Online Appendix

for "Satisfaction with Democracy: When Government by the People brings Electoral Losers and Winners Together"

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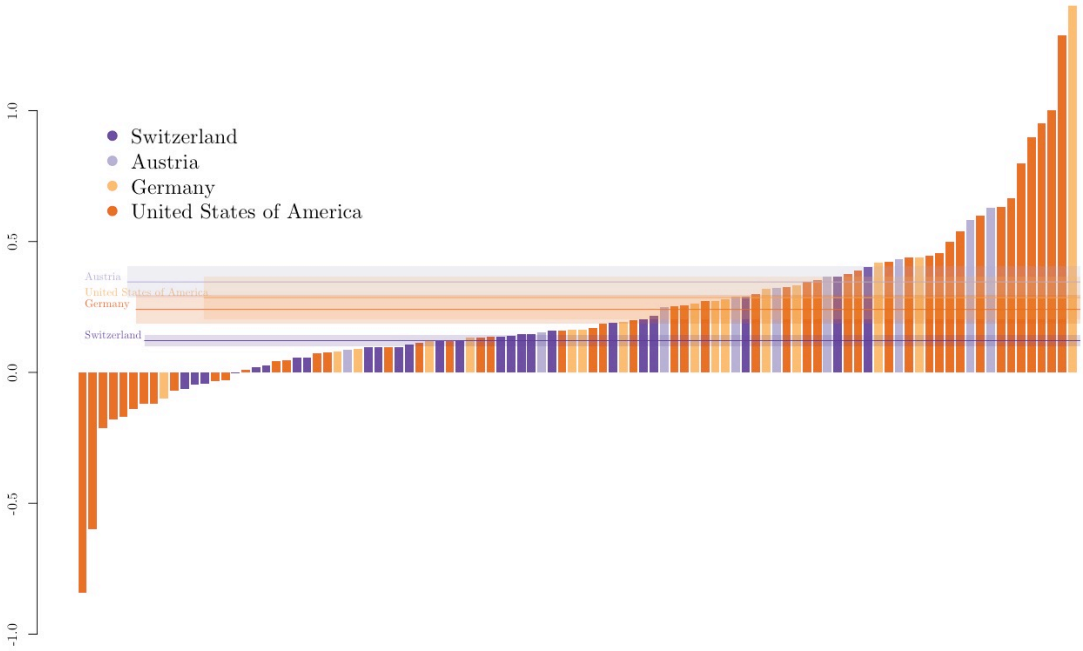
A1 Variable Overview

A1.1 Satisfaction Gap and Direct Democracy

Here, we descriptively explore the winner-loser gap (Anderson and Guillory, 1997). Each vertical bar in Figure A3 represents the average difference in satisfaction with democracy for electoral winners and losers. Positive values indicate that electoral winners are more satisfied with democracy than electoral losers. The horizontal lines show the country average gap per sub-national unit and its 68% confidence interval (± one standard error).

Figure A3: Winner-Loser Gap by Sub-national Unit



Note: Positive values indicate that winners are more satisfied with democracy than losers. Horizontal bars show national averages of winner-loser gap and plus/minus one standard error.

A1.2 Variable Description and Sources

Table A4: Variable description

Variable	Description	Operationalization
Individual-level variables		
Satisfaction with Democracy	Satisfaction with how democracy works in a country	Ordinal variables from 1 (not at all satisfied) to 4 (very satisfied)
Voted for Party in Government	Respondents who voted for a party in the government are considered as electoral winners, all others electoral losers	Dummy variable created based on two variables: 1) the party the respondent elected in the last national elections; 2) own coding of sub-national governments and their party compositions. For coalition governments, all parties included in the government are considered. For the US states, the party affiliation of the governor is taken into account. If a respondent has voted for a party that is currently in the government, the variable takes the value 1, and it takes the value 0 if this is not the case.
Participated in the Last National Election	Self-reported participation in the last national elections	Dummy variable assuming 1 if respondents indicated to have voted in the last national elections, and 0 otherwise.
Age	Age in years	Age in years as well as age squared to account for non-linear age effects.
Female	Respondent's gender	Dummy variable female (reference category) vs. male
Education	Educational level	Ordinal variable with 6 educational level from 0 (low education) to 6 (high education, the reference category) based on ISCED.

Table A5: Continuation of Table A4

Variable	Description	Operationalization
Employment	Level of employment	Ordinal variable for varying employment status. The categories are full-time employed (reference category), part-time employed, unemployed or disabled, retired, student, or homemaker
Sub-nation level variables		
Direct Democracy Index	The degree of direct democracy in a sub-national unit	See coding information in Appendix A3
Past DD Usage	Frequency of past direct democratic votes	See coding information in Sub-section subsection A3.1 of the Appendix
Size of Majority	The size of the governing coalition	Total share of votes of the governing parties in the sub-national units. Own coding based on information from governmental homepages.

Note: All individual-level variables are taken from ANES (2019), AUTNES et al. (2016), GLES (2018) and Selects (2016). The recoding scheme used to make the individual-level variables comparable across surveys can be found in the supplemental material.

Table A6: Descriptive Statistics

Statistic	N	Mean	St. Dev.	Min	Max
Individual-level variables					
Satisfaction with Democracy	11,888	2.862	0.706	1.000	4.000
Voted for Party in Government	12,690	0.368	0.482	0	1
Participated in Last National Election	12,609	0.727	0.446	0.000	1.000
Age	12,481	0.492	0.182	0.150	0.960
Female	12,638	0.514	0.500	0.000	1.000
Employment Categories	12,459	3.378	1.436	1.000	6.000
Education Categories	12,550	4.398	2.188	1.000	7.000
Sub-national level variables					
Direct Democracy Index	12,690	1.128	0.646	0.000	2.000
Past DD Usage	12,690	2.803	3.202	0.000	11.400
Size of Majority	12,690	0.643	0.154	0.154	0.967

A2 Satisfaction with Democracy: Comparison of National and Sub-national Levels

Figure A4: Correlations between National and Sub-national Democratic Satisfaction

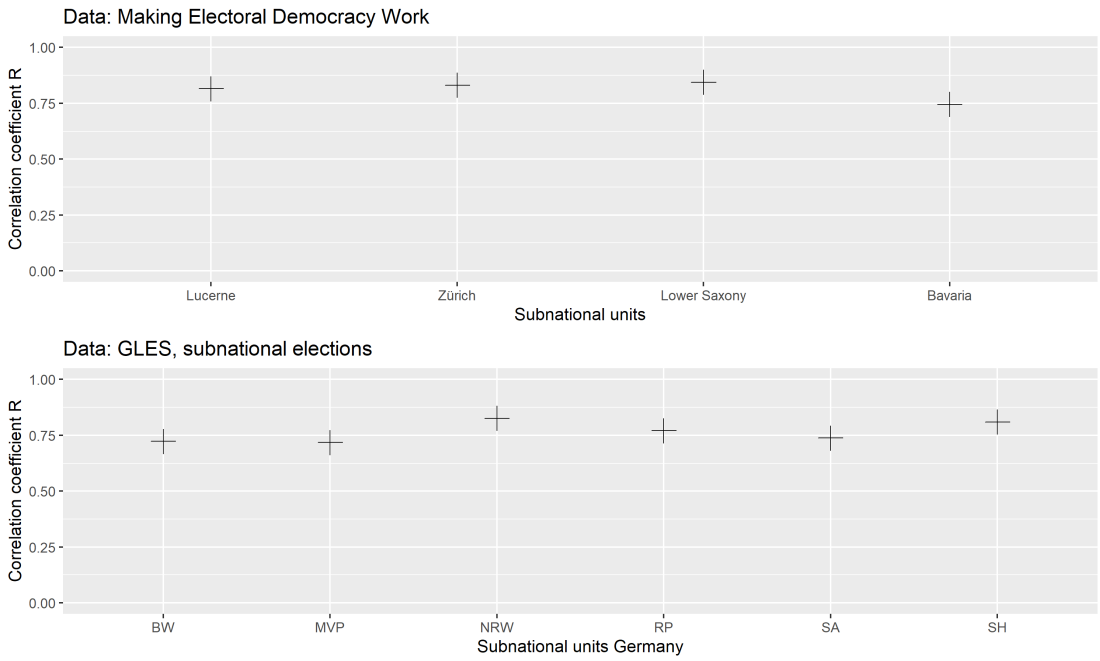


Table A7: Satisfaction

	MEDW		GLES	
	National	Sub-national	National	Sub-national
Winner	0.499***	1.225***	0.269***	0.356***
	(0.108)	(0.104)	(0.039)	(0.035)
Individual-Level Variables	✓	✓	✓	✓
FE Sub-national units	✓	✓	✓	✓
Observations	2,023	2,023	2,613	2,631
R^2	0.038	0.082	0.108	0.117
Adjusted R^2	0.034	0.078	0.103	0.112

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$, all models include a gender indicator, age and age^2, indicators for 2 (MEDW) resp. 3 (GLES) education categories. The GLES models further include participation in the upcoming sub-national elections and five employment categories.

