

The International Conference on PIAAC and PIAAC-Longitudinal

April 5-6, 2017 in Mannheim, Germany



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Dear participants, dear readers,

International comparative studies provide important impetus for education policy debates – in Germany as well as in other countries. School achievement studies like PISA have brought the challenges facing the German education system to the forefront of public debate and have prompted policy-makers to set a new course.

Photo: Stefan Kugler



International comparative studies like PIAAC enable us to identify the strengths and weaknesses of our education system in its entirety – not only in a single field such as schools. Life expectancy is rising, people are working longer years and the digital transformation is changing the way we live and work. Lifelong learning is becoming increasingly important against this backdrop.

PIAAC assesses adult competencies in an international benchmark. We expect PIAAC to deliver important impetus for education policy action since it assesses competencies in the fields of literacy, numeracy and technology-based problem solving which are vital in both the professional and private field. They are the key to acquiring job-specific skills and participating in social life.

Germany is facing up to international competition by participating in PIAAC. The first study results confirm the importance of our vocational education and training system, which keeps our country competitive.

The conference provides an excellent forum to discuss the strategic development of PIAAC in future and to exchange ideas with colleagues. I wish all participants inspiring days in Mannheim.

Prof. Dr. Johanna Wanka
German Minister of Education

Dear participants, dear readers,

A skilled population is key to a country's sustainable development, stability and prosperity. Life-long learning is pivotal for a person in order to maintain his or her competencies and acquire new skills needed in our time, characterized by increasing complexity, digitalization and technological change.

The Programme for the International Assessment of Adult Competencies PIAAC forms the basis for assessing the specific needs of populations and hence policy strategies in order to facilitate life-long learning and skill development.

As President of the Leibniz Association I am proud to say that the breadth and depth of scientific expertise within the Leibniz Association on questions of formal and institutionalized education as well as informal education from a variety of disciplinary perspectives is unique in Germany. This is reflected in the prominent role Leibniz institutes had and continue to have in the PIAAC process:

- The Leibniz Institute for the Social Sciences GESIS and the German Institute for International Education Research DIPF were part of the international PIAAC consortium;
- GESIS was the national project manager for PIAAC in the first project cycle and called upon the expertise of other Leibniz institutes in the process;
- GESIS as well as the German Institute for Economic Research DIW Berlin and the Leibniz Institute for Educational Trajectories LifBi conducted the longitudinal follow-up of PIAAC with a repeated assessment of competencies.

Since 2015, the Leibniz Association funds the PIAAC Leibniz Network formed by eight Leibniz institutes¹ which work collaboratively in order to further analyze the data generated by PIAAC, develop the research questions further and disseminate the results, for instance through this conference. I am confident that its discussions and results will provide invaluable input to the further development of the PIAAC design for the second cycle. The conference will be a prominent platform for exchanging ideas and discussing research results on adult competencies. I wish all participants a fruitful and enriching dialogue on this highly important and timely topic.

Prof. Dr. Matthias Kleiner

President of the Leibniz Association



Photo: Oliver Lang

¹ GESIS, DIPF, LifBi, DIW Berlin, The Berlin Social Science Center WZB, the ifo Institute, the German Institute for Adult Education – Leibniz Centre for Lifelong Learning (DIE) and the Leibniz Institute for Science and Mathematics Education IPN.

Dear participants,

The Organizing Committee of The International Conference on PIAAC and PIAAC-Longitudinal 2017 welcomes all participants to Mannheim. The conference focuses on scientific work based on the international data of the first cycle of PIAAC and especially on analyses of the German PIAAC longitudinal follow-up, PIAAC-L.

We are happy that so many national and international researchers have responded to our conference call. We are proud to offer a broad and diverse conference program including more than 80 contributions. We are especially thankful to the two keynote speakers, Eric Hanushek and Matthias von Davier. The conference program reflects the broad and interdisciplinary focus of PIAAC. Particularly the contributions based on the PIAAC-L data offer first insights into the longitudinal effects of and on the PIAAC skills. The conference not only provides the opportunity to learn about adult skills, but, beyond that, it also enables networking and thus provides the ground for future joint research and practice. Eventually, we aim to inspire additional work based on the extensive PIAAC and PIAAC-L data and to provide insights into design and measurement alternatives for the upcoming second cycle of PIAAC.

We cordially invite you to experience this exciting event with us.

Prof. Dr. Beatrice Rammstedt & Dr. Débora B. Maehler

(On behalf of the Organizing Committee)

GESIS - Leibniz-Institute for the Social Sciences

Photo: Markus Heißler



The International Conference on
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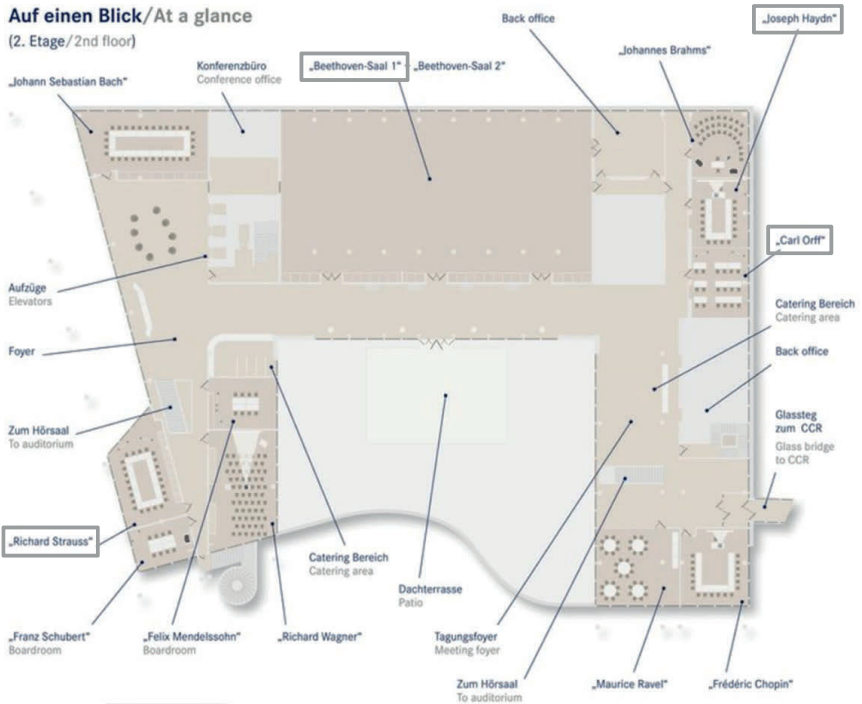
P.O. Box 12 21 55

68072 Mannheim, Germany

Conference Venue

Auf einen Blick/At a glance

(2. Etage/2nd floor)



Dorint Kongress Hotel

Friedrichsring 6

68161 Mannheim, Germany

Phone: +49 (0) 621 1251 0

Registration

The on-site registration desk will be open as follows:

Tuesday, April 4th

18:00 – 20:00

Wednesday, April 5th

8:00 – 18:00

Thursday, April 6th

8:00 – 16:15

The registration desk is located on the 2nd floor of the Dorint hotel. We will be happy to assist you with any questions you may have during the conference.

Note: Please carry your conference badge with you during the conference to benefit from all amenities.

Internet availability

Free internet access is available during the conference:

1. Connect to "dorint"
2. Enter the password "dorint".

Informal Get-together

The informal get-together will be held at the foyer on the 2nd floor of the Dorint hotel on Tuesday, April 4th from 18:30 to 20:00. We would be happy if you join us for a glass of wine and pretzel.

Coffee breaks and lunch

Coffee, tea, water and snacks will be available at coffee breaks served at the foyer in front of the conference rooms. Lunch will be served in the restaurant *Symphonie* on the ground floor of the Dorint hotel.

Conference Dinner

The complimentary conference dinner will be held on the evening of Wednesday, April 5th, at Keller's Keller winery & restaurant in Ruppertsberg, a small palatine place along the famous German Wine Route (ca. 20 km from Mannheim). In line with regional tradition, we will be holding a quick wine-tasting session before the dinner.

Dinner, beverages, wine tasting and transfer are free of charge for all conference participants.

Note: A bus shuttle to Ruppertsberg will depart at 18:15 from the Dorint and Wyndham hotel, respectively. Buses will return around 22:00, 23:00 and at midnight.

Pre- and Post-Conference Workshops

Monday to Tuesday, April 3rd-4th	GESIS Mannheim
9.00 - 16.00	Workshop A: Analyzing PIAAC data with structural equation modeling in Mplus (Dr. Ronny Scherer, CEMO, Norway)
9.00 - 16.00	Workshop B: Analyzing PIAAC data with multi-level analysis in Stata (Dr. Jan Paul Heisig, WZB, Germany)
Friday, April 7th	GESIS Mannheim
9.00 - 13.00	Workshop C: Analyzing PIAAC log file data (Prof. Dr. Frank Goldhammer & Krisztina Tóth, DIPF, Germany)

Workshop A: Analyzing PIAAC data with structural equation modeling in Mplus.

Instructor

Dr. Ronny Scherer (*CEMO, Norway*)

Location

GESIS Mannheim (B2,8)

Abstract

Structural equation modeling (SEM) has become one of the most commonly applied statistical approaches to disentangle the relationships among latent variables across groups, over time, and at different analytical levels. The potential of SEM has been recognized in many areas, including educational sciences, sociology, psychology, and business.

This workshop provides an introduction to the principles and procedures of basic and more advanced SEM in the context of international large-scale assessments such as PIAAC. Specifically, the following topics will be covered: (a) Principles of latent variable modeling, (b) Model identification and specification, (c) Measurement models (including confirmatory factor analysis), (d) Parceling, (e) Structural regression models (including exploratory SEM), (f) Multi-group SEM (including measurement invariance testing), and (g) Indirect effects and moderation models. If time permits, a brief outlook to multilevel SEM and longitudinal models will be provided.

The workshop comprises lectures and practical sessions, in which participants will put into practice basic and more advanced SEM with PIAAC data. Participants will primarily use the statistical software Mplus; yet, code and syntax for AMOS and R (lavaan) will be provided.

Workshop B: Analyzing PIAAC data with multi-level analysis in Stata.

Instructor

Dr. Jan Paul Heisig (*WZB, Germany*)

Location

GESIS Mannheim (B2,8)

Abstract

The first part of the workshop focuses on the analysis of PIAAC using the statistics package Stata. Emphasis is on two features of the PIAAC data that lead to challenges for the analyst: 1) the availability of multiple (10) "plausible values" for individual competence scores and 2) the use of jackknife replication methods for variance estimation. Different approaches to accounting for these features are presented. Participants will be introduced to the *piaactools* package developed by the Polish PIAAC team, a convenient option that is, however, compatible only with a limited number of (regression) methods. Participants will also learn more flexible strategies for correctly estimating quantities that are not supported by *piaactools* (e.g., average marginal/partial effects). The second part of the workshop reviews different approaches to analyzing multilevel data (mixed models, clustered standard errors, two-step procedures), with the emphasis again being on PIAAC and thus on country comparisons. Advantages and disadvantages of the different approaches and their implementation in Stata will be discussed.

Pre- and Post-Conference Workshops

Workshop C: Analyzing PIAAC log file data.

Instructor

Prof. Dr. Frank Goldhammer & Krisztina Tóth (*DIPF, Germany*)

Location

GESIS Mannheim (B2,8)

Abstract

The PIAAC 2012 study was the first fully computer-based large scale assessment in education. Using computers allowed not only to deliver innovative item formats and an adaptive test design, but also to collect a stream of user events (e.g., mouse clicks, text input) stored by the assessment system in log files. This data is interesting from a measurement point of view (e.g., to assess the quality of the response data), but also to address substantive research questions (e.g., to investigate the cognitive solution process). The process data gathered in PIAAC 2012 will be made available for researchers by the OECD in 2017. Therefore, this workshop will make participants familiar with the accessibility, structure and content of PIAAC log file data. In particular, we will present and provide a tool, the PIAAC LogDataAnalyzer, that allows to extract log data from PIAAC xml log files. Users can select among pre-defined generic and task-specific aggregate variables (e.g., the number and sequence of page visits) and export them into a wide format. Furthermore, complete log data can be transformed and exported into a long format. The workshop will also include sample analysis to demonstrate how exported log data can be further processed in standard statistical software such as the R environment or Weka.

Program Overview

Tuesday, April 4th	Dorint Hotel		
18.00 – 20.00	Registration		
18.30 – 20.00	Informal Get-together		
Wednesday, April 5th	Dorint Hotel		
8.00 – 9.00	Registration		
9.00 – 9.15	Welcome Address		
9.15 – 10.45	Invited Symposium I: Longitudinal follow-ups of PIAAC (Chairs: B. Rammstedt & A. Zabal)	Invited Symposium II: Surveying migrant subpopulations: Skills, surveying practices and recommendations for PIAAC (Chair: D. Maehler)	Invited Symposium III: The economics of skills (Chair: L. Wößmann)
10.45 – 11.00	Coffee break		
11.00 – 12.30	Invited Symposium IV: Competence measures and general mental ability (Chairs: F. Goldhammer & C. Carstensen)	Invited Symposium V: Adult reading and numeracy skills and practices (Chair: A. Grotlüschen)	Invited Symposium VI: Overeducation and skill mismatch in labor markets (Chair: P. Protsch)
12.30 – 13.30	Lunch		

Room:

- Beethoven-Saal 1
- ▲ Joseph Haydn
- Richard Strauss

Program Overview

Wednesday, April 5th	Dorint Hotel		
13.30 - 14.15	Keynote: Prof. Dr. Eric A. Hanushek ■		
14.15 - 14.45	Plenary debate on Keynote Discussants: H. Solga & W. Thorn Moderator: L. Wößmann		
14.45 - 15.00	Coffee break		
15.00 - 16.30	Symposium VII: The social context of skills: Improving the PIAAC Background Questionnaire (Chairs: N. Massing & S. Schneider) ●	Invited Symposium VIII: Dynamics of participation in further education and its effects (Chair: H. Kuper) ▲	Invited Symposium IX: Skills and the labor market (Chair: S. Wiederhold) ■
16.30 - 17.30	Individual Paper Session I: Mismatch in the labor market (Chair: B. Schmidt- Hertha) ●	Individual Paper Session II: Digital skills and inequality (Chair: F. Goldhammer) ▲	Individual Paper Session III: Competence assessment (Chair: A. Zabal) ■
19.00	Conference Dinner		

Room:

- Beethoven-Saal 1
- ▲ Joseph Haydn
- Richard Strauss

Thursday, April 6th	Dorint Hotel		
8.00 – 8.30	Registration		
8.30 – 9.15	Keynote: Dr. Matthias von Davier ■		
9.15 – 9.45	Plenary debate on Keynote Discussants: J.-E. Gustafsson & R. Desjardins Moderator: C. Carstensen		
9.45 – 11.15	Individual Paper Session IV: Skill formation across the life course (Chair: H. Kuper) ■	Invited Symposium X: Assessing non- cognitive skills in large-scale assessments (Chairs: B. Rammstedt & D. Danner) ▲	Individual Paper Session V: Response styles (Chair: M. von Davier) ●
11.15 – 11.30	Coffee break		
11.30 – 13.00	Symposium XI: Social trust, education and skills (Chair: W. Thorn) ■	Individual Paper Session VI: Skills and wages (Chair: M. Paccagnella) ▲	Individual Paper Session VII: Civic engagement and migrant skills (Chair: P. Protsch) ●
13.00 – 14.00	Lunch		
14.00 – 15.30	Individual Paper Session VIII: Returns to education and skills (Chair: J. Heisig) ●	Symposium XII: Skills in the labor market, choices in the working sphere, and the anatomy of risk and trust preferences (Chair: D. Schnitzlein) ■	Individual Paper Session IX: Skill gain and loss around the world (Chair: S. Wiederhold) ▲
15.30 – 15:45	Closing Remarks by Coffee and Tea		

Room:

- Beethoven-Saal 1
- ▲ Joseph Haydn
- Richard Strauss

Prof. Dr. Eric A. Hanushek

Stanford University, USA



Eric Hanushek is the Paul and Jean Hanna Senior Fellow at the Hoover Institution of Stanford University. He has been a leader in the development of economic analysis of educational issues. He has authored numerous, highly cited studies on the effects of class size reduction, high-stakes accountability, value-added assessments of teacher quality, and other education-related topics. His pioneering analysis measuring teacher quality through the growth in student achievement forms the basis for current research into the development of value-added measures for teachers and schools. His latest book, *The Knowledge Capital of Nations: Education and the Economics of Growth*, identifies the close link between the skills of the people and the economic growth of the nation and shows the economic impact of high quality schools. He has authored or edited 23 books along with over 200 articles. He is a Distinguished Graduate of the United States Air Force Academy and completed his Ph.D. in economics at the Massachusetts Institute of Technology.

Dr. Matthias von Davier

National Board of Medical Examiners (NBME), USA

Dr. Matthias von Davier is Distinguished Research Scientist at the National Board of Medical Examiners (NBME) in Philadelphia, PA. Before, he was a senior research director in the Research & Development Division at Educational Testing Service (ETS), and co-director of the center for Global Assessment at ETS, leading psychometric research and operations of the center. In the Center for Advanced Assessment at NBME, he works on psychometric methodologies for analyzing data from technology-based high-stakes assessments. He is one of the editors of the journal *Large Scale Assessments in Education* jointly published by the International Association for the Evaluation of Educational Achievement (IEA) and ETS. He is also editor-in-chief of the *British Journal of Mathematical and Statistical Psychology (BJMSP)*, and co-editor of the book series *Methodology of Educational Measurement and Assessment*. His work involves psychometric methodologies used in analyzing data from psychological and educational assessments and licensure exams. He develops software for multidimensional models for item response data, and he works on improving models and estimation methods for the analysis of data from large-scale assessments. Dr. von Davier's areas of expertise include topics such as item response theory, latent class analysis, diagnostic classification models, and more broadly classification and mixture distribution models as well as computational statistics, person-fit, item-fit, and model checking, as well as hierarchical extension of models for categorical data, and the analytical methodologies used in large-scale educational surveys.



Symposium I

Wednesday, April 5th, 2017, 9:15 – 10:45

Symposium:

Longitudinal follow-ups of PIAAC

Chairs

Beatrice Rammstedt & Anouk Zabal (*GESIS – Leibniz-Institute for the Social Sciences, Germany*)

Room: Beethoven-Saal 1

Abstract

Four PIAAC Round 1 countries have carried out longitudinal follow-ups of their PIAAC 2012 surveys. This symposium will give an overview of the somewhat different approaches followed by Canada, Germany, Italy, and Poland, thus bringing a variety of insights both from a methodological as well as a content-oriented perspective. The Canadian PIAAC respondents are followed biannually as a part of the comprehensive Canadian longitudinal social survey LISA (Longitudinal and International Study of Adults). Andrew Heisz will focus on methodological and design aspects of LISA, addressing topics such as data collection, data linkage, and access. This first presentation is complemented by a second presentation by Gilles Bérubé which delineates how the information from PIAAC and its longitudinal follow-up can inform policy making. In Germany, the project PIAAC-Longitudinal (PIAAC-L) carried out three additional waves of data collection with the PIAAC 2012 respondents. Anouk Zabal and Beatrice Rammstedt will elaborate on the PIAAC-L design and share some of the lessons learnt. Gabriella Di Francesco and her colleagues will present some of their research results in the context of their single-wave longitudinal follow-up of PIAAC in Italy. Finally, in Poland, the postPIAAC survey was carried out with one additional wave of data collection, and Marta Palczyńska will report on results regarding the measurement properties of specific non-cognitive skills assessed as a part of their longitudinal study.

Presentations

- Title: The Longitudinal and International Study of Adults: A Canadian PIAAC-Longitudinal.
Authors: Andrew Heisz & Cathy Oikawa (*Statistics Canada, Canada*)
- Title: Skills research using the first two waves of Canada's Longitudinal and International Study of Adults.
Authors: Bruno Rainville & Gilles Bérubé (*Employment and Social Development Canada, Government of Canada, Canada*)
- Title: Following-up on German PIAAC respondents: The PIAAC-Longitudinal (PIAAC-L) project.
Authors: Anouk Zabal & Beatrice Rammstedt (*GESIS – Leibniz-Institute for the Social Sciences, Germany*)
- Title: Skills, non-cognitive dimensions and job complexity: A new framework for analysis from the "PIAAC Italy Survey".
Authors: Fabio Roma, Michela Bastianelli (*National Agency for Active Labour Market Policies – ANPAL, Italy*), Simona Mineo (*National Institute for the Public Policies Analysis – INAPP, Italy*) & Orazio Giancola (*Sapienza University of Rome, Italy*)
- Title: Getting to know PIAAC respondents better: Polish follow-up study.
Author: Marta Palczyńska (*Educational Research Institute, Poland*)

S1.1: The Longitudinal and International Study of Adults: A Canadian PIAAC-Longitudinal.**Authors**

Andrew Heisz & **Cathy Oikawa** (*Statistics Canada, Canada*)

Abstract

The Longitudinal and International Study of Adults (LISA) is a PIAAC-Longitudinal for Canada built upon the 2011-12 PIAAC collection cycle. In LISA, Canadian PIAAC respondents were re-interviewed in 2014 and 2016, and their cohabitants were also interviewed, with interviews covering a diverse set of subjects, such as labour market activity, health, family changes, caregiving, income, assets and debts, and non-cognitive skills (a 2018 collection is also planned). LISA incorporates an additional sample of households not initially eligible for PIAAC, making the LISA sample representative of the Canadian population overall, including children and seniors. An additional feature of LISA is that up to 30 years of data from four different administrative datasets representing income, tax, pension, immigration, and employment records are also linked to LISA. The presentation will describe the main features of the LISA survey design such as the LISA sampling methodology, collection procedures, record linkage, weighting and content.

S1.2: Skills research using the first two waves of Canada's Longitudinal and International Study of Adults.**Authors**

Bruno Rainville & **Gilles Bérubé** (*Employment and Social Development Canada, Government of Canada, Canada*)

Abstract

Launched in 2012, the Longitudinal and International Study of Adults (LISA) collects information every two years from people across Canada about their jobs, education, health and family. A particularity of LISA is that the initial sample in 2012 included 8,600 respondents who also participated in the OECD Programme for the International Assessment of Adult Competencies (PIAAC). With a focus on PIAAC respondents, this presentation will discuss three research projects exploiting the first two waves of LISA. The first project examines returns to non-cognitive skills, measured by personality traits, taking literacy and numeracy proficiencies and educational attainment into consideration. The second project looks at how self-reported changes in skill proficiency are associated with participation in job-related formal and non-formal learning activities, and whether those changes in skill proficiencies led to changes in labour market status, job mobility and wages between the two waves. The third project uses the historical administrative tax data that are linked to LISA to assess the relationship between reception of unemployment insurance benefits and literacy and numeracy proficiencies. Issues related to the attrition of the group of PIAAC respondents over the successive waves of LISA will also be discussed.

