Contextualising the teaching of quantitative research methods for social science undergraduates

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Workshop for Teachers of Quantitative Methods for Social Scientists

University of Oxford, 20 September 2013
Structure of talk

• Introduction
  – The 1 minute ‘all you need’ version of the talk

• UG quantitative methods at Sheffield

• General themes of teaching UG quantitative methods

• UG quantitative methods at Mannheim
What is this?

Campbell, Converse, Miller & Stokes (1960) *The American Voter*
Sheffield courses: Overall aims

- *Basic* quantitative methods for all
- *Advanced* quantitative methods for some
- Link quantitative academic study of politics with existing ‘knowledge’ of politics
- Link UG training with PG training/careers
Dilemma

- Statistics anxiety, denial, ignorance...

Solutions

- Subject specific
- Link with ‘real’ world
  - e.g. external speakers from PMSU, MoJ, MORI
- Stress application & interpretation
- Variation in activities, teaching & assessment
- Time
Sheffield Politics UG courses

Year 2 Political Analysis – Compulsory (≈200)
   Empirical research design
   Quantification of politics
   Quantitative Methods

Year 3 Dissertation in Political Analysis – Optional (≈4-8)
   ‘Student-led’ workshop teaching
Level 2 Political Analysis

- Theories, approaches, scientific method...
- Quantification of Politics
  - Ubiquity of numbers in political & social world
- Research design in Political Science
- Methodology in Political Science
- Data collection
- Data analysis
Level 3 Quantitative Dissertation in Political Science

- ‘Advanced’ data collection (on demand)
- ‘Advanced’ data analysis (on demand)
- Visual presentation of research design
- Visual presentation of quantitative data
- Dual supervision
# Incentives

<table>
<thead>
<tr>
<th></th>
<th>Students</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prize of £200 advertised</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 1</td>
<td>4</td>
<td>1.9</td>
</tr>
<tr>
<td>Year 2</td>
<td>8</td>
<td>4.5</td>
</tr>
<tr>
<td>No prize advertised</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 3</td>
<td>7</td>
<td>3.8</td>
</tr>
</tbody>
</table>

There’s now a YouGov prize (£100) since the ESRC funding ended
Do students do better?

<table>
<thead>
<tr>
<th>Type of Dissertation</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard dissertation (Year 1)</td>
<td>66.6</td>
<td>8</td>
</tr>
<tr>
<td>Quantitative dissertation (Year 1)</td>
<td>66.0</td>
<td>11</td>
</tr>
<tr>
<td>Standard dissertation (Year 2)</td>
<td>67.1</td>
<td>8</td>
</tr>
<tr>
<td>Quantitative dissertation (Year 2)</td>
<td>70.5</td>
<td>6</td>
</tr>
</tbody>
</table>
# Do students improve more?

<table>
<thead>
<tr>
<th>Category</th>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard dissertation</td>
<td>66.6</td>
<td>67.1</td>
</tr>
<tr>
<td>All L3 taught modules</td>
<td>65.2</td>
<td>64.8</td>
</tr>
<tr>
<td>Improvement</td>
<td>+1.4</td>
<td>+2.3</td>
</tr>
<tr>
<td>Quantitative dissertation</td>
<td>66.0</td>
<td>70.5</td>
</tr>
<tr>
<td>QD students’ L3 modules</td>
<td>63.6</td>
<td>64.1</td>
</tr>
<tr>
<td>Improvement</td>
<td>+2.4</td>
<td>+6.4</td>
</tr>
<tr>
<td>Award winners</td>
<td>+10.5</td>
<td>+19.3</td>
</tr>
<tr>
<td>Postgraduate Study</td>
<td>50%</td>
<td>25%</td>
</tr>
</tbody>
</table>
Potential drawbacks

- Departmental willingness
- Departmental structure
  - E.g. course length, assessment length/frequency
- Resources
  - It takes a village to raise a political scientist

But...

You provide a service to every other colleague

Demonstrable preparation for careers, PG, theses, etc.