A3 Sub-National Direct Democracy Index (snDDI)

A3.1 Coding Details and Data Sources for the snDDI

Any index faces a large number of coding decisions and relies on a large host of original or secondary data. In this sub-section, we provide additional information on the data sources and the coding of variables. To make this easier to read, we break it up in four country-specific parts.

- **Germany** Data were collected from various sources, mostly from original ballot voting laws (last accessed on February 15, 2021):
  - https://www.lpb-bw.de/bwverf/bwverf.htm#Gesetzgebung
  - https://www.wahlen.bayern.de/volksentscheide/volksbegehren.htm
  - https://bb.mehr-demokratie.de/berlin/berlin-volksbegehren/berlin-land-uebersicht/
  - https://www.landtag.brandenburg.de/de/mitgestalten/volksgesetzgebung/volksbegehren/396768, https://www.mehr-demokratie.de/themen/volksbegehren-in-den-laendern/bisherige-volksbegehren/,
  - https://www.hamburg.de/volksabstimmungen/54020/volksabstimmungen/#anker_0
  - http://www.rv.hessenrecht.hessen.de/lexsoft/default/hessenrecht_rv.html?pid=Dokumentanzeige&showdoccase=1&js_peid=Trefferliste&documentnumber=1&numberofresults=20&fromdoctodoc=yes&doc_id=jlr-VAbstGHE1950rahmen%3Ajuris-lr00&doc_part=X&doc_price=0.0&doc_hl=1#docid:170048,24,17770101
  - http://www.landesrecht-mv.de/jportal/portal/page/bsmvprod.psml?nid=g&showdoccase=1&doc.id=jlr-VaGMVpP12&st=lr, http://www.nds-voris.de/jportal/portal/t/glc/page/bsvorisprod.psml?doc.hl=1&doc.id=jlr-VerfNDpArt48&documentnumber=58&numberofresults=92&doctyp=Norm&showdoccase=1&doc.part=S&paramfromHL=true#focuspoint
  - https://recht.nrw.de/lmi/owa/br_bes_detail?sg=0&menu=1&bes_id=3321&anw_nr=2&aufgehoben=N&det_id=393352
  - http://landesrecht.rlp.de/jportal/portal/t/l6t/page/bsrlpprod.psml/action/portlets.jw.MainAction?p1=3r&eventSubmit_doNavigate=searchInSubtreeTOC&showdoccase=1&doc.hl=0&doc.id=jlr-VerfRPpArt109&doc.part=S&toc.poskey=#focuspoint
  - http://www.lexsoft.de/cgi-bin/lexsoft/justizportal_nrw.cgi?xid=147988,25
  - https://www.revosax.sachsen.de/vorschrift/3975-Verfassung#a72
  - https://www.landtag.sachsen-anhalt.de/fileadmin/Downloads/Volksabstimmungsgesetz.pdf
  - http://www.gesetze-rechtsprechung.sh.juris.de/jportal/?quelle=jlink&query=Verf+SH&psml=bsshoprod.psml&max=true&aiz=true#jlr-VerfSH2014pArt49
  - https://www.thueringen.de/imperia/md/content/landtag/gesetze/verfassung_internet.pdf
  - https://www.historisches-lexikon-bayerns.de/Lexikon/Volksabstimmungen
  - Initiative
    - Bavaria: Counted for proposed law and not change in constitution (which has stricter rules, e.g., 25% quorum).

    - Berlin: Counted for proposed law and not change in constitution (which has stricter rules, e.g., 20% signature threshold and 2/3 quorum).
    - Brandenburg: Signature threshold in absolute numbers; 80,000 have to be collected in 180 days.
    - Bremen: Counted for proposed law and not change in constitution (which has stricter rules, e.g., 10% signature threshold and 40% quorum).
    - Mecklenburg-Vorpommern: Signature threshold in absolute numbers (120,000 signatures). Counted for proposed law and not change in constitution (which has stricter rules, e.g., 50% quorum).
    - Nordrhein-Westfalen: Counted for proposed law and not change in constitution (which has stricter rules, e.g., 2/3 majority and 50% quorum).
    - Rheinland-Pfalz: Signature threshold in absolute numbers; 300,000 have to be collected.
    - Sachsen: Signature threshold in absolute numbers; 450,000 have to be collected.
    - Schleswig-Holstein: Signature threshold in absolute numbers; 80,000 have to be collected.
    - Thuringia: Different thresholds depending on whether freely collected or collected in municipality buildings. We took the lower threshold of non-freely collected.
  - Optional Referendum
    - Hamburg: Exists only since 2009, more information: https://hh.mehr-demokratie.de/themen/direkte-demokratie/referenden/fakultatives-referendum/
  - Mandatory Referendum
    - Bavaria: Las use in 2013 (https://www.historisches-lexikon-bayerns.de/Lexikon/Volksabstimmungen)
    - Hessen: Last use in 2011 (https://wahlen.hessen.de/land-hessen/volksbegehren-und-volksentsc allgemeine-informationen)

- **Unites States of America** Data were collected from various sources, mostly from original ballot voting laws (last accessed on February 15, 2021):
  - http://akleg.gov/docs/pdf/citizens_guide.pdf
  - https://azsos.gov/sites/default/files/2020_Initiative%20_Referendum_Guide.pdf
  - https://www.sos.arkansas.gov/uploads/2019-2020_I__R_Handbook_-_Jan_2020.pdf

