Public Support for Gay Rights
Across Countries and Over Time

April 15, 2024

Appendices

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Appendix A: Sample of Published Articles on Public Opinion and Attitudes Toward Gay Rights

To generate a sample of published articles on public opinion and support for gay rights, we combined results from two searches, the first on the Web of Science and the second on Google Scholar. Web of Science topic searches return articles in which the search terms appear in the title or abstract. We executed the following search: `TS=("public opinion" AND (homosexual* OR gay OR LGB*))`. The fifty most cited empirical research articles returned were retained for our sample. Google Scholar, according to its about page, "aims to rank documents the way researchers do, weighing the full text of each document, where it was published, who it was written by, as well as how often and how recently it has been cited in other scholarly literature." We searched `"public opinion" homosexuality` and identified the first fifty research articles returned. To ensure comparability of citation counts, we collected the Web of Science records for this second group of articles (Google Scholar, because it includes citations in books, white papers, working papers, some journals not in the Web of Science collection, and other sources, tends to report higher—and sometimes *much* higher— numbers of citations for the same article). Then we added the Web of Science records for the Google Scholar results to our original Web of Science sample and dropped all duplicates, yielding a total of 86 different articles. Each of the articles was then consulted to identify its number of countries and mean years observed per country. This information is listed in Table A1 below.

Table A1: Prominent Research Articles on Public Opinion Toward Homosexuality

Article	Countries Observed	Mean Years Observed per Country	Country-Years Observed	WoS Citations
Loftus 2001	1	21	21	490
Herek 2002	1	1	1	457
Nelson and Kinder 1996	1	1	1	407
Lax and Phillips 2009a	1	9	9	371
Norton and Herek 2013	1	1	1	330
Adamczyk and Pitt 2009	40	1	40	318
Olson et al. 2006	1	1	1	312
Lax and Phillips 2012	1	12	12	276
Lewis 2003	1	31	31	274
Lax and Phillips 2009	1	12	12	256
Andersen and Fetner 2008a	2	3	6	241
Andersen and Fetner 2008	35	1.8	63	228
Haider-Markel and Joslyn 2008	1	2	2	216
Yang 1997	1	26	26	201
Baunach 2012	1	14	14	192
Sherkat et al. 2011	1	13	13	187
Brewer 2003a	1	3	3	180
Perez-Brumer et al. 2015	1	1	1	180
Tankard and Paluck 2017	1	1	1	172
Herek et al. 2003	1	1	1	172
Brewer 2003	1	2	2	159
Hicks and Lee 2006	1	14	14	146
Gerhards 2010	27	1	27	139
Sherkat et al. 2010	1	4	4	139
Brace et al. 2002	1	16	16	136
Frost et al. 2016	1	1	1	135
Van Den Akker et al. 2013	20	3.8	75	135
Oldenburg et al. 2015	1	1	1	122
Whitehead 2010	1	1	1	103
Avery et al. 2007	1	15	15	98
Hooghe and Meeusen 2013	29	4.2	123	93
Lewis 2011	1	22	22	93
Brewer 2002	1	1	1	92
Price et al. 2005	1	1	1	91
Lindaman, Haider-Markel 2002	1	16	16	88
Doan et al. 2014	1	1	1	86
Clements and Field 2014	1	42	42	86
Lewis and Gossett 2008	1	6	6	86
Flores 2015	1	1	1	85
Baiocco et al. 2013	1	1	1	79
Flores and Barclay 2016	1	2	2	78
Craig et al. 2005	1	1	1	76
Hooghe et al. 2010	2	1	2	73
Lewis et al. 2017	1	1	1	72
Schwartz 2010	1	1	1	72