S1.3: Following-up on German PIAAC respondents: The PIAAC-Longitudinal (PIAAC-L) project.**Authors**

Anouk Zabal & Beatrice Rammstedt (*GESIS – Leibniz-Institute for the Social Sciences, Germany*)

Abstract

The German PIAAC-L project aims at enriching and enhancing the PIAAC (Programme for the International Assessment of Adult Competencies) data to address research questions and policy issues that are beyond the scope of the available data from PIAAC. In order to achieve this objective, a longitudinal design with three follow-up waves of data collection was implemented. This design makes it possible to explore longitudinal effects on skill acquisition and loss. It also significantly expands the background information available, enabling the identification of additional correlates of the key skills assessed in PIAAC.

The German PIAAC 2012 respondents that were successfully recruited for PIAAC-L were administered very varied questionnaires and also a cognitive assessment with PIAAC literacy and numeracy instruments as well as reading and mathematics instruments from the NEPS (National Education Panel Survey). In addition, the design included an extension to include the household by also addressing adults aged 18 years and above living in the same household as the targeted PIAAC anchor persons. We will present the PIAAC-L design, discuss some methodological issues, and give an overview of the wide variety of information to be found in the PIAAC-L data sets. Furthermore, we will reflect on some lessons learnt, especially with a view to inputting on the next cycle of PIAAC.

S1.4: Skills, non-cognitive dimensions and job complexity: A new framework for analysis from the "PIAAC Italy Survey".**Authors**

Fabio Roma, Michela Bastianelli (*National Agency for Active Labour Market Policies – ANPAL, Italy*), Simona Mineo (*National Institute for the Public Policies Analysis – INAPP, Italy*) & Orazio Giancola (*Sapienza University of Rome, Italy*)

Abstract

Background and research design: The presentation explains the origin, the purpose and the design of the "PIAAC - ITALY Survey", conducted by the Institute for the Development of Vocational Training for Workers (ISFOL) in 2014. The "PIAAC - ITALY Survey" is a continuation of the OECD PIAAC Survey but it is not merely a longitudinal study in the strict sense as the cognitive skills have not been measured again. The sample is representative at national level and it is composed by 2003 respondents interviewed from a panel of 4043 respondents (18-68 years old) that had participated to the OECD PIAAC Survey (2011-2012). The panel is based on the 4621 respondents of PIAAC-OECD study less those retired and disabled people. The questionnaire, administered in Computer-Aided Personal Interview format by the interviewer, is a revised version of the OECD PIAAC background questionnaire.

Aims: The presentation focuses on the results of the Job Requirements Approach Module ("JRA") adopted in the "PIAAC - ITALY Survey". This module represents an extended version of the JRA adopted by the OECD PIAAC Survey and includes 44 items relating to work activities required from the professional position. The objectives were: to go beyond the few, albeit crucial, OECD PIAAC skill domains and to strengthen the framework of the generic skills measured; to promote a validate self-report instrument for acted-out competences analysis; and to investigate the relationship between job requirements and other variables such as proficiency scores, non-cognitive skills and job complexity.

Results: Using the Principal Component Analysis the 44 items have been reduced to 26 and five main factors (job requirements) were extracted: 1) working with data, 2) problem solving and problem setting, 3) cooperation, 4) leadership, 5) physical work. Results show the five factors: display satisfactory reliability indices; have significant correlations with literacy and numeracy proficiency scores; are correlated with several non-cognitive dimensions and with job complexity. Conclusions: the JRA module can be considered a standardized and reliable instrument for measuring and analyzing skills at work and foundation skills are higher in people involved in more complex jobs.

Keywords: PIAAC, job requirements approach, non-cognitive dimensions, job complexity.

S1.5: Getting to know PIAAC respondents better: Polish follow-up study.

Author

Marta Palczyńska (*Educational Research Institute, Poland*)

Abstract

The Polish Follow-up Study on PIAAC (postPIAAC) involved a single-wave follow-up of PIAAC respondents after 3 years. The main objectives of the project were to gather longitudinal information on PIAAC respondents in Poland and to collect wider set of background information on participants not available in the international study. Additionally, it aimed at broadening the PIAAC analytical potential by including short assessments possibly related to literacy and numeracy. The important extension of the postPIAAC study is the inclusion of measures of noncognitive skills, the self-assessment of competences, short cognitive tests and a test of basic ICT skills. We will give an overview of the study design and present selected research results relevant for the next PIAAC cycle. The analysis shows that non-cognitive skills play an important role in determining meaningful life outcomes and are incremental to cognitive skills. The next important topic covered by the study are ICT skills. The basic ICT test included is an expansion of the PIAAC core ICT locator test. The additional items can be compared with self-reports on ICT use analogical to Eurostat indicators. This comparison suggests that individuals in Poland overstate the level of their ICT skills. Finally, the relationship between self-assessment of literacy and numeracy and their direct assessment will be shown. We conclude with several implications for the next cycle of PIAAC.

Symposium II

Wednesday, April 5th, 2017, 9:15 – 10:45

Symposium:

**Surveying migrant subpopulations:
Skills, surveying practices and recommendations for PIAAC****Chair**Débora B. Maehler (*GESIS – Leibniz-Institute for the Social Sciences, Germany*)**Room:** Richard Strauss**Abstract**

This symposium will address the issue of migration and integration in selected PIAAC countries. Many OECD countries have long been confronted with the task of integrating migrants. However, because of the somewhat unexpected extent of current migration flows, the integration task is an exceptional challenge. A central objective of PIAAC is obtaining information about the placement of adults in the labor market. For instance, migrant receiving countries are dealing with the recognition of qualifications of the immigrants, that were acquired in the countries of origin as well as the current qualification of potential immigrant workers. Therefore the first contribution compares the qualifications of immigrants in several PIAAC countries and the implications for the respective labor market integration (A. Perry). However, analyzing migration issues with PIAAC data could be restricted due to a limited number of cases in the sample with migration background. Thus the following contributions are directed on methodological issues when surveying the immigrant subpopulation in the case of two European countries with different integration policies: Austria and Germany. With regard to Germany on the one hand a nonresponse analysis will be presented, that investigates the coverage of the immigrant subpopulation, using German PIAAC data (S. Martin & D. Maehler). On the other hand challenges emerging as well as experiences from surveying particularly refugees will be discussed in general (J. Jacobsen & L. Pagel). In the last contribution an evaluation of experiences made with PIAAC in Austria, a country that put some effort into the inclusion of the migrant population, will be presented. It will further be discussed how comparability in addressing and covering migrants between the PIAAC participating countries in future cycles can be improved (M. Bönisch).

Presentations

- Title: Migrants in the OECD: Over-qualified but under-skilled? An international comparison of labor market integration.
Author: Anja Perry (*GESIS – Leibniz-Institute for the Social Sciences, Germany*)
- Title: The coverage of the immigrant subpopulation in PIAAC Germany: Experiences from PIAAC.
Authors: Silke Martin & Débora B. Maehler (*GESIS – Leibniz-Institute for the Social Sciences, Germany*)
- Title: Surveying the refugee population in Germany – Experiences from the IAB-BAMF-SOEP Refugee Sample.
Authors: Jannes Jacobsen & Lisa Pagel (*German Institut for Economic Research (DIW), Germany*)
- Title: The coverage of migrants in PIAAC Austria – International standards and national practices.
Author: Markus Bönisch (*Statistics Austria, Austria*)

S2.1: Migrants in the OECD: Over-qualified but under-skilled? An international comparison of labor market integration.**Author**

Anja Perry (*GESIS – Leibniz-Institute for the Social Sciences, Germany*)

Abstract

Participation in the labor market is an important aspect of immigrants' successful integration. Previous research on this topic particularly focuses on education mismatch (e.g., Piracha & Vadean, 2012; Dustmann & Glitz, 2011) and on the selection into certain professions (Peri 2008a, 2008b). Reasons for mismatch among immigrants can be imperfect transferability and signaling of skills (Chiswick & Miller, 2007, 2009). However, over-education does not necessarily imply that someone is over-skilled and vice versa (Allen & van der Velden, 2001). Reasons for the selection into certain professions are comparative advantages in certain skills compared to natives (Peri 2008a, 2008b). In this paper we bring these two research branches together and investigate the occurrence of immigrants' and natives' education mismatch in different professions. We also add the dimension of skill mismatch when examining the employment fit of immigrants and natives (Perry, Wiederhold, Ackermann-Piek, 2014; Allen, Levels, and van der Velden, 2013). In a second step the impact of the selection into professions, qualification mismatch, and skill mismatch on immigrants' and natives' earnings will be addressed. We use the most recent data on basic skills of the working-age population (24 to 54 years) provided by the Programme for the International Assessment of Adult Competencies (PIAAC 2012) and compare education and literacy mismatch of first generation immigrants and natives in manual and quantitative jobs in 12 OECD countries with a share of at least 10 % first generation immigrants in the PIAAC sample. Interestingly, we find that, while immigrant workers are typically more often over-qualified than natives (Piracha & Vadean, 2012), they are also more often under-skilled. Immigrant workers that are under-skilled typically receive a higher wage premium (Allen & van der Velden, 2001) than native workers that are under-skilled, suggesting that these immigrants are compensated for skills that go beyond their literacy skills in the language of their host country.

S2.2: The coverage of the immigrant subpopulation in PIAAC Germany: Experiences from PIAAC.**Authors**

Silke Martin & Débora B. Maehler (*GESIS – Leibniz-Institute for the Social Sciences, Germany*)

Abstract

European countries, and especially Germany, are currently very much affected by human migration flows, with the result that the task of integration has become a challenge. Only very little empirical evidence on topics such as labor market participation and processes of social integration of migrant subpopulations is available from large-scale social surveys to date. The present paper provides an overview of the representation of the migrant population in the German PIAAC sample and evaluates reasons for the under-coverage of this population. We examine outcome rates and reasons for nonresponse among the migrant population based on sampling frame data, and we also examine paradata from the interviewers' contact protocols to evaluate time patterns for the successful contacting of migrants. The results show that the overall outcome rates were lower for migrants than for non-migrants. Migrants and non-migrants differed in their response behavior, particularly due to address- and literacy-related reasons. In addition the results revealed, that contact attempts were most successful in the evening and are lower in school holiday time. In conclusion language is a barrier to contact and participation of migrants in PIAAC, so that e.g. translation of the background questionnaire seems reasonable. Further implications of the results will be discussed regarding future PIAAC cycles.

S2.3: Surveying the refugee population in Germany – Experiences from the IAB-BAMF-SOEP Refugee Sample.**Authors**

Jannes Jacobsen & Lisa Pagel (*German Institut for Economic Research (DIW), Germany*)

Abstract

With the past and ongoing influx of refugees to Europe, conducting empirical data is most valuable. However, compared to surveys in a non-migrant population we have to bear in mind that new challenges emerge. Especially with face-to-face interviewing we need to develop new concepts in order to overcome language barriers or cultural misunderstandings. The German IAB-BAMF-SOEP Refugee Survey is a representative longitudinal study of more than 4,500 individuals in Germany. The sample has been drawn from the Central Register of Foreign Nationals and consists of refugees who entered Germany between January 1, 2013, and January 31, 2016, and applied for asylum (regardless of their current legal status). The questionnaire as well as an ultra-short test for cognitive abilities was made available in seven languages: Arabic, Northern Kurdish, Persian, Urdu, Pashto, German, and English. To ensure that people unable to read well are able to participate in the survey, the institute that conducted the survey developed innovative audio-visual survey instruments, making the questionnaire available both in written and verbal form. Moreover, interpreters were available to provide support as required. Besides giving inside into these instruments we will present first findings on how well the instruments worked and how they can be integrated in research with migrant populations.

S2.4: The coverage of migrants in PIAAC Austria – International standards and national practices.**Author**

Markus Bönisch (*Statistics Austria, Austria*)

Abstract

The coverage of migrants in surveys is getting more and more important, because empirical evidence about language skills and economic and social participation is crucial to deal with integration issues. This is particularly true for large scale assessments as PIAAC. In order to obtain high quality data and to ensure comparability between the participating countries, the international PIAAC Consortium produced an elaborate set of standards and guidelines for almost all aspects of the national implementation – to a certain extent also in regard to the coverage of migrants. In Austria, a comprehensive set of procedures was put in place for the PIAAC fieldwork to cover migrants. The following fieldwork procedures will be discussed: - Sampling and weighting; - Translation of survey material and background questionnaire; - Contact strategies; • Respondents motivation and incentives; - Non Response follow up measures. The paper will talk about PIAAC and its methodological background, describe key fieldwork measures related to the coverage of migrants in Austria and discuss how specific measures relate to international data collection standards. Reflecting on the experience in Austria and on the documentations of other participating countries, the conclusions will discuss still open issues regarding data quality in cross-national surveys (translation, exclusions, sampling/weighting) with the focus on the coverage of migrants.

Symposium III

Wednesday, April 5th, 2017, 9:15 – 10:45

Symposium:

The economics of skills

Chair

Ludger Wößmann (*Ifo Institute and University of Munich, Germany*)

Room: Joseph Haydn

Abstract

PIAAC provides the unique opportunity to study both the consequences and the determinants of economically relevant skills. This session will combine two papers from both streams of analysis to shed new light on the economics of skills. On the one hand, two studies analyze how skills are demanded in permanent and temporary jobs and how ICT skills affect workers' earnings on the labor market. On the other hand, two studies analyze how school systems affect adult skills as measured in PIAAC – one focusing on the effects of central school exams, the other on the quality of compulsory schooling as measured in PISA. Together, the four studies help to deepen our understanding of economic consequences and determinants of adult skills.

Presentations

- Title: Permanent jobs, employment protection and job content.
Author: Lawrence M. Kahn (*Cornell University, USA*)
- Title: Returns to ICT skills.
Authors: Simon Wiederhold, Oliver Falck & Alexandra Heimisch (*University Eichstaett-Ingolstadt and Ifo Institute Munich, Germany*)
- Title: Central school exams and adult skills: Evidence from PIAAC.
Authors: Guido Schwerdt, Lisa Leschnig & Katarina Zigova (*University of Konstanz, Germany*)
- Title: Lasting effects of quality of schooling revealed by combining PIAAC and PISA at country level.
Author: Jan-Eric Gustafsson (*University of Gothenburg, Sweden*)

S3.1: Permanent jobs, employment protection and job content.**Author**

Lawrence M. Kahn (*Cornell University, USA*)

Abstract

Using Programme for the International Assessment of Adult Competencies (PIAAC) data for 21 countries, I study the impact of employment protection laws (EPL) on job content. Economic theories predict that stricter protection increases workers' willingness to make firm-specific investments. These theories also predict that stricter protection leads firms to raise their hiring and promotion standards for permanent jobs. Both of these mechanisms predict higher levels of job content in permanent than in temporary jobs; further, it is predicted that stricter EPL increases the gap in job content between permanent and temporary jobs due both to workers' investments and firm hiring standards. I found support for both sets of predictions. First, in almost all cases, workers' self-reported use of influence, reading, writing, planning, numeracy and ICT skills, and their task discretion, were higher in permanent than in temporary jobs. Second, stricter EPL raised the gap in job content for influence, reading, writing and planning skills used in permanent jobs vs. temporary jobs, controlling for industry, occupation and human capital. This finding suggests that workers are making firm-specific (or perhaps occupation- or industry- specific) investments that raise their productivity levels and thus warrant higher level job content. These effects became larger when I did not control for industry, occupation, government employment, and human capital variables including schooling, actual labor market experience, cognitive test scores and nativity status. The larger effects of EPL without these controls provide some indirect support for the idea that EPL leads firms to raise their hiring standards.

S3.2: Returns to ICT skills.**Authors**

Simon Wiederhold, Oliver Falck & Alexandra Heimisch (*University Eichstaett-Ingolstadt, Ifo Institute Munich, Germany*)

Abstract

How important is mastering information and communication technology (ICT) in modern labor markets? We answer this question with unique data on ICT skills tested in 19 countries. Our two instrumental-variable models exploit technologically induced variation in broadband Internet availability that gives rise to variation in ICT skills across countries and German municipalities. We find that a one-standard-deviation increase in ICT skills raises earnings by about 25 percent. Exogenous broadband availability cannot explain numeracy or literacy skills, suggesting that estimated returns are unaffected by general ability. One mechanism driving positive returns is selection into occupations with high abstract task content.

S3.3: Central school exams and adult skills: Evidence from PIAAC.**Authors**

Guido Schwerdt, Lisa Leschnig & Katarina Zigova (*University of Konstanz, Germany*)

Abstract

Centralized exit exams are often hypothesized to favorably affect incentive structures in schools. While previous research indeed provides evidence on positive effects of centralized exams on test scores of students, critics warn that this finding may simply reflect differences in students' test-taking ability, rather than actual differences in knowledge and skills. If that were so, central exams would not genuinely improve human capital that affects productive skills of adults. Indeed, the existing evidence on the relationship between central exams and labor market outcomes is at best mixed.

We provide first direct evidence on the relationship between the type of exit examination at the end of secondary school and skills of adults based on PIAAC. The PIAAC data allows a comprehensive analysis of the relationship between central exams and cognitive skills as well as labor market outcomes. We supplement the PIAAC data with specifically collected data on the type of exit examinations for 31 participating countries in PIAAC over the last 50 years. This allows us to study the potential impact of central exams on adult skills by exploiting the cross-country and within-country variation in exam types over time.

Our findings suggest a substantial positive effect of central exit exams on adult skills. Conditional on covariates, individuals in education systems with centralized exams at the end of high school are associated with more than 20 percent of a standard deviation in higher skills during adulthood. Taking unobserved country variation into account, graduates in central exam regimes still significantly outperform graduates of schools using local exams by more than 6 percent of a standard deviation. Our results are robust to a large set of alternative specifications and robustness checks. In particular, by exploiting variation in exam types across German federal states, we document that central exam effects of a similar magnitude exist within a single country. In sum, our findings support the hypothesis that centralized exit exams have long term productivity-enhancing effects.

S3.4: Lasting effects of quality of schooling revealed by combining PIAAC and PISA at country level.**Author**

Jan-Eric Gustafsson (*University of Gothenburg, Sweden*)

Abstract

Differences in level of performance on cognitive tasks between different age cohorts may be due to age effects, such as maturation or decay. However, they may also be due to cohort-effects, implying that persons belonging to a certain age-group have experienced common influences conducive to performance, such as better nutrition, less environmental pollution, improved mass media, more education, or better education. The main aim of the study was to investigate to what extent quality of compulsory schooling is reflected in performance differences between age-cohorts.

Data for 20 countries participating both in the five rounds of the PISA survey between 2000 and 2012 and in the cross-sectional PIAAC survey of adult skills conducted in 2012 were analyzed. The idea was that trends in levels of achievement at age 15 can be estimated with the PISA survey and that these trends may be reflected in the PIAAC data as differences in level of performance between younger and older age groups.

For each country the PISA data was used to estimate linear achievement trends for literacy and numeracy across the five PISA rounds to indicate change in quality of schooling. For the PIAAC data mean differences were computed between a younger (16 – 19 years) and an older (25 – 29 years) age group. The regression coefficients indicating country-level change in PISA performance were then related to the PIAAC performance differences between age groups with scatter plots and regression analysis. Results showed that age-group performance differences were strongly and significantly related to the PISA achievement trends ($r = .70$). Furthermore, the relations held up when controls were introduced for level of education attained ($\beta = .55$) and for general social and cultural development of the country ($\beta = .48$). It is concluded that quality of schooling has lasting impact on adult literacy and numeracy performance levels, and it is also observed that the results provide a validation both of the PISA and the PIAAC studies.

Symposium IV

Wednesday, April 5th, 2017, 11:00 – 12:30

Symposium:

Competence measures and general mental ability

Chairs

Frank Goldhammer (*German Institute for International Educational Research (DIPF), Germany*)
& Claus H. Carstensen (*Leibniz Institute for Educational Trajectories, Germany*)

Room: Beethoven-Saal 1

Abstract

PIAAC assesses adult competencies in the domains of literacy, numeracy and problem solving in technology-rich environments. This symposium addresses these competencies both from a measurement perspective and a substantive point of view. Specifically, the presented research work investigates the validity of test score interpretation, that is, whether the assumption that PIAAC test scores reflect individual differences in competencies can be justified. Furthermore, methodological challenges in modelling longitudinal data from PIAAC-L are addressed, and the role of competencies in developing romantic relationships. The symposium starts with the presentation by Engelhardt et al. who address the fundamental question of whether the competence measures in PIAAC actually measure more than general cognitive ability. For this, the dimensional structure of literacy, numeracy and reasoning items as well as differences in the convergent evidence of educational variables with these constructs have been investigated. The second presentation by Goldhammer et al. is about test-taking disengagement in PIAAC which potentially affects the validity of test score interpretations if test-takers differ in their willingness to engage into task completion. Specifically, determinants of test-taking disengagement measured by means of response times are investigated at person (e.g., competence) and item level (e.g., difficulty). The next presentation by Gaasch et al. investigates whether adult competencies as assessed in PIAAC and PIAAC-L change over three years. From a technical point of view, this research addresses the question of how to include a huge amount of background variables into the estimation of plausible values. Three different approaches for selecting background variables are proposed and compared. Finally, the presentation by Blossfeld et al. addresses the competence match (i.e., homophily) of romantic couples using PIAAC-L data to shed light on social closure and social inequalities. Amongst others, partners are compared regarding their formal education, the duration of their partnership, and age differences. Thus, the symposium will present various research work on PIAAC competence measures with data from PIAAC and PIAAC-L. Thereby, it will demonstrate the great analytical potential of the data from these studies.

Presentations

- Title: Levels of education and age: Are they differently predictive for PIAAC competencies and general cognitive ability?
Authors: Lena Engelhardt & Frank Goldhammer (*German Institute for International Educational Research (DIPF) and Centre for International Student Assessment (ZIB), Germany*)
- Title: Effects of person and item characteristics on test-taking engagement in PIAAC.
Authors: Frank Goldhammer (*German Institute for International Educational Research (DIPF) and Centre for International Student Assessment (ZIB), Germany*), Thomas Martens (*Hamburg Medical School, Germany*) & Oliver Lüdtke (*IPN – Leibniz Institute for Science and Mathematics Education and Centre for International Student Assessment (ZIB), Germany*)
- Title: The PIAAC-Longitudinal study in Germany – do adult competencies change over three years of time?
Authors: Christoph Gaasch, Sebastian Prechsl & Claus H. Carstensen (*Leibniz Institute for Educational Trajectories, Germany*)
- Title: Competence homophily among couples.
Authors: Gwendolin Blossfeld & Sebastian Prechsl (*Leibniz Institute for Educational Trajectories, Germany*)

S4.1: Levels of education and age: Are they differently predictive for PIAAC competencies and general cognitive ability?

