The sources and consequences of non-equivalence across subnational groups: The case of immigration attitudes in Switzerland

Oriane Sarrasin & Eva G. T. Green
Research Centre Methodology, Inequalities & Social Change
University of Lausanne

Measurement invariance: Methods, problems and further directions
Zurich, 15-16 July 2011
oriane.sarrasin@unil.ch

Attitudes toward immigration in Switzerland
Measurement equivalence

• STUDY 1 (Sarrasin, Green, Berchtold, & Davidov, in preparation)
  • German- vs. French-speaking regions
  • ESS, ISSP & WVS: Conception of nationhood

• STUDY 2
  • Examines two types of diversity (language, background)
  • WVS (inclusion of the Italian-speaking region)
  • Conception of nationhood: Naturalization criteria

• STUDY 3 (Berchtold, Sarrasin, & Green, in preparation)
  • Examines the application of propensity scores in the context of measurement equivalence testing
Conception of nationhood: Naturalization criteria in Switzerland

Naturalization in Switzerland (Helbling, 2008)

- Decided at the local level (municipality)
- Different decision-making procedures
- High rejection rate, differences between origin country

Great variety of criteria are applied by local politicians: how to categorise them in distinct dimensions?

- **Ethnic** (or ascribed): e.g., being born in Switzerland
- **Civic** (or acquired): e.g., being able to speak the local language

World Values Survey 2007

How important should the following be as requirements for somebody seeking citizenship of your country? (1=not important; 2=not really important; 3=rather important; 4=very important)

- having Swiss **ancestors**
- being **born** in Switzerland
- adapting Swiss **way of living**
- observing the **law**
- acquiring **language** of residence
- attending **school** in Switzerland → **close to born**?
- knowing Swiss **history** → **can be acquired**?
- being member of an **association** → **integration**?
- abandon old citizenship → integration?
Cultural diversity in Switzerland I

first language of Swiss residents / citizens in 2000

Swiss Statistical Federal Office

Cultural diversity I: Equivalence?

• Different languages (e.g., Davidov & De Beuckelaer, 2010)
  • Translations might be inaccurate (Study 1)
  • Exact translations are difficult to find

• Some criteria might be more important or hold different meanings across the regions:
  • Swiss history: main events in the German-speaking region – different representations?
  • Language: e.g., Swiss German vs. standard German
Cultural diversity in Switzerland II

Permanent resident population aged 15 or over, by migration status, in 2008

<table>
<thead>
<tr>
<th>Population with an immigration background</th>
<th>in 1000s</th>
<th>in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>6417</td>
<td>100.0</td>
</tr>
<tr>
<td>Population without an immigration background</td>
<td>4362</td>
<td>68.0</td>
</tr>
<tr>
<td>Swiss citizens</td>
<td>4360</td>
<td>67.9</td>
</tr>
<tr>
<td>of whom naturalised</td>
<td>15</td>
<td>0.2</td>
</tr>
<tr>
<td>Persons with foreign citizenship (3rd generation)</td>
<td>2</td>
<td>0.0</td>
</tr>
<tr>
<td>Population with an immigration background</td>
<td>1935</td>
<td>30.6</td>
</tr>
<tr>
<td>Swiss citizens</td>
<td>651</td>
<td>10.1</td>
</tr>
<tr>
<td>of whom naturalised</td>
<td>563</td>
<td>9.1</td>
</tr>
<tr>
<td>Persons with foreign citizenship (1st and 2nd generation)</td>
<td>1315</td>
<td>20.5</td>
</tr>
<tr>
<td>Persons for whom some relevant data are unavailable</td>
<td>89</td>
<td>1.4</td>
</tr>
</tbody>
</table>

source: Swiss Federal Statistical Office

Cultural diversity II: Equivalence?

- Respondents with an immigration background: Better knowledge of the criteria?
  - Naturalized, in the naturalization process
  - Relatives who are naturalized, etc.

Question: how to categorise “respondents with an immigration background”?