Article	Countries Observed	Mean Years Observed per Country	Country-Years Observed	WoS Citations
Bishin et al. 2016	1	2	2	71
Reynolds 2013	81	1.8	145	71
Kreitzer et al. 2014	1	3	3	69
Price and Hsu 1992	1	2	2	69
Baunach 2011	1	3	3	67
Willnat et al. 2002	1	1	1	67
Barth et al. 2009	1	1	1	66
Schnabel 2016	1	25	25	65
Gearhart and Zhang 2014	1	1	1	65
Herek and Glunt 1991	1	1	1	65
Whitehead and Perry 2015	1	1	1	62
Ayoub and Garretson 2017	72	2.4	173	62
Stipp and Kerr 1989	1	1	1	60
Detenber et al. 2007	1	1	1	55
Stoutenborough et al. 2006	1	14	14	54
Jaspers et al. 2007	1	10	10	40
Pollock 1994	1	2	2	38
Brewer 2014	30	1	30	34
Roggemans et al. 2015	1	1	1	33
Alston 1974	2	7	14	25
Kazyak and Stange 2018	1	2	2	23
Redman 2018	70	2.9	203	23
Engel 2013	1	6	6	21
Perry and Whitehead 2016	1	1	1	18
Deboer 1978	8	2.3	18	18
Seltzer 1993	1	2	2	16
Roder and Lubbers 2016	4	2	8	13
Hildebrandt et al. 2017	19	2.9	54	12
Lewis 2001	1	19	19	12
Kleiner 2018	23	3	68	12
Rayside and Bowler 1988	3	3.7	11	11
Burke 2008	1	21	21	10
Hetzel 2011	1	1	1	9
Perry and Snawder 2016	1	1	1	8
Tolkachev and Tolordava 2020	2	3	6	6
Hildebrandt et al. 2019	73	1	73	6
Lau et al. 2017	1	2	2	6
Hayes 1997	1	4	4	5
Kuyper et al. 2018	3	1	3	3
Becker and Todd 2018	1	2	2	2
Northcott and Reutter 1991	1	1	1	2

Appendix B: Survey Items Used to Estimate Support for Gay Rights

National and cross-national surveys have often included questions tapping attitudes toward homosexuality over the past half century, but the resulting data are both sparse, that is, unavailable for many countries and years, and incomparable, generated by many different survey items. In all, I identified 51 such survey items that were asked in no fewer than five country-years in countries surveyed at least three times; these items were drawn from 435 different survey datasets. These items are listed in the table below, along with the dispersion (α) and difficulty (β) scores estimated for each from the DCPO model. Lower values of dispersion indicate questions that better identify publics with a higher level of trust from those with lower. Items have one less difficulty score than the number of response categories. Survey dataset codes correspond to those used in the `DCPOtools` R package (Solt, Hu, and Tai 2019); they appear in decreasing order of country-years contributed.

Together, the survey items in the source data were asked in 118 different countries in at least two time points over 51 years, from 1973 to 2023, yielding a total of 3,639 country-year-item observations. The number of items observed in the source data for each country-year is plotted in Figure A1 below. The estimates of support in country-years with more observed items are more precise. In country-years with fewer observed items, the estimates rely more heavily on the random-walk prior and are therefore more uncertain, and when there are no observed items, the estimates rely *entirely* on the random-walk prior and so uncertainty increases still further.