- https://www.sos.ca.gov/elections/ballot-measures/referendum
- https://www.sos.state.co.us/pubs/info_center/laws/COConstitution/ArticleVSection1.html
- https://fldoswebumbracoprod.blob.core.windows.net/media/697659/initiative-petition-handbook-2018-election-cycle pdf
- https://sos.ga.gov/admin/files/Constitution_2013_Final_Printed.pdf
- https://legislature.idaho.gov/statutesrules/idconst/ArtIII/Sect1/
- https://www.sos.ks.gov/elections/19elec/2019-Kansas-Election-Standards-Chapter-V-Petitions.pdf
- https://www.sos.la.gov/ElectionsAndVoting/FindPublicOfficials/RecallAnElectedOfficial/Pages/default. aspx
- https://www.maine.gov/sos/cec/elec/citizens/peoppak.html
- https://msa.maryland.gov/msa/mdmanual/43const/html/16art16.html
- https://www.sec.state.ma.us/ele/elepdf/State-Ballot-Question-Petitions-01-2019.pdf
- http://www.legislature.mi.gov/(S(3vd2ojdpjl3ohdk4d3gositl))/mileg.aspx?page=getObject&objectName= mcl-Article-II-9
- https://www.sos.state.mn.us/elections-voting/how-elections-work/ballot-questions/?searchTerm= referendum
- https://www.sos.ms.gov/Elections-Voting/Pages/Initiatives.aspx
- https://www.sos.mo.gov/CMSImages/Elections/Petitions/MakeYourVoiceHeard2020Cycle-Updated2-4-2020. pdf
- https://leg.mt.gov/bills/mca/title_0130/chapter_0270/parts_index.html
- https://sos.nebraska.gov/sites/sos.nebraska.gov/files/doc/elections/2018/state-initiative-and-referendum-packet pdf
- https://www.nvsos.gov/sos/elections/initiatives-referenda
- https://lis.njleg.state.nj.us/nxt/gateway.dll?f=templates&fn=default.htm&vid=Constitution:Public
- https://realfileee3072ab0d43456cb15a51f7d82c77a2.s3.amazonaws.com/d94fb18b-4eb2-4503-a71f-d7c2b716a88c? AWSAccessKeyId=AKIAJBKPT2UF7EZ6B7YA&Expires=1615816334&Signature=d0konum%2FA4BIw4iJCbd8%2FB7kpqQ% 3D&response-content-disposition=inline%3B%20filename%3D%22nmconst2019.pdf%22&response-content-type= application%2Fpdf
- https://vip.sos.nd.gov/PortalListDetails.aspx?ptlhPKID=2&ptlPKID=1#content-start
- https://www.sos.state.oh.us/legislation-and-ballot-issues/putting-an-issue-on-the-ballot/
- https://www.sos.ok.gov/gov/petition_process.aspx
- https://sos.oregon.gov/elections/Pages/statelaw.aspx
- https://sdsos.gov/elections-voting/upcoming-elections/ballot-question-information/signature-requirements-ballot aspx
- https://voteinfo.utah.gov/instructions-for-a-statewide-initiative/
- https://www.sos.wa.gov/elections/initiatives/

- https://elections.wi.gov/elections-voting/recall
- https://sos.wyo.gov/Elections/InitiativeReferendumInfo.aspx
- https://www.sos.state.co.us/pubs/elections/Initiatives/files/PetitionManual.pdf
- https://legislature.idaho.gov/statutesrules/idstat/Title34/T34CH18/
- https://www.maine.gov/sos/cec/elec/citizens/inipak.html
- https://sos.oregon.gov/elections/Documents/stateIR.pdf
- https://voteinfo.utah.gov/instructions-for-a-statewide-referendum/
- https://ballotpedia.org/

One difficulty that can arise in the US is that citizens can use DDIs for statutes or the constitution. When there were two instruments available, we opted to code the one that gives citizens more influence.

- **Initiative**
  - Signature requirements are usually defined in percentage of votes cast in the previous gubernatorial election. We calculate the equivalent percentage of eligible voters that need to sign to make these numbers comparable.
  - We did not take into account whether there is a geographic quorum, which does exist in some states.
  - Some states have exceptions on what can be voted on or make the process more difficult. In Utah, e.g., proposing new laws that would limit hunting require a two-third majority. In Washington, there is a super-majority for proposals that would affect gambling. We disregard these additional limits.
  - Collection time is often defined as until X months before the election as the ballot vote is also held on election day. In those cases, we took the midpoint between the earliest possibility and the latest.
- **Optional Referendum**
  - Collection time is often defined as until X months before the election as the ballot vote is also held on election day. In those cases, we took the midpoint between the earliest possibility and the latest.
  - We did not take into account whether there is geographic quorum, which does exist in some states.

– **Mandatory Referendum**

* Every state, with the exception of Delaware, has a mandatory ballot vote for changes to the constitution.
* We did not take into account whether there is geographic quorum, which does exist in some states.

- **Austria**: The Austrian Länder are coded mostly based on the ballot vote laws. Here are a number of additional resources used (last accessed on February 15, 2021):
  - http://wahl.bgld.gv.at/wahlen/lt20150531.nsf
  - http://www.ktn.gv.at/wahlen/ltwahl2013/
  - http://www.noe.gv.at/wahlen/L20131/Index.html
  - http://www.land-oberoesterreich.gv.at/files/statistik/wahlen/wahlenooe/ltw/ltw_4.pdf
  - https://www.salzburg.gv.at/stat/wahlen/ltw/index.html#hist.5.0
  - https://egov.stmk.gv.at/wahlen/LT2015/LT2015_60000.html
  - https://wahlen.tirol.gv.at/landtagswahl_2013/
  - www.vorarlberg.at/wahlen/lt.asp
  - https://www.wien.gv.at/wahl/NET/GR151/GR151.htm

  – **Initiative**

  * Kärnten: To launch an initiative, one has to register it first, and for that, one already needs 2000 signatures. They are not taken into account in the total signature count.
  * Steiermark: They have two signature levels. A low one, where the government only has to pass the proposal on to the legislature but there is no direct vote. The higher one is similar, but if the legislature does not act within a year, there is a vote. We did take the higher signature threshold as only that which can force a ballot vote.
  * In Vorlarlberg, there are also two thresholds, and we again go for the lower value (5,000 signatures).

  – **Optional Referendum**

    - In several Bundesländer, it is not enough to sign, they also require validation through municipality that a person has the right to sign (Burgenland, Salzburg, Steiermark, Tirol, and Vorarlberg). Although this is an added level of difficulty, it does not enter as such in the index.
  - **Mandatory Referendum**
    - In Salzburg, any change in the constitution triggers a mandatory vote.
    - In Vorarlberg, this is only the case if the changes affect the sovereignty of the Bundesland, the territory of Vorarlberg, the suffrage rules, or the right of citizens and municipalities to launch referendums or initiatives. We coded this as a case with mandatory referendum.

- **Switzerland**: The Swiss cantons were coded based on Stutzer (1999), and the cantonal constitutions were used to update numbers and verify the changes that had occurred since the last coding. For the initiative and the optional referendum, there are some specific coding choices that are highlighted below. Financial referendums are not counted.
  - **Initiative**
    - If the number of signatures for the legislative initiative was smaller than that for the constitutional initiative, the smaller hurdle was taken, this concerns: VS, TI, SG, NE, LU, GR, GE, and NW.
    - The votes in recent years have been either constitutional initiatives or legislative initiatives, except in:
      - 2010: In the canton of Jura, a unified initiative took place in 2008; the last legislative initiative was in 2000.
      - 2010: In the canton of Obwalden, a financial initiative took place in 2010; the last legislative initiative was in 2007.
      - 2016: In the canton of St.Gallen, a unity initiative took place in 2016; the last legislative initiative was in 2015.
    - In the canton of ZH, there is also a single initiative (but if rejected in parliament, it does not come before the people, so the normal law initiative was taken as a basis)

* SG: There is also the so-called unit initiative (Art. 43 KV), which provides a general suggestion of a law. For this, only 4,000 signatures are necessary.
  → This was chosen as the basis for calculating the relative signatures.
* Total and partial revision do not always demand the same number of signatures:
  · VD: Total revision requires 18,000 signatures instead of 12,000 signatures.
  · NW: For a total revision 1,000 instead of 500 signatures are required.
  · BE: 30,000 instead of 15,000 signatures are required for a total revision.
  · NE: 10,000 instead of 6,000 signatures are required for a total revision.
* If there was no indication of the collection period, the maximum value (i.e., 540 days) was taken. This concerns ZG, VS, UR, SZ, SO, BS, BL, OW, NW, AR, GL, and AI.

- **Optional Referendum:**
  - In the following cantons, the boundary between obligatory and facultative referendum is difficult/absent. SH, BL, GL, AI:
    * SH: The obligatory legislative referendum applies to all those laws that are not subject to the facultative referendum (Art. 32 KV). Therefore, the obligatory legislative referendum exists for all those laws that have been approved by less than 4/5 of the members of the cantonal council present. See also Stutzer (1999, 5).
    * BL: According to Stutzer, only the mandatory referendum exists. That is, in principle, all laws and amendments to laws are subject to mandatory referendum. See also: https://www.baselland.ch/v97-088_2-htm.298297.0.html#body-over, However, very rarely there is an optional referendum with 1,500 signatures (see cantonal constitution). The last one was in 2002.
    * GL: In the canton of Glarus, there is no facultative referendum, since all legislative decisions are taken at the Landsgemeinde. Hence, the threshold is very low, and this counts as 'a lot of' direct democracy.
    * AI: In AI very rarely there are facultative referendums, since, as a rule, almost everything comes before the Landsgemeinde; actually, there are only financial

referendums, which occur in part.

