au/research/about (accessed on 26 May 2021); TREE 1 Database – more information is available at https://www.tree.unibe.ch/data/index_eng.html (accessed on 26 May 2021); Danish Ministry of Children and Education, PISA-PIAAC Database – more information available on https://www.uvm.dk/-/media/filer/uvm/udd/folke/pdf15/jan/150115-datavejledning-pisa-piaac-og-pisa-piaac.pdf?la=da (accessed on 26 May 2021); OECD PISA 2000 and 2003 Databases - https://www.oecd.org/pisa/data/database-pisa2000.htm (accessed on 26 May 2021) and https://www.oecd.org/pisa/data/database-pisa2003.htm (accessed on 26 May 2021).

Believing that "school is waste of time" and job satisfaction in Australia

In Australia, there is a significant and negative relationship between agreeing that school has been a waste of time at age 15 and job satisfaction at 25, meaning that teenagers who agree or strongly agree that school has been waste of time are less likely to be satisfied with their jobs as young adults than those who did not agree with the statement as teenagers. The difference is 15.1 percentage points in reported job satisfaction between youth who did not agree that school had been a waste of time and those who agreed or strongly agreed, after accounting for gender, academic achievement in mathematics, immigrant status and socio-economic status (measured as the PISA index of economic, social and cultural status, ESCS). In the other two countries, this relationship was not significant.

Table 21. Agreeing that school was a waste of time and job satisfaction at 25 in Australia

	Job satisfaction at 25			Interpretation
N = 3020	%	S.E.	*P*-value	
Youth who agreed or strongly agreed that "School has been a waste of time" at age 15	74.3	(5.5)		
Youth who disagreed or strongly disagreed that "School has been a waste of time" at age 15	88.0	(2.1)		
Difference	**-13.7****	(6.3)	0.030	
Difference, after accounting for gender, academic achievement in mathematics and socio-economic status	**-15.1****	(6.7)	0.024	Between youth that agreed or strongly agreed that "school has been a waste of time" and those who did not, there was a -15.1 percentage-point difference in reported job satisfaction at 25.

Notes: Differences with a *P*-value < .1 are indicated in bold (* = p < .1; ** = p <.05; *** = p < .01).
Only respondents for which information on gender, socio-economic status, immigrant status and achievement in mathematics were included in the analyses.
The socio-economic status is measured by the PISA index of economic, social and cultural status (ESCS).
Sources: LSAY Y03 Database – more information is available at https://www.lsay.edu.au/research/about (accessed on 26 May 2021); OECD PISA 2003 Database - https://www.oecd.org/pisa/data/database-pisa2003.htm (accessed on 26 May 2021).

In Switzerland, the relationship between agreement with the statement that "school is a waste of time" and higher NEET rates is associated with a *P*-value of 0.129, after accounting for gender, academic achievement in mathematics and socio-economic status (see Table A B.5). This figure, while noteworthy, has a *P*-value higher than the 10% taken for statistical significance in this paper.

No association was found in the three countries between agreeing or strongly agreeing as teenagers that "School has been a waste of time" and earnings in the mid-twenties.

Distribution of "I study to get a good job"

Close to 70% of the respondents in both countries (67.8% of students in Denmark and 69.5% in Switzerland) agreed or strongly agreed with the statement that "I study to get a good job". In Denmark, agreeing or not is associated with gender. Boys agree or strongly agree more than girls that they study to get a good job with a difference of 8.7 percentage points.

Table 22. Students who agreed they study to get a good job

	Youth who agreed or strongly agreed that "I study to get a good job" at age 15			
	Denmark (2000)		Switzerland (2000)	
	%	S.E.	%	S.E.
All respondents	67.8	(1.4)	69.5	(1.7)
Boys	72.1	(1.9)	70.8	(2.2)
Girls	63.4	(1.9)	68.1	(2.2)
Difference	**8.7*****	(2.6)	2.7	(2.7)
Bottom 25% ESCS	68.0	(2.5)	69.1	(2.6)
Top 25% ESCS	66.3	(2.7)	70.5	(3.4)
Difference	1.7	(3.6)	-1.3	(4.2)

Low achievers in mathematics	64.0	(4.0)	69.8	(4.1)
High achievers in mathematics	69.0	(3.3)	62.0	(5.2)
Difference	-5.0	(4.9)	7.9	(7.0)
Native	m		68.9	(1.8)
Immigrant	m		71.2	(3.1)
Difference			-2.2	(3.2)
Upper secondary VET education	m		66.0	(2.9)
Upper secondary general education	m		68.4	(3.0)
Difference			-2.4	(4.1)

Notes: The differences indicated in bold are statistically significant (* = $p < .1$; ** = $p < .05$; *** = $p < .01$).
"m" denotes missing data: there was no observation in the sample.
The socio-economic status is measured by the PISA index of economic, social and cultural status (ESCS).
Information on career vision was only available for Denmark and Switzerland, as the item "I study to get a good job" was included in PISA 2000 but not in PISA 2003.
Sources: TREE 1 Database – more information is available at https://www.tree.unibe.ch/data/index_eng.html (accessed on 26 May 2021); Danish Ministry of Children and Education, PISA-PIAAC Database – more information available on https://www.uvm.dk/-/media/filer/uvm/udd/folke/pdf15/jan/150115-datavejledning-pisa-piaac-og-pisa-piaac.pdf?la=da (accessed on 26 May 2021); OECD PISA 2000 Database - https://www.oecd.org/pisa/data/database-pisa2000.htm (accessed on 26 May 2021).

Studying "to get a good job" and job satisfaction in Denmark

In Denmark, there is a positive and significant relationship between agreeing or strongly agreeing that "I study to get a good job" and job satisfaction in adulthood. There is a five percentage point difference between the job satisfaction at age 25 of young adults who, as teenagers, agreed or strongly agreed that "I study to get a good job" and those who did not agree with this statement, after accounting for gender, academic achievement in mathematics and socio-economic status.

Table 23. Agreement with "I study to get a good job" and job satisfaction at 25 in Denmark

	NEET at 25			Interpretation
N = 1 440	%	S.E.	*P*-value	
Youth who agreed or strongly agreed that "I study to get a good job" at age 15	82.3	(2.5)		
Youth who did not	87.3	(1.1)		
Difference	**5.0***	(2.9)	0.083	
Difference, after accounting for gender, academic achievement in mathematics and socio-economic status	**5.0***	(3.0)	0.089	Between youth that agreed or strongly agreed that "I study to get a good job" and those who did not, there was a 5 percentage-point difference in job satisfaction at 25.

Notes: Differences with a *P*-value < .1 are indicated in bold (* = $p < .1$; ** = $p < .05$; *** = $p < .01$).
Only respondents for which information on gender, socio-economic status, immigrant status and achievement in mathematics were included in the analyses.
The socio-economic status is measured by the PISA index of economic, social and cultural status (ESCS).
Information on career vision was only available for Denmark and Switzerland, as the item "I study to get a good job" was included in PISA 2000 but not in PISA 2003.
Sources: Danish Ministry of Children and Education, PISA-PIAAC Database – more information available on https://www.uvm.dk/-/media/filer/uvm/udd/folke/pdf15/jan/150115-datavejledning-pisa-piaac-og-pisa-piaac.pdf?la=da (accessed on 26 May 2021); OECD PISA 2000 Database - https://www.oecd.org/pisa/data/database-pisa2000.htm (accessed on 26 May 2021).

Studying "to get a good job" and not in education, employment or training (NEET) status in Denmark

In Denmark, agreeing or strongly agreeing that "I study to get a good job" at age 15 is significantly and negatively associated with being NEET at age 25, meaning that teenagers that agree or strongly agree with the statement are less likely to be NEET later on than those who did not agree. There is a 3.7 percentage point difference in NEET status between youth who disagreed or strongly disagreed that "I study to get a good job" and youth who agreed or strongly agreed with the statement, after accounting for gender, academic achievement in mathematics and socio-economic status. No such association was found in Switzerland, and no significant association between agreeing or strongly agreeing that "I study to get a good job" at age 15 and earnings in the mid-twenties was found in either of the two datasets reviewed within this paper where the statement was included.

Table 24. Agreeing with "I study to get a good job" and not in education, employment or training (NEET) status at 25 in Denmark

	NEET at 25			Interpretation
N = 1791	%	S.E.	*P*-value	
Youth who agreed or strongly agreed that "I study to get a good job" at age 15	6.0	(0.8)		
Youth who did not	10.3	(1.8)		
Difference	**-4.3****	(1.9)	0.021	
Difference, after accounting for gender, academic achievement in mathematics and socio-economic status	**-3.7****	(1.8)	0.042	Between youth that agreed or strongly agreed that "I study to get a good job" and those who did not, there was a -3.7 percentage-point difference in NEET status at 25.

Notes: Differences with a *P*-value < .1 are indicated in bold (* = p < .1; ** = p <.05; *** = p < .01).
Only respondents for which information on gender, socio-economic status, immigrant status and achievement in mathematics were included in the analyses.
The socio-economic status is measured by the PISA index of economic, social and cultural status (ESCS).
Information on career vision was only available for Denmark and Switzerland, as the item "I study to get a good job" was included in PISA 2000 but not in PISA 2003.
Sources: Danish Ministry of Children and Education, PISA-PIAAC Database – more information available on https://www.uvm.dk/-/media/filer/uvm/udd/folke/pdf15/jan/150115-datavejledning-pisa-piaac-og-pisa-piaac.pdf?la=da (accessed on 26 May 2021); OECD PISA 2000 Database - https://www.oecd.org/pisa/data/database-pisa2000.htm (accessed on 26 May 2021).

Career concentration

What is career concentration

Career concentration is a new indicator being explored in this working paper that refers to the level of originality of teenage career expectations compared with the expectations of their peers. As noted since 2000, representative samples of young people around the world have been asked through the PISA questionnaire: What kind of job do you expect to have when you are about 30 years old? In PISA 2018, three-quarters of students (across OECD countries) indicated a job they expected to be doing. The jobs were coded up using 2008 version of the International Standard Classification of Occupations. This then allowed analysts to collate results to see the jobs that 15-year-olds most commonly anticipated. Across the OECD in PISA 2018, 53% of girls and 47% of boys who described a job said that they would be working in one of the ten most frequently chosen jobs in their country. Career concentration therefore is used to distinguish between the half of students who plan

on working in these ten jobs (popular occupations) and the half who named one of typically hundreds of other different occupations (non-popular occupations).

Several of the fairly narrow set of occupations that teenagers aspire to are not realistic and can be described as "glamorous" or "fantasy" occupations (City & Guilds, 2015; Mann, Massey, Glover, Kashefpadkel, & Dawkins, 2013, all in (Australian Institute of Family Studies, 2017[72])). This is particularly observable in children and younger teenagers, and their expectations are likely to become more realistic as they grow older and their career maturity increases (Auger, Blackhurst, & Wahl, 2005; Super, 1980; Furlong & Biggart, 1999; Gottfredson, 1981, all in (Australian Institute of Family Studies, 2017[72])). It can thus be theorised that while in some specific cases high career concentration may reflect the demands of the market, it is likely that young people with more original career aspirations may have directed greater thought to their plans for the future. In such a way, it is possible that low levels of career concentration are a sign of greater ultimate critical reflection, career maturity, and of agency being applied within decision-making.

What does PISA tell us about career concentration

Data from PISA 2018 show that career concentration is highest among girls, foreign-born students, urban residents, students from higher socio-economic backgrounds and higher achievers. Between countries and economies, levels of career concentration are much higher among certain non-OECD countries. The highest levels of concentration, in excess of 60% for boys and 70% for girls, are found in Baku (Azerbaijan), Brunei Darussalam, Indonesia, Jordan, Kosovo, Lebanon, Morocco, Philippines, Qatar, Turkey, Saudi Arabia and the United Arab Emirates. As first reported in "Career Ready?", in many education systems more than one girl in five expressing a preference about her occupational expectation anticipated becoming a doctor by the age of 30: Brazil (23%), Colombia (21%), Costa Rica (27%), Dominican Republic (25%), Jordan (21%), Kazakhstan (20%), Kosovo (20%), Lebanon (27%), Morocco (20%), Qatar (28%), Turkey (24%), United Arab Emirates (26%), United States (22%). In Saudi Arabia, a remarkable 38% of teenage girls stated that they expected to be a doctor by the age of 30. The lowest levels of career concentration (typically around 40%) are found in central European countries such as France, Germany, the Netherlands and Switzerland. Such countries are characterised by high teenage participation levels in programmes of Vocational Education and Training, which may help explain the breadth of career interests recorded by PISA. Teenagers anticipating joining programmes designed to enable entrance to specific occupations should be expected to have received support from their schools in exploring the labour market prior to decision-making that take learners towards a wide range of different jobs and careers (Musset and Kureková Mýtna, 2018[14]; Mann, Denis and Percy, 2020[2]).

