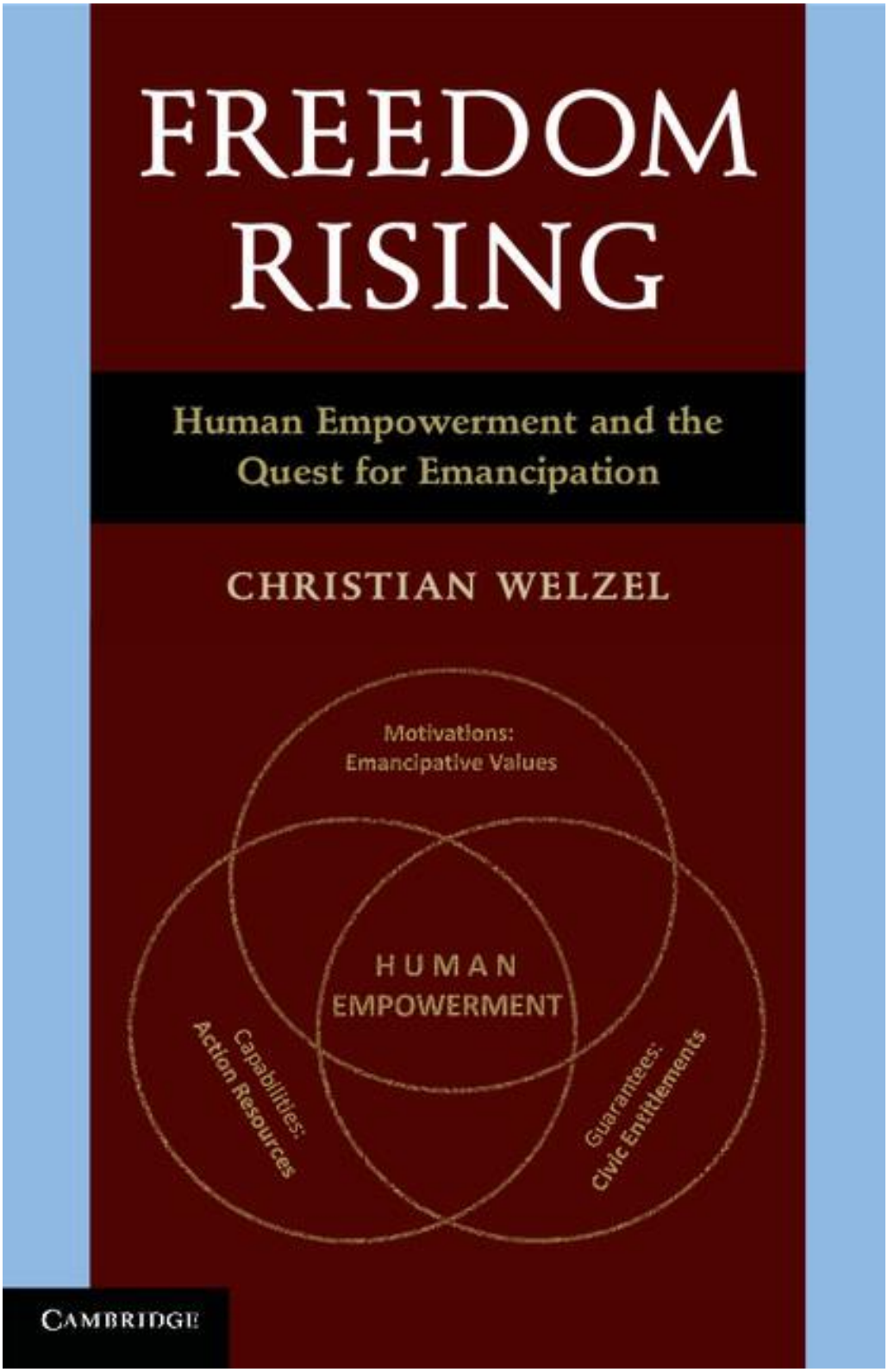

ONLINE APPENDIX

(www.cambridge.org/welzel)

TABLE OF CONTENT

PREFACE

This extensive Online Appendix refers to my book *Freedom Rising* (2013, CUP). It is an attempt to document in a meticulous way the measurement and coding procedures, to provide detailed variable descriptions, reference data sources, report auxiliary analyses and give links to downloadable data for replication analysis.

The appendix is organized into sections whose numbers correspond with the chapter numbers in *Freedom Rising*. Each variable used in the book will be described once, in the appendix section corresponding to the chapter where the variable first appears. To find the description of a particular variable, use the search function and type the name of the variable as it is labelled in the book.

Replication data are provided in various SPSS or Excel files. The files are named after the tables and figures in *Freedom Rising*. Usually, these files include each variable reported in a given table or figure of *Freedom Rising*. The various datasets can all be merged upon a scholar's preference using the variables "casenum" for individual-level variables and "ctrcode" for societal-level variables as merger keys.

This is the first edition of this appendix and it will be updated periodically. I cordially invite colleagues and scholars to provide me any feedback you might have. To do so, please contact: cwelzel@gmail.com.

Christian Welzel
UC Irvine
September 24, 2013

APPENDIX I (Ref. INTRODUCTION)

Variables and Data in Figure I.1

Figure I.1 in the main text covers data for 135 countries worldwide, using all countries for which the United Nations Development Program provides data. For better oversight, these 135 countries are grouped into 12 global regions, as follows.

Subsaharan Africa: Benin, Botswana, Burkina Faso, Burundi, Cameroon, CAR, Chad, Congo (Brazzaville), Congo (Kinshasa), Cote d'Ivoire, Djibouti, Ethiopia, Ghana, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sudan, Swaziland, Togo, Uganda, Zambia, Zimbabwe.
Middle East: Algeria, Bahrain, Egypt, Iran, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, Tunisia, Turkey, UAE.
South Asia: Bangladesh, Brunei, India, Indonesia, Malaysia, Mauritius, Nepal, Pakistan, Philippines.
Central Asia: Afghanistan, Armenia, Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan.
East Asia: Cambodia, China, Hong Kong, Japan, Laos, Mongolia, South Korea, Vietnam.
Ex-communist East: Albania, Belarus, Bulgaria, Georgia, Moldova, Romania, Russia, Serbia, Ukraine.
Ex-communist West: Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, Slovenia.
Catholic Europe: Austria, Belgium, (Cyprus), France, (Greece), (Israel), Italy, Luxembourg, Malta, Portugal, Spain.
Protestant Europe: Denmark, Finland, Iceland, Netherlands, Norway, Sweden, Switzerland.
Latin America: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Trinidad and Tobago, Uruguay, Venezuela.
English West: Australia, Canada, Ireland, New Zealand, UK, USA.
Oceania: Fiji, Samoa, Tonga.

Data for replication analyses are included in the file "FigureI.1.sav" at www.cambridge.org/welzel.

Variables and Data in Tables I.2 and I.3

Technological Advancement: To measure technological advancement, I use the World Bank's (2008) 'knowledge index (KI)', using the 1995 measure of this index. The index indicates "a society's ability to generate, adopt and, diffuse knowledge. The KI is the simple average of the normalized scores of a society on the key variables in the three knowledge economy pillars: education, innovation, and ICT" (World

Bank, 2008). The knowledge index combines data on education (using indicators like the tertiary enrolment ratio), on innovation (using indicators like the number of patents per 10,000 inhabitants), and on information technology (using indicators like the number of internet hosts per 1,000 inhabitants). I rescale the index into a range from 0 to 1.0, with higher values indicating a more advanced knowledge economy and thus farther advanced technology. A description of index construction and data are available online at: http://.info.worldbank.org/etools/kam2/_KAM_page5.asp. For the analyses in Tables I.2 and I.3, countries are categorized as 'traditional economis' when they score in the lower third of the technological advancement index, as 'industrial economies' when they score in the middle third, and as 'knowledge economies' when they score in the upper third. Data for replication analyses are included in the file "TableI.1_I.2.sav" at www.cambridge.org/welzel.

Democratic Achievement: Democratic achievement is measured by a citizen rights index to indicate civic entitlements. This is done in two steps. In the first step, I invert the two 1-to-7 scales for civil liberties and political rights by Freedom House (2012), available online at www.freedomhouse.org. The aim is that higher scores indicate more freedom. Then I add the two scores and normalize the sum into a scale range from minimum 0 (no freedoms) to 1.0 (full amount of freedoms). In the second step, the freedom scores are weighted down to the extent that they fail to tap human rights violations. The latter data are taken for the same years from the Cingranelli and Richards (CIRI) Human Rights Project (2010), available online at www.ciri.binghamton.edu. I use the indices for non-repression of 'physical integrity rights' (an eight-point scale) and 'empowerment rights' (a ten-point scale), normalize them into a range from minimum 0 (maximum repression) to maximum 1 (minimal repression) and average the two scores. These non-repression scores are then used as a weight for the freedom scores, using multiplication. Thus, a society that has a high freedom score of, say, .80 but a lower non-repression score of, say, .60, obtains a final score of (.60 * .80 =) .48 in civic entitlements. The emphasis of this measurement procedure is on civic entitlements that are truly respected in practice. Since emancipative values in most of the analyses in the book cover the period from 1995 to 2005, wheres civic entitlements are tested as an alternative predictor of these values, next to technological advancement, the introductory chapter measures civic entitlements over the five-year period preceding emancipative values. For the analyses in Tables I.2 and I.3, countries are categorized as 'non-democracies' when they score in the lower third of the civic entitlements index, as 'hybrid regimes' when they score in the middle third, and as 'democracies' when they score in the upper third. Data for replication analyses are included in the file "TableI.1_I.2.sav" at www.cambridge.org/welzel.

Stages of Human Empowerment: Stages of human empowerment over the capability and guarantees domain of people power result from the cross-tabulation of the three categories of technological advancement and democratic achievement. If the sequence from traditional economies to industrial economies to knowledge economies is coded 1, 2, and 3 and the sequence from non-democracies to hybrid regimes to democracies is also coded 1, 2, and 3, then the average of the two

sequences yields another five-stage sequence: 1 – suffering stage, 1.5 – struggling stage (lower end), 2 – struggling stage (middle ground), 2.5 – struggling stage (upper end), 3 – thriving stage. This characterization is justified because life changes via expanding capabilities and guarantees from a source of threats into a source of opportunities.

Data for replication analyses are included in the file "TableI.1_I.2.sav" at www.cambridge.org/welzel.

APPENDIX 1 (Ref. CHAPTER 1)

Since Chapter 1 is purely theoretical and includes no data analysis, no variable descriptions and no replication data are available.

APPENDIX 2 (Ref. CHAPTER 2)

Variables in Tables 2.1 to 2.4

Secular Values (or *Sacred-vs.-Secular Values*)

Secular values are not in the center of this book. They are rather used as a contrast means to highlight emancipative values. Nevertheless, they need to be documented. Like emancipative values, secular values are a multi-point index from minimum 0 to maximum 1.0 based on twelve items from the World Values Surveys (World Values Survey Association 2010). The World Values Surveys have been conducted in five waves in more than 90 countries around the globe. Samples represent the adult residential population of a country (people at and above 18 years of age), with sample sizes averaging at 1,200 respondents per country. Interviews are based on a fully standardized master questionnaire, translated (with back-translation checks) and pre-tested in local languages. Details on fieldwork, questionnaire, sampling methods, and data are available online at: www.worldvaluessurvey.org.

The countries sampled by the World Values Surveys represent almost 90 per cent of the world population and include the countries with the largest populations and biggest economies in each world region. They cover the full range of variation in cultural traditions, levels of development, and political regimes that exists in the world.

On the conceptual level, secular values dissociate people from external sources of quasi-sacred authority, like religion, the nation, the state and group norms. Screening the World Values Surveys for items that have been fielded repeatedly, I identified twelve items that represent such a dissociation from external sources of authority. I average scores on the twelve items in a two-step procedure. In the first step, I average scores on the twelve items into four, domain-specific sub-indices, each consisting of three items. In the second step, I average the scores on the four domain-specific sub-indices into the overall index of secular values. Before averaging, all items are re-coded into the same polarity from low scores indicating weaker secular values, to high scores indicating stronger secular values. Also, all items are standardized into the same scale range, from minimum 0 to maximum 1.0. Data are displayed in Appendix-Table 2.2 below.

The logic of this index construction is *not* to create a latent variable that reflects a one-dimensional construct: there is no claim to uni-dimensionality in the construct of secular values, nor is there such a claim in the construct of emancipative values. Instead, the measurement follows the logic of 'formative index construction.' Secular values and emancipative values are measured that way because theoretically they are defined as such: survey responses are measured against this theoretically pre-defined standard, irrespective of how large the overlapping variance between constituent items is across respondents. Indeed, it is assumed that the combination of items has important consequences exactly because they are *not* fully equivalent: only under imperfect equivalence can the combination make a difference. In formative index construction, items are combined because (a) the combination represents a meaningful theoretical concept and because (b) the combination is supposed to be consequential for other phenomena, more consequential than each of its components is. In contrast to a 'reflective scale,' a 'formative index' assumes at least some degree of complementarity, instead of maximum equivalence, among constituent components. For a

formative index like the index of emancipative values, information about the dimensionality is simply descriptive but not the basis to justify the index construction. What follows is a detailed description of the two-step index construction procedure.

Replication data are included in the file "Table2.1_2.6a.sav" at www.cambridge.org/welzel.

First Step: Creating Four *Sub-Indices* of Secular Values

(1) *Defiance Sub-Index*: Multi-point index from 0 to 1. The defiance index is created from responses to three items, asking for the respondents' devoutness to their parents, respect for authority, and national pride. Responses are inversely recoded so that larger scores indicate greater distance from external authority.

The question on devoutness to one's parents [V64 in the wave-5 version of the WVS questionnaire] reads like this:

"People pursue different goals in life. For each of the following goals, can you tell me if you strongly agree, agree, disagree or strongly disagree with it? (*Read out and code one answer for each statement*):

	Strongly agree	Agree	Disagree	Strongly disagree
One of my main goals in life has been to make my parents proud.	1	2	3	4"

Responses to this statement (V64) are recoded into 0 for 'strongly agree,' .33 for 'agree,' .66 for 'disagree' and 1 for 'strongly disagree.'

The question on respect for authority reads like this [variable numbers in the wave-5 version of the WVS questionnaire are V76 to V79]:

"I'm going to read out a list of various changes in our way of life that might take place in the near future. Please tell me for each one, if it were to happen, whether you think it would be a good thing, a bad thing, or don't you mind? (*Code one answer for each*):

	Good	Don't mind	Bad
Greater respect for authority	1	2	3"

Responses to "greater respect for authority" (V78) are recoded into 0 for 'good,' .5 for 'don't mind,' and 1 for 'bad.'

The question on national pride [V209 in the wave-5 version of the WVS questionnaire] reads like this:

"How proud are you to be [**French**]*? (*Read out and code one answer*):

1 Very proud
2 Quite proud
3 Not very proud
4 Not at all proud
5 I am not [**French**]* (*do not read out! Code only if volunteered!*)"

* [*Substitute your own nationality for "French"*]

Responses are recoded into 0 for 'very proud,' .25 for 'quite proud,' .75 for 'not very proud' and 1 for 'not at all proud.'

To create the defiance sub-index, recoded responses to V64, V78, and V209 are averaged, yielding a multi-point index between 0 and 1.0.

(2) *Agnosticism Sub-Index*: Multi-point index from 0 to 1. The agnosticism index is calculated from responses to questions about the importance of religion, religious practice, and the respondents' self-perception as religious or not. The question on the importance of religion reads like this [variable V9 in the wave-5 version of the WVS questionnaire]:

"For each of the following, indicate how important it is in your life. Would you say it is (*read out and code one answer for each*):

	Very important	Rather important	Not very important	Not at all important
Religion	1	2	3	4"

Responses are recoded into 0 for 'very important,' .33 for 'rather important,' .66 for 'not very important' and 1 for 'not at all important.'

The question on religious practice reads like this [V186 in the wave-5 version of the WVS questionnaire]:

> "Apart from weddings and funerals, about how often do you attend religious services these days? (*Code one answer*):
> 1 More than once a week
> 2 Once a week
> 3 Once a month
> 4 Only on special holy days
> 5 Once a year
> 6 Less often
> 7 Never, practically never
> (*NOTE: In Islamic societies, ask how frequently the respondent prays!*)"

Responses are recoded into a 7-point index from minimum 0 for 'never, practically never' to 1 for 'more than once a week.' This is done by subtracting 1 from all codes and dividing the resulting score by 6.

The question on religious self-perception [V187 in the wave-5 version of the WVS questionnaire] reads:

> "Independently of whether you attend religious services or not, would you say you are (*read out and code one answer*):
> 1 A religious person
> 2 Not a religious person
> 3 An atheist

Responses are recoded into a dummy variable with code 0 for 'a religious person' and 1 for 'not a religious person' and 'an atheist.' To create the agnosticism sub-index, recoded responses to V9, V186 and V187 are averaged, yielding a multi-point index from 0 to 1.0.

(3) *Relativism Sub-Index*: Four-point index from 0 to 1.

Question Wording [variable numbers in the wave-5 version of the WVS questionnaire are V199, V200, V201, in the order below]:

"Please tell me for each of the following actions whether you think it can always be justified, never be justified, or something in between, using this card. (*Read out and code one answer for each statement*):

	Never justifiable									Always justifiable
Avoiding a fare on public transport	1	2	3	4	5	6	7	8	9	10
Cheating on taxes if you have a chance	1	2	3	4	5	6	7	8	9	10
Someone accepting a bribe in the course of their duties	1	2	3	4	5	6	7	8	9	10

Responses are recoded into a dummy variable for each of the three items, coding 1 ('never justifiable') as 0 and all other responses as 1. Then scores are averaged over the three dummies, yielding a 4-point index from 0 to 1.0.

(4) *Skepticism Sub-Index*: Multi-point index from minimum 0 to maximum 1.

Question Wording [variable numbers in the wave-5 version of the WVS questionnaire are V132, V136, V137]:

"I am going to name a number of organizations. For each one, could you tell me how much confidence you have in them: is it a great deal of confidence, quite a lot of confidence, not very much confidence or none at all? (*Read out and code one answer for each*):

	A great deal	Quite a lot	Not very much	None at all
The armed forces	1	2	3	4
The police	1	2	3	4
The courts	1	2	3	4"

Responses are recoded for all three items into 0 for 'a great deal' of confidence, .33 for 'quite a lot' of confidence, .66 for 'not very much' confidence and 1 for 'none at all.' Then the recoded responses are averaged over the three items, yielding a multi-point index from 0 to 1.0.

Second Step: Creating the *Overall Index* of Secular Values

The overall index of secular values is the average over the four sub-indices, yielding a multi-point scale from minimum 0 to maximum 1. This procedure is justified on the basis of the hierarchical factor analysis shown in Table 2.1 of the book.

SPSS Syntax to Create the Secular Values Index (*SVI*)

```
***Creating SACRED-vs.-SECULAR VALUES (in short: SECULAR VALUES)***

***Sub-Index 1 (3 items): DEFIANCE***

recode v78 (1=0) (2=.5) (3=1) into i_authority.
recode i_authority (sysmiss=-99).
mis val i_authority (-99).
var lab i_authority "inverse respect for authority".
exec.

recode v209 (1=0) (2=.33) (3=.66) (4=1) into i_nationalism.
recode i_nationalism (sysmiss=-99).
mis val i_nationalism (-99).
var lab i_nationalism "inverse national pride".
exec.

recode v64 (1=0) (2=.33) (3=.66) (4=1) into i_devout.
recode i_devout (sysmiss=-99).
mis val i_devout (-99).
var lab i_devout "inverse devoutness".
exec.

***The following procedure creates the defiance sub-index in such a way that, whenever all three of its components are available, it is the average of these three; whereas when one component is missing it is the linear transformation of the available two components. The formula for the linear transformation (constant and component coefficients) is obtained from regressing the three component average on the two available components. Since there are three possible combinations of available two components, this procedure is performed for each of these possibilities separately. All this is done to avoid losing observations when just one of the three components is unavailable.***

mis val i_nationalism i_authority i_devout ().
exec.
if (i_nationalism ne -99) and (i_authority ne -99) and (i_devout ne -99) defiance=(i_nationalism+i_authority+i_devout)/3.
exec.
if (i_nationalism = -99) and (i_authority ne -99) and (i_devout ne -99) defiance=.077+.463*i_devout+.384*i_authority.
exec.
if (i_nationalism ne -99) and (i_authority = -99) and (i_devout ne -99) defiance=.103+.385*i_nationalism+.434*i_devout.
exec.
if (i_nationalism ne -99) and (i_authority ne -99) and (i_devout = -99) defiance=.202+.372*i_nationalism+.363*i_authority.
exec.
recode defiance (sysmiss = -99).
exec.
mis val defiance i_nationalism i_authority i_devout (-99).
exec.
var lab defiance "defiance sub-index".
exec.


***The following procedure calculates weights in order to weigh down cases in which the defiance sub-index is based on only two instead of three components.***

mis val i_nationalism i_authority i_devout ().
exec.
```

```
if (i_nationalism ne -99) and (i_authority ne -99) and (i_devout ne -99) weight1a=1.
exec.
if (i_nationalism=-99) or (i_authority=-99) or (i_devout=-99) weight1a=.66.
exec.
mis val i_nationalism i_authority i_devout (-99).
exec.
```

Sub-Index 2 (3 items): DISBELIEF

```
recode v9 (4=0) (3=.33) (2=.66) (1=1) into i_religimp.
recode i_religimp (sysmiss=-99).
mis val i_religimp (-99).
var lab i_religimp "inverse import of relig".
exec.

recode v187 (1=0) (2,3=1) into i_religbel.
recode i_religbel (sysmiss=-99).
mis val i_religbel (-99).
var lab i_religbel "inverse relig person".
exec.

recode v186 (1=0) (2=1) (3=2) (4=3) (5=4) (6=5) (7=6) into i_religprac.
compute i_religprac=i_religprac/6.
recode i_religprac (sysmiss=-99).
mis val i_religprac (-99).
var lab i_religprac "inverse relig practice".
exec.
```

The following procedure creates the disbelief sub-index in such a way that, whenever all three of its components are available, it is the average of these three; whereas when one component is missing it is the linear transformation of the available two components. The formula for the linear transformation (constant and component coefficients) is obtained from regressing the three component average on the two available components. Since there are three possible combinations of available two components, this procedure is performed for each of these possibilities separately. All this is done to avoid losing observations when just one of the three components is unavailable.

```
mis val i_religimp i_religbel i_religprac ().
exec.
if (i_religimp ne -99) and (i_religbel ne -99) and (i_religprac ne -99) disbelief=(i_religimp+i_religbel+i_religprac)/3.
exec.
if (i_religimp = -99) and (i_religbel ne -99) and (i_religprac ne -99) disbelief=.088+.423*i_religbel+.468*i_religprac.
exec.
if (i_religimp ne -99) and (i_religbel = -99) and (i_religprac ne -99) disbelief=.078+.501*i_religimp+.435*i_religprac.
exec.
if (i_religimp ne -99) and (i_religbel ne -99) and (i_religprac = -99) disbelief=.023+.481*i_religimp+.393*i_religbel.
exec.

recode disbelief (sysmiss=-99).
mis val disbelief i_religimp i_religbel i_religprac (-99).
exec.
```

The following procedure calculates weights in order to weigh down cases in which the disbelief sub-index is based on only two instead of three components.

```
mis val i_religimp i_religbel i_religprac ().
exec.
if (i_religimp ne -99) and (i_religbel ne -99) and (i_religprac ne -99) weight2a=1.
exec.
if (i_religimp=-99) or (i_religbel=-99) or (i_religprac=-99) weight2a=.66.
exec.
mis val i_religimp i_religbel i_religprac (-99).
exec.
```

Sub-Index 3 (3 items): RELATIVISM*

```
if (v199=1) i_norm1=0.
if (v199 gt 1) i_norm1=1.
recode i_norm1 (sysmiss=-99).
mis val i_norm1 (-99).
var lab i_norm1 "inverse norm conform1".
exec.

if (v200=1) i_norm2=0.
if (v200 gt 1) i_norm2=1.
recode i_norm2 (sysmiss=-99).
mis val i_norm2 (-99).
var lab i_norm2 "inverse norm conform2".
exec.

if (v201=1) i_norm3=0.
if (v201 gt 1) i_norm3=1.
recode i_norm3 (sysmiss=-99).
mis val i_norm3 (-99).
var lab i_norm3 "inverse norm conform3".
exec.
```

The following procedure creates the relativism sub-index in such a way that, whenever all three of its components are available, it is the average of these three; whereas when one component is missing it is the linear transformation of the available two components. The formlula for the linear transformation (constant and component coefficients) is obtained from regressing the three component average on the two available components. Since there are three possible combinations of available two components, this procedure is performed for each of these possibilities separately. All this is done to avoid losing observations when just one of the three components is unavailable.

```
mis val i_norm1 i_norm2 i_norm3 ().
exec.
if (i_norm1 ne -99) and (i_norm2 ne -99) and (i_norm3 ne -99) relativism=(i_norm1+i_norm2+i_norm3)/3.
exec.
if (i_norm1 = -99) and (i_norm2 ne -99) and (i_norm3 ne -99) relativism=.078+.450*i_norm2+.424*i_norm3.
exec.
if (i_norm1 ne -99) and (i_norm2 = -99) and (i_norm3 ne -99) relativism=.050+.441*i_norm1+.465*i_norm3.
exec.
if (i_norm1 ne -99) and (i_norm2 ne -99) and (i_norm3 = -99) relativism=.071+.419*i_norm1+.469*i_norm2.
exec.
recode relativism (sysmiss=-99).
mis val i_norm1 i_norm2 i_norm3 relativism (-99).
exec.
```

The following procedure calculates weights in order to weigh down cases in which the relativism sub-index is based on only two instead of three components.

```
mis val i_norm1 i_norm2 i_norm3 ().
exec.
if (i_norm1 ne -99) and (i_norm2 ne -99) and (i_norm3 ne -99) weight3a=1.
exec.
if (i_norm1=-99) or (i_norm2=-99) or (i_norm3=-99) weight3a=.66.
exec.
mis val i_norm1 i_norm2 i_norm3 (-99).
exec.
```

Sub-Index 4 (3 items): SCEPTICISM

```
recode v132 (1=0) (2=.33) (3=.66) (4=1) into i_trustarmy.
recode i_trustarmy (sysmiss=-99).
mis val i_trustarmy (-99).
var lab i_trustarmy "inverse trust in army".
exec.

recode v136 (1=0) (2=.33) (3=.66) (4=1) into i_trustpolice.
recode i_trustpolice (sysmiss=-99).
mis val i_trustpolice (-99).
var lab i_trustpolice "inverse trust in police".
exec.

recode v137 (1=0) (2=.33) (3=.66) (4=1) into i_trustcourts.
recode i_trustcourts (sysmiss=-99).
mis val i_trustcourts (-99).
var lab i_trustcourts "inverse trust in courts".
exec.
```

The following procedure creates the scepticism sub-index in such a way that, whenever all three of its components are available, it is the average of these three; whereas when one component is missing it is the linear transformation of the available two components. The formula for the linear transformation (constant and component coefficients) is obtained from regressing the three component average on the two available components. Since there are three possible combinations of available two components, this procedure is performed for each of these possibilities separately. All this is done to avoid losing observations when just one of the three components is unavailable.

```
mis val i_trustarmy i_trustpolice i_trustcourts ().
exec.
if (i_trustarmy ne -99) and (i_trustpolice ne -99) and (i_trustcourts ne -99) scepticism=(i_trustarmy+i_trustpolice+i_trustcourts)/3.
exec.
if (i_trustarmy = -99) and (i_trustpolice ne -99) and (i_trustcourts ne -99) scepticism=.099+.427*i_trustpolice+.408*i_trustcourts.
exec.
if (i_trustarmy ne -99) and (i_trustpolice = -99) and (i_trustcourts ne -99) scepticism=.059+.411*i_trustarmy+.475*i_trustcourts.
exec.
if (i_trustarmy ne -99) and (i_trustpolice ne -99) and (i_trustcourts = -99) scepticism=.060+.395*i_trustarmy+.473*i_trustpolice.
exec.
recode scepticism (sysmiss=-99).
mis val i_trustarmy i_trustpolice i_trustcourts scepticism (-99).
exec.
```

The following procedure calculates weights in order to weigh down cases in which the scepticism sub-index is based on only two instead of three components.

```
mis val i_trustarmy i_trustpolice i_trustcourts ().
exec.
if (i_trustarmy ne -99) and (i_trustpolice ne -99) and (i_trustcourts ne -99) weight4a=1.
exec.
if (i_trustarmy=-99) or (i_trustpolice=-99) or (i_trustcourts=-99) weight4a=.66.
exec.
mis val i_trustarmy i_trustpolice i_trustcourts (-99).
exec.
```

Overall SECULAR VALUES

The following procedure creates the overall index of secular values in such a way that, whenever all four of its components are available, it is the average of these four; whereas when one component is missing it is the average of the remaining three components. No linear transformation is applied because the averages of the four components are quite similar.

```
mis val scepticism relativism disbelief defiance ().
exec.
if (scepticism ne -99) and (relativism ne -99) and (disbelief ne -99) and (defiance ne -99) SacSecVal=(scepticism+relativism+disbelief+defiance)/4.
exec.
if (scepticism = -99) and (relativism ne -99) and (disbelief ne -99) and (defiance ne -99) SacSecVal=(relativism+disbelief+defiance)/3.
exec.
if (scepticism ne -99) and (relativism = -99) and (disbelief ne -99) and (defiance ne -99) SacSecVal=(scepticism+disbelief+defiance)/3.
exec.
if (scepticism ne -99) and (relativism ne -99) and (disbelief = -99) and (defiance ne -99) SacSecVal=(scepticism+relativism+defiance)/3.
exec.
if (scepticism ne -99) and (relativism ne -99) and (disbelief ne -99) and (defiance = -99) SacSecVal=(scepticism+relativism+disbelief)/3.
exec.
recode SacSecVal (sysmiss=-99).
mis val scepticism relativism disbelief defiance SacSecVal (-99).
exec.
```

The following procedure creates an average weight of the specific weights for the four sub-indices. This weight should be used when analyzing the index of secular values. The average weight down-weighs cases proportional to the number items missing, related to the total of all 12 items on which the overall index of secular values is based.

```
compute weight_a=(weight1a+weight2a+weight3a+weight4a)/4.
exec.
```

The following procedure collapses the overall index of secular values into ten ascending categories of equal interval size: each interval covers a .10-range of the index.

```
if (SacSecVal ge 0) and (SacSecVal le .10) seccat=1.
exec.
if (SacSecVal gt .10) and (SacSecVal le .20) seccat=2.
exec.
if (SacSecVal gt .20) and (SacSecVal le .30) seccat=3.
```

```
exec.
if (SacSecVal gt .30) and (SacSecVal le .40) seccat=4.
exec.
if (SacSecVal gt .40) and (SacSecVal le .50) seccat=5.
exec.
if (SacSecVal gt .50) and (SacSecVal le .60) seccat=6.
exec.
if (SacSecVal gt .60) and (SacSecVal le .70) seccat=7.
exec.
if (SacSecVal gt .70) and (SacSecVal le .80) seccat=8.
exec.
if (SacSecVal gt .80) and (SacSecVal le .90) seccat=9.
exec.
if (SacSecVal gt .90) and (SacSecVal le 1.00) seccat=10.
exec.
recode seccat (sysmiss=-99).
mis val seccat (-99).
exec.
```

Emancipative Values (or *Obedient-vs.-Emancipative Values*)

Emancipative values are a multi-point index from minimum 0 to maximum 1.0 based on twelve items from the WVS. On the conceptual level, emancipative values appreciate a life free from external domination, for which reason these values emphasize equal freedoms for everyone. Thus, emancipative values involve a double emphasis on freedom of choice and equality of opportunities. Screening the World Values Surveys for items that have been fielded repeatedly, I identified twelve items that represent an emphasis on freedom of choice or equality of opportunities or both. I average scores on the twelve items in a two-step procedure. In the first step, I average scores on the twelve items into four, domain-specific sub-indices, each consisting of three items. In the second step, I average the scores on the four domain-specific sub-indices into the overall index of emancipative values. Before averaging, all items are re-coded into the same polarity from low scores indicating weaker emancipative values, to high scores indicating stronger emancipative values. Also, all items are standardized into the same scale range, from minimum 0 to maximum 1.0. Data are displayed in Appendix-Table 2.2 below. What follows is a description of the two-step index construction procedure.

Replication data are included in the file "Table2.1_2.6a.sav" at www.cambridge.org/welzel.

First Step: Creating Four *Sub-Indices* of Emancipative Values

(1) *Autonomy Sub-Index*: Four-point index from 0 to 1.

Question Wording [variable numbers in the wave-5 version of the WVS questionnaire are V12 to V21]:

"Here is a list of qualities that children can be encouraged to learn at home. Which, if any, do you consider to be especially important?

	Mentioned	Not mentioned
Independence	1	2
Imagination	1	2
Obedience	1	2"

Mentioning of 'independence' and 'imagination' are both coded 1 and 0 otherwise. Mentioning of 'obedience' is coded 0 and 1 otherwise. To create the autonomy sub-index, recoded scores are averaged over the three items.

(2) *Equality Sub-Index*: Twelve-point index from 0 to 1.

Question Wording [variable numbers in the wave-5 version of the WVS questionnaire are V44, V62, and V63, in this order]:

"Do you agree, disagree or neither agree nor disagree with the following statements? When jobs are scarce, men should have more right to a job than women."

"For each of the following statements I read out, can you tell me how strongly you agree or disagree with each. Do you strongly agree, agree, disagree, or strongly disagree?
- A university education is more important for a boy than for a girl.
- On the whole, men make better political leaders than women do."

For the first item (V44), agree is coded 0, neither nor is coded .5 and disagree is coded 1. For the next two items (V62, V63), 'strongly agree' is coded 0, 'agree' is coded .25, 'disagree' is coded .75 and 'strongly disagree' is coded 1. To create the equality sub-index, recoded scores are averaged over the three items.

(3) *Choice Sub-Index*: Thirty-point index from 0 to 1.

Question Wording [variable numbers in the wave-5 version of the WVS questionnaire are V202, V204, V205, in the order below]:

"Please tell me for each of the following actions whether you think it can always be justified, never be justified, or something in between using this card (10-point scale):

Homosexuality	1	2	3	4	5	6	7	8	9	10
Abortion	1	2	3	4	5	6	7	8	9	10
Divorce	1	2	3	4	5	6	7	8	9	10
	Never justifiable								Always justifiable	

Codes are rescaled from minimum 0 to maximum 1 for each of the three items. This is done by subtracting 1 from the respondent's score and then dividing the resulting difference by 9 (given score minus minimum possible score divided by the difference between the maximum and minimum possible score). To create the choice sub-index, recoded scores are averaged over the three items.

(4) *Voice Sub-Index*: Six-point index from minimum 0 to maximum 1.

Question Wording [variable numbers in the wave-5 version of the WVS questionnaire are V69, V70, V71, V72]:

"People sometimes talk about what the aims of this country should be for the next ten years. On this card are listed some of the goals which different people would give top priority. Would you please say which one of these you, yourself, consider the most important? (…) And second most important?
There are twelve aims in total, among them:
- Giving people more say in important government decisions
- Protecting freedom of speech
- Seeing that people have more say about how things are done at their jobs and in their communities."

Responses are recoded into 0 when the item has not been chosen as important, .5 when it has been chosen as second most important and 1 when it has been chosen as most important. To create the voice sub-index, the recoded scores are averaged over the three items.

Second Step: Creating the *Overall Index* of Emancipative Values

The overall index of emancipative values is the average over the four sub-indices, yielding a multi-point scale from minimum 0 to maximum 1. This procedure is justified on the basis of the hierarchical factor analysis shown Table 2.3 of the book.

SPSS Syntax to Create the Emancipative Values Index (*EVI*)

```
***OBEDIENT-vs.-EMANCIPATIVE VALUES (in short: EMANCIPATIVE VALUES)***
***Sub-Index 1 (3 items): AUTONOMY***

recode v12 (1=1) (2=0) into indep.
recode indep (sysmiss=-99).
mis val indep (-99).
var lab indep "independ as kid qual".
exec.

recode v15 (1=1) (2=0) into imagin.
recode imagin (sysmiss=-99).
mis val imagin (-99).
var lab imagin "imagin as kid qual".
exec.

recode v21 (1=0) (2=1) into nonobed.
recode nonobed (sysmiss=-99).
mis val nonobed (-99).
var lab nonobed "obedience not kid qual".
exec.


***The following procedure creates the autonomy sub-index index in such a way that whenever all three of its components are available, it is the average of these three, whereas when one component is missing it is a linear transformation of the available two components. The formula for the linear transformation (constant and component coefficients) is obtained from regressing the three component average on the two specific components in question. Since there are three possibilities of which combination of two components is available, this procedure has to be performed separately for each combination. All this is done to avoid losing observations when just one of the three components is missing.***

mis val indep imagin nonobed ().
exec.
if (indep ne -99) and (imagin ne -99) and (nonobed ne -99) autonomy=(indep+imagin+nonobed)/3.
exec.
if (indep ne -99) and (imagin ne -99) and (nonobed=-99) autonomy=.175+.397*indep+.366*imagin.
exec.
if (indep ne -99) and (imagin=-99) and (nonobed ne -99) autonomy=.037+.364*indep+.356*nonobed.
exec.
if (indep=-99) and (imagin ne -99) and (nonobed ne -99) autonomy=.102+.379*imagin+.400*nonobed.
exec.

recode autonomy (sysmiss=-99).
mis val indep imagin nonobed autonomy (-99).
var lab autonomy "autonomy subindex".
exec.


***The following procedure creates weight variables to weigh down cases in which one of the three components is missing, giving these cases three third of the unit weight of 1.***

mis val indep imagin nonobed ().
exec.
if (indep ne -99) and (imagin ne -99) and (nonobed ne -99) weight1b=1.
exec.
if (indep ne -99) and (imagin ne -99) and (nonobed ne -99) weight1b=.66.
```

```
exec.
mis val indep imagin nonobed (-99).
exec.
```

Sub-Index 2 (3 items): EQUALITY

```
recode v44 (1=0) (2=.5) (3=1) into womjob.
recode womjob (sysmiss=-99).
mis val womjob (-99).
var lab womjob "gend equal: job".
exec.

recode v61 (1=0) (2=.33) (3=.66) (4=1) into wompol.
recode wompol (sysmiss=-99).
mis val wompol (-99).
var lab wompol "gend equal: politics".
exec.

recode v62 (1=0) (2=.33) (3=.66) (4=1) into womedu.
recode womedu (sysmiss=-99).
mis val womedu (-99).
var lab womedu "gend equal: education".
exec.
```

The following procedure creates the equality sub-index index in such a way that whenever all three of its components are available, it is the average of these three, whereas when one component is missing it is a linear transformation of the available two components. The formula for the linear transformation (constant and component coefficients) is obtained from regressing the three component average on the two available components. Since there are three possibilities of which combination of two components is available, this procedure has to be performed separately for each combination. All this is done to avoid losing observations when just one of the three components is missing.

```
mis val wompol womedu womjob ().
exec.
if (wompol ne -99) and (womedu ne -99) and (womjob ne -99) equality=(wompol+womedu+womjob)/3.
exec.
if (wompol = -99) and (womedu ne -99) and (womjob ne -99) equality=.049+.447*womedu+.404*womjob.
exec.
if (wompol ne -99) and (womedu = -99) and (womjob ne -99) equality=.145+.443*wompol+.372*womjob.
exec.
if (wompol ne -99) and (womedu ne -99) and (womjob = -99) equality=.042+.485*wompol+.421*womedu.
exec.
recode equality (sysmiss=-99).
var lab equality "equality sub-index".
mis val wompol womedu womjob equality (-99).
exec.
```

The following procedure creates weight variables to weigh down cases in which one of the three components is missing, giving these cases three third of the unit weight of 1.

```
mis val wompol womedu womjob ().
exec.
if (wompol ne -99) and (womedu ne -99) and (womjob ne -99) weight2b=1.
exec.
if (wompol = -99) or (womedu = -99) or (womjob = -99) weight2b=.66.
exec.
mis val wompol womedu womjob (-99).
```

```
exec.


***Sub-Index 3 (3 items): CHOICE***

compute homolib=(v202-1)/(10-1).
recode homolib (sysmiss=-99).
mis val homolib (-99).
var lab homolib "homosex acceptable".
exec.

compute abortlib=(v204-1)/(10-1).
recode abortlib (sysmiss=-99).
mis val abortlib (-99).
var lab abortlib "abortion acceptable".
exec.

compute divorlib=(v205-1)/(10-1).
recode divorlib (sysmiss=-99).
mis val divorlib (-99).
var lab divorlib "divorce acceptable".
exec.


***The following procedure creates the choice sub-index index in such a way that whenever all three of its components are available, it is the average of these three, whereas when one component is missing it is a linear transformation of the available two components. The formula for the linear transformation (constant and component coefficients) is obtained from regressing the three component average on the two available components. Since there are three possibilities of which combination of two components is available, this procedure has to be performed separately for each combination. All this is done to avoid losing observations when just one of the three components is missing.***

mis val homolib abortlib divorlib ().
exec.
if (homolib ne -99) and (abortlib ne -99) and (divorlib ne -99) choice=(homolib+abortlib+divorlib)/3.
exec.
if (homolib = -99) and (abortlib ne -99) and (divorlib ne -99) choice=.008+.434*abortlib+.439*divorlib.
exec.
if (homolib ne -99) and (abortlib = -99) and (divorlib ne -99) choice=.015+.408*homolib+.496*divorlib.
exec.
if (homolib ne -99) and (abortlib ne -99) and (divorlib = -99) choice=.069+.416*homolib+.505*abortlib.
exec.
recode choice (sysmiss=-99).
var lab choice "choice sub-index".
mis val homolib abortlib divorlib choice (-99).
exec.


***The following procedure creates weight variables to weigh down cases in which one of the three components is missing, giving these cases three third of the unit weight of 1.***

mis val homolib abortlib divorlib ().
exec.
if (homolib ne -99) and (abortlib ne -99) and (divorlib ne -99) weight3b=1.
exec.
if (homolib = -99) or (abortlib = -99) or (divorlib = -99) weight3b=.66.
exec.
mis val homolib abortlib divorlib (-99).
exec.
```

```
***Sub-Index 4 (3 items): VOICE***

if ((v71=2 and v72=4) or (v71=4 and v72=2)) voice1=1.
exec.
if ((v71=2 and v72 ne 4) or (v71=4 and v72 ne 2)) voice1=.66.
exec.
if ((v71 ne 2 and v72=4) or (v71 ne 4 and v72=2)) voice1=.33.
exec.
if ((v71 ne 2) and (v71 ne 4) and (v72 ne 2) and (v72 ne 4)) voice1=0.
exec.
recode voice1 (sysmiss=-99).
mis val voice1 (-99).
var lab voice1 "voice 1".
exec.

if (v69=3) voice2=1.
exec.
if (v70=3) voice2=.5.
exec.
if ((v69 ne 3) and (v70 ne 3)) voice2=0.
exec.
recode voice2 (sysmiss=-99).
mis val voice2 (-99).
var lab voice2 "voice 2".
exec.


***The following procedure creates auxiliary versions of voice indices for the situation that both voice1 and voice2 or only one of them are available***.

compute voi2_00=(voice1+voice2)/2.
recode voi2_00 (sysmiss=-99).
mis val voi2_00 (-99).
exec.

compute voi1_01=voice1.
recode voi1_01 (sysmiss=-99).
mis val voi1_01 (-99).
exec.

compute voi1_02=voice2.
recode voi1_02 (sysmiss=-99).
mis val voi1_02 (-99).
exec.

mis val voi2_00 voi1_01 voi1_02 ().
exec.


***The following procedure creates the final index of voice in such a way that whenever voice1 and voice2 are available, the index is the average of the two. However, when (as in wave 1), the voice2 index is not available, the final voice index is a linear transformation of the voice1 index only. The formula for the linear transformation is obtained by regressing the combined voice1 and voice2 index on the voice1 index***.

if (voi2_00 ne -99) voice=voi2_00.
exec.
if (voi2_00=-99) and (voi1_01 ne -99) voice=.656*voi1_01+.136.
exec.
if (voi2_00=-99) and (voi1_02 ne -99) voice=.613*voi1_02+.141.
```

```
exec.
mis val voi2_00 voi1_01 voi1_02 (-99).
recode voice (sysmiss=-99).
mis val voice (-99).
var lab voice “voice sub-index”.
exec.
```

The following procedure creates weight variables to weigh down cases in which one of the three components is missing, giving these cases three third of the unit weight of 1.

```
mis val voi2_00 voi1_01 voi1_02 ().
exec.
if (voi2_00 ne -99) and (voi1_01 ne -99) and (voi1_02 ne -99) weight4b=1.
exec.
if (voi2_00 = -99) or (voi1_01 = -99) or (voi1_02 = -99) weight4b=.66.
exec.
mis val voi2_00 voi1_01 voi1_02 (-99).
exec.
```

Overall EMANCIPATIVE VALUES INDEX.