Authors

Lena Engelhardt & Frank Goldhammer (*German Institute for International Educational Research (DIPF) and Centre for International Student Assessment (ZIB), Germany*)

Abstract

Competence tests like Literacy and Numeracy in PIAAC are intended to assess, beyond general cognitive ability, also the outcomes of learning processes (OECD, 2016). The goal of this study is to continue previous research on whether competence tests measure something different than general cognitive ability, which was done before for student populations in PISA and TOSCA by dimensionality analyses (e.g. Baumert, Lüdtke, Trautwein, & Brunner, 2009).

We focus on an adult population from the PIAAC study, which allows investigating the relation of education level and age to competence test performance. Since competence tests should measure aspects resulting from education, we expect that the education level predicts success in competence tests stronger than in tests that measure general cognitive ability (Hypothesis 1). Based on the assumption that fluid intelligence declines with age compared to abilities resulting from learning experiences, like crystallized intelligence (Horn & Cattell, 1967), we expect that age predicts success in a test measuring general cognitive ability more negatively than in competence tests (Hypothesis 2).

A longitudinal German subsample (N = 857) of PIAAC 2012 completed in 2016 a number series test (McArdle & Woodcock, 2009), which serves as a measure for general cognitive ability. For data analyses, a three-dimensional generalized linear mixed model was used with random effects for person abilities across domains (one-tailed tests). The effects of education level (1 = low, 2 = medium, 3 = high) differed for Numeracy positively from the number series test (Level 2: $\hat{\beta} = 0.59$, $p < .001$, Level 3: $\hat{\beta} = 0.41$, $p = .016$) but not for Literacy (Level 2: $\hat{\beta} = 0.29$, $p = .069$, Level 3: $\hat{\beta} = 0.05$, $p = .404$). Age differed positively (and was less negative) for both competence tests (Numeracy: $\hat{\beta} = 0.16$, $p = .004$; Literacy $\hat{\beta} = 0.12$, $p = .036$) from the number series test. Results support, that competence tests were less affected by age and success in Numeracy depended more on education level. One explanation why this held not for Literacy could be that Literacy depends also on current skill use, which should be included in further analyses.

S4.2: Effects of person and item characteristics on test-taking engagement in PIAAC.

Authors

Frank Goldhammer (*German Institute for International Educational Research (DIPF) and Centre for International Student Assessment (ZIB), Germany*), Thomas Martens (*Hamburg Medical School, Germany*) & Oliver Lüdtke (*IPN – Leibniz Institute for Science and Mathematics Education and Centre for International Student Assessment (ZIB), Germany*)

Abstract

A potential problem of low-stake large-scale assessments such as the Programme for the International Assessment of Adult Competencies (PIAAC) is low test-taking engagement. If test takers are not motivated to show what they know and can do, the validity of inferences based on test scores is threatened. To better understand conditions of test-taking disengagement the present study pursued two goals: First, a model-based approach was used to investigate whether item indicators of disengagement constitute a latent person variable by assessment domain. Second, the effect of person and item characteristics on

disengagement was jointly tested using explanatory item response models. The analyses were based on the Canadian sample of PIAAC round one with $N = 26\,683$ participants completing test items in the domains of literacy, numeracy, and problems solving. Binary item disengagement indicators were defined by means of response time thresholds. The results show that disengagement indicators define a latent dimension by domain. Disengagement increased with lower educational attainment, lower cognitive skills, and if the test language is not the native language. Gender did not show any effect and age only a positive one for problem solving. Item position was positively related to disengagement as was item difficulty. The latter effect was negatively moderated by cognitive skill suggesting that especially poor test takers rush through more difficult items.

S4.3: The PIAAC-Longitudinal study in Germany – do adult competencies change over three years of time?

Authors

Christoph Gaasch, Sebastian Prechsl & Claus H. Carstensen (*Leibniz Institute for Educational Trajectories, Germany*)

Abstract

In the national study PIAAC-L the participants of the German PIAAC sample were followed up with three further waves of data collection. The data comprises new information in terms of additional background variables, additional participants (partners and household members of the PIAAC participants) and additional competency assessments including a repeated measurement of the PIAAC competence tests.

Plausible values, which are provided to the user via the corresponding scientific use files, represent the state of the art to perform analyses with large scale assessment competency data. However, given the number of available background variables in PIAAC-L resulting from four waves of data collection, the number of model parameters gets too large to obtain reliable estimates. Thus, a reduced number of background variables has to be selected to estimate plausible values. This selection is made either through theoretical considerations or statistical criteria. For instance, principal components can be extracted from the total set of background variables to achieve a dimensionality reduction in the population model. Using PIAAC-L data, we examine different specifications of the population model: i) a covariate set as large as feasible, ii) a reduced covariate set by principal components and iii) a reduced covariate set by theoretical considerations. We compare the results of these specifications with regard to the change in competencies over time in German adults and particular sub populations of adults.

S4.4: Competence homophily among couples.**Authors**

Gwendolin Blossfeld & **Sebastian Prechsl** (*Leibniz Institute for Educational Trajectories, Germany*)

Abstract

In the course of globalization and modernization, the complexity of requirements of individuals and societies has changed dramatically. In this context, education gains in importance both as capital and as an asset of individuals. In addition to formal education certificates, skills gain in relevance for individuals since they have an impact on their successful working life, their social participation as well as their partner choice and family decisions. The question of "Who enters into a (romantic) union with whom?" is central to our understanding of the reproduction of social inequality in modern societies. Rates of homophily within a society reflect the degree to which individuals with specific characteristics (e.g. age, education, religion, race, ethnicity, occupation) bond with each other. For two reasons, this is of great sociological interest: (1) it is an indicator of social closure in a society; and (2) homophily leads to an accumulation of advantageous and disadvantageous conditions within couples and, therefore, intensifies social inequalities between families. Research has shown that, even though partner selection is a formally free choice in modern societies, individuals prefer to choose a partner who is similar to themselves with regard to certain characteristics e.g. educational attainment.

Due to data restrictions, research on educational homophily has only focused on formal certificates so far. Though formal education is seen as a key factor for the development of skills, it has been shown that competencies of adults do not always match their formal education level. Hence, there is a mismatch between formal education levels and key competencies when we study adults. This contribution aims to analyze cross-sectionally the competence homophily among couples using data from the Program for the Assessment of Adult Competencies – Longitudinal (PIAAC-L) Wave 2. The data allows us to study the competence match among partners with regard to their formal education, the duration of their partnership, age differences among partners, their partnership status (cohabiting or married) as well as the existence of (and if so age of) children.

Symposium V

Wednesday, April 5th, 2017, 11:00 – 12:30

Symposium:

Adult reading and numeracy skills and practices

Chair

Anke Grotlüschen (*Hamburg University, Germany*)

Room: Joseph Haydn

Abstract

The symposium aims at a better understanding of adult reading and numeracy competences as well as the related practices. Even at low performance levels, literacy and numeracy practices are relevant (Grotlüschen, Mallows, Reder, & Sabatini, 2016). But while the "New Literacy Studies" lead to qualitative studies (Thériault, 2016, Euringer, 2016), it has seldom been addressed to large scale assessments. However, PIAAC allows study skills uses which can be understood as practices. This symposium focuses adults with low literacy competences. New results indicate, an increase of competences can not only take place via non-formal learning but also informally, with literacy supporters (Buddeberg, 2015) or mediators (Theriatult 2016) in a literate environment (Mallows & Litster, 2016). Longitudinal studies show how practices improve while competences stay at the same level for a long time (Reder, 2011). Earlier research also states that numeracy practices often are not understood as having something to do with mathematics anymore (Lave, 1988). This asks for more attention on practices and environment when searching for adequate support strategies for adults.

Presentations

- Title: Skill use. Engagement in reading, writing and numeracy practices.
Author: Stephen Reder (*Portland State University, USA*)
- Title: Numeracy skills, numeracy skills use and numerate environment.
Author: Jeff Evans (*Middlesex University, United Kingdom*)
- Title: A better understanding of adults with lower literacy skills – use of reading components and skill use data.
Authors: Britta Gauly (*GESIS – Leibniz-Institute for the Social Sciences, Germany*) & Barbara Nienkemper (*Hamburg University, Germany*)
- Title: German adult literacy level one survey 2017/18: Concept and methodological approach.
Authors: Klaus Buddeberg, Caroline Euringer & Anke Grotlüschen (*Hamburg University, Germany*)

S5.1: Skill use. Engagement in reading, writing and numeracy practices.**Author**

Stephen Reder (*Portland State University, USA*)

Abstract

Although proponents of the social practices approach have offered strong critiques of the interpretive and policy frameworks that rely on standardised test scores alone (e.g. Barton & Hamilton, 2003), alternatives have not been proposed that are practical for use on a large scale. Initial analyses of ALLS data about skill use in the workplace (Desjardins and Rubenson, 2011) and in PIAAC (OECD, 2013) demonstrate how useful skill use data can be in the context of large-scale assessments. Analyses of the skill use data in both surveys showed substantially increased earnings for workers at higher levels of skill use. In the case of their more in-depth analyses of ALLS, Desjardins and Rubenson (2011) estimated 32%, 20% and 10% increased earnings for high levels of reading, writing and numeracy skill use at work, respectively, compared to low levels of skill use after controlling for proficiencies, demographics, education, work experience, occupation and industry. With the more sophisticated measurement of skill use now available in the Survey of Adult Skills, more comprehensive understandings of the relationship between skill use proficiency and a range of social and economic variables become possible. The potential impact of skill use, of course, is not limited to economic outcomes. OECD (2013) estimated the likelihood of positive social outcomes of adults with high levels of literacy proficiency (Level 4 or 5) compared with adults with low literacy proficiency (at or below Level 1). For each of these outcomes, individuals with high levels of assessed literacy proficiency were more likely to have positive social outcomes, even after controlling for demographic and educational attainment variables. Neither of these analyses looked closely at the role played by skill use in social outcomes as we will do in this presentation, especially by comparing the importance of practices in the U.S. general population and the U.S. incarcerated population (PIAAC data for the latter to be released in November): a case of practice-constrained development.

S5.2: Numeracy skills, numeracy skills use and numerate environment.**Author**

Jeff Evans (*Middlesex University, United Kingdom*)

Abstract

In the UK Country Note (OECD, 2013), one of the headlines is that "There are particularly large proportions of adults in England and Northern Ireland with poor numeracy skills" (p1). (This confirmed a finding in the UK Skills for Life survey, done in 2011 (BIS, 2012).) Fortunately the survey provides a wealth of variables that may offer at least a partial explanation. Some of these variables are (relatively fixed) socio-demographic characteristics, but others appear to be more amenable to policy responses or to social interventions. Evans et al. discussed what they called the 'numerate environment' (NE), following the EU High Level Group on Literacy's (2012) discussion of the 'literate environment', and the way that the NE might provide 'affordances' for the development of numeracy in numerate practices used by adult citizens both at work and in the wider culture. For them, these affordances would include opportunities to use numeracy, supports for doing so, and indeed demands for doing so (in particular, at work; cf. OECD's comment on French PIAAC results (2013). This work suggests considering explanations which focus on the numeracy practices in which adults are engaged (Reder, 2009). The PIAAC Background Questionnaire Provides questions on the frequency with which the adult respondent participates in six numeracy (or mathematical) practices, at work and in everyday life. Results will be presented of empirical analysis relevant to the concepts of numeracy practices, and the numerate environment.

S5.3: A better understanding of adults with lower literacy skills – use of reading components and skill use data.**Authors**

Britta Gaulty (*GESIS – Leibniz-Institute for the Social Sciences, Germany*) & Barbara Nienkemper (*Hamburg University, Germany*)

Abstract

The present work discusses two approaches to gain a better understanding of the German adult population with lower literacy skills.

The first approach draws on data from the paper-based reading component assessment that was implemented in PIAAC 2012. It was intended to give a more detailed picture on the skills of adults with very low reading proficiency and comprises three dimensions of basic reading skills: print vocabulary, sentence processing and passage comprehension (Sabatini, 2015). Not only is the percentage of correct responses measured, but also the time taken by respondents to complete the tasks. Using this information, we suggest that four groups of readers can be differentiated for further analyses: efficient readers, readers with some difficulties, speed-accuracy-trade-offs and readers with severe difficulties. A major limitation regarding this approach is the fact that the sample is not representative for the population of adults with lower literacy skills and difficulties in the routing procedure led to the inclusion of adults with higher literacy skills. The second research approach makes use of an understanding of literacy as a 'social practice' (Barton & Hamilton, 2012) and focuses primarily on the PIAAC skill use data. A subset of 'skill use variables' was chosen: the use of literacy, numeracy and ICT at work as well as in everyday life. For the purpose of differentiating subgroups by their skill use, a latent class analysis (LCA) was carried out. LCA is a statistical procedure by which individuals are organised into groups, based on their response patterns. As a result of this LCA procedure, three groups can be distinguished in terms of the frequency that they use selected skill-related activities: Surprisingly, the individual literacy level does not clearly predict the group membership. Two out of the three groups contain a significant number of adults with lower literacy skills. A further interesting result is that participants in one of the groups seem to compensate for the few chances they have to use their skills at work by using them more often in their everyday life. Those results contribute to a more differentiated picture of adults with lower literacy skills.

S5.4: German adult literacy level one survey 2017/18: Concept and methodological approach.**Authors**

Klaus Buddeberg, Caroline Euringer & Anke Grotlüschen (*Hamburg University, Germany*)

Abstract

The German Level One Survey (LEO, Grotlüschen & Riekmann, 2011) provides data on adult literacy with a differentiated focus on the lowest level. In this contribution we will discuss the concept and methodological design of the second LEO survey 2017/18 which won't be a mere replication of the first one. First of all, the data won't be limited to reading and writing but will consider a broader concept of adult basic education. Grotlüschen and Euringer show, that German policy makers do not longer limit adult basic education to reading and writing skills but also take into consideration further content and skills, e.g. health literacy, digital literacy, political literacy, financial literacy (Euringer, 2016; Grotlüschen, 2016).

Secondly, there will be a stronger emphasis on skill use in everyday life and work. While the New Literacy Studies have coined a theoretical approach to literacy as social practice (Hamilton et al., 2015), the PIAAC study took a first step in implementing background questions about skill use within the context of large scale assessment (OECD, 2013). LEO 2017/18 will gather information on further basic skills, their use in everyday life and at the workplace as well as their relevance for social participation and inclusion. Therefore, the literacy scale (Alpha-Levels) is complemented by an enlarged background questionnaire. This contribution will focus on the innovative aspects of the second leo.-survey 2017/18. Methodological issues concerning the development of background questions regarding skill use, participation and social inclusion are going to be addressed.

Symposium VI

Wednesday, April 5th, 2017, 11:00 – 12:30

Symposium:

Overeducation and skill mismatch in labor markets

Chair

Paula Protsch (*WZB - Berlin Social Science Center, Germany*)

Room: Richard Strauss

Abstract

Educational and skill mismatch can be seen as major challenges of modern labor markets. While educational mismatch refers to discrepancies in formal qualifications, skill mismatch concerns the actual skills possessed by the worker and required by the job. The symposium will present new insights into both types of labor market mismatch and will open the floor for an indepth discussion of substantial and methodological issues. Vocational in contrast to general education is assumed to facilitate the matching of non-tertiary educated individuals to jobs in entry labor markets. But what about careers in the longer run? Buisman, Levels, and van der Velden's analysis based on cross-sectional PIAAC 2011/12 data for 24 countries suggests that general skills are important for employment chances across the birth cohorts. Thus, vocational education might prevent early mismatches but general skills seem to be a more flexible asset throughout the life course. To actually measure mismatch is a complex and bias-prone endeavor. Perry exemplifies this in her presentation on skill-mismatch self-reports. Since self-reports are easily implementable in surveys, PIAAC-related research would benefit strongly from a valid and robust measure. Perry discusses how her newly developed instruments perform in comparison to other self-reports. Measuring overeducation – educational mismatch in the sense of being higher qualified than one's job requires – is not trivial either as Lind and Larsson emphasize in their contribution. Using register variables linked to the Nordic PIAAC-database and thus longitudinal data, they show that being overeducated (measured by the Job Analysis approach) is a rather persistent state, particularly for older workers. Their analysis indicates that initial differences in basic skills cannot explain who becomes overeducated in Denmark, Finland, and Sweden. By contrast, using cross-sectional PIAAC data for 16 European countries, Borgna, Solga, and Protsch, find that among prime-age workers at same levels of education, lower basic skills are related to (self-assessed) overeducation. Skill heterogeneity, however, does not explain the observed cross-country differences. Their findings suggest that supply and demand side behavior and consequently overeducation rates are not only affected by the different institutional contexts but also the respective economic conditions, especially in times of economic downturn.

Presentations

- Title: Should we teach general skills in vocational education? Evidence from 24 developed countries.
Authors: Marieke Buisman (*University of Amsterdam, Netherlands*), Mark Levels (*ROA, Maastricht University, Netherlands*) & Rolf van der Velden (*ROA, Maastricht University, Netherlands*)
- Title: Developing a subjective skill mismatch measure for PIAAC.
Author: Anja Perry (*GESIS – Leibniz-Institute for the Social Sciences, Germany*)
- Title: Educational attainment, overeducation and basic skills in the Nordic countries.
Authors: Patrik Lind (*IFAU – The Institute for Evaluation of Labour Market and Education Policy, Sweden*) & Ann-Charlott Larsson (*Statistics Sweden, Sweden*)
- Title: Overeducation, labor market dynamics, and economic downturn in Europe.
Authors: Camilla Borgna, Heike Solga & Paula Protsch (*WZB – Berlin Social Science Center, Germany*)

S6.1: Should we teach general skills in vocational education? Evidence from 24 developed countries.**Authors**

Marieke Buisman (*University of Amsterdam, Netherlands*), Mark Levels (*ROA, Maastricht University, Netherlands*) & Rolf van der Velden (*ROA, Maastricht University, Netherlands*)

Abstract

Whether secondary vocational education should primarily teach occupationally specific skills or should also aim at providing pupils with general skills is still a hotly debated question. Recent research suggests that in many countries, vocationally educated graduates from non-tertiary education experience higher quality school-to-work transitions than their generally educated peers, suggesting that occupationally specific skills are key in quickly finding and keeping well-matching jobs. However, evidence strongly suggests that early career education-to-job matching may come at a price. The relatively high returns to vocational education in the early career peter out during the career, and in the long run, generally educated workers appear to be better off. This regularity has been explained by assuming that the lack of general skills makes vocationally educated less flexible on the labor market, which would hamper their ability to find jobs outside of their field or at a different education level if they are unemployed.

Although these assumptions are plausible they have not been tested yet. In this paper, we use adult literacy data from the Programme for the International Assessment of Adult Competencies [PIAAC] to explore the relationship between general skills and labor market success of 20-65 year old (potential) workers from 24 developed countries with advanced economies. Focusing on people who completed education at ISCED levels 3 or 4, we assess the differential role of general skills in predicting employment chances and earnings for generally and vocationally educated workers from different birth cohorts. Preliminary results indicate that general skills contribute in important ways to the productivity of vocationally trained workers of all cohorts. Findings have major implications for curriculum design of vocational education systems. Ideally, they should not just aim at teaching occupationally specific skills that enable quick education-to-job matches, but also strive to inculcate general skills that help workers to remain employable and productive later in their careers.

S6.2: Developing a subjective skill mismatch measure for PIAAC.**Author**

Anja Perry (*GESIS – Leibniz-Institute for the Social Sciences, Germany*)

Abstract

There are essentially two ways to measure skill mismatch: self-reported (subjective) and direct (objective) measures of skill mismatch (see Flisi et al., 2015; and Perry, Wiederhold & Ackermann-Piek, 2014). Skill mismatch self-reports are most often used to measure skill mismatch. Although, compared to objective measures, they are prone to biases (Hartog, 2000); they have the advantage of being easily implementable in a survey; thus, up-to-date information on skill mismatch can be obtained.

Also in the Programme for the International Assessment of Adult Competencies (PIAAC), a skill mismatch self-report was implemented. It is based on a set of two questions and is used by the OECD to derive an objective measure (OECD, 2013; Pellizzari & Fichen, 2013). However, this subjective measure does not provide valid results. For example, only about 6 % of the workers in the participating countries are well-matched according to this self-report. Furthermore, the combination of both questions leads to four categories, one of them being

"over-skilled as well as under-skilled" which makes the interpretation of resulting data unclear. But also alternative measures in other studies lead to differing results. The percentages of underskilled workers range between 4 and 13 % and that of over-skilled workers between 30 and 59 % across the different surveys. The shares of self-reported over-skilled workers are typically higher than that of under-skilled workers which can be a result of a social desirability bias, leading respondents to overstate their skills. An important goal should be the development of a skill mismatch measure that minimizes potential biases such as the social desirability bias. The aim of this presentation is to describe the steps towards developing a valid and robust skill mismatch self-report. New questions are tested against previously used self-reports by implementing them in the German Internet Panel (GIP, Blom, Gathmann & Krieger, 2015). The results of this test will be presented and critically evaluated.

S6.3: Educational attainment, overeducation and basic skills in the Nordic countries.

Authors

Patrik Lind (*IFAU – The Institute for Evaluation of Labour Market and Education Policy, Sweden*) & Ann-Charlott Larsson (*Statistics Sweden, Sweden*)

Abstract

Using direct measures of skills together with the time dimension available through register data in the Nordic PIAAC-database we analyze flows out of overeducation and skill-differences between those who are categorized as over-educated and well-matched individuals. The Nordic PIAAC-database consists of the national PIAAC files for Denmark, Estonia, Finland, Norway, and Sweden, together with a set of register variables on e.g. family background, employment status, and education from each country's national administrative registers. The register information covers the year of the PIAAC survey (2011) as well as 2008. Due to partly missing data, only Denmark, Finland, and Sweden can be included in our main analyses. We are able to compare three commonly used measures of overeducation: Self-assessment (SA), Job Analysis (JA; based on the ISCO occupational skill levels and their associated, usually required, educational level), and Realized Matches (RM; required educational level defined as the occupational average). The three measures differ in levels, but not in patterns. We cannot tell which measure gives the more accurate incidence of overeducation. To use the time-dimension available through register data, the only feasible measure is JA. According to JA, overeducation seems to be a persistent state for many individuals, at least in the medium-run. Barely half of those aged 23–32 at the time of PIAAC, and who were classified as over-educated in 2008, were well-matched in 2011. Among the older individuals, 70–80 percent were still classified as overeducated after three years. To test whether initial skill differences (i.e. before employment) can explain the incidence of overeducation we would need measures of skills from at least two points in time – before employment and at some point in time after. As this is not available, we compare the skills of over-educated and well-matched individuals who recently graduated (proxying initial skill differences) to the skill differences between those who graduated earlier. Neither unadjusted estimates of "initial" skill-differences, nor estimates adjusted for education and gender, are significantly different from zero. This suggests that initial differences in basic skills cannot explain overeducation. However, potential differences in higher-order skills or non-cognitive skills could still possibly explain overeducation.