PISA 2018 highlights interesting relations between levels of career concentration and participation in career development activities. Students attending schools, which offer no access to career guidance, have some of the highest average levels of career concentration across the OECD: 55%.

What the literature says about career concentration and adult employment outcomes

A review of the research literature undertaken in the preparation of this working paper failed to reveal any existing studies that draw a direct connection between highly concentrated teenage career aspirations and labour market outcomes.

What the new data adds

Distribution of career concentration

The data about career concentration in this section is based on PISA 2000 (Denmark and Switzerland) and PISA 2003 (Australia) where 15-year-olds were asked "What kind of job do you expect to have when you are about 30 years old?" Their answers where classified according to ISCO-88 (for more information on ISCO, see the Readers' guide in Annex A). Career concentration is defined as when the student's choice of occupation was among the ten most popular occupations in their country. When looking at specific subpopulations (e.g. males, females) career concentration was defined according to the ten most popular occupations of those subpopulations.

Overall, the percentage of all students who chose the ten most popular occupations in their countries varied from 34% in Australia to 47% in Denmark. It should be noted that levels of career concentration separated by gender are routinely higher.

Table 25. Career concentration

	10 most popular jobs among teenagers, by country			
	Rank	Profession	ISCO 88	Valid %[1]
Australia (2003)	1	Teaching professionals	23	7.2
	2	Lawyers	2421	4.0
	3	Artistic, entertainment and sports associate professionals	3470	3.4
	4	Engineers	214	3.2
	5	ICT professionals	213	2.9
	6	Medical doctors	2221	2.8
	7	Architects	2148	2.7
	8	Physiotherapists and related associate professionals	3226	2.6
	9	Machinery mechanics and fitters	723	2.6
	10	Nursing and midwifery professionals	223	2.5
	Total			**33.9**
Denmark (2000)	1	Teaching professionals	23	9.1
	2	Engineers	214	7.4
	3	Carpenters and joiners	7124	4.8
	4	Lawyers	2421	4.7
	5	Building and related electricians	7137	4.7
	6	Cooks	5122	4.0
	7	Veterinarians	2223	3.1
	8	Hairdressers, barbers, beauticians and related workers	5141	3.1
	9	Motor vehicle mechanics and fitters	7231	2.8
	10	Authors, journalists and other writers	2451	2.7
	Total			**46.5**
Switzerland (2000)	1	Teaching professionals	23	7.5
	2	ICT professionals	213	5.8
	3	Shop salespersons and demonstrators	5220	3.6
	4	Nursing associate professionals	3231	3.6
	5	Office clerks (not specified)	4100	2.9
	6	Clerks (not specified)	4000	2.7
	7	Cooks	5122	2.6
	8	Medical doctors	2221	2.6

	9	Hairdressers, barbers, beauticians and related workers	5141	2.4
	10	Motor vehicle mechanics and fitters	7231	2.3
	Total			**36.2**

Note: 1. Weighted percentage computed over the total of indicated professions.
Sources: LSAY Y03 Database – more information is available at https://www.lsay.edu.au/research/about (accessed on 26 May 2021); TREE 1 Database – more information is available at https://www.tree.unibe.ch/data/index_eng.html (accessed on 26 May 2021); Danish Ministry of Children and Education, PISA-PIAAC database – more information available on https://www.uvm.dk/-/media/filer/uvm/udd/folke/pdf15/jan/150115-datavejledning-pisa-piaac-og-pisa-piaac.pdf?la=da (accessed on 26 May 2021).

There are gender differences in the career concentration of students, with girls showing higher levels of concentration than boys in all three countries.

Table 26. Career concentration and gender

% 15-year-old youth expecting to have one of the most popular jobs at 30[1]	All respondents	Boys	Girls
Australia	33.9	39.3	44.2
Denmark	46.5	56.8	60.6
Switzerland	36.2	40.2	49.3

Note: 1. The percentages were computed each time over the preferences of the correspondent population/subpopulation (the 10 most popular jobs were re-computed for each category).
Sources: LSAY Y03 Database – more information is available at https://www.lsay.edu.au/research/about (accessed on 26 May 2021); TREE 1 Database – more information is available at https://www.tree.unibe.ch/data/index_eng.html (accessed on 26 May 2021); Danish Ministry of Children and Education, PISA-PIAAC database – more information available on https://www.uvm.dk/-/media/filer/uvm/udd/folke/pdf15/jan/150115-datavejledning-pisa-piaac-og-pisa-piaac.pdf?la=da (accessed on 26 May 2021).

One finding from the analysis is that there are differences in the level of career concentration according to students' ambition (whether students expect to have a professional or managerial job or not). In all three countries, students who expect to have a professional or managerial job show higher levels of career concentration than students who do not. It may be that students focused on programmes of vocational education and training which link to a wide range of specific occupations are encouraged and enabled at an earlier age to broaden their aspirations. In the analysis undertaken for this working paper, a comparison was made of the employment outcomes of young people with popular job expectations (expressing the expectation at the age of 15 that they would work by age 30 in one of the ten most popular jobs named by their peers) with those of their classmates with non-popular job expectations (expressing the expectation at age 15 that they would work by age 30 in any job outside of the ten most popular jobs names by peers).

Table 27. Career concentration and teenage career ambition

% 15-year-old youth expecting to have one of the most popular jobs at 30[1]	All respondents	15-year-old youth expecting to have a professional or managerial job requiring academic qualifications at age 30[2]	15-year-old youth expecting to have a job other than professional or managerial at age 30
Australia (2003)	33.9	57.9	47.4
Denmark (2000)	46.5	83.1	54.7
Switzerland (2000)	36.2	66.7	40.6

Notes: 1. The percentages were computed each time over the preferences of the correspondent population/subpopulation (the 10 most popular jobs were re-computed for each category).

2. Jobs with ISCO codes that begin with 1 or 2.
Sources: LSAY Y03 Database – more information is available at https://www.lsay.edu.au/research/about (accessed on 26 May 2021); TREE 1 Database – more information is available at https://www.tree.unibe.ch/data/index_eng.html (accessed on 26 May 2021); Danish Ministry of Children and Education, PISA-PIAAC Database – more information available on https://www.uvm.dk/-/media/filer/uvm/udd/folke/pdf15/jan/150115-datavejledning-pisa-piaac-og-pisa-piaac.pdf?la=da (accessed on 26 May 2021); OECD PISA 2000 and 2003 Databases - https://www.oecd.org/pisa/data/database-pisa2000.htm (accessed on 26 May 2021) and https://www.oecd.org/pisa/data/database-pisa2003.htm (accessed on 26 May 2021).

While no significant relationships were found between career concentration and earnings in the overall population, the relationship is significant when focusing on some specific subgroups in Australia and Denmark.

Career concentration and earnings in Denmark

In Denmark, at age 25, a statistical relationship is observed between earnings and the concentration of career aspirations across a number of subgroups. Ambitious individuals (those expecting to work as managers or professionals) who as teenagers expected to have occupations that were not among the 10 most popular earned on average 15% more than their comparably ambitious peers expecting to have popular occupations, after accounting for gender, socio-economic status, and achievement in mathematics.

Table 28. Career concentration, teenage career ambition and earnings in full-time employment in Denmark: regression

Reported hourly earnings (USD PPP) in full-time employment at 25 N = 236 R2 = 0.74	B	S.E.	*P*-value	Interpretation
Less popular teenage job expectations[1] (ambitious individuals only)	**3.1****	(1.25)	0.013	At 25, on average, ambitious individuals who aspired to non-popular occupations as teenagers earn 15% more than their comparably ambitious peers aspiring to popular occupations, in Denmark.
Achievement in mathematics (higher achievers - lower achievers)	1.2	(1.41)	0.413	
Gender (girls - boys)	-1.3	(0.92)	0.153	
Socio-economic status (more advantaged - less advantaged)	-0.8	(1.00)	0.445	
Constant	20.6	(1.81)	0.000	

Notes: 1. Ambitious youth who reported to aspire to a non-popular job. Popular teenage job expectations were measured over the preferences of the ambitious youth.
Coefficients with a *P*-value < .1 are indicated in bold (* = $p < .1$; ** = $p < .05$; *** = $p < .01$).
Only respondents for which information on gender, socio-economic status, and achievement in mathematics were included in the analyses.
The socio-economic status is measured by the PISA index of economic, social and cultural status (ESCS).
Sources: Danish Ministry of Children and Education, PISA-PIAAC Database – more information available on https://www.uvm.dk/-/media/filer/uvm/udd/folke/pdf15/jan/150115-datavejledning-pisa-piaac-og-pisa-piaac.pdf?la=da (accessed on 26 May 2021); OECD PISA 2000 Database - https://www.oecd.org/pisa/data/database-pisa2000.htm (accessed on 26 May 2021).

More socially advantaged young Danes are also seen to benefit from holding broader career aspirations at age 15. Considering solely the most advantaged quarter of Danish participants (based on the PISA index of economic, social and cultural status), the analysis finds that teenagers who expected to have jobs that were not among the 10 most popular could expect to earn around 10% more at age 25 than peers who planned on working in one of the most popular occupational choices. These results take account of gender and achievement in mathematics.

Table 29. Career concentration and earnings in Denmark: socio-economically advantaged youth

Reported hourly earnings (USD PPP) in full-time employment at 25 N = 126 R^2 = 0.036	Socio-economically advantaged youth (Top 25% ESCS) Percentage with less popular teenage job expectations[1]: 47.2%			Interpretation
	B	S.E.	*P*-value	
Having less popular teenage job expectations[1]	**2.1***	(1.3)	0.094	The more socio-economically advantaged with less popular teenage job expectations benefit from an earnings premium of around 10%.
Constant	20.2	(1.0)	0.000	

Notes: "Less popular teenage job expectations" denotes those job expectations at age 15 that are not among the 10 most popular for that category of respondents.
Coefficients with a *P*-value < .1 are indicated in bold (* = $p < .1$; ** = $p < .05$; *** = $p < .01$).
Sources: Danish Ministry of Children and Education, PISA-PIAAC Database – more information available on https://www.uvm.dk/-/media/filer/uvm/udd/folke/pdf15/jan/150115-datavejledning-pisa-piaac-og-pisa-piaac.pdf?la=da (accessed on 26 May 2021); OECD PISA 2000 Database - https://www.oecd.org/pisa/data/database-pisa2000.htm (accessed on 26 May 2021).

And while the sample is too small to draw significant conclusions (n=25), a similar pattern is found among low-performing Danish girls. Those who expect to work in a job that is not among the 10 most popular as teenagers, at age 30 go on to earn more than those who expect popular jobs (see Table A B.3 in the Annex B).

Career concentration and earnings in Australia

In Australia, career concentration as a teenager is associated with variation in earnings at age 25 in the case of individuals who anticipate working in a jobs that are not managerial or professional. Individuals who aspired at age 15 to non-popular jobs that are not managerial or professional went on to earn on average 6% more at age 25 than their comparable peers aspiring to popular jobs that are not managerial or professional. However, the strength of this relationship varies between males and females, and between individuals of more or less advantaged socio-economic backgrounds. At age 25, on average, girls who aspired to popular jobs that are not managerial or professional earned about 15% less than their comparable male peers with similar aspirations. And at age 25, on average, the more socio-economically advantaged individuals who aspire to non-popular jobs that are not managerial or professional earn about 11% more than their comparable less socio-economically advantaged peers with similar aspirations.