The following procedure creates the overall index of emancipative values in such a way that whenever all four of its components are available, it is the average of these four, whereas when one component is missing it is a linear transformation of the available three components. The formula for the linear transformation (constant and component coefficients) is obtained from regressing the four component average on the three available components. Since there are four possibilities of which combination of three components is available, this procedure has to be performend for each of these possibilities separately. All this is done to avoid losing observations when just one of the four components is missing.

```
mis val autonomy equality choice voice ().
exec.
if (autonomy ne -99) and (equality ne -99) and (choice ne -99) and (voice ne -99) ObeEmaVal=(autonomy+equality+choice+voice)/4.
exec.
if (autonomy ne -99) and (equality = -99) and (choice ne -99) and (voice ne -99) ObeEmaVal=.103+.266*autonomy+.305*choice+.286*voice.
exec.
if (autonomy = -99) and (equality ne -99) and (choice ne -99) and (voice ne -99) ObeEmaVal=.070+.274*equality+.304*choice+.271*voice.
exec.
if (autonomy ne -99) and (equality ne -99) and (choice = -99) and (voice ne -99) ObeEmaVal=.016+.291*autonomy+.310*equality+.288*voice.
exec.
if (autonomy ne -99) and (equality ne -99) and (choice ne -99) and (voice = -99) ObeEmaVal=.051+.267*autonomy+.292*equality+.290*choice.
exec.

recode ObeEmaVal (sysmiss=-99).
var lab ObeEmaVal "emanc vals".
mis val autonomy equality choice voice ObeEmaVal (-99).
exec.
```

The following procedure creates an average weight of the specific weights for the four sub-indices. This weight should be used when analyzing the index of emancipative values. The average weight down-weighs cases proportional to the number items missing, related to the total of all 12 items on which the overall index of emancipative values is based.

```
compute weight_b=(weight1b+weight2b+weight3b+weight4b)/4.
exec.
```

The following procedure collapses the overall index of emancipative values into ten ascending categories of equal interval size: each interval covers a .10-range of the index.

```
if (ObeEmaVal ge 0) and (ObeEmaVal le .10) emacat=1.
exec.
if (ObeEmaVal gt .10) and (ObeEmaVal le .20) emacat=2.
exec.
if (ObeEmaVal gt .20) and (ObeEmaVal le .30) emacat=3.
exec.
if (ObeEmaVal gt .30) and (ObeEmaVal le .40) emacat=4.
exec.
if (ObeEmaVal gt .40) and (ObeEmaVal le .50) emacat=5.
exec.
if (ObeEmaVal gt .50) and (ObeEmaVal le .60) emacat=6.
exec.
if (ObeEmaVal gt .60) and (ObeEmaVal le .70) emacat=7.
exec.
if (ObeEmaVal gt .70) and (ObeEmaVal le .80) emacat=8.
exec.
if (ObeEmaVal gt .80) and (ObeEmaVal le .90) emacat=9.
exec.
if (ObeEmaVal gt .90) and (ObeEmaVal le 1.00) emacat=10.
exec.
recode emacat (sysmiss=-99).
exec.
mis val emacat (-99).
exec.
```

Appendix-Table 2.1: Cross-cultural Factor Analysis of the Components of Emancipative Values and Self-expression Values

Emanc. Values Components:	Old West	Reformed West	New West	Returned West	Orthodox East	Islamic East	Indic East	Sinic East	Latin America	Subsaharan Africa	Global Mean (variance coefficient)
Choice	.75	.75	.75	.63	.65	.57	.62	.69	.67	.59	.67 (.09)
Equality	.66	.66	.68	.73	.60	.63	.27	.60	.57	.50	.59 (.22)
Autonomy	.60	.68	.64	.59	.57	.62	.52	.51	.55	.66	.59 (.10)
Voice	.63	.59	.53	.56	.45	.49	.68	.58	.60	.38	.55 (.16)
Mean	.66	.67	.65	.63	.57	.58	.52	.60	.60	.53	**.60 (.08)**
Dissimilarity[a)]	.06	.07	.06	.05	.04	.04	.14	.02	.03	.10	**.06**
Self-ex. Values Components:	Old West	Reformed West	New West	Returned West	Orthodox East	Islamic East	Indic East	Sinic East	Latin America	Subsaharan Africa	Global Mean (variance coefficient)
Tolerance	.67	.73	.68	.62	.53	.59	.65	.65	.64	.55	.63 (.10)
Postmaterialism	.69	.65	.62	.60	.63	.62	.71	.65	.67	.21	.60 (.23)
Petitioning	.64	.60	.63	.59	.48	.61	.32	.60	.52	.64	.56 (.18)
Trust	.41	.53	.42	.41	.36	- .26	- .27	.17	.36	.50	.26 (1.11)
Happiness	.18	.16	.06	.39	.32	- .19	.23	.16	.05	.39	.18 (1.00)
Mean	.52	.53	.48	.52	.46	.27	.33	.45	.45	.46	**.45 (.18)**
Dissimilarity[a)]	.07	.10	.08	.08	.09	.20	.19	.04	.07	.20	**.12**
N	37,047	31,931	27,388	37,589	42,193	33,400	23,093	21,630	41,675	28,733	**327,829**

Note: Figures based on explorative factor analysis with the full-blown, time-and-country-pooled individual-level dataset of WVS rounds one to five (respondents distribute across 95 countries in ten culture zones). Factor analysis conducted separately for respondents in the ten culture zones. National samples weighed to equal impact.

[a)] Duncan Index of Dissimilarity for deviation of culture-zone specific loadings from the global mean loadings.

For the factor analyses, all samples are weighted to equal size (N = 1,200), without changing the average sample size. National samples are grouped into culture zones as follows. *Old West*: Andorra, Austria, Belgium, (Cyprus), France, (Greece), Ireland, (Israel), Italy, Luxembourg, Malta, Portugal, Spain; *Reformed West*: Denmark, Finland, Germany (West), Iceland, Netherlands, Norway, Sweden, Switzerland; *New West*: Australia, Canada, New Zealand, UK, USA; *Returned West*: Croatia, Czechia, Estonia, Germany (East), Hungary, Latvia, Lithuania, Poland, Slovakia, Slovenia; *Orthodox East*: Albania, Armenia, Azerbaijan, Belarus, Bosnia, Bulgaria, Georgia, Kyrgyzstan, Macedonia, Moldova, Romania, Russia, Serbia, Ukraine; *Islamic East*: Algeria, Egypt, Iran, Iraq, Jordan, Morocco, Saudi Arabia, Turkey; *Indic Asia*: Bangladesh, India, Indonesia, Malaysia, Pakistan, Philippines, Singapore, Thailand; *Sinic East*: China, Hong Kong, Japan, South Korea, Taiwan, Vietnam; *Latin America*: Argentina, Brazil, Chile, Colombia, Dominican Republic, El Salvador, Guatemala, Mexico, Peru, Venezuela, Trinidad and Tobago, Uruguay; *Sub-saharan Africa*: Burkina Faso, Ghana, Mali, Nigeria, Rwanda, South Africa, Tanzania, Uganda, Zambia, Zimbabwe.

As the separate factor analysis for respondents from the ten different global culture zones in Appendix-Table 2.3 shows, the overlapping variances among the four sub-indices of emancipative values are largely similar across culture zones. As the analyses also shows, this cannot be said of Inglehart and Welzel's (2005) measure of self-expression values—the conceptual predecessor of emancipative values. With self-expression values, especially the trust and happiness components show pronounced cross-cultural differences—yet these are not part of the measure of emancipative values.

Additional Variables and Data in Figure 2.1 and Table 2.5

Coherence of Emancipative Values: Using the latest available survey (1995-2005) from each society surveyed once by the WVS, I measure per country the individual-level Cronbach's alpha for the four the sub-indexes of emancipative values.

Western Society (dummy): Societies are coded 1 ('Western') if they belong into one of the four Western culture zones in Table I.3. Otherwise, countries are coded 0 ('Non-Western').

Democratic Tradition: 'Democracy stock index' measuring per society the historically accumulated experience with democracy until 1995, with a premium on more recent experience. Index is calculated by adding up the yearly -10 to +10 'autocracy-democracy' scores of a country with a 1%-deflation rate for each year reaching back into the past. Thus, from the perspective of the year 1995, a hundred years back to 1895 scores cease to count. I normalized scores so that the minimum possible score is 0 and the maximum possible score is 1, with fractions of 1 for intermediate positions. Source: Gerring et al. (2005).

Replication data are included in the file "Table2.5Figure2.1.sav" at www.cambridge.org/welzel.

Additional Data and Variables in Table 2.6

Attitudinal measures in Table 2.6 are taken from the WVS, using the latest available survey from each country. Samples are weighted to equal size.

Formal Education: The variable is measured in nine ascending categories, indicating the highest achieved level of education from 1 "no formal education" to 9 "university degree" based V238 of the WVS round-five questionnaire. I recode the scores into a range from minimum 0 to maximum 1.0, with fractions for intermediate positions.[1] The right-hand diagram in Figure 2.7 plots the emancipative values of people with the highest level of education in each acountry against those of people with the lowest level of education on the horizontal axis.

Informational Connectedness: This variable measures the variety of sources a respondent uses to obtain information, in ascending order on a nine-point scale from no

[1] SPSS syntax: compute educ = (v238 – 1) / (9 – 1). Exec.

source to eight sources. The respective questions in the WVS 2005 questionnaire are V223 to V230.[2]

Social Movement Activity: This variable measures the variety of social movement activities a respondent has been or considers to be involved in, on a seven-point scale in ascending order from no participation or intention of participation in any social movement activity, including petitions, peaceful demonstrations, and consumer boycotts. Despite only three types of activities asked for, the scale is that fine-grained because intention to participate is coded as a state in between rejection to participate and actual participation. The reliability and validity of this variable is shown in Deutsch and Welzel (2012). The respective variables are V96 to V99 in the 2005 WVS questionnaire.[3] See Appendix 7 for more details.

Understanding Democracy: This variable measures how strongly a respondent's notion of democracy coincides with democracy's liberal definition, on a multi-point scale in ascending order. The information is taken from a battery asking respondents on a 1-to-10 scale how strongly they support each of ten stated meanings of democracy. Four of these meanings denote a liberal or procedural definition of democracy: free elections (V154), civil rights (V157), legal equality (V161), and referenda votes (V160). I average the respondents' support ratings for these four meanings and subtract from this their average support rating of four non-liberal meanings of democracy: military political intervention (V156), religious political authority (V153), harsh crime punishment (V159) and economic growth (V158). The resulting index is standardized into a scale range from minimum 0 to maximum 1.0 such that score below .50 indicate stronger support for a non-liberal definition of democracy while scores above .50 indicate

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[2] The SPSS syntax for this variable reads like this: "Recode v223 (1 = 1) (2 = 0) into inf_newsp. Recode inf_newsp (sysmiss = -99). Mis val inf_newsp (-99). Var lab inf_newsp 'info source: newsp'. Recode v224 (1 = 1) (2 = 0) into inf_tvnews. Recode inf_tvnews (sysmiss = -99). Mis val inf_tvnews (-99). Var lab inf_tvnews 'info source: tv news'. Recode v225 (1 = 1) (2 = 0) into inf_magaz. Recode inf_magaz (sysmiss = -99). Mis val inf_magaz (-99). Var lab inf_magaz 'info source: magazines'. Recode v226 (1 = 1) (2 = 0) into inf_indepth. Recode inf_indepth (sysmiss = -99). Mis val inf_indepth (-99). Var lab inf_indepth 'info source: in-depth-docs'. Recode v227 (1 = 1) (2 = 0) into inf_book. Recode inf_book (sysmiss = -99). Mis val inf_book (-99). Var lab inf_book 'info source: book'. Recode v228 (1 = 1) (2 = 0) into inf_web. Recode inf_web (sysmiss = -99). Mis val inf_web (-99). Var lab inf_web 'info source: web'. Recode v229 (1 = 1) (2 = 0) into inf_talk. Recode inf_talk (sysmiss = -99). Mis val inf_talk (-99). Var lab inf_talk 'info source: interpers talk'. Exec. If (v230 = 3) pc_use=1. If (v230 ne 3) pc_use = 0. Recode pc_use (sysmiss = -99). Mis val pc_use (-99). Var lab pc_use 'frequent pc use'. Compute infconnec = (inf_newsp + inf_tvnews + inf_magaz + inf_indepth + inf_book + inf_web + inf_talk + pc_use)/8. Recode infconnec (sysmiss=-99). Mis val infconnec (-99). Var lab infconnec 'informational connectedness'."

[3] The SPSS syntax for this variable reads like this: "If (v96 = 3) sma_pet = 0. If (v96 = 2) sma_pet = .30. If (v96 = 1) sma_pet = 1. Recode sma_pet (sysmiss = -99). Mis val sma_pet (-99). Var lab sma_pet 'elite chall act: petition'. If (v97 = 3) sma_boy = 0. If (v97 = 2) sma_boy = .30. If (v97 = 1) sma_boy = 1. Recode sma_boy (sysmiss = -99). Mis val sma_boy (-99). Var lab sma_boy 'elite chall act: boycotts'. If (v98 = 3) sma_dem = 0. If (v98 = 2) sma_dem = .30. If (v98 = 1) sma_dem=1. Recode sma_dem (sysmiss = -99). Mis val sma_dem (-99). Var lab sma_dem 'elite chall act: demonstrations'. Compute sma = (sma_pet + sma_boy + sma_dem) / 3. Recode sma (sysmiss = -99). Mis val sma. Var lab sma 'sma'."

the opposite. The index has been analyzed and validated by Welzel (2010).[4] See Appendix 10 for more details.

Self-expression Values: This measure is created following the instructions of Inglehart and Welzel (2005: ch. 2), using a two-factor analysis over the ten WVS items that are constitutive for the traditional-vs.-secular/rational value dimension and the survival-vs.-self-expression value dimension. In the upper two panels of Table 2.6, individual-level respondent scores on the survival-vs.-self-expression value dimension are used. In the lower panel, country averages of the respondent scores are used.

Advancement & Achievement: This variable is a factor combination of country scores on technololigcal advancement and democratic achievement over the years 1995 to 2005. The two variables share 66 per cent variance and are one-dimensional with loadings of .93 for both on the underlying factor. I use per country the factor score on the underlying 'advancement-achievement dimension.

Replication data are included in the file "Table2.6b.sav" at www.cambridge.org/welzel.

Additional Data and Variables in Table 2.7

Variables are listed in the order in which they appear in Table 2.7. Replication data are included in the file "Table2.7.sav" at www.cambridge.org/welzel.

Tightness/Looseness: Gelfand et al.'s (2011) tightness/looseness scores inverted so that scores increase from tightness to looseness and normalized into a scale range from minimum 0 (tightness pole) to maximum 1.0 (looseness pole). See also p.127.

Collectivism/Individualism: Index created in three steps from data published in the online supplement of Thornhill and Fincher et al. (2008) (see: http:// rspb. royalsocietypublishing.org/content/suppl/2009/03/20/275.1640.1279.DC1.html). First, I standardize individualism scores that Thornhill and Fincher et al. have taken from Hofstede (2001 [1980]) and Suh et al. (1998) into normalized scales from minimum 0 to maximum 1.0. Then I invert collectivism scores that

[4] The SPSS syntax for this variable reads as follows: "Compute dem_elections = (v154 - 1) / (10 - 1). Recode dem_elections (sysmiss = -99). Mis val dem_elections (-99). Var lab dem_elections 'democr as free elections'. Compute dem_civlib = (v157 - 1) / (10 - 1). Recode dem_civlib (sysmiss=-99). Mis val dem_civlib (-99). Var lab dem_civlib 'democr as civ libs'. Compute dem_gendeq = (v161 - 1) / (10 - 1). Recode dem_gendeq (sysmiss=-99). Mis val dem_gendeq (-99). Var lab dem_gendeq 'democr as eq rights'. Compute dem_referend = (v160 - 1) / (10 - 1). Recode dem_referend (sysmiss = -99). Mis val dem_referend (-99). Var lab dem 'referend democr as referenda'. Compute dem_army = (v156 - 1) / (10 - 1). Recode dem_army (sysmiss=-99). Mis val dem_army (-99). Var lab dem_army 'democr as military coups'. Compute dem_relig = (v153 - 1) / (10 - 1). Recode dem_relig (sysmiss = -99). Mis val dem_relig (-99). Var lab dem_relig 'democr as relig leadershp'. Compute dem_crimepun = (v159 - 1) / (10 - 1). Recode dem_crimepun (sysmiss = -99). Mis val dem_crimepun (-99). Var lab dem_crimepun 'democr as punishing criminals'. Compute dem_ecoprosp = (v158 - 1) / (10 - 1). Recode dem_ecoprosp (sysmiss = -99). Mis val dem_ecoprosp (-99). Var lab dem_ecoprosp 'democr as econom prosp'. Compute understdemoc = ((dem_elections + dem_civlib + dem_gendeq + dem_ referend)) + (1 – (dem_army + dem_relig + dem_crimepun + dem_ecoprosp)) / 8. Recode libdem (sysmiss = -99). Mis val libdem (-99). Var lab libdem 'understanding democracy'."

Thornhill and Fincher et al. have taken from Gelfand et al. (2004) into individualism scores with the same standard scale range as the other two. Whenever all three measures are available, I take their average; otherwise I take the average of the remaining two or the score of the only available one. This is done to avoid losing a whole country when only one index is available. This procedure suggests that the three indices are inter-changeable, which is justified on the basis of very high inter-index correlations: r = .91 between Suh's and Hofstede's individualism scores (N = 45; p < .001, two-tailed); r = .85 between Suh's individualism scores and Gelfand's inverted collectivism scores (N = 38; p < .001, two-tailed); r = .75 between Hofstede's individualism scores and Gelfand's inverted collectivism scores (N = 46; p < .001, two-tailed). See also p. 127.

Per capita GDP (indexed): Measure taken from the year 2000 and indexed such that a GDP/cap of 60,000 US-Dollars is set at maximum 1.0 and all other scores at their proper fraction of 1.0. The formula for this transformation is: observed GDP/value divided by 60,000. Source: World Bank (2010).

Urbanization: Proportion of the urban population in 2000 per society as a fraction of 1.0. Source: World Bank (2010).

Schooling Years: Measure taken from the year 2000. Scores are indexed such that 25 years of schooling are set at maximum 1.0 and all other scores at their proper fraction of 0. The formula for this transformation is: observed schooling years divided by 25. Source: Barro and Lee (2010).

Fertility: Average birth rate per women in 2000, normalized into a scale range from minimum 0 to maximum 1.0. Source: World Bank (2010).

Infant Mortality: Mortality rate of born children before the age of five in 2000. Source: World Bank (2010).

'White' Settler Mortality: Estimated historic mortality rate of Europeans in countries that once were European colonies. Source: Acemoglu, Johnson and Robinson (2002).

Human Development: Human development index (HDI) in 2000, summarizing per capita GDP, life expectancy, and literacy rate as well as the tertiary enrolment ratio into a normalized index from minimum 0 to maximum 1.0. Source: United Nations Development Program (2005).

Gender Empowerment: Gender empowerment measure (GEM) in 2000, measuring women's representation in decision-making positions in politics, public administration, and private business. Source: United Nations Development Program (2005).

Rule of Law: Rule of law index from the World Bank's 'governance quality project', measured in 2000. Normalized into a scale from minimum 0 to maximum 1.0, the index measures the impartiality of law and law enforcement. Source: Kaufmann, Kraay and Mastruzzi (2005). See also "State Integrity" at p. 127.

Order and Stability: Peace and stability index from the World Bank's 'governance quality project', measured in 2000. Normalized into a scale from minimum 0 to

maximum 1.0, the index measures the absence of governmental and anti-governmental violence as well as political stability. Source: Kaufmann, Kraay and Mastruzzi (2005). See also p. 127.

Encompassing Peace: Global peace index in 2000, inverted and normalized into a scale range from minimum 0 to maximum 1.0. Index measures the absence of inter-state and intra-state violence and conflict. Source: Vision of Humanity (online at: www.visionofhumanity.org/gpi-data/#/2010/scor).

Consanguinity: Consanguinity measures the average incidence of marriage within the wider family circle in a society; measures are logged to adjust a skewed distribution. Source: Woodley and Bell (2013).

Social Movement Activity: Fraction of people per society reporting in the World Values Surveys 1995-2005 (2010) to have participated in the past in peaceful demonstrations, boycotts, or petitions. For variable construction, see Appendix 7.

Additional Variables in Figure 2.5

Birth Cohorts: Based on the respondents' birth year [V237 in the wave-5 questionnaire of the WVS] respondents are arranged into eight successive birth cohorts in ten-year intervals, except for the first and last cohort: cohort 1 – born before 1921, cohort 2 – born between 1921 and 1930, cohort 3 – born between 1931 and 1940, cohort 4 – born between 1941 and 1950, cohort 5 – born between 1951 and 1960, cohort 6 – born between 1961 and 1970, cohort 7 – born between 1971 and 1980, cohort 8 – born after 1980.[5]

Additional Variables in Figure 2.7 and Appendix-Figures 2.3 and 2.4

Household Income: This variable is measured on a 1-to-10 scale based on question V253 in the WVS round-fove questionnaire, asking people to indicate in which national income decile they see their household. I recode responses into a score range from minimum 0 to maximum 1.0.[6] The left-hand diagram in Figure 2.7 plots the emancipative values of people in the two highest income groups in each country against those of people in the two lowest income groups on the horizontal axis.

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[5] SPSS syntax: Compute birthyear = v236. Recode birthyear (sysmiss = -99). Mis val birthyear (-99). Var lab birthyear "year of birth". If (birthyear le 1920) cohort = 1. If (birthyear ge 1921) and (birthyear le 1930) cohort = 2. If (birthyear ge 1931) and (birthyear le 1940) cohort = 3. If (birthyear ge 1941) and (birthyear le 1950) cohort = 4. If (birthyear ge 1951) and (birthyear le 1960) cohort = 5. If (birthyear ge 1961) and (birthyear le 1970) cohort = 6. If (birthyear ge 1971) and (birthyear le 1980) cohort = 7. If (birthyear ge 1981) cohort = 8. Recode cohort (sysmiss = -99). Mis val cohort (-99). Val lab cohort 1"before 1921" 2"1921-30" 3"1931-40" 4"1941-50" 5"1951-60" 6"1961-70" 7"1971-80" 8"after 1980". Var lab cohort "birth cohort".

[6] SPSS syntax: Compute income = (v253 – 1) / (10 – 1). Exec.

Biological Sex: V235 in the wave-5 questionnaire advizes interviewers to code the sex of the respondent by observation. I recoded the variable into 0 for male and 1 for female.[7] For each country, the left-hand diagram in Appendix-Figure 2.3 below plots the emancipative values of women on the vertical axis against those of men on the vertical axis.

Rural/Urban Residency: V255 of the wave-5 questionnaire of the WVS measures the inhabitant size of a respondent's residential location in eight ascending categories from 1 'less than 2,000' inhabitants to 8 'more than 500,000' inhabitants. For each country, the left-hand diagram in Appendix-Figure 2.4 below plots the emancipative values of people in the two most urban categories on the vertical axis against those in the two most rural categories on the horizontal axis.[8]

Blue/White Collar Workers: V242 of the wave-5 questionnaire of the WVS classifies a respondent's occupation in twenty categories (including 'no occupation'). Note that the preset codes in the questionnaire differ and are not as many as in the actual data file. I classify the categories 22 ('middle-level non-manual office worker'), 23 ('supervisory non-manual office worker'), 24 ('junior-level non-manual office worker') and 25 ('non-manual office worker') as 'white collar' occupations and the categories 31 ('foreman and supervisor'), 32 ('skilled manual'), 33 ('semi-skilled manual worker') and 34 ('unskilled manual worker') as 'blue collar' occupations. For each country, the right-hand diagram in Appendix-Figure 2.4 below plots the emancipative values of white-collar occupations on the vertical axis against those of blue-collar occupations on the horizontal axis.[9]

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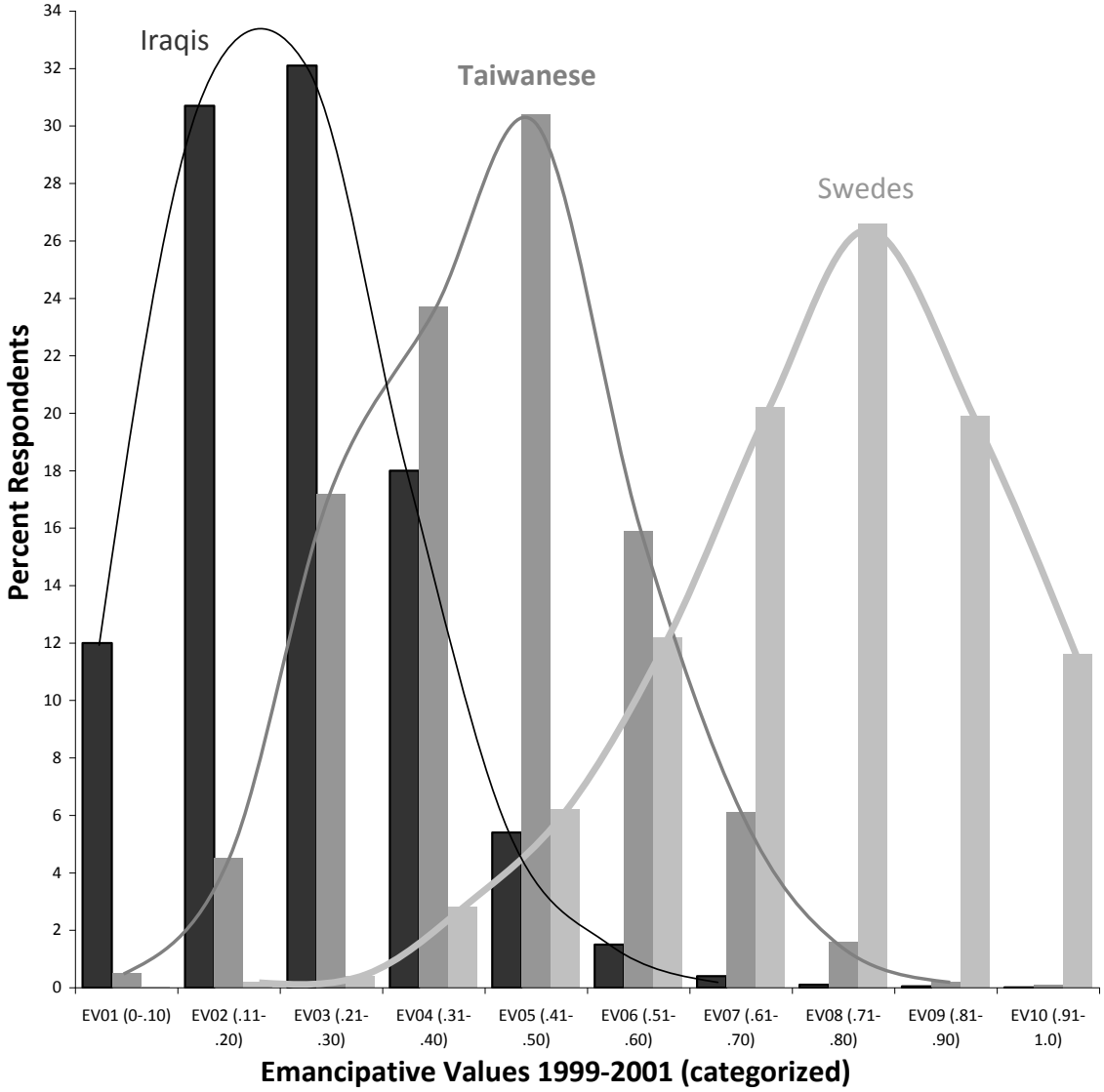
[7] SPSS syntax: Recode v235 (2=1) (1=0) into female. Recode female (sysmiss=-99). Mis val female (-99). Val lab female 1"female" 0"male". Var lab female "female dummy".

[8] SPSS syntax: Compute urban=(v255 - 1) / (8 - 1). Recode urban (sysmiss=-99). Mis val urban (-99). Var lab urban "townsize index".

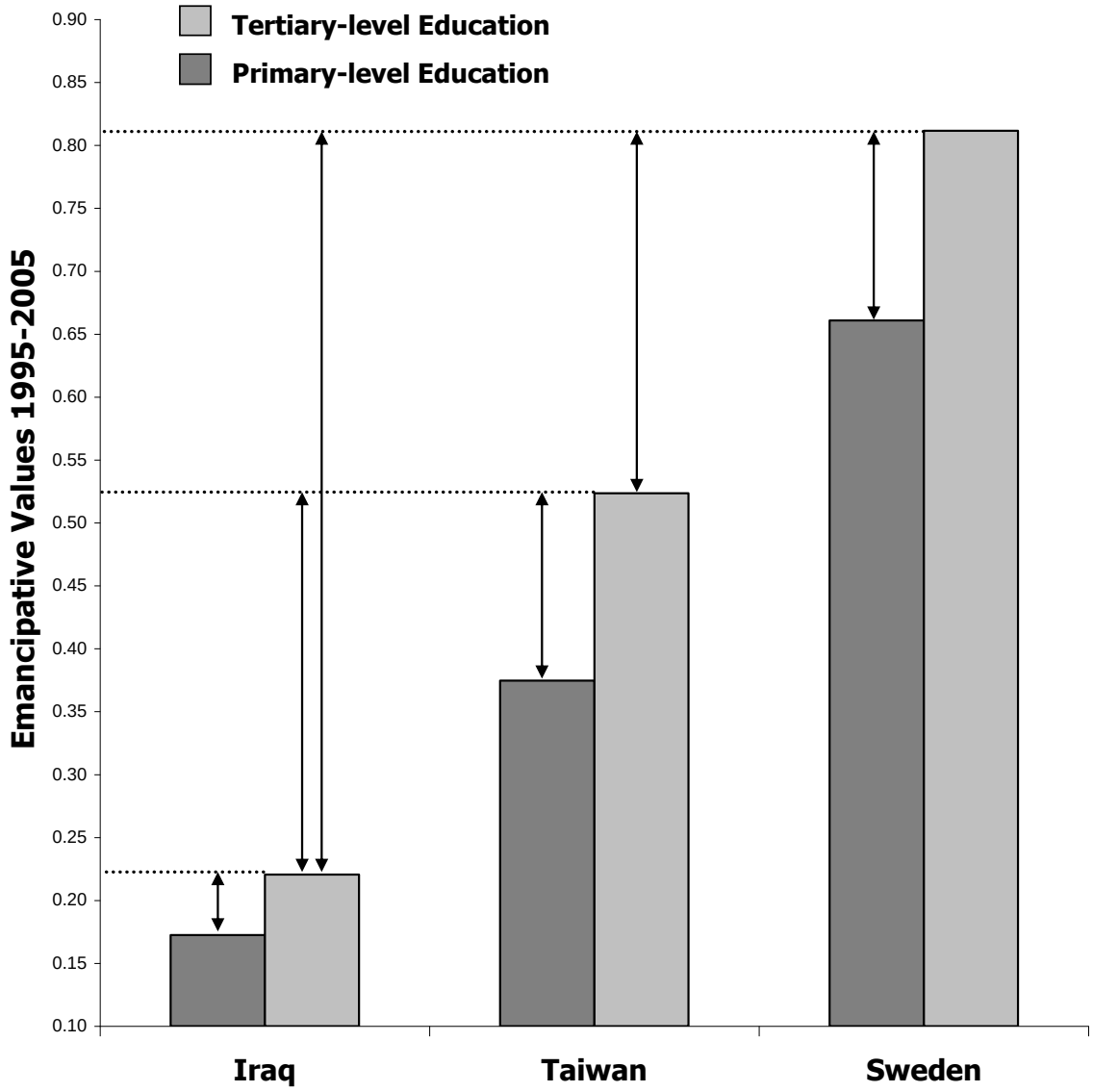
[9] SPSS syntax: If (v242=22) or (v242=23) or (v242=24) or (v242=25) whitecollar = 1. If (v242 ne 22) and (v242 ne 23) and (v242 ne 24) and (v242 ne 25) whitecollar = 0. Recode whitecollar (sysmiss=-99). Mis val whitecollar (-99). Var lab whitecollar "white collar worker dummy". If (v242=31) or (v242=32) or (v242=33) or (v242=34) bluecollar = 1. If (v242 ne 31) and (v242 ne 32) and (v242 ne 33) and (v242 ne 34) bluecollar=0. Recode bluecollar (sysmiss=-99). Mis val bluecollar (-99). Var lab bluecollar "blue collar worker dummy".

Appendix-Figure 2.1: Illustration of the Societal Clustering of Emancipative Values



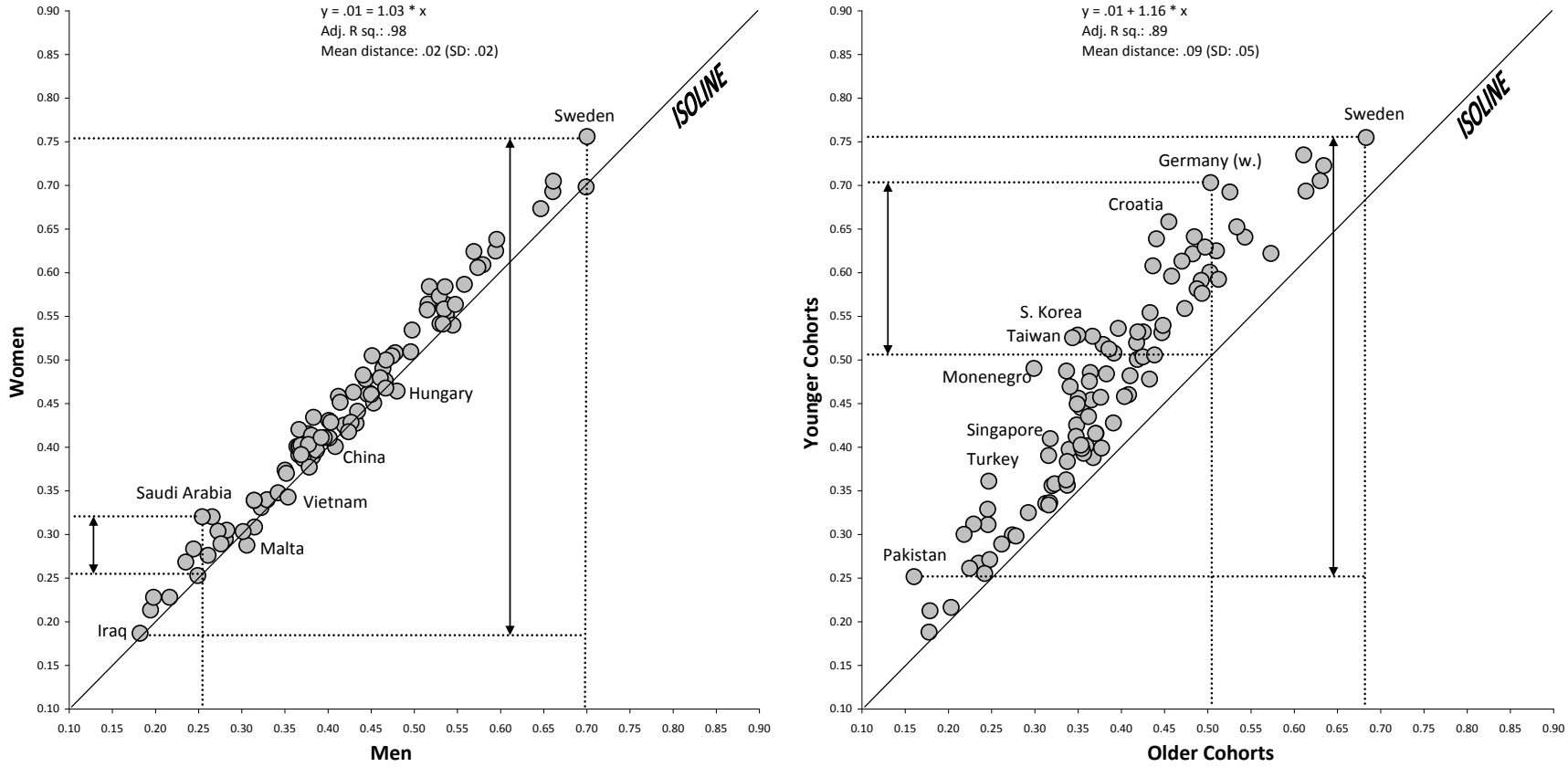
Interpretation: Figure shows the frequency distribution of a population with a very weak emphasis on emancipative values (Iraqis), a population with a modest emphasis on these values (Taiwanese), and one with a strong emphasis (Swedes) over ten categories of emancipative values, which ascend in strength of emphasis. Because all three populations show a strongly mean-clustered and single-peaked distribution, they are culturally very distinct as concerns emphasis on emancipative values.

Appendix-Figure 2.2: Differences in Emancipative Values by Nation and Education



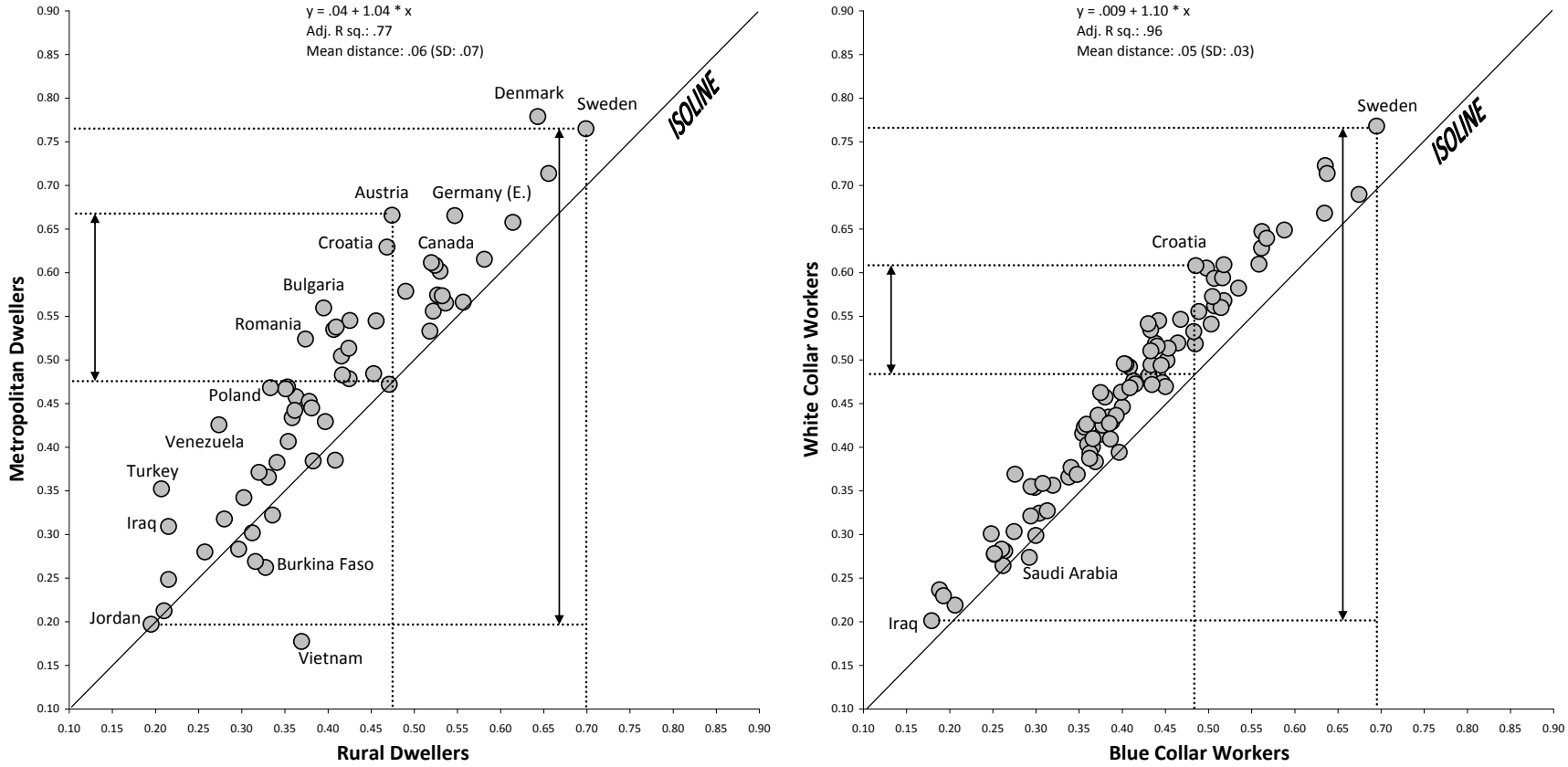
Interpretation: Bars contrast the emancipative values of people with little education to those of people with much education in Iraq, Taiwan, and Sweden. People with much education emphasize emancipative values more in all three populations. However, because this additional emphasis occurs relative to each population's gravity point in emancipative values, national differences in these values are no less pronounced among people with much education than among those with little education.