S6.4: Overeducation, labor market dynamics, and economic downturn in Europe.**Authors**

Camilla Borgna, Heike Solga & Paula Protsch (*WZB - Berlin Social Science Center, Germany*)

Abstract

Early overeducation studies have focused on micro- and meso-level determinants within single-country frameworks. Recent cross-country comparisons investigate the role of labor markets and educational systems (Allen et al., 2013; Levels et al., 2014). However, the endurance of the current economic crisis, with its heterogeneous repercussions across European countries, challenges cross-country overeducation studies. This paper investigates the link between overeducation incidence and economic conditions by explicitly considering cross-sectional overeducation rates as the result of labor market dynamics over a long time span, starting from the moment when the individual with the longest job tenure at the time of observation was hired. We analyze data from the 2011/12 round of the Programme for the International Assessment of Adult Competences (PIAAC) for prime-age workers (35-to-55-year-old) in 16 European countries. The direct measures of general skills available in PIAAC allow us to disentangle 'apparent' overeducation (resulting from individuals having higher qualifications than their skills would suggest) from 'real' overeducation (signaling an actual job mismatch). This is particularly important in international comparisons because the association between qualifications and skills – hence, skills heterogeneity within qualification levels – has been shown to vary substantially across countries (Heisig & Solga, 2014).

Our results, based on mixed-effects linear-probability models, indicate that overeducation is partly explained by a lack of skills in all countries studied; however, workers' skill heterogeneity is not responsible for cross-country variation in overeducation rates. Moreover, our findings suggest that 'real' overeducation is influenced by the economic downturn, as: (i) individuals who experienced job mobility after the outbreak of the 2007 financial crisis are more likely to be overeducated than those who stayed in their jobs; (ii) overeducation is more pronounced in labor markets with higher shares of not-employed adults.

Keynote I

Wednesday, April 5th, 2017, 13:00 – 14:45

Keynote:

What can be gained from international surveys?

Author

Prof. Dr. Eric A. Hanushek (Stanford University, USA)

Room: Beethoven-Saal 1

Plenary debate on Keynote

Discussants: Heike Solga (*WZB – Berlin Social Science Center, Germany*) &
William Thorn (*OECD, France*)Moderator: Ludger Wößmann (*Ifo Institute and University of Munich, Germany*)

Abstract

Many countries have been expanding their survey data about their economies and their labor markets, so it is natural to consider how the PIAAC surveys can potentially add to our knowledge about economic outcomes. The primary space that these data open up is a fertile new area of research – what might be called a vastly enriched “comparative economic systems.” The PIAAC data, with the comprehensive picture of the labor force and labor market outcomes for a range of countries, change the vantage point for considering operations of labor markets. Analyses of markets within individual countries can at best be generalized to outcomes in the individual country, although this limitation is seldom noted. So people have been quite willing to take the results of from one place and to apply them broadly without clear understanding of how local institutions may affect these results.

Some initial analyses of the PIAAC data suggest that the institutional structure of individual economies may be very important. A simple but powerful example is seen in the dramatically different estimates of the returns to skills across countries. A second example comes from looking at individual submarkets. For example, the determination of salaries, the selection of teachers, and ultimately the impact of varying teacher quality appear very different across countries. And, while these labor market differences have been the subject of considerable speculation and assertion, they have not previously been subject to rigorous analysis because of the lack of appropriate data.

The new comparative economic systems subfield would begin to investigate how the institutional structure of countries guides and defines the operation of individual labor markets. And, to this end, the PIAAC surveys begin to open a window on the similarities and differences of national and regional labor markets.

Symposium:**The social context of skills: Improving the PIAAC background questionnaire****Chairs**

Natascha Massing & Silke Schneider (*GESIS – Leibniz-Institute for the Social Sciences, Germany*)

Room: Richard Strauss

Abstract

Developing a background questionnaire (BQ) for a cross-national assessment study like PIAAC is a major challenge. Theoretical input, questionnaire design, ex-ante harmonization, pretesting, coding, as well as negotiations between stakeholders and logistics are all very complex, and time pressure is usually high. Firstly, in order to achieve unbiased estimates in statistical analyses, the background questionnaire needs to cover indicators (and if possible, multiple indicators) of all concepts regarded as relevant predictors, covariates and outcomes of the basic competencies covered in the assessment part. What is ‚relevant‘ is determined by the theoretical framework underlying questionnaire development, which therefore needs to be strong and well-grounded in prior research. Secondly, the chosen indicators should be measured using state-of-the-art instruments and harmonization procedures resulting in reliable, valid and comparable measurements, and if these do not yet exist, they need to be developed and comprehensively tested for crossnational use. Thirdly, in as far as indicators were covered in preceding studies like IALS and ALL, achieving comparability over time was another goal for PIAAC. Fourthly, in order to make efficient use of interview time, questions and routing needed to be highly efficient. This for example means that questions need to be applicable to the whole adult population, and only few or very crucial topics should apply to sub-groups (such as the working population) only. This session brings together experts from various scientific fields - economics, education, labour market sociology and sociology of education - to review and reflect upon the PIAAC BQ and discuss suggestions for future PIAAC cycles. Some of this work was initiated by OECD directly. Important subsequent questions to discuss are: Was the balance right between direct assessment and BQ? Was the balance right between topic areas and concepts within the BQ? Which procedures can ensure that optimal decisions are made in future BQ development, to achieve a BQ that is fit for purpose? What have we learned substantively from PIAAC cycle one that helps revising the BQ for future cycles?

Presentations

- Title: Education and training – What is being measured and what needs to be improved.
Authors: Natascha Massing & Silke Schneider (*GESIS – Leibniz Institute for the Social Science, Germany*)
- Title: A critical review of the 2012 PIAAC background questionnaire.
Author: Richard Desjardins (*University of California, USA*)
- Title: Strengths and weaknesses of the PIAAC background questionnaire from a sociological point of view.
Authors: Gwendolin Blossfeld (*Leibniz Institute for Educational Trajectories, Germany*) & Pia N. Blossfeld (*University of Leipzig, Germany*)
- Title: Making PIAAC even better: Perspectives from sociological research on education and the labor market.
Authors: Jan Paul Heisig & Heile Solga (*WZB – Berlin Social Science Center, Germany*)
- Title: A critical evaluation of the PIAAC cycle 1 background questionnaire.
Authors: Jim Allen & Rolf van der Velden (*ROA, Maastricht University, Netherlands*)

S7.1: Education and training – What is being measured and what needs to be improved.**Authors**

Natascha Massing & Silke Schneider (*GESIS – Leibniz Institute for the Social Science, Germany*)

Abstract

Educational attainment is one of the most important control variables in all kinds of survey micro data analysis, but, especially in a study like PIAAC, it is also one of the most important – if not THE most important – variable captured in the background questionnaire for theoretical reasons: Formal education is the main policy instrument for skill production. After initial education, adult education or lifelong learning opportunities become increasingly important in order to maintain or further develop skills and competencies throughout the life course. The investment in training is one of the key measures of policy makers to increase skills and competencies after leaving initial education. However, the analysis of the PIAAC data shows that improvements can be made in the measurement of these two important concepts. With respect to educational attainment, since the measurement instruments refer to national educational systems, output harmonization is a 'necessary evil'. The chosen methods of harmonization are a major influence on data quality and comparability. When a harmonised variable carries less information than a non-harmonised (national) one, and the amount of information loss differs across countries, the comparative validity and thus comparability of the harmonised measure is limited. Methods of comparative construct validation can be used to evaluate and improve comparative validity of harmonised variables. By comparing the predictive power of educational attainment on skills using differently coded education variables, we will check empirically which aspects of educational attainment are most important for the analysis of skills across PIAAC countries. With respect to training, measurement instruments do not require output harmonization. However, the theoretical framework surrounding adult education is much less clear. Again, analysing training and skills information empirically enables us to better understand which aspects of training are important to measure in order to find out more about antecedents to training participation but also to reasons preventing adults from lifelong learning activities. We will conclude our presentation by proposing changes to the questionnaire items and/or variables on education and training for the next cycle of PIAAC. For educational attainment, in order to achieve cross-nationally more comparable and useful variables for PIAAC, they need to be output-harmonized into a better (but still ISCED-based) coding scheme. Country-specific education items should more clearly differentiate vocational and general education than in PIAAC Cycle 1. Concerning training participation, the changes are intended to better measure the intensity and the aims of training participation.

S7.2: A critical review of the 2012 PIAAC background questionnaire.**Author**

Richard Desjardins (*University of California, USA*)

Abstract

This paper assesses the extent to which the PIAAC 2012 Background Questionnaire (BQ) meets its analytic goals, that is, to provide information that helps understand: (1) The antecedents and outcomes of proficiency in information processing skills; (2) The practices that are associated with the development and maintenance of proficiency; (3) The use of generic skills in the workplace and the match of workers' skills and qualification with job requirements. The

paper considers the balance of information collected in different sections of the BQ, and the coverage of different domains of interest such as education and training, labour market participation and skills use. It also attempts to identify priorities for revision of the BQ (together with a rationale for these priorities) and offers suggestions as to how the BQ could be revised to better meet the information needs of researcher and policy makers in the next cycle of the study.

S7.3: Strengths and weaknesses of the PIAAC background questionnaire from a sociological point of view.

Authors

Gwendolin Blossfeld (*Leibniz Institute for Educational Trajectories, Germany*) & Pia N. Blossfeld (*University of Leipzig, Germany*)

Abstract

This contribution aims to discuss the PIAAC background questionnaire with a focus on social inequality issues. The current PIAAC background questionnaire lacks important information for sociologists, making an analysis of the given data rather unattractive. Therefore, we would like to discuss the strengths and weaknesses of the PIAAC background questionnaire from a sociological point of view. For example, previous research has shown that social origin seems to play a particularly important role for educational careers and educational outcomes for both men and women (Baumert & Schümer, 2001; Jackson & Jonsson, 2013; Jonsson et al., 1996; OECD, 2001, 2004). This is particularly true for countries that: (1) track students at a comparatively early age, (2) have a very rigid tracking system, making incorrect (early) placements hard to revise, and (3) have school systems that are organized in half-day schools relying heavily on parents actively helping their children with homework and exam preparation. When analyzing social origin, sociologists usually base their analyses on multi-dimensional social origin measures to gain a better understanding of how different kinds of family capital influence the opportunities of the next generation. To capture all kinds of social origin effects, empirical analyses must not only capture highest parental educational level but also include information on both parental status and parental class as separate concepts (Chan & Goldthorpe, 2007, p. 529; Mayer, 1977, p. 156).

S7.4: Making PIAAC even better: perspectives from sociological research on education and the labor market.

Authors

Jan Paul Heisig & Heile Solga (*WZB - Berlin Social Science Center, Germany*)

Abstract

The first round of the PIAAC is a major milestone for research on skills, education, and employment, and it has stimulated exciting research on a wide variety of topics. At the same time, PIAAC, like any data set, also has certain limitations. In this contribution, we describe some of the issues that we have encountered while working with PIAAC and suggest changes for future cycles.

Perhaps the greatest strength of PIAAC is its comparative nature. For this potential to be realized, researchers need to have access to maximally detailed individual-level data for the largest possible set of countries, while respecting reasonable standards of confidentiality and data protection. Currently, public use files (PUFs) are readily available for all countries except Australia, but important information is coarsened substantially or not available at all in the PUFs. A few countries provide restricted-access Scientific Use Files (SUFs), but their value for

comparative research is very limited because the majority of countries do not offer a SUF. Provision of access to SUFs for all countries based on a single application procedure would greatly facilitate the work of comparative researchers.

As for the contents of the background questionnaire, a unique and remarkable feature of the first round of PIAAC is the (perhaps excessively) large number of items devoted to skill use at work and in private life. In other areas the information provided is relatively thin, especially in the PUFs. Drawing on our own research and current debates in sociology and adjacent disciplines, we advocate the collection/provision of more comprehensive information on the following aspects: - Educational biographies (e.g., more fine-grained information on fields of study, information on final grades); - Immigrant background (e.g., country/region of origin) - Family background (e.g., parental occupation); - Health (e.g., chronic conditions); - Economic situation (e.g., household income); - Income of last job for those not employed at time of interview.

57.5: A critical evaluation of the PIAAC cycle 1 background questionnaire.

Authors

Jim Allen & Rolf van der Velden (*ROA, Maastricht University, Netherlands*)

Abstract

In this paper we provide an evaluation of the background questionnaire (BQ) as it was developed in Round 1 of the first cycle of PIAAC. As members of the PIAAC consortium we bore the primary responsibility for developing the cycle 1 BQ. In that role we frequently encountered issues that were difficult to solve within the time frame of the first cycle, due to the heavily path-dependent nature of the project and the difficulty of altering things in a later stage of proceedings without causing major problems for the countries as well as our consortium partners. Since the BQ was finalized prior to the round 1 field phase (the same BQ being implemented in rounds 2 and 3 with only minor modifications) we have had the opportunity to reflect on the process as well as to extensively analyse the data with a view to establishing the things that worked well, and perhaps more importantly the things that didn't work as well as might have been hoped. In the capacity of leaders of the BQ development in cycle 1 we have twice been engaged by the OECD to conduct an evaluation of the BQ. The first occasion resulted in a general report on the PIAAC BQ finalized in the spring of 2015. The second occasion, currently ongoing, involves a detailed evaluation, together with partners Silke Schneider and Natascha Massing from GESIS, of the education and training module which will culminate in a proposal for an improved module for this section of the BQ. In this paper we will focus heavily, although not exclusively, on this section of the BQ. The evaluation addresses both general points relating to the process of BQ development, as well as more specific points relating to the various BQ sections and the concepts covered in them.

Symposium VIII

Wednesday, April 5th, 2017, 15:00 – 16:30**Symposium:****Dynamics of participation in further education and its effects****Chair**Harm Kuper (*Freie Universität Berlin, Germany*)**Room:** Joseph Haydn**Abstract**

PIAAC-L offers new opportunities to analyze the selectivity of participation and effects of further education. Due to two central design features of PIAAC-L, research can focus on central desiderata under new theoretical and methodological perspectives. The measurement of basic competences illuminates one of the theoretically most important variables to explain decisions to participate in further education and to analyze effects of adult learning. Thus, a theoretically promising perspective can be added to the current state of research that shows the selectivity of participation in further education due to formal prerequisites such as educational attainment or employment status. Although competences correlate with formal education and employment opportunities their independent influence on adult learning can be analyzed as well as the fit between job requirements and employees competences. The longitudinal design of the dataset allows to focus on the dynamic nature of further education. Participation in continuing education is a highly context dependent event with high interindividual variation. PIAAC-L data allows to test assumptions on the causal relations between individual prerequisites, participation and effects of continuing education under changing circumstances. Since three sample points are planned, the interaction between educational participation of adults, the effects in terms of competences and social participation and succeeding participation can be modelled. With its unique design characteristics, PIAAC-L is an opportunity to apply advanced methods of statistical data analysis and a challenge for interdisciplinary research on adult learning and continuing education. The contributions to this symposium apply different disciplinary perspectives and share the systematic use of the longitudinal data-structure and the competence measures. One of the most fundamental questions of empirical research on continuing education – whether it shows effects on individual skills – is the matter of the first contribution from a psychological perspective. The second contribution combines theoretical approaches of educational economy and sociology to explain the consequences of skill mismatch for decisions to participate in continuing education. The third contribution again uses psychological theories to explain the influence of motivation on adult's educational participation. Finally, the last approach combines educational and sociological theories on social participation to analyze interdependences between non-formal learning and social participation.

Presentations

- Title: Learning beyond schooling: Estimating causal effects of adult education on individual skills.
Authors: Britta Gauly & Natascha Massing (*GESIS – Leibniz-Institute for the Social Sciences, Germany*)
- Title: Conceptualization of mismatch and the relationship to participation in further education.
Authors: Sarah Widany & Katrin Kaufmann (*Freie Universität Berlin, Germany*)
- Title: Can you get it if you really want? Motivation to learn as a predictor of participation in further education using German PIAAC-L data.
Authors: Julia Gorges (*Bielefeld University, Germany*), Dèbora B. Maehler (*GESIS – Leibniz-Institute for the Social Sciences, Germany*) & Judith Offerhaus (*University of Cologne, Germany*)
- Title: Learning to engage and engaging to learn – a virtuous cycle?
Authors: Ina Elisabeth Rüber, Andreas Martin & Carolin Knauber (*German Institute for Adult Education, Leibniz Centre for Lifelong Learning, Germany*)

S8.1: Learning beyond schooling: Estimating causal effects of adult education on individual skills.**Authors**

Britta Gauly & Natascha Massing (*GESIS – Leibniz-Institute for the Social Sciences, Germany*)

Abstract

Developing and maintaining individual skills and competencies is essential in today's knowledge societies. To adapt to new technologies and new workplace settings and to acquire further human capital after finishing schooling further training activities are necessary (OECD, 2004). By participating in further training activities individuals can expect positive effects, not only in terms of wages, but on job-security as well higher labor participation rates, lower unemployment, and shorter unemployment periods (for a detailed overview see e.g., Blundell, Dearden, Meghir & Sianesi, 1999; or Hansson, 2008). As several studies find a positive relationship between training and wages, it is implicitly assumed that training increases individual productivity. But, while there has been a large amount of literature concerning the economic outcomes of training, little is known about learning outcomes of training in terms of individual skills (Cegolon, 2015).

Previous research provides some evidence for positive effects of training activities on adult literacy or numeracy skills (see e.g., Vorhaus, Litster, Frearson & Johnson, 2011; or Wolf & Evans, 2011). However, the existing studies only refer to small sample sizes and as the data is not representative, it is not possible to generalize results. To date the question whether there is a causal relationship between increased training and individual skills or whether individuals with higher ability participate in more training is not answered satisfactorily (Blundell et al., 1999). One of the main challenges is to find an adequate skill measure. The latter is offered by the Programme for the International Assessment of Adult Competencies (PIAAC), an international large scale survey. However, due to the cross sectional character of the data, it is not possible to draw causal claims. We overcome the problem of endogeneity and selection by using longitudinal data on training activities and skills. The German PIAAC Longitudinal Project follows up the German PIAAC sample with three additional waves of data collection. With the help of this unique data set it is possible to estimate the causal impact of training on skills. We apply first-difference and fixed-effects estimation methods to control for innate ability bias which might drive the selection into training.

S8.2: Conceptualization of mismatch and the relationship to participation in further education.**Authors**

Sarah Widany & Katrin Kaufmann (*Freie Universität Berlin, Germany*)

Abstract

The term mismatch covers labor-market related discrepancies between the fit of job requirements and qualification. For some years now and with varying focuses, a growing body of literature discusses causes for and consequences of mismatch on individual, company and societal/macroeconomic level. Thereby, research on this topic displays a huge variety in underlying terminology and conceptualization. Differences in subsequent operationalization and measurement quite naturally show considerable variations in empirical findings on mismatch. On the one hand, mismatch is considered as a permanent condition (e.g. Büchel & van Ham, 2003; McGuinness & Wooden, 2007). On the other hand, findings indicate mismatch as temporary phenomenon related to transitions and adjustments on the micro-, meso- and macro-level (Quintini, 2011). Thus, mismatch can be a by-product of technological change, reorganization on the company level or specific characteristics within the occupational

career.

Recent availability of data on competencies as well as information on job-related skill requirements has boosted the debate on the adequate measurement of mismatch with several competing indicators (Desjardins & Rubenson, 2011; Fichen & Pellizari, 2013; Allen et al., 2013; Perry, 2014). As further education can be an effective way to tackle skill and educational mismatch of adults on the labor market, it seems likely to investigate adult's (job-related) educational activities with respect to various states of mismatch (vgl. Hartog, 1999; Desjardins & Rubenson, 2011). However, depending on the mismatch indicator at hand, results can be ambiguous. In the presentation, we will address this issue firstly, by juxtaposing selected mismatch indicators and secondly, their effects on participation in further education by multivariate analysis using the cross-sectional German PIAAC data. Thirdly, using the PIAAC Longitudinal data, we address the dynamic nature of mismatch and investigate possibilities to monitor intraindividual changes in the measurement of mismatch.

S8.3: Can you get it if you really want? Motivation to learn as a predictor of participation in further education using German PIAAC-L data.

Authors

Julia Gorges (*Bielefeld University, Germany*), Débora B. Maehler (*GESIS – Leibniz-Institute for the Social Sciences, Germany*) & Judith Offerhaus (*University of Cologne, Germany*)

Abstract

Empirical educational research has rarely addressed the role of psychological factors for a person's decision to participate in further education. From a Rational Choice perspective, individuals evaluate further education opportunities based on subjective utility by weighing costs and benefits. However, this perspective neglects individual factors beyond strictly rational decision-making that play a role in explaining human behavior. In particular, motivation as a proximal determinant of behavior should be an important predictor of participation in further education. Motivation comprises psychological, non-monetary factors like enjoyment, interests, and sources of psychological strain. Empirical findings suggest that such motivational beliefs may promote participation despite contextual constraints. Unfortunately, motivation to learn is rarely included in empirical research on participation in adult education, which partially is due to a lack of measurement instruments. In addition, most studies only use a cross-sectional design, thereby precluding causal interpretations of findings.

The present paper draws on the motivation-to-learn scale, which consist of four items from the first PIAAC background questionnaire. The scale focuses on intrinsic aspects of motivation to learn that typically relate to a deep approach to learning (e.g., using elaborative learning strategies). The scale shows good psychometric properties and measurement invariance across relevant subpopulations. Using PIAAC-longitudinal data, we will be able to investigate the contribution of motivation to learn for adults' participation in further education. Controlling for demographic and socio-economic predictors of participation in further education such as sex, age, level of education, and employment status, our analyses present a comprehensive and interdisciplinary account of participation in further education. Further, it aims at isolating the impact of motivation to learn to job-related and non-job-related non-formal and informal learning. Results will be discussed with respect to theoretical and practical implications.