Table 30. Career concentration, teenage career ambition and earnings in full-time employment in Australia: regression

Reported hourly earnings (USD PPP) in full-time employment at 25 N = 954 R2 = 0.04	B	S.E.	*P*-value	Interpretation
Less popular teenage jobs expectations[1], among individuals expecting to have occupations other than managerial or professional	**1.2***	(0.69)	0.096	At 25, on average, individuals who aspired as teenagers to non-popular jobs that are not managerial or professional earn about 6% more than their comparable peers aspiring to popular, non-skilled jobs, in Australia.
Achievement in mathematics (higher achievers - lower achievers)	0.9	(1.59)	0.559	
Gender (girls - boys)	**-2.7****	(1.08)	0.011	At 25, on average, girls who aspired as teenagers to popular jobs that are not managerial or professional earn about 15% less than their comparable male peers with similar aspirations, in Australia.
Socio-economic status (more advantaged - less advantaged)	**1.9***	(1.12)	0.081	At 25, on average, the more socio-economically advantaged who aspired as teenagers to popular jobs that are not managerial or professional earn about 11% more than their comparable less socio-economically peers with similar aspirations, in Australia.
Constant	17.5	(1.63)	0.000	

Notes: 1. Non-ambitious youth who reported to aspire to a non-popular job. Popular teenage job expectations were measured over the preferences of the non-ambitious youth.
Coefficients with a *P*-value < .1 are indicated in bold (* = $p < .1$; ** = $p < .05$; *** = $p < .01$).
Only respondents for which information on gender, socio-economic status, and achievement in mathematics were included in the analyses.
The socio-economic status is measured by the PISA index of economic, social and cultural status (ESCS).
Sources: LSAY Y03 Database – more information is available at https://www.lsay.edu.au/research/about (accessed on 26 May 2021); OECD PISA 2003 Database - https://www.oecd.org/pisa/data/database-pisa2003.htm (accessed on 26 May 2021).

Discussion

Additional evidence that thinking about the future makes a difference

It is widely recognised that evidence on the impacts on teenage career readiness has been limited, but is gradually evolving. In the OECD working paper, "Career Ready? How schools can better prepare young people for working life in the era of COVID-19" existing academic reviews of data from national longitudinal surveys was systematically reviewed to identify statistically significant connections between teenage career thinking and experiences and labour market outcomes. That analysis identified studies from Australia, the United Kingdom and the United States, which looked for, and overwhelmingly found, evidence of more positive employment outcomes in young adulthood related to teenagers' interactions with the working world. Such indicators were grouped in the working paper into three aspects of teenage lives that can be related to better than expected adult employment outcomes: how young people think about their futures in work, what they do to explore potential futures in work and the extent to which they have opportunity to experience workplaces.

This paper set out to find new evidence of the relationship between indicators related with thinking about the future and employment outcomes. It goes beyond analyses of English-

speaking countries to look (for the first time) for wider evidence of employment boosts connected to the attitudes that teenagers' express about their imagined working futures whilst still in secondary education. The paper is focused narrowly on the theme of thinking about the future due to the limits of the available data. The study looks at experiences of young people recorded in three longitudinal surveys – in Australia, Denmark and Switzerland – which each first questioned participants at age 15 within surveys of the OECD Programme for International Student Assessment (PISA). In these early PISA surveys (undertaken in 2000 and 2003), only limited questions were asked about students' consideration of, and preparation for, the world of work. In each case, follow-up surveys were undertaken approximately one decade later, allowing assessment to be made of the associations between teenage work-related thinking and outcomes in employment.

The new data analysed in this paper provides some additional evidence that indicators related with thinking about the future have an impact on adult outcomes in relation to three areas: earnings if in full-time employment, experience of being Not in Education, Employment or Training (NEET) and job satisfaction. This is after statistical controls were put in place to account for the impact of academic achievement, personal characteristics and social background. This relationship was not found for every indicator in every country, and in some cases the effect sizes were modest even if significant. But overall, a similar pattern to that reported in "Career Ready?" was found. How young people think about their futures in work is frequently related to their actual employment outcomes.

Mapping indicators of teenage career thinking

The table below summarises research findings that were already available from the academic literature about the relationship between each indicator and employment outcomes, and adds in the new evidence collected by this paper (referred to as (Covacevich et al., 2021[73]). In some analyses, including some of those presented in this paper, it should be noted that significant relationships are only found for subgroups within the whole population.

Longitudinal studies during periods of higher than average youth unemployment

This paper has been written at a time of, and in response to, growing concern over increasing youth unemployment. Consequently, the table also highlights whether youth unemployment was higher than long-term averages for the 10-year period that followed the first data collection in each study, in which respondents were aged 15-16 to 25-26. Where youth unemployment was higher than average, an asterisk is applied. The process for assessing short- and long-term unemployment levels is described in detail in table Table A B.4 in the Annex B. The annex also provides this comparison for all the datasets reviewed by "Career Ready?". Roughly half of the cohorts in the studies reviewed faced a higher youth unemployment when aged 15/16-25/26, than the average long-term youth unemployment rate (covering the period between 1980 and 2020). Moreover, in five of the 12 studies where cohorts faced higher youth unemployment than in 1980-2020, the time-period coincided totally or in part with the years following the Great Financial Crisis of 2007 and 2008.

Table 31. Summary of analyses that look for evidence of associations between teenage indicators related with thinking about the future and adult employment outcomes

Country	Study	Periods of data collection	Certainty	Ambition	Alignment	Instrumental motivation	Career concentration
Australia	(Sikora and Saha, 2011[31]) LSAY	1998-2008	✓	✓	✓		
	(Covacevich et al., 2021[73]) PISA-LSAY	2003-2013	×	✓	×	✓	✓
	(Thomson and Hillman, 2010[32]) LSAY	2003-2007	✓			✓	
	(Sikora, 2018[27]) LSAY	2006-2016	✓				
Denmark	(Covacevich et al., 2021[73]) PISA-PIAAC	2000-2012	✓	×		✓	✓
Switzerland	(Covacevich et al., 2021[73]) PISA-TREE1*	2000-2010	✓	✓		×	×
United Kingdom	(Duckworth and Schoon, 2012[65]) BCS70	1986-1988				✓	
	(Schoon and Parsons, 2002[61]) NCDS*	1974-1991		✓			
	(Schoon and Polek, 2011[50]) NCDS*	1974-1991		✓			
	(Ashby and Schoon, 2010[47]) BCS	1986		✓			
	(Sabates, Gutman and Schoon, 2017[36]) BCS70	1986	✓				
	(Yates et al., 2010[37]) BCS	1986-1988	✓		✓		
	(Gutman, Sabates and Schoon, 2014[33]) BCS	1986-1988	✓				
	(Mann, Kashefpakdel and Rehill, 2017[71]) BCS	1986-1996				✓	
	(Schoon and Parsons, 2002[61]) BCS	1986-1996		✓			
	(Sabates, Harris and Staff, 2010[35]) BCS70	1986-2004	✓		✓		
	(Schoon and Polek, 2011[50]) BCS	1986-2004		✓			
	(Green et al., 2017[60]) BCS	1986-2012		✓			
	(Croll, 2008[45]) BHPS	1994-2004		✓			
	(Gutman, Sabates and Schoon, 2014[33]) LSYPE*	2004-2008	×				
	(Mann, Kashefpakdel and Rehill, 2017[71]) LSYPE*	2004-2009				✓	
	(Gutman and Schoon, 2018[34]) LSYPE*	2004-2010	✓	✓			

	(Duckworth and Schoon, 2012[65]) LSYPE*	2005/6-2007/8				✓	
United States	(Kim, Klager and Schneider, 2019[44]) NLSY79*	1979-2012			✓		
	(Mello, 2008[62]) NELS*	1988-2000		✓			
	(Mortimer, Rolando and Zierman, 2017[38])YDS*	1988-2000	✓	✓			
	(Schmitt-Wilson and Faas, 2016[46]) NELS:88*	1988-2000			✓		
	(Staff et al., 2010[28]) NELS*	1990-2000	✓				
Total number of studies that look for a significant relationship between the indicator and adult employment outcomes			14	14	6	8	3
Number of studies that find a significant and positive relationship between the indicator and adult employment outcomes			12 out of 14	13 out of 14	5 out of 6	7 out of 8	2 out of 3

Notes:
* Study in which respondents of first survey faced a 10-year period of higher youth unemployment in the 10 years after the first survey, compared with 1980-2020 in that country.
Green/Tick: Evidence of a significant relationship was found between the indicator and adult employment outcomes for at least a significant minority of respondents.
Red/Cross: The analyses looked for evidence of a relationship between the indicator and adult employment outcomes and found no significant association.
Blanks: No analysis was undertaken of the indicator in question. .

The first objective of this paper was to look for new evidence in three national longitudinal datasets from Australia, Denmark and Switzerland of the relationship between career certainty, career alignment, career ambition, and the three adult career-related outcomes. The analyses found new evidence for career ambition and certainty. Career ambition is the indicator where most new evidence was found. In Australia, ambitious teenagers are more likely to be in employment, education or training in their mid-twenties than non-ambitious teenagers. In Switzerland, ambitious teenagers are more likely to be satisfied with their jobs in their mid-twenties than non-ambitious teenagers, and to have higher salaries than their non-ambitious teenage peers. Several significant relationships were also found in certain subgroups in these two countries. In Denmark and in Switzerland, high-performing youth who were uncertain as teenagers earn less than when they are in their mid-twenties than those individuals who were certain in their career plans as teenagers. For alignment, an important limitation was that data was only available for Australia. No further evidence was found, between misalignment and job satisfaction. However, youth who were not in education, employment or training (NEET) at 25 tended to be more misaligned at 15 than those who were not NEET at 25 (*P*-value of 0.146.) and youth who were aligned at 15 earned more per hour at 25 than those who were misaligned at 15 (*P*-value of 0.114). While these two results did not reach statistical significance, they show a trend warranting further exploration.

The second objective of this paper was to look in the three databases for evidence of two new indicators related with teenage career thinking about the future: instrumental motivation and career concentration.

The findings confirm that teenagers who see a connection between their education and their futures in work – instrumental motivation – have better labour outcomes than those who

do not see this connection. In Australia, agreeing or strongly agreeing that school has been a waste of time at age 15 is associated with lower levels of job satisfaction at 25. And in Denmark, agreeing or strongly agreeing that "I study to get a good job" at age 15 is associated with a lower likelihood of being NEET at age 25.

The new analyses also explored the evidence in relation to what might be called originality in career thinking or teenage expectation of working in non-popular employment. While no significant relationships were found between career concentration and earnings in the overall population, the relationship is significant when focusing on some specific subgroups in some countries. For example, in Denmark, ambitious individuals who expected to have an occupation that was not among the 10 most popular of their peers earn more than their comparable ambitious peers. And in Australia, in the subgroup of individuals who aspire to jobs that are not managerial or professional those who expect to have an occupation that was not among the 10 most popular earn more than those expecting to have popular occupations. This indicator warrants further research, but these first results are promising.

The summary table does not include details of the how the relationship between each indicator and the work-related outcomes is affected by an individual's background variables, mostly gender, achievement, socio economic status and general or vocational school track. So for example, teenage career uncertainty is associated with lower earnings in high-performing youth in Denmark and in Switzerland, but this association does not exist for low-performing youth. Or, in Switzerland, both males and females who were ambitious as teenagers have better salaries when in their mid-twenties, but males benefit more than females, meaning that the salary difference between ambitious males and non-ambitious males is bigger than the salary difference between ambitious females and non-ambitious females.

Longitudinal surveys are the only way to follow students in their transition from school to work and to try to understand the relationship between how students are thinking about their future and their outcomes when they join the world of work, and having results based on data from previous generations is unavoidable. The findings of this working paper must be applied with caution to the current context, as is the case with all research conducted with longitudinal survey data. The population of students that took PISA in 2000 or 2003 has some differences compared with the population taking PISA today, and the working world that the surveyed youth encountered is different to today's working world. But despite the differences, there are also similarities between both populations and the working world each has to face -including an economic crisis as a common factor-, that make the findings worth taking into account and arguably applicable to today's context.