Appendix-Figure 2.3: Group-specific Emancipative Values by Society (Gender and Generation Opposites)



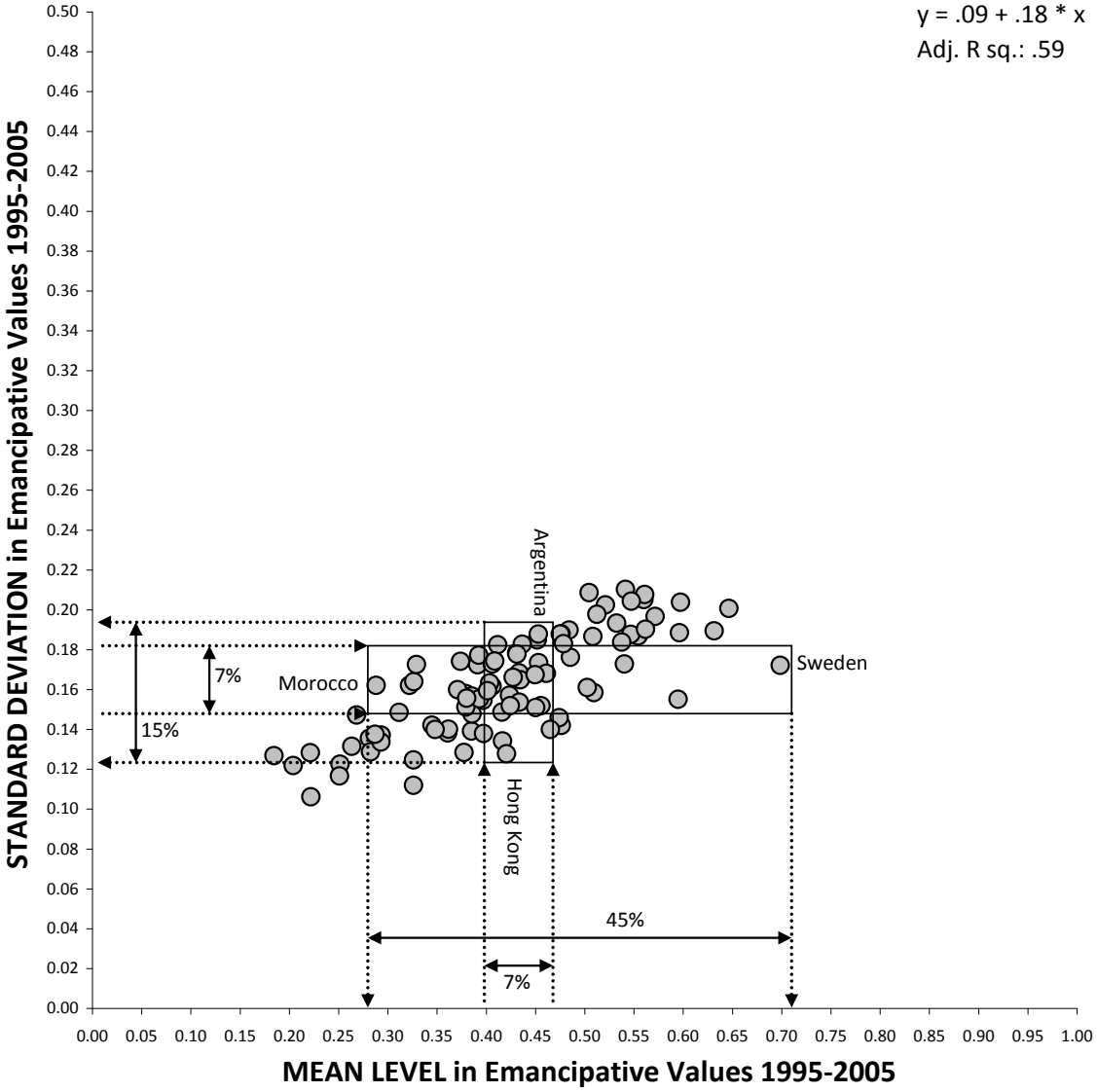
Interpretation: With few exceptions, women emphasize emancipative values more than men in all societies (left-hand diagram). Likewise, with few excpetions, recent generations emphasize emancipative values more than earlier generations in all societies (right-hand diagram). However, since these additional emphases occur relative to a given society's gravity point in emancipative values, cross-national differences across gender and generations outsize intra-national differences along these dividing lines by far.

Appendix-Figure 2.4: Group-specific Emancipative Values by Society (Residence and Occupation Opposites)



Interpretation: With few exceptions, urban residents emphasize emancipative values more than rural residents in all societies (left-hand diagram). Likewise, with few excpetions, white collar workers emphasize emancipative values more than blue collar workers in all societies (right-hand diagram). However, since these additional emphases occur relative to a given society's gravity point in emancipative values, cross-national differences across urban and rural dwellers and white and blue collar workers outsize intra-national differences along these dividing lines by far.

Appendix-Figure 2.5: Between-Societal Differences in Emancipative Values (Central Tendencies and Dispersion Differences)



Interpretation: Percentages show the percentage of the theoretically possible scale range on the horizontal and vertical axis covered by the empirical scale range of 95 per cent of the societies. Coefficient of variance (i.e., standard deviation over mean) in mean level of emancipative values is .24 (.10/.42), coefficient of variance in the standard deviation of emancipative values is .12 (.02/.16). As is obvious, the means in emancipative values differ much more across societies than the deviations around these means (N = 96 societies).

APPENDIX 3 (Ref. CHAPTER 3)

Additional Variables in Table 3.1

Internet Access: Measure taken from the year 2000, indicating the number of Internet hosts per 1,000 inhabitants in a country. Scores are indexed such that 650 hosts per 1,000 inhabitants are set at maximum 1.0 and all other scores at their proper fraction of 0. The formula for this transformation is: observed host number divided by 650. *Data source*: World Bank (2010).

Technological Advancement[a)]: Average of the indexed scores for per capita GDP, schooling years, and internet access. A factor analyses demonstrates that the three indices are clearly one-dimensional with extremely high factor loadings of .95 for both per capita GDP and Internet access and .90 for schooling years. The Cronbach's alpha for the three variables is .90.

Technological Advancement[b)]: Indexed scores of the 'knowledge index' from the year 2000 (see documentation on p. 6).

Birth Year (indexed): Information on the respondents' birth years [V236 in the wave-5 questionnaire of the WVS] has been indexed, setting 1900 at 0, 1990 at 1.0, and years in between at their corresponding intermediate position between 1900 and 1990. The formula for this calculation: birth year minus 1900 divided by 1990 minus 1900.

Replication data are included in the file "Table3.1.sav" at www.cambridge.org/welzel.

Additional Variables in Table 3.2

The analyses in Table 3.2 proceeds in the following steps:

(1) for emancipative values and each of their predictor variables I calculate contextual culture zone (CCZ) scores by assigning each society the mean score in the respective variable of all other societies in the same culture zone;[10]

(2) I regress the CCZ scores in emancipative values separately on the CCZ scores of each of their predictor variables to obtain estimated culture zone (ECZ) scores in emancipative values, separately on the basis of the CCZ of each predictor variable;

(3) I regress the national mean scores in emancipative values separately on each of the various ECZ in these values;

(4) I examine on the basis of which predictor variable the ECZ in emancipative values explain most of the variance in the national mean scores in emancipative values;

New predictor variables not introduced before include the following:

[10] If subscript *j* denotes supra-national culture zones, subscript *i* denotes a nation, *S* denotes a mean score on a given variable and *N* the number of societies belonging to a culture zone, then contextual culture zone scores for each nation are calculated by the following formula: $(S_j * N_j - S_i) / N_j - 1$. This procedure can be complicated by calculating culture zone mean scores that are weighted for the various nations' differing population size. I experimented with this possibility but the scores produced by this complication are not dramatically different.

Neolithic Revolution Timing: Time per society passed since majority of population transited to herding or farming as main subsistence method. Source: Putterman (2008), online at www.econ.brown.edu/fac/Louis_Putterman/agricultural%20data%20 page.htm.

Long-Allele 5-HTTLPR Gene: Estimated fraction of a country's population carrying the long-allele version of the serotonin transporter gene 5-HTTLPR. Source: Chiao and Blizinsky (2010) who obtain their data from the 'allele frequency database' (ALFRED), online at www.alfred.med.yale.edu.

Demographic 'Big-5' Profile: Average score of country samples on the personality traits 'openness' plus 'extraversion' minus 'neuroticism.' Source: Schmitt et al. (2012).

Bio-Climate: Mean annual temperature measured in deviations from 22 degrees Celsius from van de Vliert (2008).

State Antiquity: 'State antiquity index' measuring per society the amount of time reaching back into the past with continuous state organization. Source: Bockstette et al. (2002), variable v53.

Mean Temperature: Annual mean temperature on a country's entire territory from Dell, Jones and Olken (2011).

Household Patrilocality: Percent married men per country above 25 years of age living with their parents. Numbers calculated from latest available survey of the WVS.

Disease Security: See documentation in Appendix 11.

Val158Met COMT Gene: Estimated fraction of a country's population with the 'Val$^{108/158}$Met' polymorphism of the COMT (catechol-o-methyltransferase) gene. Source: Inglehart et al. (forthcoming) who obtain their data from the 'allele frequency database' (ALFRED), online at www.alfred.med.yale.edu.

Cool-Water-Condition: See documentation in Appendix 11.

Protestantism-vs.-Islam: Percentage Protestants minus percent Muslims, standardized into a score range with a theoretical minimum of 0 (in case of 0% Protestants and 100% Muslims) to 1.0 (in the opposite case), with .50 indicating equal percentages of both denominations. [11] Source: Quality of Governance Institute (2010), online at www.qog.org.

Replication data are included in the files "Table3.2.sav" and "Figure3.8.sav" at www.cambridge.org/welzel.

[11] SPSS syntax: Compute DifInd = Pro – Mus. Compute ProIslFra = (DifInd - - 100) / (100 - - 100).

Appendix-Table 3.1: Testing the Culture Zone Effect on Emancipative Values against the Effect of Technological Advancement (multi-level models)

	DEPENDENT VARIABLE: Emancipative Values					
PREDICTORS:	Model 1			Model 2		
• Constant	.41	(53.82)	***	.41	(65.43)	***
Societal-level Effects:						
• Western Fringe (dummy)	-.10	(-4.97)	***			
• Islamic East (dummy)	-.16	(-6.89)	***			
• Indic East (dummy)	-.21	(-7.89)	***			
• Sinic East (dummy)	-.10	(-3.04)	***			
• Subsaharan Africa (dummy)	-.17	(-6.77)	***			
• Protestantism-vs.-Islam				.17	(4.41)	***
• Technological Advancement				.23	(7.28)	***
Individual-level Effects:						
• Female Sex	.02	(14.07)	***	.02	(14.06)	***
• Muslim Identification	-.02	(-3.36)	***	-.02	(-3.36)	***
• Protestant Identification	N. S.			N. S.		
Cross-level Interactions:						
• Birth Year, indexed	.10	(14.54)	***	.10	(14.50)	***
*Western Fringe (dummy)	-.05	(-3.54)	***			
*Islamic East (dummy)	N. S.					
*Indic East (dummy)	-.09	(-5.70)	***			
*Sinic East (dummy)	N. S.					
*Subsaharan Africa (dummy)	-.11	(-4.37)	***			
*Protestantism-vs.-Islam				N. S.		
*Technological Advancement				.15	(4.65)	***
• Formal Education	.11	(22.85)	***	.11	(20.40)	***
*Western Fringe (dummy)	N. S.					
*Islamic East (dummy)	-.06	(-2.71)	**			
*Indic East (dummy)	N. S.					
*Sinic East (dummy)	-.04	(-2.67)	**			
*Subsaharan Africa (dummy)	-.05	(-4.10)	***			
*Protestantism-vs.-Islam				N. S.		
*Technological Advancement				.06	(2.59)	**
Number of Observations (*N*)	111,834 respondents in 86 societies					
Percent Error Reduction:						
Within-societal Variation of DV	11.4%			11.4%		
Between-societal Variation of DV	45.9%			66.0%		
Variation in Effect of Education	20.5%			08.5%		
Variation in Effect of Birth Year	25.1%			26.5%		

Notes: Models estimated with HLM 6.01. Entries are unstandardized regression coefficients with T-ratios in parentheses based on robust standard errors. Individual-level variables are country-mean centered; societal-level variables are global-mean centered. Percent error reduction calculated from change in random variance component related to empty model. Data cover all societies with available data surveyed at least once by the WVS/EVS, using the latest available survey from each society (ca. 1995-2005) and weighting each sample to equal size without changing the overall *N*. Measures of technological advancement are taken from the year of the survey.

Significance levels: N. S. (not significant) $p \geq .100$; * $p < .100$; ** $p < .050$; *** $p < .005$.

Interpretation: Differences in the dominance of Protestant over Islamic legacies and above all differences in technological advancement explain cross-country variation in emancipative values better than does the clustering power of culture zones. These differences also explain better the cross-country variation in the effect of birth cohorts on emancipative values. Note that in Model 1 Western societies (as defined in Table I.1 of the book) are the reference category of the culture zone dummies. "Western Fringe" in Model 1 groups together the societies of Latin America and the Orthodox East (see Table I.1. in the book): these societies have historic linkages with the West but are not part of it.

Appendix-Table 3.2: Testing the Effect of the Democratic Tradition on Emancipative Values against the Effect of Technological Advancement (multi-level model)

PREDICTORS:	DEPENDENT VARIABLE: Emancipative Values	
• Intercept	.39 (57.72)	***
Societal-level Effects:		
• Democratic Tradition	.09 (2.77)	**
• Technological Advancement	.21 (4.96)	***
Individual-level Effects:		
• Female Sex	.03 (14.05)	***
• Biological Age	- .14 (-10.98)	***
• Muslim Identification	- .03 (-4.73)	***
• Protestant Identification	N. S.	
Cross-level Interactions:		
• Education Level	.11 (23.69)	***
* Democratic Tradition	N. S.	
* Technological Advancement	.12 (5.19)	***
• Political Interest	.03 (6.19)	***
* Democratic Tradition	.04 (2.23)	**
* Technological Advancement	N. S.	
Number of Observations (*N*)	162,029 respondents in 83 societies	
Percent Error Reduction:		
Within-societal variation of DV	10.3%	
Between-societal variation of DV	57.3%	
Variation in effect of Education	34.9%	
Variation in effect of Polit. Int.	06.3%	

Notes: Models estimated with HLM 6.01. Entries are unstandardized regression coefficients with T-ratios in parentheses (robust standard errors). Individual-level variables are group-mean-centered, societal-level variables are grand-mean-centered. Percent error reduction calculated from change in random variance component related to empty model. Data cover all societies with available data surveyed at least once by the WVS/EVS, using the latest available survey from each society (ca. 1995-2005) and weighting each sample to equal size without changing the overall *N*. Measures of the democratic tradition and technological advancement are taken from the year of the survey.

Significance levels: N. S. (not significant) $p \geq .100$; * $p < .100$; ** $p < .050$; *** $p < .005$.

Interpretation: The existential component of human empowerment, manifest in technological advancement, is a considerably stronger force in giving rise to emancipative than is true for the institutional component of human empowerment, manifest in the democratic tradition. Technological advancement is also a stronger amplifier of education's positive effect on emancipative values than is the democratic tradition.

APPENDIX 4 (Ref. CHAPTER 4)

Appendix-Table 4.1: Emancipative Values in Earliest and Latest Survey

	1981-83	1989-91	1995-98	1999-2001	2005-07	Net change
Reformed West:						
Denmark	.54			.65		+ .11
Finland		.56			.61	+ .05
Germany (W.)	.42				.60	+ .18
Iceland	.44			.62		+ .19
Netherlands	.40				.60	+ .20
Norway	.42				.74	+ .32
Sweden	.41				.75	+ .34
Switzerland		.42			.63	+ .21
New West:						
Australia	.39				.58	+ .20
Canada	.35				.55	+ .21
Ireland	.29			.44		+ .15
N. Ireland	.28			.45		+ .18
New Zealand			.50		.55	+ .05
U.K.	.36				.56	+ .19
U.S.A.	.34				.51	+ .17
Old West:						
Austria		.44		.51		+ .08
Belgium	.33			.48		+ .14
France	.40				.57	+ .16
Italy	.35				.44	+ .09
Malta	.19			.25		+ .07
Portugal		.35		.38		___
Spain	.37				.55	+ .18
Returned West:						
Czech R.		.42		.51		+ .09
Estonia		.38		.39		___
Germany (E.)		.48			.59	+ .11
Hungary	.38			.43		+ .05
Latvia		.44		.41		___
Lithuania		.39		.46		+ .07
Poland		.26			.39	+ .13
Slovakia		.38		.38		___
Slovenia		.45			.53	+ .09
Orthodox East:						
Belarus		.37		.43		+ .06
Bulgaria		.42			.47	+ .05
Moldova			.32		.37	+ .06
Romania		.36			.36	___
Russia	.39				.39	___
Serbia			.42		.50	+ .09
Ukraine			.34		.39	+ .05

… to be continued:

… *Appendix-Table 4.1* continued

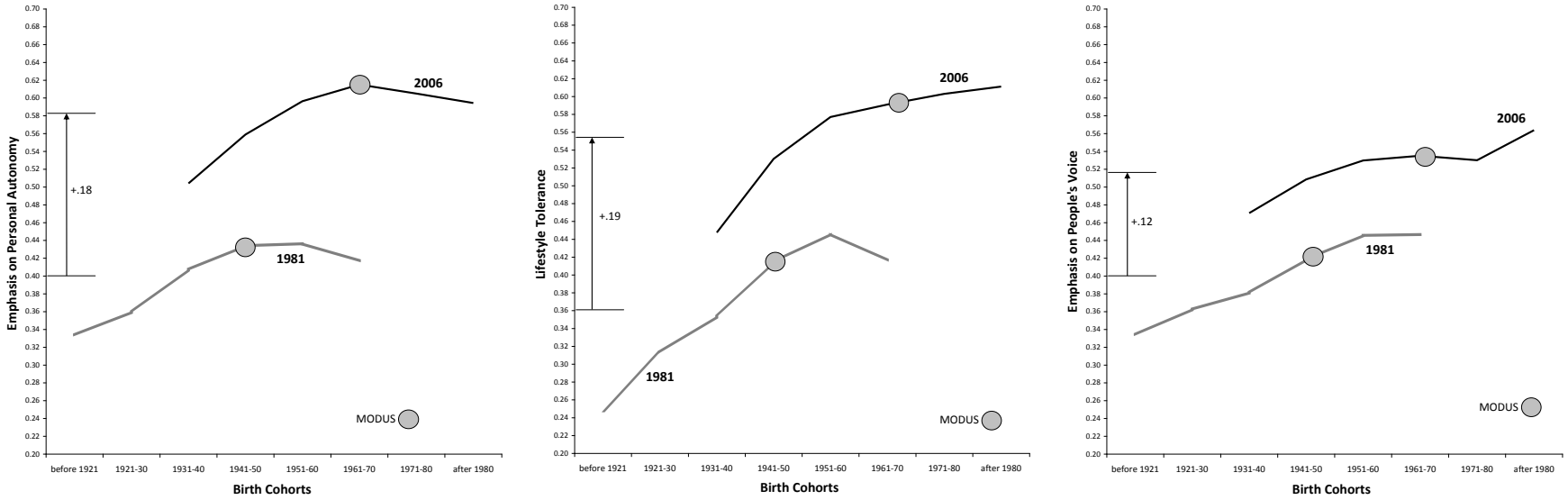
	1981-83	1989-91	1995-98	1999-2001	2005-07	Net change
Islamic East:						
Turkey		.34			.30	___
Indic East:						
India		.28			.37	+ .09
Sinic East:						
China		.43			.34	- .09
Japan	.36				.51	+ .15
S. Korea	.36				.44	+ .08
Taiwan			.33		.43	+ .09
Latin America:						
Argentina	.38				.50	+ .12
Brazil		.34			.42	+ .08
Chile		.36			.46	+ .10
Colombia			.36		.39	___
Mexico		.45			.45	___
Uruguay			.47		.55	+ .08
Sub-saharan Africa:						
Nigeria		.24		.20		___
South Africa		.27			.39	+ .12

Note: _ change is below .05. Included in this table are the societies with a time series over at least three waves of the WVS. Bold figures indicate a time series from the first to the last wave; italic figures indicate a time series over at least four waves (i.e., wave 1 to 4 or wave 2 to 5).

Summary:

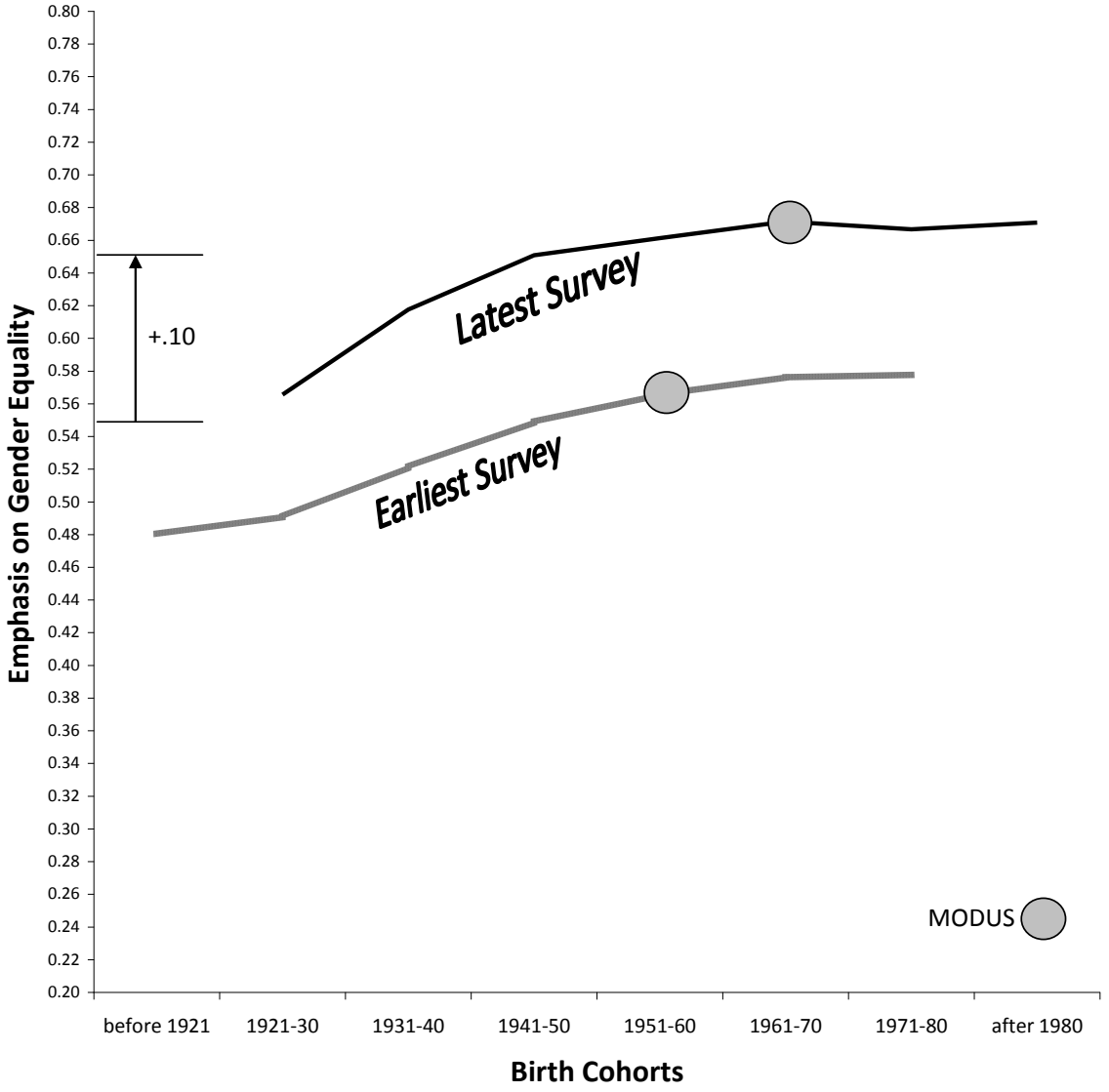
- in 42 societies with a time series evidence stretching over at least three waves experienced a value change above an amount of .05;
- 41 of these changes are positive and 1 is negative;
- among the 14 countries with a full time series evidence over all five waves, all 14 changes are positive.

Appendix-Figure 4.1: Changes in 3 of 4 Component Orientations of Emancipative Values



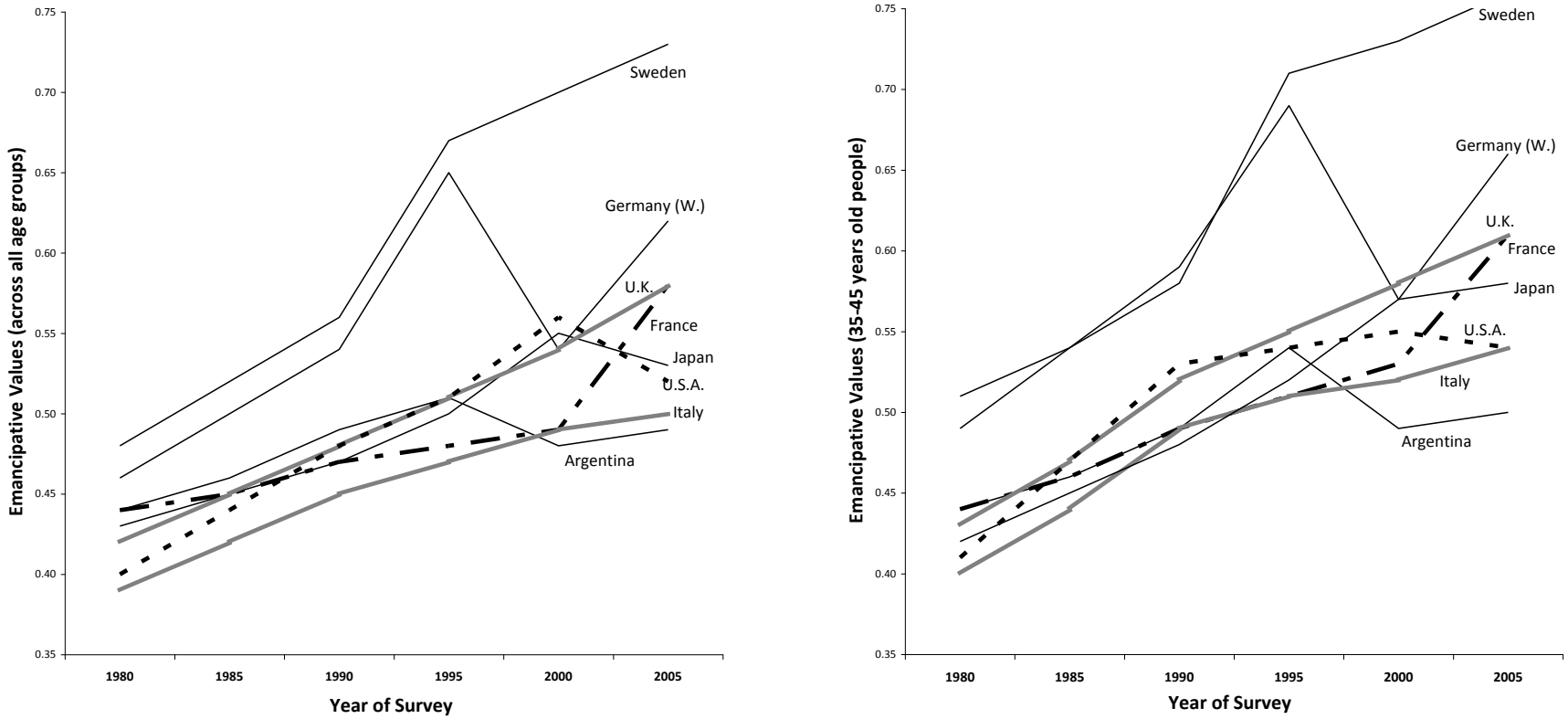
Interpretation: The increase in emancipative values shown for a selection of eleven post-industrial knowledge societies in Figure 4.1 of the book is not an artifact of aggregating the four components of emancipative values into an encompassing index. Instead, the increase is visible in all four components, as is shown in this figure for the autonomy, choice, and voice components and in Appendix-Figure 4.2 (below) for the equality component. As in Figure 4.1 of the book, the figures here use the earliest and latest WVS from Australia, Canada, France, West Germany, Italy, Japan, The Netherlands, Norway, Sweden, U.S.A., U.K. Each sample weighted to equal size.

Appendix-Figure 4.2: Change in Emphasis on Gender Equality



Interpretation: The increase in emancipative values shown for a selection of eleven post-industrial knowledge societies in Figure 4.1 of the book is not an artifact of aggregating the four components of emancipative values into an encompassing index. Instead, the increase is visible in all four components, as is shown in Appendix-Figure 4.1 (above) for the autonomy, choice, and voice components and in this figure for the equality component. As in Figure 4.1 of the book, the figures here use the earliest and latest WVS from Australia, Canada, France, West Germany, Italy, Japan, The Netherlands, Norway, Sweden, U.S.A., U.K. Each sample weighted to equal size.

Appendix-Figure 4.3: Change in Emancipative Values over Consecutive Rounds of the WVS among Selected Societies



Interpretation: The increase in emancipative values shown in Figure 4.1 of the book is not an artifact of only looking at the earliest and latest available surveys. Instead, there is a continuous increase over all five waves of the WVS. The left-hand diagram shows this for all age groups, the right-hand diagram controls for the ageing of societies over time by holding the studied age groups constant, looking only at the change in values among the 35 to 45 years old people in each society. As expected, economic shocks, such as the re-unification shock in Germany in the early 1990 and the financial breakdown in Argentina in the late 1990s, can cause dips in the increasing trend. The same applies for the 9/11 shock in the US.

Time Span of Change Measures in Emancipative Values in Table 4.1

Temporal distances from earliest to latest available surveys are as follows: Argentina (round I to V): 25 years, Australia (III to V): 10 years, Austria (II to IV): 10 years, Belgium (I to IV): 20 years, Brazil (II to V): 15 years, Bulgaria (II to V): 10 years, Belarus (II to IV): 10 years, Canada (I to V): 25 years, Chile (II to V): 15 years, China (II to V): 15 years, Taiwan (III to V): 10 years, Colombia (III to V): 10 years, Czech R. (II to IV): 10 years, Denmark (I to IV): 20 years, Estonia (II to IV): 10 years, Finland (II to V): 15 years, France (I to V): 25 years, Hungary (I to IV): 20 years, Iceland (I to IV): 20 years, India (II to V): 15 years, Ireland (I to IV): 20 years, Italy (I to V): 25 years, Japan (I to V): 25 years, S. Korea (I to V): 25 years, Latvia (II to IV): 10 years, Lithuania (II to IV): 10 years, Malta (I to IV): 20 years, Mexico (II to V): 15 years, Moldova (III to V): 10 years, Netherlands (I to V): 25 years, New Zealand (III to V): 10 years, Nigeria (II to IV): 10 years, Norway (I to V): 25 years, Poland (II to V): 15 years, Portugal (II to IV): 10 years, Romania (II to V): 15 years, Russia (II to V): 15 years, Slovakia (II to IV): 10 years, Slovenia (II to V): 15 years, S. Africa (II to V): 15 years, Spain (I to V): 25 years, Sweden (I to V): 25 years, Switzerland (II to V): 15 years, Turkey (II to V): 15 years, Ukraine (III to V): 10 years, UK (I to V): 25 years, USA (I to V): 25 years, Uruguay (III to V): 10 years, Germany (W.) (I to V): 25 years, Germany (E.) (II to V): 15 years, Yugoslavia (III to V): 10 years.

Note that, in order to compare univariate change measures in emancipative values, one needed to standardize the differences in covered time spans (for instance, by calculating the mean annual change for each society). However, in a bivariate analyses in which change in the predictor variables of emancipative values is measured for each society over the same time span as change in emancipative values, the differences in time spans are not a source of inequivalence between emancipative values and its predictors: if the time span of change in emancipative values is short, the time span of change in the predictors is equally short; if the time span of change in emancipative values is long, the time span of change in the predictors is equally long.

New Variables in Figures 4.2 and 4.3 and Table 4.1

Change in Emancipative Values (earliest to latest survey): Change in a country's mean level of emancipative values from the earliest to the latest survey in the WVS, provided there is an at least fifteen-year distance between these surveys. Calculation is done by subtracting the earlier from the later score. Theoretical range of the resulting change measure is from -1 to +1. For the calculation of emancipative values, see p. 18ff.

Change in GDP/capita (earliest to latest survey): I use real per capita GDP figures in constant US-Dollars of the year 2000 and index these figures: 60,000 is set as the maximum 1.0 and all figures below 60,000 obtain their proper fraction of 1.0. To measure change I subtract a country's GDP index score in the year of the earliest WVS survey from its score in the latest WVS survey, as I do with emancipative values.

Change in Citizen Rights (earliest to latest survey): I use the citizen rights index documented in Appendix 8 and subtract a country's citizen rights score in the year of the earliest WVS survey from its score in the latest WVS survey, as I do with emancipative values.

Replication data are included in the file "Table4.1.sav" at www.cambridge.org/welzel.

New Variables in Table 4.2 and Figures 4.4 to 4.8

Proxy for Action Resources/Technological Advancement

Because the measure for action resources/technological advancement described on p. _ does not go farther back in time than 1995, I rely on a proxy using data that Vanhanen (2003) had compiled to cover various decades back in time. Because technological advancement that enhances ordinary people's action resources depends on and strongly correlates with the size of the literate urban workforce (de Vries 1984; Bairoch 1995; Acemoglu, Johnson & Robinson 2001; Maddison 2007), I weight a society's urbanization rate by its literacy rate using multiplication, after having standardized both variables into a range from minimum 0 to maximum 1.0. Thus, if the urbanization rate is .60 (60%) and the literacy rate is .50 (50%), the final score for the proxy of technological progress is (.50 * .60 =) .30. The assumption of the multiplicative combination is that intellectual resources (i.e., literacy) and connective resources (i.e., urbanization) amplify rather than supplement each other.

That this measure is a reasonable proxy for technical advancement is evident from the fact that the proxy measure for 2000 correlates with my measure of technological advancement described on p. _ at $r = .91$ ($N = 180$; $p < .001$, two-tailed). The correlation of technological advancement with an additive combination of literacy and urbanization is by an order of .10 lower.

Data for this proxy are available from 1850 onward in decade-wise measures, for most nationally independent societies in each decade. For the longitudinal analysis in Table 4.2 of the book, I use the decade measures for 1940-50, 1950-60, 1960-70, 1970-80, 1980-90, 1990-2000. I am not going farther back in time than the decade 1940-50 because this is the farthest point back in time for which reasonable estimates of a society's emancipative values can be calculated (see explanation below). Since emancipative values are one of the key three variables in Table 4.2, this restricts the possible temporal scope.

Replication data are included in the file "Table4.2.sav" at www.worldvaluessurvey.org.

Proxy for Civic Entitlements/Citizen Rights in Table 4.2 and Figures 4.3 to 4.8

As a proxy for civic entitlements/citizen rights, I use the index of democratization by Vanhanen (2003), standardized into a 0-to-1.0 scale format (0 indicating no democracy, 1.0 indicating maximum democracy). The index is based on Dahl's (1973) definition of democracy. Dahl defines democracy as the interaction between (a) political inclusion/participation and (b) political competition/pluralism. Political inclusion/participation is measured as the turnout in national parliamentary elections (calculated for the adult residential population); political competition/pluralism is the seat share not captured by the largest party in parliament. After standardization, these two indices are multiplied to yield the overall index of democratization. Note that this index has the intended property that, when the participation is 100% because all voters vote while pluralism is zero because all votes go to one party (a situation closely approximated in societies of the former Soviet bloc), the index of democratization yields a score of 0. The multiplicative combination treats the two components of participation and pluralism as necessary-yet-

insufficient conditions of democracy—as it should be due to the theoretical notion of democracy.

Arguably, a high degree of both participation and pluralism requires a strong institutionalization of civil and political freedom. Hence, the index of democratization is a reasonable proxy for civic entitlements/citizen rights for times for which a more direct measure of the latter is not available. Empirically, this is obvious from the fact that my measure of civic entitlements/citizen rights described on p. _ correlates with Vanhanen's index of democratization in 2000 at $r = .88$ ($N = 170$; $p < .001$, two-tailed).

Data for this proxy of civic entitlements are available from 1850 onward in decade-wise measures. For the longitudinal analysis in Table 4.2 of the book, I use the decade measures for 1940-50, 1950-60, 1960-70, 1970-80, 1980-90, 1990-2000. I am not going farther back in time than the decade 1940-50 because this is the farthest point for which reasonable estimates of a society's emancipative values can be calculated (see description below). Since emancipative values are one of the key variables in Table 4.2, this restricts the temporal scope of the analyses.

Another widely used indicator of democracy whose temporal coverage goes as far back as Vanhanen's index of democratization is the 'democracy-autocracy index' from the Polity IV Project (data and description available at: www.systemicpeace. org/polity/polity4.htm). Using this index instead of that by Vanhanen as a proxy for civic entitlements in the analyses of Table 4.2, we obtain weaker results: civic entitlements are significantly but less strongly determined by emancipative values and technological progress and continue to have no effect of their own on either emancipative values or technological progress (these results are available upon request from the author). From the viewpoint of nomological validity, this finding validates the democratization index by Vanhanen as a better measure of civic entitltements than the Polity IV autocracy-democracy index. This is not surprising if one takes into account that the Vanhanen index is entirely based on official statistical data while the Polity index is the result of subjective expert judgments (see Munck & Verkuilen 2002).

Replication data are included in the file "Table4.2.sav" at www.worldvaluessurvey.org.

Estimates of Emancipative Values in Table 4.2 and Figures 4.3 to 4.8

Data for emancipative values are unavailable for any society before 1981, and even then they exist for just two dozen societies. However, the analyses in the book demonstrate pronounced cohort differences in these values and strong evidence that these cohort differences show the footprints of value change in a society's past. Stunning in its simplicity, the basic pattern is that younger cohorts emphasize emancipative values more than older cohorts. And this regularity is cross-culturally universal. What differs is merely how pronounced the pattern is. Because the book shows that the younger cohorts' stronger emancipative values are definitely not a lifecycle phenomenon, it is certain that the cohort differences reflect generational value change. If this is true, the cohort differences provide a valid basis to estimate how much weaker a society's emancipative values have been in the past. Hence, we can estimate how much weaker a society's emancipative values have been a decade ago by calculating how much weaker these values are among the cohort born a decade before the youngest cohort. Likewise, we can estimate how much weaker the emancipative values of this society have been two, three, four and even five decades ago by calculating how much weaker these values are among cohorts born this number of decades before the youngest cohort. Doing so, we obtain backward estimates for each society whose recent emphasis on emancipative

values is known and for which the cohort differences in these values are known too. Restricting ourselves to cohorts that include at least fifty respondents per society, we can do this six decades back in time, covering the decennial sequence from 1940-1950 to 1990-2000.

Unfortunately, the world is complicated and there are two more things to be considered. To begin with, backward estimates derived solely from cohort differences of a recent cross-section ignore that emancipative values do not only rise through the cohort succession. As Figure 4.1 in the book shows, emancipative values also rise through the time trend within each cohort. Neglecting the trend factor, we certainly overestimate each society's past emancipative values. In fact, we overestimate them the more, the farther back in time our estimates reach because--with each decade in the past--we miss a bigger chunk of the trend. To correct this error, we must subtract from the backward estimates the average decennial increase in emancipative values, multiplied by the number of decades that the retrospection reaches back. By a rough estimate, the recent decennial increase in emancipative values within cohorts has been .05 scale points on average.[12] This suggests to subtract from each retrospective estimate another .05 points for every decade it reaches back into the past.[13]

The second complication is that the time trend has certainly not been uniform across all societies. Instead, societies on a higher level of emancipative values today obviously climbed to this level by a more pronounced emancipatory trend than societies on a lower level of these values today. Hence, the recently reached level of emancipative values indicates how strong the emancipatory trend has been in this society. This allows us to calculate *specific* decennial subtraction scores for each society, rather than subtracting the same scores across the board. We calculate country-specific subtraction scores by weighting the constant .05-point subtraction score for each society's recent level of emancipative values.[14] As a result, decennial subtraction scores are larger for societies with higher levels of emancipative values today. An immediate consequence of this adjustment is that societies whose levels of emancipative values are far apart today were closer to each other in the past. This implication is intuitively plausible. Postmaterialist orientations, for instance, did not become a mass phenomenon before the late 1960s, and even this only in the most advanced postindustrial societies. Likewise, societies whose gender norms and sexual liberties appear advanced today were probably not quite as traditional as the most traditional societies of today but they were certainly closer to them.

---

12 Among a constant set of ten advanced postindustrial democracies, emancipative values rose by .05 scale points from an average of .51 to an average of .56 in the period between 1990 and 2000. For this calculation, the ten societies are weighted to equal sample size and include: Canada, France, Germany (West), Italy, Japan, The Netherlands, Norway, Sweden, the US and the UK.

13 There are good reasons to assume that the time trend is a more recent phenomenon, linked with the rise of knowledge economies in the postindustrial era. This suggests that the emancipatory trend picked up speed, starting from a base of zero during WWII. To model this assumption, I employ a backward deceleration factor, so that the trend decreases for each decade farther back in time. If the trend started from a zero-base and then continuously approached the .05-point decennial increase of the recent decade, the backward deceleration factor amounts to .01 points for every decade back in the past. Thus, I assume a decennial increase in emancipative values of .05 scale points from 1990 to 2000, .04 points from 1980 to 1990, .03 points from 1970 to 1980, .02 points from 1960 to 1970, .01 points from 1950 to 1960 and zero from 1940 to 1950. The regression results in Table 4.2 are based on estimates using this deflator. Not using the deflator produces weaker results but the conclusions as concerns the determination pattern among the three elements of human empowerment remain the same.

14 Western societies in which the emancipatory trend has been most pronounced have an average score in emancipative values of .60 scale points. I equate .60 with 1.0 and standardize all other scores for this value. Then I use these standardized scores as weights with which I multiply the .05-point decennial subtraction score.

In summary, we derive retrospective estimates of emancipative values for a given decade by three pieces of information:

(1) *cohort differences*: we subtract from a society's recent emancipative values the difference in these values between the youngest cohort and the cohort which is born as many decades before the youngest as the number of decades the retrospective estimate reaches back;
(2) *decennial trend*: for further subtraction we assume a constant score of .05 points for each additional decade in the past;
(3) *outcome level*: we use a given society's outcome level in emancipative levels to adjust the .05-point decennial subtraction score, assuming steeper trends with higher outcome levels.

Substantively speaking, this estimation procedure recognizes that emancipative values have been rising (i) by the succession of cohorts and (ii) by an emancipatory trend throughout all cohorts, the steepness of which differs (iii) with the outcome level of emancipative values. The scheme below illustrates how the estimation has been performed on a country-by-country basis:

Appendix-Table 4.1: Scheme for Backward Estimation of Emancipative Values

Backward-estimated EV for Decade		Cohort-specific EV Today		Recent EV Country Mean	Accum. Decen. Trend
EV in 1990-2000	=	EV of 1970-1980 Cohort Today	-	(Recent EV Country Mean *	.00)
EV in 1980-1990	=	EV of 1960-1970 Cohort Today	-	(Recent EV Country Mean *	.05)
EV in 1970-1980	=	EV of 1950-1960 Cohort Today	-	(Recent EV Country Mean *	.09)
EV in 1960-1970	=	EV of 1940-1950 Cohort Today	-	(Recent EV Country Mean *	.12)
EV in 1950-1960	=	EV of 1930-1940 Cohort Today	-	(Recent EV Country Mean *	.14)
EV in 1940-1950	=	EV of 1920-1930 Cohort Today	-	(Recent EV Country Mean *	.15)

Due this scheme, the backward estimated score for emancipative values is lower (i) when the emancipative values of the cohort born in the decade before are lower and (ii) when the product between a country's current score in emancipative values and the accumulated trend is higher. I have experimented with various other estimation schemes but this one proved the most powerful one.