Table A2: Indicators Used in the Support for Gay Rights Latent Variable Model

Survey Item Code	Country-Years	Question Text	Response Categories	Dispersion	Difficulties	Survey Dataset Codes
just10	527	Please tell me for each of the following statements whether you think it can always be justified, or something in between, using this card. READ OUT STATESMENTS. COME ONE ANSWEWR FOR EACH[Homosexuality]	[1-10]1 Never Justifiable 10 Always justifiable	0.42	0.01, 0.30, 0.54, 0.75, 1.39, 1.70, 1.98, 2.35, 2.63	evs, wvs, asiab, lb, caucasusb
neigh2	520	Homosexuals. Would you mind having them as neighbors?	0 Do not have a problem with having them as neighbors / 1 Do not want them as neighbors	0.86	-0.33	evs, wvs, lits, cid, lb, amb, fsdreligion
free5	264	Homosexuality is a personal behavior, others should not blame	1 Strongly disagree / 2 disagree / 3 Neither / 4 Agree / 5 Strongly Agree	1.23	-3.08, -1.54, -0.08, 2.69	ess, seessp, ress, cgss
approve4	210	A sexual relationship between two adults of the same sex	1 Very bad 2 Fairly bad 3 Not so bad 4 Definitely not bad	0.21	0.55, 1.00, 1.58	usgss, issp, lat, bsa, allbus, pgss, isshr, chcep, seessp, jgss, nsss, twscs
accept2	200	And which one of these comes closer to your opinion?	1 homosexuality is a way of life that should be accepted by society / 2 homosexuality is a way of life that should not be accepted by society	0.62	0.63	uspew, gallup, pew, pewrel
run10	197	And now, changing the topic and thinking of homosexuals, how strongly do you approve or disapprove of such people being permitted to run for public office?	1 Strongly disapprove / 23456789 / 10 Strongly approve	0.56	-0.67, -0.32, -0.05, 0.21, 0.65, 0.95, 1.27, 1.66, 1.99	amb
hioff10	140	Using a scale from 1 to 10, please tell me how you would feel about having a person from each of the following groups in the highest elected political position in	1 Not at all comfortable / 23456789 / 10 Totally comfortable	0.16	-0.83, -0.53, -0.22, 0.02, 0.50, 0.76, 1.06, 1.44, 1.75	eb
marry10	103	How strongly do you approve or disapprove of same-sex couples having the right to marry?	1 Strongly disapprove / 23456789 / 10 Strongly approve	0.24	0.18, 0.48, 0.68, 0.86, 1.17, 1.36, 1.58, 1.82, 2.07	amb
marry4a	96	Overall, do you support or oppose allowing gays and lesbians to marry legally?	1 Support strongly 2 Support somewhat 3 Oppose somewhat 4 Oppose strongly	0.82	-0.59, 1.06, 3.36	nbcwsj, lat, uspew, prri, abcwapo, pewrel, lb, pew, aes
approve3	92	Is homosexual behavior morally acceptable, morally wrong, or is it not a moral issue?	1 morally acceptable / 2 morally wrong / 3 not a moral issue	0.44	0.86, 2.00	uspew, pew, pewrel
marry4e	85	For each of the following propositions, tell me if you Homosexual marriages should be allowed throughout Europe?	Totally agree 1 totally disagree 4	0.09	-0.01, 0.84, 2.06	eb

Survey Item Code	Country-Years	Question Text	Response Categories	Dispersion	Difficulties	Survey Dataset Codes
adopt5	80	How acceptable or unacceptable do you consider the following issues? That homosexual and lesbian couples have the right to adopt children	1 completely unacceptable 2 unacceptable 3 neither acceptable nor unacceptable 4 acceptable 5 completely acceptable	0.76	-0.61, 0.74, 1.77, 3.37	bsa, ess, belgiumes, dkes, nores, icenes
parent5	79	How much do you agree or disagree with this statement? Homosexual couples are as good parents as other couples	Agree strongly1 strongly disagree 5	0.88	-1.52, 0.30, 1.53, 3.49	wvs, evs
ashamed5	73	If a close family member was a gay man or a lesbian, I would feel ashamed.	Agree strongly 1 Disagree strongly 5	1.01	-2.55, -0.88, 0.39, 2.30	ess
marry3	69	What is your view on same-sex marriage?	1 Favour same-sex marriage / 2 Oppose same-sex marriage, but would accept civil unions / 3 Oppose entirely same-sex marriage	0.97	-0.74, 0.90	ipsos, cgeis
rights4	57	To what extent do you agree or disagree with each of the following statements? Gay, lesbian and bisexual people should have the same rights as heterosexual people	Totally agree 1 totally disagree 4	0.72	-1.31, -0.12, 1.67	eb, itanes
approve4a	56	To what extent do you agree or disagree with each of the following statements?There is nothing wrong in a sexual relationship between two persons of the same sex	Totally agree 1 totally disagree 4	0.71	-0.93, 0.34, 2.00	eb
child10	56	Regardless of whether you have children or not, please tell me, using a scale from 1 to 10, how comfortable you would feel if one of your children was in a love relationship with a person from each of the following groups: A person of the same sex	1 Totally uncomfortable / 23456789 / 10 Totally comfortable		NA	eb
adopt4a	55	Same-sex couples' right to adopt is a good thing	1 strongly agree / 2 somewhat agree / 3 somewhat disagree / 4 strongly disagree	0.55	0.01, 1.03, 2.31	prri, ipsos, prriatlantic, fsdelection, ptvs
adopt5a	53	How would you feel about the following statement? Do you agree or disagree with them? Homosexual couples should be able to adopt children	Agree strongly1 strongly disagree 5	1.70	-0.90, 1.41, 3.01, 5.61	evs, som, snes, ptvs
adopt2	51	Do you favor or oppose allowing gay or lesbian couples to adopt a child?	1 Favor / 2 Oppose	0.10	1.60	gallup, anes, cnn, psra, abcwapo, bsa, eb, pew, angus
marry4c	47	Same-sex marriage is or could be harmful to society	1 strongly disagree / 2 somewhat disagree / 3 somewhat agree / 4 strongly agree	0.45	-0.77, 0.33, 1.48	ipsos