Indicators as flags of low student agency

The results presented in this paper suggest strongly that what school-age teenagers think about their futures in work and how they are working towards realising their plans, can be expected to affect their futures. During high school, students are making significant decisions about what they will study, where they will study and what investment they need to make in different school subjects to develop the right profile for their future plans (Frenette, 2009[74]; Morgan, 2012[39]). As an example of this, in many countries young people are required to narrow down their learning or to choose between learning streams in some cases from age 14 onwards, and if students are not making informed choices they may be unknowingly restricting the opportunities they will have later on. A recent study in the UK shows that one in five university students reported they were unable to follow their

preferred choice of undergraduate degree subject in higher education because of qualification and subject decisions they made in secondary school. A further 40% wished that they had had access to better career guidance whilst in school. As young people go through schooling, they are embarked on a process of self-discovery, learning to explore and understand their interests, preferences and aspirations. Career guidance, which is available only at the end of schooling, can be expected to be too late in many cases. It is critical to offer students information and advice through their schooling[16] to help them to reflect on their own senses of emerging identity and to approach the decisions that they make in school with confidence, understanding the effect they can be expected to have on the options that will be available to them later on (UCAS, 2021[75]). In making those choices, it is important that they have thought critically about want they want to do in the future. Ambitious, informed young people who can connect today's education to tomorrow's evolving labour market opportunities can expect to do better later on.

The evidence presented in this paper suggests that uncertainty, misalignment, lack of ambition, lack of instrumental motivation, and high career concentration should be considered as flags of concern for schools, as national data show that often these indicators help to signal whether young people are thinking critically about their transitions into work or not. The more flags students show, the more support they can be expected to need as they reflect on their aspirations and the decisions that can help them achieve their plans. Effective career education and career guidance will use multiple techniques to encourage and enable students through their time in school to think seriously about their futures and how they relate to the education they are experiencing. It is the task of schools to help young people to initially articulate their thinking about the future and then actively and openly discuss and explore their ideas.

The data presented in this section shows that for each indicator there is an important proportion of students who could have benefited from greater support in thinking about their future careers. For example, overall, 11% of youth were misaligned in Australia at age 15, so one out of 10 students would have benefitted from help to better understand the level of education required for their career plans. While the data about indicators related with thinking about the future used in this paper is from the early 2000's, PISA 2018 data shows that these indicators continue to be cause of concern for an important number of students today, and that in some cases, such as uncertainty, the phenomenon has notably increased (Mann, Denis and Percy, 2020[2]).

Student background characteristics are of fundamental importance to understanding the relationship between the career-related indicators and the labour market outcomes analysed in this paper. While there were differences depending on the indicator and the country, the distribution of all the indicators analysed in this paper was affected to some extent by background characteristics, particularly academic achievement, gender, socio-economic status and school track, confirming the findings of previous literature and research on this topic (Musset and Kureková Mýtna, 2018[14]). For example, not all students are equally vulnerable to misalignment in Australia, which was more common in boys, students from low socio-economic status, and in those students in a vocational education and training (VET) track. And, in all three countries, high achievers in mathematics are significantly more ambitious than low achievers; in Australia and Denmark, girls are significantly more

[16] The UCAS study finds that undergraduate students who began thinking about tertiary study whilst in primary school are happier with their decisions than peers who only considered tertiary education while in secondary school.

ambitious than boys; in Australia and Denmark, teenagers from the top 25% of the PISA index of economic, social and cultural status (ESCS) are significantly more ambitious than those from the lower 25% ESCS; and in Australia and Switzerland, students who follow general secondary education are significantly more ambitious than those who follow an upper secondary vocational education and training (VET) track. Interventions related with each indicator could focus on the groups of students that are known to be more misaligned, less ambitious, more uncertain, to have lower instrumental motivation and to have higher career concentration.

The concept of the capacity to aspire, developed by Arjun Appadurai (Appadurai, 2004[15]) and described earlier in this paper, provides schools with a simple theoretical approach that takes account of student background variables when designing and implementing activities to support their thinking about their future. Appadurai describes the capacity of students to aspire as being limited by their social context, and that young people can lack the capacity to aspire because they lack access to the information, support and resources that would allow them to visualise and plans their ambitions in the working world. Consequently, guidance becomes a resource with requirements that vary considerably between young people. It is unsurprising that the recent large-scale survey of undergraduate students in United Kingdom by the national Universities and Colleges Admissions Service shows that the odds of a student studying subjects related to parental occupations are high: the children of medical practitioners are 19 times more likely to be studying medicine than other students and the children of artists three times more likely to be studying creative arts than their peers (UCAS, 2021[75]). Just as students vary in their proficiency in mathematics and other school subjects, students vary in their abilities to visualise and plan for their futures and vary in the extent to which they demand support. It is the role of schools to provide all students before the age of 15 with the careers education, information, advice and guidance that will allow them to aspire higher and broader, outside out of the limits inherited from their background characteristics. Section 2 of this paper explores how can schools help their students think about their future, by providing examples and guidelines of effective practice.

Section 2: How to help young people think about the future?

Introduction

This working paper builds on the OECD studies "Dream Jobs?" and "Career ready?" to explore further the relationship between how teenagers think about the labour market and what goes on to happen to them in the adult employment. Presenting new analysis of data from Australia, Denmark and Switzerland alongside existing analysis from Australia, the United Kingdom and the United States, the paper sets out quantitative evidence that finds that better employment outcomes are commonly associated with the ways in which teenagers think about their futures. Teenagers who are more certain and more ambitious, whose educational plans align with their occupational expectations, who see the relevance of education to their lives in work and who demonstrate greater originality in their career aspirations can typically expect to spend less time out of work, to earn more once they are in full-time work and to be more satisfied with their working lives.

The results are best understood in the light of earlier analysis of PISA data. In a series of publications, OECD analysts have raised concern over teenage thinking about their careers. Young people's career ambitions can be characterised as commonly narrow, often confused and frequently distorted by social background (Musset and Kureková Mýtna, 2018[14]; Mann et al., 2020[13]; Mann, Denis and Percy, 2020[2]). As noted, across the OECD typically half of boys and girls at 15 say they will be working by the age of 30 in one of the ten most popular career choices in their countries, rising to three-quarters in many non-OECD countries. One in five students (on average across the OECD) who expresses a job expectation underestimates the education typically required to achieve it, rising to one-third of young people from the most disadvantaged backgrounds. PISA 2018 shows that students who perform well on the PISA assessments from the most advantaged backgrounds are more than twice as likely as their disadvantaged peers of equal academic ability to anticipate working in a professional or managerial occupations by the age of 30 (Mann et al., 2020[13]). Career ambitions are also heavily shaped by gender and migrant status (Musset and Kureková Mýtna, 2018[14]).

The indicators of teenage career readiness presented in this paper show that such constrained thinking can be expected to have a negative impact on young people's job outcomes in the early labour market. For schools, it becomes important to review such indicators of career thinking (as well as further indicators relating to teenage career exploration and experience first presented in "Career Ready?" and this is the focus of ongoing work by the OECD project team). In this section of the working paper, insights as are available from the research literature and from career guidance professionals are presented that show ways in which constrained teenage career thinking can be challenged. Teachers and career guidance counsellors have key roles to play in encouraging and enabling students to reflect on their interests and abilities and how they can relate to the labour market. Use of student questionnaires -including career interest guides and inventories that support students' career exploration- and particularly engagements with people in work provide opportunities to initiate and develop critical reflection about career aspirations. Effective provision will begin young, giving students maximum opportunity to benefit from their improving understanding of how their daily classroom experiences relate to imagined futures in the world of work.

Career Counselling

> "I have one-to-one career conversations with my 10th and 11th grade students (ages 16-18). Before each session, we chat and get to know one another. Through this, they begin to understand me and my own career journey. Building trust and developing a rapport is essential in creating successful student-counsellor relationships. At the start of our meetings, I provide students with a free online personality test designed to get them thinking about their interests and passions, but also to encourage and enable discussion. Often, students have an idea of what they might be interested in, but don't know the names of certain jobs. This presents a problem, as they cannot aspire to be what they don't know. It is crucial to start thinking early, so for my lower-secondary school students (ages 11-14), among other activities, I encourage them to maintain a "career journal", to keep track of and write down what they might like or might not like as they discover new career interests."

Niya Stateva, Career Counsellor, American English Academy, Sofia, Bulgaria

> "In Pakistan, the career aspirations of young people are often limited and mostly revolve around traditional careers. Career thinking is heavily influenced by parents. It is important to broaden the aspirations of students and to give parents the confidence and the tools they need to support their children's career exploration. A good starting point is having a career dialogue with the parents of students in grades 8-12 (ages 13-18). The parents complete a 15-20 minute questionnaire, which is designed to help them realise the limitations of their children's career aspirations and the extent of resources available to them. This prompts a mutually engaging dialogue about what makes for a good job/livelihood and how to find useful information about jobs, careers, education and training pathways. Both parents and children are encouraged to become more proactive and investigative about future plans, including consideration of newly emerging industries. One important activity is a careers and vocational fair where they have the opportunity to meet with people working in jobs of interest, employers and representatives of post-secondary education and training and vocational institutions. Parents come into this process with partial career information and with many assumptions. An enlightened and good counsellor will empower them by helping them to understand how sustainable careers are crafted. Afterwards, many students end up pursuing a career that they didn't even know existed at the start of the process which contributes to their economic livelihood and prosperity."

Raza Abbas, Director - Pakistan, Asian Regional Association for Career Development (ARACD), Pakistan

Career counselling provides young people with specific advice to make educational, training and occupational choices on an individual basis (OECD, 2004, p. 10[76]). Career counselling includes activities that "help young people to gather, understand and interpret information and apply it to their own situation, as well as impartial guidance and specialist support to help young people to understand themselves and their needs, confront barriers, resolve conflicts, develop new perspectives and make progress" (Musset and Kureková Mýtna, 2018, p. 5[14]). As noted in "Career Ready?", on average across participating OECD

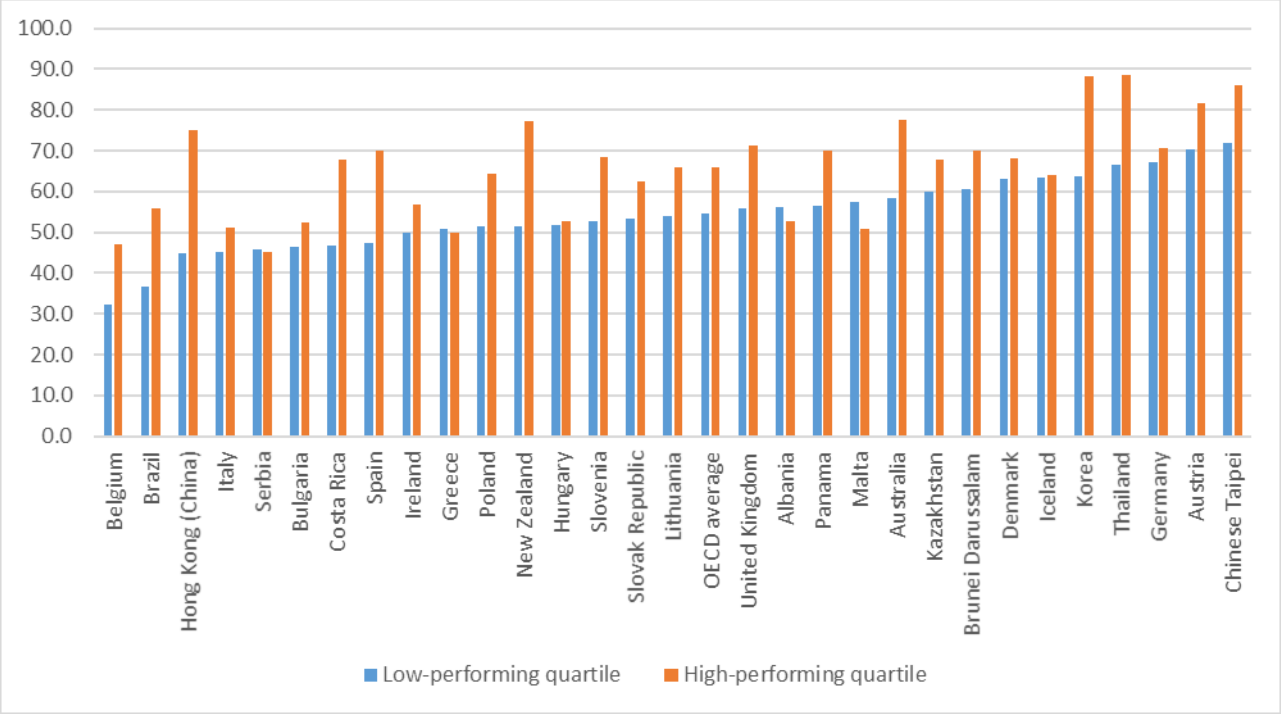
countries, just 50% of students report having spoken to a careers advisor in school by the age of 15. Variation between countries is considerable with fewer than 40% of students in Belgium, Brazil, Brunei Darussalam, Bulgaria, Italy, Serbia and the Slovak Republic and more than 70% of students in Denmark, Iceland and Thailand reporting such a conversation (Mann, Denis and Percy, 2020[2]).