- The following cantons are also mentioned in Stutzer: UR, SZ, SO, and AG
  - SZ: The mandatory referendum applies only to laws that were accepted with a majority of less than 3/4 of the members of the cantonal council (§34 KV).
  - SO: The mandatory referendum applies only to laws adopted with a majority of less than 2/3 of the members of the cantonal council. See also Stutzer (1999, 5).
  - AG: The mandatory legislative referendum applies only to laws that have not been adopted by an absolute majority of all members of the Grand Council (§62 para. 1 let. b KV).

A3.2 Values of the snDDI

Table A8: Values of the snDDI and Sub-Components (CH, GE, AT)

Country	Unit	Initiative	Referendum	Mandatory Referendum	Total snDDI
CH	Zurich	1.70	1.40	2.00	1.70
CH	Zug	1.97	1.40	2.00	1.79
CH	Valais	1.98	1.49	2.00	1.82
CH	Vaud	1.56	1.39	2.00	1.65
CH	Uri	1.98	1.49	2.00	1.82
CH	Ticino	1.39	1.34	2.00	1.58
CH	Thurgovia	1.69	1.49	2.00	1.73
CH	Schwyz	1.98	1.40	2.00	1.79
CH	Soleure	1.98	1.49	2.00	1.83
CH	Schaffhausen	1.98	1.49	2.00	1.82
CH	St Gall	1.63	1.33	2.00	1.65
CH	Neuchatel	1.67	1.48	2.00	1.72
CH	Lucerne	1.98	1.40	2.00	1.79
CH	Jura	1.96	1.39	2.00	1.78
CH	Grisons	1.97	1.49	2.00	1.82
CH	Geneva	1.56	1.32	2.00	1.63
CH	Fribourg	1.30	1.48	2.00	1.60
CH	Basel-City	1.97	1.33	2.00	1.77
CH	Basel-Country	1.99	1.39	2.00	1.79
CH	Bern	1.69	1.49	2.00	1.73
CH	Argovia	1.99	1.49	2.00	1.83
CH	Obwalden	1.98	1.49	2.00	1.83
CH	Nidwalden	1.40	1.40	2.00	1.60
CH	Appenzell Outer-Rhodes	1.99	1.40	2.00	1.80
CH	AppenzellInner-Rhodes	2.00	1.28	2.00	1.76
CH	Glarus	2.00	2.00	2.00	2.00
DE	Baden-Wurttemberg	0.00	0.00	0.00	0.00
DE	Bayern	1.18	0.00	2.00	1.06
DE	Berlin	1.53	0.00	0.00	0.51
DE	Brandenburg	1.68	0.00	0.00	0.56
DE	Bremen	1.03	0.00	0.00	0.34
DE	Hamburg	1.32	0.00	0.00	0.44
DE	Hessen	0.00	0.00	2.00	0.67
DE	Mecklenburg-Vorpommern	1.59	0.00	0.00	0.53
DE	Niedersachsen	0.65	0.00	0.00	0.22
DE	Nordrhein-Westfalen	0.00	0.00	0.00	0.00
DE	Rheinland-Pfalz	0.00	0.00	0.00	0.00
DE	Saarland	0.00	0.00	0.00	0.00
DE	Sachsen	0.60	0.00	0.00	0.20
DE	Sachsen-Anhalt	0.00	0.00	0.00	0.00
DE	Schleswig-Holstein	1.37	0.00	0.00	0.46
DE	Thuringen	1.44	0.00	0.00	0.48
AT	Burgenland	0.00	0.00	0.00	0.00
AT	Kaernten	0.00	0.00	0.00	0.00
AT	Niederoesterreich	0.00	0.00	0.00	0.00
AT	Oberoesterreich	0.00	0.00	0.00	0.00
AT	Salzburg	0.00	0.00	2.00	0.67
AT	Steiermark	0.00	0.00	0.00	0.00
AT	Tirol	0.00	0.00	0.00	0.00
AT	Vorarlberg	0.78	0.00	2.00	0.93
AT	Wien	0.00	0.00	0.00	0.00

Table A9: Values of the snDDI and Sub-Components (US)

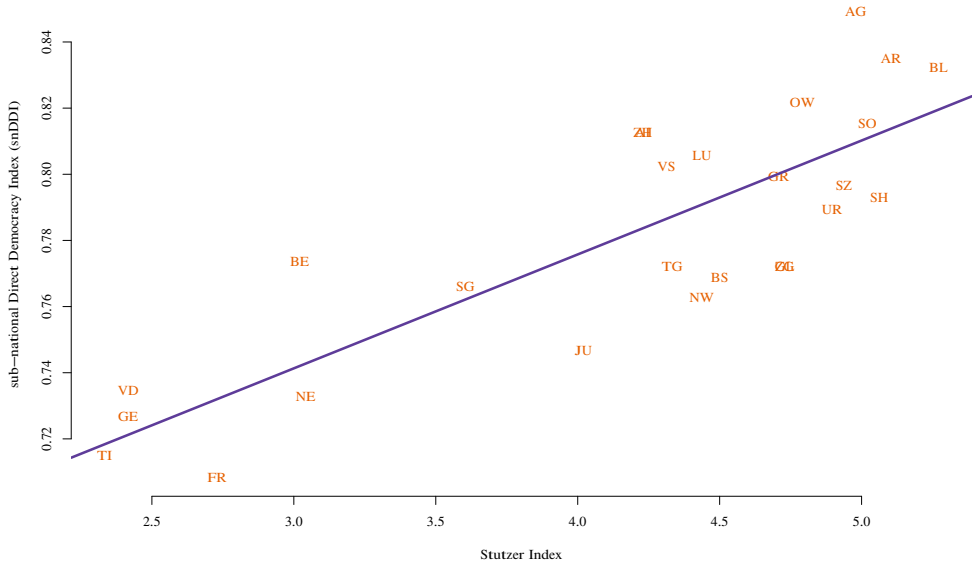
Country	Unit	Initiative	Referendum	Mandatory Referendum	Total snDDI
US	Alabama	0.00	0.00	2.00	0.67
US	Alaska	1.95	1.47	2.00	1.81
US	Arizona	1.96	0.33	2.00	1.43
US	Arkansas	1.97	0.86	2.00	1.61
US	California	1.69	1.49	2.00	1.73
US	Colorado	1.69	0.00	2.00	1.23
US	Connecticut	0.00	0.00	2.00	0.67
US	Delaware	0.00	0.00	0.00	0.00
US	Florida	1.96	0.00	2.00	1.32
US	Georgia	0.00	0.00	2.00	0.67
US	Hawaii	0.00	0.00	2.00	0.67
US	Idaho	1.38	0.98	2.00	1.45
US	Illinois	0.00	0.00	2.00	0.67
US	Indiana	0.00	0.00	2.00	0.67
US	Iowa	0.00	0.00	2.00	0.67
US	Kansas	0.00	0.00	2.00	0.67
US	Kentucky	0.00	0.00	2.00	0.67
US	Louisiana	0.00	0.00	2.00	0.67
US	Maine	1.94	1.47	2.00	1.80
US	Maryland	0.00	1.97	2.00	1.32
US	Massachusetts	1.39	0.33	2.00	1.24
US	Michigan	1.68	1.49	2.00	1.72
US	Minnesota	0.00	0.00	2.00	0.67
US	Mississippi	1.96	0.00	2.00	1.32
US	Missouri	1.97	0.00	2.00	1.32
US	Montana	1.83	1.68	2.00	1.84
US	Nebraska	1.95	1.48	2.00	1.81
US	Nevada	1.97	0.00	2.00	1.32
US	New Hampshire	0.00	0.00	2.00	0.67
US	New Jersey	0.00	0.00	2.00	0.67
US	New Mexico	0.00	0.00	2.00	0.67
US	New York	0.00	0.00	2.00	0.67
US	North Carolina	0.00	0.00	2.00	0.67
US	North Dakota	1.98	1.49	2.00	1.82
US	Ohio	1.98	1.49	2.00	1.82
US	Oklahoma	1.48	0.00	2.00	1.16
US	Oregon	1.97	1.49	2.00	1.82
US	Pennsylvania	0.00	0.00	2.00	0.67
US	Rhode Island	0.00	0.00	2.00	0.67
US	South Carolina	0.00	0.00	2.00	0.67
US	South Dakota	1.98	1.49	2.00	1.82
US	Tennessee	0.00	0.00	2.00	0.67
US	Texas	0.00	0.00	2.00	0.67
US	Utah	1.10	1.00	2.00	1.37
US	Vermont	0.00	0.00	2.00	0.67
US	Virginia	0.00	0.00	2.00	0.67
US	Washington	0.00	1.48	2.00	1.16
US	West Virginia	0.00	0.00	2.00	0.67
US	Wisconsin	0.00	0.00	2.00	0.67
US	Wyoming	0.19	0.15	2.00	0.78