Under these premises, I probe into simulation and estimate emancipative values for 85 countries over six decades (of all 95 countries surveyed once by the WVS, we lack cohort data for ten). This provides a data matrix of 510 country-per-decade observations. For 74 of these, we also have the proxy measures of action resources and civic entitlements, as reported on p. _. Theoretically, this sums up to 444 country-per-decade observations in a time-pooled-cross-sectional dataset. Yet, when we introduce double-time lagged variables, we lose two decades with 74 countries each, leaving us with 296 country-per decade observations. Still, not all 74 countries were independent in every decade from 1940 to 2000. Hence, the proxy measures of action resources and civic entitlements are not available in every decade either. In the worst situation, this leaves us with 230 country-per-decade observations. As the replication data in the file "Table4.2.sav" at www.worldvaluessurvey.org document, the 85 countries in this dataset show no sampling bias: they are from all world regions, include the largest population of each region, and cover the whole range of variation in all three variables of interest.

Appendix-Table 4.2: Descriptives for the Data Analyzed in Table 4.2

MEASURES:	*N*	Minimum	Maximum	Mean	Std. Deviation
Action Resources at T_0 [1)]	398	0.00	0.97	0.50	0.32
Action Resources at T_{-1} [1)]	314	0.00	0.97	0.46	0.31
Action Resources at T_{-2} [1)]	239	0.00	0.96	0.42	0.30
Emancipative Values at T_0 [2)]	510	0.10	0.76	0.36	0.12
Emancipative Values at T_{-1} [2)]	425	0.10	0.66	0.34	0.11
Emancipative Values at T_{-2} [2)]	340	0.10	0.62	0.32	0.10
Civic Entitlements at T_0 [3)]	423	0.00	1.00	0.30	0.30
Civic Entitlements at T_{-1} [3)]	340	0.00	1.00	0.27	0.29
Civic Entitlements at T_{-2} [3)]	257	0.00	0.89	0.23	0.28
Valid N (listwise)	230				

Notes: Times T_0, T_{-1}, and T_{-2} do not signify some specific decade but refer to any given decade (T_0), its previous decade (T_{-1}), and the pre-previous decade (T_{-2}).

1) Proxy for Action Resources described on p. _

2) Proxy for Emancipative Values described on p. _

3) Proxy for Civic Entitlements described on p. _.

Multiple Imputations in Figure 4.8 and Appendix-Tables 4.3 and 4.4

Based on the data matrix displayed in the table above, I ran a standard, multiple imputation algorithm in SPSS to replace missing values with expected values. For each missing values five different estimates are produced based on differently assumed parameter values, yielding five different data matrices. Each of these data matrices is complete, including (85 * 6 =) 510 country-per-decade observations. I reran with each of these five datasets the same three panel regressions as in Table 4.2, using panel-corrected standard errors. Also, with each of the five impute datasets I ran a 'seemingly unrelated regression' (SUR) in which the three panel regressions among technological progress, emancipative values, and civic entitlements are defined as parts one integrated system of equations. This procedure takes care of correlated error terms between the three regressions (Greene 2003). Appendix-Tables 4.3 and 4.4 display the results. They are practically identical to those in Table 4.2 of the article, confirming the same pattern of reciprocity and dominant flow of causality.

Replication data with the multiple impuations are included in the file "Figure4.8.dta" at www.worldvaluessurvey.org.

Appendix-Table 4.3: PCSE Regressions with Imputed Data

IMPUTATION 1		*Dependent Variables*:	
Predictors:	Action Resources at T_0	Emancipative Values at T_0	Civic Entitlements at T_0
Dependent Variable at T_{-2}	.99***	.90***	.41***
Action Resources at T_{-1}		.08***	.35***
Emancipative Values at T_{-1}	.04		.58***
Civic Entitlements T_{-1}	- .02†	.01†	
Constant	.13***	.07***	- .13***
Adj. R^2	.93	.91	.70
IMPUTATION 2		*Dependent Variables*:	
Predictors:	Action Resources at T_0	Emancipative Values at T_0	Civic Entitlements at T_0
Dependent Variable at T_{-2}	.95***	.91***	.35***
Action Resources at T_{-1}		.09***	.32***
Emancipative Values at T_{-1}	.13**		.68***
Civic Entitlements T_{-1}	- .01†	- .00†	
Constant	¤ .11***	.06***	- .14***
Adj. R^2	.93	¤ .91	.69
IMPUTATION 3		*Dependent Variables*:	
Predictors:	Action Resources at T_0	Emancipative Values at T_0	Civic Entitlements at T_0
Dependent Variable at T_{-2}	.93***	.91***	.39***
Action Resources at T_{-1}		.08***	.32***
Emancipative Values at T_{-1}	.24***		.64***
Civic Entitlements T_{-1}	- .02†	.01†	
Constant	.08***	.06***	- .13***
Adj. R^2	.93	.91	.71
IMPUTATION 4		*Dependent Variables*:	
Predictors:	Action Resources at T_0	Emancipative Values at T_0	Civic Entitlements at T_0
Dependent Variable at T_{-2}	.95***	.90***	.39***
Action Resources at T_{-1}		.08***	.28***
Emancipative Values at T_{-1}	.11*		.72***
Civic Entitlements T_{-1}	- .01†	.01†	
Constant	.12***	.07***	- .15***
Adj. R^2	.93	.90	.70
IMPUTATION 5		*Dependent Variables*:	
Predictors:	Action Resources at T_0	Emancipative Values at T_0	Civic Entitlements at T_0
Dependent Variable at T_{-2}	.95***	.91***	.35***
Action Resources at T_{-1}		.08***	.35***
Emancipative Values at T_{-1}	.07†		.58***
Civic Entitlements T_{-1}	.00†	.01†	
Constant	.13***	.07***	- .11***
Adj. R^2	.93	.90	.68
N (observations)	510 country-per-decade units (85 countries over 6 decades)		

Appendix-Table 4.4: SUR-Regressions with Imputed Data

IMPUTATION 1		*Dependent Variables*:	
Predictors:	Action Resources at T_0	Emancipative Values at T_0	Civic Entitlements at T_0
Dependent Variable at T_{-2}	1.01***	.92***	.42***
Action Resources at T_{-1}		.08***	.33***
Emancipative Values at T_{-1}	.00†		.55***
Civic Entitlements T_{-1}	-.03†	.00†	
Constant	.14***	.07***	-.12***
Adj. R^2	.93	.91	.70
IMPUTATION 2		*Dependent Variables*:	
Predictors:	Action Resources at T_0	Emancipative Values at T_0	Civic Entitlements at T_0
Dependent Variable at T_{-2}	.96***	.92***	.36***
Action Resources at T_{-1}		.08***	.31***
Emancipative Values at T_{-1}	.09†		.67***
Civic Entitlements T_{-1}	-.01†	-.00†	
Constant	¤ .12***	.06***	-.13***
Adj. R^2	.93	.91	.69
IMPUTATION 3		*Dependent Variables*:	
Predictors:	Action Resources at T_0	Emancipative Values at T_0	Civic Entitlements at T_0
Dependent Variable at T_{-2}	.93***	.93***	.40***
Action Resources at T_{-1}		.07***	.31***
Emancipative Values at T_{-1}	.21***		.64***
Civic Entitlements T_{-1}	-.03†	.01†	
Constant	.09***	.06***	-.13***
Adj. R^2	.93	.91	.71
IMPUTATION 4		*Dependent Variables*:	
Predictors:	Action Resources at T_0	Emancipative Values at T_0	Civic Entitlements at T_0
Dependent Variable at T_{-2}	.97***	.91***	.41***
Action Resources at T_{-1}		.08***	.28***
Emancipative Values at T_{-1}	.09*		.70***
Civic Entitlements T_{-1}	-.02†	.01†	
Constant	.12***	.07***	-.14***
Adj. R^2	.93	.90	.70
IMPUTATION 5		*Dependent Variables*:	
Predictors:	Action Resources at T_0	Emancipative Values at T_0	Civic Entitlements at T_0
Dependent Variable at T_{-2}	.96***	.91***	.36***
Action Resources at T_{-1}		.08***	.33***
Emancipative Values at T_{-1}	.07†		.58***
Civic Entitlements T_{-1}	-.01†	.00†	
Constant	.14***	.06***	-.11***
Adj. R^2	.93	.90	.68
N (observations)	510 country-per-decade units (85 countries over 6 decades)		

APPENDIX 5 (Ref. CHAPTER 5)

New Variables in Table 5.1

General Wellbeing: One's sense of general wellbeing is measured by the question on general life satisfaction [V22 in the wave-5 questionnaire of the WVS]: "All things considered, how satisfied are you with your life as a whole these days? Using this card on which 1 means you are "completely dissatisfied" and 10 means you are "completely satisfied" where would you put your satisfaction with your life as a whole?" I transform response codes to this question into a range from minimum 0 for the lowest life satisfaction to 1.0 for the highest satisfaction, with proper fractions of 1.0 for intermediate positions.[15]

Extrinsic (material) Wellbeing: This is the level of financial satisfaction [V10 in the wave-5 questionnaire of the WVS]: "How satisfied are you with the financial situation of your household? Please use this card again to help with your answer." The response options are ordered on a 10-point scale from 1 ('completely dissatisfied') to 10 ('completely satisfied'). I transform response codes into a range from minimum 0 for the lowest satisfaction to 1.0 for the highest satisfaction, with the proper fractions of 1.0 for intermediate positions.[16]

Intrinsic (emotional) Wellbeing: This variable is based on the question that asks for feelings of happiness [V10 in the wave-5 questionnaire of the WVS]: "Taking all things together, would you say you are (*read out and code one answer*): 1 very happy, 2 rather happy, 3 not very happy, 4 not at all happy." I transform response codes into a range from minimum 0 for the lowest happiness to 1.0 for the highest happiness, assigning the codes .33 and .66 for intermediate positions.[17]

Priority for Extrinsic Wellbeing: This variable is the proximity of general wellbeing to extrinsic (material) wellbeing. To measure the proximity I inverse the magnitude of the difference between general and extrinsic wellbeing.[18]

Priority for Intrinsic Wellbeing: This variable is the proximity of general wellbeing to intrinsic (emotional) wellbeing. To measure the proximity I inverse the magnitude of the difference between general and intrinsic wellbeing.[19]

SV Prevalence: Social prevalence of secular values measured as the arithmetic mean of the individual respondents' scores on secular values per country. For the documentation of secular values, see p. 10ff.

EV Prevalence: Social prevalence of emancipative values measured as the arithmetic mean of the individual respondents' scores on emancipative values per country. For the documentation of emancipative values, see p. 18ff.

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15 SPSS syntax: Compute GenWel = (v22 - 1) / (10 - 1). Recode GenWel (sysmiss = -99). Mis val GenWel (-99). Var lab GenWel "general wellbeing".

16 SPSS syntax: Compute ExtWel = (v68 - 1) / (10 - 1). Recode ExtWel (sysmiss = -99). Mis val ExtWel (-99). Var lab ExtWel "extrinsic wellbeing".

17 SPSS syntax: Recode v10 (1 = 1) (2 = .66) (3 = .33) (4 = 0) into IntWel. Recode IntWel (sysmiss = -99). Mis val IntWel (-99). Var lab IntWel "intrinsic wellbeing".

18 SPSS syntax: Compute ExtPrio = 1 – (sqrt (GenWel – ExtWel) * (GenWel – ExtWel)). Recode ExtPrio (sysmis = -99). Mis val ExtPrio (-99). Var lab ExtPrio "extrinsic priority".

19 SPSS syntax: Compute IntPrio = 1 – (sqrt (GenWel – IntWel) * (GenWel – IntWel)). Recode IntPrio (sysmis = -99). Mis val IntPrio (-99). Var lab IntPrio "intrinsic priority".

SV Preference: A respondent's preference for secular values, as documentated on p. 10ff.

EV Preference: A respondent's preference for emancipative values, as documented on p. 18ff.

Replication data are included in the files "Table5.1_IL.sav" and "Table5.1_CL.sav" at www.cambridge.org/welzel.

New Variables in Table 5.2

Sense of Extrinsic Wellbeing: At the country level, I measure the population average on extrinsic wellbeing.

Sense of Intrinsic Wellbeing: At the country level, I measure the population average on intrinsic wellbeing.

Replication data are included in the files "Table5.1_IL.sav" and "Table5.1_CL.sav" at www.cambridge.org/welzel.

APPENDIX 6 (Ref. CHAPTER 6)

New Variables in Figure 6.1

The variables created for Figure 6.1 are based on a condensed version of the Schwartz values surveys. The respective question and items [V80 to V89 in the wave-5 version of the WVS questionnaire] read like this, with the value orientation that each item is supposed to address in brackets:

> "Now I will briefly describe some people. Using this card, would you please indicate for each description whether that person is very much like you, like you, somewhat like you, not like you, or not at all like you? It is important to this person to think up new ideas and be creative; to do things one's own way [*self-direction*]. It is important to this person to be rich; to have a lot of money and expensive things [*power*]. Living in secure surroundings is important to this person; to avoid anything that might be dangerous [*security*]. It is important to this person to have a good time; to "spoil" oneself [*hedonism*]. It is important to this person to help the people nearby; to care for their well-being [*caretaking*]. Being very successful is important to this person; to have people recognize one's achievements [*achievement*]. Adventure and taking risks are important to this person; to have an exciting life [*stimulation*]. It is important to this person to always behave properly; to avoid doing anything people would say is wrong [*conformity*]. Looking after the environment is important to this person; to care for nature [*universalism*]. Tradition is important to this person; to follow the customs handed down by one's religion or family [*tradition*]."

Response options are offered on a 6-point ordinal scale from 1 ('very much like me') to 6 ('not at all like me'). I recode responses inversely into a scheme from 0 for 'not at all like me' to 1 for 'very much like me,' with intermediate positions obtaining the proper fraction of 1. The formula for the code transformation is: 1 – ((original response code – 1) / 5).

In the next step, the responses for each of the ten items are centered on a respondent's mean over all ten items, subtracting a respondent's mean rating of all items from each of her/his specific item ratings. The mean-centered respondent scores for the values of conformity security, self-direction, stimulation, power, achievement, universalism and benevolence are then subjected to a two-factorial, varimax-rotated factor analysis. The respondents' scores on the resulting two dimensions are saved.

Collectivism-vs.-Individualism: Respondent factor scores on the first extracted dimension, representing a polarity between conformity and security on one pole (collectivism) versus self-direction and stimulation on the opposite pole (individualism). Polarity has been reversed from the original polarity so that collectivism is on the negative and individualism on the positive pole. This has been done by multiplying the original factor scores by -1.

Unselfishness-vs.-Selfishness: Respondent factor scores on the second extracted dimension, representing a polarity between power and achievement on the negative pole (selfishness) versus unversalism and benevolence on the on the positive pole (unselfishness).

Replication data are included in the file "Figure6.1.sav" at www.cambridge.org/welzel.

New Variables in Figure 6.2

Collectivism-vs.-Individualism: See documentation on p. 60. For this and the following analyses, the original factor scores on this variable have been rescaled to range from minimum 0 (most collectivist position) to 1.0 (most individualistic position). To perform this transformation, the following formula has been applied:

NS_i = (OS*i* – MinS) / (MaxS – MinS), where NS_i is the new score for a given case *i*, OS*i* is the observed score of a given case *i*, MinS is the minimum socres of all cases and MaxS is the maximum score of all cases.

Unselfishness-vs.-Selfishness: See documentation on p. 60. For this and the following analyses, the original factor scores on this variable have been rescaled to range from minimum 0 (most selfish position) to 1.0 (most unselfish position). To perform this transformation, the following formula has been applied:

NS_i = (OS*i* – MinS) / (MaxS – MinS) , where NS_i is the new score for a given case *i*, OS*i* is the observed score of a given case *i*, MinS is the minimum socres of all cases and MaxS is the maximum score of all cases.

Replication data are included in the file "Figure6.1.sav" at www.cambridge.org/welzel.

New Variables in Figure 6.3

Weakly, Moderately, Strongly Emancipative Societies: I divide societies into three categories of ascending emphasis on emancipative values based on their population mean scores in these values in wave 5 of the WVS. 'Weakly emancipative societies' score below .38 scale points, 'moderately emancipative societies' between .38 and .47 scale points, and 'strongly emancipative societies' above .47 scale points. These thresholds are chosen on the basis of the empirical distribution such that each category includes an about equal number of countries and respondents.

Replication data are included in the file "Figure6.3.sav" at www.cambridge.org/welzel.

New Variables in Table 6.1

Association Membership: The WVS asks respondents for their membership and activity in voluntary associations. The entry statement reads: "Now I am going to read off a list of voluntary organizations. For each one, could you tell me whether you are an active member, an inactive member or not a member of that type of organization?" Among the listed associations, four are rich in social capital because they contribute to local community life and general wellbeing: "sport or recreational organization" (V25 in the wave-five WVS questionnaire), "art, music or educational organizations" (V26), "environmental organizations" (V29), "humanitarian or charitable organizations" (V31). For each association, I code non-membership 0, inactive membership .50, and active membership 1.0. I average the scores across the four types of associations. This yields a 9-point index with minimum 0 for no involvement in any of the four associations to 1.0 for active involvement in all four.[20] Activity in these four

[20] SPSS-Syntax: Recode v25 (0=0) (1=.5) (2=1) into memsports. Recode memsports (sysmiss=-99). Mis val memsports (-99). Var lab memsports "member of sports assoc". Val lab memsports 0"no member" .5"inact memb" 1"act memb". Recode v26 (0=0) (1=.5) (2=1) into memarts. Recode memarts

associations proves to be one-dimensional in a factor analysis across the time- and country-pooled individual-level dataset of WVS rounds one to five. It is also one-dimensional in temporal and spatial subdivisions of this dataset. At the societal level, I use the country mean on this 9-point index for activity in voluntary associations.

Replication data are included in the file "Table6.1.sav" at www.cambridge.org/welzel.

New Variables in Figures 6.4 and 6.5

Generalized Trust: The fifth round of the WVS includes three items asking for trust in close people. The items are introduced with the following question:

> "I 'd like to ask you how much you trust people from various groups. Could you tell me for each whether you trust people from this group completely, somewhat, not very much or not at all?"

Then the first three items name people from groups that are close to oneself: "your family" (V125), "your neighbors" (V126) and "people you know personally" (V127). Thus, to measure a person's trust in close people I recode the trust levels "not at all," "not very much," "somewhat," and "completely" as 0, 0.33, 0.66 and 1.0, respectively, and calculate the average trust score over the three close goups.

Two additional questions ask for trust in people with no further specification of these people: question V23 simply asks if "most people can be trusted" or if "you can't be too careful enough," whereas question V47 asks on a 10-point scale whether "most people would try to take advantage of you" (1) or "whether people would try to be fair" (10). I recode the first variable into a dummy with 0 for the non-trusting and 1.0 for the trusting response. The second variable is rescaled from minimum 0 for the non-trusting to maximum 1.0 for the trusting response. Then I measure trust in unspecified people as the average trust score over these two items.

The same battery on the basis of which I measure close trust provides another three items suited to measure trust in remote people: "people you meet for the first time" (V128), "people of another religion" (V129), and "people of another nationality" (V130). I rescale the responses to these items in the same way as those for close trust and calculate each respondent's average trust score over the three remote groups of people.

Finally, I calculate generalized trust by adding up each respondent's average scores on trust in close people, trust in unspecific people and trust in remote people, after assigning increasing weights from close to unspecific to remote to take into account the increasing generality of trust along this sequence. Thus, the generalized trust score is one times the close trust score plus two times the unspecific trust score plus three times the remote trust score, divided by six. This procedure yields a very

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(sysmiss=-99). Mis val memarts (-99). Var lab memarts "member of arts assoc". Val lab memarts 0"no member" .5"inact memb" 1"act memb". Recode v29 (0=0) (1=.5) (2=1) into memenviron. Recode memenviron (sysmiss=-99). Mis val memenviron (-99). Var lab memenviron "member of environm org". Val lab memenviron 0"no member" .5"inact memb" 1"act memb". Recode v31 (0=0) (1=.5) (2=1) into memhumanit. Recode memhumanit (sysmiss=-99). Mis val memhumanit (-99). Var lab memhumanit "member of humanit org". Val lab memhumanit 0"no member" .5"inact memb" 1"act memb". Compute memscorg = (memsports + memarts + memenviron + memhumanit) / 4. Recode memscorg (sysmiss=-99). Mis val memscorg (-99). Var lab memscorg "added membshps in soc cap orgs".

fine-grained trust score between 0 and 1.0. At the societal level, I use the population average on this variable.[21]

Humanistic Orientations: I define humanism as an orientation that operates with a notion of humanity as a unifying identity category of all members of our species. Having such a notion defies putting people into categories whose boundaries are irreversibly divisive, avoiding to split humanity into separate species. The WVS questionnaire includes five questions that fit this definition. They measure whether and to what extent people (1) reject a similarity-centered ideal of citizenship, (2) appreciate ethnic diversity, (3) dissociate from divisive identities, (4) support helping the poor in the world and (5) refuse to inflict violence on people in war.

The question used to measure the denial of a similarity-centered ideal of citizenship is phrased as follows:

> "In your opinion, how important should the following be as requirements for somebody seeking citizenship of your country? Specify for each requirement if you consider it as very important, rather important, or not important."

Respondents are confronted with four requirements. I consider the requirements "having ancestors from my own country" (V217) and "being born on my country's soil" (V218) as an indication of a similarity-centered ideal of citizenship: it requires fellow citizens to be similar by origin or culture. To measure the rejection of such an ideal, I code both items in ascending order of *rejection*, assigning scores of 0 for "very important," 0.33 for "rather important" and 1.0 for "not important" on each item. Then I calculate the average score over the two items for each respondent. This procedure yields a 5-point index from minimum 0 to maximum 1.0, indicating refusal of a similarity-centered ideal of citizenship.[22]

The question used to measure the appreciation of ethnic diversity (V221) reads:

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[21] SPSS-Syntax: Recode v23 (1=1) (2=0) into trust. Recode trust (sysmiss=-99). Mis val trust (-99). Var lab trust "unspecif interpers trust". Compute fair=(v47-1)/(10-1). Recode fair (sysmiss=-99). Mis val fair (-99). Var lab fair "fairness of unspecif others".
Recode v125 (1=1) (2=.66) (3=.33) (4=0) into tr_family. Recode tr_family (sysmiss=-99). Mis val tr_family (-99). Var lab tr_family "trust in family". Recode v126 (1=1) (2=.66) (3=.33) (4=0) into tr_neighb. Recode tr_neighb (sysmiss=-99). Mis val tr_neighb (-99). Var lab tr_neighb "trust in neighbors". Recode v127 (1=1) (2=.66) (3=.33) (4=0) into tr_know. Recode tr_know (sysmiss=-99). Mis val tr_know (-99). Var lab tr_know "trust in known people". Recode v128 (1=1) (2=.66) (3=.33) (4=0) into tr_unknown. Recode tr_unknown (sysmiss=-99). Mis val tr_unknown (-99). Var lab tr_unknown "trust in unknown people". Recode v129 (1=1) (2=.66) (3=.33) (4=0) into tr_difrel. Recode tr_difrel (sysmiss=-99). Mis val tr_difrel (-99). Var lab tr_difrel "trust in people of diff rel". Recode v130 (1=1) (2=.66) (3=.33) (4=0) into tr_difnat. Recode tr_difnat (sysmiss=-99). Mis val tr_difnat (-99). Var lab tr_difnat "trust in people of diff nation".
Compute clo_trust=(tr_family+tr_neighb+tr_know)/3. Recode clo_trust (sysmiss=-99). Mis val clo_trust (-99). Var lab clo_trust "close trust".
Compute uns_trust=(trust+fair)/2. Recode uns_trust (sysmiss=-99). Mis val uns_trust (-99). Var lab uns_trust "unspecific trust".
Compute rem_trust=(tr_unknown+tr_difrel+tr_difnat)/3. Recode rem_trust (sysmiss=-99). Mis val rem_trust (-99). Var lab rem_trust "remote trust".
Compute gen_trust=(clo_trust+2*uns_trust+3*rem_trust)/6. Recode gen_trust (sysmiss=-99). Mis val gen_trust (-99). Var lab gen_trust "generalized trust".

[22] SPSS-Syntax: Recode v217 (1=0) (2=.33) (3=1) into rejblood. Recode rejblood (sysmiss=-99). Mis val rejblood (-99). Var lab rejblood "reject citznshp req: same blood". Recode v218 (1=0) (2=.33 (3=1) into rejsoil. Recode rejsoil (sysmiss=-99). Mis val rejsoil (-99). Var lab rejsoil "reject citznshp req: born same soil". Compute RejSam=(rejblood+rejsoil)/2. Recode RejSam (sysmiss=-99). Mis val RejSam (-99). Var lab RejSam "reject sameness".

> "Turning to the question of ethnic diversity, with which of the following views do you agree? Please use this scale to indicate your position: 1 "ethnic diversity erodes a country's unity," 10 "ethnic diversity enriches life."

I rescale the responses to this question into a 10-point index from 0 for the least supportive and 1.0 for the most supportive attitude toward ethnic diversity.[23]

Another question asks respondents about their identity. Two of the statements for which respondents rate their support on a 4-point scale address identities that defy group divisions: "I see myself as a world citizen" (V210) and "I see myself as an autonomous individual." Indeed, cosmopolitanism and individualism deny rather than reify group boundaries: these are universal identities. Two other statements refer to the identification with the local community (V211) and the national community (V212). These identifications involve group boundaries. They are divisive for this reason. On this basis I calculate for each respondent how strong her or his universal identities are relative to the divisive ones, by subtracting the latter from the former. I standardize the difference into a scale from minimum 0 (the divisive identities completely outweigh the universal ones) to maximum 1.0 (the opposite case).[24]

To measure how strongly people support helping the poor in the world, round five of the WVS includes the following question (V178):

> "Thinking of your own country's problems, should your country's leaders give top priority to reducing poverty in the world or should they give top priority to solving your own country's problems? Use this scale where 1 means 'top priority to reducing poverty in the world' and 10 means 'top priority to solving my own country's problems'."

I rescale the responses into a range from minimum 0, for prioritizing "solving my own country's problems," to maximum 1.0, for prioritizing "helping the poor in the world." Fractions of 1.0 indicate intermediate priorities.[25]

Finally, the WVS asks people if they are willing fight in war for their country (V75). I code the pacifistic response "no" as 1.0 and "yes" as 0.[26]

Finally, I average each respondent's score over these five domains of humanism, which yields a very fine-grained, normally distributed humanism index between minimum 0 and maximum 1.0. As a societal-level measure of humanism, I use the population average on the index.[27]

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23 SPSS-Syntax: Compute EthDiv=(V221-1)/(10-1). Recode EthDiv (symiss=-99). Mis val EthDiv (-99). Var lab EthDiv "ethnic diversity".

24 SPSS-Syntax: Recode v210 (1=1) (2=.66) (3=.33) (4=0) into id_world. Recode id_world (sysmiss=-99). Mis val id_world (-99). Var lab id_world "identif w world". Recode v214 (1=1) (2=.66) (3=.33) (4=0) into id_individ. Recode id_individ (sysmiss=-99). Mis val id_individ (-99). Var lab id_individ "identif as auton individ". Compute id_open=(id_world+id_individ)/2. Recode id_open (sysmiss=-99). Mis val id_open (-99). Var lab id_open "open identity".
Recode v211 (1=1) (2=.66) (3=.33) (4=0) into id_local. Recode id_local (sysmiss=-99). Mis val id_local (-99). Var lab id_local "identif w loc comm". Recode v212 (1=1) (2=.66) (3=.33) (4=0) into id_nation. Recode id_nation (sysmiss=-99). Mis val id_nation (-99). Var lab id_nation "identif w nation". Compute id_closed=(id_local+id_nation)/2. Recode id_closed (sysmiss=-99). Mis val id_closed (-99). Var lab id _closed "closed identity".
Compute OpeClo=(id_open+(1-id_closed))/2. Recode OpeClo (sysmiss=-99). Mis val OpeClo (-99). Var lab OpeClo "open vs closed id".

25 SPSS-Syntax: Compute PovRed=(10-v178)/(9). Recode PovRed (sysmiss=-99). Mis val PovRed (-99). Var lab PovRed "poverty i world priority over own cntr's prblm".

26 SPSS-Syntax: Recode V75 (1=0) (2=1) into RejWar. Recode RejWar (symiss=-99). Mis val RejWar (-99). Var lab RejWar "reject fighting in war".

27 SPSS-Syntax: Compute Humanism=(RejSam+EthDiv+OpeClo+PovRed+RejWar)/5.

Replication data are included in the file "Figure6.4&6.5.sav" and "Table6.2.sav" at www.cambridge.org/welzel.

APPENDIX 7 (Ref. CHAPTER 7)

New Variables in Tables 7.1 and 7.2

Social Movement Activity (SMA): The WVS asks respondents about their social movement activity in the following way:

> "Now I'd like you to look at this card. I'm going to read out some forms of political action that people can take, and I'd like you to tell me, for each one, whether you have done any of these things, whether you might do it or would never under any circumstances do it."

Then respondents are supposed to indicate whether they did do the activity, might do it or would never do it for "signing a petition" [V96 of the WVS round 5 questionnaire], "Joining in boycotts" [V97] and "Attending peaceful demonstrations" [V98]. For each of these activities, I code "would never do it" 0, "might do it" .33 and "have done it" 1.0, and average each respondent's scores over the three activities.[28] At the societal level, I calculate the population average on this index.

[28] SPSS-Syntax (the first batch of commands standardizes the three constituent activities into scale range from 0 to 1): If (v96=3) sma_pet=0. If (v96=2) sma_pet=.30. If (v96=1) sma_pet=1. Recode sma_pet (sysmiss=-99). Mis val sma_pet (-99). If (v97=3) sma_boy=0. If (v97=2) sma_boy=.30. If (v97=1) sma_boy=1. Recode sma_boy (sysmiss=-99). Mis val sma_boy (-99). If (v98=3) sma_dem=0. If (v98=2) sma_dem=.30. If (v98=1) sma_dem=1. Recode sma_dem (sysmiss=-99). Mis val sma_dem (-99).
SPSS-Syntax (the next batch of commands creates auxiliary sma variables, one for each possibility of one or two of the three activities missing): Compute sma3_00=(sma_pet+sma_boy+sma_dem)/3. Recode sma3_00 (sysmiss=-99). Mis val sma3_00 (-99). Var lab sma3_00 "sma, 3 comps, no miss". Compute sma2_03=(sma_pet+sma_boy)/2. Recode sma2_03 (sysmiss=-99). Mis val sma2_03 (-99). Var lab sma2_03 "sma, 2 comps, 03 miss". Compute sma2_01=(sma_boy+sma_dem)/2. Recode sma2_01 (sysmiss=-99). Mis val sma2_01 (-99). Var lab sma2_01 "sma, 2 comps, 01 miss". Compute sma2_02=(sma_pet+sma_dem)/2. Recode sma2_02 (sysmiss=-99). Mis val sma2_02 (-99). Var lab sma2_02 "sma, 2 comps, 01 miss". Compute sma1_0103=sma_boy. Recode sma1_0103 (sysmiss=-99). Mis val sma1_0103 (-99). Var lab sma1_0103 "sma, 1 comp, 01 03 miss". Compute sma1_0102=sma_dem. Recode sma1_0102 (sysmiss=-99). Mis val sma1_0102 (-99). Var lab sma1_0102 "sma, 1 comp, 01 02 miss". Compute sma1_0203=sma_pet. Recode sma1_0203 (sysmiss=-99). Mis val sma1_0203 (-99). Var lab sma1_0203 "sma, 1 comp, 02 03 miss". Mis val sma3_00 sma2_03 sma2_01 sma2_02 sma1_0103 sma1_0102 sma1_0203 ().
SPSS-Syntax (the next batch of commands creates the final sma index from the auxiliary sma variables, using linear transformation formulae obtained from regressing the complete version of the sma on the incomplete auxiliary versions): If (sma3_00 ne -99) sma=sma3_00. Exec. If (sma3_00=-99) and (sma2_03 ne -99) sma=.838*sma2_03+.023. Exec. If (sma3_00=-99) and (sma2_03=-99) and (sma2_01 ne -99) sma=.883*sma2_01+.081. Exec. If (sma3_00=-99) and (sma2_03=-99) and (sma2_01=-99) and (sma2_02 ne -99) sma=.781*sma2_02+.002. Exec. If (sma3_00=-99) and (sma2_03=-99) and (sma2_01=-99) and (sma2_02=-99) and (sma1_0103 ne -99) sma=.659*sma1_0103+.138. Exec. If (sma3_00=-99) and (sma2_03=-99) and (sma2_01=-99) and (sma2_02=-99) and (sma1_0103=-99) and (sma1_0102 ne -99) sma=.563*sma1_0102+.101. Exec. If (sma3_00=-99) and (sma2_03=-99) and (sma2_01=-99) and (sma2_02=-99) and (sma1_0103=-99) and (sma1_0102=-99) and (sma1_0203 ne -99) sma=.486*sma1_0203+.040. Exec. Recode sma (sysmiss=-99). Mis val sma (-99). Var lab sma "elite-challng action".
SPSS-Syntax (the next batch of commands creates a weight variable to weigh down respondents on the sma index depending on the number of activities missing): If (sma3_00 ne -99) smaweight=1. Exec. If (sma3_00=-99) and ((sma2_03 ne -99) or (sma2_01 ne -99) or (sma2_02 ne -99)) smaweight=.66. Exec. If (sma3_00=-99) and (sma2_03=-99) and (sma2_01=-99) and (sma2_02=-99) and ((sma1_0103 ne -99) or (sma1_0102 ne -99) or (sma1_0203 ne -99)) smaweight=.33. Exec. Recode smaweight

Dissatisfaction with Life: I use the question on general life satisfaction [V22 in the WVS round 5 questionnaire], rescale into a 0-to-1.0 range and invert it so that the higher scores show more dissatisfaction.[29]

Distrust in Government: I use the four point index on confidence in "government [V138 in the WVS round 5 questionnaire] and rescale it into a 0-to-1.0 range with higher numbers indicating more distrust.[30]

Political Interest: To measure political interest I use a respondent's rating of the importance of "politics" as a life domain from 1 "very important" to 4 "not at all important" [V7 in the WVS round 5 questionnaire] and the respondent's rating of her interest in politics from 1 "very interested" to 4 "not at all interested" [V95 in the WVS round 5 questionnaire]. I rescale both variables into a 0-to-1.0 range, invert both indices so that higher scores indicate more emphasis on politics, and average each respondent's score over the two variables.[31]

Replication data are included in the file "Table7.1&7.2.sav" and "Figure7.1.sav" at www.cambridge.org/welzel.

New Variables in Figure 7.2

Social Movement Activity (societal level): Data are from the latest available round of the WVS for each surveyed society, 1995-2005. See documentation above.

Risk of Repression: Data are from the last five years before and at the time of the latest available survey for all societies surveyed once by the WVS, using Gibney, Wood and Cornett's (2008) 'political terror scale.' Based on reports by Amnesty International and the US State Department, the scale measures the violation of citizen rights through state repression as well as terrorism by non-state actors. There are two highly intercorrelated scales for the two sources, each ranging from 1 (lowest repression level) to 5 (highest repression level). For each year, I calculated the average over the two scales, yielding a 9-point scale from 2 to 10 and averaged these annual scores over the five years before and at the time of the societal-level measures of emancipative values and social movement activities. Finally, I rescaled the repression measures into a range from minimum 0 (lowest repression) to maximum 1.0 (highest repression). Societies surveyed by the WVS are found at all levels of repressive risk.

Replication data are included in the files "Table7.3_IL.sav" (individual level) and "Table7.3_CL" (country level) at www.cambridge.org/welzel.

(sysmiss=-99). Mis val smaweight (-99). Var lab smaweight "sma weight". Mis val sma3_00 sma2_03 sma2_01 sma2_02 sma1_0103 sma1_0102 sma1_0203 (-99).

29 SPSS-Syntax: Compute DisLife=1 - ((v22 – 1)/(10-1)). Recode DisLife (sysmiss=-99). Mis val DisLife (-99).

30 SPSS-Syntax: Recode v138 (1=0) (2=.33) (3=.66) (4=1) into DisGov. Recode DisGov (sysmiss=-99). Mis val DisGov (-99).

31 SPSS-Syntax: Compute Pol1=1-((v7-1)/(4-1)). Recode Pol1 (sysmiss=-99). Mis val Pol1 (-99). Compute Pol2=1-((v95-1)/(4-1)). Recode Pol2 (sysmiss=-99). Mis val Pol2 (-99). Compute PolInt=(Pol1+Pol2)/2.

New Variables in Table 7.4 and Figure 7.3

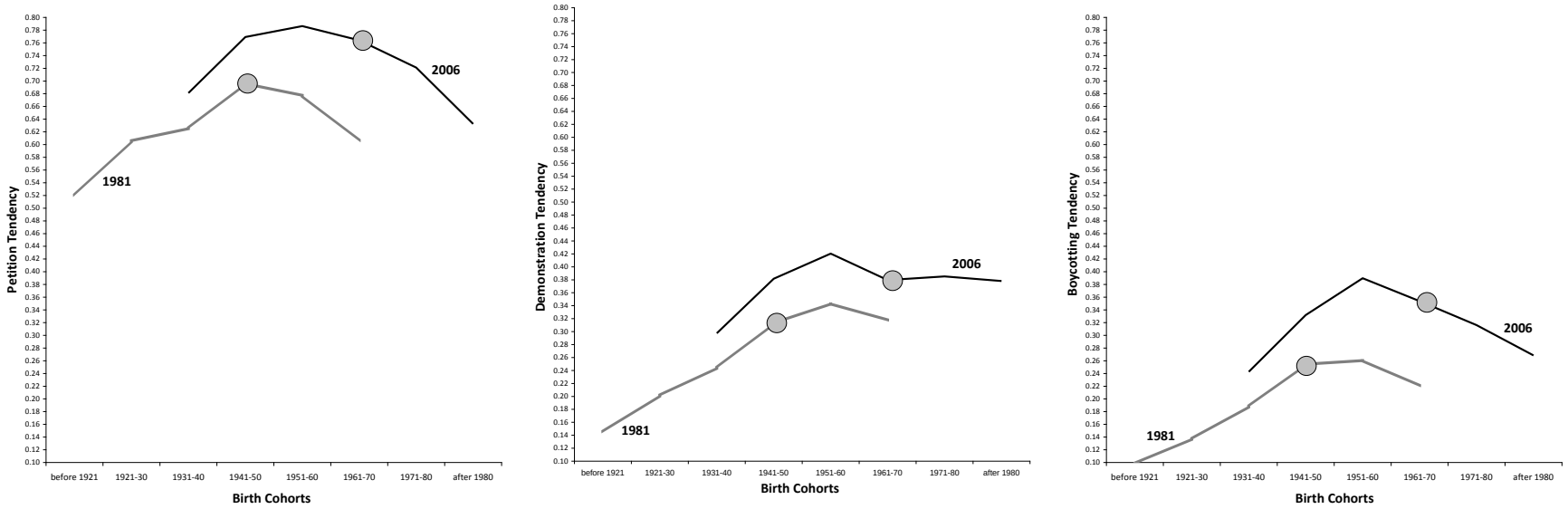
SMA (latest survey): A country's mean level of social movement activity at the latest survey in the WVS, provided there is an at least fifteen-year distance to the earliest survey. For the calculation of social movement activity, see p. 66.

SMA (earliest survey): A country's mean level of social movement activity at the earliest survey in the WVS, provided there is an at least fifteen-year distance to the latest survey. For the calculation of social movement activity, see p. 66.

Change in SMA (earliest to latest survey): Change in a country's mean level of social movement activity from the earliest to the latest survey in the WVS, provided there is an at least fifteen-year distance between these surveys. Calculation is done by subtracting the earlier from the later score. Theoretical range of the resulting change measure is from -1 to +1. For the calculation of social movement activity, see p. 66.

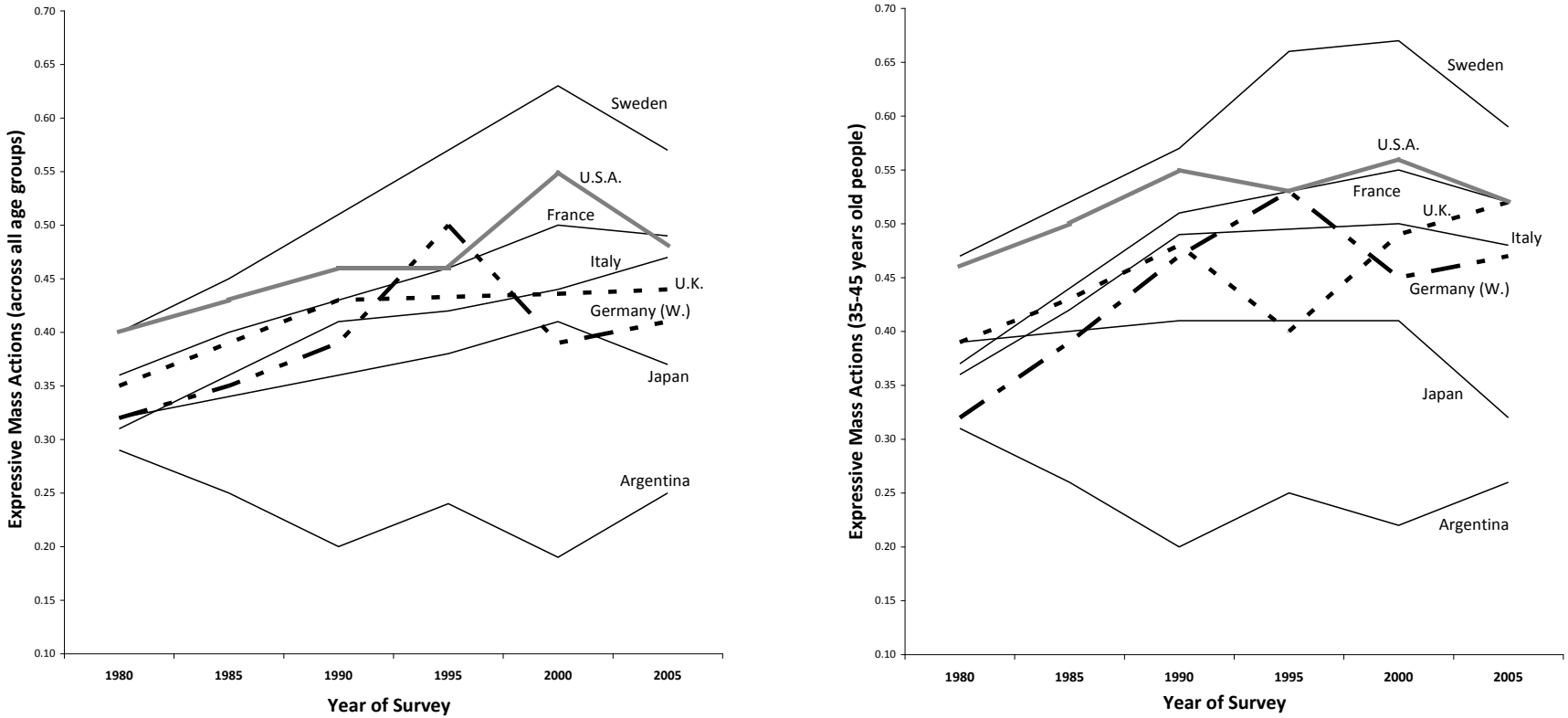
Replication data are included in the file "Table7.4.sav" at www.cambridge.org/welzel.

Appendix-Figure 7.1: Change in the Separate Components of Social Movement Activities among Societies Covered in Figure 7.3 of the Book



Interpretation: The level of mass participation in the three constituent activities of the SMA-index differs. Nevertheless, we observe the same curvilinear cohort pattern and the same upward time trend in all three types of activities. Thus, the pattern shown in Figure 7.3 of the book is not an artifact of aggregating the three activities.