There’s money to be had
  - E.g. Nuffield Q-Step Programme
The ubiquity of numbers & data
Data & Statistics are everywhere

*The book of love is long and boring*
*No one can lift the damn thing*
*It's full of charts and facts and figures,*
*and instructions for dancing...*

Variation, variation, variation

- **Examples**
  - From political science

Why might these two countries be outliers?
Variation, variation, variation

• Examples
  – From across political science
  – From politics

It’s the economy, stupid
Variation, variation, variation

• Examples
  – From across political science
  – From politics
  – From pop culture

Sports team salaries

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode</td>
<td>$12,900</td>
</tr>
<tr>
<td>Median</td>
<td>$49,250</td>
</tr>
<tr>
<td>Mean</td>
<td>$324,125</td>
</tr>
</tbody>
</table>
Variation, variation, variation

• Examples
  – From across political science
  – From politics
  – From pop culture

What links these musicians?
  Kurt Cobain
  Amy Winehouse
  Jimi Hendrix
  Jim Morrison
  Janis Joplin
  Brian Jones
Variation, variation, variation

- Examples
  - From political science
  - From politics
  - From pop culture
  - From them

```
.tabstat percent, statistics(mean median min max) by(exacredit)

Summary for variables: percent
by categories of: extracredit (Extra credit)

<table>
<thead>
<tr>
<th>extracredit</th>
<th>mean</th>
<th>p50</th>
<th>min</th>
<th>max</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>41.81818</td>
<td>38.5</td>
<td>0</td>
<td>89</td>
</tr>
<tr>
<td>5</td>
<td>61.73718</td>
<td>61.5</td>
<td>23</td>
<td>102</td>
</tr>
<tr>
<td>Total</td>
<td>59.27528</td>
<td>59</td>
<td>0</td>
<td>102</td>
</tr>
</tbody>
</table>
```
Variation, variation, variation

- Examples
  - From political science
  - From politics
  - From pop culture
  - From them

Grades in the EPR exam and the number of letters in candidates' names.
Variation: Activities, e.g. debating with data

e.g. the rate of immigration should be lowered/raised

Projection of numbers of households

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of households (thousands)</th>
<th>Average household size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>22,487</td>
<td>2.44</td>
</tr>
<tr>
<td>1993</td>
<td>22,624</td>
<td>2.43</td>
</tr>
<tr>
<td>1994</td>
<td>22,758</td>
<td>2.42</td>
</tr>
<tr>
<td>1995</td>
<td>22,896</td>
<td>2.41</td>
</tr>
<tr>
<td>1996</td>
<td>23,025</td>
<td>2.40</td>
</tr>
<tr>
<td>1997</td>
<td>23,132</td>
<td>2.40</td>
</tr>
<tr>
<td>1998</td>
<td>23,260</td>
<td>2.39</td>
</tr>
<tr>
<td>1999</td>
<td>23,406</td>
<td>2.39</td>
</tr>
<tr>
<td>2000</td>
<td>23,597</td>
<td>2.37</td>
</tr>
<tr>
<td>2001</td>
<td>23,927</td>
<td>2.36</td>
</tr>
<tr>
<td>2002</td>
<td>24,152</td>
<td>2.35</td>
</tr>
<tr>
<td>2003</td>
<td>24,365</td>
<td>2.34</td>
</tr>
<tr>
<td>2004</td>
<td>24,555</td>
<td>2.33</td>
</tr>
<tr>
<td>2011</td>
<td>26,235</td>
<td>2.25</td>
</tr>
<tr>
<td>2016</td>
<td>27,526</td>
<td>2.20</td>
</tr>
<tr>
<td>2021</td>
<td>28,732</td>
<td>2.15</td>
</tr>
<tr>
<td>2026</td>
<td>30,042</td>
<td>2.11</td>
</tr>
</tbody>
</table>