A3.3 Comparing the snDDI to Existing Indices

In this part, we briefly compare the new index, the snDDI, with another measure. The snDDI is the average score a unit reaches based on the score for the (optional and mandatory) referendum and the score for the initiative.

There is only one widely used measure for the extent of direct democratic rights on the sub-national level: the Stutzer index covering all Swiss cantons (Stutzer, 1999). We can now show how closely (or not) the snDDI is related to the Stutzer index.

Figure A5: Stutzer Index and the snDDI for Swiss Cantons



The Stutzer index only exists for 24 cantons (rather than all 26) since Stutzer does not code the cantons that still rely on an annual citizens' assembly. Figure A5 illustrates that the proposed index is fairly close to the existing measures for the Swiss cantons with a correlation of .81. Most importantly, despite the fact that the snDDI is conceptualized for a cross-country comparison including countries and sub-national units with quite limited direct democracy, this new index is able to also capture variance in a high-direct-democracy context, namely Switzerland.

A3.4 Details of the sub-national Direct Democracy Index (snDDI)

The snDDI is based on a number of different institutions and indicators. We present a measure here that is based on the optional and mandatory referendum and the initiative. For each of these, institutions we want to measure how easily they can be used by citizens to force the legislative or executive to change policy, and whether they are actually used.

To measure the strength of each component we follow – with some exceptions (see later) – the indicators of the cross-national direct democracy measure proposed by Altman (2017). We will rely on the signatures that have to be collected (`signature`), the time given to collect the required signatures (`time`), whether there is any participatory requirement to validate the vote outcome (`quorum`)[16], whether a ballot vote is required to pass any extra-majority to be considered successful (`extramaj`), and a variable that indicates whether this institution was used recently (`threat`); this is supposed to allow to distinguishing cases where there is the *de jure* possibility but it is not used *de facto*.

Operationalization

The operationalization of `time` (t measured in years) is $\sqrt{t}$, whereas all durations longer than one year are capped at one. If one has 9 months to gather signatures, the value of `time` will be 0.87 ($= \sqrt{\frac{9}{12}}$). This is directly taken from Altman 2017. The aspect `quorum` is based on whether there is any extra majority required. This is based on the status quo surface Altman (2011) and takes the value 0.5 if there are no restrictions. The indicator `extramaj` (e_m), which accommodates double-majority requirements such as the majority of cantons and votes for national initiatives in Switzerland, is $e_m = 0.5 + \frac{1-D}{2}$, whereas D measures the share of districts that have to approve. The `threat` indicator measures whether the institution also exists *de facto* and whether any use in the last five years leads to its maximum value. After that, the score continuously declines by 0.06 per year – if the last use of an institution was 22 or more years ago, the value is 0. These measures all follow Altman 2017 closely with only one minor difference in rescaling to ensure that the index is between 0 and 1, whereas Altman's index is between 0 and 2.

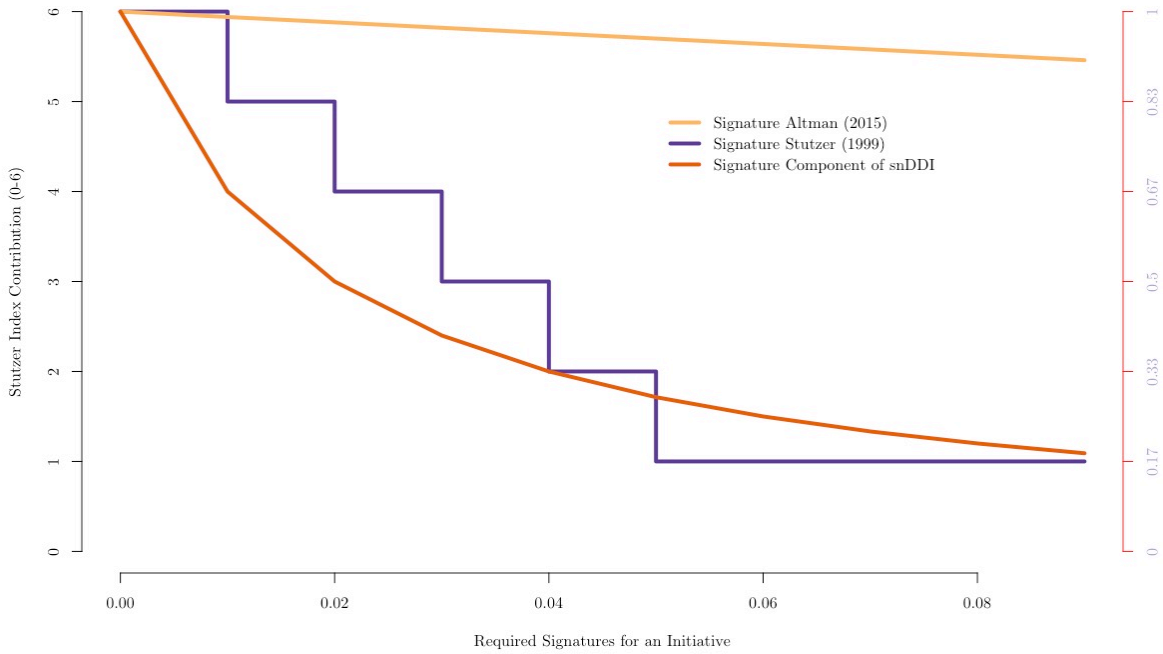
[16] For national referendums in Italy, there is a quorum of 50%, and one frequent strategy (of the group supporting the bill that would be toppled by the referendum ballot) is to not participate to reduce the participation sufficiently such that the outcome is not valid Uleri (2002).

There is one clear deviation from Altman's approach, and it is found when we operationalize the signature threshold. This component should be high when very few signatures are needed and low when many signatures are needed. In Figure A6, one can see the operationalization based on Altman (2017) and on Stutzer (1999). We think that the coding in Altman (2017) is not sensitive enough to the differences among low thresholds, which becomes very clear when comparing it to Stutzer (1999). But equally, we prefer the continuous function over a step-function and hence propose to change the operationalization here. We measure how low the signature threshold is and rely on a quickly declining function in the number of required signatures. We measure `signature` (s) as $s = \frac{0.01}{\frac{s\%}{2}+0.01}$. This function is continuous in $s\%$ (required share of citizens that have to sign) but much more sensitive than the proposed $(1 - s\%)$ by Altman (2017).[17] Unlike in Stutzer (1999), which defines thresholds and assigns these thresholds to values between 6 (lowest requirements) and 1 (highest requirements) our signature measure is continuous and is not a step-function. Figure A6 shows a range of potential signature requirements and how they are translated into an index according to different coding rules from different indices.