S8.4: Learning to engage and engaging to learn – A virtuous cycle?**Authors**

Ina Elisabeth Rüber, Andreas Martin & Carolin Knauber (*German Institute for Adult Education, Leibniz Centre for Lifelong Learning, Germany*)

Abstract

Lifelong learning is to enhance the development of citizenship (European Commission, 2002) while social capital enables a well-functioning society in terms of economic growth and political effectiveness (Putnam, 2000). Field (2005) picks up both concepts and investigates how they relate. He provides evidence for their strong association, while on the one hand proposing a virtuous cycle, but on the other hand acknowledging that they may also function as substitutes to one another. Although the empirical support of learning to positively impact social capital piles up (e.g. McIntyre, 2012; Preston, 2003), assessments, which take both directions into account, are rather rare. Further, the evidence is majorly built upon qualitative interviews or descriptive statistics, with only a few exceptions from Britain (e.g. Fujiwara, 2012). This is where our work ties in, focusing on the association between participation in non-formal learning, as one inherent part of lifelong learning, and volunteering. Following Putnam (2000) volunteering is one of the strongest indicators for social capital. Non-formal learning resembles any institutionalized learning activity after formal schooling. Theoretically, we expect learning to positively influence volunteering, following the concept of internal efficacy. The learning experience creates knowledge and skills, which independent of their content, create a greater sense of agency within the learner, which in turn lowers the barriers to engage voluntarily. Voluntary engagement successively broadens one's network, providing access to more information, which may foster new interests or strive for more knowledge and therewith participation in non-formal learning. To empirically test the association we employ a quasi-experimental approach using combined German data of the PIAAC and the CiLL pile-up study. Due to the data combination (age-expansion 16-80) we are able to observe the effect outside of work settings and therewith control for a greater range of possible confounders. Employing propensity score matching, we try to combat the difficulty of investigating causality in a cross-sectional setting. We run two sets of models using participation in non-formal learning and volunteering interchangeably as predictor and outcome. The stepwise inclusion of literacy competence and eagerness to learn in the model shall provide first insights on the plausibility of the proposed mechanism

Symposium:**Skills and the labor market****Chair**

Simon Wiederhold (*University Eichstaett-Ingolstadt and Ifo Institute Munich, Germany*)

Room: Beethoven-Saal 1

Abstract

Initial analysis of the PIAAC data has shown the crucial importance of skills for success on the labor market in general. However, many of the more detailed questions remain unanswered, and many of the relevant mechanisms that give rise to the association between skills and labor-market outcomes are still a black box. The four studies combined in this symposium try to dig deeper into several aspects of how skills transform into success on the labor market. How exactly are skills used at work, and why is this so? How relevant is the reliability of educational credentials for the importance of skills on the labor market? How do vocational education programs affect adult skills and wages? And how do the effects of vocational and general education programs change over the life-cycle? These are among the key questions to be addressed in this symposium.

Presentations

- Title: Skills use at work: Why does it matter and what influences it?
Author: Glenda Quintini (*OECD, France*)
- Title: The effects of vocational education on adult skills and wages: What can we learn from PIAAC?
Authors: Lorenzo Rocco & Giorgio Brunello (*University of Padova, Italy*)
- Title: Vocational vs. general education and employment over the life-cycle: New evidence from PIAAC.
Authors: Ludger Wößmann & Franziska Hampf (*Ifo Institute and University of Munich, Germany*)
- Title: The reliability of educational credentials: A general model on how education systems affect labor market allocation.
Authors: Rolf van der Velden & Mark Levels (*ROA, Maastricht University, Netherlands*)

S9.1: Skills use at work: Why does it matter and what influences it?**Author**

Glenda Quintini (*OECD, France*)

Abstract

This paper analyses how skills are used at work, why skills use matters for workers and economies and its key determinants. It draws on data for the 28 OECD countries participating in the Survey of Adult Skills. The use of skills at work is just as important a determinant of individual and aggregate economic outcomes as the development of skills, but it is less studied. After explaining how skills use at work is measured in the survey, the paper reviews how skills are used at work and how this varies across countries. It then shows that skills use has a substantial impact on productivity, wages and job satisfaction.

The paper also analyses several determinants of skills use, including High Performance Work Practices, globalisation and offshoring, and labour market institutions. It concludes by identifying policy options for improving skills use, drawing from specific country examples and the chapter's empirical findings.

S9.2: The effects of vocational education on adult skills and wages: What can we learn from PIAAC?**Authors**

Lorenzo Rocco & Giorgio Brunello (*University of Padova, Italy*)

Abstract

We investigate the effects of VET on adult skills and labour market outcomes by using the PIAAC survey. Our approach is to think of the possible education careers available to individuals as alternative treatments in a multivalued treatment framework. Focusing mainly but not exclusively on upper secondary, post-secondary and tertiary education, we assume that individuals are exposed to four alternative treatments: 1. vocational education at the upper secondary or post-secondary level; 2. academic education at the upper secondary or post-secondary level; 3. vocational education at the tertiary level; 4. academic education at the tertiary level. In most of this paper, comparisons between vocational and academic education are made at the same level of educational attainment, hence outcomes of treatment 1 (3) are compared to those of treatment 2 (4). Isolating the effect of VET courses is difficult in the absence of students' ability at the time of entry. In this paper, we assume that the assignment of individuals to the treatments listed above is explained by parental education, country of birth, the number of books in the house at age 16 as well as the pupil/teacher ratio in primary school and the proportion of residents in rural areas at the age of selection. If there are factors affecting selection into different curricula that we cannot control for with the data at hand, our estimates may still be affected by selection bias, which could amplify the estimate gap in labour market outcomes associated to alternative curricula. At the ISCED 3 and 4 level, we find that VET performs about as well as academic education as far as earnings are concerned and a bit better in terms of employment outcomes. VET at the ISCED 3-4 level is also associated with higher training incidence. Finally, our findings support the view that the presence of vocational tracks helps keeping students with limited academic attitudes in school. On the other hand and despite the emphasis put on creating and/or expanding VET opportunities at the ISCED 5 level, we find a clear advantage of academic education at this level across all outcomes considered.

S9.3: Vocational vs. general education and employment over the life-cycle: New evidence from PIAAC.**Authors**

Ludger Wößmann & Franziska Hampf (*Ifo Institute and University of Munich, Germany*)

Abstract

It has been argued that vocational education facilitates the school-to-work transition but reduces later adaptability to changing environments. Using the recent international PIAAC data, we confirm such a trade-off over the life-cycle in a difference-in-differences model that compares employment rates across education type and age: An initial employment advantage of individuals with vocational compared to general education turns into a disadvantage later in life. Results are strongest in apprenticeship countries that provide the highest intensity of industry-based vocational education.

S9.4: The reliability of educational credentials: A general model on how education systems affect labor market allocation.**Authors**

Rolf van der Velden & Mark Levels (*ROA, Maastricht University, Netherlands*)

Abstract

How educational systems should be organized to achieve an optimal allocation of graduates on the labor market is still a topic of persistent scholarly debate (see, for example, Müller, 2005; Breen, 2005). Building on insights from the sociology of education and labor economics, we explicate a general explanatory mechanism in which countries' labor force allocation is determined by the extent to which employers are able to select workers whose skills and cognitive levels are congruent with the competences demanded by their respective jobs. We show how educational systems can improve productivity of employees, firms and countries, by improving the signaling function of educational credentials. This mechanism is an important factor in explaining countries' labor force allocation in all circumstances where educational credentials are used to signify graduates' skill levels, but imperfectly reflect the true skills of graduates.

We first construct a micro-level model about the relationship between workers' skills and their job productivity, to show how and why a proper labor market allocation is important. We then argue how the outcomes of matching depend on the reliability with which educational credentials signal about graduates' skills. This reliability in turn is dependent on the differentiation of the educational system and the reliability of track placement. To explore the theoretical and empirical merits of this model, we present a computational model that formalizes our reasoning, and use simulations to explore how this model behaves in artificial experimental conditions. Secondly, we use PIAAC data on workers' skills and years of schooling to directly measure the reliability of credentials. By linking this measure to data on the relative productivity of workers, we show our model's empirical applicability. We show how educational differentiation and the reliability of track placement affect labor market outcomes and how this effect is mitigated by the flexibility of the employment system to adjust any misallocation. The model can be used to explain a wide variety of empirical regularities. To illustrate our model's general utility, we conclude the paper by linking our findings to observations in the literature on educational systems and labor force allocation.

Individual Paper Session I

Wednesday, April 5th, 2017, 16:30 – 17:30

Paper Session:

Mismatch in the labor market

Chair

Bernhard Schmidt-Hertha (*University of Tuebingen, Germany*)

Room: Richard Strauss

Presentations

- Title: Qualification mismatch and educational activities among older workers.
Authors: Sai-Lila Rees & Bernhard Schmidt-Hertha (*University of Tuebingen, Germany*)
- Title: MisMatch in human capital accumulation.
Authors: Russell Cooper & Huacong Liu (*The Pennsylvania State University, USA*)
- Title: Occupational mismatch in Singapore: Extent and determinants.
Authors: San Chye Cheng & Bao Zhen Tan (*Institute for Adult Learning, Singapore*)

P1.1: Qualification mismatch and educational activities among older workers.**Authors**

Sai-Lila Rees & Bernhard Schmidt-Hertha (*University of Tuebingen, Germany*)

Abstract

In Germany 15% of full and part-time workers are formally overqualified (Reichelt & Vicari, 2015). Thus, the formal qualifications of these employees acquired in the system of education do not correspond with the formal qualifications which are needed to do their job (Hotz-Hart & Rohner, 2014). In this case there is a qualification-mismatch that may end up in an overload or underload leading to negative individual and overall economic consequences like losses in income and productivity of workers (Rohrbach-Schmidt & Tiemann, 2010), lower job satisfaction (Quintini, 2011), early retirement and substantial costs for enterprises (Güpner & Seebacher, 2014). Especially in face of the demographic change and the fast progression of technological developments, enterprises are pressured to stay innovative and competitive. In this context an adequate fit between the formal qualification level of employees on the one hand and formal qualification requirements of the work on the other hand becomes increasingly important. As there are hardly any studies analysing the effects of formal qualifications mismatch on the participation in adult education and adults' basic skills (reading, calculating, problem solving) in Germany, this research project addresses following questions using reanalyses of the national PIAAC data: - Are there any differences between overqualified, underqualified and adequately qualified workers regarding their basic skills?; - Do under- and overqualification have an effect on the participation in non-formal adult education? For the analysis, a variable that represented information about an overqualification, underqualification or adequate qualification was created by matching the highest formal qualification level (coded with ISCED-97) and the variable of the required formal qualification level for doing the job (coded with ISCED-97). Logistic and linear regressions show that, when controlling for the variables of age, gender and level of education, a qualification mismatch has significant effects on all three basic skills of workers and on their participation in adult education. Underqualified workers participate significantly more and overqualified workers significantly less in adult education than adequately qualified workers. Moreover, workers with a qualification mismatch achieve in all three basic skills lower means than adequately qualified ones.

P1.2: MisMatch in human capital accumulation.**Authors**

Russell Cooper & Huacong Liu (*The Pennsylvania State University, USA*)

Abstract

As noted by the OECD, skill mismatch is one of the main challenges faced by economies. Empirical evidence shows that, in far too many cases, workers are not well-matched with their current jobs. Productive efficiency requires the matching of high ability people to appropriate education and eventually to productive jobs. Inefficiencies arise in a couple of ways. First, the sorting of individuals to education opportunities may be distorted. Second, frictions in labor markets may prevent the matching of individuals, distinguished by ability and education, with appropriate jobs. This paper studies the first part of the matching process: the allocation of heterogeneous agents to levels of educational attainment. To the extent high ability individuals have low educational attainment and thus low skill jobs, these forms of mismatch are related. As we see using the PIAAC data across 21 countries, observed

educational outcomes are often at odds with the stark predictions of assortative matching: i.e. mismatch occurs when high ability agents are not always the most educated and some low ability agents have high educational attainment. Our primary goal of the paper is to understand the magnitudes, sources and consequences of this mismatch, both in theory and in the data. The paper presents evidence of substantial mismatch between ability and educational attainment across 21 OECD countries, with a main focus on Germany, Italy, Japan and the US. In the model, mismatch could originate from: (i) taste shocks, (ii) binding borrowing constraints and (iii) noisy measures of ability in test scores. The model is estimated using a simulated method of moments approach. The main empirical finding is that measured mismatch arises largely from noise in test scores and does not reflect borrowing constraints. Taste shocks play a minor role in explaining mismatch. Further, the estimation allows us to decompose the college wage premium, isolating cross-country differences in selection effects from the return to education.

P1.3: Occupational mismatch in Singapore: Extent and determinants.

Authors

San Chye Cheng & Bao Zhen Tan (*Institute for Adult Learning, Singapore*)

Abstract

Occupational mismatch can have important labour market consequences for individuals, employers, and society. Understanding the extent and determinants of mismatch are therefore critical. Most research on occupational mismatch focus on qualification rather than skill mismatch due to the lack of (a) data to measure the latter and (b) universal agreement on how to measure the latter. However, even for qualification mismatch, not much is known about the extent of non-time-related qualification mismatch in countries like Singapore. From a public policy perspective, the question of qualification mismatch is relevant, given the substantial investment on post-secondary institutions and the role devoted to human capital in economic development. Using data from the Programme for the International Assessment of Adult Competencies, this paper examines the extent of both types of mismatches in Singapore and factors associated with qualification mismatch among workers who are well-matched in skills. Our results suggest that qualification and skill mismatch represent different aspects of occupational mismatch, where the majority of adults who are mismatched in qualifications are not mismatched in skills. The extent of qualification mismatch is larger for adults with certain sociodemographic characteristics (e.g., adults in industries with high proportion of rank and file workers), whereas, the extent of skill mismatch is larger for adults with other socio-demographic characteristics (e.g., adults in the associate professionals and technicians occupational group). Our study also found that high levels of learning strategies and reading in everyday life have statistically significant associations with under-qualification among adults who are well-matched in literacy proficiency, suggesting that these factors could compensate for the lack of qualifications in order to match the level of literacy proficiency required by a job. By contrast, the type of institutions adults graduated from and their working arrangement in jobs are significantly associated with over-qualification among adults who are well-matched in literacy skills. This possibly suggests: (a) inherent differences between adults who graduated from different types of institutions; (b) differences in the quality of education they received; and/or (c) perception of how society views qualifications from different institutions.

Individual Paper Session II

Wednesday, April 5th, 2017, 16:30 – 17:30

Paper Session:

Digital skills and inequality

Chair

Frank Goldhammer (*German Institute of International Educational Research (DIPF); Centre for International Student Assessment (ZIB), Germany*)

Room: Joseph Haydn

Presentations

- Title: Problem solving in technology rich environments. Effects of the life situation on the digital literacy in Austria and Germany.
Authors: Bernhard Ertl & Christian Tarnai (*Universität der Bundeswehr München, Germany*)
- Title: Examining digital problem solving skills in libraries to promote digital equity.
Authors: Gloria Jacobs & Jill Castek (*University of Arizona, USA*)
- Title: Data Linking to assess the role of numeracy skills in occupational gender segregation: Evidence from PIAAC.
Authors: Katie Seely-Gant & Lisa M. Frehill (*Energetics Technology Center, USA*)

P2.1: Problem solving in technology rich environments. Effects of the life situation on the digital literacy in Austria and Germany.**Authors****Bernhard Ertl & Christian Tarnai** (*Universität der Bundeswehr München, Germany*)**Abstract**

The PIAAC study developed and conducts the Survey of Adult Skills. The survey measures adults' proficiency in key information-processing skills - literacy, numeracy and problem solving in technology-rich environments (PS) - and gathers information and data on how adults use their skills at home, at work and in the wider community (OECD, 2013). PS describes the competency of an individual to apply different technological tools in complex situations that may also require communication skills and meta-cognitive activities. These skills belong to the key qualifications of the 21st century, often labelled as digital literacy, and the term digital divide postulates a big discrepancy of technologically skilled and not/less skilled persons with respect to their chances for participation in society. However, research has shown that these skills are subject to several influences that relate to age, sex, education, migration status etc. Therefore, intersectional effects may appear when different of these influences coincidence. The presentation compares effects of different influence factors on digital literacy in the context of the Austrian and the German sample of the PIAAC study. A first research question will analyse in which extent the German and the Austrian PIAAC sample of employed persons with computer use at home and at work differ with respect to their digital literacy. Then we will analyse the impact of the different factors on the digital literacy of both samples. The analyses show that both samples differ with respect to their digital literacy outcomes and the impact of the influencing factors. Analyses could explain 32 per cent of the variance of digital literacy in the German sample while 24 per cent of Austrian one. The main factors influencing digital literacy are - to different extent - age and education. In the German sample they are followed by migration background, status, and computer use at home while for the Austrian sample this was computer use at work and at home, status, and migration background. The influence of gender was quite low but comparably higher in the Austrian sample. The presentation concludes with a discussion of possible causes for these differences and their implications.

P2.2: Examining digital problem solving skills in libraries to promote digital equity.**Authors**

Gloria Jacobs & Jill Castek (*University of Arizona, USA*)

Abstract

University researchers and public librarians in the USA are collaborating on PIAAC research designed to improve library practices, programs, and services for adult library users – especially economically vulnerable and socially isolated adults, seniors, English learners, and others lacking basic digital literacy skills. Data were collected using Education and Skills Online (ESO) – a PIAAC innovation that enables researchers to assess PIAAC skills in specific populations and settings and to compare these scores with other measures of performance in given contexts. In this study, researchers assessed the PSTRE skills of adult library users in relation to their performance on problem-solving tasks encountered in the technology-rich environment of libraries. This research has yielded a data-grounded learning progression that describes all levels of digital problem solving using observable strategies. The resulting taxonomy can be used to design effective learning sequences aligned to learners' needs. Two hundred library users completed the PSTRE and a background questionnaire that included demographics, Internet use metrics, and perspectives about the library's digital resources. Seventeen verbal protocols were audio recorded and screen-captured as participants completed the PSTRE and accomplished digital problem solving tasks using the library's website. The library tasks were designed using the PSTRE framework that considers the intrinsic complexity of the problem and task directions. Inferential statistics were run to examine the scoring patterns of different demographic groups who participated. Coding of the verbal protocols was mapped onto the cognitive dimensions of goal setting and monitoring progress; planning; accessing and evaluating information; and selecting, analyzing and transforming information as well as additional documented problem solving skills that emerged through inductive analysis. Preliminary analyses have revealed a set of observable strategies that seek to explain questions such as, what does the planning phase of digital problem solving look like? How do individuals self-monitor? Verbal protocol observations provide a grounded view of what digital problem solving processes actually look like within the PSTRE items and other problem solving tasks across proficiency levels from low- to highly-skilled. Results have important implications for deepening the field's understanding of both the PSTRE framework, digital literacy, and problem solving skills for libraries and their users.

P2.3: Data linking to assess the role of numeracy skills in occupational gender segregation: Evidence from PIAAC.**Authors**

Katie Seely-Gant & Lisa M. Frehill (*Energetics Technology Center, USA*)

Abstract

Numeracy skills are increasingly crucial for quality, long-term employment in the 21st century workplace. The emphasis on science, technology, engineering, and mathematics (STEM) careers to support national competitiveness further motivate research to understand the role of numeracy skills in recruitment and retention, particularly for women who are underrepresented in some STEM career fields, exacerbating the gender wage gap (Hegewisch & Hartmann, 2014). Previous analyses with Program for International Assessment of Adult Competencies (PIAAC) data provide insights about the relationship between gender, numeracy, and wages. Hanushek et al. (2015) found that a one standard deviation increase in numeracy skills corresponded to a 28% increase in U.S. workers' wages, with a 15% gender wage gap when conditioning wages on numeracy. Lindemann's (2014) PIAAC analysis of skill use found, despite common stereotypes, men and women have little significant variation in their use of numeracy skills in the workplace, with the key difference occurring in occupational classification; men are more likely to be employed in more traditional "STEM careers" where the use of numeracy skills is obvious. This paper also engages with comparable worth theory, wherein occupations dominated by women were seen as less demanding, despite the actual skillsets needed to perform the work (England 1992). We investigate this concept by examining the correlation between skill use and compensation for jobs that are predominately female and predominately male. Representing part of a larger project, this paper explores the relationship between numeracy skills and occupational gender segregation by creating and analyzing a new dataset, constituted from the U.S. PIAAC and data from the U.S. Bureau of Labor Statistics (BLS) occupational-level data, including data elements from the O*NET database. These merged enable us to answer the following research questions: - To what extent are numeracy skills associated with occupational gender segregation?; - To what extent are there correlations between assessed numeracy skills (PIAAC), numeracy requirements (O*NET), and occupational gender segregation? The paper will also explore the potential of merging additional national and international occupational and labor datasets with PIAAC to support similar research for the OECD countries as well as for benchmarking.

Individual Paper Session III

Wednesday, April 5th, 2017, 16:30 – 17:30

Paper Session:

Competence assessment

Chair

Anouk Zabal (*GESIS - Leibniz Institute for the Social Sciences, Germany*)

Room: Beethoven-Saal 1

Presentations

- Title: Reviewing the PIAAC numeracy assessment framework.
Authors: Diana Coben (*University of Waikato, New Zealand*), Kees Hoogland (*Mathematics Curriculum Researcher and Developer, The Netherlands Institute for Curriculum Development (SLO), Netherlands*) & Vincent Geiger (*Australian Catholic University, Australia*)
- Title: On additional items should be included in PIAAC for comparing long-run academic achievements among persons with disabilities.
Author: Norihito Sakamoto (*Tokyo University of Science, Japan*)
- Title: Standardized nonresponse bias analyses in PIAAC.
Authors: Tom Krenzke, John Lopdell & Leyla Mohadjer (*WESTAT, USA*)

P3.1: Reviewing the PIAAC numeracy assessment framework.**Authors**

Diana Coben (*University of Waikato, New Zealand*), Kees Hoogland (*The Netherlands Institute for Curriculum Development (SLO), Netherlands*), Vincent Geiger (*Australian Catholic University, Australia*), Lynda Ginsburg (*Rutgers University, USA*), Terry Maguire (*National Forum for the Enhancement of Teaching and Learning in Higher Education, Ireland*), Sue Thomson, Dave Tout & Ross Turner (*ACER, Australia*)

Abstract

This presentation will report on selected aspects of the Review of the Programme for the International Assessment of Adult Competencies (PIAAC) Numeracy Assessment Framework, the Framework that guided the assessment of numeracy in the first cycle of PIAAC. The Review has been undertaken for the OECD by an international expert team brought together by the Australian Council for Educational Research (ACER) in order to enhance the Numeracy Assessment Framework for the second cycle of PIAAC. The presentation will evaluate the extent to which the PIAAC Numeracy Assessment Framework reflects current understandings of adult numeracy and continues to be an appropriate basis for the assessment of adults' capacity to undertake successfully the range of numeracy tasks they will face in their everyday and working lives in the third decade of the 21st century.