Survey Item Code	Country-Years	Question Text	Response Categories	Dispersion	Difficulties	Survey Dataset Codes
marry2	39	Do you think homosexuals should or should not have equal rights to marry one another?	1 Should have equal rights to marry / 2 Should not have equal rights to marry	0.88	1.20	cnn, abcwapo, psra, ap, gallup, uspew, cces, eb, angus, aes
ff5	39	same sex female couple can bring up a child as well as a male-female couple	1 Strongly agree / 2 Agree / 3 Neither agree nor disagree / 4 Disagree / 5 Strongly disagree	0.74	-0.73, 0.87, 1.62, 3.67	issp
mm5	39	same sex male couple can bring up a child as well as a male-female couple	1 Strongly agree / 2 Agree / 3 Neither agree nor disagree / 4 Disagree / 5 Strongly disagree	0.72	-0.38, 1.17, 1.94, 3.80	issp
marry5a	33	Here are some statements about general social concerns. Please say whether you strongly agree, agree, disagree or strongly disagree with each of these statements. Same-sex marriages should be prohibited by law	1 Strongly agree / 2 Agree / 3 Neither agree nor disagree / 4 Disagree / 5 Strongly disagree	0.65	-0.71, 0.39, 1.15, 2.56	ees, ptvs, ines, aes
approve5	31	What about sexual relations between two adults of the same sex?	1 Always wrong 2 Mostly wrong 3 Sometimes wrong 4 Rarely wrong 5 Not wrong at all	0.11	0.46, 0.80, 1.32, 1.65	bsa, cgss
marry5	29	Agree: The law should recognise same-sex relationships	1 Strongly agree / 2 Agree / 3 Neither agree nor disagree / 4 Disagree / 5 Strongly disagree	0.56	-0.26, 0.69, 1.51, 2.96	issp, usgss, bsa, som, chcep, nsss, aussa, kgss
adopt4	29	For each of the following propositions, tell me if you Adoption of children should be authorised for homosexual couples throughout Europe	Totally agree 1 totally disagree 4	0.76	0.67, 1.81, 3.31	eb
marry11	28	I would like you to tell me your views on various issues: same-sex marriage	0 fully in favour of same sex marriage / 123456789 / 10 fully opposed to same sex marriage	1.13	-0.41, -0.15, 0.17, 0.46, 0.67, 1.57, 1.82, 2.15, 2.50, 2.91	ees
neigh10	27	Having a homosexual	1 Not at all comfortable / 23456789 / 10 Totally comfortable	0.86	-2.37, -1.94, -1.50, -1.20, -0.55, -0.23, 0.14, 0.68, 1.21	eb
civil2	22	.Allowing homosexual couples to have the same benefits as married heterosexual couples, such as health benefits inheritance rights and Social Security survivor benefits	1 Support / 2 Oppose	0.86	0.61	abcwapo, eb, politbarometer, gallup
accept4	20	Homosexuals are people who should be accepted like anybody else	Agree completely 1 Disagree completely 4	0.90	-2.04, -0.92, 0.91	cdcee
parent4	17	Homosexual couples are equally good parents as other couples	1 strongly agree / 2 agree / 3 disagree / 4 strongly disagree		NA	lb
rights10	17	How strongly do you approve or disapprove of people from sexual minorities, such as gay, lesbian, bisexual, etc., having the same rights as the majority of Canadians?	1 Strongly disapprove / 23456789 / 10 Strongly approve		NA	amb