The left y-axis is in the 0 to 6 range, which is the original scale of Stutzer (1999). The right y-axis is in the 0 to 1 range used by the snDDI. Figure A6 illustrates that the signature threshold decreases Altman's index very slowly since the function is $(1-s\%)$, i.e., the difference between 1% and 10% is literally 9% points of the index range. Based on this, one could say that gathering 2% of signatures is half as difficult as gathering 4%. However, for the sake of argument, this does not take into account how prohibitively difficult it becomes at some point if even more signatures are required. We side with Stutzer and operationalize a much quicker decline but do want to retain the continuity of the function (as found in Altman's index). To this end, we rely on the above described function, where collecting 1% of all voters' signatures is half-way between collecting 1 single signature (which is the case in the canton of Appenzell Innerrhoden, where any individual citizen can force a vote) and between requiring 4% of all citizens.

[17] One difficulty in collecting data is that the signature threshold is defined in different ways. In Swiss cantons, it is usually formulated as the share of all voting-eligible citizens. In the US, it is usually formulated as the share of people participating in the last gubernatorial election. We translate the US rules, by taking vote turn-out into account, into a comparable measure.

Figure A6: Comparison of How Various Indices Account for Signature Threshold



We measure the value for initiatives and optional referendums as $\texttt{score} = \frac{0.01}{\frac{s\%}{2}+0.01} \cdot \texttt{time} \cdot (1-\texttt{quorum}) \cdot \texttt{extramaj} \cdot \texttt{threat}$. While this suffices to generate the snDDI, we also operationalize, for *illustrative* purposes, the recall (using the same operationalization as for the optional referendum and initiative) and the mandatory referendum. The mandatory referendum is measured as $\texttt{score} = (1-\texttt{quorum}) \cdot \texttt{extramaj}$. We then add the score over all institutions and take the average value, which will lie between 0 and 1.

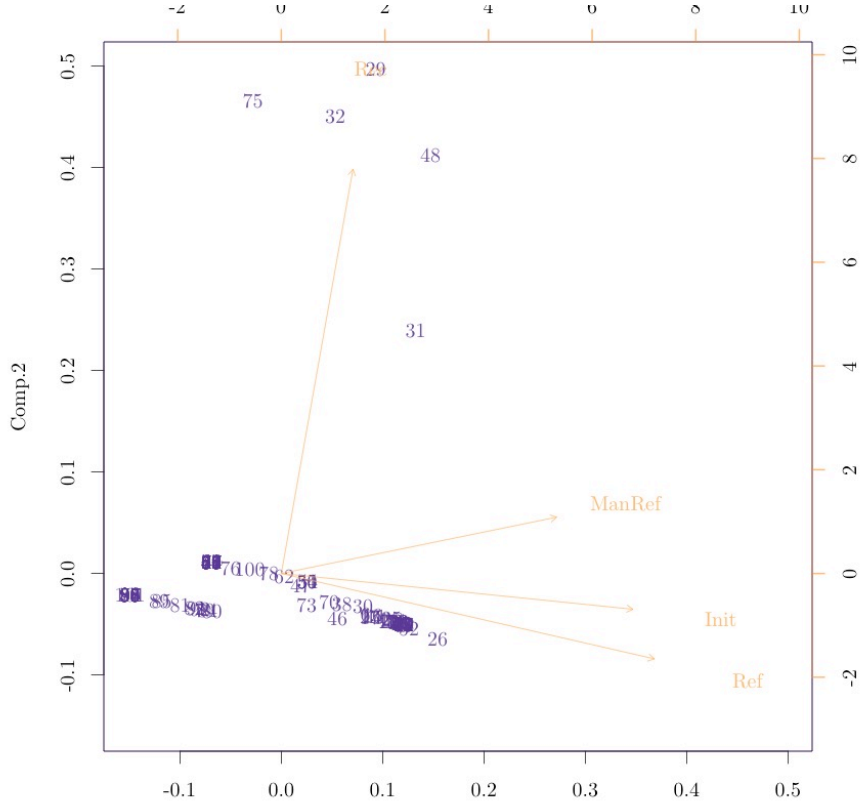
Why the focus on optional referendum, mandatory referendum, and the initiative?

To discuss the question of which components should be covered, we perform a principle component analysis and enter the scores of the mandatory referendum, the optional referendum, the initiative, and the recall (another institution that we considered in the first place). The recall's index value is calculated the same way as for optional referendum and initiative. Figure A7 is a biplot Gregory and von Winterfeldt (1996) and shows that the three of the four

institutions seem to explain similar variance across all US states and Switzerland, whereas the recall is picking up on unexplained variation of these other institutions.

Apart from the theoretical reasons outlined in the article, these empirical results further point toward the somewhat different nature of the recall. The recall is not just another variation of direct democracy but seems to be a special form that does not co-occur in a similar way as the other direct democratic variations. A second observation, based on Figure A7, is that the mandatory referendum has a weaker correlation with this underlying dimension than the optional referendum or the initiative. Part of the reason is that the mandatory referendum exists in all states and cantons that have direct democratic rights as well as in states that do not have additional direct democratic rights, with the single exception of Delaware. There is also no variation in that measure as there are no signature thresholds (or circulation times for that matter).

Figure A7: Principle Components, input: recall, mand/opt referendum, initiative



A4 Robustness Section

A4.1 Excluding Single-Member Districts

The variable winner is coded based on the survey response of the individual observations. In Switzerland, we have to rely on a survey question for whom the respondent voted rather than a general partisan ID question. Since some cantons are a single-member district, this raises two problems: i) strategic voting may induce measurement error and ii) respondents' responses may not reflect their preference since their preferred party does not run a candidate. In the other countries, we either have a different survey question (tapping directly into partisan preference) or respondents are living in PR multi-member districts.

To ensure that our estimation results are not affected by this measurement issue, we re-estimate the first seven models and drop any Swiss canton that is also a single-member district

in the national legislative elections.

Table A10: Replication of Table 2 without Single-Member Districts

	Model 1-r	Model 2-r	Model 3-r	Model 4-r
Voted for Party in Government	0.42^{***}	0.41^{***}	0.39^{***}	0.39^{***}
	(0.04)	(0.04)	(0.04)	(0.04)
Direct Democracy	0.29^{***}	0.26^{***}	−0.09	−0.97
	(0.07)	(0.07)	(0.10)	(0.78)
Size of Majority		1.12^{***}	0.15	0.13
		(0.29)	(0.32)	(0.35)
DD X Indicator AT				0.87
				(0.85)
DD X Indicator GE				1.04
				(0.81)
DD X Indicator US				0.86
				(0.78)
Individual-Level Variables	✓	✓	✓	✓
Country FE	×	×	✓	✓
τ_1	-2.50^{***}	-1.90^{***}	-3.51^{***}	-5.04^{***}
τ_2	-0.47^{**}	0.13	-1.48^{***}	-3.01^{*}
τ_3	2.61^{***}	3.21^{***}	1.60^{***}	0.08
$\ell\ell$	−11008.63	−11001.40	−10979.01	−10978.11
$N_{\text{Individuals}}$	10913	10913	10913	10913
N_{Groups}	95	95	95	95
$\hat{\sigma}^2_{\text{Groups}}$	0.13	0.11	0.05	0.05

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$, all models include a gender indicator, age and age^2, indicators for seven education categories, and six employment categories.

Both Table A10 and Table A11 provide substantively identical results to those provided by the main tables presented in the manuscript (Table 2 and Table 3). While we cannot rule out that our measures can be error-prone for some observations, we can show that our main findings in this manuscript also hold when we exclude the observations that could be affected by this measurement problem.