One common tool used by career counsellors is the career questionnaire. Commonly, questionnaires are used to help students better understand their own personality traits and interests and to show how these relate to different types of employment. Examples include O*NET Interest Profiler[17], a free online survey developed by the U.S. Department of Labor that provides feedback on an individual's interest in relation to the Holland occupation themes (RIASEC). Another example is 16personalities[18], a free, online personality assessment, inspired by the Myers-Briggs Type Indicator (MBTI). For counsellors, often the aim of the questionnaire is not to determine a narrow occupational choice for a student, but to begin and encourage processes of reflection about their individual preferences and how these relate to potential futures on work. By the age of 15, many students reported having completed a questionnaire about their interests and abilities. Across participating OECD countries, PISA 2018 shows an average of 61% of all students had completed a questionnaire with over three-quarters of students in Austria, Chinese Taipei, and Korea reporting that they had done so, while less than 50% of students reporting that they had completed one in Belgium, Brazil, Bulgaria, Greece, Italy, Morocco, and Serbia. PISA 2018 shows considerable variation within countries with (on average across participating OECD countries) girls (65%), students from higher socio-economic status backgrounds (66%) and higher achievers (66%) more likely to have done so than boys (58%), students from lower socio-economic status backgrounds (56%) and lower achievers (55%). Figure 1 illustrates the difference between students achieving the highest and lowest scores on the PISA academic assessments. Routinely, lower achieving students (who can be expected to join the labour market earlier than their higher achieving peers) are less likely to have undertaken such a reflection.

[17] https://www.mynextmove.org/explore/ip

[18] https://www.16personalities.com/

Figure 1. Percentage of students reporting completion of a questionnaire on their interests and abilities by achievement level.



Note: Costa Rica is not included in the OECD average.
Source: OECD PISA 2018 Database - https://www.oecd.org/pisa/data/2018database/ (accessed on 04 May 2021).

An example of introspective self-reported questionnaires being integrated into practice is available from World of Work[19], a US programme designed to expose young people to career education and career options continuously throughout their K-12 education (ages 5-17). Central to the World of Work approach is RIASEC – a set of six occupational themes (Realistic, Investigative, Artistic, Social, Enterprising, and Conventional) designed to help learners discover careers related to their strengths, interests and personality traits. Beginning at kindergarten (age 5), students in World of Work participate in self-awareness lessons and activities, to help identify where they fit within the RIASEC framework. After choosing a theme that they identify with, students then explore career pathways in their theme through in-class activities to help spark initial career interests.

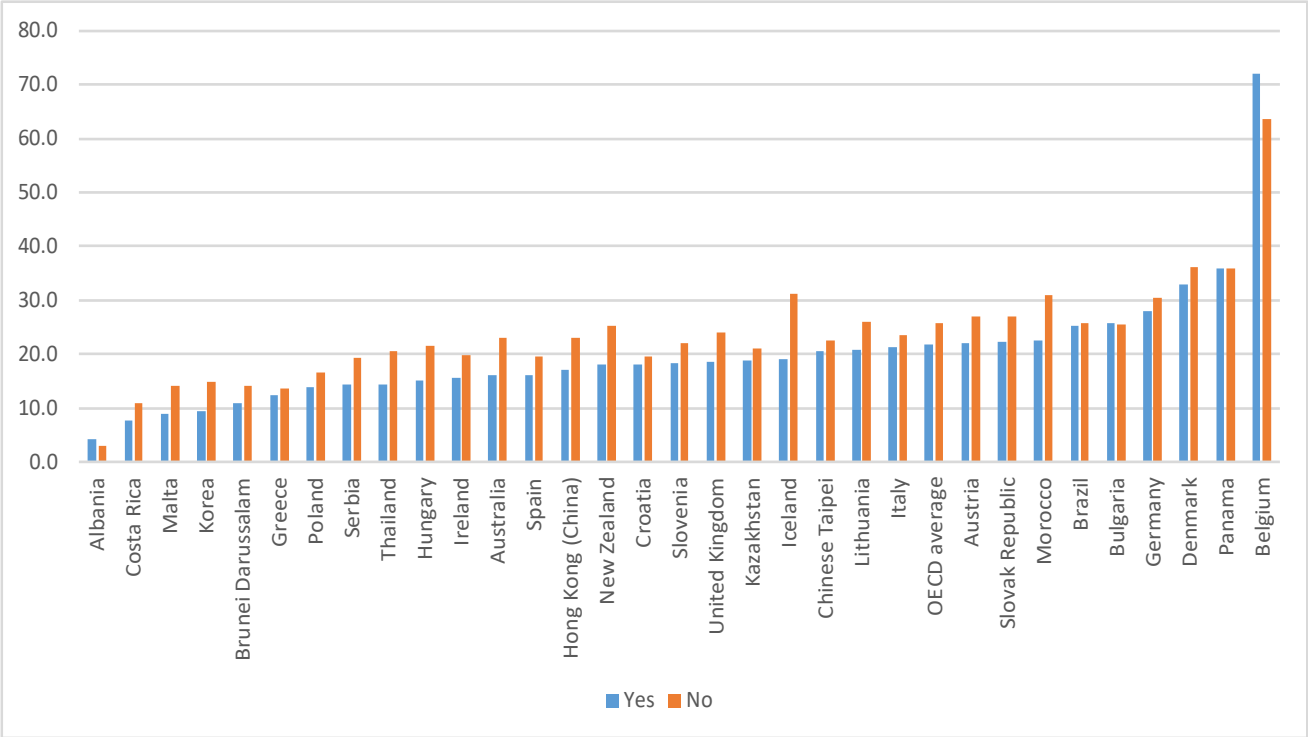
Career counselling, uncertainty, misalignment and instrumental motivation

As noted above and previously explored in "Career Ready?" (Mann, Denis and Percy, 2020[2]), research on the long-term impact of career guidance counsellors on young people's adult employment outcomes is surprisingly thin (Mann, Denis and Percy, 2020[2]). Such studies as do exist, for example in Germany and the United States, tend however to see long-term benefits. A number of quantitative studies have explored relationships between teenage career uncertainty and participation in career development activities and

[19] https://www.oecd.org/education/career-readiness/OECD%20Example%20of%20Practice,%20WoW,%20Cajon%20Valley.pdf

found positive outcomes linked to involvement. According to a 2015 survey of 14- to 18-year-olds in Australia, researchers found significant associations between greater levels of career certainty and meeting with a career counsellor in school (2.12 times more likely to be certain than uncertain) (Galliot and Graham, 2015[77]). As illustrated in Figure 2, data from PISA 2018 shows that students who have spoken to a careers advisor are consistently less likely to report being uncertain than their peers.

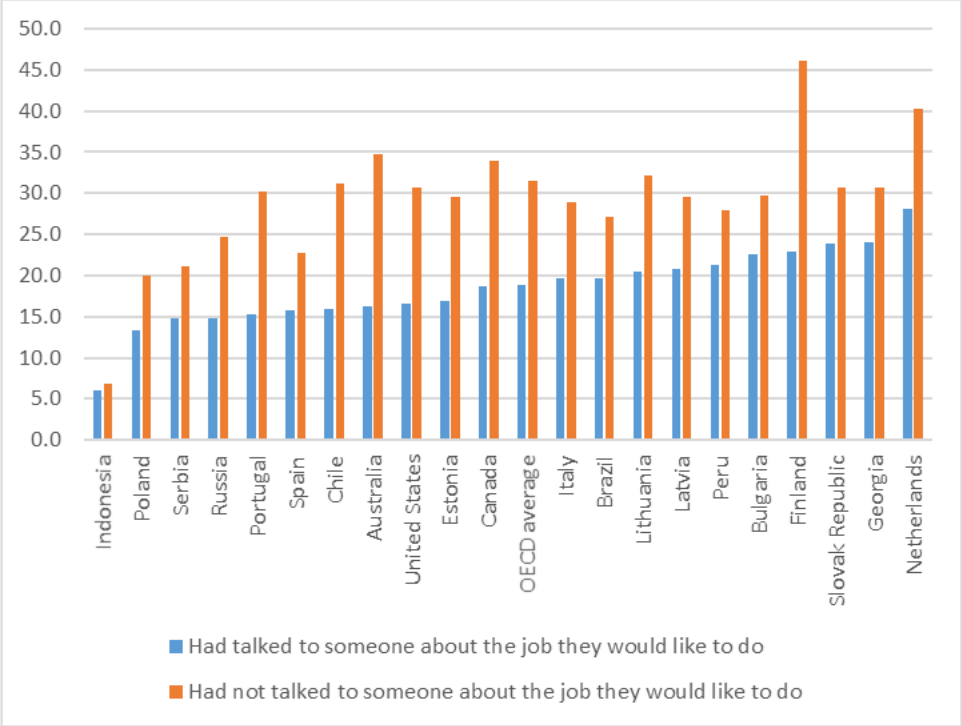
Figure 2. Percentage of students who are uncertain, by whether or not they have spoken to a career advisor at school by age 15.



Note: Costa Rica is not included in the OECD average.
Source: OECD PISA 2018 Database - https://www.oecd.org/pisa/data/2018database/ (accessed on 04 May 2021).

Earlier work has also highlighted a strong connection between teenage participation in any discussion about a job of interest and lower levels of uncertainty. While the relationship may be more likely to be one of correlation, rather than causation, than is the case with engagement with career advisors, it is helpful for advisors to be aware of the extent to which young people are actively engaging in discussions about their futures in work. Effective counsellors will encourage and enable students to engage in multiple and continuing discussions about their career interests and how they relate to their educational experiences.

Figure 3. Percentage of students who are uncertain about their career expectations by participation in career conversations.



Source: OECD PISA 2018 Database - https://www.oecd.org/pisa/data/2018database/ (accessed on 04 May 2021).

Analysis of PISA 2018 first presented in *Dream Jobs? Teenagers' Career Aspirations and the Future of Work* (Mann et al., 2020[13]) moreover highlights significant relationships between teenage participation in a number of career development activities, including speaking with a careers advisor and completing a careers questionnaire, and lower levels of misalignment between career expectations and educational plans. Students agreeing that they had taken part in the following activities were significantly less likely to be misaligned after taking account of personal circumstances and achievement on the PISA academic assessments:

Table 32. Career misalignment among students participating in different career related activities

	Misalignment % among students who had undertaken the activity	Misalignment % among students who had not undertaken the activity
Completed a questionnaire to find out about my interests and abilities	20.0%	27.4%
Researched the internet for information about careers	21.0%	27.4%
Researched the internet for information about ISCED 3-5 programme	19.8%	28.5%

Analysis also shows a particularly strong relationship between agreement with the statement "Trying hard at school will help me get a good job" (an indicator of instrumental motivation) and having spoken to a career advisor in school. Controlling for a wide range

of personal characteristics, young people who had spoken to an advisor were 18% more likely to agree with the statement at a *P*-value of 0% (Mann et al., 2020[13]). The results are in keeping with earlier analysis of PISA 2012 data from Australia, Belgium, Canada, Denmark, Finland and Ireland that found that participation in a number of career development activities (internships, job shadowing, job fairs and speaking with a careers advisor) was significantly related to more positive responses to statements that draw a connection been educational commitment and employment outcomes, including "school is a waste of time" (Kashefpakdel, Mann and Schleicher, 2016[78]).