- To our knowledge, this has never been tested as a potential cause of non-equivalence
- How to define “immigration background”?
- Heterogeneous group?
World Values Survey 2007

Sample Switzerland: N = 1223
Oversampling of national minorities (Silver & Dowley, 2000)

<table>
<thead>
<tr>
<th>Region</th>
<th>German (N = 623)</th>
<th>French (N = 404)</th>
<th>Italian (N = 196)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No immigration background</td>
<td>473 (75.9%)</td>
<td>247 (61.1%)</td>
<td>112 (57.1%)</td>
</tr>
<tr>
<td>Immigration background</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>– not Swiss citizen</td>
<td>150 (24.1%)</td>
<td>157 (38.9%)</td>
<td>84 (42.9%)</td>
</tr>
<tr>
<td>– not born in CH</td>
<td>40</td>
<td>68</td>
<td>27</td>
</tr>
<tr>
<td>– parent(s) not born in CH</td>
<td>86</td>
<td>108</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td>75</td>
<td>79</td>
<td>48</td>
</tr>
</tbody>
</table>

Analyses: Steps

Step 1: EFA within each region
Step 2: MGCFA within each region
Step 3: MGCFA all data
Analyses (for ordinal data, Mplus)

1. EFA: within each linguistic region
   - Oblimin rotation
   - Items are retained for further steps only in case of similar factor structure

2. MGCFA: within each linguistic region
   - Immigration background vs. no immigration background

3. MGCFA: all data
   - German vs. French vs. Italian

<table>
<thead>
<tr>
<th></th>
<th>German Ethnic</th>
<th>Civic</th>
<th>French Ethnic</th>
<th>Civic</th>
<th>Cult.</th>
<th>Italian Ethnic</th>
<th>Civic</th>
</tr>
</thead>
<tbody>
<tr>
<td>ancestors</td>
<td>.90</td>
<td>-.13</td>
<td>.64</td>
<td>-.12</td>
<td>.21</td>
<td>.86</td>
<td>-.05</td>
</tr>
<tr>
<td>born</td>
<td>.83</td>
<td>.00</td>
<td>.98</td>
<td>.03</td>
<td>-.09</td>
<td>.76</td>
<td>-.03</td>
</tr>
<tr>
<td>school</td>
<td>.66</td>
<td>.26</td>
<td>.56</td>
<td>.02</td>
<td>.34</td>
<td>.54</td>
<td>.37</td>
</tr>
<tr>
<td>laws</td>
<td>-.17</td>
<td>.72</td>
<td>-.02</td>
<td>.95</td>
<td>-.01</td>
<td>-.23</td>
<td>.79</td>
</tr>
<tr>
<td>language</td>
<td>.06</td>
<td>.71</td>
<td>.00</td>
<td>.28</td>
<td>.48</td>
<td>.04</td>
<td>.60</td>
</tr>
<tr>
<td>customs</td>
<td>.34</td>
<td>.48</td>
<td>.16</td>
<td>.51</td>
<td>.19</td>
<td>.23</td>
<td>.56</td>
</tr>
<tr>
<td>history</td>
<td>.36</td>
<td>.39</td>
<td>.04</td>
<td>.07</td>
<td>.73</td>
<td>.22</td>
<td>.64</td>
</tr>
<tr>
<td>association</td>
<td>.38</td>
<td>.09</td>
<td>-.06</td>
<td>-.17</td>
<td>.53</td>
<td>.44</td>
<td>-.02</td>
</tr>
<tr>
<td>old citizenship</td>
<td>.41</td>
<td>.21</td>
<td>.13</td>
<td>.09</td>
<td>.36</td>
<td>.35</td>
<td>.21</td>
</tr>
</tbody>
</table>
2. MGCFA within each linguistic region

- Performed on the six remaining items
- Within each linguistic group
  - Immigration background vs. no immigration background
- MGCFA for ordinal data (e.g., Lubke & Muthén, 2004)
  - Testing for scalar equivalence
  - $\chi^2$ and df cannot be used for $\chi^2$ difference tests
  - Fit indices: CFI (> .95) & RMSEA (< .08)
  - If non-adequate fit indices $\rightarrow$ modification indices
  - Theta parametrization: residual variances (Muthén & Asparouhov, 2002)

2. MGCFA: Results in German

![Diagram showing relationships between ethnic and civic variables such as ancestors, born, school, customs, laws, and language.]

Scalar equivalence: $\chi^2$ (18) = 56.453, p < .001; CFI = .973, RMSEA = .083
Two errors are correlated: $\chi^2$ (17) = 36.436, p < .01; CFI = .986, RMSEA = .061
2. MGCFA: Results in French

Scalar equivalence: $\chi^2 (21) = 63.616, \ p < .001; \ CFI = .947, \ RMSEA = .100$

Negative cross-loading: $\chi^2 (21) = 52.591, \ p < .001; \ CFI = .961, \ RMSEA = .086$

Thresholds relaxed: $\chi^2 (19) = 33.592, \ p < .05; \ CFI = .982, \ RMSEA = .062$
2. MGCFA: Results in Italian

Scalar equivalence: $\chi^2 (23) = 174.892, p < .001; \text{CFI} = .935, \text{RMSEA} = .104$