Table A11: Replication of Table 3 without Single-Member Districts

	Model 5-r	Model 6-r	Model 7-r
Size of Majority		0.10	0.15
		(0.32)	(0.37)
Direct Democracy	0.04	0.05	0.04
	(0.11)	(0.11)	(0.11)
Voted for Party in Government	0.74***	0.74***	0.79**
	(0.10)	(0.10)	(0.24)
DD X Voted for Gov	−0.28**	−0.28**	−0.28**
	(0.09)	(0.09)	(0.09)
Voted for Gov X Size of Majority			−0.09
			(0.37)
Individual-Level Variables	✓	✓	✓
Country FE	✓	✓	✓
τ_1	−3.41***	−3.33***	−3.30***
τ_2	−1.37***	−1.29***	−1.26***
τ_3	1.74***	1.82***	1.84***
$\ell\ell$	−10951.74	−10951.69	−10951.66
$N_{\text{Individuals}}$	10913	10913	10913
N_{Groups}	95	95	95
$\hat{\sigma}^2_{\text{Groups}}$	0.09	0.09	0.09
$\hat{\sigma}^2_{\beta_{\text{Winner}}}$	0.08	0.09	0.08

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$, all models include a gender indicator, age and age^2, indicators for seven education categories, and six employment categories.

A4.2 Usage Rather than Institutional Provision

The results in Table A12 and Table A13 are replications of Table 2 and Table 3,but here we do not rely on the snDDI but rather on actual usage of these instruments. We count the number of votes that took place in the last five years and use the mean number of direct democratic votes per year. This allows us to see whether the found relationship is related to the *de jure* rules or rather to the *de facto* use of these institutions.

The interaction between the usage of direct democracy and the US country indicator is significant. To investigate this interaction more specifically, we compute the marginal effect of direct democracy usage in the US. The 95% confidence interval for the marginal effect is $[-0.087, 0.004]$ and overlaps 0. Hence, there is no significant relationship between the average use of direct democratic institutions and reported levels of satisfaction with democracy.

In Table A13, we find a significant interaction effect, but note that the marginal effect of direct democracy on winners is not statistically significant (the 95% confidence interval is

Table A12: Replication of Table 2 with Usage

	Model 1-u	Model 2-u	Model 3-u	Model 4-u
Voted for Party in Government	0.42^{***}	0.41^{***}	0.39^{***}	0.38^{***}
	(0.04)	(0.04)	(0.00)	(0.04)
Direct Democracy Use	0.06^{**}	0.06^{**}	-0.01	0.02
	(0.02)	(0.02)	(0.01)	(0.02)
Size of Majority		1.27^{***}	-0.06^{***}	0.02
		(0.29)	(0.00)	(0.30)
DD Use X Indicator GE				0.57
				(0.46)
DD Use X Indicator US				-0.07^{*}
				(0.03)
Individual-Level Variables	✓	✓	✓	✓
Country FE	×	×	✓	✓
τ_1	-2.71^{***}	-1.98^{***}	-3.63^{***}	-3.38^{***}
τ_2	-0.68^{***}	0.05	-1.60^{***}	-1.35^{***}
τ_3	2.43^{***}	3.16^{***}	1.51^{***}	1.76^{***}
$\ell\ell$	-11354.51	-11345.29	-11315.58	-11312.26
$N_{\text{Individuals}}$	11318	11318	11318	11318
N_{Groups}	101	101	101	101
$\hat{\sigma}^2_{\text{Groups}}$	0.16	0.13	0.05	0.04

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$, all models include a gender indicator, age and age^2, indicators for seven education categories, and six employment categories.

$[-0.070, 0.005]$). But even if we are just interested in a potential differential effect, i.e., just the interaction term, we note that it is substantively about five times smaller than that in our main models. We take this as an indication that the *de jure* relationship may not be the only avenue but definitely the dominant one.

Table A13: Replication of Table 3 with Usage

	Model 5-u	Model 6-u	Model 7-u
Size of Majority		0.04	0.19
		(0.31)	(0.35)
Direct Democracy Use	0.03	0.03	0.03
	(0.02)	(0.02)	(0.02)
Voted for Party in Government	0.60***	0.60***	0.79***
	(0.08)	(0.08)	(0.23)
DD Use X Voted for Gov	−0.06***	−0.06**	−0.06**
	(0.02)	(0.02)	(0.02)
DD Use X Share of Voters in Gov			−0.32
			(0.36)
Individual-Level Variables	✓	✓	✓
Country FE	✓	✓	✓
τ_1	−3.34***	−3.31***	−3.21***
τ_2	−1.29***	−1.27***	−1.17***
τ_3	1.83***	1.86***	1.96***
$\ell\ell$	-11288.79	-11288.78	-11288.40
$N_{\text{Individuals}}$	11318	11318	11318
N_{Groups}	101	101	101
$\hat{\sigma}^2_{\text{Groups}}$	0.09	0.09	0.09
$\hat{\sigma}^2_{\beta_{\text{Winner}}}$	0.09	0.09	0.09

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$, all models include a gender indicator, age and age^2, indicators for seven education categories, and six employment categories.

A4.3 Alternative Measure for Horizontal Power Sharing

In Table 3 in the main text, models include a variable for the size of the coalition in the government. We thereby assume that the size of the governing majority is likely correlated with the extent of proportional representation or power-sharing in general. However, we agree that it is not an ideal measure of the latter. In fact, it is difficult to find a good measure that can capture this dimension at the sub-national level. As a robustness test, we rely on a measure of horizontal power-sharing from Bernauer and Vatter (2019). The one caveat is that they do not have a measure for three Swiss cantons (Bernauer and Vatter, 2019, , see p.214). Nevertheless, we present a replication of Table 3 here based on 98 sub-national units (excluding Glarus and the two Appenzell due to missingness).

Table A14: Alternative Measure for Horizontal Power Sharing

	Model 5-ps	Model 6-ps	Model 7-ps
Power Sharing		-0.19^{*}	-0.12
		(0.09)	(0.10)
Direct Democracy	0.04	0.04	0.03
	(0.11)	(0.11)	(0.10)
Voted for Party in Government	0.75^{***}	0.74^{***}	0.72^{***}
	(0.10)	(0.10)	(0.09)
DD X Voted for Gov	-0.28^{***}	-0.27^{***}	-0.22^{**}
	(0.08)	(0.08)	(0.08)
Voted for Gov X Power Sharing			-0.10
			(0.06)
Individual-Level variables	✓	✓	✓
Country FE	✓	✓	✓
τ_1	-3.37^{***}	-3.62^{***}	-3.61^{***}
τ_2	-1.34^{***}	-1.58^{***}	-1.57^{***}
τ_3	1.78^{***}	1.53^{***}	1.54^{***}
$\ell\ell$	-11092.71	-11090.84	-11089.47
$N_{\text{Individuals}}$	11095	11095	11095
N_{Groups}	98	98	98
$\hat{\sigma}^2_{\text{Groups}}$	0.08	0.08	0.08
$\hat{\sigma}^2_{\beta_{\text{Winner}}}$	0.08	0.06	0.03

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$, all models include a gender indicator, age and age^2, indicators for seven education categories, and six employment categories.

These results are empirically and substantively identical to the ones presented in the main part of the manuscript.

A4.4 Alternative Operationalization

During the review process, one reviewer asked for model estimations with alternative measures. They requested that we just look at the presence of the institutions. In Table A15, we do not add up the index values for each institution but we count how many of these three institutions exist; thereby, we completely disregard that there is a lot of variation in how easy it is to use these institutions. While we think that our index has conceptual and empirical advantages, as discussed in the article, we show the results using this simpler measure, which document a significant but somewhat smaller interaction effect between direct democracy and the winner/loser variable.

Another question raised is whether it makes sense to combine these institutions into one single overall index. This is definitely a fair question since the institutions work fairly differently, and it might be possible that this affects the satisfaction gap in different ways.

In Table A16, we show the models in which we replace the snDDI by the respective sub-components for an individual institution. The caveat here is that the emergence of these institutions is usually caused by the same factors; hence, empirically, there is a strong correlation across the sub-components (the initiative component and the referendum component have a correlation of 0.70). Nevertheless, these separate analyses demonstrate that for all sub-components of the index, a similar pattern can be observed with respect to our central variables.