Table 33. Summary of statistically significant positive responses to four attitudinal statements by career development activity and country

	Australia	Belgium	Canada	Denmark	Finland	Ireland
Disagreement with: *School does little to prepare you for life*						
• Internship					✓	
• Job shadowing		✓	✓			
• Job fair	✓					
• Career advisor	✓	✓	✓	✓	✓	✓
Disagreement with: *School is a waste of time*						
• Internship					✓	✓
• Job shadowing			✓			✓
• Job fair	✓		✓		✓	✓
• Career advisor	✓		✓	✓	✓	✓
Agreement with: *School is useful for jobs*						
• Internship			✓		✓	
• Job shadowing	✓	✓		✓	✓	✓
• Job fair	✓		✓		✓	✓
• Career advisor	✓	✓	✓	✓	✓	✓
Agreement with: *School helps to get a job*						
• Internship				✓	✓	
• Job shadowing		✓		✓	✓	
• Job fair	✓	✓			✓	✓
• Career advisor		✓		✓	✓	✓

Source: (Kashefpakdel, Mann and Schleicher, 2016[78])

Recommendations for effective practice of career counselling

In the OECD paper "Working It Out: Career Guidance and Employer Engagement", Musset and Mýtna Kureková (Musset and Kureková Mýtna, 2018[14]) review the relevant research literature and provide recommendations for the more effective delivery of career counselling:

1. **Starting early**. Research has shown career interests to be relatively stable throughout upper-secondary education. This means that career guidance interventions need to start early, before secondary education, when career thinking is emerging.
2. **Ensure that career counsellors are well-trained**. Strong knowledge of education systems, labour markets, and careers and learning opportunities, to provide more specific career advice to individuals is essential.
3. **Ensure that career counsellors are independent and impartial**. While it makes sense to deliver guidance in schools in order to ensure access to all students, it is important that guidance professionals preserve their independence from the school. This could involve, for example, a professional career guidance service managed from outside schools, but with a function in the schools. Countries should address the quality issues that sometimes exist in school-based career guidance.
4. **Integrate teachers into the provision of career guidance in school-wide approaches**. Teachers should embed career education within subjects as taught in the curriculum. For example, highlighting how a particular scientific process is used in research or industry. Teachers' roles are distinct from, but complementary to, the role of career guidance professional.
5. **Complete these approaches with the opportunities given by information and communications technologies (ICT) and labour market information**. Technological advances have made career decision making more complex, but they have also opened up access to new sources of information about the labour market and the average returns for different qualifications.
6. **Ensure that the approaches used are personalised**. Counsellors should consider and prepare students based on their distinct desires and suitability.
7. **Focus on certain groups, those who need the most assistance**. Career guidance needs to be more proactive and to target specific groups to overcome the barriers faced by students from under-represented groups. Programmes specifically for disadvantaged students, such as young people at risk of becoming NEET, work best when they are targeted, located in the community and highly individualised.

Employer engagement

"Students (even from the most disadvantaged backgrounds) have no lack of aspirations, but their aspirations often remain dormant at the back of their minds. It is not until you engage with them or have someone else engage with them that those aspirations come to the fore. When people come into the school to talk about the jobs they do, it allows and encourages students to voice their own ambitions perhaps for the first time. There is a magic that happens when they hear first-hand from someone in work about how they got into their occupational field and then inviting the students to talk about where they are on the same long journey. This

> year, we have had small groups of 8-10 students (aged 14) join talks with four different volunteers over a morning. We realise now that more activities, beginning at a younger age will create more time for their aspirations to be raised, discussed and thought through."

Beth Nalter, Careers Advisor, Green Bay High School, Auckland, New Zealand

> "Experiential learning (like job fairs and work experience placements) is very effective in getting students to think more seriously about their futures, but what really makes the difference are the opportunities which it presents. Students gain most from reflection and dialogue after their experiences. They gain a better understanding of their own preferences and interests and see how these are relevant to their decisions about careers of interest and education/training pathways. One approach we use to optimise the benefits of employer engagement is to require the Year 11s (age 17) to arrange a job fair for the Year 7s (age 13). Here, the older students share their direct experiences of industry and training with younger ones, helping them to think early about the connections between education and employment."

Michael Openshaw, Head of Careers and VET, St. Norbert College, Australia

One of the most important tools within career counselling is employer engagement. An employer engagement activity is one in which a learner is provided with the opportunity to engage first-hand under the guidance of their school or other supporting institution with someone who works for pay in the world of work. Employer engagement activities are relevant to students undertaking both general and vocational learning tracks and include such activities as:

- assembly-wide or classroom career talks,
- career fairs,
- one to one or small group discussions,
- simulated recruitment activities (such as mock interviews and CV workshops),
- workplace visits or job-shadowing, and
- practical work experience.

Key outcomes of employment engagement activities, as outlined by (Mann, Rehill and Kashefpakdel, 2018, p. 5[79]), include helping young people by:

- enhancing understanding of jobs and careers,
- providing the knowledge and skills demanded by the contemporary labour market,
- providing the knowledge and skills demanded for successful school-to-work transitions, and
- enriching education and underpinning pupil attainment.

As well as providing scope for gaining first hand experiences of workplaces and employment, school-mediated employer engagement activities provide opportunity for students to gain valuable insights into careers of interest which will challenge and enhance

career thinking (Mann, Rehill and Kashefpakdel, 2018[79]; Mann, Denis and Percy, 2020[2]). Through school-mediated employer engagement activities, young people are offered opportunities to interact with professionals working in occupational areas of potential interest. Employer engagement acts in a similar way to social capital, a resource providing trusted information and support that emerges from naturally forming social networks. In their personal interactions, individuals gain resources of value (Mann, Kashefpakdel and Percy, 2018[80]). Through first-hand encounters, young people learn about the labour market in new ways which are difficult to ignore. First-hand experiences provide sources of evidence that are significantly more trusted than information sources lacking interaction and through encounters with people in work, students are challenged to confirm or revise their career thinking (Linnehan, 2004[81]; Jones, Mann and Morris, 2016[82]). Consequently, the new information that they access about jobs and careers is particularly valued as it feels more authentic to students. Studies show that the more employer engagement activities young people are exposed to, the more helpful they are felt to be and the greater the long-term benefits gained (Kashefpakdel and Percy, 2016[83]). Effective provision will ensure that in each year of schooling, young people encounter people in work on multiple occasions. Because student career thinking is distorted by social backgrounds, it is effective to require student participation in career guidance activities. Students don't know what they don't know and mandatory activities can help challenge ignorance or preconceptions. Careers carousels (where students in very small groups spend a few minutes with different volunteers who tell them about their jobs) are especially effective in challenging and broadening the career thinking of young people (Rehill, Kashefpakdel and Mann, 2017[84]).

In the realm of helping young people think more critically about their future careers, multiple studies have highlighted the way that children's career thinking is heavily shaped by gender (Percy and Amegah, 2021[85]; Chambers et al., 2018[86]; OECD, 2015[87]). Such stereotypical thinking begins at a very young age (OECD, 2021[88]). There is evidence that carefully planned career-related learning interventions in primary school can boost children's career awareness and ambition, as well as diminish career gender stereotyping and help them acquire a better sense of their career-related skills. Such interventions include activities that expose children to employer representatives and the completion of a personal "careers learning log" (Hughes, 2021[89]).

Analysis of PISA 2018 data provides evidence of the ways in which employer engagement activities can constructively influence the ways in which young people think about their futures in work. The OECD paper "Dream Jobs? Teenagers' Career Aspirations and the Future of Work" (Mann et al., 2020[13]) showed for example that relationships between a number of career development activities and greater likelihood of agreeing with the statement "Trying hard at school will help me get a good job", an indicator of instrumental motivation.

In "Career Ready?", the results of a survey of a representative sample of young British adults aged 19-24 are reported, illustrating a strong relationship between recollection of school-mediated employer engagement activities and more positive responses to the statement that school had prepared them well for adult life (Mann et al., 2017[90]). Whereas only one-third of young adults who had no recollection of engagement with employers in secondary school felt that their school had prepared them well, this was the view of two-thirds of their peers who remembered four of more interactions. The role of employer engagement may be as much help teenagers to make sense of their schooling as providing concrete skills.

Other analysis of PISA data provides further evidence of the relationship between employer engagement and more positive teenage career thinking. As highlighted above, making use of PISA 2012 data, (Kashefpakdel, Mann and Schleicher, 2016[78]) find that young people in PISA participating countries who took part in job shadowing or in a work-site visit were 8% more likely to agree (at a *P*-value of 1%) with statements illustrating instrumental motivation such as "Trying hard at school will help me get a good job" than would be expected after gender, socio-economic status, school characteristics, migrant background, academic proficiency and other background factors were taken into account. Equally, young people who had attended a job fair were 11% more likely to agree with the statement (at a *P*-value of 0%), while participation in an internship was associated with 5% greater levels of agreement, if at a *P*-value of 0.15.

Analysis of data in PISA 2018 shows similar relationships between teenage part-time working and more positive career thinking. With regard to participating OECD countries, teenagers who work alongside their full-time education are on average 20% less likely to misaligned in their career plans than non-workers (after controlling for personal characteristics at a *P*-value of 6%). Volunteering is also associated with benefits for students: young people who volunteer (a form of encountering work places and organisations) are (on average across participating OECD countries), 16% less likely to be uncertain about their career ambitions than their non-volunteering classmates, aligning with (Mann, Denis and Percy, 2020[2]). The results align with findings from Australia. Drawing on a survey of 706 Australian students aged 14 to 18, researchers found "significant associations between career certainty … and taking part in voluntary work experience placements (2.40 times)" (Galliot and Graham, 2015[77]).

In earlier analysis presented in the OECD publication "Dream Jobs?" (Mann et al., 2020[13]), significant relationships were identified between a number of career development activities and both higher and lower average levels of career concentration. Students who reported taking part in the following activities all demonstrated lower levels of concentration with controls in place for academic achievement and a range of personal characteristics:

- An internship
- Speaking to a career advisor both in and out of school
- Attending job-shadowing or a work-site visit, and
- Visiting a job fair

These are all activities that require an individual to interact with others, notably with people from workplaces. As discussed below, such engagement with employers and career counsellors are widely seen as effective approaches to enhancing young people's thinking about the future.

By contrast, students reporting that they had undertaken the following activities reported higher than expected levels of concentration:

- Researching the internet for information about ISCED 3-5 programmes
- Researching the Internet for information about careers
- Completing a questionnaire to find out about my interests and abilities.

Effective guidance, the results indicate, is a social activity, based upon active engagement and career exploration of potential futures, supported by career guidance professionals and

people in work according to individual needs. Analysis however showed no significant relationships between levels of career concentration and students reporting that they had volunteered, worked part-time or having spoken to someone about a job they would like to do.

Recommendations for more effective practice of employer engagement in education

In a 2018 publication (Mann, Rehill and Kashefpakdel, 2018, p. 72[79]), commissioned by the United Kingdom government agency, the Education Endowment Foundation, practical insights into more effective inclusion of employer engagement in career guidance activities were provided by the authors. Based on an extensive international literature review, they argue that young people's engagement with employers is more effective if it is:

1. **Authentic**: Employer engagement activities should be based on first-hand encounters between young people, and workplaces and individuals from the world of work.
2. **Recurrent**. A number of studies have highlighted the importance of recurrent employer engagement activities.
3. **Valued**. Evidence suggests that when young people themselves testified that the employer engagement activities were of value to them, better outcomes have followed.
4. **Varied**. Employer engagement activities should be varied. Evidence suggests that different activities can be associated with improving different outcomes for different types of pupils.
5. **Contextualised**. When employer engagement activities are undertaken within the context of effective careers provision, some studies highlight improved outcomes.
6. **Personalised**. Evidence suggests that young people entering educational experiences with limited access to relevant work-related networks should be targeted with more intensive and personalised employer engagement.
7. **Started at a young age**. With benefits appearing to be more driven by changes in attitude and expectation than the growth of human capital, employer engagement should begin in primary schooling where identity formation can be supported through career learning activities within and outside of the classroom.

An example of employer engagement aimed at younger children is Primary Futures, a programme of Education and Employers, an independent United Kingdom based charity. The programme provides primary school children (ages 5-11) with opportunities to meet and interact with volunteers from a wide and diverse range of careers and backgrounds to inspire and motivate them, through school-mediated employer engagement activities. One activity that seen as being particularly effective is a "What's My Line?" assembly. In this activity, a group of 4-6 volunteers assemble in a panel and answer "yes or no" questions from an audience of children who attempt to guess the panellists' professions. Towards the end of the event, after many incorrect guesses from the audience, the volunteers reveal their professions – which are often very different from what the children had imagined. This exercise helps challenge assumptions as well as enables primary schoolchildren to begin career thinking early.

Simulated recruitment activities

> "I find that many of my (14-15 years old) students have ambition, but it is often very narrow. Therefore, I organise activities for them to broaden their aspirations. Among them are simulated recruitment activities. These are particularly useful because along with the benefits of building confidence and improving communication skills, students also have the opportunity of engaging with and networking with someone from a career they haven't fully explored yet."