Survey Item Code	Country-Years	Question Text	Response Categories	Dispersion	Difficulties	Survey Dataset Codes
pension4	16	Couples of the same sex should be entitled to a widow's/widower's pension as if they had lived with a partner of the opposite sex	1 strongly agree / 2 agree / 3 disagree / 4 strongly disagree	0.82	-0.75, 0.20, 2.04	eb
job5	15	Do you think that it is right or wrong to refuse a job or a training to an applicant because he or she is: A homosexual	1 Always right / 2 Usually right / 3 Sometimes right, sometimes wrong / 4 Usually wrong / 5 Always wrong		NA	eb
promote5	15	Do you think that it is right or wrong to refuse a promotion to a person because he or she is: A homosexual	1 Always right / 2 Usually right / 3 Sometimes right, sometimes wrong / 4 Usually wrong / 5 Always wrong		NA	eb
marry4d	13	Gays and lesbians should be allowed to get married	1 strongly agree / 3 somewhat agree / 5 somewhat disagree / 7 strongly disagree	0.20	0.44, 1.15, 2.42	uspew, fsdelection, cnes, poc, canadianes, twscs
legal2	12	Do you think homosexual relations between consenting adults should or should not be legal	1 should be legal / 2 should not be legal	0.70	-0.21	gallup, abcwapo, cbsnyt, cnn, uswapo, anpas, aes
teacher4	12	School boards ought to have the right to fire teachers who are known homosexuals	1 completely agree / 2 mostly agree / 3 mostly disagree / 4 completely disagree	0.75	-1.56, -0.48, 1.18	uspew
adopt10	12	How strongly do you approve or disapprove of sexual minority couples having the right to adopt children?	1 Strongly disapprove / 23456789 / 10 Strongly approve		NA	amb
neigh5	12	For each of the following types of people, please tell me whether you would like having people from this group as neighbors, dislike it, or not care: Homosexuals	1 strongly dislike / 2 somewhat dislike / 3 would not care / 4 somewhat like / 5 strongly like	0.45	-0.38, 0.19, 1.54, 2.20	afrob
legal2a	9	Do you think gay or lesbian relations between consenting adults should or should not be legal?	1 should be legal / 2 should not be legal	1.68	-0.03	gallup
accept2a	7	Do you feel that homosexuality should be considered an acceptable alternative lifestyle or not?	1 acceptable / 2 not acceptable	1.40	0.43	gallup, usnwr, cbsnyt
accept5	7	Homosexuals are people just like others	1 Disagree completely / 2 Disagree / 3 Neither agree nor disagree / 4 Agree / 5 Completely agree	0.46	-2.18, -1.25, -0.41, 0.79	eb, fsdimm
marry4b	6	Do you think it should be LEGAL or ILLEGAL for homosexual couples to get married?	1 Legal, STRONGLY /2 Legal, SOMEWHAT / 3 Illegal, SOMEWHAT / 4 Illegal, STRONGLY	0.84	0.40, 0.91, 1.95	abcwapo
approve5a	6	Homosexual relations are always wrong	1 strongly agree / 2 agree to some extent / 3 hard to say / 4 disagree to some extent / 5 strongly disagree	0.51	-1.24, -0.36, 1.06, 2.43	bsa, nzes