Table A15: Alternative Measure (Number of Institutions Present in an Unit)

	Model Index	Model Raw Count
Share of Voters in Government	0.07	0.07
	(0.35)	(0.34)
Direct Democracy	0.05	
	(0.11)	
Raw Count of DD Institutions		0.04
		(0.06)
Voted for Party in Government	0.86^{***}	0.86^{***}
	(0.23)	(0.23)
DD X Voted for Gov	-0.31^{***}	
	(0.08)	
Raw Count X Voted for Gov		-0.18^{***}
		(0.05)
Voted for Gov X Share of Voters in Government	−0.17	−0.15
	(0.35)	(0.35)
Individual-Level variables	✓	✓
Country FE	✓	✓
τ_1	-3.38^{***}	-3.37^{***}
	(0.37)	(0.34)
τ_2	-1.34^{***}	-1.32^{***}
	(0.36)	(0.34)
τ_3	1.79^{***}	1.80^{***}
	(0.36)	(0.34)
Num. obs.	11318	11318
Groups (subnatID)	101	101
Variance: subnatID: (Intercept)	0.08	0.08
Variance: subnatID: winner	0.07	0.07

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table A16: Individual Institutions

	Index	Referendum	Initiative	Mandatory Referendum
Share of Voters in Government	0.07	−0.00	0.11	0.42
	(0.35)	(0.35)	(0.35)	(0.35)
Direct Democracy	0.05			
	(0.11)			
Just Optional Referendum Score		0.04		
		(0.09)		
Just Initiative Score			−0.01	
			(0.06)	
Just Mandatory Referendum Score				0.26**
				(0.09)
Voted for Party in Government	0.86***	0.58*	0.76**	0.99***
	(0.23)	(0.23)	(0.24)	(0.26)
DD X Voted for Gov	−0.31***			
	(0.08)			
Referendum X Voted for Gov		−0.32***		
		(0.08)		
Initiative X Voted for Gov			−0.19**	
			(0.07)	
Mandatory Referendum X Voted for Gov				−0.18**
				(0.07)
Voted for Gov X Share of Voters in Government	−0.17	0.10	−0.21	−0.43
	(0.35)	(0.37)	(0.37)	(0.36)
Individual-Level variables	✓	✓	✓	✓
Country FE	✓	✓	✓	✓
τ_1	−3.38***	−3.48***	−3.42***	−2.66***
	(0.37)	(0.32)	(0.32)	(0.38)
τ_2	−1.34***	−1.44***	−1.38***	−0.62
	(0.36)	(0.31)	(0.32)	(0.38)
τ_3	1.79***	1.68***	1.75***	2.51***
	(0.36)	(0.31)	(0.32)	(0.38)
Num. obs.	11318	11318	11318	11318
Groups (subnatID)	101	101	101	101
Variance: subnatID: (Intercept)	0.08	0.08	0.09	0.09
Variance: subnatID: winner	0.07	0.07	0.09	0.09

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

A4.5 Country Variation

We also provide an additional set of model estimations where we allow the winner effect and the interaction effect to vary by country.

Table A17: Adding Country Variation

	Model 5	Model 6	Model 7
Share of Voters in Government		−0.01	0.07
		(0.30)	(0.35)
Direct Democracy	0.06	0.06	0.05
	(0.11)	(0.11)	(0.11)
Voted for Party in Government	0.76***	0.76***	0.86***
	(0.10)	(0.10)	(0.23)
DD X Voted for Gov	−0.31***	−0.31***	−0.31***
	(0.08)	(0.08)	(0.08)
Voted for Gov X Size of Majority			−0.17
			(0.35)
τ_1	−3.42***	−3.43***	−3.38***
	(0.26)	(0.35)	(0.37)
τ_2	−1.38***	−1.39***	−1.34***
	(0.25)	(0.35)	(0.36)
τ_3	1.75***	1.74***	1.79***
	(0.25)	(0.35)	(0.36)
Num. obs.	11318	11318	11318
Groups (subnatID)	101	101	101
Variance: subnatID: (Intercept)	0.08	0.08	0.08
Variance: subnatID: winner	0.08	0.08	0.07
Variance: country: (Intercept)	0.00	0.00	0.00
Variance: country: snDDI	0.00	0.00	0.00
Variance: country: winner	0.00	0.00	0.00
Variance: country: snDDI:winner	0.00	0.00	0.00

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

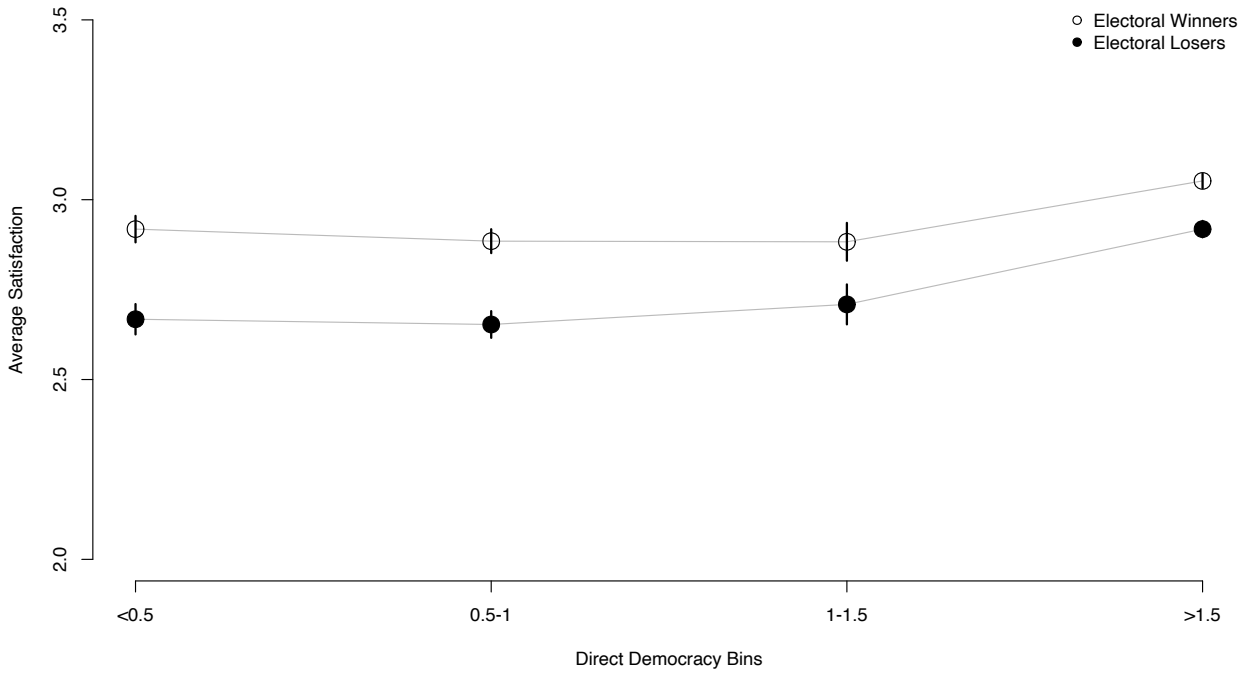
The results further bolster our confidence as they show that even under less strict modeling assumptions – i.e, allowing the most relevant coefficient `winner` and its interaction with the `snDDI` to vary across countries – the results obtained are almost identical. The estimated variances of the added random effects are so small that the estimate is 0.00.

A4.6 Raw Data

A reviewer suggested that we also explore whether we can show the main finding in the raw data. They asked to bin the values of the direct democracy index into categories and then show how the satisfaction gap between electoral losers and winners varies.

We present a figure along the lines of what the reviewer describes. We show on the y-axis the average value of the satisfaction. For the x-axis, we binned the values of the direct democracy index into four groups (0-0.49, 0.5-.99, 1.0-1.49, 1.5-2). Figure A8 shows that the gap narrows for higher values of the direct democracy index.

Figure A8: Binned Index Values, Raw Data



Although we do not want to over-emphasize this as it is not strong "evidence" – it is entirely possible that a relationship exists that is only visible once one controls for a number of factors – something that we do not do in the figure above which only shows raw bivariate data.