Lin Proctor, Careers Lead, Wallington County Grammar School, United Kingdom

One approach that can help students gain a better understanding of the requirements of different jobs is simulated recruitment exercises. In such activities, students are provided with the opportunity to engage in processes necessary for securing ultimate employment under the guidance of their school or other supporting institution. Activities may include job searching, preparation of a résumé or Curriculum Vitae (CV), an application for a potential job, and preparation for, and participation in, a mock interview. Advancements in artificial intelligence and machine learning offer new opportunities for young people's careers exploration both within and outside of the classroom e.g. careers chatbots, interactive career portals. Collectively, such experience is designed to help learners better understand how recruitment exercises work and to review their own current or anticipated knowledge, skills and qualifications against those desired for a specific occupation. Participation may also help to develop verbal communication skills and build confidence. Feedback from interviewers (commonly volunteers from workplaces with interview experience) is typically used to help student interviewees to identify areas for development in terms of qualification and experience acquisition and to improve their presentation skills and responses, ultimately to increase the likelihood of obtaining a position of employment (Huss, Jhileek and Butler, 2017, p. 25[91]). Consequently, simulated recruitment activities can be particularly expected to help young people think about the levels of education required to access occupations (career misalignment) as well as potentially broadening aspirations (career concentration).

An example of the use of simulated recruitment activities in practice is the School-to-Work Group Method in Finland[20], where students are taught to "think like an employer" and to reflect on the challenges and barriers which they can expect to encounter in their search for attractive work (Koivisto, Vuori and Vinokur, 2010[92]). The programme, which is co-taught with by a career counsellor and a representative of the local Public Employment Service and includes considerable involvement from employer/employee volunteers, is designed as a week-long course delivered in the final year of secondary education. During the programme, students prepare for, and take part in, a mock interview with an employer. Overall, the programme seeks to develop the confidence of students in their ability to perform essential job-search activities well, such as securing job leads and successful interviewing (Vuori and Price, 2015[93]).

An example of practice that makes use of simulated recruitment activities within a wider programme based on extensive employer engagement is the WE3 Continuum in New

[20] https://www.oecd.org/education/career-readiness/Finland%20School%20to%20Work%20Group%20Method%20for%20Web.pdf

Zealand[21], a career readiness curriculum developed by Australian educationalist Dave Turner. The WE3 approach includes a strong focus on the development of young people's critical thinking about the world of work by ensuring multiple, thoughtful engagements between young people and employers, employee volunteers and workplaces. Largely aimed at young people aged 13 to 16, typical activities include career talks and conversations from people in work, CV writing and interview skills with employee volunteers, and job shadowing (Turner, 2020[94])[22].

> "We build guidance into everything we do. Every meeting of our senior leadership and board of governors has guidance as an agenda item. Our students have big decisions to make about their futures at 16, and we start at 11, engaging them in multiple activities and discussions about jobs and careers in both guidance sessions and in their subject lessons. Many of our activities are deliberately mandatory, like a visit to a highly selective university. It helps make sure any preconceptions students may have won't get in the way of broadening and informing their career thinking. Offering guidance only at the end of compulsory schooling (age 16) is too late. Starting early gives students the time they need to learn about themselves and to think seriously about their futures and how they relate what they are doing everyday in the classroom."

Stephen Logan, Deputy Head teacher, Malet Lambert School, Kingston-upon-Hull, United Kingdom

[21] https://www.oecd.org/education/career-readiness/New%20Zealand%20WE3%20for%20Web.pdf

[22] While not further developed in this paper, an upcoming Policy Brief of the Career Readiness project will focus on recommendations for more effective practice of simulated recruitment activities.

Conclusions

The OECD Career Readiness project aims to identify the student indicators and school activities that most help teenagers transition into the world of work. This is particularly relevant in times of economic crisis that lead to youth employment precariousness. The project does so by focusing on analysis of national longitudinal surveys, the best quality international evidence available on the long-term impact of teenage career thinking and experiences.

This paper develops the work of the "Career Ready? How schools can better prepare young people for working life in the era of COVID-19" working paper (Mann, Denis and Percy, 2020[2]). It brings more evidence into the public domain to show that what teenagers think about their future in employment affects their actual labour outcomes later on. This is the second of three research papers that will contribute to the confirmation of teenage non-cognitive indicators of better-than-expected employment outcomes and the development of data-driven tools for policy and practice.

The analysed data: How? When? Who?

In this paper, the evidence was gathered from large, representative groups of respondents in Australia, Denmark and Switzerland, over a period of ten years. The first data collections were based on the OECD Programme for International Student Assessment, when the students were 15 years old, and the follow-up surveys were national longitudinal studies implemented by each country when respondents were 25-27 years old, spanning either from 2000 to 2010 (Denmark and Switzerland) or from 2003 to 2013 (Australia). While these longitudinal datasets allow to follow students into their adult life and first working experiences, they also present limitations in the extent to which the findings may be contextually relevant today.

Indicators related with thinking about the future and career outcomes

The first part of this paper provided further evidence on the indicators first considered in "Career Ready?" (*career certainty*, *career alignment and career ambition*), as well as evidence on two new indicators (*instrumental motivation* and *career concentration*). It described how teenage indicators relating to thinking about the future are associated with one or more of three adult career-related outcomes (earnings in full-time employment, likelihood of an individual not being in education, employment or training (NEET), and job or career satisfaction) in one or more of the analysed countries. The main associations found between teenage career thinking indicators and young adult career outcomes are the following:

Career certainty – High-performing teenagers who were more certain about their career plans were more likely to earn more later on (Denmark and Switzerland)

Career ambition – Students who at 15 were more ambitious , were less likely to be NEET (not in education, employment or training) in their mid-twenties in and better paid (in some subgroups) in Australia, and more satisfied and better paid in their jobs in Switzerland (all groups).

Instrumental motivation – Teenagers who saw a connection between their education and their career future were more satisfied with their jobs (Australia and Denmark) and less prone to be NEET (Denmark).

Career concentration – Ambitious teenagers who expected to have less popular jobs earned more later on than their equally ambitious peers who aspired to work in the most popular jobs, and students from high socio-economic backgrounds earned more if they expected to have less popular jobs (Denmark). On another hand, students aiming at jobs that are not managerial or professional earned more if they expected to have non-popular instead of popular jobs (Australia).

While certain trends were observable, no significant association was found between career alignment and labour outcomes, but it must be highlighted that such data was only available for Australia.

Applications for policy and practice

The results of this paper provide further evidence that teenage indicators related to thinking about the future are associated with better labour market outcomes. Reviewing the results of analyses newly presented within this paper alongside studies from the existing research literature, clear patterns emerge. Long-term employment benefits for young people are identified in:

- 12 out of 14 studies from five countries into career certainty
- 13 out of 14 studies from five countries into career ambition
- 5 out of 6 studies from three countries into career alignment
- 7 out of 8 studies from four countries into instrumental motivation
- 2 out of 3 studies from three countries into career concentration

Such indicators are based upon the limited insights into the lives of young people that are available from national longitudinal surveys. They underpin the conclusion that students who engage in serious thought about their futures in work and how they relate to their educational choices can anticipate better outcomes in their transitions into work. Students with clear, high and more original occupational ambitions, which align and are seen as relevant to their educational plans provide confidence that the agency needed to successful transition into good employment is in development. Where indicators are not met, a potential disadvantage is identified and flags of concern are raised.

The decisions that young people make at turning points in their educational careers are the results of many years of cumulative thinking. Career guidance should start from educational stages that precede the moment when future-shaping decisions must be taken, and should take into account student background factors.

This paper further identified forms of career guidance activities that are central to helping students develop their thinking about the future: career counselling (including use of career questionnaires), employer engagement, and simulated recruitment activities. Common to these activities is a determination to challenge, encourage and enable students to reflect actively on their career plans while they are still in a position to shape their current education to their imagined futures.

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Annex A. Readers' guide

Indices and variables used in the analysis

Indicators and background variables

The teenage career-related indicators and the background variables used in this paper all come from PISA. Most of the information on the PISA indices and variables presented below is based on the PISA 2000 and the PISA 2003 Technical Reports (OECD, 2002[95]; OECD, 2005[96]) and Annex A of the PISA 2015 publication *Equity in Education – Breaking down barriers to social mobility* (OECD, 2018[21]).

Teenage career-related indicators

PISA asked students the following questions about their expected occupation and education:

Expected educational level

In PISA 2003, students were asked about their educational expectations. Educational levels were classified according to ISCED. The index of the expected educational level (ISCED) has the following categories: (1) ISCED 1 (students not expecting to finish their current ISCED 2 programme); (2) ISCED 2 (lower secondary); (3) ISCED Level 3B or 3C (vocational/pre vocational upper secondary); (4) ISCED 3A (upper secondary) or ISCED 4 (non-tertiary post-secondary); (5) ISCED 5B (vocational tertiary); and (6) ISCED 5A, 6 (theoretically oriented tertiary and post-graduate).

Expected occupation

In PISA 2000 and 2003, students were asked: "What kind of job do you expect to have when you are about 30 years old?" This was an open question, meaning that no response categories were provided and students were able to answer freely using their own words. Responses were coded to four-digit ISCO 88 codes.

The International Standard Classification of Occupations, also known as ISCO, is a classification system developed by the International Labour Organization (ILO). The objective of this classification system is to enable international comparisons related to jobs and occupations for statistics and research purposes. Within this classification, *"an occupation is defined a set of jobs (or work activities) whose main tasks and duties are characterised by a high degree of similarity*" (UNSTATS, 2020[97])[23]. Occupations are then grouped according to the level of skills it requires, meaning the ability and level of training needed to perform a specific job. Four broad skill levels are used for the classification, each

[23] For more information, please visit: https://unstats.un.org/unsd/classifications/Family/Detail/1067

relating to one level of the International Standard Classification of Education (ISCED), although it does not mean that the skills required for an occupation can only be obtained through formal education (ILO, 2004[98])[24]. ILO acknowledges that national differences can occur and that in some circumstances the level of skills required for certain occupations may vary, however ISCO aims to represent main trends.

Based on the above questions, the following four variables were constructed:

Career certainty

For teenage career uncertainty, a dichotomous variable was created taking value 1 when the student could not name a job that they were expecting to do at age 30 (answers to the question were vague, the respondent did not know or was undecided), and 0 otherwise.

Career alignment

Teenage career misalignment was defined as expecting to work in a job classified as managerial or professional in ISCO-88 (4-digit codes beginning with 1 and 2) and not expecting to complete tertiary education (ISCED levels 5 and 6).

Career ambition

Teenage career ambition was identified by expectations of working in a job classified as managerial or professional in ISCO 88 (4-digit codes beginning with 1 and 2).

Career concentration

Career concentration is defined as when the student's choice of occupation was among the 10 most popular occupations in their country. When looking at specific subpopulations (e.g. males, females) career concentration was defined according to the preferences of those subpopulations.

Instrumental motivation

In addition, the following two PISA items related with instrumental motivation were used.

"I study to get a good job"

In PISA 2000, students were asked whether they strongly agreed, agreed, disagreed or strongly disagreed with the statement "I study to get a good job". Responses were grouped according to whether students agreed and strongly agreed versus those who disagreed or strongly disagreed.

"School has been a waste of time"

In PISA 2000 and 2003, students were asked whether they strongly agreed, agreed, disagreed or strongly disagreed with the statement "School has been a waste of time". Responses were grouped according to whether students agreed and strongly agreed versus those who disagreed or strongly disagreed.

[24] For more information, please visit: https://www.ilo.org/public/english/bureau/stat/isco/isco88/publ2.htm

Background variables

Immigrant background

The PISA database contains country-specific variables relating to the country of birth of the student, their mother and their father. These variables were recoded into items with the following categories: (1) country of birth is the same as the country of assessment and (2) other. The index of immigrant background (IMMIG) was calculated from these variables with the following categories: (0) non-immigrant students (those students who had at least one parent born in the country), and (1) first- and second-generation immigrant students (those born outside the country of assessment and whose parent[s] were also born in another country; and those born in the country of assessment but whose parent[s] were born in another country).