Appendix-Figure 7.2: Change in Social Movement Activities over the Various Survey Waves of WVS: Selected Societies



Interpretation: The increase in social movement activities shown for the technologically advanced and most emancipatory societies in Figure 7.3 of the book is not an artifact of taking the latest measure during an upward mobilization cycle and the earliest measure during a downward cycle. Instead, there is a fairly steady increase in social movement activities over all consecutive rounds of the WVS among the technologically advanced societies and most emancipatory societies. Exceptional dips usually occur in the wake of unexpected systemic shocks, like the post-reunification economic crisis in Germany after 1990, the blow up of the financial bubble in Japan in the late 1990s and the 9/11 terrorist attacks in the US in 2001.

Appendix-Table 7.1: Replicating the DVW-Model of Protest with WVS-Round V-Data

PREDICTORS:	*DEPENDENT VARIABLE*: Social Movement Activities (SMA-Index Model 1 (Entitlements)	 Model 2 (Capacities)
• Intercept	.32 (22.3)***	.32 (20.22)***
Societal-level Effects:		
• Entitlements 1 (Rule of Law)	.43 (7.2)***	
• Capacities 1 (GDP/cap)		.41 (4.4)***
Fixed Individual-level Effects:		
• Dissatisfaction with Life	.03 (3.1)**	.03 (3.0)**
Random Individual-level Effects:		
• Distrust in Parliament	N. S.	N. S.
* Entitlements 1 (Rule of Law)	N. S.	
* Capacities 1 (GDP/cap)		N. S.
• Association Membership	.19 (13.57)***	.19 (13.7)***
* Entitlements 1 (Rule of Law)	N. S.	
* Capacities 1 (GDP/cap)		N. S.
• Formal Education	.17 (15.7)***	.17 (15.8)***
* Entitlements 1 (Rule of Law)	N. S.	
* Capacities 1 (GDP/cap)		N. S.
• Leftist Orientation	.09 (6.4)***	.09 (5.9)***
* Entitlements 1 (Rule of Law)	.49 (8.5)***	
* Capacities 1 (GDP/cap)		.47 (5.2)***
• Postmaterialist Values	.08 (12.4)***	.08 (12.1)***
* Entitlements 1 (Rule of Law)	.14 (4.3)***	
* Capacities 1 (GDP/cap)		.15 (4.2)***
Reduction of Error:		
Within-societal Variation of DV	13%	13%
Between-societal Variation of DV	44%	30%
Variation in Effect of Ideology	55%	40%
Variation in Effect of Postmat.	35%	30%
N (number of observations)	42,667 respondents in 48 societies	

Notes: Entries are unstandardized regression coefficients with T-values in parentheses (robust standard errors). Significance levels: N. S. $p \geq .10$ (not significant), * $p < .100$, ** $p < .050$, *** $p < .010$. Individual-level variables are 'group-mean centered,' societal-level variables are 'grand mean centered.' Percent error reduction calculated from change in random variance component related to empty-model. National samples are weighted to equal size without changing the overall *N*. Models calculated with HLM 6.01. Data source is WVS round V (2005-7).

APPENDIX 8 (Ref. CHAPTER 8)

New Variables in Figure 8.3

Personal Autonomy Rights (PAR): 'Civil liberties' rating of the year 2000 by Freedom House inverted and standardized [32], plus the standardized 'integrity rights' rating by Cingranelli/Richards of the same year[33], divided by 2.[34]

Political Participation Rights (PPR): 'Political rights' rating of the year 2000 by Freedom House inverted and standardized[35], plus the standardized 'empowerment rights' rating by Cingranelli/Richards of the same year[36], divided by 2.[37]

New Variables in Figure 8.5 and 8.6

Citizen Rights Index: The citizen rights index of a given year is the product of the personal autonomy rights and political participation rights scores of that year.[38]

Regime Types: 1 – (Pure) Autocracies (PAR less equal .5 and PPR less equal .5), 2 – Liberal Autocracies (PAR greater than .5 and PPR less equal .5), 3 – Inclusive Autocracies (PAR less equal .5 and PPR greater than .5), 4 – (Minimal) Democracies (PAR greater than .5 and PPR greater than .5).[39]

Scale Zones: 1 – Complete Autocracies (CitRig less equal .25), 2 – Incomplete Autocracies (CitRig greater than .25 and less equal .5), 3 – Incomplete Democracies (CitRig greater than .5 and less equal .75), 4 – Complete Democracies (CitRig greater than .75).[40]

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32 Assume the variable name for the original civil liberties rating in 1981 is "civlib81", the SPSS-Syntax to create the inverted and standardized rating is: Compute cl81 = 1 – ((civlib81 – 1) / 6).

33 Assume the variable name for the original integrity rights rating in 1981 is "intrig81", the SPSS-Syntax to create the standardized rating is: Compute ir81 = intrig81 / 8.

34 SPSS-Syntax to calculate personal autonomy rights in 1981: Compute par81 = (cl81 + ir81) / 2.

35 Assume the variable name for the original political rights rating in 1981 is "polrig81", the SPSS-Syntax to create the inverted and standardized rating is: Compute pr81 = 1 – ((polrig81 – 1) / 6).

36 Assume the variable name for the original empowerment rights rating in 1981 is "empow81", the SPSS-Syntax to create the standardized rating is: Compute er81 = empow81 / 14.

37 SPSS-Syntax to calculate political participation rights in 1981: Compute ppr81 = (pr81 + er81) / 2.

38 SPSS-Syntax to calculate the citizen rights index in 1981: Compute citrig81 = par81 * ppr81.

39 SPSS-Syntax to calculate regime types for 1981: If (par81 le .5) and (ppr le .5) regtyp81 = 1. If (par81 gt .5) and (ppr81 le .5) regtyp81 = 2. If (par81 gt .5) and (ppr81 le .5) regtyp81 = 3. If (par81 gt .5) and (ppr81 gt .5) regtyp81 = 4. Val lab regtyp81 1"pure autoc" 2"liberal autoc" 3"inclus autoc" 4"minim democ".

40 SPSS-Syntax to calculate regime types for 1981: If (citrig81 le .25) scalzone81 = 1. If (citrig81 gt .25) and (citrig le .5) scalezone81 = 2. If (citrig81 gt .5) and (citrig81 le .5) scalezone81 = 3. If (citrig81 gt .75) scalezone81 = 4. Val lab scalezone81 1"compl autoc" 2"incompl autoc" 3"incompl democ" 4"compl democ".

New Variables in Figure 8.8

Preferences for Democracy: 4-point scale support of 'having democracy' as a form of government [V151 in the round-five questionnaire of the WVS], averaged against 4-point scale support of 'having the army rule' [V150] and 'having a strong leader who does not have to bother with parliaments and elections' [V148].[41]

Ungrounded Preferences for Democracy: Part of preferences for democracy that overshoots emancipative values. For 89 percent of all respondents the preference score for democracy indeed overshoots the socre in emancipative values. In case of these 89 percent of respondents, I subtract the score in emancipative values from the democratic preference score. The resulting difference measures to what extent democratic preferences overshoot the emphasis on emancipative values. In case of the just 11 percent of respondents for whom democratic preferences do not overshoot emancipative values, the score in ungrounded preferences for democracy is set at 0 because under this condition there is no ungroundedness.[42]

Grounded Preferences for Democracy: Part of the preferences for democracy matched by emancipative values: if democratic preferences overshoot emancipative values, the variable obtains the score of emancipative values; if emancipative values overshoot democratic preferences, the variable obtains the score of democratic preferences. Thus, the construction of this variable follows the 'weakest link approach' outlined by Goertz (2006).[43]

The methods and contents of the Freedom House ratings can be inspected at www.freedomhouse.org, the Cingranelli/Richards ratings at www.humanrightsdata.org.

Replication data are included in the files "Figure8.3&8.5&8.6.sav," "Figure8.8.sav" and "Table8.1&8.2.sav" at www.cambridge.org/welzel.

41 SPSS-syntax: Recode v148 (1=0) (2=.33) (3=.66) (4=1) into strgleadrej. Recode strgleadrej (sysmiss=-99). Mis val strgleadrej (-99). Var lab strgleadrej "reject strg leader".
Recode v150 (1=0) (2=.33) (3=.66) (4=1) into armyrulerej. Recode armyrulerej (sysmiss=-99). Mis val armyrulerej (-99). Var lab armyrulerej "reject army rule".
Recode v151 (4=0) (3=.33) (2=.66) (1=1) into democsup. Recode democsup (sysmiss=-99). Mis val democsup (-99). Var lab democsup "support democracy".
Compute DemPref = (strgleadrej + armyrulerej + democsup) / 3. Recode DemPref (sysmiss=-99). Mis val DemPref (-99). Var lab DemPref "democr prefer".

42 SPSS-syntax: If (DemPref gt EmaVal) UngPref = DemPref – EmaVal. If (DemPref = EmaVal) UngPref = 0.

43 SPSS-syntax: If (DemPref gt EmaVal) GrouPref = EmaVal. If (DemPref le EmaVal) GrouPref = DemPref.

APPENDIX 9 (Ref. CHAPTER 9)

New Variables in Figure 9.1

Human Rights Ratings (vertical axis): Four-point rating of one's society's human rights performance [V164 in WVS-round five] inversed, such that a higher code indicates a better performance, then standardized into a 0-to-1 range (0, .33, .66, 1), minus the 0-to-1 citizen rights index of the five years before and at the survey.

Replication data are in the file "Figure9.1.sav" www.cambridge.org/welzel.

New Variables in Tables 9.1 and 9.3

The dynamic regressions in Tables 9.1 and 9.3 are limited to the about fifty societies with a temporal coverage in the WVS of at least ten years. In these regressions, each society appears only once, so there is no need to take care of serial correlations. To inspect the composition of the country sample and to see at which times the earliest and latest surveys took place for which society, see Appendix-Table 4.1. What follws is the variable description.

Emancipative Values at T_2: A society's score on the emancipative values index at the time of the latest available WVS survey (T_2). Theoretical score range is from 0 to 1.0, with any possible fraction for intermediate positions. For the construction of the emancipative values index, see Appendix 2.

Citizen Rights at T_2: A society's score on the citizen rights index at the time of the latest available WVS survey (T_2). Theoretical score range is from 0 to 1.0, with any possible fraction for intermediate positions. For the construction of the citizen rights index, see Appendix 8.

Women's Rights at T_2: A society's score on the women's rights index at the time of the latest available WVS survey (T_2). Theoretical score range is from 0 to 1.0, with any possible fraction for intermediate positions. For the construction of the women's rights index, see documention in this Appendix below.

$\Delta(T_2 - T_1)$ *Emancipative Values* (change from earliest to latest survey): Change in a country's mean level of emancipative values from the earliest available WVS survey (T_1) to the latest available one (T_2). Calculation is done by subtracting the earlier from the later score. Theoretical range of the resulting change measure is from -1 to +1. For the construction of emancipative values, see Appendix 2.

$\Delta(T_2 - T_1)$ *Citizen Rights* (change from earliest to latest survey): I use the citizen rights index documented in Appendix 8 and subtract a country's citizen rights score in the year of the earliest WVS survey (T_1) from its score in the latest WVS survey (T_2). Theoretical range of the resulting change measure is from -1 to +1.

$\Delta(T_2 - T_1)$ *Women's Rights* (change from earliest to latest survey): I use the women's rights index documented below and subtract a country's women's rights score in the year of the earliest WVS survey (T_1) from its score in the latest WVS survey (T_2). Theoretical range of the resulting change measure is from -1 to +1.

$\Delta(T_2 - T_1)$ *Economic Development* (change from earliest to latest survey): I use the per capita Gross Domestic Product (GDP) index documented in Appendix 4 and subtract a country's GDP index score in the year of the earliest WVS survey (T_1) from its score in the latest WVS survey (T_2). Theoretical range of the resulting change measure is from -1 to +1.

$\Delta(T_2 - T_1)$ *Global Linkages* (change from earliest to latest survey): I use the global linkages index documented below and subtract a country's global linkages score in the year of the earliest WVS survey (T_1) from its score in the latest WVS survey (T_2). Theoretical range of the resulting change measure is from -1 to +1.

Exogenous Change in DV (change from earliest to latest survey): Depending on what is the explained variable in Tables 9.1 and 9.3 (emancipative values, citizen rights or women's rights), I calculate for each society the average score of all other societies in the same culture zone (as defined in Table I.3 of *Freedom Rising*) and subtract the score at the time of the earliest survey (T_1) from that of the latest survey (T_2). Theoretical range of the resulting change measure is from -1 to +1.

Dependent Variable at T_1: Depending on what is the explained variable in Tables 9.1 and 9.3 (emancipative values, citizen rights or women's rights), I use the score at the time of the earliest available WVS survey (T_1).

Variables in Tables 9.2 and 9.4

The dynamic regressions in Tables 9.2 and 9.4 treat as an observation every pair of two consecutive WVS rounds, treating any previous WVS round as the earlier time T_1 and its subsequent round as the later time T_2. Thus, this analysis covers every society for which at least two WVS surveys exist (which is true for about 65 societies after the completion of round five of the WVS) and several societies appear in repeated observations if more than two WVS surveys have been conducted. To see at which times pairs of consecutive WVS surveys took place for which society, inspect the data file "Table9.1_9.5.sav" at www.cambridge.org/welzel. What follows is a variable description.

Emancipative Values at T_2: A society's score on the emancipative values index at the time of a WVS survey following a preceding survey (T_2). Theoretical score range is from 0 to 1.0, with any possible fraction for intermediate positions. For the construction of the emancipative values index, see Appendix 2.

Citizen Rights at T_2: A society's score on the citizen rights index at the time of a WVS survey following a preceding survey (T_2). Theoretical score range is from 0 to 1.0, with any possible fraction for intermediate positions. For the construction of the citizen rights index, see Appendix 8.

Women's Rights at T_2: A society's score on the women's rights index at the time of a WVS survey following a preceding survey (T_2). Theoretical score range is from 0 to 1.0, with any possible fraction for intermediate positions. For the construction of the women's rights index, see documention in this Appendix below.

$\Delta(T_2 - T_1)$ *Emancipative Values* (change from any preceding to its subsequent survey): Change in a country's score on the emancipative values index from any preceding WVS survey (T_1) to its subsequent one (T_2). Calculation is done by subtracting the T_1 score from the T_2 score. Theoretical range of the resulting change measure is from -1 to +1. For the construction of the emancipative values index, see Appendix 2.

$\Delta(T_2 \_ T_1)$ *Citizen Rights* (change from any preceding to its subsequent survey): Change in a country's citizen rights score from any preceding WVS survey (T_1) to its subsequent one (T_2). Calculation is done by subtracting the T_1 score from the T_2 score. Theoretical range of the resulting change measure is from -1 to +1. For the construction of the citizen rights index, see Appendix 8.

$\Delta(T_2 \_ T_1)$ *Women's Rights* (change from any preceding to its subsequent survey): Change in a country's women's rights index from any preceding WVS survey (T_1) to its subsequent one (T_2). Calculation is done by subtracting the T_1 score from the T_2 score. Theoretical range of the resulting change measure is from -1 to +1. For the construction of the women's rights index, see documentation in this Appendix below.

$\Delta(T_2 \_ T_1)$ *Economic Development* (change from any preceding to its subsequent survey): Change in a country's score on the per capita GDP index from any preceding WVS survey (T_1) to its subsequent one (T_2). Calculation is done by subtracting the T_1 score from the T_2 score. Theoretical range of the resulting change measure is from -1 to +1. For the construction of the per capita GDP index, see Appendix 4.

$\Delta(T_2 \_ T_1)$ *Global Linkages* (change from any preceding to its subsequent survey): Change in a country's score on the global linkages index from any preceding WVS survey (T_1) to its subsequent one (T_2). Calculation is done by subtracting the T_1 score from the T_2 score. Theoretical range of the resulting change measure is from -1 to +1. For the construction of the global linkages index, see documentation in this Appendix below.

Exogenous Change in DV (change from any preceding to its subsequent survey): Depending on what is the explained variable in Tables 9.2 and 9.4 (emancipative values, citizen rights or women's rights), I calculate for each society the average score of all other societies in the same culture zone (as defined in Table I.3 of *Freedom Rising*) and subtract the score at the time of a preceding WVS survey (T_1) from that of its subsequent survey (T_2). Theoretical range of the resulting change measure is from -1 to +1.

Dependent Variable at T_1: Depending on what is the explained variable in Tables 9.2 and 9.4 (emancipative values, citizen rights or women's rights), I use the score at the time of a preceding WVS survey (T_1).

Women's Rights Index

I use three indicators to measure women's rights. All three are provided by the Cingranelli/Richards Human Rights Data Project (CIRI) at www.ciri.binghamton.edu. The three indicators include women's political rights, women's economic rights and women's social rights. Based on documentation by the US State Department and Amnesty International, CIRI measures how well these rights are legally guaranteed and how strongly these guarantees are respected in practice. According to CIRI, these rights cover the following domains.

Women's *political* rights:
- the right to vote;
- the right to run for political office;
- the right hold elected and appointed government positions;
- the right to join political parties; and the right to petition government officials.

Women's *economic* rights:
- the adoption and enforcement of equal pay for equal work;

- the free choice of profession or employment without the need to obtain a husband's or male relative's consent;
- equality in hiring and promotion practices;
- equality in job security (maternity leave, unemployment benefits, etc.);
- non-discrimination by employers; right to be free from sexual harassment;
- the right to work at night;
- the right to work in occupations classified as dangerous;
- the right to work in the military or police force.

Women's *social* rights:

- the right to equal inheritance;
- the right to enter into marriage on the basis of equality with men;
- the right to travel abroad; the right to obtain a passport;
- the right to confer citizenship to children or a husband; the right to initiate divorce;
- the right to own, manage, and retain property brought into marriage;
- the right to participate in social, cultural and community activities;
- the right to an education;
- the freedom to choose a residence/domicile;
- freedom from genital mutilation of children and of adults without their consent;
- freedom from forced sterilization.

Each of these three groups of women's rights is measured on a 4-point scale from 0 (none of the listed rights respected in practice) to 3 (all listed rights repsected in practice). Adding the scores on the three scales provides a 10-point index from 0 to 9, which I standardize into a range from minimum 0 to maximum 1.0, with various fractions for intermediate positions.

Global Linkages Index

The global linkages variable is based on Dreher, Gaston and Martens' (2008) globalization index, which averages measures of economic, social, and political globalization in the following way:

A. Economic Globalization [37%]

i) • Actual Flows (50%)
  - Trade (percent of GDP) (19%)
  - Foreign Direct Investment, flows (percent of GDP) (20%)
  - Foreign Direct Investment, stocks (percent of GDP) (24%)
  - Portfolio Investment (percent of GDP) (17%)
  - Income Payments to Foreign Nationals (percent of GDP) (20%)

ii) Restrictions (50%)
  - Hidden Import Barriers (22%)
  - Mean Tariff Rate (28%)
  - Taxes on International Trade (percent of current revenue) (27%)
  - Capital Account Restrictions (22%)

B. Social Globalization [39%]

i) • Data on Personal Contact (33%)
  - Telephone Traffic (26%)
  - Transfers (percent of GDP) (3%)
  - International Tourism (26%)
  - Foreign Population (percent of total population) (20%)
  - International letters (per capita) (25%)

ii) Data on Information Flows (36%)
  - Internet Users (per 1000 people) (36%)
  - Television (per 1000 people) (36%)
  - Trade in Newspapers (percent of GDP) (28%)

iii) Data on Cultural Proximity (31%)
  - Number of McDonald's Restaurants (per capita) (43%)
  - Number of Ikea (per capita) (44%)

- Trade in books (percent of GDP) (12%)

C. Political Globalization [25%]

- Embassies in Country (25%)
- Membership in International Organizations (28%)
- Participation in U.N. Security Council Missions (22%)
- International Treaties (25%)

I use these authors overall globalization measure and standardize it into a range from minimum 0 to maximum 1.0, with fractions for intermediate positions. Note that this standardization is based on the authors' time-pooled database. Thus, the standaridized index scores are temporally comparable: if a society has a higher score at a later point in time, this indeed indicates an absolute increase in its global linkages, not just a climb in relative position to other societies.

Lesbian-Gay-Bisexual-Transgender (LGBT) Rights

I use data from the International Gay and Lesbian Human Rights Commission (2010) on the absence (coded 0) or presence (coded 1) of (*a*) the legal recognition of same-sex relationships, (*b*) legalization of same-sex marriage, (*c*) the right of LGBTs for child adoption, (*d*) access of LGBTs to the military, (*e*) anti-discrimination laws, and (*f*) legal protection of expressing one's sexual identity. This provides a seven-point index which I normalize into a score range from minimum 0 to maximum 1.0, with various fractions for intermediate positions.

The lowest LGBT-score (0) is found in Algeria, Ethiopia, and Vietnam. The highest score (1.0) is found in Belgium, Sweden, and The Netherlands. The mean LGBT-score is .52, a level found in the Czech Republic, Japan and Peru. Because of lack of older data, no change scores can be calculated.

Robustness Checks of the Findings in Tables 9.1 to 9.4 in Freedom Rising

The strongest model pair in Tables 9.1 to 9.4 in *Freedom Rising* is pair 1-2/2-2. The following tables show a variety of alterations of these models in order to figure out whether the reciprocity pattern between values and rights established in pair 1-2/2-2 is robust against alternative model specifications. As the following tables illustrate, this is indeed the case. Under all alterations, the more strongly positive and more significant effect runs from change in values to change in rights, rather than the other way round--irrespective of whether we look at short-term or long-term changes.

Appendix-Table 9.1: Alternating Model Pair 1-2/2-2 of Table 9.1 by Replacing Global Linkages with Exogenous Contagion

	DEPENDENT VARIABLES:	
PREDICTORS:	Citizen Rights at time t_2	Emancipative Values at time t_2
Constant	.24 (3.9)**	.07 (1.3)
Dependent Variable (DV) at time t_1	.52 (5.2)***	.81 (5.8)***
$\Delta_{(t2-t1)}$ Emancipative Values	.95 (1.9)*	
$\Delta_{(t2-t1)}$ Citizen Rights		.02 (0.5)
$\Delta_{(t2-t1)}$ Economic Development	.39 (0.8)	.56 (5.5)***
$\Delta_{(t2-t1)}$ Exogenous Contagion	.49 (3.6)***	.41 (2.2)**
Adjusted R^2	.64	.76
N	49	49

Notes: Entries are unstandardized regression coefficients with T-values in parentheses. Estimates are calculated with the "sureg"-procedure in STATA, conducting a 'seemingly unrelated regression' for the two models. Δ-variables measure change from the earliest survey at time t_1 to the latest survey at time t_2. For each society, time t_1 is measured 10 to 25 years before time t_2. Since each society appears only once in this dataset, no test for serial correlations is necessary.

In each model, regression diagnostics for heteroskedasticity (White Test), multicollinearity (variance inflation factors), and influential cases (DFFITs) reveal no violation of OLS-assumptions.

Significance levels: $^{n.s.}$ $p \geq .100$, * $p < .100$, ** $p < .050$, *** $p < .005$.

Interpretation: Replacing global linkages with exogenous contagion, the long-term reciprocity pattern between values and rights established in Table 9.1 is confirmed: the more strongly positive and more significant effect in the relationship between values and rights runs from change in values to change in rights. On a side note, exogenous contagion is a stronger contributor to both citizen rights improvements and rising emancipative values than are global linkages.

Appendix-Table 9.2: Alternating Model Pair 1-2/2-2 of Table 9.2 by Replacing Global Linkages with Exogenous Contagion

	DEPENDENT VARIABLES:	
PREDICTORS:	Citizen Rights at time t_2	Emancipative Values at time t_2
Constant	.09 (4.1)***	.04 (2.1)**
Dependent Variable (DV) at time t_1	.82 (21.9)***	.87(16.6)***
$\Delta_{(t2-t1)}$ Emancipative Values	1.09 (4.5)***	
$\Delta_{(t2-t1)}$ Citizen Rights		.09 (3.2)***
$\Delta_{(t2-t1)}$ Economic Development	.03 (0.1)	.41 (3.8)***
$\Delta_{(t2-t1)}$ Exogenous Contagion	.54 (4.1)***	.97 (3.7)***
Adjusted R^2	.86	.84
Durbin Watson	1.90	1.90
N	127	127

Notes: Entries are unstandardized regression coefficients with T-values in parentheses. Estimates are calculated with the "sureg"-procedure in STATA, conducting a 'seemingly unrelated regression' for the two models. Δ-variables measure change from the earliest survey at time t_1 to the latest survey at time t_2. For each society, time t_1 is measured 10 to 25 years before time t_2. Since each society appears only once in this dataset, no test for serial correlations is necessary.

In each model, regression diagnostics for heteroskedasticity (White Test), multicollinearity (variance inflation factors), and influential cases (DFFITs) reveal no violation of OLS-assumptions.

Significance levels: $^{n.s.}$ $p \geq .100$, * $p < .100$, ** $p < .050$, *** $p < .005$.

Interpretation: Replacing global linkages with exogenous contagion, the short-term reciprocity pattern between values and rights established in Table 9.2 is confirmed: the more strongly positive and more significant effect in the relationship between values and rights runs from change in values to change in rights. On a side note, exogenous contagion is a stronger contributor to both citizen rights improvements and rising emancipative values than global linkages.

Appendix-Table 9.3: Alternating Model Pair 1-2/2-2 of Table 9.3 by Replacing Global Linkages with Exogenous Contagion

	DEPENDENT VARIABLES:	
PREDICTORS:	Women's Rights at time t_2	Emancipative Values at time t_2
Constant	.29 (4.7)***	.02 (0.3)
Dependent Variable (DV) at time t_1	.47 (4.5)***	.92 (6.8)***
$\Delta_{(t2-t1)}$ Emancipative Values	1.30 (4.6)***	
$\Delta_{(t2-t1)}$ Women's Rights		.18 (3.5)***
$\Delta_{(t2-t1)}$ Economic Development	- .02 (-0.1)	.43 (4.2)***
$\Delta_{(t2-t1)}$ Exogenous Contagion	.01 (0.1)	.47 (2.6)**
Adjusted R^2	.60	.77
N	46	46

Notes: Entries are unstandardized regression coefficients with T-values in parentheses. Estimates are calculated with the "sureg"-procedure in STATA, conducting a 'seemingly unrelated regression' for the two models. Δ-variables measure change from the earliest survey at time t_1 to the latest survey at time t_2. For each society, time t_1 is measured 10 to 25 years before time t_2. Since each society appears only once in this dataset, no test for serial correlations is necessary.

In each model, regression diagnostics for heteroskedasticity (White Test), multicollinearity (variance inflation factors), and influential cases (DFFITs) reveal no violation of OLS-assumptions.

Significance levels: $^{n.s.}$ $p \geq .100$, * $p < .100$, ** $p < .050$, *** $p < .005$.

Interpretation: Replacing global linkages with exogenous contagion, the long-term reciprocity pattern between values and rights established in Table 9.3 is confirmed: the more strongly positive and more significant effect in the relationship between values and women's rights runs from change in values to change in rights. On a side note, exogenous contagion is a stronger contributor to both women's rights improvements and rising emancipative values than are global linkages.

Appendix-Table 9.4: Alternating Model Pair 1-2/2-2 of Table 9.4 by Replacing Global Linkages with Exogenous Contagion

	DEPENDENT VARIABLES:	
PREDICTORS:	Women's Rights at time t_2	Emancipative Values at time t_2
Constant	.11 (4.4)***	.04 (1.9)*
Dependent Variable (DV) at time t_1	.80 (17.8)***	.14 (3.6)***
$\Delta_{(t2-t1)}$ Emancipative Values	.73 (4.2)***	
$\Delta_{(t2-t1)}$ Women's Rights		.30 (2.6)**
$\Delta_{(t2-t1)}$ Economic Development	.44 (1.9)*	.43 (4.2)***
$\Delta_{(t2-t1)}$ Exogenous Contagion	- .16 (-0.8)	.94 (3.6)***
Adjusted R^2	.78	.84
Durbin Watson	2.10	2.10
N	122	122

Notes: Entries are unstandardized regression coefficients with T-values in parentheses. Estimates are calculated with the "sureg"-procedure in STATA, conducting a 'seemingly unrelated regression' for the two models. Δ-variables measure change from the earliest survey at time t_1 to the latest survey at time t_2. For each society, time t_1 is measured 10 to 25 years before time t_2. Since each society appears only once in this dataset, no test for serial correlations is necessary.

In each model, regression diagnostics for heteroskedasticity (White Test), multicollinearity (variance inflation factors), and influential cases (DFFITs) reveal no violation of OLS-assumptions.

Significance levels: $^{n.s.}$ $p \geq .100$, * $p < .100$, ** $p < .050$, *** $p < .005$.

Interpretation: Replacing global linkages with exogenous contagion, the short-term reciprocity pattern between values and rights established in Table 9.4 is confirmed: the more strongly positive and more significant effect in the relationship between values and women's rights runs from change in values to change in rights. On a side note, exogenous contagion is a stronger contributor to rising emancipative values than are global linkages.

Appendix-Table 9.5: Alternating Model Pair 1-2/2-2 of Table 9.1 by Replacing Economic Development with Human Development

	DEPENDENT VARIABLES:	
PREDICTORS:	Citizen Rights at time t_2	Emancipative Values at time t_2
Constant	.27 (2.6)**	.05 (0.8)
Dependent Variable (DV) at time t_1	.48 (4.2)***	1.79 (6.0)***
$\Delta_{(t2-t1)}$ Emancipative Values	.88 (1.8)*	
$\Delta_{(t2-t1)}$ Citizen Rights		- .06 (-1.2)
$\Delta_{(t2-t1)}$ Human Development	- .32 (-0.4)	.34 (1.2)
$\Delta_{(t2-t1)}$ Global Linkages	.55 (1.5)	- .08 (-0.6)
Adjusted R^2	.57	.51
N	48	48

Notes: Entries are unstandardized regression coefficients with T-values in parentheses. Estimates are calculated with the "sureg"-procedure in STATA, conducting a 'seemingly unrelated regression' for the two models. Δ-variables measure change from the earliest survey at time t_1 to the latest survey at time t_2. For each society, time t_1 is measured 10 to 25 years before time t_2. Since each society appears only once in this dataset, no test for serial correlations is necessary.

In each model, regression diagnostics for heteroskedasticity (White Test), multicollinearity (variance inflation factors), and influential cases (DFFITs) reveal no violation of OLS-assumptions.

Significance levels: $^{n.s.}$ $p \geq .100$, * $p < .100$, ** $p < .050$, *** $p < .005$.

Interpretation: Replacing economic development with human development, the long-term reciprocity pattern between values and rights established in Table 9.1 is confirmed: the more strongly positive and more significant effect in the relationship between values and rights runs from change in values to change in rights. On a side note, human development is a weaker contributor to both citizen rights improvements and rising emancipative values than is economic development. Note that human development is measured by using the United Nation Development Program's Human Development Index.

Appendix-Table 9.6: Alternating Model Pair 1-2/2-2 of Table 9.1 by Including the Temporal Length of the Delta-Variables as a Predictor

	DEPENDENT VARIABLES:	
PREDICTORS:	Citizen Rights at time t_2	Emancipative Values at time t_2
Constant	.37 (2.6)**	.02 (0.2)
Dependent Variable (DV) at time t_1	.45 (3.6)***	.98 (7.4)***
$\Delta_{(t2-t1)}$ Emancipative Values	1 .40 (2.2)**	
$\Delta_{(t2-t1)}$ Citizen Rights		.01 (0.4)
$\Delta_{(t2-t1)}$ Economic Development	.37 (0.6)	.40 (2.7)**
$\Delta_{(t2-t1)}$ Global Linkages	.67 (1.7)*	- .15 (-1.4)
Temporal Length of $\Delta_{(t2-t1)}$	- .29 (-1.3)	.13 (2.3)**
Adjusted R^2	.53	.74
N	48	48

Notes: Entries are unstandardized regression coefficients with T-values in parentheses. Estimates are calculated with the "sureg"-procedure in STATA, conducting a 'seemingly unrelated regression' for the two models. Δ-variables measure change from the earliest survey at time t_1 to the latest survey at time t_2. For each society, time t_1 is measured 10 to 25 years before time t_2. Since each society appears only once in this dataset, no test for serial correlations is necessary.

In each model, regression diagnostics for heteroskedasticity (White Test), multicollinearity (variance inflation factors), and influential cases (DFFITs) reveal no violation of OLS-assumptions.

Significance levels: $^{n.s.}$ $p \geq .100$, * $p < .100$, ** $p < .050$, *** $p < .005$.

Interpretation: Adding the varying temporal length of the delta-variables (variation is from ten to fifteen to twenty and twenty-five years), the long-term reciprocity pattern between values and rights established in Table 9.1 is confirmed: the more strongly positive and more significant effect in the relationship between values and rights runs from change in values to change in rights. On a side note, a longer temporal span of the change period does not add to citizen rights improvements under control of other change factors but it does contribute to emancipative values, which rise merely by the passage of time.

Appendix-Table 9.7: Alternating Model Pair 1-2/2-2 of Table 9.2 by Replacing Economic Development with Human Development

	DEPENDENT VARIABLES:	
PREDICTORS:	Citizen Rights at time t_2	Emancipative Values at time t_2
Constant	.15 (4.7)**	.00 (0.1)
Dependent Variable (DV) at time t_1	.78 (20.2)***	1 .10 (24.1)***
$\Delta_{(t2-t1)}$ Emancipative Values	1 .43 (4.9)***	
$\Delta_{(t2-t1)}$ Citizen Rights		.07 (2.9)***
$\Delta_{(t2-t1)}$ Human Development	-1.80 (-3.2)***	.61 (3.5)***
$\Delta_{(t2-t1)}$ Global Linkages	.46 (2.1)**	- .20 (3.0)***
Adjusted R^2	80	.82
Durbin Watson	1.70	1.70
N	131	131

Notes: Entries are unstandardized regression coefficients with T-values in parentheses. Estimates are calculated with the "sureg"-procedure in STATA, conducting a 'seemingly unrelated regression' for the two models. Δ-variables measure change from an earlier survey at time t_1 to a later survey at time t_2 (with time t_1 measured 5 to 10 years before time t_2). Observations are included in a time-series-cross-sectional dataset in which each society appears in repeated observations.

In each model, regression diagnostics for heteroskedasticity (White Test), multicollinearity (variance inflation factors), and influential cases (DFFITs) reveal no violation of OLS-assumptions.

Significance levels: $^{n.s.}$ $p \geq .100$, * $p < .100$, ** $p < .050$, *** $p < .005$.

Interpretation: Replacing economic development with human development, the short-term reciprocity pattern between values and rights established in Table 9.2 is confirmed: the more strongly positive and more significant effect in the relationship between values and rights runs from change in values to change in rights. On a side note, human development is a weaker contributor to both citizen rights improvements and rising emancipative values than is economic development. Note that human development is measured using the United Nations Development Program's Human Development Index.

Appendix-Table 9.8: Alternating Model Pair 1-2/2-2 of Table 9.3 by Including the Temporal Length of the Delta-Variables as a Predictor

	DEPENDENT VARIABLES:	
PREDICTORS:	Women's Rights at time t_2	Emancipative Values at time t_2
Constant	.37 (3.6)***	- .04 (-0.5)
Dependent Variable (DV) at time t_1	.43 (3.7)***	1 .02 (7.7)***
$\Delta_{(t2-t1)}$ Emancipative Values	1 .03 (3.0)***	
$\Delta_{(t2-t1)}$ Women's Rights		.09 (1.6)
$\Delta_{(t2-t1)}$ Economic Development	.45 (1.3)	.36 (2.4)**
$\Delta_{(t2-t1)}$ Global Linkages	- .01 (-0.1)	- .13 (-1.3)
Temporal Length of $\Delta_{(t2-t1)}$	- .13 (-0.9)	.12 (2.1)**
Adjusted R^2	.58	.75
N	46	46

Notes: Entries are unstandardized regression coefficients with T-values in parentheses. Estimates are calculated with the "sureg"-procedure in STATA, conducting a 'seemingly unrelated regression' for the two models. Δ-variables measure change from the earliest survey at time t_1 to the latest survey at time t_2. For each society, time t_1 is measured 10 to 25 years before time t_2. Since each society appears only once in this dataset, no test for serial correlations is necessary.

In each model, regression diagnostics for heteroskedasticity (White Test), multicollinearity (variance inflation factors), and influential cases (DFFITs) reveal no violation of OLS-assumptions.

Significance levels: $^{n.s.}$ $p \geq .100$, * $p < .100$, ** $p < .050$, *** $p < .005$.

Interpretation: Adding the varying temporal length of the delta-variables (variation is from ten to fifteen to twenty and twenty-five years), the long-term reciprocity pattern between values and rights established in Table 9.3 is confirmed: the more strongly positive and more significant effect in the relationship between emancipative values and women's rights runs from change in values on change in rights. On a side note, a longer temporal span of the change period does not add to women's rights improvement under control of other change factors but it does contribute to emancipative values, which rise merely by the passage of time.

Appendix-Table 9.9: Alternating Model Pair 1-2/2-2 of Table 9.3 by Replacing Economic Development with Gender Development

	DEPENDENT VARIABLES:	
PREDICTORS:	Women's Rights at time t_2	Emancipative Values at time t_2
Constant	.26 (3.5)***	- .07 (-0.9)
Dependent Variable (DV) at time t_1	.54 (5.3)***	1 .30 (8.0)***
$\Delta_{(t2-t1)}$ Emancipative Values	1 .50 (7.1)***	
$\Delta_{(t2-t1)}$ Women's Rights		.34 (5.1)***
$\Delta_{(t2-t1)}$ Gender Development	- .67 (-1.6)	.52 (2.0)**
$\Delta_{(t2-t1)}$ Global Linkages	- .05 (-0.2)	- .30 (0.9)
Adjusted R^2	.58	.56
N	46	46

Notes: Entries are unstandardized regression coefficients with T-values in parentheses. Estimates are calculated with the "sureg"-procedure in STATA, conducting a 'seemingly unrelated regression' for the two models. Δ-variables measure change from the earliest survey at time t_1 to the latest survey at time t_2. For each society, time t_1 is measured 10 to 25 years before time t_2. Since each society appears only once in this dataset, no test for serial correlations is necessary.

In each model, regression diagnostics for heteroskedasticity (White Test), multicollinearity (variance inflation factors), and influential cases (DFFITs) reveal no violation of OLS-assumptions.

Significance levels: $^{n.s.}$ $p \geq .100$, * $p < .100$, ** $p < .050$, *** $p < .005$.

Interpretation: Replacing economic development with gender development, the long-term reciprocity pattern between values and rights established in Table 9.3 is confirmed: the more strongly positive and more significant effect in the relationship between emancipative values and women's rights runs from change in values on change in rights. On a side note, economic development is a stronger contributor to improving women's rights and rising emancipative values than is gender development. Note that gender development is measured by using the United Nations Development Program's Gender Development Index.

Appendix-Table 9.10: Alternating Model Pair 1-2/2-2 of Table 9.4 by Replacing Economic Development with Gender Development

	DEPENDENT VARIABLES:	
PREDICTORS:	Women's Rights at time t_2	Emancipative Values at time t_2
Constant	.10 (3.2)***	.00 (0.0)
Dependent Variable (DV) at time t_1	.83 (18.1)***	1.05 (24.3)***
$\Delta_{(t2-t1)}$ Emancipative Values	.97 (5.6)***	
$\Delta_{(t2-t1)}$ Women's Rights		.19 (4.6)***
$\Delta_{(t2-t1)}$ Gender Development	- .15 (-0.4)	.44 (2.4)**
$\Delta_{(t2-t1)}$ Global Linkages	.10 (0.7)	- .17 (-2.6)**
Adjusted R^2	.75	.82
Durbin Watson	2.10	2.10
N	126	126

Notes: Entries are unstandardized regression coefficients with T-values in parentheses. Estimates are calculated with the "sureg"-procedure in STATA, conducting a 'seemingly unrelated regression' for the two models. Δ-variables measure change from an earlier survey at time t_1 to a later survey at time t_2 (with time t_1 measured 5 to 10 years before time t_2). Observations are included in a time-series-cross-sectional dataset in which each society appears in repeated observations. Durbin Watson coefficients are close to 2.0, indicating no serial correlation.

In each model, regression diagnostics for heteroskedasticity (White Test), multicollinearity (variance inflation factors), and influential cases (DFFITs) reveal no violation of OLS-assumptions.

Significance levels: $^{n.s.}$ p ≥ .100, * p < .100, ** p < .050, *** p < .005.

Interpretation: Replacing economic development with gender development, the short-term reciprocity pattern between values and rights established in Table 9.4 is confirmed: the more strongly positive and more significant effect in the relationship between emancipative values and women's rights runs from change in values on change in rights. On a side note, economic development is a stronger contributor to improving women's rights and rising emancipative values than is gender development. Note that gender development is measured by using the United Nations Development Program's Gender Development Index.

Appendix-Table 9.11: Alternating Model Pair 1-2/2-2 of Table 9.1 by Replacing Global Linkages with Social Movement Activity

	DEPENDENT VARIABLES:	
PREDICTORS:	Citizen Rights at time t_2	Emancipative Values at time t_2
Constant	.33 (5.3)***	.02 (0.5)
Dependent Variable (DV) at time t_1	.43 (4.0)***	1.00 (9.7)***
$\Delta_{(t2-t1)}$ Emancipative Values	1.80 (3.0)***	
$\Delta_{(t2-t1)}$ Citizen Rights		.05 (1.8)*
$\Delta_{(t2-t1)}$ Economic Development	.05 (0.1)	.41 (4.1)***
$\Delta_{(t2-t1)}$ Social Movement Activity	- .71 (-1.8)*	.35 (4.1)***
Adjusted R^2	.53	.80
N	48	48

Notes: Entries are unstandardized regression coefficients with T-values in parentheses. Estimates are calculated with the "sureg"-procedure in STATA, conducting a 'seemingly unrelated regression' for the two models. Δ-variables measure change from the earliest survey at time t_1 to the latest survey at time t_2. For each society, time t_1 is measured 10 to 25 years before time t_2. Since each society appears only once in this dataset, no test for serial correlations is necessary.

In each model, regression diagnostics for heteroskedasticity (White Test), multicollinearity (variance inflation factors), and influential cases (DFFITs) reveal no violation of OLS-assumptions.

Significance levels: $^{n.s.}$ $p \geq .100$, * $p < .100$, ** $p < .050$, *** $p < .005$.

Interpretation: Replacing global linkages with social movement activity, the long-term reciprocity pattern between values and rights established in Table 9.1 is confirmed: the more strongly positive and more significant effect in the relationship between emancipative values and women's rights runs from change in values on change in rights. Importantly, under control of rising emancipative values, the otherwise positive effect of increasing social movement activity on expanding women's rights loses significance and turns negative, whereas the effect of rising emancipative values remains significant and positive even controlling for increasing social movement activity. This means that social movement activity only contributes to women's rights when it is motivated by emancipative values but not when it is detached from them. Thus, what matters for rights improvements is not social movement activity in and by itself but social movement activity motivated by emancipative values. These values, in turn, do not exist in detachment from social movement activity: as Chpater 7 of *Freedom Rising* demonstrates, emancipative values almost always motivate social movement activity. As the right-hand model in Appendix-Table 9.11 shows, increasing social movement activity contributes to rising emancipative values, presumably by reinforcing these values through their active expression. But the reverse effect from emancipative values to social movement activity shown in Chapter 7 (Table 7.4) of *Freedom Rising* is considerably stronger (a *b*-coefficient of .72 compared to .35 here in an equally controlled model). For the measurement of social movement activity, see Appendix 7.

