Are Canadian jobs more or less skilled than American jobs?

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Background

• Changes in skill demands due to automation an increasing concern
  - Workers in jobs with higher skill requirements in technical skills and skills complementary to technology may be better prepared

• Canada-U.S. comparison:
  - Similarities between labor markets suggest workers’ occupational skill requirements may be comparable
  - However, on average, Canadians have higher levels of education, literacy, numeracy than Americans
Research Questions

- Are the occupational skill level requirements of Canadians’ jobs higher or lower than Americans’ jobs?
  - Are there notable gaps in particular skill areas?
- How do occupational skill requirements differ among workers with the same level of education?
- To what extent do workers’ characteristics (e.g., sex, age, education level, literacy, numeracy) account for differences in occupational skill levels?
Data & Methods

- Data: 2012 Programme for the International Assessment of Adult Competencies (PIAAC)
  - Canada and U.S. data
  - Paid employees aged 25 to 64

- Occupational skill level requirement data from the Occupational Information Network (O*NET, U.S. Dept. of Labor, version 17)

- O*NET occupation codes (SOC2010) converted to ISCO codes and linked to PIAAC’s ISCO codes
Data & Methods

• 35 O*NET occupational skill levels examined
  ▪ Includes reading, writing, math, science, social, problem solving, technical, and management skills

• Main outcome: Percentage differences in occupational skill levels for Canadian and U.S. jobs

• Oaxaca decomposition of skill level gaps
  ▪ Indicates portion of occupational skill level gaps explained by worker characteristics (socio-demographics, education level, literacy, numeracy)
## Sample characteristics by country

<table>
<thead>
<tr>
<th>Socio-dem.</th>
<th>Canada</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immigrant</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Education</th>
<th>Canada</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>No postsecondary credential</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-university postsecondary credential</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-year college (university) credential</td>
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<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Occupational Groups</th>
<th>Canada</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elementary occupations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plant &amp; machine operators, assemblers</td>
<td></td>
<td></td>
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<tr>
<td>Craft &amp; related trades</td>
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<td></td>
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<tr>
<td>Skilled agricultural, forestry, fishery</td>
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<td></td>
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<tr>
<td>Services &amp; sales</td>
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<td></td>
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<tr>
<td>Clerical support</td>
<td></td>
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<tr>
<td>Technicians, associate professionals</td>
<td></td>
<td></td>
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<tr>
<td>Professionals</td>
<td></td>
<td></td>
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<tr>
<td>Managers</td>
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</tbody>
</table>
Mean literacy and numeracy scores by country

- **Literacy**:
  - Canada: Mean score
  - United States: Mean score
  - 1.4% difference

- **Numeracy**:
  - Canada: Mean score
  - United States: Mean score
  - 4.3% difference
Percent difference in skill level of Canadian vs. U.S. jobs

- Installation
- Equipment maintenance
- Repairing
- Equipment selection
- Operations analysis
- Science
- Programming
- Mathematics
- Troubleshooting
- Technology design
- Quality control analysis
- Operation monitoring
- Operation and control

* significant difference at p<0.05
** significant difference at p<0.01
*** significant difference at p<0.001
† significant difference at p < 0.10
Percent difference in skill level of Canadian vs. U.S. jobs

- Systems analysis
- Systems evaluation
- Management of financial resources
- Learning strategies
- Management of material resources
- Management of personnel resources
- Judgement and decision making
- Complex problem solving
- Time management
- Negotiation
- Instructing
- Writing
- Active learning
- Persuasion
- Coordination
- Monitoring
- Active listening
- Reading comprehension
- Speaking
- Critical thinking
- Service orientation
- Social perceptiveness

* significant difference at p<0.05
** significant difference at p<0.01
*** significant difference at p<0.001
† significant difference at p < 0.10
Percent difference in skill level of Canadian vs. U.S. jobs, workers with non-university postsecondary credential

- Installation
- Repairing
- Equipment maintenance
- Equipment selection
- Operations analysis
- Programming
- Troubleshooting
- Technology design
- Mathematics
- Quality control analysis
- Operation and control
- Operation monitoring
- Science

* significant difference at p<0.05
** significant difference at p<0.01
*** significant difference at p<0.001
† significant difference at p < 0.10
Percent differences for non-university postsecondary cont’d

Management of financial resources
Management of material resources
  Systems analysis
  Systems evaluation
Management of personnel resources
  Complex problem solving
  Judgement and decision making
  Persuasion
  Time management
  Negotiation
  Coordination
Learning strategies
  Instructing
  Writing
  Monitoring
Active learning
Active listening
Critical thinking
Reading comprehension
Speaking
Social perceptiveness
Service orientation

* significant difference at p < 0.05
** significant difference at p < 0.01
† significant difference at p < 0.10
Percent difference in skill level of Canadian vs. U.S. jobs, workers with 4-year college (university) credential

- Installation
- Equipment maintenance
- Repairing
- Equipment selection
- Troubleshooting
- Science
- Quality control analysis
- Operation and control
- Mathematics
- Operation monitoring
- Programming
- Operations analysis
- Technology design

* significant difference at p<0.05
** significant difference at p<0.01
† significant difference at p < 0.10
Percent differences for 4-year college (university) continued

- Systems analysis
- Systems evaluation
- Learning strategies
- Judgement and decision making
- Complex problem solving
- Time management
- Management of personnel resources
  - Coordination
  - Social perceptiveness
    - Monitoring
  - Service orientation
  - Instructing
  - Active listening
    - Writing
    - Speaking
  - Critical thinking
  - Active learning
  - Reading comprehension
  - Persuasion
  - Negotiation
- Management of financial resources
- Management of material resources

* significant difference at p<0.05
** significant difference at p<0.01
† significant difference at p < 0.10
Differences in worker characteristics explained over 50% of the skill gaps in 26 of 30 skill areas

- Educational attainment, literacy, and (especially) numeracy skills played important roles in explaining the skill gaps
- Socio-demographics (sex, age, immigrant status) only explained a small portion of the skill gaps
Conclusions

- Overall, Canadian jobs more skilled than American jobs, particularly in technical skills
  - Among 4-year college degree holders, Americans held jobs with higher reading, writing, social skills

- Higher numeracy skills have led Canadian workers to be matched to more skilled occupations than their U.S. peers
  - Literacy, education level played smaller roles

- Improving numeracy skills may increase workers’ ability to find higher skilled jobs
THANK YOU!

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www.statcan.gc.ca

Link to study:
https://www150.statcan.gc.ca/n1/pub/11f0019m/11f0019m2018406-eng.pdf

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