Negative cross-loading: $\chi^2 (22) = 139.954, p < .001; \text{CFI} = .949, \text{RMSEA} = .094$

+ correlated errors: $\chi^2 (22) = 109.100, p < .001; \text{CFI} = .963, \text{RMSEA} = .081$

2. MGCFA: Summary of results

Scalar equivalence: $\chi^2 (23) = 174.892, p < .001; \text{CFI} = .935, \text{RMSEA} = .104$

Negative cross-loading: $\chi^2 (22) = 139.954, p < .001; \text{CFI} = .949, \text{RMSEA} = .094$

+ correlated errors: $\chi^2 (22) = 109.100, p < .001; \text{CFI} = .963, \text{RMSEA} = .081$
2. MGCFA: Intermediary conclusion

- In each linguistic region: reasonable measurement equivalence between respondents with an immigration background and respondents without an immigration background
  - Differences between the two groups: similarities across regions
- Negative cross-loading between “laws” and the ethnic dimension = essential for equivalence in French and Italian (no background)
  - Similar cross-loading (ISSP data; Reeskens & Hooghe, 2010)
- Errors of “school” and “language” correlated in German and Italian
- The next step is possible
  - Same model, all data
  - Test for measurement equivalence across the three linguistic regions

3. MGCFA: German vs. French vs. Italian

![Diagram showing the relationships between various factors like ancestors, born, school*, customs, laws, and language, with scalar equivalence and negative cross-loading results.]
Conclusion

• With a reduced number of items (6/9), partial scalar equivalence across the three linguistic regions is reached
  ➔ Possible to compare latent means

• Prior to MGCFA, three items had to be discarded. If included, results would have been biased
  ➔ Importance of preliminary single-group analyses

• Only a few differences between respondents with an immigration background and respondents without an immigration background
  ➔ No major measurement equivalence issue

Discussion I: The school item.. a troublemaker?

• If the school items is discarded (5-item solution)...
  • ... the born item no longer loads significantly on the ethnic dimension
  • Why?

• How can we know why this item is problematic?
  • Differences in support across municipalities: (ICC = .177)
  • Multilevel approach?
Discussion II: Discarded items

• Three items were discarded in Step 1: history, association and old citizenship

• Not present in surveys using similar ethnic vs. civic scales
  • International Social Survey Programme (2003)
  • European Social Survey (2002)

• More than two dimensions? (e.g., Shulman, 2002)

Discussion III: Sample

• In this study: measurement of naturalization criteria can be considered as reasonably equivalent between respondents with an immigration background and without an immigration background (within each linguistic region)

• Next step: if one is interested in comparing adhesion to naturalization criteria across the linguistic regions, does the inclusion of respondents with an immigration background affect the conclusions? For instance if
  • Respondents with background: lower support
  • More respondents with immigrants background in the Italian- and French-speaking regions
thank you for your attention!

oriana.sarrasin@unil.ch

References


Additional slide #1:
Cultural Diversity in Switzerland II

![Bar chart showing Swiss citizenship at birth and no Swiss citizenship at birth for those born in CH and not born in CH.]

Source: Swiss Federal Statistical Office
population aged > 15 in 2003

Additional slide #2
EFA in French (6 items only)

<table>
<thead>
<tr>
<th></th>
<th>Ethnic</th>
<th>Civic</th>
</tr>
</thead>
<tbody>
<tr>
<td>ancestors</td>
<td>.78</td>
<td>-.08</td>
</tr>
<tr>
<td>soil</td>
<td>.88</td>
<td>-.03</td>
</tr>
<tr>
<td>school</td>
<td>.74</td>
<td>.12</td>
</tr>
<tr>
<td>laws</td>
<td>-.05</td>
<td>.97</td>
</tr>
<tr>
<td>language</td>
<td>.26</td>
<td>.40</td>
</tr>
<tr>
<td>customs</td>
<td>.25</td>
<td>.53</td>
</tr>
</tbody>
</table>
Additional slide #3

Items in German
• Schweizer Vorfahren haben
• In der Schweiz geboren sein
• Die schweizerische Lebensweise annehmen
• Die Schweizer Gesetze beachten
• Die Sprache am Wohnort beherrschen
• Die Schule in der Schweiz besucht haben
• Die Schweizer Geschichte kennen
• Mitglied in einem Verein sein
• Die alte Staatsbürgerschaft aufgeben

Additional slide #4

Items in French
• Avoir des ancêtres suisses
• Etre né en Suisse
• Adopter le style de vie suisse
• Respecter les lois suisses
• Maîtriser la langue du domicile
• Avoir fait ses écoles en Suisse
• Connaître l’histoire suisse
• Etre membre d’une association
• Renoncer à l’ancienne nationalité
Additional slide #5