Appendix-Table 9.12: Alternating Model Pair 1-2/2-2 of Table 9.2 by Replacing Global Linkages with Social Movement Activity

	DEPENDENT VARIABLES:	
PREDICTORS:	Citizen Rights at time t_2	Emancipative Values at time t_2
Constant	.10 (4.3)***	.02 (1.4)
Dependent Variable (DV) at time t_1	.85 (21.1)***	.97 (23.8)***
$\Delta_{(t2-t1)}$ Emancipative Values	1 .11 (4.2)***	
$\Delta_{(t2-t1)}$ Citizen Rights		.10 (3.6)***
$\Delta_{(t2-t1)}$ Economic Development	- .29 (-0.8)	.32 (2.9)***
$\Delta_{(t2-t1)}$ Social Movement Activity	- .34 (-1.8)*	.28 (4.8)***
Adjusted R^2	.85	.86
Durbin Watson	1.70	1.70
N	122	122

Notes: Entries are unstandardized regression coefficients with T-values in parentheses. Estimates are calculated with the "sureg"-procedure in STATA, conducting a 'seemingly unrelated regression' for the two models. Δ-variables measure change from an earlier survey at time t_1 to a later survey at time t_2 (with time t_1 measured 5 to 10 years before time t_2). Observations are included in a time-series-cross-sectional dataset in which each society appears in repeated observations.

In each model, regression diagnostics for heteroskedasticity (White Test), multicollinearity (variance inflation factors), and influential cases (DFFITs) reveal no violation of OLS-assumptions.

Significance levels: $^{n.s.}$ $p \geq .100$, * $p < .100$, ** $p < .050$, *** $p < .005$.

Interpretation: Exactly the same conclusions as under Appendix-Table 9.11 also apply to the short-term reciprocity pattern between citizen rights and emancipative values: the stronger and more significant effect operates from values to rights rather than in the opposite direction.

Appendix-Table 9.13: Alternating Model Pair 1-2/2-2 of Table 9.3 by Replacing Global Linkages with Social Movement Activity

	DEPENDENT VARIABLES:	
PREDICTORS:	Women's Rights at time t_2	Emancipative Values at time t_2
Constant	.26 (4.2)***	- .00 (-0.1)
Dependent Variable (DV) at time t_1	.49 (4.7)***	1 .07 (9.9)***
$\Delta_{(t2-t1)}$ Emancipative Values	1 .40 (4.2)***	
$\Delta_{(t2-t1)}$ Women's Rights		.14 (3.0)***
$\Delta_{(t2-t1)}$ Economic Development	.11 (0.4)	.33 (3.1)**
$\Delta_{(t2-t1)}$ Social Movement Activity	- .24 (-1.0)	.30 (3.5)***
Adjusted R^2	.59	.80
N	45	45

Notes: Entries are unstandardized regression coefficients with T-values in parentheses. Estimates are calculated with the "sureg"-procedure in STATA, conducting a 'seemingly unrelated regression' for the two models. Δ-variables measure change from the earliest survey at time t_1 to the latest survey at time t_2. For each society, time t_1 is measured 10 to 25 years before time t_2. Since each society appears only once in this dataset, no test for serial correlations is necessary.

In each model, regression diagnostics for heteroskedasticity (White Test), multicollinearity (variance inflation factors), and influential cases (DFFITs) reveal no violation of OLS-assumptions.

Significance levels: $^{n.s.}$ $p \geq .100$, * $p < .100$, ** $p < .050$, *** $p < .005$.

Interpretation: Exactly the same conclusions as under Appendix-Table 9.11 also apply to the long-term reciprocity pattern between women's rights and emancipative values.

Appendix-Table 9.14: Alternating Model Pair 1-2/2-2 of Table 9.4 by Replacing Global Linkages with Social Movement Activity

	DEPENDENT VARIABLES:	
PREDICTORS:	Women's Rights at time t_2	Emancipative Values at time t_2
Constant	.11 (4.3)***	.03 (1.5)
Dependent Variable (DV) at time t_1	.80 (17.3)***	.97 (23.0)***
$\Delta_{(t2-t1)}$ Emancipative Values	.54 (2.8)**	
$\Delta_{(t2-t1)}$ Women's Rights		.08 (2.1)**
$\Delta_{(t2-t1)}$ Economic Development	.42 (1.8)*	.26 (2.3)**
$\Delta_{(t2-t1)}$ Social Movement Activity	.11 (0.8)	.25 (4.3)***
Adjusted R^2	.78	.86
Durbin Watson	2.10	2.10
N	118	118

Notes: Entries are unstandardized regression coefficients with T-values in parentheses. Estimates are calculated with the "sureg"-procedure in STATA, conducting a 'seemingly unrelated regression' for the two models. Δ-variables measure change from an earlier survey at time t_1 to a later survey at time t_2 (with time t_1 measured 5 to 10 years before time t_2). Observations are included in a time-series-cross-sectional dataset in which each society appears in repeated observations. Durbin Watson coefficients are close to 2.0, indicating no serial correlation.

In each model, regression diagnostics for heteroskedasticity (White Test), multicollinearity (variance inflation factors), and influential cases (DFFITs) reveal no violation of OLS-assumptions.

Significance levels: $^{n.s.}$ p ≥ .100, * p < .100, ** p < .050, *** p < .005.

Interpretation: Exactly the same conclusions as under Appendix-Table 9.11 also apply to the long-term reciprocity pattern between women's rights and emancipative values.

Appendix-Table 9.15: Alternating Model Pair 1-2/2-2 of Table 9.3 by Replacing Emancipative Values with Gender-egalitarian Values

	DEPENDENT VARIABLES:	
PREDICTORS:	Women's Rights at time t_2	Gender-egalitarian Values at time t_2
Constant	.33 (4.2)***	.35 (2.7)**
Dependent Variable (DV) at time t_1	.41 (3.6)***	.50 (2.3)**
$\Delta_{(t2-t1)}$ Gender-egalitarian Values	.38 (1.8)*	
$\Delta_{(t2-t1)}$ Women's Rights		.00 (0.0)
$\Delta_{(t2-t1)}$ Economic Development	.70 (3.1)***	.56 (3.5)***
$\Delta_{(t2-t1)}$ Global Linkages	- .12 (-0.6)	- .19 (-1.3)
Adjusted R^2	.58	.44
N	46	46

Notes: Entries are unstandardized regression coefficients with T-values in parentheses. Estimates are calculated with the "sureg"-procedure in STATA, conducting a 'seemingly unrelated regression' for the two models. Δ-variables measure change from the earliest survey at time t_1 to the latest survey at time t_2. For each society, time t_1 is measured 10 to 25 years before time t_2. Since each society appears only once in this dataset, no test for serial correlations is necessary.

In each model, regression diagnostics for heteroskedasticity (White Test), multicollinearity (variance inflation factors), and influential cases (DFFITs) reveal no violation of OLS-assumptions.

Significance levels: $^{n.s.}$ $p \geq .100$, * $p < .100$, ** $p < .050$, *** $p < .005$.

Interpretation: Replacing emancipative values with one of their more narrow components, gender-egalitarian values,, the long-term reciprocity pattern between values and rights established in Table 9.3 is confirmed: the more strongly positive and more significant effect in the relationship between values and women's rights runs from change in values on change in rights. However, gender-egalitarian values are a weaker predictor of women's rights than the broader set of emancipative values. This shows that gender-egalitarian values are more effective in combination with other emancipative values than they are merely by themselves. By the way, the determination of women's rights does not vary depending on whether we measure only the values of women, men or those of both sexes. Gender-egalitarian values are measured by the equality sub-index of emancipative values documented in Appendix 2.

Appendix-Table 9.16: Alternating Model Pair 1-2/2-2 of Table 9.4 by Replacing Emancipative Values with Gender-egalitarian Values

	DEPENDENT VARIABLES:	
PREDICTORS:	Women's Rights at time t_2	Gender-egalitarian Values at time t_2
Constant	.11 (3.6)***	.07 (1.7)*
Dependent Variable (DV) at time t_1	.80 (16.8)***	.92 (13.4)***
$\Delta_{(t2-t1)}$ Gender-egalitarian Values	.33 (2.9)***	
$\Delta_{(t2-t1)}$ Women's Rights		.12 (1.8)*
$\Delta_{(t2-t1)}$ Economic Development	.59 (2.6)**	.43 (2.4)**
$\Delta_{(t2-t1)}$ Global Linkages	.02 (0.2)	- .07 (-0.6)
Adjusted R^2	.78	.68
Durbin Watson	2.00	2.00
N	119	119

Notes: Entries are unstandardized regression coefficients with T-values in parentheses. Estimates are calculated with the "sureg"-procedure in STATA, conducting a 'seemingly unrelated regression' for the two models. Δ-variables measure change from an earlier survey at time t_1 to a later survey at time t_2 (with time t_1 measured 5 to 10 years before time t_2). Observations are included in a time-series-cross-sectional dataset in which each society appears in repeated observations. Durbin Watson coefficients are close to 2.0, indicating no serial correlation.

In each model, regression diagnostics for heteroskedasticity (White Test), multicollinearity (variance inflation factors), and influential cases (DFFITs) reveal no violation of OLS-assumptions.

Significance levels: $^{n.s.}$ $p \geq .100$, * $p < .100$, ** $p < .050$, *** $p < .005$.

Interpretation: Exactly the same conclusions as under Appendix-Table 9.15 also apply to the short-term reciprocity pattern between women's rights and gender-egalitarian values.

Appendix-Table 9.17: Explaining Contemporary LGBT-Rights

	DEPENDENT VARIABLE:	
PREDICTORS:	LGBT-Rights in about 2010	
Constant	.15 (0.8)	.32 (1.5)
Level of Emancipative Values, earliest time	.73 (1.7)*	.15 (0.2)
Change in Emancipative Values, earliest to latest time	2 .10 (5.7)***	1 .08 (3.1)***
Level of Economic Development, earliest time		.60 (1.4)
Change in Economic Development, earliest to latest time		- .03 (-0.1)
Adjusted R^2	.44	.44
N	48	48

Notes: Entries are unstandardized regression coefficients with T-values in parentheses.

In both models, regression diagnostics for heteroskedasticity (White Test), multicollinearity (variance inflation factors), and influential cases (DFFITs) reveal no violation of OLS-assumptions.

Significance levels: $^{n.s.}$ p ≥ .100, * p < .100, ** p < .050, *** p < .005.

Interpretation: The left-hand model in the above table shows the regression results for the scattergram in Figure 9.6 in Chapter 9 of *Freedom Rising*. Controlling this result for the level and change in economic development, change in emancipative values retains a strongly positive and the only significant effect on LGBT-rights. The same pattern is obtained when we control for the level and change of global linkages, exogenous contagion, and social movement activity.

Durbin-Wu-Hausman Test of Value Change's Potential Endogeneity

The Durbin-Wu-Hausman test (augmented regression test) is a version of two-stage-least-squares regression in order to check whether an endogenous variable in a system of simultaneous equations produces inconsistent estimates in ordinary least squares regression. If this is the case, the respective variable should be replaced by instrumental variables. If this is not the case, the variable can be used. To do so, Davidson and MacKinnon (1993) suggest an augmented regression test (DWH test), which is performed by including the residuals of each endogenous right-hand side variable, as a function of all exogenous variables, in a regression of the original model.

In my analyses, I find that change in values from time t_1 to time t_2 is a function of exogenous changes in economic development, global linkages, and contagion over the same period of time, while rights at time t_2 shift away from their t_1-level as a function of value change. In this setting, value change is potentially endogenous to the shift in rights and the question is whether this produces inconsistent OLS-estimates for the effect of value change. To check this, I perform a two-stage-least squares regression: in the first stage, I regress value change on the exogenous changes in economic development, global linkages and contagion and save the residual scores for value change; in the second stage, I model change in rights as a function of the observed scores in value change and the residual scores from the first regression. If the coefficient for the residual scores is significant, then OLS estimates for the observed value change scores are inconsistent and instrumental variables must be used.

The following tables show that this is not what I find: the coefficients for the residual value change scores are entirely insignificant. Hence, my finding that, in the reciprocal

relationship between values and rights the stronger effect runs from values to rights, is not inflicted by endogeneity problems.

Appendix-Table 9.18a: First Stage of DWH-Test for Endogeneity of Value Change to Citizen Rights

	DEPENDENT VARIABLE:	
PREDICTORS:	$\Delta_{(t2-t1)}$ Emancipative Values	
Constant	.00	(0.6)
$\Delta_{(t2-t1)}$ Economic Development	.55	(5.1)***
$\Delta_{(t2-t1)}$ Global Linkages	- .01	(-1.3)
Exogenous Change in DV ($\Delta_{(t2-t1)}$)	.26	(1.5)
Adjusted R^2	.48	
N	49	

Notes: *Notes*: Entries are unstandardized regression coefficients with T-values in parentheses.

Significance levels: n.s. $p \geq .100$, * $p < .100$, ** $p < .050$, *** $p < .005$

Appendix-Table 9.18b: Second Stage of DWH-Test for Endogeneity of Value Change to Citizen Rights

	DEPENDENT VARIABLE:	
PREDICTORS:	Citizen Rights at time t_2	
Constant	.39	(7.0)***
Citizen Rights at time t_1	.37	(3.0)**
$\Delta_{(t2-t1)}$ Emancipative Values, observed	1 .40	(1.8)*
$\Delta_{(t2-t1)}$ Emancipative Values, residuals	- .37	(-0.4)
Adjusted R^2	.51	
N	48	

Notes: *Notes*: Entries are unstandardized regression coefficients with T-values in parentheses.

Significance levels: n.s. $p \geq .100$, * $p < .100$, ** $p < .050$, *** $p < .005$

Appendix-Table 9-19a: First Stage of DWH-Test for Endogeneity of Value Change to Women's Rights

	DEPENDENT VARIABLE:
PREDICTORS:	$\Delta_{(t2-t1)}$ Emancipative Values
Constant	.00 (0.6)
$\Delta_{(t2-t1)}$ Economic Development	.55 (5.1)***
$\Delta_{(t2-t1)}$ Global Linkages	- .01 (-1.3)
Exogenous Change in DV ($\Delta_{(t2-t1)}$)	.26 (1.5)
Adjusted R^2	.48
N	49

Notes: *Notes*: Entries are unstandardized regression coefficients with T-values in parentheses.

Significance levels: $^{n.s.}$ p ≥ .100, * p < .100, ** p < .050, *** p < .005

Appendix-Table 9-19b: Second Stage of DWH-Test for Endogeneity of Value Change to Women's Rights

	DEPENDENT VARIABLE:
PREDICTORS:	Women's Rights at time t_2
Constant	.31 (5.1)***
Women's Rights at time t_1	.42 (3.7)***
$\Delta_{(t2-t1)}$ Emancipative Values, observed	1 .40 (4.1)***
$\Delta_{(t2-t1)}$ Emancipative Values, residuals	- .59 (-1.3)
Adjusted R^2	.60
N	46

Notes: *Notes*: Entries are unstandardized regression coefficients with T-values in parentheses.

Significance levels: $^{n.s.}$ p ≥ .100, * p < .100, ** p < .050, *** p < .005

Estimating Emancipative Values in 1975

Because value change is a roughly predictable process, it is possible to estimate values at an earlier point in time for which one has no real observation from values at a later point where one has a real observation. Thus, I use emancipative values from the earliest observation to estimate emancipative values in 1975. To do so, I use three patterns of predictability in values, which characterize the relationship between emancipative values at the latest and earliest observed point in time. The three patterns of predictability are the following (see also *Appendix-Table 9.20* below):

(1) Regressing emancipative values at the earliest observation point on emancipative values at the latest point (and on the two additional variables below), values at the latest point 'explain' 32 percent of their variation at the earliest point (this is the partial explained variance). The partial regression coefficient for emancipative values at the latest point is significant and positive ($b_{partial}$ = .43), showing that higher

emancipative values at the latest observation point indicate higher emancipative values at the earliest observation point. This component of the estimation reflects the path dependency and inertia of emancipative values.

(2) The time distance of the latest to the earliest observation point 'explains' 16 percent of the variation in emancipative values at the earliest point (partial explained variation). The coefficient is significant and negative ($b_{partial}$ = -.10), indicating that emancipative values at the earliest observation are lower, the farther this earliest observation lies in the past. This component of the estimation reflects the fact that levels of emancipative values accumulate the more, the more time has passed.

(3) The age differentiation[44] in emancipative values at the later point 'explains' 9 percent of the variation in emancipative values at the earlier point. The partial regression coefficient is significant and positive ($b_{partial}$ = .17). This component of the estimation reflects the fact that, the longer value change continues, the stronger an age-differentiation it produces. Hence, a larger age differentiation in emancipative values indicates a farther-back reaching change in these values, which in turn means a higher-than-otherwise level of emancipative values already at earlier times.

In total, the backward-estimation explains 59 percent of the variation in emancipative values at an earlier point in time. This means that when we estimate emancipative values at an earlier point in time from these values at a later point, the point estimates will on average correspond to sixty percent with the true scores. This is shown in *Appendix-Table 9.20*.

Appendix-Table 9.20: Backward-Estimation of Emancipative Values

	DEPENDENT VARIABLE:	
PREDICTORS:	Emancipative Values at Earliest Time	
Constant	.24	(8.7)***
Emancipative Values at Latest Time	.43	(5.8)***
Temporal Distance from Earliest to Latest Time	- .10	(-2.9)**
Age-Differentiation in Emancipative Values	.17	(2.0)*
Adjusted R^2	.59	
N	44	

Notes: Entries are unstandardized regression coefficients with T-values in parentheses.

Regression diagnostics for heteroskedasticity (White Test), multicollinearity (variance inflation factors), and influential cases (DFFITs) reveal no violation of OLS-assumptions.

Significance levels: $^{n.s.}$ p ≥ .100, * p < .100, ** p < .050, *** p < .005.

[44] The age differentiation is measured for each society as the magnitude of the regression coefficient when emancipative values are regressed on a 0-to-1.0 normalized score for the respondents' age (a score of 0 being equivalent to an age of 18 years and a score of 1.0 to an age of 100 years).

Assuming that the estimation pattern in *Appendix-Table 9.20* is temporally generalizable at least for some time into the past[45], one can estimate emancipative values at a time before the first real WVS-observation. For instance, we can estimate emancipative values in 1975 by applying the regression formula in *Appendix-Table 9.20* to emancipative values at the earliest real observation, this observation's temporal distance to 1975 and the age-differentiation in emancipative values at this earliest observation as regressors. Thus, we estimate:

Emancipative Values in 1975 = .43 * Emancipative Values at Earliest Observation
+ .10 * Distance of 1975 to Earliest Observation
+ .17 * Age Differentiation in Emancipative Values
+ .24

The distance of 1975 to the earliest observation is standardized between minimum 0 (i.e., a distance of six years if the first observation is in the first round of the WVS in 1981) and maximum 1.0 (i.e., a distance of twenty years if the first observation is in the third round of the WVS in 1995). No first observation is later than 1995 because my sample only covers societies whose longitudinal evidence reaches at least ten years back from the last round of the WVS (which was in 2005).

Adjusted Citizen Rights in 1975

The citizen rights index for 1975 is only based on Freedom House (FH) civil and political rights (see *Appendix 8*). The reason is that the Cingranelli/Richards (CIRI) measure is not available for this time. Because the FH measure alone is more optimistic than when it is combined with the CIRI measure, I adjust the FH measure downwards, using the regression formula that characterizes the FH-CIRI relationship for time periods over which both are available:

Human Rights = .95 * FH Civil/Political Rights - .15

ZZZ

[45] Analyses of Eurobarometer data by Inglehart and Abramson (1999) indicate that the temporal predictability pattern of postmaterialist values can be generalized backward to the early 1970s. Postmaterialist values are identical with the voice-index in our concept and, thus, cover one of the four key components of emancipative values. This suggests that the temporal generalizability also applies to emancipative values. Our target estimation point in time, the year 1975, lies well within the evidenced period of generalizability.

APPENDIX 10 (Ref. CHAPTER 10)

Data for Chapter 10 in *Freedom Rising* are available for download in the files "Table10.2IL.sav" (individual-level data) and "Table10.2SL.sav (societal-level data) at www.cambridge.org/welzel. ZZZ

Liberalness in Notions of Democracy

With feedback from Yilmaz Esmer and Franziska Deutsch, I have designed a battery of questions to capture people's notion of democracy as well as a question to tap people's desire for democracy and their rating of democracy in their country. In the master questionnaire for WVS-round five (in which these questions have been fielded for the first time), the question on people's notion of democracy reads as follows:

(*Show Card T*)
Many things may be desirable, but not all of them are essential characteristics of democracy. Please tell me for each of the following things how essential you think it is as a characteristic of democracy. Use this scale where 1 means "not at all an essential characteristic of democracy" and 10 means it definitely is "an essential characteristic of democracy" (*read out and code one answer for each*):

		Not an essential characteristic of democracy									An essential characteristic of democracy
V152.	Governments tax the rich and subsidize the poor.	1	2	3	4	5	6	7	8	9	10
V153.	Religious authorities interpret the laws.	1	2	3	4	5	6	7	8	9	10
V154.	People choose their leaders in free elections.	1	2	3	4	5	6	7	8	9	10
V155.	People receive state aid for unemployment.	1	2	3	4	5	6	7	8	9	10
V156.	The army takes over when government is incompetent.	1	2	3	4	5	6	7	8	9	10
V157.	Civil rights protect people's liberty against oppression.	1	2	3	4	5	6	7	8	9	10
V158.	The economy is prospering.	1	2	3	4	5	6	7	8	9	10
V159.	Criminals are severely punished.	1	2	3	4	5	6	7	8	9	10
V160.	People can change the laws in referendums.	1	2	3	4	5	6	7	8	9	10
V161.	Women have the same rights as men.	1	2	3	4	5	6	7	8	9	10

I recode scores on each of these items into a scale range from minimum 0 to maximum 1.0, with various fractions for intermediate positions. On this basis, the liberal notion of democracy (without further qualification) is the average over the items V154, V157, V160 and V161. The *unequivocally* liberal notion is calculated as the average over the same four items and the inverse of items V153, V156, V158 and V159.[46] Scores below .50 indicate that people define democracy more in non-liberal than liberal terms; scores above .50 indicate the opposite. To measure the prevalence of liberal and unequivocally liberal notions of democracy, I calculate for each society the population average on these two indices. National distributions always show a mean-clustered and single-peaked shape.

[46] SPSS syntax: Compute dem_elections = (v154 - 1) / (10 - 1). Compute dem_civlib = (v157 - 1) / (10 - 1). Compute dem_gendeq = (v161 - 1) / (10 - 1). Compute dem_referend = (v160 - 1) / (10 - 1). Compute dem_army = (v156 - 1) / (10 - 1). Compute dem_relig = (v153 - 1) / (10 - 1). Compute dem_crimepun = (v159 - 1) / (10 - 1). Compute dem_ecoprosp = (v158 - 1) / (10 - 1). Compute LibDef1 = (dem_elections + dem_civlib + dem_gendeq + dem_ referend) / 4. Compute AltDef = (dem_army + dem_relig + dem_crimepun + dem_ecoprosp) / 4. Compute LibDef = (LibDef1 + (1 – AltDef)) / 2.

Strength of Desires for Democracy

The question to measure the strength of a respondent's desire for democracy reads as follows:

V162. How important is it for you to live in a country that is governed democratically? On this scale where 1 means it is "not at all important" and 10 means "absolutely important" what position would you choose? (*Code one number*):

Not at all important									Absolutely important
1	2	3	4	5	6	7	8	9	10

I recode response scores into a scale range from minimum 0 to maximum 1.0, with various fractions for intermediate positions.[47] This measures the desire for democracy, without further qualification. To measure the prevalence of desires for democracy, I calculate for each society the population average on this index. National distributions always show a mean-clustered and single-peaked shape.

Criticalness in Ratings of Democracy

The question to measure how people rate the quality of democracy in their country reads as follows:

V163. And how democratically is this country being governed today? Again using a scale from 1 to 10, where 1 means that it is "not at all democratic" and 10 means that it is "completely democratic," what position would you choose? (*Code one number*):

Not at all democratic									Completely democratic
1	2	3	4	5	6	7	8	9	10

I recode response scores into a scale range from minimum 0 to maximum 1.0, with various fractions for intermediate positions. To calculate how critical a respondent rates democracy, the 0-to-1 rating scores are subtracted from a country's citizen rights index, which is measured in the same 0-to-1 score range and averaged over the five years before and at the time of the survey, with a 20 percent deflator for each additional year backward from the survey. The resulting difference index is again standardized into a scale range from 0 to 1.0.[48] Scores below .50 indicate that people rate their country's democracy better than it is; scores above .50 indicate the opposite. To measure the prevalence of critical ratings of democracy, I calculate for each society the population average on this index. National distributions always show a mean-clustered and single-peaked shape.

Liberal Desires for Democracy

The liberal desire for democracy measures the desire for democracy *on the condition* that is tied to an unequivocally liberal notion of democracy, discounting the desire strength for deficiencies in the liberal notion of democracy. Technically speaking, I calculate the liberal

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47 SPSS syntax: Compute DemDes = (v163 – 1) / (10 – 1).

48 Assuming that "CitRig05" is a country's score on the 0-to-1 citizen rights index in 2005 (see Appendix 8 for a detailed description), the SPSS syntax to create the index for the criticalness of people's democracy rating reads as follows: Compute RatDem = (v163 - 1) / (10 - 1). Compute CriRat1 = CitRig05 - RateDem. Compute CriRat = (CriRat1 - - 1) / (1 - - 1).

desire for democracy by multiplying the desire for democracy with the (unequivocal) liberalness in the notion of democracy.[49] Since both factors of this product term are measured in 0-to-1 scales, this is equivalent to downweighting the strength of the desire for democracy for lack of an unequivocally liberal notion of democracy. Hence, the liberal desire for democracy is a conditional index, not a latent variable. To measure the prevalence of liberal desires for democracy, I calculate for each society the population average on this index. National distributions always show a mean-clustered and single-peaked shape.

Critical-liberal Desires for Democracy

The critical-liberal desire for democracy measures the desire for democracy *on the double condition* that is tied to an unequivocally liberal notion of democracy and to a critical rating of democracy, discounting the desire strength for deficiencies in the liberal notion of democracy as well as deficiencies in the critical rating of democracy. Technically speaking, I calculate the liberal desire for democracy by multiplying the desire for democracy with (a) the (unequivocal) liberalness in the notion of democracy as well as (b) the criticalness in the rating of democracy. Since all three factors of this product term are measured in 0-to-1 scales, this is equivalent to downweighting the strength of the desire for democracy for both lack of an unequivocally liberal notion of democracy and lack of a critical rating of democracy.[50] Hence, the critical-liberal desire for democracy is a conditional index, not a latent variable. To measure the prevalence critical-liberal desires for democracy, I calculate for each society the population average on this index.

(Seemingly) Deficient Democracy in Figure 10.6 of Freedom Rising

This societal-level variable is used for the vertical axis in Figure 10.6 of Chapter 10 of *Freedom Rising*. It measures the degree to which a society's actual level of democracy in about 2005 falls short of the aggregate strength of people's (unqualified) desire for democracy, subtracting the democracy-level score from the aggregate desire score. Since both measures appear in a score range from 0 to 1.0, the resulting scores of their difference range from -1.0 (for the case that the democracy-level score is at maximum 1.0 and the aggregate desire score at minimum 0) to +1.0 (for the case that the democracy-level score is at minimum 0 and the aggregate desire score at maximum 1.0). The more the scores approximate +1.0, the more does a society's actual level of democracy fall short of what people's (unqualified) desires seem to suggest where they want the level to be. As a measure of the actual level of democracy, I use the citizen rights index documented in Appendix 8.

Degree of Absence of Critical-liberal Orientations in Figure 10.6 of Freedom Rising

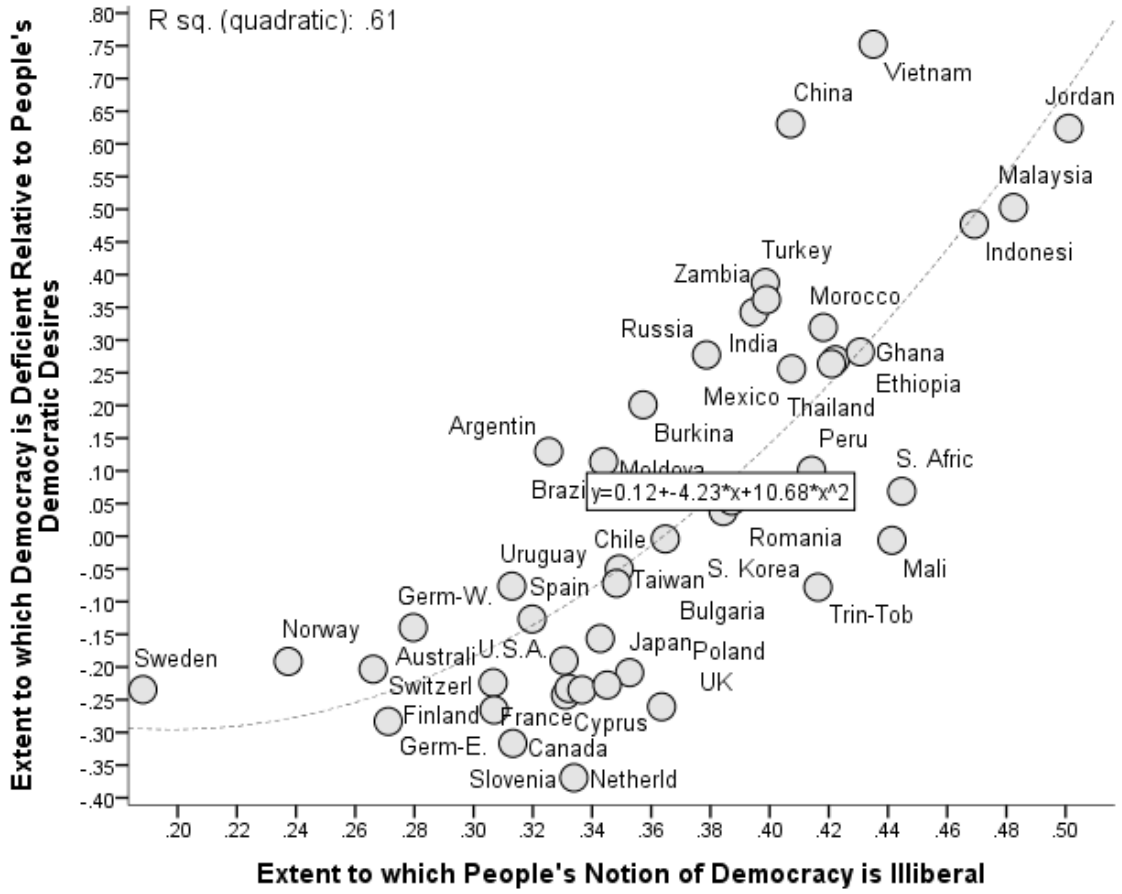
ERRATUM: The horizontal axis in Figure 10.6 of Chapter 10 of *Freedom Rising* is based on a variable that measures the inverse of a respondent's critical-liberal orientations (1 minus the score in a respondent's critical-liberal orientation). The inverted scores, which range from 0

[49] Compute LibDes = LibDef * DemDes.

[50] SPSS syntax: Compute CriLibDes = CriRat * LibDef * DemDes.

to 1, are averaged across the respondents of each national population to obtain an estimate of the deficiency of critical-liberal orientations throughout a society. However, the inverse of critical ratings already defines the vertical axis in Figure 10.6. Hence, the relationship shown in Figure 10.6 is semi-tautological. What I shoud have shown on the horizontal axis is the extent to which national populations lack an unequivocally liberal understanding of democracy by calculating the inverse of unequivocally liberal understandings for democracy for each respondent and then calculating the national population averages on this deficit index. Doing so, we obtain the relationship shown in Appendix-Figure 10.1 below. The interpretation remains substantively the same, however: wherever a regime's actual level of democracy falls short of what people seem to desire, these desires lack an unequivocally liberal understanding of democracy. In other words, elties can afford to prevent democracy to the extent that people's desire for democracy lacks focus on democracy's defining freedoms.

Appendix-Figure 10.1: Democratic Deficits and Illiberal Notions of Democracy



APPENDIX 11 (Ref. CHAPTER 11)

Data used in the analyses for Chapter 11 of Freedom Rising are available for download in the files "Figure11.4xls" and "Table11.1&11.2.xls" at www.cambridge.org/welzel.

The Cool-Water Index (CWI)

To capture the developmentally relevant features of a society's natural environment, I use data based on the Köppen-Geiger climate zone classification published by Gallup, Mellinger and Sachs (2010) in the Harvard Geography Datasets. The same classification is applied in two ways: (1) fraction of the inhabitable area of a society located in each climate zone; (2) fraction of a society's population located in each climate zone. Since the first version is a more purely natural measure, it is more certainly prior to developmental factors with a direct human cause.

There has been climate change in the past but on the time scale of human history, these changes have been much slower than the transformations of human societies. This justifies two important conclusions as concerns the climate data. First, for most of the time scope of my analyses, climate zone locations can be considered as rather invariant (especially as concerns the first, purely territorial, version of the climate zone measures). Second, climate zone characteristics are first causes in the sense that they are prior to any human cause. Hence, any correlation pattern we find between climatic characteristics and societal characteristics must be interpreted as an effect of nature on society rather than the other way round.

Based on the correlation pattern shown in Appendix-Table 11.1 below, I create impact-weighted summary indices for climate zones, as specified in Appendix-Table 11.2. This is done to summarize climatic features in ways that reflect their relative technological impact.

Appendix-Table11.1: Correlation of the Human Empowerment Components with Köppen-Geiger Climate Zones

	Technol. Advancement		Emancipative Values		Civic Entitlements	
CLIMATE ZONES:	A	B	A	B	A	B
Tropical: Rainforest[1)]	- .16*	- .18**	- .13	- .14	- .09	- .11
Tropical: Monsoon[2)]	- .04	- .08	- .10	- .03	- .00	- .00
Tropical: Savannah[3)]	- .45***	- .45***	- .26**	- .26**	- .26***	- .25***
Arid: Desert[4)]	- .13	- .12	- .37***	- .34***	- .37***	- .34***
Arid: Steppe[5)]	- .27***	- .28***	- .31***	- .41***	- .13	- .20**
Temperate: Dry Summer[6)]	.15*	.13	.01	.05	.16**	.08
Temperate: Dry Winter[7)]	- .27**	- .26***	- .16	- .19*	- .16*	- .17**
Temperate: No Dry Season[8)]	.58***	.61***	.61***	.63***	.62***	.64***
Cold: Dry Season[9)]	.09	.09	- .07	- .03	- .12	- .08
Cold: No Dry Season[10)]	.36***	.36***	.18*	.20*	.25***	.24***
Polar[11)]	.27***	.13	.36***	.18	.23**	.16
N (societies)	134		89		151	

Notes: A - Measure relates to fraction of a society's inhabitable **territory** in respective climate zone.
B - Measure relates to fraction of a society's **population** in respective climate zone.

1) Zone '**Af**'
2) Zone '**Am**'
3) Zone '**Aw**'
4) Zone '**Bw**'
5) Zone '**Bs**'
6) Zone '**Cs**'
7) Zone '**Cw**'
8) Zone '**Cf**'
9) Zone '**Dw**'
10) Zone '**Df**'
11) Zone '**E**' in the Köppen-Geiger classification.

For the criteria of the Köppen-Geiger classification, see Peel, Finlayson and McMahon (2007: 1636).

Technological Advancment, Emancipative Values, and Civic Entitlements are measured as described in Appendix I, Appendix 2 and Appendix 8.

Significance Levels (two-tailed): † $p \geq .100$, * $p < .100$, ** $p < .050$, *** $p < .005$.

Appendix-Table 11.2: Correlation of the Human Empowerment Components with Climate Zone Summaries

	Technol. Advancement		Emancipative Values		Civic Entitlements	
CLIMATE ZONES:	A	B	A	B	A	B
Rainy & Cool (RC)[1)]	.69***	.72***	.66***	.69***	.68***	.67***
Dry & Hot (DH)[2)]	- .60***	- .63***	- .39***	- .45***	- .35***	- .38***
Rainy & Cool vs. Dry & Hot[3)]	.75***	.77***	.64***	.68***	.62***	.64***
N (societies)	134		89		151	

Notes: A - Measure relates to fraction of a society's inhabitable **territory** in respective climate zone.
B - Measure relates to fraction of a society's **population** in respective climate zone.

Letter-abbreviations for climate zones in the formula below refer to the notes 1) to 11) in the footer of Appendix-Table 11.1. Zones are combined in an impact-weighted manner: impact factors represent the partial effects of the combined zones (partial *r*) obtained from regressing technological advancement on these zones. Sum is divided by the sum of impact weights to keep index scores (fractions) in a 0-to-1.0 range.

1) Index of *rainy/cool climates*: RC = (**cf**_zone * 0.53 + **df**_zone * 0.40) / 0.93.
2) Index of *dry/hot climates*: DH = (**aw**_zone * 0.35 + **bs**_zone * 0.26 + **cw**_zone * 0.28) / 0.89.
3) Index of *rainy/cool-vs.-dry/hot climates*: RC_DH = (RC + (1 – DH)) / 2.

For the criteria of the Köppen-Geiger classification, see Peel, Finlayson and McMahon (2007: 1636).

Technological Advancement, Emancipative Values, and Civic Entitlements are measured as described in Appendix I, Appendix 2 and Appendix 8.

Significance Levels (two-tailed): † $p \geq 0.100$, * $p < 0.100$, ** $p < 0.050$, *** $p < 0.005$.

The 'cool-water' condition (CW-condition) is supposed to measure water autonomy: equal and easy access to fresh, clean and safe water resources to the individuals on the territory of a given society. The index of rainy/cool-vs.-dry/hot climates introduced in Appendix-Table 11.2 already depicts a considerable proportion of this condition. Yet, variation on the rainy/cool-vs.-dry/hot index does by no means capture all variation in continuous rainfall and proximity of ice-free waterways. Taking from Parker (2000) the monthly minimum rainfall (average across a society's whole territory in a year's driest month), measured as a fraction of the maximum, and from Gallup, Mellinger and Sachs (2010), the fraction of a society's territory in less than a hundred kilometres distance from ice-free waterways, whether rivers or oceans, the rainy/cool-vs.-dry/hot index correlates with minimum rainfall at $r = .45$ ($N = 158$; $p < .001$, two-tailed) and at $r = .35$ ($N = 159$, $p < .001$, two-tailed) with waterway proximity. As expected, these correlations are positive and highly significant but from their strength we can calculate that about eighty percent of the variation in minimum rainfall and eighty-eight percent of the variation in waterway proximity is uncovered by the rainy/cool-vs.-dry/hot index. To measure water autonomy in an encompassing and fine-grained, this uncovered variation should be tapped by the index. Hence, we need to incorporate it.

To do so, I weight the rainy/cool-vs.-dry/hot territorial fraction measure ('rc-vs.-dh'), the minimum rainfall measure, and the waterway proximity measure for their simultaneous partial impact on technological advancement and recombine the impact-weighed measures additively. This is done after transforming each of the three variables into an index with minimum 0 and maximum 1.0:

CW-Index = (.69 * rc-vs.-dh + .40 * waterway proximity + .26 * minimum rainfall) / 1.35.

This procedure differentiates the three components for their relative importance and weights them for their separate contribution to technological advancement. Impact factors are obtained by regressing technological advancement simultaneously on the three components,

using the partial regression coefficients. The resulting CW-Index is available for 172 countries.