Total International migration

<table>
<thead>
<tr>
<th>Year</th>
<th>inflow</th>
<th>outflow</th>
<th>balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>268</td>
<td>281</td>
<td>- 13</td>
</tr>
<tr>
<td>1993</td>
<td>266</td>
<td>266</td>
<td>0</td>
</tr>
<tr>
<td>1994</td>
<td>315</td>
<td>238</td>
<td>+ 77</td>
</tr>
<tr>
<td>1995</td>
<td>312</td>
<td>236</td>
<td>+ 76</td>
</tr>
<tr>
<td>1996</td>
<td>318</td>
<td>264</td>
<td>+ 54</td>
</tr>
<tr>
<td>1997</td>
<td>327</td>
<td>279</td>
<td>+ 48</td>
</tr>
<tr>
<td>1998</td>
<td>391</td>
<td>251</td>
<td>+ 140</td>
</tr>
<tr>
<td>1999</td>
<td>454</td>
<td>291</td>
<td>+ 163</td>
</tr>
<tr>
<td>2000</td>
<td>479</td>
<td>321</td>
<td>+ 158</td>
</tr>
<tr>
<td>2001</td>
<td>479</td>
<td>306</td>
<td>+ 173</td>
</tr>
<tr>
<td>2002</td>
<td>513</td>
<td>358</td>
<td>+ 155</td>
</tr>
<tr>
<td>2003</td>
<td>508</td>
<td>361</td>
<td>+ 147</td>
</tr>
<tr>
<td>2004</td>
<td>586</td>
<td>342</td>
<td>+ 244</td>
</tr>
<tr>
<td>2005</td>
<td>563</td>
<td>359</td>
<td>+ 204</td>
</tr>
<tr>
<td>2006</td>
<td>591</td>
<td>400</td>
<td>+ 191</td>
</tr>
</tbody>
</table>

Communities and Local Government (www.communities.gov.uk)

Office for National Statistics
Variation: Activities, e.g. interpretation

The Comparative Manifestos Project has devised a scale for measuring the ideology of political parties from -100 (far left) to +100 (far right). The following table shows the average ideology of governing parties in a selection of countries, firstly through an analysis of their campaign promises and secondly through an analysis of their policy declarations.

Why do you think there are differences between the two scales?

Table 8.1. Government ideology and policy declarations

<table>
<thead>
<tr>
<th>Country</th>
<th>Government ideology Average</th>
<th>Government policy declarations Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden</td>
<td>-21.5</td>
<td>-9.1</td>
</tr>
<tr>
<td>Norway</td>
<td>-24.8</td>
<td>-21.1</td>
</tr>
<tr>
<td>Denmark</td>
<td>-0.3</td>
<td>2.0</td>
</tr>
<tr>
<td>Netherlands</td>
<td>-5.5</td>
<td>5.5</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>-13.8</td>
<td>-2.5</td>
</tr>
<tr>
<td>Italy</td>
<td>-2.9</td>
<td>-1.6</td>
</tr>
<tr>
<td>Germany</td>
<td>3.2</td>
<td>12.3</td>
</tr>
<tr>
<td>Ireland</td>
<td>7.3</td>
<td>-14.3</td>
</tr>
</tbody>
</table>

Variation: Assessment

- Questionnaire design (group)
- Comparison of 2 political organisations’ use of statistics
- Data Analysis, using SPSS & real data
  - British Election Study
  - British Social Attitudes Survey
  - Eurobarometer
  - Political Terror Scale / Polity / COW / WDI

↓ # of variables
provide meaningful variables names/labels
create easy-to-read codebooks
Variation: Assessment support

- Data Analysis, using SPSS & real data

Support

1. SPSS workshops
2. SPSS how-to guides
3. FAQs & message board on VLE
4. SPSS surgeries
5. Alternative dataset sessions
6. SPSS output interpretation seminars
Assessment

- Questionnaire design (group)
- Comparison of 2 political organisations’ use of statistics
- Data Analysis, using SPSS & real data
- Unseen exam
Variation, variation, variation

- Examples
- Activities
- Assessment
- Data sets
- Homework
- Personnel
General tips

- Build in ‘breaks’ to lectures

Alchemy or science?

\[ R^2 = .98 \]
General tips

- Build in ‘breaks’ to lectures
- Be enthusiastic
General tips

- Build in ‘breaks’ to lectures
- Be enthusiastic
General tips

• Build in ‘breaks’ to lectures
• Be enthusiastic
• Occasionally, be fun
General tips