Items in Italian

- Avere antenati svizzeri
- Essere nato in Svizzera
- Adottare gli usi ed i costumi svizzeri
- Obbedire alle leggi svizzere
- Parlare la lingua locale
- Aver frequentato le scuole in Svizzera
- Conoscere la storia svizzera
- Essere membro di una associazione
- Rinunciare alla cittadinanza d'origine

Additional slide #6

Exact sample composition

<table>
<thead>
<tr>
<th></th>
<th>Born in CH</th>
<th>No CH</th>
<th>Not born in CH</th>
<th>CH</th>
<th>No CH</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Parents = no imm.</td>
<td>Parent(s) = imm</td>
<td>Parents = no imm.</td>
<td>Parent(s) = imm</td>
<td>Parents = no imm.</td>
</tr>
<tr>
<td>GER</td>
<td>537 (86.20%)</td>
<td>3 (0.48%)</td>
<td>86 (13.80%)</td>
<td>49 (7.86%)</td>
<td>37 (5.94%)</td>
</tr>
<tr>
<td>FR</td>
<td>433 (75.92%)</td>
<td>61 (9.79%)</td>
<td>78 (12.73%)</td>
<td>42 (6.74%)</td>
<td>7 (1.12%)</td>
</tr>
<tr>
<td>IT</td>
<td>289 (71.53%)</td>
<td>7 (1.73%)</td>
<td>111 (27.80%)</td>
<td>47 (11.63%)</td>
<td>61 (15.10%)</td>
</tr>
<tr>
<td></td>
<td>42 (10.40%)</td>
<td>1 (0.25%)</td>
<td>1 (1.53%)</td>
<td>34 (8.42%)</td>
<td>13 (3.22%)</td>
</tr>
<tr>
<td></td>
<td>149 (76.02%)</td>
<td>47 (23.98%)</td>
<td>146 (74.49%)</td>
<td>3 (1.53%)</td>
<td>25 (11.73%)</td>
</tr>
</tbody>
</table>

Table shows the sample composition by birthplace and parents' immigration status.
### Additional slide #7a
**MGCFA (GER vs. FR vs. IT)**
6 items, scalar equivalence

<table>
<thead>
<tr>
<th>Group</th>
<th>ETCNIC BY</th>
<th>CIVIC BY</th>
<th>CIVIC WITH</th>
<th>Means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Estimate</td>
<td>S.E.</td>
<td>Est./S.E.</td>
<td>P-Value</td>
</tr>
<tr>
<td>GERMAN</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ETCNIC</td>
<td>1.000</td>
<td>0.000</td>
<td>999.000</td>
<td>999.000</td>
</tr>
<tr>
<td>CIVIC</td>
<td>1.000</td>
<td>0.000</td>
<td>999.000</td>
<td>999.000</td>
</tr>
<tr>
<td>CIVIC WITH</td>
<td>2.668</td>
<td>0.717</td>
<td>3.720</td>
<td>0.000</td>
</tr>
<tr>
<td>Means</td>
<td>0.000</td>
<td>0.000</td>
<td>999.000</td>
<td>999.000</td>
</tr>
</tbody>
</table>

a = ancestors; b = born; f = school; e = language; c = customs; d = laws

---

### Additional slide #7b
**MGCFA (GER vs. FR vs. IT)**
6 items, partial scalar equivalence (thresholds are relaxed) + negative cross-loading

<table>
<thead>
<tr>
<th>Group</th>
<th>ETCNIC BY</th>
<th>CIVIC BY</th>
<th>CIVIC WITH</th>
<th>Means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Estimate</td>
<td>S.E.</td>
<td>Est./S.E.</td>
<td>P-Value</td>
</tr>
<tr>
<td>GERMAN</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ETCNIC</td>
<td>1.000</td>
<td>0.000</td>
<td>999.000</td>
<td>999.000</td>
</tr>
<tr>
<td>CIVIC</td>
<td>1.422</td>
<td>0.126</td>
<td>11.268</td>
<td>0.000</td>
</tr>
<tr>
<td>CIVIC WITH</td>
<td>0.920</td>
<td>0.055</td>
<td>26.430</td>
<td>0.000</td>
</tr>
<tr>
<td>Means</td>
<td>0.000</td>
<td>0.000</td>
<td>999.000</td>
<td>999.000</td>
</tr>
</tbody>
</table>
Additional slide #7c
MGCFA (GER vs. FR vs. IT)
Five items (no school item), scalar equivalence

\[ \chi^2 (26) = 98.807, \ p < .001; \ CFI = .951, \ RMSEA = .083 \]