Appendix-Table 11.3: Data for the CW-Condition and Its Components

COUNTRY	Fraction of inhabited territory with cool/rainy conditions in excess of fraction in hot/dry conditions	Fraction of territory in 100 km reach of ice-free waterways	Index of minimum rainfall in driest month	Cool-Water (CW) Index
Afghanistan	0.38	0.00	0.00	0.19
Albania	0.43	0.80	0.16	0.49
Algeria	0.37	0.68	0.00	0.39
Andorra	1.00	0.90	0.17	0.81
Angola	0.11	0.24	0.00	0.13
Argentina	0.73	0.32	0.28	0.52
Armenia	0.43	0.00	0.04	0.23
Australia	0.87	0.83	0.20	0.73
Austria	0.95	0.71	0.19	0.73
Azerbaijan	0.31	0.00	0.04	0.17
Bahrain	0.43	1.00	0.00	0.52
Bangladesh	0.06	0.98	0.01	0.32
Belarus	0.88	0.90	0.18	0.75
Belgium	1.02	0.99	0.26	0.87
Belize	0.27	1.00	0.28	0.49
Benin	0.06	0.51	0.06	0.19
Bhutan	0.15	0.45	0.01	0.22
Bolivia	0.33	0.02	0.04	0.18
Bosnia	0.57	0.82	0.16	0.57
Botswana	0.14	0.00	0.00	0.07
Brazil	0.29	0.37	0.20	0.30
Brunei	0.43	1.00	0.65	0.64
Bulgaria	0.98	0.60	0.14	0.70
Burkina Faso	0.13	0.00	0.00	0.07
Burma	0.24	0.33	0.01	0.22
Burundi	0.08	0.00	0.02	0.05
Cambodia	0.18	0.67	0.03	0.29
Cameroon	0.24	0.15	0.11	0.19
Canada	0.82	0.68	0.28	0.68
CAR	0.04	0.00	0.02	0.02
Cabo Verde	0.03	1.00	0.00	0.31
Chad	0.20	0.00	0.00	0.10
Chile	0.42	0.41	0.01	0.34
China	0.48	0.45	0.01	0.38
Colombia	0.26	0.25	0.25	0.26
Congo	0.08	0.18	0.00	0.09
Costa Rica	0.09	1.00	0.02	0.34
Cote Divoire	0.04	0.37	0.20	0.17
Croatia	0.84	1.00	0.23	0.77
Cuba	0.03	1.00	0.23	0.36
Cyprus	0.43	1.00	0.00	0.52
Czechia	1.02	0.75	0.09	0.76
Denmark	1.02	1.00	0.16	0.85
Djibouti	0.43	1.00	0.00	0.51

COUNTRY	Fraction of inhabited territory with cool/rainy conditions in excess of fraction in hot/dry conditions	Fraction of territory in 100 km reach of icefree waterways	Index of minimum rainfall in driest month	Cool-Water (CW) Index
Dominica	0.03	1.00	0.30	0.37
Dominican Rep.	0.03	1.00	0.18	0.35
Ecuador	0.33	0.51	0.10	0.34
Egypt	0.43	0.99	0.00	0.51
El Salvador	0.04	0.98	0.02	0.31
Eq. Guinea	0.43	0.61	0.02	0.40
Eritrea	0.34	0.77	0.00	0.40
Estonia	0.88	0.66	0.18	0.68
Ethiopia	0.38	0.02	0.02	0.20
Finland	0.87	0.64	0.18	0.67
France	0.97	0.90	0.17	0.79
Gabon	0.16	0.28	0.01	0.17
Gambia	0.03	1.00	0.00	0.31
Germany (E.)	1.00	0.95	0.19	0.83
Germany (W.)	1.00	0.95	0.19	0.83
Georgia	0.62	0.27	0.07	0.41
Ghana	0.05	0.45	0.07	0.17
Greece	0.48	0.97	0.03	0.54
Guatemala	0.18	0.70	0.01	0.30
Guinea	0.17	0.25	0.01	0.16
Guinea-Bissau	0.03	0.99	0.00	0.31
Guyana	0.41	0.43	0.37	0.41
Haiti	0.03	1.00	0.16	0.35
Honduras	0.37	0.69	0.00	0.40
Hungary	0.99	0.93	0.16	0.81
Iceland	0.88	0.90	0.21	0.76
India	0.12	0.38	0.01	0.18
Indonesia	0.38	0.95	0.21	0.52
Iran	0.31	0.06	0.01	0.18
Iraq	0.39	0.06	0.00	0.22
Ireland	1.02	0.94	0.22	0.84
Israel	0.40	0.96	0.00	0.49
Italy	0.64	0.91	0.07	0.61
Jamaica	0.03	1.00	0.07	0.33
Japan	0.99	0.97	0.24	0.84
Jordan	0.29	0.04	0.00	0.16
Kazakhstan	0.33	0.00	0.02	0.17
Kenya	0.17	0.08	0.07	0.13
North Korea	0.43	0.84	0.05	0.48
South Korea	0.48	0.94	0.10	0.54
Kuwait	0.43	1.00	0.00	0.51
Kyrgyzstan	0.39	0.00	0.11	0.22
Laos	0.07	0.08	0.01	0.06
Latvia	0.89	0.44	0.18	0.62
Lebanon	0.43	1.00	0.00	0.51
Lesotho	1.00	0.00	0.04	0.52

COUNTRY	Fraction of inhabited territory with cool/rainy conditions in excess of fraction in hot/dry conditions	Fraction of territory in 100 km reach of icefree waterways	Index of minimum rainfall in driest month	Cool-Water (CW) Index
Liberia	0.26	0.66	0.15	0.36
Libya	0.37	0.61	0.00	0.37
Liechtenstein	0.95	0.71	0.32	0.76
Lithuania	0.90	0.84	0.18	0.74
Luxembourg	1.02	1.00	0.21	0.86
Maced.	0.89	0.17	0.16	0.54
Madagascar	0.21	0.50	0.04	0.26
Malawi	0.11	0.00	0.00	0.06
Malaysia	0.43	0.89	0.49	0.58
Malta	0.43	1.00	0.00	0.52
Mauritania	0.33	0.16	0.00	0.22
Mexico	0.34	0.29	0.02	0.26
Moldova	0.43	1.00	0.15	0.54
Mongolia	0.35	0.00	0.00	0.18
Monaco	0.75	1.00	0.10	0.70
Morocco	0.39	0.60	0.00	0.38
Mozambique	0.06	0.50	0.06	0.19
Namibia	0.16	0.04	0.00	0.10
Nepal	0.13	0.06	0.01	0.09
The Netherlands	1.02	1.00	0.20	0.86
New Zealand	1.01	0.99	0.40	0.89
Nicaragua	0.20	0.71	0.00	0.31
Niger	0.17	0.00	0.00	0.09
Nigeria	0.15	0.32	0.12	0.19
Norway	0.91	0.85	0.13	0.74
Oman	0.43	0.52	0.00	0.37
Pakistan	0.31	0.09	0.06	0.20
Panama	0.30	1.00	0.05	0.46
Papua-New Guin.	0.39	0.67	0.09	0.42
Paraguay	0.17	0.51	0.19	0.27
Peru	0.40	0.49	0.00	0.35
Philippines	0.41	1.00	0.06	0.52
Poland	0.91	0.88	0.15	0.76
Portugal	0.43	0.87	0.01	0.48
Qatar	0.43	1.00	0.00	0.51
Romania	0.87	0.52	0.13	0.62
Russia	0.79	0.07	0.18	0.46
Rwanda	0.17	0.00	0.03	0.10
Saudi Arabia	0.43	0.23	0.00	0.29
Senegal	0.10	0.82	0.00	0.30
Sierra Leone	0.26	0.50	0.01	0.28
Singapore	0.40	1.00	0.49	0.60
Slovakia	0.86	0.76	0.13	0.69
Slovenia	1.01	0.98	0.23	0.85
Somalia	0.29	0.60	0.00	0.33
South Africa	0.45	0.38	0.04	0.35

COUNTRY	Fraction of inhabited territory with cool/rainy conditions in excess of fraction in hot/dry conditions	Fraction of territory in 100 km reach of icefree waterways	Index of minimum rainfall in driest month	Cool-Water (CW) Index
Spain	0.61	0.66	0.05	0.52
Sri Lanka	0.03	0.99	0.34	0.38
Sudan	0.27	0.02	0.00	0.14
Suriname	0.43	0.76	0.37	0.52
Swaziland	0.68	0.38	0.10	0.48
Sweden	0.94	0.70	0.12	0.71
Switzerland	0.59	0.39	0.32	0.48
Syria	0.36	0.24	0.00	0.26
Taiwan	0.47	1.00	0.33	0.60
Tajikistan	0.27	0.00	0.01	0.14
Tanzania	0.05	0.16	0.00	0.07
Thailand	0.10	0.40	0.02	0.17
Togo	0.06	0.42	0.07	0.17
Trinidad-T.	0.43	1.00	0.20	0.55
Tunisia	0.37	0.85	0.01	0.44
Turkey	0.40	0.53	0.05	0.37
Turkmenistan	0.38	0.00	0.02	0.20
Uganda	0.06	0.00	0.23	0.07
Ukraine	0.56	0.71	0.15	0.52
UAE	0.43	0.78	0.00	0.45
U.K.	1.02	1.00	0.18	0.85
U.S.A.	0.82	0.65	0.33	0.68
Uruguay	1.02	0.80	0.33	0.82
Uzbekistan	0.31	0.00	0.02	0.16
Venezuela	0.23	0.83	0.05	0.37
Vietnam	0.11	0.92	0.09	0.34
Yemen	0.43	0.39	0.00	0.33
Serbia	0.50	0.58	0.23	0.47
Montenegro	0.46	0.60	0.23	0.46
Zaire	0.17	0.03	0.01	0.10
Zambia	0.12	0.00	0.00	0.06
Zimbabwe	0.12	0.00	0.00	0.06
Palestine	0.29	0.40	0.00	0.27
MEAN	0.44	0.63	0.14	0.42
SD	0.31	0.37	0.17	0.23
MINIMUM	0.03	0.00	0.00	0.02 (CAR)
MAXIMUM	1.00	1.00	1.00	0.89 (New Zealand)

Disease Security Index

To measure disease security, I use the historic pathogen incidence data published by Murray and Schaller (2011). I use their historic instead of their contemporary disease data because I intend to analyse these data on the condition that they have a causally prior status to later measures of development. Before using the data, I invert them so that higher scores indicate more disease security; as with all our variables, the scale range is normalized from minimum 0 to maximum 1.0. Data are available for 187 countries. Appendix-Table 11.4 displays the data.

As these data correlate closely with rather invariant climatic features and more closely so than with a society's affluence, we can safely assume that these disease data indicate a society's *naturally induced* disease burden: they are *not endogenous* to development. For instance, the disease security index correlates at $r = .74$ with the countries' scores on the rainy/cool-vs.-dry/hot climate index ($N = 165$; significant at $p < .001$, two-tailed) before controlling the countries' per capita GDP in 1960 and at $r_{partial} = .50$ *after* controlling for per capita GDP ($N = 87$; significant at $p < .001$, two-tailed). The partial correlation of per capita GDP with disease security is much smaller: .39.

Appendix-Table 11.4: Data for Disease Security

COUNTRY	Murray & Schaller's Original Disease Data	Disease Data Inverted and Normalized
Afghanistan	0.15	0.45
Albania	0.00	0.50
Algeria	0.63	0.29
Andorra	-1.05	0.85
Angola	0.93	0.19
Antigua-B.	-0.27	0.59
Argentina	0.00	0.50
Armenia	0.15	0.45
Australia	-0.14	0.55
Austria	-0.65	0.72
Azerbaijan	0.29	0.40
Bahamas	-0.51	0.67
Bahrain	0.15	0.45
Bangladesh	0.66	0.28
Barbados	-0.15	0.55
Belarus	-0.78	0.76
Belgium	-0.78	0.76
Belize	0.28	0.41
Benin	1.07	0.14
Bhutan	0.27	0.41
Bolivia	0.30	0.40
Bosnia	0.03	0.49
Botswana	0.39	0.37
Brazil	1.06	0.15
Brunei	0.00	0.50
Bulgaria	-0.10	0.53
Burkina Faso	1.19	0.10
Burma	0.53	0.32
Burundi	1.07	0.14
Cambodia	0.28	0.41
Cameroon	1.20	0.10
Canada	-1.18	0.89
CAR	1.19	0.10
Cabo Verde	-0.26	0.59
Chad	1.04	0.15
Chile	-0.22	0.57
China	1.03	0.16
Colombia	0.53	0.32
Comoros	-0.25	0.58
Congo	1.19	0.10
Costa Rica	0.18	0.44
Cote Divoire	1.06	0.15
Croatia	-0.38	0.63
Cuba	0.00	0.50
Cyprus	-0.25	0.58
Czech R.	-0.78	0.76

COUNTRY	Murray & Schaller's Original Disease Data	Disease Data Inverted and Normalized
Denmark	-0.91	0.80
Djibouti	0.50	0.33
Dominica	-0.02	0.51
Dominican R.	-0.13	0.54
Ecuador	0.30	0.40
Egypt	0.76	0.25
El Salvador	0.42	0.36
Eq. Guinea	0.93	0.19
Eritrea	0.37	0.38
Estonia	-0.78	0.76
Ethiopia	0.77	0.24
Fiji	-0.39	0.63
Finland	-0.78	0.76
France	-0.40	0.63
Gabon	1.19	0.10
Gambia	0.92	0.19
Germany (E.)	-0.78	0.76
Germany (W.)	-0.78	0.76
Georgia	0.16	0.45
Ghana	1.19	0.10
Greece	0.29	0.40
Grenada	-0.53	0.68
Guatemala	0.56	0.31
Guinea	1.06	0.15
Guinea-B.	1.06	0.15
Guyana	0.64	0.29
Haiti	-0.01	0.50
Honduras	0.16	0.45
Hungary	-0.78	0.76
Iceland	-1.18	0.89
India	0.91	0.20
Indonesia	0.51	0.33
Iran	-0.16	0.55
Iraq	0.40	0.37
Ireland	-0.23	0.58
Israel	0.53	0.32
Italy	0.40	0.37
Jamaica	0.25	0.42
Japan	0.25	0.42
Jordan	0.39	0.37
Kazakhstan	-0.38	0.63
Kenya	0.92	0.19
Kiribati	-0.53	0.68
North Korea	-0.14	0.55
South Korea	-0.28	0.59
Kuwait	-0.25	0.58
Kyrgyzstan	-0.38	0.63
Laos	0.28	0.41

COUNTRY	Murray & Schaller's Original Disease Data	Disease Data Inverted and Normalized
Latvia	-0.78	0.76
Lebanon	0.65	0.28
Lesotho	-0.13	0.54
Liberia	0.80	0.23
Libya	0.24	0.42
Liechtenstein	-1.05	0.85
Lithuania	-0.78	0.76
Luxembourg	-0.91	0.80
Macedonia	0.03	0.49
Madagascar	0.51	0.33
Malawi	0.64	0.29
Malaysia	0.51	0.33
Maldives	-0.90	0.80
Malta	-0.50	0.67
Marshall	-0.25	0.58
Mauritania	0.26	0.41
Mauritius	0.11	0.46
Mexico	0.56	0.31
Micronesia	-0.11	0.54
Moldova	-0.37	0.62
Mongolia	-0.78	0.76
Monaco	-0.65	0.72
Morocco	0.62	0.29
Mozambique	0.93	0.19
Namibia	-0.25	0.58
Nauru	-0.80	0.77
Nepal	-0.12	0.54
The Netherlands	-0.78	0.76
New Zealand	-0.91	0.80
Nicaragua	0.16	0.45
Niger	0.52	0.33
Nigeria	1.19	0.10
Norway	-0.91	0.80
Oman	0.00	0.50
Pakistan	-0.12	0.54
Palau Isld.	-0.38	0.63
Panama	0.31	0.40
Papua-N.	0.15	0.45
Paraguay	0.17	0.44
Peru	0.16	0.45
Philippines	0.51	0.33
Poland	-0.78	0.76
Portugal	0.63	0.29
Qatar	-0.25	0.58
Reunion	-0.25	0.58
Romania	-0.37	0.62
Russia	-0.64	0.71
Rwanda	1.05	0.15

COUNTRY	Murray & Schaller's Original Disease Data	Disease Data Inverted and Normalized
Samoa	-0.41	0.64
Sao Tome	-0.19	0.56
Saudi Arabia	0.24	0.42
Senegal	0.78	0.24
Seychelles	-0.63	0.71
Sierra Leone	0.92	0.19
Singapore	0.26	0.41
Slovakia	-0.78	0.76
Slovenia	-0.78	0.76
Somalia	0.64	0.29
Solomon Isld.	-0.12	0.54
South Africa	0.00	0.50
Spain	0.13	0.46
Sri Lanka	0.52	0.33
Sudan	1.15	0.12
Suriname	0.67	0.28
Swaziland	0.13	0.46
Sweden	-0.91	0.80
Switzerland	-1.05	0.85
Syria	0.41	0.36
Taiwan	0.25	0.42
Tajikistan	0.02	0.49
Tanzania	0.66	0.28
Thailand	0.52	0.33
Togo	1.19	0.10
Tonga	-0.67	0.72
Trinidad-T.	-0.01	0.50
Tunisia	0.90	0.20
Turkey	0.40	0.37
Turkmenistan	0.02	0.49
Tuvalu	-0.93	0.81
Uganda	1.05	0.15
Ukraine	-0.64	0.71
UAE	-0.39	0.63
U.S.A.	-0.64	0.71
Uruguay	0.53	0.32
Uzbekistan	-0.37	0.62
Vanuatu	-0.13	0.54
Venezuela	0.80	0.23
Vietnam	0.64	0.29
Yemen	0.23	0.42
Zaire	0.95	0.18

COUNTRY	Murray & Schaller's Original Disease Data	Disease Data Inverted and Normalized
Zambia	0.52	0.33
Zimbabwe	0.53	0.32
Hong Kong	0.37	0.38
MEAN	0.10	0.47
SD	0.63	0.21
MINIMUM	-1.18	0.10 (Congo)
MAXIMUM	1.20	0.89 (Canada)

Geographic Distance/Proximity Index (Distance from Human Origin)

The origin of modern *homo sapiens sapiens* lies supposedly in East Africa, most likely Ethiopia (Oppenheimer 2004). On their way out of Africa, the distance from Ethiopia was one determinant of when modern humans began to populate an area. To measure each country's distance from Africa, I calculate the country centroid's combined longitudinal and latitudinal distance from the centroid of Ethiopia. Data for the country centroids' longitudinal and latitudinal positions are taken from Gallup, Mellinger and Sachs (2010). To measure each country's geographic distance from the supposed human origin in Ethiopia, these data were transformed in a five-step procedure:

(1) The longitudinal and latitudinal positions of all country centroids are centered on the coordinates of Ethiopia, such that both Ethiopia's longitudinal and its latitudinal position obtain a score of 0 and the positions of all other countries turn into negative and positive deviation scores from 0.

(2) The signs of the negative deviation scores in the longitudinal dimension (i.e., to the South of Ethiopia) and in the latitudinal dimension (i.e., to the West of Ethiopia) are inverted to positive by multiplying these scores with -1. Tthe sign of the positive deviation scores to the North and East of Ethiopia remains.

(3) Longitudes cover a maximum of 180 degrees and latitudes a maximum of 90 degrees. For this reason I divide the longitudinal deviation scores by 2. This assures that similar deviation scores in the longitudinal and latitudinal dimensions cover identical distances in miles.

(4) I standardize both the longitudinal and latitudinal deviation scores to maximum 1.0 (dividing the observed scores by 90) and keep the minimum deviation score on both dimensions at 0, which is the score for Ethiopia.

(5) I average the longitudinal and latitudinal deviation scores for each country (adding them up and dividing the sum by 2).

The resulting scores provide my geographic distance index. The inverse of this index (1 minus the score on the distance index) is the geographic proximity index, showing larger scores the closer a country's centroid is to the human origin in Ethiopia. The proximity index is a proxy and the distance index an inverse proxy for how early modern humans began to populate an area (for the evidence, see the next entry in this Appendix after Appendix-Table 11.5). Data are displayed in Appendix-Table 11.5 below and are available for 196 countries. I have experimented with Diamond's (1997) idea that bridging longitudinal distances is more challenging than bridging latitudinal distances because with the latter one does not change climate zones, is more likely to remain within similar ecological habitats and, thus, less pressured to innovate—which should make migration easier over latitudinal than longitudinal distances. To come to terms with this idea, I created versions of the geographic distance index in which latitudinal distances weigh more than longitudinal ones (operating with weights of 1.5, 2.0 and 3.0). However, these versions of the distance index showed no stronger effects on other variables than the version described here.

Appendix-Table 11.5: Data Matrix underlying Figure 11.4 of *Freedom Rising*

COUNTRY	Distance from Human Origin (pre-historic)	Estimated Human Arrival	Cool-Water Index (historic)	Disease Security Index (historic)	Fertility Control Index 1980	Technological Advancement Index 2005
Afghanistan	0.31	40,000	0.23	0.45	0.16	
Albania	0.35	50,000	0.46	0.50	0.66	0.39
Algeria	0.31	40,000	0.37	0.29	0.28	0.36
Andorra		35,000	0.80	0.85		1.01
Angola	0.12	90,000	0.13	0.19	0.23	0.21
Antigua-B.		12,000		0.59	0.86	
Argentina	0.32	10,000	0.56	0.50	0.72	0.65
Armenia	0.29	25,000	0.26	0.45	0.82	0.54
Australia	0.50	50,000	0.79	0.55	0.89	0.91
Austria	0.43	25,000	0.74	0.72	0.92	0.88
Azerbaijan	0.30	25,000	0.19	0.40	0.72	0.41
Bahamas		12,000		0.67	0.73	
Bahrain		90,000	0.54	0.45	0.52	0.58
Bangladesh	0.32	70,000	0.24	0.28	0.45	0.16
Barbados		12,000		0.55	0.87	0.76
Belarus	0.43	25,000	0.73	0.76	0.87	0.62
Belgium	0.49	20,000	0.85	0.76	0.92	0.88
Belize	0.26	12,000	0.43	0.41	0.41	
Benin	0.15	130,000	0.15	0.14	0.23	0.18
Bhutan	0.35	70,000	0.18	0.41	0.39	
Bolivia	0.16	10,000	0.21	0.40	0.44	0.36
Bosnia	0.38	50,000	0.53	0.49	0.86	0.47
Botswana	0.18	90,000	0.08	0.37	0.37	0.34
Brazil	0.07	10,000	0.30	0.15	0.62	0.61
Brunei	0.32	70,000	0.56	0.50	0.62	
Bulgaria	0.34	50,000	0.74	0.53	0.87	0.69
Burkina F.	0.18	130,000	0.08	0.10	0.16	0.11
Burma	0.32	70,000	0.23	0.32		0.17
Burundi	0.08	130,000	0.05	0.14	0.28	
Cambodia	0.28	70,000	0.26	0.41	0.40	0.15
Cameroon	0.13	130,000	0.20	0.10	0.33	0.19
Canada	0.67	15,000	0.74	0.89	0.91	0.91
CAR	0.09	130,000	0.03	0.10	0.40	
Cabo Verde		130,000	0.30	0.59	0.30	0.30
Chad	0.14	40,000	0.12	0.15	0.29	
Chile	0.35	10,000	0.38	0.57	0.78	0.65
China	0.48	60,000	0.41	0.16	0.81	0.47
Colombia	0.16	10,000	0.26	0.32	0.63	0.50
Congo	0.16	130,000	0.08	0.10	0.34	
Costa Rica	0.18	12,000	0.31	0.44	0.67	0.58
Cote D'Ivoire	0.14	130,000	0.13	0.15	0.20	0.18
Croatia	0.40	50,000	0.79	0.63	0.88	0.73
Cuba	0.26	12,000	0.33	0.50	0.88	0.54
Cyprus	0.25	50,000	0.54	0.58	0.82	0.75

COUNTRY	Distance from Human Origin (pre-historic)	Estimated Human Arrival	Cool-Water Index (historic)	Disease Security Index (historic)	Fertility Control Index 1980	Technological Advancement Index 2005
Czech R.	0.44	25,000	0.77	0.76	0.87	0.79
Denmark	0.52		0.91	0.80	0.93	0.95
Djibouti	0.04	200,000	0.49	0.33	0.29	0.13
Dominica		12,000	0.33	0.51		0.55
Dominican R.	0.20	12,000	0.30	0.54	0.57	0.38
Ecuador	0.20	10,000	0.35	0.40	0.50	0.46
Egypt	0.19	40,000	0.49	0.25	0.45	0.42
El Salvador	0.23	12,000	0.25	0.36	0.51	0.37
Eq. Guinea	0.17	130,000	0.41	0.19	0.41	
Eritrea	0.06	200,000	0.40	0.38	0.31	0.13
Estonia	0.48		0.75	0.76	0.87	0.83
Ethiopia	0.00	200,000	0.23	0.24	0.30	0.09
Finland	0.52		0.70	0.76	0.92	0.94
France	0.46	20,000	0.82	0.63	0.88	0.86
Gabon	0.17	130,000	0.17	0.10	0.44	
Gambia	0.13	130,000	0.23	0.19	0.31	
Germany (E.)	0.47	25,000	0.82	0.76		0.89
Germany (W.)	0.47	20,000	0.82	0.76		0.89
Georgia	0.30	25,000	0.45	0.45	0.84	0.52
Ghana	0.15	130,000	0.14	0.10	0.31	0.20
Greece	0.32	50,000	0.56	0.40	0.85	0.76
Grenada		12,000		0.68		
Guatemala	0.25	12,000	0.26	0.31	0.36	0.27
Guinea	0.13	130,000	0.16	0.15	0.27	0.12
Guinea-B.	0.12	130,000	0.24	0.15	0.24	
Guyana	0.10	10,000	0.39	0.29	0.68	0.50
Haiti	0.21	12,000	0.31	0.50	0.36	
Honduras	0.23	12,000	0.39	0.45	0.35	0.31
Hungary	0.40	25,000	0.80	0.76	0.89	0.79
Iceland	0.56	15,000	0.81	0.89	0.82	0.88
India	0.27	70,000	0.18	0.20	0.51	0.30
Indonesia	0.35	70,000	0.52	0.33	0.58	0.32
Iran	0.26	90,000	0.22	0.55	0.30	0.47
Iraq	0.22	90,000	0.25	0.37	0.31	
Ireland	0.50	15,000	0.89	0.58	0.72	0.90
Israel	0.21	90,000	0.45	0.32	0.72	0.79
Italy	0.39	35,000	0.64	0.37	0.92	0.82
Jamaica	0.22	12,000	0.31	0.42	0.66	0.52
Japan	0.61	30,000	0.90	0.42	0.91	0.86
Jordan	0.20	90,000	0.19	0.37	0.25	0.54
Kazakhstan	0.44	40,000	0.20	0.63	0.76	0.52
Kenya	0.08	200,000	0.14	0.19	0.21	0.27
Kiribati		40,000		0.68	0.55	
North Korea	0.60	60,000	0.48	0.55		
South Korea	0.57	60,000	0.56	0.59		0.84
Kuwait	0.20	90,000	0.50	0.58	0.47	0.56

COUNTRY	Distance from Human Origin (pre-historic)	Estimated Human Arrival	Cool-Water Index (historic)	Disease Security Index (historic)	Fertility Control Index 1980	Technological Advancement Index 2005
Kyrgyzstan	0.41	40,000	0.25	0.63	0.62	0.42
Laos	0.32	70,000	0.06	0.41	0.29	0.21
Latvia	0.46	25,000	0.67	0.76	0.89	0.75
Lebanon	0.23	90,000	0.48	0.28	0.62	0.49
Lesotho	0.22	90,000	0.61	0.54	0.42	0.19
Liberia	0.13	130,000	0.33	0.23	0.26	
Libya	0.24	40,000	0.36	0.42	0.22	
Lithuania	0.46		0.73	0.76	0.87	0.77
Luxembourg	0.48	20,000	0.84	0.80	0.94	0.84
Macedonia	0.35	50,000	0.59	0.49	0.81	0.57
Madagascar	0.12	200,000	0.31	0.33	0.32	0.15
Malawi	0.06	90,000	0.07	0.29	0.18	0.12
Malaysia	0.33	70,000	0.54	0.33	0.60	0.61
Malta		35,000	0.54	0.67	0.87	0.72
Mauritania	0.21	40,000	0.26	0.41	0.33	0.19
Mauritius		200,000		0.46	0.79	0.46
Mexico	0.37	12,000	0.32	0.31	0.55	0.54
Micronesia		30,000		0.54	0.36	
Moldova	0.37	25,000	0.47	0.62	0.83	0.53
Mongolia	0.56	60,000	0.21	0.76	0.46	0.47
Morocco	0.32	40,000	0.39	0.29	0.43	0.34
Mozambique	0.09	90,000	0.17	0.19	0.33	0.11
Namibia	0.20	90,000	0.13	0.58	0.32	0.34
Nauru		30,000		0.77		
Nepal	0.33	70,000	0.09	0.54	0.43	0.16
Netherlands	0.50	20,000	0.86	0.76	0.92	0.94
New Zealand	0.78	1,500	0.93	0.80	0.87	0.90
Nicaragua	0.21	12,000	0.29	0.45	0.36	0.26
Niger	0.19	40,000	0.10	0.33	0.10	
Nigeria	0.13	130,000	0.18	0.10	0.26	0.21
Norway	0.59		0.80	0.80	0.91	0.93
Oman	0.16	90,000	0.41	0.50	0.23	0.48
Pakistan	0.29	70,000	0.22	0.54	0.25	0.25
Panama	0.15	12,000	0.40	0.40	0.66	0.51
Papua-NG.	0.41	70,000	0.45	0.45	0.42	
Paraguay	0.19	10,000	0.22	0.44	0.47	0.42
Peru	0.13	10,000	0.36	0.45	0.51	0.49
Philippines	0.33	70,000	0.54	0.33	0.48	0.40
Poland	0.45	25,000	0.75	0.76	0.84	0.74
Portugal	0.38	35,000	0.48	0.29	0.85	0.73
Qatar	0.19	90,000	0.53	0.58	0.41	0.66
Romania	0.37	50,000	0.65	0.62	0.82	0.63
Russia	0.67	25,000	0.56	0.71		0.68
Rwanda	0.09	130,000	0.11	0.15	0.06	0.09
Saudi Arabia	0.15	90,000	0.33	0.42	0.23	0.51
Senegal	0.15	130,000	0.24	0.24	0.25	0.22

COUNTRY	Distance from Human Origin (pre-historic)	Estimated Human Arrival	Cool-Water Index (historic)	Disease Security Index (historic)	Fertility Control Index 1980	Technological Advancement Index 2005
Sierra Leone	0.11	130,000	0.28	0.19	0.31	0.09
Singapore		70,000	0.58	0.41	0.91	0.80
Slovakia	0.42	25,000	0.69	0.76	0.84	0.74
Slovenia	0.41	25,000	0.83	0.76	0.87	0.82
Somalia	0.04	200,000	0.34	0.29	0.22	
South Africa	0.23	90,000	0.38	0.50	0.56	0.53
Spain	0.41	35,000	0.56	0.46	0.85	0.82
Sri Lanka	0.16	70,000	0.34	0.33	0.68	0.40
Sudan	0.08	40,000	0.17	0.12	0.33	0.22
Suriname	0.10	10,000	0.47	0.28	0.64	
Swaziland	0.18	90,000	0.49	0.46	0.35	0.29
Sweden	0.55		0.76	0.80	0.92	0.96
Switzerland	0.44	25,000	0.47	0.85	0.93	0.91
Syria	0.23	90,000	0.27	0.36	0.21	0.36
Taiwan	0.43	60,000	0.60	0.42		0.88
Tajikistan	0.37	40,000	0.17	0.49	0.41	0.33
Tanzania	0.04	200,000	0.09	0.28	0.30	0.15
Thailand	0.29	70,000	0.17	0.33	0.70	0.57
Togo	0.15	130,000	0.13	0.10	0.25	
Trinidad-T.	0.10	12,000	0.56	0.50	0.71	0.55
Tunisia	0.33	40,000	0.43	0.20	0.48	0.45
Turkey	0.28	90,000	0.41	0.37	0.59	0.51
Turkmenistan	0.33	40,000	0.23	0.49	0.50	
Uganda	0.09	130,000	0.06	0.15	0.24	0.18
Ukraine	0.37	25,000	0.52	0.71	0.88	0.66
UAE	0.18	90,000	0.46	0.63	0.45	0.67
U.K.	0.52	15,000	0.91		0.89	0.91
U.S.A.	0.59	15,000	0.71	0.71	0.90	0.90
Uruguay	0.27	10,000	0.84	0.32	0.79	0.65
Uzbekistan	0.37	40,000	0.19	0.62	0.52	0.40
Venezuela	0.11	10,000	0.34	0.23	0.60	0.54
Vietnam	0.32	70,000	0.29	0.29	0.50	0.37
Yemen	0.09	90,000	0.38	0.42	0.14	0.20
Yugoslavia	0.37	50,000	0.46		0.84	0.63
Zaire	0.11	130,000	0.11	0.18		
Zambia	0.09	90,000	0.07	0.33	0.25	0.19
Zimbabwe	0.13	90,000	0.07	0.32	0.25	0.30
MEAN	0.28	62,000	0.42	0.47	0.55	0.52
SD	0.16	50,500	0.24	0.21	0.25	0.26
MINIMUM	0.00	1,500	0.03	0.10	0.06	0.08
MAXIMUM	0.78	200,000	0.93	0.89	0.94	1.00

To download these data, save the file "Figure11.4.xls" at www.cambridge.org/welzel.

Migratory Distance and Human Arrival Estimates

Based on data published in Oppenheimer (2004), the third column of Appendix-Table 11.5 shows regional estimates of the time past since modern humans began to populate an area, assigning the same estimates to all countries belonging to the same region. These estimates correlate at r = -.56 with the geographic distance index to the left in Appendix-Table 11.5 (N = 153; p ‹ .001, two-tailed). The negative correlation indicates that societies in larger geographic distance from the human origin tend to have shorter time spans since they are habitats of modern humans. For Africa, Eurasia, and Australasia, the geographic distance index is indeed a decent proxy for estimated human arrival times because in order to arrive at places on these connected territories, humans needed to bridge the combined latitudinal and longitudinal distance to them. This is different for the Americas, however. Here the central part is geographically closer to Ethiopia than the North and South but the human migratory path was different. Modern humans entered the Americas some 20,000 years over the Bering Strait and then migrated from North to South. Thus, if one transforms the geographic distance index in such a way that, for the Americas the distance increases from North to South, we obtain a measure that comes closer to a true *migratory* distance index. Thus, this migratory distance index correlates more strongly negative with the human arrival estimates, namely at r = -.76 (N = 153; p ‹ .001, two-tailed).

Referring to Oppenheimer (2004) and Cavalli-Sforza (2005), Galor (2011) reports that human genetic diversity diminished in the course of human migrations, such that genetic diversity is highest among African populations, modicum among Eurasian populations and lowest among native American populations. Indeed, Galor shows that an area's migratory distance from the human origin explains a sizeable percentage of its population's genetic diversity. In other words, migratory distance is an inverse indicator of genetic diversity. Put differently, migratory *proximity* to the human origin in Ethiopia (i.e., 1 minus the migratory distance) is a direct indicator of genetic diversity. Geographic distance, by contrast, is a direct indicator of the presence of the cool-water condition: this condition tends to prevail in a large North-South and East-West distance from Ethiopia. Indeed, a country's score on the cool-water index correlates at r = .70 (N = 158; p ‹ .001, two-tailed) with its geographic distance from the human origin but only at r = .39 with its migratory distance from there (N = 158; p ‹ .001, two-tailed).

Now, if the migratory proximity is a valid proxy for a country population's genetic diversity, we can ask whether genetic diversity or the cool-water condition are more important for development: is it variation in biological genes or in ecological environments that matters more? Asked differently, is it variation in the different populations' inner qualities or variation in their outer opportunities that affect their development stronger?

Galor (2011) argues that genetic diversity affects development like an inverted U: low and high levels of diversity have an adverse effect on development; modicum levels have a conducive effect (Galor's 'humpback hypothesis'). Using the index of technological advancement described in Appendix I, I can replicate this pattern: diminishing genetic diversity first increases and then decreases technological advancement. Indeed, the quadratic term for genetic diversity (instrumented by migratory proximity) explains a significant 42 percent of the cross-national variation in technological advancement across 134 countries. A graphical inspection shows that diminishing genetic variation increases technological advancement among African and Eurasian populations but further diminishing variation among American populations then decreases technological advancement. However, if I run a regression in which I control the impact of genetic variation on technological advancement for the presence of the cool-water condition, the U-shaped effect of the genetic diversity vanishes and its explanatory power over technological advancement drops to 9 percent. By

contrast, the explanatory power of the cool-water condition over technological advancement remains at 64 percent (N = 134). Hence, distance from the human origin influences development much more by variation in environments than by variation in genes. Differences in the populations' outer opportunities shape their development more than differences in their inner qualities.

Appendix-Table 11.6 below shows which countries I assigned to which region shown in Figure 11.1 of Chapter 11 in *Freedom Rising*.

Appendix-Table 11.6: Arrangement of Societies Analysed in Figure 11.1 of *Freedom Rising* into Regions

WORLD REGION:	COUNTRIES
East Africa	Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Tanzania
Central Africa	Cameroon, Rwanda, Uganda
Southern Africa	Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia, Zimbabwe
Northern Africa	Algeria, Egypt, Mauritania, Morocco, Sudan, Tunisia
West Africa	Benin, Burkina Faso, Cote D'Ivoire, Ghana, Guinea, Nigeria, Senegal, Sierra Leone
Middle East	Iran, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syria, Turkey, UAE, Yemen
India	India
Southeast Asia	Bangladesh, Burma, Cambodia, Indonesia, Laos, Malaysia, Nepal, Pakistan, Philippines, Sri Lanka, Thailand, Vietnam
China	China
East Asia	Mongolia, North Korea, South Korea, Taiwan
Central Asia	Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan
Japan	Japan
Southeast Europe	Albania, Bosnia, Bulgaria, Croatia, Cyprus, Greece, Macedonia, Romania
Southwest Europe	Italy, Portugal, Spain
Eastern Europe	Armenia, Azerbaijan, Belarus, Georgia, Moldova, Russia, Ukraine
Central Europe	Austria, Czech R., Germany, Hungary, Poland, Slovakia, Slovenia, Switzerland
Western Europe	Belgium, France, Luxemburg, Netherlands
Northern Europe	Denmark, Estonia, Finland, Latvia, Lithuania, Norway, Sweden
Northwest Europe	Iceland, Ireland, U.K.
Australasia	Australia, New Zealand
North America	Canada, U.S.A.
Central America	Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama
Caribbean	Cuba, Dominican R., Jamaica, Trinidad-Tobago
South America	Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Uruguay, Venezuela

Fertility Control Index

The fertility control index is the inverse of female fertility in 1980, taken from the World Bank's (2010) Development Indicators Series. Data are available for 170 countries and are displayed in Appendix-Table 11.5 above.

Additional Variables in Tables 11.1 and 11.2 of Freedom Rising

For replication purposes, data used for the analyses in Tables 11.1 and 11.2 of *Freedom Rising* are available for download in the file "Table11.1&11.2.xls" at www.cambridge.org/welzel. Data sources for these variables are as follows:

- *Continuous Peace*: Number of armed conflicts in which the government of a society has been involved since the end of World War II. Source: Gleditsch et al. (2002), UCDP/PRIO Armed Conflict Dataset-version 3 (online at www.pcr.uu.se /database/index.php).
- *Neuroticism, Openness, Extraversion (Big-5)*: Average score of country samples on these three of the 'Big-5' personality traits. Source: Schmitt et al. (2012).
- *Protestants, Catholics, Muslims*: Fractions of denominational Protestants, Catholics, and Muslims per country. Data are for varying time points in the 1990s. Source: Quality of Governance Institute (2010), online at www.qog.org.
- *State Integrity*: 'Control of corruption' index from the World Bank's 'governance quality project', measured in 2000. Normalized into a scale from minimum 0 to maximum 1.0, the index measures the impartiality of law and law enforcement. Source: Kaufmann, Kraay and Mastruzzi (2005).
- *Order and Stability*: Peace and stability index from the World Bank's 'governance quality project', measured in 2000. Normalized into a scale from minimum 0 to maximum 1.0, the index measures the absence of governmental and anti-governmental violence as well as political stability. Source: Kaufmann, Kraay and Mastruzzi (2005).

Appendix-Table 11.7: Data for Variables in Tables 11.1 and 11.2 of *Freedom Rising*

Key: V1 – Time since Neolithic Revolution in years; V2 – 'White' settler mortality per 1,000 settlers; V3 – State history in years; V4 – Democratic tradition in historically accumulated 'autocracy-democracy' scores from Polity IV; V5 – Continuous peace as inverted and indexed conflict count since WWII; V6 – Percent population with longe-allele version of the HTTLPR gene; V7 - Percent population with ComtVal gene; V8 – Mean population score in neuroticism; V9 - Mean population score in neuroticism in openness; V10 – Mean population score in extraversion; V11 – Mean population score in individualism; V12 – Mean population score in tightness; V13 – Logged population score in consanguinity; V14 – Percent Catholics; V15 – Percent Muslims; V16 – Percent Protestants; V17 – State integrity (factor scores); V18 – Order and stability (factor scores)

COUNTRY	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	V17	V18
Afghanistan	9,000	0	1,197	-430	0.13								4.01	0	99	0	-1.91	-2.73
Albania	7,500	0	1,089	-387	0.00									0	21	0	-0.74	-0.96
Algeria	4,000	78	1,077	-504	0.13		17						3.12	1	99	0	-0.75	-1.90
Andorra		0		464							0.39			99	0	1	1.39	1.14
Angola	1,250	280	359	-106	0.25									69	0	20	-1.49	-2.39
Antigua-B.														10	0	42	0.92	0.67
Argentina	3,800	69	253	-63	0.00	51		0.55	0.51	0.49	0.28		-0.69	92	0	3	-0.38	0.05
Armenia	8,000	0	1,119	-378	0.00									0	0	0	-0.74	-1.24
Australia	400	9	138	615	0.00	46	52	0.51	0.50	0.49	0.13	4.40	-0.69	30	0	24	1.96	1.20
Austria		0	1,419	401	0.00	44	45	0.50	0.49	0.51		6.80		89	1	7	1.93	1.20
Azerbaijan	8,000	0	776	-422	0.00									0	93	0	-1.14	-0.91
Bahamas		85		161	0.00									26	0	47	1.39	1.10
Bahrain	7,500			-214	0.00								3.79	1	95	1	0.69	0.07
Bangladesh	5,500	71	750	-21	0.00			0.51	0.53	0.45			2.35	0	86	0	-0.93	-0.55
Barbados	1,700		162	216	0.00									6	0	33	1.39	0.99
Belarus	4,500	0	620	-381	0.00									14	0	0	-0.58	-0.14
Belgium	5,500	0	1,305	584	0.00	45	49	0.54	0.55	0.46		5.60	0.10	90	1	0	1.54	0.94
Belize	3,300			118	0.00									67	0	13	-0.14	0.29
Benin	3,100		196	-109	0.00									19	15	3	-0.58	0.67
Bhutan	5,500	0		-521	0.00									0	5	0	0.56	0.48
Bolivia	4,000	71	1,243	-7	0.00								0.53	93	0	2	-0.55	-0.25
Bosnia	7,000	0	1,113	-327	0.00									15	40	4	-0.57	-0.62
Botswana	1,000		434	189	0.00									9	0	27	0.77	0.94

COUNTRY	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	V17	V18
Brazil	3,500	71	276	-52	0.00	47	53	0.53	0.49	0.46	-0.20	3.50	1.46	88	0	4	0.09	0.11
Brunei	4,000			-155	0.00									3	64	1	0.35	1.23
Bulgaria	7,500	0	1,038	-330	0.00	43					-0.02			1	11	0	-0.24	0.49
Burkina F.	2,900	280	363	-158	0.00						0.00		4.19	9	43	2	-0.01	-0.09
Burma			1,553		0.25									1	4	3	-1.37	-1.58
Burundi	3,500		213	-167	0.13									78	1	5	-1.13	-2.22
Cambodia	4,500		1,643	-164	0.00									0	2	0	-0.91	-0.75
Cameroon	3,000	280	565	-213	0.00									35	22	18	-1.09	-0.54
Canada	1,500	16	189	610	0.00	42	59	0.51	0.49	0.48	0.22		0.41	47	1	30	2.02	1.05
CAR	3,000		25	-175	0.00									33	3	50	-1.35	-1.33
Cabo Verde	538		250	-80	0.00									96	0	3	0.20	1.08
Chad	2,700		340	-185	0.13									21	44	12	-0.87	-1.37
Chile	4,000	69	304	85	0.00	54		0.51	0.55	0.48	-0.02		-0.11	82	0	2	1.39	0.62
China	9,000	0	1,784	-405	0.00	75	27				-0.26	7.90	1.61	0	2	0	-0.36	-0.10
Colombia	3,400	71	284	212	0.13	58	61						1.25	97	0	1	-0.61	-1.91
Comoros				-49	0.00									0	100	0	-1.06	-0.19
Congo	3,000	240	288	-147	0.00									54	0	25	-1.02	-1.15
Costa Rica	2,500	78	265	619	0.00								1.22	91	0	6	0.85	0.89
Cote D'Iv.	3,500		325		0.00									19	24	5	-0.52	-0.86
Croatia	7,000		1,023	-326	0.00	37	49	0.46	0.48	0.52			-2.30	77	1	0	-0.01	0.32
Cuba	800		235	-170	0.00								-0.22	32	0	1	-0.23	-0.35
Cyprus	8,500		1,088	245	0.00			0.51	0.49	0.49	0.05			1	19	1	0.79	0.48
Czech R.	6,500	0	933	-111	0.00	43		0.51	0.51	0.50			-1.61	39	0	5	0.26	0.59
Denmark	5,500	0	1,108	577	0.00	41	61							1	0	95	2.18	1.19
Djibouti				-135	0.00									7	91	0	-0.89	-0.50
Dominica				129										90	0	8	0.44	0.43
Domin. R.	1,500	130	275	-134	0.00									97	0	1	-0.40	0.09
Ecuador	4,000	71	364	84	0.00								1.25	96	0	2	-0.92	-0.99
Egypt	7,200	68	1,287	-224	0.00		47				-0.94		3.43	0	82	0	-0.37	-0.35
El Salvador	3,000	78	274	-158	0.00								1.59	96	0	2	-0.41	0.23
Eq. Guinea				-159	0.00									71	1	5	-1.62	-0.03