P3.2: On additional items should be included in PIAAC for comparing long-run academic achievements among persons with disabilities.**Author**

Norihito Sakamoto (*Tokyo University of Science, Japan*)

Abstract

Both PIAAC and PISA are important surveys for comparing educational achievements in terms of international, intercultural, and intra-family resource allocation problems. However, there are few trials for evaluating educational policies and systems by using these rich information resources in Japan. This paper proposes and analyzes new methods and items that should be considered in PIAAC in order to promote the concept of evidenced-based policy in Japanese education systems for persons with disabilities. In Japanese primary and secondly education system, educating one child with no disabilities costs about 9 thousand dollars per year. On the other hand, educating one child with some disabilities costs about 100 thousand dollars per year. The difference of educational costs between children with and without disabilities can be explained by the number of teachers and specialists who seem to be needed for providing appropriate educational services. However, there are very few studies that analyze costs and benefits of education policies and no credible finding that shows the effectiveness and efficacy of Japanese education systems for children with special needs. Very few investigations including my studies suggest that some teaching methods such as teaching natural sign language for persons with hearing impairments can improve handicapped students' academic achievements, but all these studies have some problems for lack of full information and data availability in the long-run period. In order to scrutinize and refine the cost-effectiveness analysis of education systems for students with special needs, this paper will consider and propose new questionnaire's items in PIAAC surveys from three points of view - intra-household resource transfers, peer effects in classes, and school capabilities.

P3.3: Standardized nonresponse bias analyses in PIAAC.**Authors**

Tom Krenzke, John Lopdell & Leyla Mohadjer (*WESTAT, USA*)

Abstract

With the presence of nonresponse to surveys, it is important to gain an understanding of who the nonrespondents are. If the nonrespondents are similar to respondents, then standard weighting procedures can be used to reduce bias due to nonresponse. In this case, variables correlated with survey outcomes can impact the extent that bias is reduced. If nonrespondents are different from respondents, then the extent of potential bias needs to be investigated, determine if any adjustments can be made, and provide cautionary remarks to data users. The Programme for the International Assessment of Adult Competencies included 33 countries in Rounds 1 and 2, with 5 more countries participating in Round 3. With the goal of minimizing total survey error, and ensuring the comparability of estimates across countries, a standardized set of nonresponse bias analyses was developed. This potpourri of methods includes basic types of analyses, such as computing response rates by subgroups, chi-square tests of independence, and comparisons with official statistics. It also includes more extensive analyses, such as computing correlations among weighting variables and outcome statistics, level of effort analysis, and range of bias assessment. Standard input files are specified to the countries and Westat performs the analysis using its WesNRBA SAS macro. The protocols for the analyses will be provided, along with a presentation of results. Lessons learned are discussed and enhancements are proposed.

Keynote II

Thursday, April 6th, 2017, 8:30 – 9:45

Keynote:

Comparability of scales in international assessments

Author

Dr. Matthias von Davier (National Board of Medical Examiners (NBME), USA)

Room: Beethoven-Saal 1

Plenary debate on Keynote

Discussants: Jan-Eric Gustafsson (*University of Gothenburg, Sweden*) &
Richard Desjardins (*University of California, USA*)Moderator: Claus H. Carstensen (*Leibniz Institute for Educational Trajectories, Germany*)

Abstract

International comparisons of student and adult skills are scrutinized by experts in educational and psychological measurement. Important policy decisions are being made on the basis of data collected in assessment programs such as PIAAC, PISA, TIMSS and PIRLS, so that the quality of measurement is an issue of utmost importance. Several advances in modeling international data with generalized latent variable models have been developed and integrated into the analysis of data. These advances allow modeling data from a diverse set of countries in ways that reduce bias in the derived proficiency distributions. One particular aspect of these advances in explanatory models is the ability to account for country or language specific differences with respect to the ability to use models that incorporate strong measurement invariance. The talk will provide an overview of the methodologies used and provide an outlook with respect to the use of additional sources of data collected in computer based assessments.

Paper Session:

Skill formation across the life course

Chair

Harm Kuper (*Freie Universität Berlin, Germany*)

Room: Beethoven-Saal 1

Presentations

- Title: Findings of the young adult follow-up study.
Authors: Saida Mamedova (*American Institutes for Research, USA*) & Patrick Gonzales (*National Center for Education Statistics, USA*)
- Title: Examining the skills of older U.S. adults by demographics, workforce characteristics, and health measures.
Authors: Jaleh Soroui & Saida Mamedova (*American Institutes for Research, USA*)
- Title: REACH – reaching young adults with low achievement in literacy.
Authors: Simone C. Ehmig & Lukas Heymann (*Stiftung Lesen, Germany*)
- Title: The life-cycle evolution of gender gaps in reading and mathematical competencies.
Authors: Francesca Borgonovi, Marco Paccagnella (*OECD, France*) & Alvaro Choi (*University of Barcelona, Spain*)
- Title: Out of necessity: Educational decisions and skill-formation when graduating during a recession.
Authors: Franziska Hampf, Marc Piopiunik (*ifo Insitute, Germany*) & Simon Wiederhold (*ifo Institute, University Ingolstadt/Eichstaett, Germany*)

P4.1: Findings of the young adult follow-up study.**Authors**

Saida Mamedova (*American Institutes for Research, USA*) & Patrick Gonzales (*National Center for Education Statistics, USA*)

Abstract

Young Adult Follow-up Study (YAFS) is a study undertaken by the National Center for Education Statistics (NCES) in the United States that administered an online PIAAC survey to students who took PISA 2012 mathematics, reading, and science assessments, provided their contact information, and were willing to participate in an online study. The survey is provided by the OECD and is called Education and Skills Online (ESO). In the summer of 2016, at about 19 years of age, the students were asked to take the ESO assessments of literacy, numeracy and problem-solving in a technology-rich environment, as well as answer questions on the background questionnaire, related to their education, employment and other non-cognitive characteristics. The ESO 2016 data has then been combined with the PISA 2012 data to create a rich database on the skills outcome and employment and educational activities of 15-year-olds in the United States. The presentation will provide an overview of the results of the study. It will include the section on the demographic, socio/economic and behavioral background, examining the ESO and PISA performance as they compare across various background variables (ex. nativity, parental education, openness to problem solving). It will also include a section on successful transitions, examining the various activities and attitudes to adult life of the 19-year-olds in 2016 as related to their PISA performance four years earlier. The activities will describe the paths that the young adults take in transitioning to adult life. The three transitions that are of a particular interest are: from high school to post-secondary; from high school to the workforce; and from high school to adult life in general.

P4.2: Examining the skills of older U.S. adults by demographics, workforce characteristics, and health measures.**Authors**

Jaleh Soroui & Saida Mamedova (*American Institutes for Research, USA*)

Abstract

This presentation uses data from the first round of U.S. PIAAC data collection in 2012 and the second round of U.S. data collection in 2014 (also known as the National Supplement). The National Supplement oversampled some subgroups of interest, including unemployed adults age 16-65, and added subgroups not in the original target sample, including older adults age 66-74. The focus of this presentation will be on the skill levels of U.S. older adults. Although older adults age 55-65 perform at or above the international average of those in the same age group in all three skills domains [literacy, numeracy and problem solving in technology-rich environments], and the skills gap between younger and older adults is smaller in the U.S. than internationally; U.S. older adults have lower skill levels than younger adults. Considering recent demographic and economic trends such as population aging and increased labor force participation among older adults, this study will look at the relationship between the skills of older adults, demographics, and employment and health outcomes. After looking at the overall skill levels of U.S. adults age 55-74, this presentation will examine factors that may be associated with skills maintenance or decline with ageing. This includes looking at a profile of the demographics (educational attainment, gender, race/ethnicity, etc.) and workforce characteristics (employment status, income, occupation, etc.) of U.S. older adults and examining how these characteristics relate to skill levels. Understanding how skills and

demographics relate to workforce outcomes among older adults will help inform policymakers about continued labor force participation in this age group.

Then, we will focus on health-related outcomes and behaviors based on additional health questions included in the U.S. Background Questionnaire. We will look at the overall self-reported health of U.S. older adults, whether they have medical insurance, common sources of health information (e.g. internet, family and friends, health care professionals, etc.), preventative health measures (e.g. flu shot, cancer screenings, etc.), and how these measures relate to skill levels. This may help give a better picture of the associations between health and skills among older adults and suggest specific areas of intervention.

P4.3: REACH – Reaching young adults with low achievement in literacy.

Authors

Simone C. Ehmig & Lukas Heymann (*Stiftung Lesen, Germany*)

Abstract

The aim of the R&D project REACH is to identify ways in which young adults with low literacy skills can be reached and motivated to improve their reading skills. In a second step, access options are to be tested and evaluated in pilot projects.

The main focus is on young adults aged 16 to 35, who are an especially promising group among the adult struggling readers: they can profit most strongly and most sustainably from better reading skills, e. g. for their professional life. The earlier interventions take place, the better the chances are to maintain and strengthen reading competences in later life phases. The motivation and empowerment of the young adults as role models for their children will lead to a sustainable effect: If parents are enabled to read (aloud) their children will profit as well as further generations. REACH is working with a multi-step approach beginning with the systematic secondary analysis of data resp. the use of existing analyses from leo. Level One study, from PIAAC and the National Educational Panel (NEPS). This step will allow to characterize the target group of 16 to 35-year-olds with low reading competences as differentiated as possible. The analysis of PIAAC focuses on persons whose reading literacy is at level 1 and below. It is necessary to examine whether and to what extent these persons differ with regard to sociodemographic characteristics, with regard to experiences with education and training, unemployment and self-determination in the work of those who have better reading skills. The data will also be checked for differences in the use of digital devices in their private or business environments. The second step is a systematic analysis of data from the socio-economic panel, the health monitoring of the Robert Koch Institute and other surveys in the field of media, market and social research. Data about the way of life, employment, leisure and health behaviour as well as educational processes and their influencing factors are used. Options to reach and motivate young struggling readers are tested in three pilot projects.

P4.4: The life-cycle evolution of gender gaps in reading and mathematical competencies.**Authors**

Francesca Borgonovi, Marco Paccagnella (*OECD, France*) & Alvaro Choi (*University of Barcelona Spain*)

Abstract

While many progresses have been made in the last decades, especially in terms of educational attainments, gender gaps remain a distinct characteristic of the labor markets in virtually all OECD economies. Gender differences in field-of-study is often pointed out as an important factor behind the persistence of gender wage gaps in spite of the absence of educational attainment gaps, leading for instance to the under-representation of women in remunerative STEM careers. While gender gaps in mathematical competencies are well documented, little is known about the moment in which such gaps emerge and how they evolve over the life cycle. To better understand the role of different skills as determinants of gender gaps in labor market outcomes we make use of data from three large-scale international assessments (TIMMS/PIRLS, PISA and PIAAC), that allow us to follow representative samples of a given birth cohort over time. We are therefore able to map the evolution of gender gaps in reading and mathematics at age 10, 15, and 27. Our results suggest that male advantage in mathematics is smallest at age 10, but grows significantly between age 15 and age 27. Such evolution stands in sharp contrast with gender gaps in reading, that are small at age 10, large and in favor of females at age 15, and negligible at age 27. The relatively small cross-country variation in the evolution of gender gaps suggests that cultural and institutional factors are unlikely to play a major role in shaping such gaps.

P4.5: Out of necessity: Educational decisions and skill-formation when graduating during a recession.**Authors**

Franziska Hampf, Marc Piopiunik (*ifo Institute, Germany*) & Simon Wiederhold (*ifo Institute, University Ingolstadt/Eichstaett, Germany*)

Abstract

Does high school graduates' exposure to bad macroeconomic conditions affect their likelihood to invest further in education? If so, how much does this additional education increase cognitive skills? Using international PIAAC data for 15 OECD countries, we provide evidence on the effect of business cycles on college enrollment, college graduation, dropouts and skill formation. An increase in the national unemployment rate at the time an individual leaves high school increases the likelihood to attend and complete college. There is no effect on the probability to drop out of college. Furthermore, "re-cession graduates" have significantly higher numeracy and literacy skills than "boom-time graduates".

Symposium X

Thursday, April 6th, 2017, 9:45 – 11:15

Symposium:

Assessing non-cognitive skills in large-scale assessments

Chairs

Beatrice Rammstedt & Daniel Danner (*GESIS – Leibniz-Institute for the Social Sciences, Germany*)

Room: Joseph Haydn

Abstract

The symposium addresses different concepts and different measurement approaches for non-cognitive skills and especially addresses how noncognitive skills can be measured in large scale assessments with limited time and in heterogeneous samples. Clemens Lechner emphasizes the relevance of non-cognitive skills by demonstrating that conventional markers of cognitive skills such as aptitude tests are confounded with non-cognitive skills. Daniel Danner and Beatrice Rammstedt illuminate the incremental value of the Big Five facet structure for predicting real life outcomes. Susanne Weis introduces social skills, how they can be assessed and to what extent social skills can predict outcomes beyond the Big Five. Richard Roberts suggests situational judgments tests as an alternative way for assessing non-cognitive skills and presents data demonstrating the incremental validity of situational judgment tests in various countries.

Presentations

- Title: Identification problems in educational psychology: A replication and extension of Borghans et al. and Salkever.
Author: Clemens Lechner (*GESIS – Leibniz-Institute for the Social Sciences, Germany*)
- Title: The incremental value of a big five facet structure.
Authors: Daniel Danner & Beatrice Rammstedt (*GESIS – Leibniz-Institute for the Social Sciences, Germany*)
- Title: Social skills: A valuable complement in large scale assessments?
Authors: Susanne Weis (*University of Koblenz-Landau, Germany*) & Richard D. Roberts (*Professional Examination Service, USA*)
- Title: Situational judgment tests: Beyond self-report assessment of the big five?
Authors: Richard D. Roberts, Jeremy Burrus & Gabriel Olaru (*Professional Examination Service, USA*)

S10.1: Identification problems in educational psychology: A replication and extension of Borghans et al. and Salkever.**Author**

Clemens Lechner (*GESIS – Leibniz-Institute for the Social Sciences, Germany*)

Abstract

In two equally enlightening contributions on identification problems in personality psychology, Borghans, Golsteyn, Heckman, and Humphries (2011) and Salkever (2015) discussed two questions with potentially farreaching implications for studies on the effects of cognitive skills on important life outcomes: (1) whether measures of "achievement" and "intelligence" are distinct; (2) and to what extent achievement measures are confounded with non-cognitive skills (personality). In the present article, we revisit this controversy, identify unresolved issues, and provide a fresh look at the key questions. An independent replication and extension using a large representative sample of German ninth-grade students ($N = 13,648$) demonstrates that achievement and intelligence tests are highly but not perfectly correlated. Non-cognitive skills account for a substantial share of the variance in achievement but only a small share of that in intelligence. Importantly, non-cognitive skills incrementally explain variance in achievement after adjusting for intelligence. The problem of achievement measures being confounded with non-cognitive skills is particularly pressing for school grades, which are only modestly correlated with intelligence and highly laden with non-cognitive skills. We recommend that studies using achievement tests or school grades to identify the effects of cognitive skills on important life outcomes routinely control for non-cognitive skills.

S10.2: The incremental value of a big five facet structure.**Authors**

Daniel Danner & Beatrice Rammstedt (*GESIS – Leibniz-Institute for the Social Sciences, Germany*)

Abstract

On a global level, non-cognitive skills or personality characteristics can be described along five dimensions: extraversion, agreeableness, conscientiousness, emotional stability, and openness. Previous research has already demonstrated that these constructs are related with competence, educational attainment, success in the labor market, and life in general. We suggest that a facet structure of the Big Five allows a more fine grained description of non-cognitive skills also a better prediction of such life success indicators. Using the Big Five Inventory 2 (BFI-2) and data from three large scale assessments ($N=2,000$) from the US, the UK, and Germany, we examine the incremental predictive value of Big five facets over Big Five dimensions and discuss conceptual and practical implications.

S10.3: Social skills: A valuable complement in large scale assessments?**Authors**

Susanne Weis (*University of Koblenz-Landau, Germany*) & Richard D. Roberts (*Professional Examination Service, USA*)

Abstract

Social skills are seen as an important predictor of life and job success, both in laypersons' as well as employers' concepts of human resources. Social skills seem to represent the prototype of noncognitive skills and thus, are one of the major candidates for upcoming large scale assessments that want to extend their scope. This contribution first addresses the potential role of social skills within a predictor-criterion-model of variables assessed in large scale assessments such as PIAAC. Second, the paper describes the methodological challenges and opportunities in assessing social skills. Third, some data based on a large OECD online survey (N=7525) are presented investigating a) the psychometric properties of social skills as assessed by self-reports varying different item and response scale formats and b) the validity in predicting PIAAC outcomes over and above the Big Five personality dimensions and facets.

S10.4: Situational judgment tests: Beyond self-report assessment of the big five?**Authors**

Richard D. Roberts, Jeremy Burrus & Gabriel Olaru (*Professional Examination Service, USA*)

Abstract

Situational Judgment Tests (SJTs) are a commonly used method in personnel selection and training, and more recently have begun to be used in educational contexts. Typically, these assessments contain a situation describing a dilemma or problem that can be solved with relevant knowledge, skills, abilities and other characteristics, about the correct behavior in that given situation. Respondents are presented with different options and are required to select the most appropriate response. We discuss recent research that uses this methodology to assess each of the Big Five personality factors, that is Conscientiousness, Agreeableness, Emotional Stability, Openness and Extraversion. Two studies involving cohorts of children and adolescents given SJTs to assess Conscientiousness, not only indicate a similar nomological network as found with self-report assessments, but also noteworthy advantages (e.g., repurposing the assessments to be formative, closer alignment with emerging social and emotional learning curriculum). In two further studies, conducted in several countries with recent high school graduates, SJT assessments of all Big Five constructs not only again mirror findings concerning the various nomological networks associated with each construct, but extend to prediction of meaningful workforce outcomes (e.g., supervisor ratings, counterproductive workplace behaviors). Numerous challenges exist for using this approach in large scale group score assessments, though benefits may far exceed costs. The presentation concludes with a discussion of these issues, and some potential remedies that could make this a reality.

Individual Paper Session V

Thursday, April 6th, 2017, 9:45 – 11:15

Paper Session:

Response style

Chair

Matthias von Davier (*National Board of Medical Examiners (NBME), USA*)

Room: Richard Strauss

Presentations

- Title: A mixture IR-Tree approach for measuring response styles using timing information.
Authors: Lale Khorrarnadel (*Educational Testing Service (ETS), USA*) & Matthias von Davier (*National Board of Medical Examiners (NBME), USA*)
- Title: Response styles in factual items: Personal, contextual, and cultural correlates.
Authors: Jia He & Fons van de Vijver (*Tilburg University, Netherlands*)
- Title: Prevalence and magnitude of question order effects in household surveys.
Authors: David Richter & Martin Kroh (*DIW Berlin, Germany*)

P5.1: A mixture IR-Tree approach for measuring response styles using timing information.**Authors**

Lale Khorramdel (*Educational Testing Service (ETS), USA*) & Matthias von Davier (*National Board of Medical Examiners (NBME), USA*)

Abstract

The measurement of noncognitive constructs using rating or Likert-type scales in international large-scale assessment gained in importance but comes not without problems. Response styles (RS) can occur and harm the validity and comparability of the rating data, especially in low stakes assessments where test-taking motivation might not be high. A new IRT approach (Böckenholt, 2012) and its multidimensional extension (Khorramdel & von Davier, 2014; von Davier & Khorramdel, 2013) seem to be promising in the measurement and correction of RS and have already been tested on personality and large scale assessment data. The current study is examining data from PIAAC (the Programme for International Assessment of Adult Competencies) and aims to optimize and validate this extended approach using mixture IRT models and variables such as cognitive scores and timing information. The examined rating data come from the PIAAC 2012 background questionnaire. The responses to selected questionnaire scales using a 5-point rating scale are decomposed into multiple response sub-processes and modeled through unidimensional and multidimensional IRT models. The advantages and challenges of a unidimensional measurement of RS will be discussed together with the attempt to use external variables for optimization and validation of the IRT approach.

P5.2: Response styles in factual items: Personal, contextual, and cultural correlates.**Authors**

Jia He & Fons van de Vijver (*Tilburg University, Netherlands*)

Abstract

This study investigated response styles in factual items and explored their associations with personal, contextual, and cultural factors. Responses on various factual questions, cognitive tests, and interviewers' observational data from a total of 152,514 respondents in 22 countries in the Programme for the International Assessment of Adult Competencies (PIAAC) were analyzed. Indexes of extreme, midpoint, and acquiescent response styles were extracted from Likert-scale and dichotomous responses of factual items. A general response style with a positive loading of extreme response style and negative loadings of midpoint and acquiescent response style was confirmed. This factor showed a similar crosscultural patterning as another general factor from attitudinal and self-evaluative items of Likert scales in a previous study, which indicated the pervasiveness of response styles irrespective of types of survey items. In a multilevel analysis, the individual-level general response style was found to be negatively related to being male, educational level, and literacy competency, and positively related to third person presence and background noise, and at country level negatively associated with socioeconomic development. Cross-level interactions were also found. Implications on the pervasiveness and nature of response styles are discussed.

P5.3: Prevalence and magnitude of question order effects in household surveys.**Authors**

David Richter & Martin Kroh (*DIW Berlin, Germany*)

Abstract

Question order effects refer to the phenomenon that different orders in which questions (or response options) are presented may influence respondents' answers in a systematic way. We draw on three large panel surveys (SOEP, SOEP-IS, PIAAC-L), in which the order of questions in the questionnaire often changes in an essentially random fashion over time. Analyses showed that distributions, means, and standard deviations of responses to questions on attitudes, beliefs, and opinions were highly comparable and almost identical across the different panels and across different survey years. We conclude that household panel surveys are robust with regard to question order effects.

Symposium XI

Thursday, April 6th, 2017, 11:30 – 13:00

Symposium:

Social trust, education and skills

Chair

William Thorn (*OECD, France*)

Room: Beethoven-Saal 1

Abstract

Part I: Trust is a complex, multidimensional concept that is hard to define and operationalize. However, despite ongoing disputes about how best trust can be conceived and measures, there is a general consensus on the importance trust has for social well-being and economic performance. Robert Putnam (1993) in his influential book *Making Democracy Work*, argued that 'generalized trust' fosters social solidarity between citizens, willingness to cooperate, and is therefore an important prerequisite of functioning democracies. In societies with high levels of generalized trust individuals share new ideas and exchange information efficiently, interacting with each other to overcome collective action problems (Fukuyama, 1995; Ostrom, 1990; Putnam, 1993, Tavits, 2006). Empirical work confirms that trust is an important social and economic resource: it is associated with economic development and functioning democratic institutions (Knack and Keefer, 1997; Putnam, 1993; Inglehart, 1997). In this symposium we want to look at different dimensions of social trust: interpersonal, institutional and political investigating the role education and skills can play in determining the propensity individuals have of trusting others. Although education has been identified as one of the strongest correlates of interpersonal trust, it is far less established what mechanisms are responsible for education gradients in trust, and what is the role of cognitive skills in shaping social trust. Even less is known about the role skills play in shaping institutional trust and the extent to which individuals perceive public actors to be responsive to citizens' demands. The three papers presented in this symposium exploit information in PIAAC to explore different mechanisms and processes that lay behind the generation of trust. Although PIAAC did not contain information on institutional trust, it contained an indicator of external political efficacy, which reflects individuals' beliefs on the responsiveness of governments.