The PISA index of economic, social and cultural status (ESCS)

In PISA, a student's socio-economic status is estimated by the PISA index of economic, social and cultural status (ESCS), a composite measure that combines into a single score the financial, social, cultural and human-capital resources available to student. (OECD, 2019[30]). The PISA ESCS index was derived from three variables related to family background: parents' highest level of education (PARED), parents' highest occupational status (HISEI), and home possessions (HOMEPOS), including books in the home. For detailed information on how the ESCS was constructed, please refer to the PISA 2000 and the PISA 2003 Technical Reports (OECD, 2002[95]; OECD, 2005[96]). The PISA ESCS index was categorised into four quarters for analytical purposes. When results for the top quarter and the bottom quarter of this index were compared, it is always specified in the table or graph ("Bottom 25% ESCS", "Top 25% ESCS").

Student performance

In this publication, "high performers" and "high achievers" refer to students who attained at least a PISA Proficiency Level 5 or 6 in mathematics. Students at this level can work strategically using broad, well-developed thinking and reasoning skills. They begin to reflect on their work and can formulate and communicate their interpretations and reasoning. "Low performers" and "low achievers" refer to students who did not attain Proficiency Level 2 in mathematics. Level 2 marks the level of proficiency at which students begin to demonstrate the competencies that will enable them to participate effectively and productively in life as continuing students, workers and citizens.

Study Programme

This variable was not obtained from PISA. Each longitudinal survey asks their participants whether they pursued a vocational education and training (VET) programme in upper-secondary education and/or tertiary education. Differences in teenage expectations-related and adult career-related outcomes by programme orientation in upper secondary education were analysed in this paper.

Career-related outcomes

The career-related outcomes used in this paper come from the three longitudinal datasets described in the methodology section. In the case of Australia and Switzerland, individuals

were 25 years old when this data was collected; in the case of Denmark, they were 26 or 27 years old.

Not in education, employment or training (NEET) status

Each survey provides NEET (Neither in Employment or in Education or Training) data on its 25-year-old participants.

Reported hourly earnings in full-time employment

25-year-olds are asked to report their hourly earnings (whether they have a full-time or part-time occupation).

Job satisfaction

In order to identify job satisfaction, the following three questions were used:

- LSAY 2003 Cohort: D28 "I'd now like to ask how satisfied you are with different aspects of this job. For each statement I read out, please tell me whether you are Very satisfied, Satisfied, Dissatisfied or Very dissatisfied with this aspect of your job. Firstly, how satisfied are you with (b.) Opportunities to use your skills and experience?"
- PIAAC: D_Q14 "All things considered, how satisfied are you with your current job? Would you say you are…" (Extremely satisfied/Satisfied/Neither satisfied nor dissatisfied/Dissatisfied/Extremely dissatisfied)
- TREE 1: jsag1 "How satisfied are you with your current work in general?" (Extraordinarily dissatisfied/Very dissatisfied/Rather dissatisfied/So, so/Rather satisfied/Very satisfied/Extraordinarily satisfied)

The job satisfaction variables were dichotomised in the analysis (1 "currently satisfied", 0 "currently dissatisfied").

Reporting the data

Symbols in tables and graphs

The symbol "m" denotes missing data: there was no observation in the sample.

Rounding figures

Because of rounding, some figures in tables may not add up exactly to the totals. Totals, differences and averages are always calculated on the basis of exact numbers and are rounded only after calculation.

All standard errors in this publication have been rounded to one or two decimal places. Where the value 0.0 or 0.00 is shown, this does not imply that the standard error is zero, but that it is smaller than 0.05 or 0.005, respectively.

Focusing on statistically significant differences

This volume discusses only statistically significant differences or changes. These are shown in bold font in tables. The significance level is set to 1%, 5% and 10%, and indicated respectively with three stars (***), two stars (**) and one star (*) in the tables.

Abbreviations used in this report

S.E. Standard error

S.D. Standard deviation

% dif. Percentage-point difference

PPP Purchasing power parity

Annex B. Additional tables

Table A B.1. NEET at 25 and misalignment in Australia

	Youth that were NEET at 25		
N = 2016	%	S.E.	*P*-value
Youth who were misaligned at age 15	6.1	(2.1)	
Youth who were not misaligned at age 15	3.1	(1.7)	
Difference	3.0	(2.1)	0.146
Difference, after accounting for gender, academic achievement in mathematics and socio-economic status	2.8	(2.2)	0.203

Notes: Only respondents for which information on gender, socio-economic status, immigrant status and achievement in mathematics were included in the analyses.
The socio-economic status is measured by the PISA index of economic, social and cultural status (ESCS).
Information on misalignment was only available for Australia, as a question on educational expectations at 15 was included in PISA 2003 but not in PISA 2000.
Sources: LSAY Y03 Database – more information is available at https://www.lsay.edu.au/research/about (accessed on 26 May 2021); OECD PISA 2003 Database - https://www.oecd.org/pisa/data/database-pisa2003.htm (accessed on 26 May 2021).

Table A B.2. Earnings in full-time employment at 25 and misalignment in Australia

	Reported hourly earnings in full-time employment at 25		
N = 2016	Average	S.E.	*P*-value
Youth who were misaligned at age 15	18.1	(1.6)	
Youth who were not misaligned at age 15	19.8	(0.7)	
Difference	-1.7	(1.1)	0.114
Difference, after accounting for gender, academic achievement in mathematics and socio-economic status	-1.5	(1.0)	0.150

Notes: Only respondents for which information on gender, socio-economic status, immigrant status and achievement in mathematics were included in the analyses.
The socio-economic status is measured by the PISA index of economic, social and cultural status (ESCS).
Information on misalignment was only available for Australia, as a question on educational expectations at 15 was included in PISA 2003 but not in PISA 2000.
Sources: LSAY Y03 Database – more information is available at https://www.lsay.edu.au/research/about (accessed on 26 May 2021); OECD PISA 2003 Database - https://www.oecd.org/pisa/data/database-pisa2003.htm (accessed on 26 May 2021).

Table A B.3. Earnings and job expectations in Denmark: low achieving girls

Reported hourly earnings (USD PPP) in full-time employment at 25 N = 25 R^2 = 0.078	Academically low achieving girls Percentage with less popular teenage job expectations[1]: 12.1%			
	B	S.E.	*P*-value	
Having less popular teenage job expectations[1]	2.5*	(1.5)	0.099	Academically low achieving girls with less popular teenage job expectations benefit from an earnings premium of around 13%.
Constant	18.6	(0.7)	0.000	

Notes: "Less popular teenage job expectations" denotes those job expectations at age 15 that are not among the 10 most popular for that category of respondents.
Coefficients with a *P*-value < .1 are indicated in bold (* = $p < .1$; ** = $p < .05$; *** = $p < .01$).

Sources: Danish Ministry of Children and Education, PISA-PIAAC Database – more information available on https://www.uvm.dk/-/media/filer/uvm/udd/folke/pdf15/jan/150115-datavejledning-pisa-piaac-og-pisa-piaac.pdf?la=da (accessed on 26 May 2021); OECD PISA 2000 Database - https://www.oecd.org/pisa/data/database-pisa2000.htm (accessed on 26 May 2021).

Table A B.4. Comparison of youth unemployment between the time-periods of each study and the period of 1980 to 2020

Country	Study	Years of data collection of each study	Country-level youth unemployment (% of total labor force ages 15-24)			
			During the period of data collection of each study	a) In the 10-year period following when respondents were aged 15/16	b) From 1980 to 2020*	Difference between a) and b)
Australia	(Sikora and Saha, 2011[31]) LSAY	1998-2008	11.61	11.34**	13.39	-2.05
	(Covacevich et al., 2021[73]) PISA-LSAY	2003-2013	10.93	10.8		-2.59
	(Thomson and Hillman, 2010[32]) LSAY	2003-2007	10.65	10.93**		-2.46
	(Sikora, 2018[27]) LSAY	2006-2016	11.39	11.48		-1.77
Denmark	(Covacevich et al., 2021[73]) PISA-PIAAC round1	2000-2012	9.2	8.58	10.6	-2.02
Switzerland	(Covacevich et al., 2021[73]) PISA-TREE1	2000-2010	7.24	7.14	7.07	0.07
United Kingdom	(Duckworth and Schoon, 2012[65]) BCS	1986-1988	14.93	14.51	14.95	-0.44
	(Schoon and Parsons, 2002[61]) NCDS	1974-1991	14.94	18.97		4.02
	(Schoon and Polek, 2011[50]) NCDS	1974-1991	14.94	18.97		4.02
	(Ashby and Schoon, 2010[47]) BCS	1986	17.61	14.51		-0.44
	(Sabates, Gutman and Schoon, 2017[36]) BCS70	1986	17.61	14.51		-0.44
	(Yates et al., 2010[37]) BCS	1986-1988	14.93	14.51		-0.44
	(Gutman, Sabates and Schoon, 2014[33]) BCS	1986-1988	14.93	14.51		-0.44
	(Mann, Kashefpakdel and Rehill, 2017[71]) BCS	1986-1996	5.07	13.71		-1.24
	(Schoon and Parsons, 2002[61]) BCS	1986-1996	14.51	14.51		-0.44

	(Sabates, Harris and Staff, 2010[35]) BCS70	1986-2004	13.71	14.51		-0.44
	(Schoon and Polek, 2011[50]) BCS	1986-2004	13.71	14.51		-0.44
	(Green et al., 2017[60]) BCS	1986-2012	14.75	14.51		-0.44
	(Croll, 2008[45]) BHPS	1994-2004	13.61	13.46**		-1.49
	(Gutman, Sabates and Schoon, 2014[33]) LSYPE	2004-2008	13.65	17.28**		2.33
	(Mann, Kashefpakdel and Rehill, 2017[71]) LSYPE	2004-in 2009	14.56	17.04**		2.09
	(Gutman and Schoon, 2018[34]) LSYPE	2004-2010	15.33	17.28**		2.33
	(Duckworth and Schoon, 2012[65]) LSYPE	2005/2006-2007/2008	7.64	17.28		2.33
United States	(Kim, Klager and Schneider, 2019[44]) NLSY79	1979-2012	12.94	15.78**	12.68	3.1
	(Mello, 2008[62]) NELS	1988-2000	11.62	14.1		1.42
	(Mortimer, Rolando and Zierman, 2017[38])[1]	1988-2000	11.62	14.10**		1.42
	(Schmitt-Wilson and Faas, 2016[46]) NELS:88	1988-2000	11.62	14.10**		1.42
	(Staff et al., 2010[28]) NELS	1990-2000	11.62	14.32		1.64

Notes:
[1]. No acronym stated as study used data from 19 surveys
*Switzerland: between 1983 and 2020, Denmark: between 1983 and 2019, UK: between 1983 and 2020
**Studies in which some or all respondents were aged 15 at the start
Grey shade- time periods when youth unemployment was higher than in 1980-2020
Sources: Data on Switzerland - Worldbank.org. (2018). Unemployment, youth total (% of total labour force ages 15-24) (modelled ILO estimate). Data. [online] Available at: https://data.worldbank.org/indicator/SL.UEM.1524.ZS .
Data on all other countries – the OECD. (2018). Unemployment - Youth unemployment rate - OECD Data. [online] Available at: https://data.oecd.org/unemp/youth-unemployment-rate.htm .

Table A B.5. NEET status at 25 and agreeing that school has been waste of time in Switzerland

	NEET at 25			
N = 3675	%	S.E.	*P*-value	
Youth who agreed or strongly agreed that "School has been a waste of time" at age 15	6.1	(2.5)		
Career confident youth	2.6	(0.8)		
Difference	3.5	(2.6)	0.180	
Difference, after accounting for gender, academic achievement in mathematics and socio-economic status	4.0	(2.7)	0.129	A 4 percentage-point difference in NEET status at 25, between youth that agreed or strongly agreed that "School has been a waste of time" and those who did not, was associated to a *P*-value of 0.129 in Switzerland.

Note: Only respondents for which information on gender, socio-economic status, immigrant status and achievement in mathematics were included in the analyses.
The socio-economic status is measured by the PISA index of economic, social and cultural status (ESCS).
Source: TREE 1 Database – more information is available at https://www.tree.unibe.ch/data/index_eng.html (accessed on 26 May 2021); OECD PISA 2000 Database - https://www.oecd.org/pisa/data/database-pisa2000.htm (accessed on 26 May 2021).