COUNTRY	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	V17	V18
Eritrea				-18	0.13									0	33		0.66	-1.26
Estonia	3,700	0	344	-231	0.00	35	56	0.47	0.53	0.50		2.60		2	0	66	0.62	0.80
Ethiopia	4,000	26	1,913	-272	0.38			0.46	0.47	0.47	0.31			1	31	4	-0.48	-1.24
Fiji			38	159	0.00									9	8	39	0.15	-0.03
Finland	3,500	0	396	450	0.00	43	53	0.48	0.50	0.50	0.30			0	0	93	2.34	1.48
France	7,500	0	1,489	464	0.00	43	44	0.52	0.48	0.45	-0.10	6.30	-0.22	76	3	2	1.50	0.84
Gabon	3,000	280	50	-234	0.00									65	1	19	-0.60	0.29
Gambia	3,000	1,470	288	176	0.00									2	85	0	-0.40	0.47
Germ. (E.)	8,000	0		-260	0.00	43	56				-0.02	7.50						
Germ. (W.)	8,000	0	1,382	397	0.00	43	56	0.50	0.48	0.50	0.10	6.50		35	0	46	2.00	1.20
Georgia	6,000	0	1,040	-388	0.00									1	11	0	-0.90	-1.46
Ghana	3,500	668	484	-149	0.00		25				-0.03			19	16	26	-0.25	-0.22
Greece	8,500	0	1,050	295	0.00	48	45	0.53	0.52	0.49		3.90		0	2	0	0.72	0.69
Grenada	2,000		150	88										64	0	13	0.61	0.83
Guatem.	3,500	71	1,164	-162	0.00									94	0	5	-0.58	-0.69
Guinea	3,250	483	300	-249	0.13								3.25	1	69	0	-0.78	-1.80
Guinea-B.	3,000			-119	0.00									10	38	1	-0.89	-0.81
Guyana	3,800	32	175	-42	0.00									18	9	18	-0.38	-0.56
Haiti	1,000	130	300	-264	0.00									83	0	13	-1.43	-0.82
Honduras	3,000	78	526	101	0.00								1.22	96	0	3	-0.77	-0.23
Hungary	7,400	0	998	-211	0.00	42	55					2.90	-2.30	54	0	22	0.69	0.76
Iceland		0	538	543	0.00		59					6.40		1	0	97	2.21	1.42
India	8,500	49	1,397	320	1.00	59	43	0.50	0.48	0.47	0.43	11.0	3.28	1	12	1	-0.33	-0.66
Indonesia	4,000	170	922	-205	0.13			0.50	0.48	0.51	0.09		2.88	3	43	5	-1.01	-1.76
Iran	9,500	0	1,578	-373	0.13	47	49				-0.21		3.47	0	98	0	-0.51	-0.35
Iraq	10,000			-360	0.00								3.54	2	96	0	-1.45	-1.75
Ireland	5,000	0	983	501	0.00		51						-0.51	95	0	1	1.59	1.31
Israel	10,500	0	978	397	0.13	49	46	0.49	0.51	0.49		3.10	3.00	1	8	0	0.98	-0.74
Italy	8,000	0	1,419	294	0.00	49	47	0.52	0.50	0.50		6.80	-0.51	83	0	0	0.98	0.72
Jamaica	1,000	130	225	308	0.00									10	0	56	-0.25	-0.09
Japan	4,500	0	1,600	403	0.00	80	31	0.58	0.42	0.47	0.15	8.60	2.03	1	0	1	1.24	1.07

COUNTRY	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	V17	V18
Jordan	10,500		1,000	-418	0.00			0.50	0.47	0.48	-0.03		3.45	2	93	0	0.04	0.01
Kazakhstan	6,500	0	482	-424	0.00									3	47	2	-0.97	0.13
Kenya	3,500	145	25	-150	0.00									26	6	19	-0.97	-1.10
Kiribati				100										49	0	45	-0.22	
North Korea	4,500	0		-327	0.00									0	0	0	-1.93	-0.08
South Korea	4,500	0	1,716	-53	0.00	80	28	0.54	0.44	0.45	0.01	10.0		4	0	12	0.14	0.12
Kuwait	9,500			-544	0.00								3.95	2	95	0	1.04	0.61
Kyrgyzstan	6,500	0	364	-423	0.13								3.81	0	70	0	-0.89	-0.48
Laos	6,000		1,029	-246	0.00									1	1	0	-0.90	-0.73
Latvia	3,700	0	384	-269	0.00			0.51	0.50	0.49				18	0	14	0.13	0.61
Lebanon	10,500			-5	0.00								3.28	36	37	1	-0.31	-0.61
Lesotho	1,500		86	-94	0.00									44	0	30	-0.17	0.00
Liberia	3,250		69	-333	0.13									2	21	19	-1.65	-2.08
Libya	5,500		1,202	-255	0.00								3.63	0	98	0	-0.83	-0.69
Lithuania	3,700	0	567	-322	0.00			0.52	0.49	0.50				80	0		0.27	0.56
Luxembourg	5,500	0		594	0.00									93	0	1	2.05	1.54
Macedonia	7,500	0	922	-226	0.00									1	30	1	-0.56	-0.85
Madagascar	2,000	536	325	-64	0.00									26	2	22	-0.07	0.12
Malawi	1,800		370	-215	0.00									28	16	32	-0.45	-0.56
Malaysia	4,500	18	1,003	176	0.00	22	27	0.58	0.48	0.50	0.00	11.6	2.03	3	49	1	0.39	0.20
Maldives				-132	0.00									0	100	0	-0.14	1.11
Malta	7,600	16		230	0.00			0.52	0.51	0.50				97	0	1	0.83	1.40
Marshall				43										0	0		-0.68	
Mauritania	3,500		594	-203	0.00									0	99	0	-0.19	0.10
Mexico	4,100	71	1,061	-260	0.00	52	43	0.48	0.52	0.50	0.01	7.20	-0.22	95	0	1	-0.42	-0.08
Moldova	7,000	0	525	-326	0.00						0.01			0	0	0	-0.73	-0.22
Mongolia	5,000		661	-354	0.00									0	1	0	-0.31	0.79
Monaco				124										91	0	5		
Morocco	3,500	78	1,540	-407	0.00	34		0.51	0.49	0.49	-0.03		2.99	0	99	0	0.04	-0.21
Mozamb.	1,400		250	-114	0.00									31	13	7	-0.68	-0.01
Namibia	1,250			12	0.25									19	0	64	0.58	-0.31

COUNTRY	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	V17	V18
Nepal	6,000		1,470	-247	0.13									0	3	0	-0.43	-1.18
Netherlands	6,000	0	1,347	534	0.00	43	54	0.49	0.50	0.50	0.48	3.30	-1.61	43	1	42	2.18	1.39
New Zeald.	800	9	63	619	0.00	43	50	0.50	0.49	0.51		3.90		19	0	38	2.16	1.15
Nicaragua	3,000	163	244	-275	0.00									95	0	4	-0.94	-0.09
Niger	4,000	400	481	-146	0.00									0	88	0	-0.96	-0.16
Nigeria	2,700	2,004	803	-74	0.00	24	32						3.94	12	45	16	-1.14	-1.58
Norway	5,000	0	860	619	0.00	42	57				0.66	9.50	-0.69	0	0	98	2.14	1.26
Oman	7,500			-496	0.00								3.58	0	99	0	0.83	0.86
Pakistan	9,000	37	1,566	49	0.13		47					12.3	3.93	1	97	1	-0.76	-0.92
Panama	2,400	163	270	-96	0.00								0.53	85	5	5	-0.31	0.26
Papua-N.	4,000		19	190	0.00									33	0	58	-0.78	-0.45
Paraguay	4,000	78	275	-309	0.00									96	0	2	-1.19	-1.08
Peru	4,300	71	993	62	0.00		41	0.53	0.51	0.48	0.03		0.92	95	0	3	-0.33	-0.93
Philippines	5,000		253	75	0.25		17	0.51	0.49	0.48			-0.92	84	4	4	-0.50	-0.77
Poland	6,000	0	834	-175	0.00	40	54	0.52	0.49	0.49	-0.03	6.00		81	0	0	0.48	0.43
Portugal	6,500	0	1,437	-42	0.00			0.50	0.50	0.48		7.80	0.47	94	0	1	1.24	1.19
Qatar	7,500			-222	0.00								3.80	1	92	1	0.84	1.03
Reunion																		
Romania	7,500	0	797	-323	0.00	45	39	0.48	0.53	0.50	-0.25			5	1	6	-0.34	0.02
Russia	5,000	0	531	-385	0.13	44	55				0.00			1	11	0	-0.94	-0.72
Rwanda	2,500		375	-187	0.25	17	33				-0.24			56	9	12	-0.71	-1.81
S. Arabia	7,600	0		-580	0.00								3.65	0	99	0	0.50	0.05
Senegal	3,000	165	631	-102	0.13									6	91	0	-0.28	-0.52
Sierra Leone	3,250	483	45	-126	0.13									2	39	5	-0.98	-1.91
Singapore	4,500	18	419	-19	0.00	71	25					10.4	1.28	5	17	3	2.25	1.15
Slovakia	6,500	0	573	-120	0.00			0.52	0.53	0.49				74	0	8	0.16	0.35
Slovenia	7,000	0	978	-260	0.00	43	53	0.45	0.51	0.51	0.03		-0.51	71	2	0	0.73	0.92
Somalia	3,500		1,599	-86	0.00									0	100	0	-1.75	-2.47
South Africa	1,700	16	131	265	0.00	28		0.49	0.49	0.50	-0.04		1.03	10	1	39	0.57	-0.39
Spain	7,200	0	1,288	61	0.00	47	45	0.54	0.50	0.49	0.07	5.40	0.69	97	0	0	1.43	0.75
Sri Lanka	5,000	70	1,649	245	0.13								3.07	7	7	0	-0.18	-1.58

COUNTRY	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	V17	V18
Sudan	5,000	88	1,287	-98	0.13								3.92	4	73	0	-0.89	-2.39
Suriname	3,600			5	0.00									36	13	37	0.42	0.24
Swaziland	1,500		133	-203	0.00									11	0	34	-0.13	-0.09
Sweden	5,500	0	731	550	0.00	44	55				0.59		-0.36	1	0	68	2.23	1.25
Switzerland	5,500	0	1,396	619	0.00		50	0.49	0.53	0.50	0.52			53	0	43	2.13	1.46
Syria	10,500		1,092	-232	0.00								3.45	1	90	0	-0.61	-0.65
Taiwan	5,500	0	294	-199	0.00	71	24	0.53	0.46	0.48	-0.52			2	1	3	0.79	0.56
Tajikistan	7,000	0	1,010	-428	0.00								3.00	0	85	0	-1.20	-1.86
Tanzania	2,500	145		-199	0.00	21	30	0.48	0.48	0.49			3.63	28	33	11	-1.07	-0.46
Thailand	5,500	0	1,091	-206	0.00	69					0.25			0	4	0	-0.13	0.40
Togo	3,100	668	81	-187	0.00									29	17	6	-0.63	-0.18
Tonga				-136										18	0	62	-0.58	
Trinidad-T.	2,000	85	175	243	0.00	23					-0.16			36	7	13	0.14	0.06
Tunisia	4,500	63	1,346	-244	0.00								3.29	0	99	0	0.12	0.24
Turkey	10,000	0	1,618	131	0.13	54	50	0.50	0.53	0.52	0.00	9.20	3.00	0	99	0	-0.19	-1.00
Turkmen.	8,000	0	685	-226	0.00									0	87	0	-1.03	-0.01
Uganda	3,500	280	288	-92	0.25									50	7	2	-0.96	-1.54
Ukraine	6,500	0	554	-378	0.00			0.48	0.42	0.46	-0.23	1.60		0	0	0	-1.00	-0.36
UAE	7,500			-178	0.00								3.58	0	95	0	0.83	0.80
U.K.	5,500	0	1,400	600	0.13	44	57	0.51	0.46	0.50	0.00	6.90	-0.92	13	1	16	2.13	1.02
U.S.A.	3,500	15	208	619	0.00	45	53	0.50	0.50	0.50	0.16	5.10	-1.61	30	1	44	1.77	1.14
Uruguay	3,600	71	186	160	0.00						0.12		0.74	60	0	2	0.76	0.89
Uzbekistan	6,500	0	1,436	-447	0.13								3.15	0	88	0	-0.96	-1.31
Venezuela	3,800	78	278	100	0.00							3.70	0.34	95	0	1	-0.59	-0.54
Yemen	7,600		1,290	-327	0.00								3.55	0	100	0	-0.66	-1.35
Serbia	7,500	0	1,169	-283				0.50	0.52	0.52	0.06						-1.08	-1.70
Zaire		240	359	-210	0.13									48	1	29	-1.60	-2.65
Zambia	1,800		100	-113	0.00						0.26			26	0	32	-0.90	-0.38
Zimbabwe	1,400		75	7	0.13			0.48	0.49	0.49				14	1	21	-0.93	-1.44
Palestine Hong Kong	5,000		1,740					0.52	0.42	0.47		6.30	0.59					

Maddison's Income Estimates

Maddison (2007) provides income estimates for 32 countries around the world that are exemplary for a given global region. In times in which these countries did not formally exist as countries, the estimates are for their contemporary territory at the respective time Estimates are given from the year One to 2000, measured in constant 1990 US-Dollars at international exchange rates. A basic assumption is that no society can survive at a material base of a lesser value than 400 US-Dollar per capita and year. Thus, the 400-US-Dollar subsistence level describes the wealth of pre-agrarian and primitive agrarian societies. Estimates are provided for benchmark time points in the years 1, 1000, 1500, 1600, 1700, 1800, 1850, 1900, 1950 and 2000.

Working over decades, Maddison gathered data from a plethora of historic sources. Of course, for the times before 1800, and even more so before 1500, Maddison has to make educated guesses. For instance, income estimates before 1500 largely rely on urbanization and population density estimates, assuming that a more dense and urban population requires a higher surplus per capita and, thus, higher average incomes. Hence, the data should not be considered as accurate measures but as estimates that are roughly in the right ballpark as concerns the magnitude of income differences. Support for this assessment is provided by Firebaugh (2010).

Around the year One, the wealthiest region was Mediterranean Europe under the Roman Empire with some 800 US-Dollar per capita in Italy; the poorest regions were those where people still lived as foragers: the Americas, Japan, and Australia/New Zealand with some 400 US-Dollars. Thus, the wealthiest regions were only by a factor of 2.0 above subsistence level and also only double as wealthy as the poorest ones. Around 1000 AD, the richest region was the Middle East under the Islamic Caliphates with some 650 US-Dollars in today's Iran and Iraq; this is just a factor of 1.5 above subsistence level, which still prevailed in the New World. Around 1500, during the Renaissance, the richest societies were again in Mediterranean Europe (especially Northern Italy) with some 1,100 US-Dollars; this is less than triple the subsistence level, which still prevailed in North America and Australia/New Zealand, the remaining foraging regions. This point marks a turn in history: humanity begins to break free from the confinements of subsistence-level economies—a condition that prevailed over the long Malthusian epoch during which income increases were largely eaten up by population growth. In 1800, the richest societies are in Northwestern Europe with some 1,700 US-Dollars in the UK and the Netherlands. This is 4.3 times the income of the poorest region in which, for instance, Ethiopia is just at subsistence level. It is noteworthy that, because of poor soil conditions, most of Sub-Saharan Africa was not suitable for high-surplus plough agriculture and large regions not even for low-surplus hoe agriculture, or horticulture (Weischet & Cavides 1993; Nolan & Lenski 1999; Gallup & Sachs 2000). In 1900, the USA is the richest region with some 5,300 US-Dollars, which is 13 times the income of the still poorest region at the time, Africa, and 13 times above subsistence level. Around 1950, the US leads by 9,600 over 450 US-Dollars in China: a factor of twenty-one and twenty-four times subsistence level. Around 2000, the US leads by 29,000 over 590 US-Dollars in Ethiopia: a factor of almost 50 (73 times subsistence level). It is noteworthy, however, that other regions of Africa are four times above subsistence level.

Appendix-Table 11.8: Maddison's Historic Income Estimates for Selected Exemplary Countries around the World

COUNTRY	1	1000	1500	1600	1700	1800[a)]	1850[b)]	1900[c)]	1950	2000[d)]
Australia	400	400	400	400	400	518	3,273	5,157	7,412	21,732
Austria	425	425	707	837	993	1,218	1,863	3,465	3,706	20,691
Belgium	450	425	875	976	1,144	1,319	2,692	4,220	5,462	20,656
Canada	400	400	400	400	430	904	1,695	4,447	7,291	22,488
China	450	466	600	600	600	600	530	552	448	3,421
Denmark	400	400	738	875	1,039	1,274	2,003	3,912	6,943	22,975
Egypt	600	500	475	475	475	475	649	902	910	2,936
Ethiopia	400	400	400	400	400	400	400	400	400	587
Finland	400	400	453	538	638	781	1,140	2,111	4,253	19,770
France	473	425	727	841	910	1,135	1,876	3,485	5,186	20,422
Germany	408	410	688	791	910	1,077	1,839	3,648	3,881	18,944
Greece	550	400	433	483	530	641	880	1,592	1,915	12,111
India	450	450	550	550	550	533	533	673	619	1,892
Iran	500	650	600	600	600	588	719	1,000	1,720	4,838
Iraq	500	650	550	550	550	588	719	1,000	1,364	1,221
Italy	809	450	1,100	1,100	1,100	1,117	1,499	2,564	3,502	18,774
Japan	400	425	500	520	570	669	737	1,387	1,921	20,738
Mexico	400	400	425	454	568	759	674	1,732	2,365	7,275
Morocco	450	430	430	430	430	430	563	710	1,455	2,652
Netherlands	425	425	761	1,381	2,130	1,838	2,757	4,049	5,996	22,161
Norway	400	400	610	665	722	801	1,360	2,447	5,430	25,102
Portugal	450	425	606	740	819	923	975	1,250	2,086	13,813
South America	400	400	416	438	527	691	676	1493	2503	5786
Spain	498	450	661	853	853	1,008	1,207	2,056	2,189	15,622
Sub-Sah. Africa	472	425	414	422	421	420	500	637	890	1,549
Sweden	400	400	651	700	750	819	1,359	3,073	6,769	20,710
Switzerland	425	410	632	750	890	1,090	2,102	4,266	9,064	22,475
Turkey	550	600	600	600	600	643	825	1,213	1,623	6,446
United Kingdom	400	400	714	974	1,250	1,706	3,190	4,921	6,939	20,353
United States	400	400	400	400	527	1,257	2,445	5,301	9,561	28,467
USSR	400	400	499	552	610	688	943	1,488	2,841	4,460

Note: In columns [a)] to [d)], Maddison indicates the years 1820[a)], 1870[b)], 1913[c)] and 2003[d)]. *Source*: Maddison (2007).

Interpolated Maddison Data and Estimated Human Arrivals

Maddison has provided per capita income estimates for 32 exemplary countries from around the world for ten benchmark points from the year One to 2000. If we interpolate these data for half-century points in between, assuming that--over the long Malthusian epoch--most regions fluctuated around or slightly above a previously achieved level, we obtain the correlations with the cool-water condition, disease security, and proximity to the human origin shown in Appendix-Table 11.19 below. According to Galor (2011) and other economic historians, this is a reasonable assumption.

Appendix-Table 11.9: Correlation Matrix for Figure 11.3 (correlations of Maddison's income estimates with water autonomy, disease security, and proximity to human origin of a country): Correlation Coefficients (*r*)

YEAR	Cool-Water-Condition	Disease Security	Proximity to Human Origin
1	-0.21	-0.40	0.32
50	-0.21	-0.40	0.32
150	-0.21	-0.40	0.32
200	-0.21	-0.40	0.32
250	-0.21	-0.40	0.32
300	-0.21	-0.40	0.32
350	-0.21	-0.40	0.32
400	-0.21	-0.40	0.32
450	-0.21	-0.40	0.32
500	-0.21	-0.40	0.32
550	-0.21	-0.40	0.32
600	-0.21	-0.40	0.32
650	-0.21	-0.40	0.32
700	-0.21	-0.40	0.32
750	-0.21	-0.40	0.32
800	-0.21	-0.40	0.32
850	-0.21	-0.40	0.32
900	-0.21	-0.40	0.32
950	-0.21	-0.40	0.32
1000	-0.47	-0.32	0.40
1050	-0.47	-0.32	0.40
1100	-0.47	-0.32	0.40
1150	-0.47	-0.32	0.40
1200	-0.47	-0.32	0.40
1250	-0.47	-0.32	0.40
1300	-0.47	-0.32	0.40
1350	-0.47	-0.32	0.40
1400	-0.47	-0.32	0.40
1450	-0.47	-0.32	0.40
1500	0.40	0.25	-0.22
1550	0.40	0.25	-0.22
1600	0.50	0.38	-0.28
1650	0.50	0.38	-0.28
1700	0.53	0.44	-0.31
1750	0.53	0.44	-0.31

YEAR	Cool-Water-Condition	Disease Security	Proximity to Human Origin
1800	0.68	0.63	-0.50
1850	0.74	0.69	-0.55
1900	0.76	0.79	-0.63
1950	0.68	0.83	-0.66
2000	0.86	0.77	-0.75
N	32 Exemplary Countries from around the World		

Note: See OA-Table 19 for the sample of countries. Grey-shaded years have real estimates; data gaps in between are interpolated by filling in the previous measure. Significance levels (two-tailed): † $p \geq .100$, * $p < .100$, ** $p < .050$, *** $p < .005$.

The switch in the signs of the correlations in around 1500 coincides with the late achievement of urban maturity in the two cool-water-area civilizations: Western Europe and Japan. Since then, the CW-area civilizations have accrued a developmental advantage and pulled other, un-urbanized CW-areas outside Eurasia into development—hence the increase in the magnitude of the correlations until recently.

If we display the recent times in a more fine-grained way (as shown Figure 8 of the article), we see that over the recent decades correlation magnitudes have fallen. I interpret this as the impact of globalization which diffuses knowledge and technologies in ways that tend to even out natural disadvantages.

Another noteworthy change in the correlation pattern occurs around 1000 CE: it's a change towards a more negative correlation in case of the cool water condition. This change is driven by the drop of per capita incomes in Italy and Mediterranean Europe after the downfall of the Roman Empire. Europe's rise began with the adaptation of intensive surplus agriculture after the introduction of field crop rotation and the oxen-charted iron plough. On this basis cities could grow. But it still lasted until the recovery from the devastating Black Death in 1348 that Europe really got on an upward slope.

Data from the Standard Cross-cultural Sample used in Freedom Rising

Founded by Murdoch and White (1969) and enriched since then with coded ethnographic descriptions by hundreds of anthropologists (Ember & Ember 1998), the Standard Cross-Cultural Sample (SCCS) is a dataset characterizing the living conditions and lifestyles of almost 200 historic local populations, from a Babylonian site in 1750 BCE to a typical Irish community in 1965 CE. These data are widely used among quantitatively oriented anthropologists. A description of the sample and classification procedures is available from the official SCCS codebook (Divale 2004). The following pages provide a description of the variables I used and created from the SCCS for the analyses in Figures 11.5 to 11.7 of *Freedom Rising*. The data are available for download in the files "Figure11.5.sav" and "Figures11.6&11.7.sav" at www.cambridge.org/welzel.

Age of Population ("socagec")

Age of population as used in *Freedom Rising* actually means the age of a location as a human habitat. In other words, what I am interested in is an estimate of the length of time since *homo sapiens sapiens* inhabits a location at the time of its observation. I assume that this time is longer (1) when the time point of the observation is later and (2) when the location's migratory distance from the human origin in Ethiopia is shorter. For any given time point of observation, then, the human habitat age of a location shrinks with its migratory distance from the human origin. Hence, to estimate a location's human habitat age at the time point of its observation, we can subtract its migratory distance from the teim of observation, provided the time point of observation and the migratory distance are measured in the same standardized score range from minimum 0 to maximum 1.0. Thus, I need standardized measures of the time point of observation and an estimate of a location's migratory distance from the human origin.

The SCCS provides a measure of the time of observation, called "focyear," which gives the year of observation for every local population sampled. The measure ranges from -1750 (i.e., 1750 BCE) to 1965. I standardize this measure into a 0-to-1 range as follows (SPSS syntax):

```
Compute focyearn = (focyear - - 1750) / (1965 - - 1750).
```

The SCCS does not provide a measure for a local population's migratory distance from the human origin. But one can create a proxy from a population's latitudinal centroid (which is given in variable V179 in degrees of latitude) and its longitudinal centroid (which is given in variable V181 in degrees of longitude). The assumption is that migratory distance increases with the combined latitudinal and longitudinal distance from Ethiopia's country centroid (9 degrees latitude, 38 degrees longitude).

Variable V180 indicates whether a latitude is North (code 1) or South (code 2), while variable V182 indicates whether a longitude is East (code 3) or West (code 4). I use this information to divide the latitudinal and longitudinal degrees in variables V179 and V181 into negative ones (South in latitude, West in longitude) and positive ones (North in latitude, West in longitude):

```
If (v180 = 1) latit1 = v179.
If (v180 = 2) latit1 = -1 * v179.
```

```
If (v182 = 3) longit1 = v181.
If (v182 = 4) longit1 = -1 * v181.
```

The following command centers latitudes and longitudes on the coordinates of Ethiopia's country centroid (+8 degrees in latitude, +38 degrees in longitude), yielding deviation scores in degrees of latitude and longitude from Ethiopia:

```
Compute latit2 = latit1 - 8.
Compute longit2 = longit1 - 38
```

The following command transforms all deviation scores into positive numbers, indicating the magnitude of latitudinal and longitudinal distance:

```
Compute latit3 = sqrt (latit2 * latit2).
Compute longit3 = sqrt (longit2 * longit2).
```

The following command standardizes latitudinal and longitudinal deviations from Ethiopia into a range with minimum 0 and maximum 1.0:

```
Compute latitn = latit3 / 63.
Compute longitn = longit3 / 210.
```

The following command averages the standardized latitudinal and longitudinal deviation scores into one distance measure but gives the latitudinal distance a double as large weight, following Diamond's (1997) assumption that bridging latitudinal distances is, under otherwise equal conditions, a bigger challenge than bridging longitudinal distances (given the change of climate zones with latitudes):

```
Compute latitlongit = (2 * latitn + longitn) / 3.
```

This is a fairly reasonable measure of migratory distances for the African-Eurasian landmass and its connection via the Indonesian archipelago to Australia/New Zealand and the Pacific. However, for the Americas the situation is different because humans migrated there over Beiring Strait from North to South. Thus, migratory distance in the latitudinal dimension operates in the Americas from the most Northern position (71 degrees) southward. The following command, hence, creates another latitudinal distance variable:

```
Compute latit1am = 71 - latit1.
```

The following commad standardizes scores on the new latitudinal distance variable into a range between minimum 0 and maximum 1.0:

```
Compute latit2am = (latit1am - 0) / (126 - 0).
```

Using information from variable V200 whose codes 5 and 6 indicate location in the Americas, the new latitudinal distance variable is used to estimate migratory distance in the Americas:

```
If (v200 ne 5) and (v200 ne 6) latitlongit1 = latitlongit.
If (v200 = 5) or (v200 = 6) latitlongit1 = (2 * latit2am + longitn) / 3.
```

To estimate human habitat age, I now subtract the standardized migratory distance from the standardized time point of observation:

```
Compute socagec = focyearn – latitlongit1.
```

The following command standardizes this estimate into a score range from minimum 0 to maximum 1.0:

```
Compute socagec = (socagec -- .27) / (.99 -- .27).
```

Cool-Water Condition ("coldwet2a")

The variables used to measure the cool-water condition for national societies in *Freedom Rising* are not available for the local populations described in the SCCS. Thus, I have to use different variables to measure the combination of continuous rainfall and the prevalence of relatively cool temperatures over the year. Variable V186 in the SCCS measures the mean annual temperature of a local population's territory in degrees of Celsius. Variable V196 measures the number of dry months in a local population's territory given as a count variable, which I invert so that higher numbers mean fewer dry months. I standardize both variables into the same score range from minimum 0 to maximum 1.0 and then average their scores, as follows (SPSS syntax):

```
Compute antemp = (v186 - - 30) / (50 - - 30).
Compute invtemp = 1 - antemp.
Compute invdry = 1 - ((v196 - 0) / (12 - 0)).
Compute coldwet2a = (invtemp + invdry) / 2.
```

Disease Security ("dissect")

The variable V1260 in the SCCS measures a local population's pathogen stress from seven diseases, including leishmanias, trypanosomes, malaria, schistosomes, filariae, spirochetes, and leprosy. Each of these is measured on a 3-point ordinal scale from 1 (absent) to 2 (present but not widespread) to 3 (widespread). Thus, scale minimum (code 1 on all seven diseases) is 7 and maximum is 21 (code 3 on all seven diseases). I standardize this measure into a score range from minimum 0 to maximum 1.0, with fractions for intermediate positions:

```
Compute dissec = 1 - (v1260 - 7) / (21 - 7).
```

Foreaging Lifestyle ("foreage")

The variable V729 measures the importance of fishing, shell fishing and marine hunting for a local population on a 5-point ordinal scale from 1 (dominant subsistence activity) to 5 (insignificant subsistence activity). Variable V730 measures the importance of hunting and gathering for a local population on the same scale. I invert the polarity of both variables (so that higher scores indicate more reliance on foraging), standardize both measures into a score range from minimum 0 to maximum 1.0 and then average them as follows (SPSS syntax):

```
Compute fishing = 1 - ((v729 - 1) / (5 - 1)).
Compute hunting = 1 - ((v730 - 1) / (5 - 1)).
Compute foreage = (fishing + hunting) / 2.
```

State Formation ("locpolaut")

Variable V699 in the SCCS measures a local population's level of political integration on a 5-point ordinal scale from 1 (complete local autonomy) to 5 (integration into a territorial state). I standardize the measure into a score range from minimum 0 to maximum 1.0 as follows:

```
Compute locpolaut = 1 - ((v699 - 1) / (5 - 1)).
```

Variable V64 meaures a local population's density on a 7-point ordinal scale from 1 (less than 1 person per 5 square miles) to 7 (more than 500 persons per 5 square miles). I use this measure as a proxy for urbanization and standardize it into a score range from minimum 0 to maximum 1.0 as follows (SPSS syntax):

```
Compute popdens = (v64 - 1) / (7 - 1).
```

Market Exchange ("capitalism")

Variable V17 measures the monetization of a local population's economy on a 5-point ordinal scale from 1 (no medium of exchange exists) to 5 (indigenous coinage/paper currency). Variable V18 measures the level of credit institutionalization in a local population on a 4-point ordinal scale from 1 (loans via relatives) to 4 (institutionalized bank system). The variable "trade1" measures whether a local population produces commodities for trade on a 3-point ordinal scale from 0 (no product for trade) to 1 (1 product for trade) to 2 (more than 1 product for trade). The variable "trade2" is a dummy measuring whether a local population has no wage labor (code 0) or does have wage labor (code 1). The variable "trade3" is a dummy measuring whether a local population has no monetary system (code 0) or does have a monetary system (code 1). I standardize each of these variables into a score range from minimum 0 to maximum 1.0 and then average their scores so as to measure the degree of market exchange, labeled "capitalism" in my dataset:

```
Compute money = (v17 - 1) / (5 - 1).
Compute credit = (v18 - 1) / (4 - 1).
Compute trade1n = (trade1 - 0) / (2 - 0).
Compute trade2n = (trade2 - 0) / (2 - 0).
Compute trade3n = (trade1 - 0) / (1 - 0).
Compute traden = (trade1n + trade2n + trade3n) / 3.
Compute capitalism = (money + credit + traden) / 3.
```

Reproductive Autonomy ("reprochoice2")

Variable V877 in the SCCS measures the presence of polygyny in a local population on an 8-point ordinal scale from 0 (no polygyny whatsoever) to 7 (widespread polygyny). If one inverts this variable, one obtains a measure of the prevalence of monogamy. Variable V967 measures the average female marriage age in a local population on a 6-point ordinal scale from 1 (under 12 years) to 6 (above 25 years). Variable V969 measures imposed restrictions on spousal choice in a local population on an 8-point ordinal scale from 1 (least restricitve) to 8 (most restrictive). Calculating the inverse of this variable, one has a measure of freedom of spousal partner choice. Variable V971 measures the superfluence of a wife's consent to be married (see Appendix-Figure 11.1 below) on a 3-point scale from 1 (consent is necessary) to 2 (spouse is consulted) to 3 (consent not necessary). Calculating the inverse of this variable, one obtains a measure of female marriage freedom. Taken together, these are all aspects of (especially female) reproductive autonomy. I standardize these variables into 0-to-1 score ranges, inverte them when necessary to obtain polarities in the same direction (larger scores indicating more autonomy) and averaged the scores as follows:

```
Recode v877 (6=1) (4=2) (2=3) (3=4) (1=5) (5=6) (0=7) into monogamy1.
Compute monogamy = (monogamy1 - 1) / (7 - 1).
Compute femmarage = (v967 - 1) / (6 - 1).
Compute marchoice = 1 - ((v969 - 1) / (8 - 1)).
Compute femcons = 1 - ((v971 - 1) / (3 - 1)).
```

```
Compute reprochoice2 = (femmarage + marchoice + femcons + monogamy) / 4.
```

Self-Reliance & Mastery ("reliance_mf")

Variable V306 in the SCCS measures for a local population the inculcation of self-reliance as a value in early boys on an ordinal scale from 1 (no inculcation) to 9 (strong inculcation). Variable V307 measures the same for early girls, V308 for late boys and V309 for late girls. These measures are one-dimensional and I average and standardize them to obtain an overall measure of a local population's emphasis on self-reliance:

```
Compute selfrely1 = (v306 + v307 + v308 + v309) / 4.
Compute selfrely = (selfrely1 – 4) / (36 – 4).
```

V310 measures for a local population the inculcation of achievement as a value in early boys on an ordinal scale from 1 (no inculcation) to 9 (strong inculcation). Variable V311 measures the same for early girls and V312 and V313 do the same for late boys and late girls, respectively. Again, these measures are one-dimensional and I average and standardize them to obtain an overall measure of a local population's emphasis on achievement, as follows:

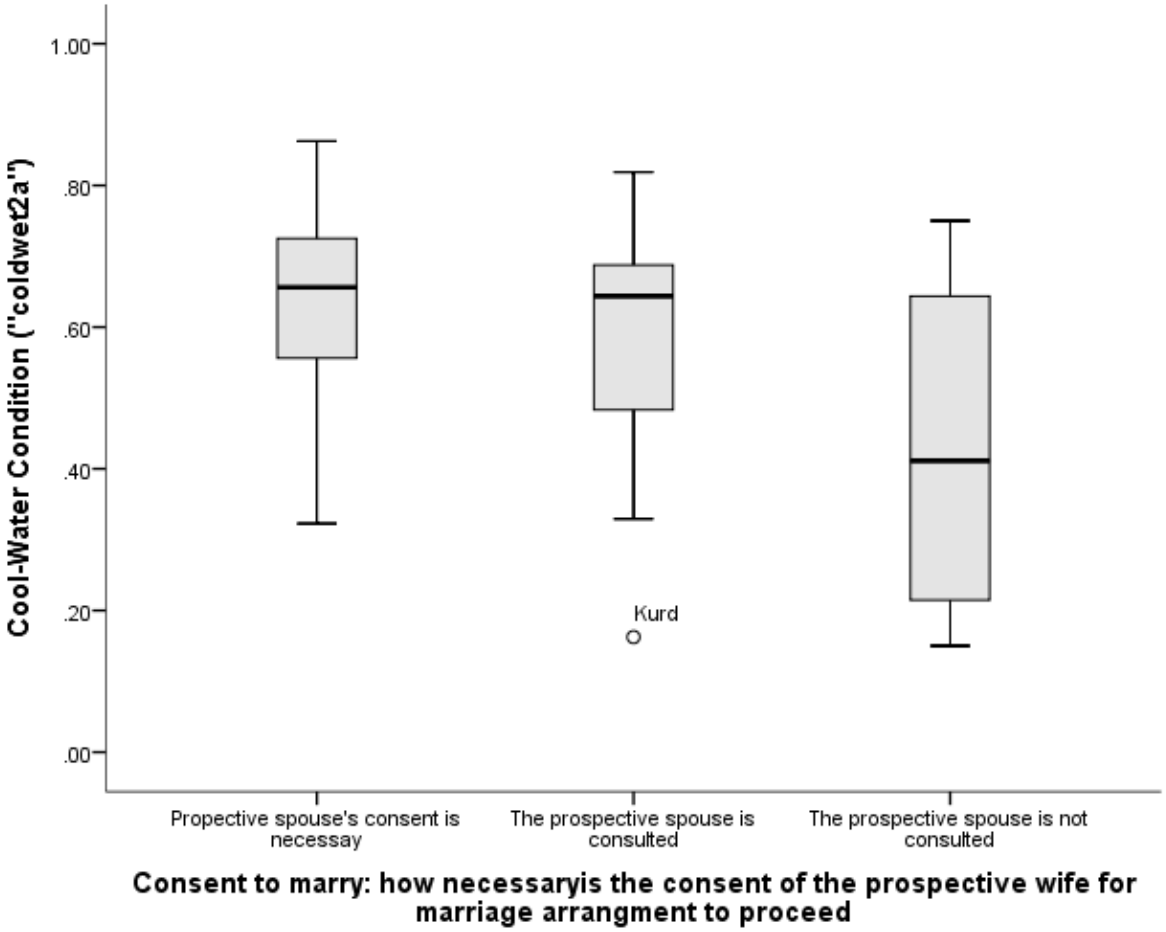
```
Compute achievem1 = (v310 + v311 + v312 + v313) / 4.
Compute achievem = (achievem1 – 4) / (36 – 4).
```

In the next step, I summarize the measures for emphasis on self-reliance and achievement in a factor scale, measuring the underlying individualism dimension, labeled "Self-reliance & Mastery" in Figure 11.7 of *Freedom Rising*. The SPSS syntax reads as follows:

```
FACTOR
  /VARIABLES selfrely achievem
  /MISSING PAIRWISE
  /ANALYSIS selfrely achievem
  /PRINT INITIAL CORRELATION KMO EXTRACTION ROTATION FSCORE
  /FORMAT SORT
  /CRITERIA MINEIGEN(1) ITERATE(25)
  /EXTRACTION PC
  /CRITERIA ITERATE(25)
  /ROTATION VARIMAX
  /SAVE REG(ALL)
  /METHOD=CORRELATION.

Rename fac1_1 into reliance_mf.
```

Appendix-Figure 11.1: Reproductive Autonomy and the Cool-Water Condition in the SCCS



APPENDIX 12 (Ref. CHAPTER 12)

New Variables in Figures 12.1 to 12.3 and Table 12.1

Human Empowerment Index (in 2005): Societies' mean score over technological advancement, emancipative values and civic entitlements.

Environmental Impact (in 2010): This variable measures the "ecological footprint" in the year 2010, measured in global hectares per person in a society (Global Footprint Network 2012). The measure indicates the area of biologically productive land and sea needed to produce the resources that a society consumes.

Environmental Quality (in 2010): Using a dimensionally extracted weighting scheme of two dozen indicators of objective air, water and soil quality, the "environmental performance index" measures the state of "environmental health" and "ecosystem vitality" in a society (Yale Center for Environmental Law and Policy 2012). The original index shows a score range from 0 to 100, which I transform into a range from 0 to 1.0, with fractions for intermediate positions.

Ecological Sustainability (in 2010): This is the ratio of a society's biological carrying capacity to its environmental impact (both measured in global hectars per person), dividing the former by the latter. A ratio above 1.0 indicates that the carrying capacity is higher than the environmental impact, which is a sustainable situation. A ratio below 1.0 indicates the opposite. Because ratios show a strongly skewed distribution, I calculated logs of them and then standardized these into a score range from minimum 0 to maximum 1.0 in such a way that 0.5 indicates the sustainability threshold, that is, a perfect balance between carrying capacity and environmental impact. Scores below that threshold indicate unsustainable situations, scores above 0.5 the opposite.

Data are available for download in the files "Figures12.1_12.3&Table12.1.sav" and "Figure12.4&Table12.2" at www.cambridge.org/welzel.

Additional Variables in Table 12.2 and Figure 12.4

'Green' Concern: A person's environmental concern is measured using questions V111 to V113 of the WVS round-five questionnaire. The question reads:

> Now let's consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all? (*Read out and code one answer for each problem*):

	Very serious	Somewhat serious	Not very serious	Not serious at all
V111. Global warming or the greenhouse effect.	1	2	3	4
V112. Loss of plant or animal species or biodiversity.	1	2	3	4
V113. Pollution of rivers, lakes and oceans.	1	2	3	4

I recode this response scheme into 0 for "not serious at all," .33 for "not very serious," .66 for "somewhat serious" and 1.0 for "very serious" for all three items and

average the score over the three items.[51] To measure the prevalence of 'green' concerns in a society, I calculate the population average on this index.

Environmental Priority: This variable measures if a respondent prioritizes environmental protection over job creation (coded 1) or the other way round (coded 0) or whether s/he does not care (coded .50). The respective question in the WVS round-five questionnaire reads:

V104. Here are two statements people sometimes make when discussing the environment and economic growth. Which of them comes closer to your own point of view? (*Read out and code one answer*):
1 Protecting the environment should be given priority, even if it causes slower economic growth and some loss of jobs.
2 Economic growth and creating jobs should be the top priority, even if the environment suffers to some extent.
3 Other answer (*code if volunteered only!*).

To meausure environmental priority, I recode response 1 into code 1, response 3 into .50 and response 2 into 0.[52] To measure the prevalence of environmental priorities in a society, I calculate the population average on this index.

Environmental Activism: This variable measures environmental priorities on the condition that they translate into social movement activity, or to the extent to which they translate into such activity. We can also say that the variable measures social movement activity on the condition that or to the extent to which they are motivated by environmental priorities. This conditional index (which is, again, not a latent variable) is calculated by multiplying the 0-to-1 measure for environmental priorities with the 0-to-1 measure for social movement activity described in Appendix 7.[53]

Economic Egalitarianism: The variable measures how strongly a respondent favors more income equality on a 10-point scale based variable V116 in the WVS round-five questionnaire. The question reads:

V116. Now I'd like you to tell me your views on various issues. How would you place your views on this scale? 1 means you agree completely with the statement on the left; 10 means you agree completely with the statement on the right; and if your views fall somewhere in between, you can choose any number in between. (*Code one number for each issue*):

Incomes should be made more equal									We need larger income differences as incentives for individual effort
1	2	3	4	5	6	7	8	9	10

I recode the responses into a scale range from minimum 0 to maximum 1.0, with fractions indicating intermediate positions. Polarity of the score range is inverted so that larger scores indicate more support for income equality.[54]

Data for the multi-level model in Table 12.2 of *Freedom Rising* are for download in the files "Table12.2IL.sav" (invidual-level data) and "Table12.2SL.sav" (societal-level data) at www.cambridge.org/welzel.

Suppressor Effect: The positive influence of societal-level emancipative values on the environmental performance shown in the right panel of Table 12.1 of *Freedom Rising*

[51] SPSS syntax: Recode V111 (1=1) (2=.66) (3=.33) (4=0) into GloHea. Recode V112 (1=1) (2=.66) (3=.33) (4=0) into BioLos. Recode V113 (1=1) (2=.66) (3=.33) (4=0) into AirPol. Compute EnvCon = (GloHea + BioLos + AirPol) / 3.

[52] SPSS syntax: Recode V104 (1=1) (2=0) (3=.50) into EnvPrio.

[53] SPSS syntax: Compute EnvAct = EnvPrio * SMA.

[54] SPSS syntax: Compute EcoEga = 1 - ((V116 – 1) / (10 – 1)).

provides a formidable example for a suppressor effect. The bivariate relationship between emancipative values and environmental performance points to an insignificant $r = .15$ ($N = 50$) but under control of technological advancement the effect of emancipative values on environmental performance turns into an $r_{partial}$ of .41 (significant at the .005-level). This shows that emancipative values have a positive effect on the environmental performance among societies at similar levels of technological advancement. If we do not control for technological advancement, this effect is invisible because technological advancement, while it is linked with emancipative values, has a negative effect on environmental performance. Not controlling for technological advancement, thus, 'suppresses' the effect of emancipative values.