Part II: Launched in 2005, the first cycle of PIAAC responded to the need for information to make cross-national comparisons on adult skills and related outcomes as well as the need to provide data for key national indicators. Its aim was to provide reliable information on how well education, training systems and life-long learning opportunities enable individuals to contribute to the social well-being and economic growth of their countries so that the quality and impact of education, training and life-long learning opportunities could be monitored and improved. The collaboration between education and labour market specialists in the development and analysis of PIAAC also provided a basis for international collaboration across different stakeholders in order to define and implement effective educational, training and labour market policies. Since the implementation of the first cycle of PIAAC, the policy discussion in many of the countries that participate in the study has progressively recognised the importance of non-labour market outcomes in shaping individual and social welfare, as the role non-cognitive skills play in determining how individuals fare in the labour market and in everyday life. Member countries are taking stock of the information provided by the first cycle of PIAAC and beginning to identify what needs they see as priority for the development

of the second cycle. This symposium will detail proposals developed by the Organisation for Economic Co-operation and Development (OECD) Secretariat, in conjunction with international experts, on two new modules: the first on non-cognitive skills and the second on non-labour market outcomes. The symposium will argue that the inclusion of personality characteristics and non-economic outcome measures will provide significant value added to the study in terms of policy insights and research potential. In the symposium developmental work conducted in these two areas will be discussed and participants in the symposium will have the opportunity to suggest improvements in light of future developments for potential inclusion in the second cycle of PIAAC.

Presentations

- Title: Beyond educational attainment: The importance of skills and lifelong learning for social outcomes. Evidence for Europe from PIAAC.
Authors: Esperanza Vera-Toscano, Margarida Rodrigues & Patricia Costa (*European Commission, France*)
- Title: Mind that gap: The mediating role of intelligence and education in explaining disparities in external political efficacy in 22 countries.
Author: Francesca Borgonovi (*OECD, France*)
- Title: Personality characteristics.
Author: Miloš Kankaraš (*OECD, France*)
- Title: Non-economic outcomes.
Author: Francesca Borgonovi (*OECD, France*)

S11.1: Beyond educational attainment: The importance of skills and lifelong learning for social outcomes. Evidence for Europe from PIAAC.**Authors**

Esperanza Vera-Toscano, Margarida Rodrigues & Patricia Costa (*European Commission, France*)

Abstract

Empirical evidence suggests that educational attainment nurtures individuals' social outcomes and promotes active participation in society and stability. However, it is unclear to what extent other types of human capital also correlate with social outcomes. To further disentangle this issue, we explored the unique opportunity offered by the PIAAC survey through its provision of information on educational attainment, observed individual key skills proficiency, and participation in adult education and training (adult lifelong learning). We therefore studied the association between these human capital variables and social outcomes, specifically interpersonal trust and participation in volunteer activities. Results revealed that these social outcomes are affected not only by the formal qualification obtained, determined by the education variable, but throughout the life-cycle. In fact, education and training when undertaken during adult life have a significant impact, especially for volunteering. The fact that the skill proficiency also plays a significant role is extremely relevant, as skills are more likely to change over the life-cycle either in a positive or negative way. Indeed, while the formal education received is constant after exiting the educational system, skills more accurately reflect competences: first, because individuals with the same level of education may have different skill levels due to differences in the quality of education or ability; second, because skills can vary over time, for example, they may increase with work experience or informal education or decrease as a result of depreciation and ageing. These findings suggest that social outcomes are prone to be affected by many factors other than formal education, suggesting that policy makers can implement recommendations even after formal education has been completed.

S11.2: Mind that gap: The mediating role of intelligence and education in explaining disparities in external political efficacy in 22 countries.**Author**

Francesca Borgonovi (*OECD, France*)

Abstract

I examine between-country variations in overall levels of external political efficacy and disparities in political efficacy by parental education. Furthermore, I identify the mediating role of individuals' cognitive abilities and own education, as well as how contextual characteristics determine the importance cognitive abilities have for political self-efficacy beliefs. I use data from the 2012 OECD Survey of Adult Skills, a large-scale international assessment containing information on the education, cognitive skills, parents' education and external political efficacy of individuals in 22 countries worldwide. I find that external political efficacy is strongly related to parents' education in virtually all countries examined and that, on average, around 60% of the parental education gradient is mediated by cognitive abilities and own education. Such mediating role differs across countries. Countries with plurality electoral rules enjoy smaller disparities in external political efficacy, but at the expense of overall lower levels of external political efficacy. Smaller disparities are explained by the fact that in these countries cognitive abilities are considerably less importantly associated with political efficacy than in countries with other political systems. Level of economic development and the quality of political institutions are not associated with

disparities in external political efficacy but are positively associated with overall levels of external political efficacy.

S11.3: Personality characteristics.

Author

Miloš Kankaraš (*OECD, France*)

Abstract

Personality characteristics shape human behaviour and influence a wide range of life events and outcomes. They do so not only through their immediate effects on life outcomes, but also through their indirect effects on other important personal factors and intermediate life events, such as the development of cognitive capacities, the attainment of educational qualifications or the formation of a family. As such, personality characteristics have a demonstrated relevance for a wide range of policy issues and represent an important subject of policy interest. Although the assessment of these characteristics is complex, a wide range of measurement instruments has been developed and tested, with relatively solid measurement properties and a range of applications. What is more, the efficiency of these instruments is often superior to those designed to measure cognitive skills, with some of them being able to provide a broad assessment of basic personality dimensions within one minute of testing time. Thus, the inclusion of some of these measures in various policy-oriented assessment programmes, such as PIAAC, would add valuable information about the ways in which these characteristics interact with cognitive skills and other personal and external factors in influencing important life events.

S11.4: Non-economic outcomes.

Author

Francesca Borgonovi (*OECD, France*)

Abstract

Reflecting an increasing dissatisfaction with measures of income as good proxy of individuals' and measures of GDP as measures of societies' welfare, the Report by the Commission on the Measurement of Economic Performance and Social Progress recommended that national statistical agencies collect and publish direct measures of well-being. The key objective of PIAAC is to identify and examine the benefits that are associated with information processing skills, and the extent to which underlying differences in such skills mediate or moderate the effects of education, personal background characteristics and labour market participation. In order to appreciate such benefits in full it is important to characterise individuals' broad well-being, which includes material well-being (through measures of income and labour market participation) as well as physical well-being (health), psychological well-being (satisfaction with different life domains), and social well-being (social connectedness, social capital and civic participation). PIAAC offers a unique opportunity to evaluate the broad social benefits education can have, both examining the indirect effects it has through labour market performance and skills acquisition. In the second cycle, PIAAC could widen and deepen the coverage of existing well-being outcome constructs. The proposal is to develop a module on non-labour market outcomes articulated around 5 themes: Health (health status and behaviours); Well-being (satisfaction with life domains); Civic engagement and leisure time; Social connectedness; Trust (institutional and interpersonal).

Individual Paper Session VI

Thursday, April 6th, 2017, 11:30 – 13:00

Paper Session:

Skills and wages

Chair

Marco Paccagnella (*OECD, France*)

Room: Joseph Haydn

Presentations

- Title: Wage inequality and returns to workplace training for male and female employees. A quantile regression analysis.
Author: Rossella Icardi (*National Centre for Social Research, United Kingdom*)
- Title: General competencies or certificates? Wage determination for complex tasks in Germany.
Authors: Stefanie Velten (*Federal Institute for Vocational Education and Training, Germany*) & Christian Ebner (*University of Cologne, Federal Institute for Vocational Education and Training, Germany*)
- Title: The causal effect of cognitive skills on the distribution of wages.
Authors: Marco Paccagnella (*OECD, France*), Lorenzo Cappellari (*Catholic University of Milan, Italia*), Daniele Checchi & Marco Leonardi (*University of Milan, Italia*)
- Title: Returns to education and skills in the new economy: The role of skill use, cognitive skills and occupational sorting.
Author: Xavier St-Denis (*McGill University, Canada*)

P6.1: Wage inequality and returns to workplace training for male and female employees. A quantile regression analysis.

Author

Rossella Icardi (*National Centre for Social Research, United Kingdom*)

Abstract

Whilst there is evidence that participation in workplace training has a positive association with wages, it is unknown whether it differs between men and women. This investigation may provide additional explanations as to why the systematic difference in wages between men and women persists in the labour market. Using data from the Programme for International Assessment of Adult Competencies (PIAAC), this paper looks at individuals educated up to the secondary level in Germany and England and examines whether workplace training returns vary by gender. This study uses quantile regressions to establish whether the association between training and wages also varies across the wage distribution. Moreover, it takes quantile regression one step further by using unconditional quantile regression to estimate the effect of workplace training participation on the unconditional wage distribution. Findings show that the association between workplace training and wages does not differ between men and women; however, unconditional quantile results reveal that workplace training returns differ across unconditional wage quantiles thereby indicating that estimation methods that focus on the mean hide more complex patterns of results.

P6.2: General competencies or certificates? Wage determination for complex tasks in Germany.

Authors

Stefanie Velten (*Federal Institute for Vocational Education and Training, Germany*) & Christian Ebner (*University of Cologne, Federal Institute for Vocational Education and Training, Germany*)

Abstract

Comparative studies document that in Germany there are particular strong links between the educational system and the labour market. However, it is rather unclear which role cognitive skills play on the German labour market. According to the OECD, skills like numeracy, literacy and problem solving are key-informationprocessing skills which "provide a foundation for effective and successful participation in the social and economic life of advanced economies" (OECD, 2013a, p. 52). A huge body of evidence demonstrates that those skills are linked to full-time-employment and earnings and to individuals' participation in community groups (OECD & Statistics Canada, 2011). Using Mincer's (1974) regression model the influence of human capital on wages is calculated, often by resorting to test scores on cognitive skills (Charette & Meng, 1998). Referring to the task approach researchers demonstrated that wages are not only influenced by individuals' skills, but also by job tasks and requirements. Autor and Handel (2013) revealed that "abstract problem solving and creative, organizational, and managerial tasks" (p.570) are linked to higher earnings than manual or routine tasks. In our paper, we investigate if there is an additional wage premium for skills and educational certificates when performing complex tasks. Evidence for this interaction hypothesis is provided by Gottfredson (2004) who argued that "the advantages conferred by higher levels of g [general cognitive skills] are successively larger in successively more complex jobs, tasks, and settings" (p. 176). Meta-analytical findings found evidence for this idea (Salgado et al., 2003). The analyses are conducted using the 2012 German PIAAC data set. For our analyses, we focus on numeracy as the core cognitive skill. As there is no clear conceptualization of task complexity, three scales are used to represent this construct: complex problem solving at

work, autonomy and social interaction. We find a significant incremental effect of numeracy skills on employee's earnings beyond a set of control variables and educational certificates. As expected, wages are strongly influenced by educational certificates. Complex task requirements like problem solving, autonomy and social interaction explain additional variance in wages. However, we could not find any interaction effects. Reasons for this will be discussed.

P6.3: The causal effect of cognitive skills on the distribution of wages.

Authors

Marco Paccagnella (*OECD, France*), Lorenzo Cappellari (*Catholic University of Milan, Italia*), Daniele Checchi & Marco Leonardi (*University of Milan, Italia*)

Abstract

This paper use data from the Survey of Adult Skills, a standardized cross-country assessment of the literacy and numeracy proficiency of the adult population in a number of OECD countries and economies, to estimate the causal effect of cognitive skills on wages. Our identification strategy exploits differences across countries in the timing of educational reforms. More specifically, we look at the introduction of national standardized tests. Reforms introducing these tests usually aims to increase the quality of education (and therefore literacy and numeracy proficiency, for given years of education), as tests are used to hold schools more accountable for their performance (Checchi et al., 2013). In the spirit of Brunello et al. (2009), we argue that the introduction of standardized tests (like most educational reforms) is orthogonal to idiosyncratic characteristics of particular cohorts, and can therefore be used to instrument the literacy or numeracy proficiency of individuals that, belonging to different cohorts, were differentially exposed to the reform. Furthermore, we use econometric techniques recently developed in Powell (2016) to estimate the effect of cognitive skills at different parts of the unconditional distribution of wages. These methods overcome the limitations of traditional conditional quantile regression (that is only informative about the impact on within wage inequality, and whose result depend on the choice of the set of control variables), allowing to interpret the results as the direct effects of cognitive skills on overall wage inequality.

P6.4: Returns to education and skills in the new economy: The role of skill use, cognitive skills and occupational sorting.

Author

Xavier St-Denis (*McGill University, Canada*)

Abstract

Recent research emphasizes the increasing reward to education and skills in the new economy. Existing findings show that some of the wage premium associated with post-secondary education is accounted for by the higher cognitive skills of university graduates. Nevertheless, this approach cannot account for highly rewarded skills that are not cognitive skills. This paper therefore asks whether the wage premium associated with a post-secondary occupation is accounted for by the greater use of a wide variety of cognitive and non-cognitive skills used at work. I find that although some share of the post-secondary wage premium is explained by the higher cognitive skill level of graduates (based on the PIAAC assessment based numeracy and literacy scores), a much greater share of that wage premium is explained by skill use variables available from the background questionnaire, which capture

a wide array of skills that are generally considered as highly rewarded in the new economy. The findings hold across 24 countries of the PIAAC sample, suggesting that labour markets operate in a similar way across OECD countries. Consistent with recent research in sociology, I also find that wage returns to education are associated with occupational sorting, net of cognitive skills. Moreover, part - but not all - of the returns to education that are associated with greater skill use are driven by this occupational sorting effect. In addition, I find a large within-occupation of skill use on earnings, which denotes skill use heterogeneity beyond 2-digit occupations. In fact, most of the between-occupation effect of skill use happens at the 1-digit level. This highlights the advantage of data sources providing direct measures of skill use rather than occupational-level skill demand measures also available to researchers. The existing literature suggests that occupational composition might be behind some of that residual effect. Finally, there is a large net effect of skill use on earnings, within occupations and levels of educational, suggesting that there is a great amount of within-group skill use heterogeneity across jobs on the labour market.

Individual Paper Session VII

Thursday, April 6th, 2017, 11:30 – 13:00

Paper Session:

Civic engagement and migrant skills

Chair

Paula Protsch (*WZB Berlin Social Science Center, Germany*)

Room: Richard Strauss

Presentations

- Title: The effect of different forms of learning activities on social capital development.
Authors: Mariel Leonard & Vlad Achimescu (*University of Mannheim, Germany*)
- Title: A multilevel analysis of risk of social exclusion for young people lack of literacy.
Author: Suehye Kim (*UNESCO Institute for Lifelong Learning, Germany*)
- Title: State institutions, social trust and participation in continuing vocational education and training: Immigrants and natives differ across 27 societies.
Authors: Nate Breznau (*Mannheim Centre for European Social Research, Germany*) & Judith Offerhaus (*Institute for Sociology and Social Psychology (ISS), University of Cologne, Germany*)
- Title: Educational tracking and the ethnic skills gap: An analysis of 14 countries.
Authors: Jan Paul Heisig (*WZB - Berlin Social Science Center, Germany*) & Merlin Schaeffer (*University of Cologne, Germany*)
- Title: Language matters: The outcomes of migrants in PIAAC.
Authors: Fernando Sols & Francesca Borgonovi (*OECD, France*)

P7.1: The effect of different forms of learning activities on social capital development.**Authors**

Mariel Leonard & Vlad Achimescu (*University of Mannheim, Germany*)

Abstract

Do different forms of learning activities have differing effects on levels of social capital? Research has shown that education plays a significant role in increasing an individual's levels of social capital (Huang et al., 2009), regardless of age, gender, health, and income (Nie et al., 1996; Putnam, 2000). However, the effects of different forms of learning activities remain relatively unexplored. While some research has compared participation in open or distance education (Francescato et al., 2006; Mays, 2016), the effects of on-the-job training and participation in seminars have not yet been considered. This project will compare the effects of four forms of learning activities (formal education, open/distance education, on-the-job training, and seminars) on an individual's level of social capital, as measured by their levels of trust and of participation in voluntary associations, using data from Round 1 of the OECD's survey of adult skills (PIAAC). In doing so, we hope to shed further light on the mechanisms by which education effects social capital.

P7.2: A multilevel analysis of risk of social exclusion for young people lack of literacy.**Author**

Suehye Kim (*UNESCO Institute for Lifelong Learning, Germany*)

Abstract

From research to practice, it has been substantially suggested that young people develop their literacy and foundational skills to fully participate in society. A well-documented literature has mainly concerned the rise of youth unemployment rate around the world since the global financial crisis (Bruno, Marelli & Signorelli, 2014; Siraj et al., 2014; Russell, 2013). It mainly focuses on causes of the youth unemployment in different dimensions such as individual risk factors, educational risk factors, and structural barriers. However, the relationships between literacy and the other social outcomes are relatively less researched. This presentation aims to fill this gap using the data sources from the Programme International Assessment for Adult Competencies (PIAAC). To take account of international variations in the association of multiple literacies with social engagement, it will adopt a multilevel and multisource dataset pertaining country level predictors available from the PIAAC and the UNESCO Institute for Lifelong Learning survey data on the third edition of Global Report on Adult Learning and Education. For a comparative analysis, I will bring key measures of adult learning and education as a national indicator into the multilevel modeling. Considering the multilevel structure inherent in the relationships literacy and social engagement of young people, two-level analysis will be used to disseminate empirical evidence on how key cognitive skills (literacy, numeracy, and problem solving skills in technology-rich environments) are related to engage in society among those aged 25 to 34 years. As an outcome of social engagement, two measures will be available from the PIAAC Background Questionnaire survey items for civic engagement and NEET (Not in Education, Employment, and Training). Key interesting variable will be measured by a set of proficiency scores in the PIAAC Assessment of the Competencies of Adults, and I will include socio-demographic background variables such as gender, years of schooling and parents' education level. This study will contribute to an extended understanding of the returns to literacy skills from economic to social outcomes. Also, it will further discuss the question of how to

encourage young adults with low skills in shaping appropriate patterns of socio-economic engagement and rethink literacy as a set of broader skills with a wide range of applications across different life spheres.

P7.3: State institutions, social trust and participation in continuing vocational education and training: Immigrants and natives differ across 27 societies.

Authors

Nate Breznau (*Mannheim Centre for European Social Research, Germany*) & Judith Offerhaus (*Institute for Sociology and Social Psychology (ISS), University of Cologne, Germany*)

Abstract

Theoretically, strong social states promote generalized trust through transfers and service-provision. However, the process may not work across all social strata. Here we observe state involvement in work-related education and training (hereafter VET). We aim to confirm previous research on the state linkage with general trust, by testing for a state-trust interaction on the likelihood of individual VET participation. Then we test whether this relationship is similar for natives (3rd generation or longer) in comparison to immigrants (1st and 2nd generation). Using PIAAC data for 27 countries we find that the 'trust effect' is largely confined to natives. All-in-all, the state-trust interaction taken at one standard deviation in differences, accounts for a 7-9 percentage point increase in the likelihood of individual VET participation. Immigrants do not have higher trust where the state is a stronger proponent of VET, nor does trust predict VET participation.

The role of the state in promoting trust is supported by this research; however, this effect exists mostly for natives. Immigrants experience only a tiny increase in trust and only taken at extreme ends of state provision of VET. Moreover the state-trust interaction offers evidence for how state involvement in education and labor markets can increase individual and employer willingness to participate or offer participation in mobility enhancing activities such as VET. But only for natives. We run additional models predicting the likelihood to train, all else equal and find that despite levels of state VET provision and levels of trust, immigrants are as likely to participate in VET as natives. If we spin this finding around, it suggests that trust may also be a barrier to native participation. States that are strong promoters and providers of VET may foster stronger status and/or trust distinctions for natives. Therefore, immigrants face trust as one less barrier to participation in VET. In fairness we have no information about the quality or quantity of VET, therefore we must exercise caution with our conclusions. Nonetheless, this research offers further evidence of immigrant social networks and their strong source of social capital operating in the realm of VET.

P7.4: Educational tracking and the ethnic skills gap: An analysis of 14 countries.

Authors

Jan Paul Heisig (*WZB - Berlin Social Science Center, Germany*) & Merlin Schaeffer (*University of Cologne, Germany*)

Abstract

Previous research shows that children of immigrants, the "second generation", have comparatively high educational aspirations that translate into unusually high transition rates given their level of performance in school. But at the same time, research also demonstrates that second-generation immigrants tend to perform worse in school. Combined, these findings imply that second-generation immigrants have lower actual skills than natives with

the same educational qualifications. In this study, we use data on 14 countries from the Programme for International Assessment of Adult Competencies (PIAAC) to investigate this possibility empirically and to study how it relates to the education system. In particular, we focus on tracking in secondary education as a key factor that strengthens the role of "gatekeepers" such as teachers in getting access to different educational tracks and thereby limits the extent to which higher aspirations can translate into higher educational attainment. We find that the actual skills of second-generation immigrants are indeed lower than those of natives with similar educational qualifications in open, "choice-driven" systems with little tracking. Conversely, we find that this gap tends to be smaller and in some cases even goes in the opposite direction in tracked systems (perhaps indicating that second-generation immigrants need to perform better than natives to have the same chance of being admitted to a higher educational track). We discuss implications of our findings for comparative research on ethnic disadvantage on the labor market.

PF.5: Language matters: The outcomes of migrants in PIAAC.

Authors

Fernando Sols & Francesca Borgonovi (*OECD, France*)

Abstract

Analyses of data from the OECD Survey of Adult Skills (PIAAC) reveal that immigrants show lower levels of literacy proficiency and have on average less favourable labour market outcomes than native-born individuals, even when they are highly educated. Furthermore, previous research reveals that poor language skills are one of the major hurdles for the social and economic integration of immigrants and acquiring such skills may be particularly time consuming for those immigrants whose mother tongue belongs to a different linguistic family than the language spoken in their destination country. By combining cross-country data from PIAAC with a unique measure of language dissimilarity, we examine the contribution of language proximity in explaining differences in literacy, numeracy, employment and wage levels across different groups of immigrants. The measure of linguistic distance is derived from the Automatic Similarity Judgement Program developed by the Max Planck Institute of Evolutionary Anthropology. The index measures the degree of dissimilarity between any two pairs of languages identifying differences in pronunciation of words that have the same meaning. Our paper broadens the existing literature in the following ways. First, Secondly, by using PIAAC, which includes an objective measure of literacy and numeracy skills, we avoid possible measurement errors included in previous analysis based on self-reported language metrics. Secondly, we develop additional evidence on the role linguistic proficiency plays in facilitating the integration of immigrants in host countries, developing a more fine-grained categorisation of language proximity which goes beyond simplistic dichotomous categorisations (speaks host country language as mother tongue or not. And thirdly, we obtain additional evidence on the validity of the Critical Period Hypothesis, which posits that language acquisition is costlier for immigrants settling at the age of 12 or older. We find that differences in literacy and numeracy proficiency levels explained by differences in linguistic origin can exceed the gaps observed between employed and unemployed individuals, and that they remain significant even after migrants stay several years in the host country. We also we find that the effect of linguistic distance is more pronounced among those immigrants who arrive at an older age to the host country.