• Build in ‘breaks’ to lectures
• Be enthusiastic
• Be fun
• Be current

Mode (from lecture on 18 Feb 2013)
e.g. Cyprus Presidential election 17 February 2013
votes

<table>
<thead>
<tr>
<th>Candidate</th>
<th>Votes</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nicos Anastasiades</td>
<td>200,591</td>
<td>45.5%</td>
</tr>
<tr>
<td>Stavros Malas</td>
<td>118,755</td>
<td>26.9%</td>
</tr>
<tr>
<td>Giorgos Lillikas</td>
<td>109,996</td>
<td>24.9%</td>
</tr>
<tr>
<td>Others (8)</td>
<td>11,914</td>
<td>2.7%</td>
</tr>
</tbody>
</table>
General tips

- Build in ‘breaks’ to lectures
- Be enthusiastic
- Be fun
- Be current
- Be approachable
  - If possible, arrive early & leave late
  - Answer emails quickly and helpfully
  - Course forum
General tips

• Build in ‘breaks’ to lectures
• Be enthusiastic
• Be fun
• Be current
• Be approachable
• Challenge them as social scientists

End of term exams

– What are they a measure of?
– Are they reliable?
– Are they valid?
– How precise are they?
– If grades comprise the dependent variable, what are the key independent variables?
General tips

- Build in ‘breaks’ to lectures
- Be enthusiastic
- Be fun
- Be current
- Be approachable
- Challenge them as social scientists

Explaining the differences between theories and hypotheses

What theories fit these hypotheses?

$H_1$ Men earn more than women
$H_2$ Ugly people are more likely to be criminals

Hypotheses are *observable implications of theories*
General tips

• Build in ‘breaks’ to lectures
• Be enthusiastic
• Be fun
• Be current
• Be approachable
• Challenge them as social scientists
• Bad data can be a better resource than good data
  – 1936 Literary Digest poll
  – 2009 NZ Corporal punishment referendum

“Should a smack as part of good parental correction be a criminal offence in New Zealand?”

Yes 12%
No 87%
Bad data – interest groups

How do you feel about the blatant abuses being foisted upon lawful, peaceable gun owners by crooked politicians and the biased media?

- Angry 26%
- Frustrated 3%
- Sad 1%
- Afraid 1%
- Ready for whatever comes our way 4%
- Empowered that we will be victorious 3%
- Amused - they will never take our guns away 1%
- All of the above 61%

Keep & Bear Arms, 2003
Bad data – political parties

Forest of Dean constituency, 2010 UK General Election
Bad data – US media
Bad data – UK media

Headline: Women athletes will one day out-sprint men. *Daily Telegraph* 30-9-04

![Graph showing Olympic 100 metre sprint times](image)
Bad data – political science

Which Party did you vote for in the 1992 General Election?

<table>
<thead>
<tr>
<th></th>
<th>Conservative</th>
<th>Labour</th>
<th>LibDem</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>38.5</td>
<td>34.0</td>
<td>15.9</td>
</tr>
<tr>
<td>1994</td>
<td>36.0</td>
<td>37.2</td>
<td>14.7</td>
</tr>
<tr>
<td>1996</td>
<td>28.7</td>
<td>47.9</td>
<td>14.9</td>
</tr>
</tbody>
</table>

British Household Panel Survey (n=4096)
Applying Sheffield method in Mannheim

What is different?

• Teach in a foreign language
• Teach them earlier
• Teach more
  – 28 lectures
  – 12 workshops (data analysis)
  – 8 tutorials (research design)
• Less variation in assessment
• Teach from formulae with hand calculations
• The students!
  – >maths in secondary education
  – Mannheim selection bias
  – Mannheim reinforcement effect
The overall message for maximizing course effectiveness

- Time – as much as possible
- Timing – as early as possible
  - preferably year 1, preferably not year 3
- Variation – as much as possible
- Context is vital
  - Across the discipline
  - Applications outside of the academic realm
- Stress the usefulness of a tangible transferable skill