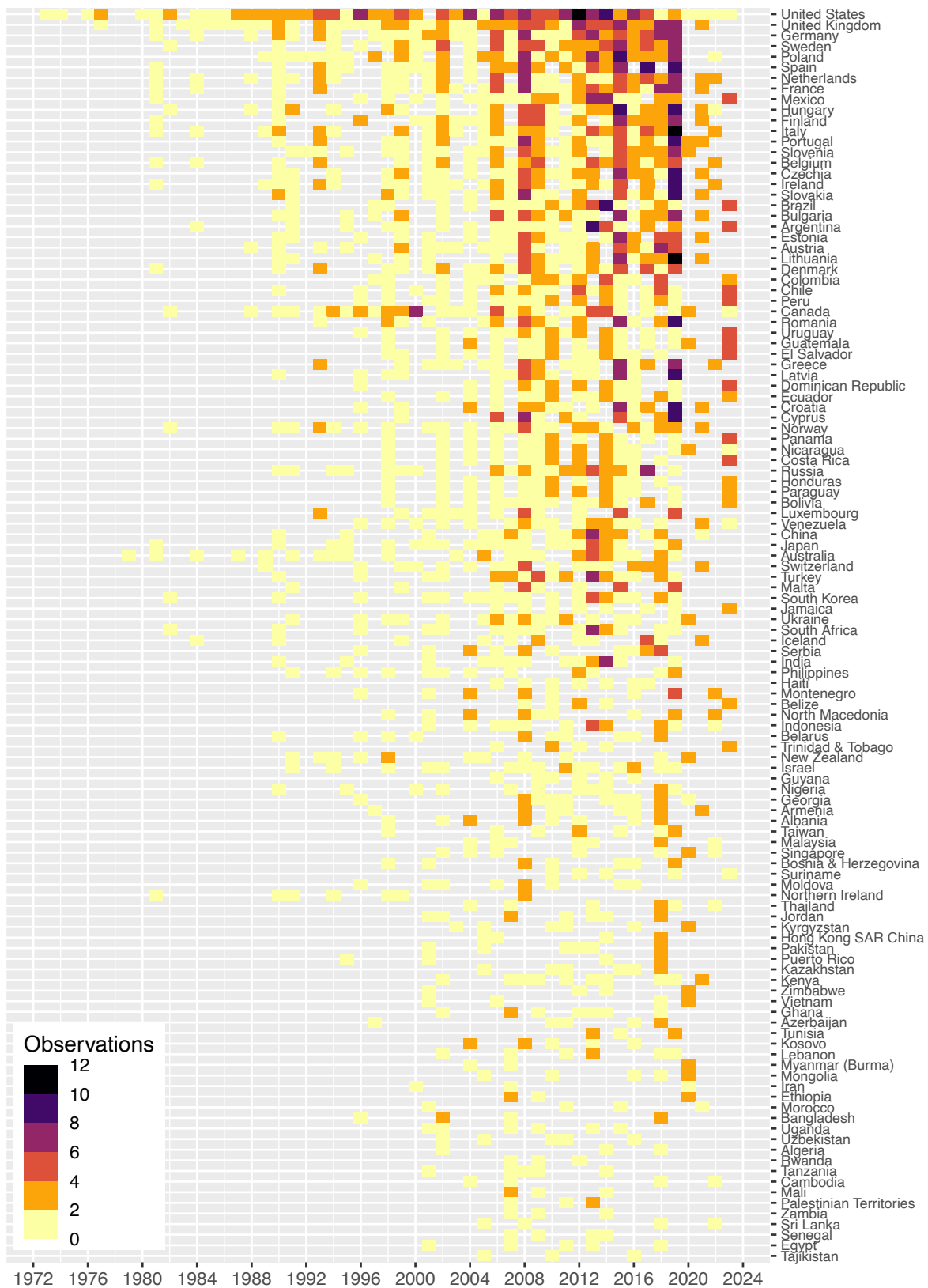| Survey Item Code	Country-Years	Question Text	Response Categories	Dispersion	Difficulties	Survey Dataset Codes
strength5	6	Strengthen the position of homosexuals, bisexuals and transsexuals in society	1 very good suggestion 2 pretty good suggestion 3 neither good nor bad suggestion 4 pretty bad suggestion 5 very bad suggestion	0.80	-0.35, 0.51, 2.70, 4.16	som
legal5	6	Homosexuals are no better than criminals and should be punished in the extreme	1 agree strongly / 2 agree / 3 neither agree nor disagree / 4 disagree / 5 disagree strongly	0.40	-1.95, -1.04, -0.39, 1.06	seessp
marry3a	5	Do you favour or oppose same-sex marriage, or do you have no opinion on this?	1 favor / 3 oppose / 8 no opinion	0.51	0.72, 2.25	canadianes