Individual Paper Session VIII

Thursday, April 6th, 2017, 14:00 – 15:30

Paper Session:

Returns to education and skills

Chair

Jan Paul Heisig (*WZB – Berlin Social Science Center, Germany*)

Room: Richard Strauss

Presentations

- Title: The relationship between non-cognitive skills and life outcomes in Poland.
Authors: Karolina Świst & Marta Palczyńska (*Educational Research Institute, Warsaw, Poland*)
- Title: Soft skills, hard world: Examining the relationships between tertiary education, soft skills, and occupational status in Germany and the United States.
Authors: Frank Fernandez & Liu Huacong (*The Pennsylvania State University, USA*)
- Title: Cross-country comparisons on the relative relationship between education and workplace task discretion.
Authors: Ashley Pullman (*University of British Columbia, Canada*) & Janine Jongbloed (*Institut de Recherche sur l'Éducation, Université Bourgogne Franche-Comté, Dijon, France*)
- Title: Cross-national deployment of "Graduate Jobs": Analysis using a new indicator based on high skills use.
Authors: Golo Henseke & Francis Green (*University College London, United Kingdom*)
- Title: Trade-off between occupation-specific skills and key competences: The consequences of different vocational education and training (VET) pathways and its impact on PIAAC skills and relevant labor market outcomes.
Author: Eduard Stöger (*Statistics Austria, Austria*)

P8.1: The relationship between non-cognitive skills and life outcomes in Poland.**Authors**

Karolina Świąt & Marta Palczyńska (*Educational Research Institute, Warsaw, Poland*)

Abstract

There is a large volume of empirical literature providing evidence that not only cognitive skills but also non-cognitive skills are important for life outcomes. This paper assesses the relationship between the Big Five and Grit scales and social and economic outcomes in a large representative sample of adults in Poland. The data from the Polish Follow-up Study on the Programme for International Assessment of Adult Competencies (postPIAAC) include longitudinal information on PIAAC respondents in Poland and additional background information not available in the international study. The results of OLS regression presented in this paper confirm earlier findings from the literature that differences in personality traits are clearly associated with differences in the outcomes. Conscientiousness is positively linked to most of the outcomes while Neuroticism has a negative relationship. Extraversion is positively related to self-rated outcomes such as job and life satisfaction or health. There is also a negative relationship between Agreeableness and wages. Openness is positively related to educational attainment. For most of the outcomes, the Big Five traits outperform cognitive skills in predictive power. Only educational attainment is more strongly related to cognitive skills, while for wages, the predictive power of personality and cognitive skills is similar. The paper also applies structural equation modeling (SEM) framework for a comparison. Such a framework allows for investigating the causality of relationships, incorporating the latent trait interactions and the analysis of mediation and moderation (Little, Card, Boivard, Preacher & Candall, 2007). What is more, this approach allows for a more effective control of measurement error. Finally, conclusions on the relationship between cognitive and non-cognitive skills in both SEM and OLS frameworks will be provided

P8.2: Soft skills, hard world: Examining the relationships between tertiary education, soft skills, and occupational status in Germany and the United States.**Authors**

Frank Fernandez & Liu Huacong (*The Pennsylvania State University, USA*)

Abstract

In an increasingly global, high-tech economy, many international leaders have looked beyond traditional skill sets, such as numeracy and literacy, to focus on more abstract attitudes and abilities, often times labeled as "soft skills" or "noncognitive skills". Non-cognitive skills are often contrasted with technical skills, which are necessary but not sufficient for workers who wish to move beyond entry-level jobs or who aspire to enter professional fields.

Although non-cognitive skills are receiving more attention, there is a lack of literature that explores how they are related to educational attainment (and how the two, together, are correlated with labor market outcomes). In this study, we focus on the United States and Germany for this analysis because of their distinct education systems as well as labor market characteristics. The two education systems differ significantly in balancing between providing students with general skills versus specific skills (Allmendinger, 1989; Bol & Van de Werfhorst, 2013; Muller & Gangl, 2003). Generally speaking, for example, the United States' educational system is strongly oriented towards providing general qualifications with an emphasis on general skills such as critical thinking, analytical writing, etc. In contrast, Germany exemplifies the traditional vocation-oriented systems that feature extensive vocational training through apprenticeship programs or occupationally specific training in vocational schools. The two

countries also exhibit distinct labor market features. For example, Germany has higher union density, stricter employment protection, and larger public-sector shares than the United States. Returns to general skills show a distinct pattern between these two countries. They are significantly lower in Germany. Hanushek, Schwerdt, Wiederhold, and Wößmann (2015) explained that this is probably due to Germany's labor market characteristics – higher union density, stricter employment protection, and larger public-sector shares.

Using OECD's Survey of Adult Skills (PIAAC) data, this study is guided by the following research questions: 1. How is tertiary educational attainment correlated with workers' development and use of non-cognitive skills in the U.S. and Germany?; 2. How are non-cognitive skills correlated with workers' occupational status after controlling for educational attainment? Is this relationship the same between U.S. and Germany, two countries with distinct labor market characteristics?

P8.3: Cross-country comparisons on the relative relationship between education and workplace task discretion.

Authors

Ashley Pullman (*University of British Columbia, Canada*) Et Janine Jongbloed (*Institut de Recherche sur l'Éducation, Université Bourgogne Franche-Comté, Dijon, France*)

Abstract

Over 40 years ago, Bowles and Gintis argued that research in education cannot be conducted without reference to both labour power and 'the demands of working people – for literacy, for the possibility of greater occupational mobility, for financial security, for personal growth, for social respect' (1976, 240). Within the study of education and work various perspectives take up this appeal, examining how education and skill not only generate productive and political forms of labour power (Collins, 1979) but also have the power to transform work (Baker, 2009). Of central importance for Bowles and Gintis is 'the degree to which workers have control over planning, decision-making, and execution of production and tasks, as well as sufficient autonomy to express their creative needs and capacities' (1976, 68-69). That is, education is argued to not only prepare individuals for economic life but also to be intimately connected to the nature of work itself. Through analyses utilizing the OECD Programme for the International Assessment of Adult Competencies (PIAAC), we consider the relationship between education and workplace task discretion in an international comparative context. We study how mechanisms of inequality function through both 'direct' and 'indirect' means by examining the mediated and non-mediated relationships between education, skill, occupational sector and task discretion through the KHB method of statistical analysis. The ways in which these relationships are dependent on the availability of task discretion across occupational sectors within a country are considered. Theoretically, individual-agency and critical-institutional hypotheses are compared, two perspectives which provide divergent explanations for the association between education and task discretion. Although our findings partially support both perspectives, we find strong evidence of a relative relationship between education and task discretion. That is, a rising tide lifts all boats. We find that in contexts where overall levels of task discretion are higher, education and skill operates less strongly as a stratifying force.

P8.4: Cross-national deployment of "Graduate Jobs": Analysis using a new indicator based on high skills use.**Authors**

Golo Henseke & Francis Green (*University College London, United Kingdom*)

Abstract

Utilising work task data drawn from the OECD's Survey of Adult Skills of 2011/2012 and 2014/2015, we derive a new skills-based indicator of graduate jobs, termed ISCO(HE)2008, for twenty-seven countries. The indicator generates a plausible distribution of graduate occupations and explains graduates' wages and job satisfaction better than hitherto existing indicators. Unlike with the traditional classifier, several jobs in major group 3 "Technicians and Associate Professionals" require higher education in many countries. Altogether, almost a third of labour is deployed in graduate jobs in the 31 countries, but with large cross-national differences. Industry and establishment-size composition can account for some of the variation. In addition, two indicators of the relative quality of the higher education system also contribute to the variation in the prevalence of graduate jobs across countries.

P8.5: Trade-off between occupation-specific skills and key competences: The consequences of different vocational education and training (VET) pathways and its impact on PIAAC skills and relevant labor market outcomes.**Author**

Eduard Stöger (*Statistics Austria, Austria*)

Abstract

Recent analyzes of the PIAAC data points out the particular relevance of the formal school system for the development of PIAAC competences "literacy" and "numeracy". Against this background, this paper focuses on a very important educational track within the Austrian school system (as well as in Germany and Switzerland): the apprenticeship system.

As the company-based part is dominating within the apprenticeship system, the training of occupation-specific skills is highlighted within the curricula, but with inherent consequences on the provision of basic skills on the one hand and employability chances on the other hand. This trade-off is an important aspect for VET policy and VET research and thus this paper provides analyses by combining different data sources in Austria covering the following research questions: - Differences on the proficiency level between apprentices and pupils who completed a comparable VET school on the same ISCED level (so called "Berufsbildende Mittlere Schulen") (Data source: PISA); - Labor market status of apprenticeship graduates (i.e. skilled workers) compared to comparable VET -graduates on the same ISCED level (so called "BMS-graduates") within the first four years after completion (Data source: Educational Monitoring); - Differences on PIAAC skills between apprenticeship graduates (i.e. skilled workers) and BMS-graduates (Data source: PIAAC) when also accounting for other important characteristics of graduates such as cultural capital of the parental home or the use of key skills in everyday life.; - Key labor market results (risk of unemployment, employment patterns, number of change of business sectors) apprenticeship graduates (i.e. skilled workers) compared to comparable VET-graduates on the same ISCED level (so called "BMS-graduates") (Data source: PIAAC linked with Educational Monitoring and Public Employment Service)

Symposium XII

Thursday, April 6th, 2017, 14:00 – 15:30

Symposium:

Skills in the labor market, choices in the working sphere,
and the anatomy of risk and trust preferences

Chair

Daniel D. Schnitzlein (*DIW Berlin & Leibniz University Hannover, Germany*)

Room: Beethoven-Saal 1

Abstract

The papers in this symposium discuss the effects and predictive power of cognitive and non-cognitive skills in different labour market contexts as well as the relationship between cognitive skills and measures of risk and trust preferences which are important individual characteristics on the labour market. The first presentation analyses the relationship between job-related training, learning opportunities at work, and personality traits. The second contribution presents new evidence on the gender wage gap in Germany, by analysing the role of field of study, and thus skills acquired, and occupational choice. Presentations three and four analyse the relationship between measures of cognitive ability and measures of risk and trust preferences.

Presentations

- Title: Job-related training, learning opportunities at work and personality traits.
Author: Katharina Poschmann (*DIW Berlin, Germany*)
- Title: The gender wage gap in Germany: Field of study and occupational choice.
Authors: Michele Battisti (*ifo Institute at the University of Munich, Germany*) & Alexandra Fedorets (*DIW Berlin, Germany*)
- Title: The relationship between cognitive skills and risk aversion. New evidence from German panel data.
Authors: Luise Burkhardt (*DIW Berlin, Germany*), Daniel D. Schnitzlein (*DIW Berlin, & Leibniz University Hannover, Germany*) & Jürgen Schupp (*DIW Berlin, Germany*)
- Title: Do cognitive skills foster trust? Evidence from 30 countries around the world.
Author: Daniel D. Schnitzlein (*DIW Berlin & Leibniz University Hannover, Germany*)
- Title: The cognitive basis of trust: A cross-national analysis of the relation between education and self-reported interpersonal trust.
Authors: Francesca Borgonovi (*OECD, France*) & Artur Pokropek (*European Commission, France*)

S12.1: Job-related training, learning opportunities at work and personality traits.**Author**

Katharina Poschmann (*DIW Berlin, Germany*)

Abstract

Participation in job related training is distributed unequally over the German working population. This is seen critically since it intensifies existing structural problems regarding education and equal (job related) opportunities. Both, individual and organizational determinants play a role for job related training: from analysis on individual characteristics we know that educational level, occupational status, age, gender and cognitive skills are strong predictors for participation in job related training. Research on company related predictors for training shows that company size, existence of a strategy for professional development of employees, professional regulations of training, public or private sector or worker participation (e.g. the existence of a work council) explain, to some degree, training chances of employees. More recent findings show that knowledge intensity of occupations and complexity of tasks are prominent predictors for training chances. So far, sociological work has not addressed the question in which way, and to which extent, personal attributes and personality are related to working contexts that foster training and professional development. Interdisciplinary literature implies more often analyses of personality traits, but with different research interest (e.g. impact of personality traits on job performance, information processing or future decision making in economics or personality-organization fit in psychology). Having data from both, PIAAC-L and PIAAC, my analysis relates working context to personal attributes of employees. In a first part I analyse tasks and skills that are applied among employees in both training intense working contexts and in work environments that offer poor conditions for training. A second part addresses the question whether personality traits, personal attributes and attitudes towards adult learning make a contribution to explain the choice of working context. This is analysed from a retrospective perspective. Multivariate regression models are applied to answer the research questions.

S12.2: The gender wage gap in Germany: field of study and occupational choice.**Authors**

Michele Battisti (*ifo Institute at the University of Munich, Germany*) & Alexandra Fedorets (*DIW Berlin, Germany*)

Abstract

The closing of the gender wage gap that has been documented since 1980s is often explained by growing educational levels of women, their engagement in non-routine cognitive tasks or falling occupational segregation. However, the literature has been unable to relate these changes to individual skills and thusly to demonstrate to what extent women's potentials are utilized in the labour market. In the current study, we use PIAAC and PIAAC-L data for Germany to relate the gender wage gap to objective measures in literacy, numeracy and problem-solving in technology-rich environments. The observed gap in skills is particularly high in numeracy, is growing with age and can be explained by different choices of field of study and occupation made by men and women. Thus, we argue that proficiency in numeracy highly depends on time spent in activities that involve this skill and, thusly we are able to quantify to what extent the gender pay gap can be explained by skills, as well as the field of study and occupational choice.

S12.3: The relationship between cognitive skills and risk aversion. New evidence from German panel data.**Authors**

Luise Burkhardt (*DIW Berlin, Germany*), Daniel D. Schnitzlein (*DIW Berlin & Leibniz University Hannover, Germany*) & Jürgen Schupp (*DIW Berlin, Germany*)

Abstract

Preferences for willingness to take risk are important characteristics that shape many economic decisions of individuals. The existing literature has emphasized the positive relationship between measures of willingness to take risks and measures of cognitive ability. Based on data from PIAAC-L, we reassess this relationship. We try to replicate the positive correlation between the skill measures in PIAAC-L and the included survey measure of willingness to take risk. However, our results show that none of the skill measures has a positive significant correlation with the risk measure. This result is robust to the inclusion of the short IQ measures surveyed in the most recent wave of PIAAC-L.

S12.4: Do cognitive skills foster trust? Evidence from 30 countries around the world.**Author**

Daniel D. Schnitzlein (*DIW Berlin & Leibniz University Hannover, Germany*)

Abstract

Beside risk preferences, willingness to trust in others is one of the key requirements in economic transactions. A growing literature in economics deals with the question what factors determine an individual's willingness to trust. Existing results highlight a strong and robust positive correlation between measures of cognitive abilities and trust measures. However, most of the existing literature only focuses on single country studies, or is only able to include proxies for cognitive ability. The present study applies data from the Programme for the International Assessment of Adult Competencies (PIAAC) which includes survey measures of trust for more than 30 countries around the world. In addition, PIAAC contains comprehensive measures of cognitive abilities in three domains, numerical skills, literacy skills, and problem solving skills. The results show, that the average level of trust varies substantially among the analysed countries with the Scandinavian countries ranked at the top of the scale. The evidence supports a positive correlation between trust and cognitive abilities over all countries. This result is robust to including country fixed effects or controlling for indices of democracy or corruption. However, the strength of this relationship substantially varies between countries with a group of countries showing no significant relationship at all and Indonesia with even a negative correlation.

S12.5: The cognitive basis of trust: A cross-national analysis of the relation between education and self-reported interpersonal trust.**Authors**

Francesca Borgonovi (*OECD, France*) & Artur Pokropek (*European Commission, France*)

Abstract

Interpersonal trust is important for social and economic well-being. Studies have indicated that education is strongly associated with individuals' propensities to trust anonymous others, although such association differs across countries. We examine between-country differences in the mechanisms through which education could promote interpersonal trust using data from the OECD's Survey of Adult Skills (PIAAC). PIAAC is unique in that it contains detailed information on individuals' cognitive abilities measured through a standardised and internationally developed assessment of information processing abilities as well as information gathered through a questionnaire on self-reported interpersonal trust, socio-economic and demographic characteristics. Our analysis reveals large differences across countries in the extent to which the association between education and interpersonal trust is direct or is mediated through cognitive abilities. Using multilevel modeling we also explain cross country differences in relation between education and self-reported interpersonal trust and moderations mechanisms.

Paper Session:

Skill gain and loss around the world

Chair

Simon Wiederhold (*Ifo Institute, Germany*)

Room: Joseph Haydn

Presentations

- Title: The value of smarter teachers: International evidence on teacher cognitive skills and student performance.
Authors: Marc Piopiunik, Simon Wiederhold (*Ifo Institute, Germany*) & Eric A. Hanushek (*Stanford University, USA*)
- Title: Skill gain and loss in North American labour markets: Skill supply is not enough.
Author: Scott Murray (*DataAngel Policy Research, Canada*)
- Title: The impact of skill supply and demand on participating in job-related training in Europe.
Author: Mari Liis Räis (*Tallinn University, Estonia*)
- Title: Having the right mix: The role of skill bundles for comparative advantage and industry performance in global value chains.
Authors: Robert Grundke, Mariagrazia Squicciarini, Stéphanie Jamet & Margarita Kalamova (*OECD, France*)

P9.1: The value of smarter teachers: International evidence on teacher cognitive skills and student performance.**Authors**

Marc Piopiunik, Simon Wiederhold (*Ifo Institute, Germany*) & Eric A. Hanushek (*Stanford University, USA*)

Abstract

Numerous international assessment tests have shown that the cognitive skills of students differ greatly across developed countries. These differences are consequential because the cognitive skills of the population have been shown to be an important driver of a country's long-run economic growth. International differences in teacher quality are commonly hypothesized to be a key determinant of these student performance gaps, but lack of consistent quality measures has precluded testing this. The PIAAC data for the first time allow to measure teacher cognitive skills consistently across countries. We first show that teacher cognitive skills differ widely internationally. To investigate the impact of teacher cognitive skills, we pursue two different strategies. First, we estimate OLS models with extensive sets of control variables, including student and family background, school inputs, institutional features of school systems, and countries' level of economic development. Controlling for parent cognitive skills allows accounting for the persistence of skills across generations. Second, we exploit student and teacher performance across two subjects in a fixed-effects model. This controls for non-subject-specific differences across countries and student-specific characteristics that similarly affect math and reading performance. The results indicate a robust impact of teacher cognitive skills on student performance. In the OLS models, a one standard deviation (SD) increase in teacher cognitive skills is associated with about 0.1 SD higher student performance in both math and reading. The fixed-effects estimates are slightly smaller (0.07 SD). We also provide evidence about the determinants of international differences in teacher cognitive skills. Existing studies have documented a strong decline in teacher cognitive skills in the U.S. during the past decades, which has been explained with improving alternative labor market opportunities for women. We generalize this evidence to a much broader set of countries, exploiting within-country changes across birth cohorts in the proportion of females working in high-skilled occupations. We find that a higher share of women working in high-skilled occupations other than teaching is significantly related to a lower cognitive skill level of teachers, particularly of female teachers. Differences in women's opportunities to enter high-skilled occupations therefore partly explain differences in teacher cognitive skills across countries.

P9.2: Skill gain and loss in North American labour markets: Skill supply is not enough.**Author**

Scott Murray (*DataAngel Policy Research, Canada*)

Abstract

Economic policy in Canada has focused on increasing the supply of skill at the expense of increasing the demand for key cognitive skills or the efficiency of the markets that put them to productive use. Our analysis documents rapid increases in the occupational demand for literacy skill and profiles changes in skill supply since 1994. Despite massive investments in post-secondary education the supply of literacy skill is actually falling. Our report uses synthetic cohort analysis to isolate and explain massive adult skill loss. The evidence suggests that skill loss can be traced to the fact that the majority of jobs impose very low levels of cognitive skill demand.

This finding suggests that public policy must begin paying attention to increasing the economic demand for skill and to improving the efficiency of the markets that match this demand to workers skills. Simply investing in the creation of new skills is not enough.

P9.3: The impact of skill supply and demand on participating in job-related training in Europe.

Author

Mari Liis Räs (Tallinn University, Estonia)

Abstract

Updating and upgrading skills of the population is increasingly important on the agenda of European countries. However significant inequalities remain in access to training opportunities and participation in non-formal education. The research has concentrated strongly on the supply of skills, i.e. individuals' education and skill levels, but the demand side has been relatively neglected. In this paper I will analyse countries with different skill formation strategies, taking into account both labour supply and demand characteristics, influence on participation in non-formal job-related education. I use data from the Programme for the International Assessment of Adult Competencies and country statistics from the OECD and Eurostat to describe the skill formation strategies of different countries. The purpose of the study is to create a better understanding of the interplay between skill demand and supply in countries with different skill formation strategies in order to provide valuable information on the transferability of policy measures within the European Union.

P9.4: Having the right mix: The role of skill bundles for comparative advantage and industry performance in global value chains.

Authors

Robert Grundke, Mariagrazia Squicciarini, Stéphanie Jamet & Margarita Kalamova (OECD, France)

Abstract

The international trade literature provides important insights on how countries' skill endowments affect their comparative advantage and specialization in international trade. However, empirical studies have mainly used the Heckscher-Ohlin-type framework to estimate the effects of countries' skill endowments on their comparative advantage. Thereby, workers are assumed to possess only one type of skill (mostly measured by educational attainment) and only countries' relative endowment with workers of different skill levels matters for countries' specialization in international trade. In contrast, Ohnsorge and Trefler (2007) argue that it is the bundling of various skills at the worker level (skill bundles) and their joint distribution within countries that matter for countries' specialization patterns. This study tests the theoretical model of Ohnsorge and Trefler (2007) using the assessed cognitive skills from the OECD Survey of Adult Skills (PIAAC) and the OECD Trade in Value Added (TiVA) database. Results indicate that the trade effect explained by the skill bundle distribution is much larger than the traditional Heckscher-Ohlin effect of relative skill endowments.

Presenters

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