Figure A1: Source Data Observations by Country and Year

Appendix C: The DCPO Model

Research on latent variable models of public opinion based on cross-national survey data has enjoyed explosive growth in recent years (see Claassen 2019; Caughey, O'Grady, and Warshaw 2019; McGann, Dellepiane-Avellaneda, and Bartle 2019; Kolczynska et al. 2020). To estimate support for gay rights across countries and over time, we draw on the latest of these methods that is appropriate for data that is not only incomparable but also sparse, the Dynamic Comparative Public Opinion (DCPO) model presented in Solt (2020c).[1] The DCPO model is a population-level two-parameter ordinal logistic item response theory (IRT) model with country-specific item-bias terms.

DCPO models the total number of survey responses expressing at least as much support for gay rights as response category r to each question q in country k at time t, y_{ktqr}, out of the total number of respondents surveyed, n_{ktqr}, using the beta-binomial distribution:

$$a_{ktqr} = \phi \eta_{ktqr} \tag{1}$$

$$b_{ktqr} = \phi(1 - \eta_{ktqr}) \tag{2}$$

$$y_{ktqr} \sim \text{BetaBinomial}(n_{ktqr}, a_{ktqr}, b_{ktqr}) \tag{3}$$

where ϕ represents an overall dispersion parameter to account for additional sources of survey error beyond sampling error and η_{ktqr} is the expected probability that a random person in country k at time t answers question q with a response at least as positive as response r.[2]

This expected probability, η_{ktqr}, is in turn estimated as follows:

$$\eta_{ktqr} = \text{logit}^{-1}\left(\frac{\bar{\theta}'_{kt} - (\beta_{qr} + \delta_{kq})}{\sqrt{\alpha_q^2 + (1.7 * \sigma_{kt})^2}}\right) \tag{4}$$

In this equation, β_{qr} represents the difficulty of response r to question q, that is, the degree of support the response expresses. The δ_{kq} term represents country-specific item bias: the extent to which all responses to a particular question q may be more (or less) difficult in a given country k due to translation issues, cultural differences in response styles, or other idiosyncrasies that render the same survey item not equivalent across countries.[3] The

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[1] Solt (2020c) demonstrates that the DCPO model provides a better fit to survey data than the models put forward by Claassen (2019) or Caughey, O'Grady, and Warshaw (2019). The McGann, Dellepiane-Avellaneda, and Bartle (2019) model depends on dense survey data unlike the sparse data on support for gay rights described in the preceding section. Kolczynska et al. (2020) is the very most recent of the five works and builds on each of the others, but the MRP approach developed in that piece is suitable not only when the available survey data are dense but also when ancillary data on population characteristics are available, so it is similarly inappropriate to this application.

[2] The ordinal responses to question q are coded to range from 1 (expressing the least support for gay rights) to R (expressing the most support for gay rights), and r takes on all values greater than 1 and less than or equal to R.

[3] Estimating δ_{kq} requires repeated administrations of question q in country k, so when responses to question q are observed in country k in only a single year, the DCPO model sets δ_{kq} to zero by assumption,

dispersion of question q, its noisiness in relation to our latent variable, is α_q. The mean and standard deviation of the unbounded latent trait of support for gay rights are $\bar{\theta}'_{kt}$ and σ_{kt}, respectively.

Random-walk priors are used to account for the dynamics in $\bar{\theta}'_{kt}$ and σ_{kt}, and weakly informative priors are placed on the other parameters.[4] The dispersion parameters α_q are constrained to be positive and all survey responses are coded with high values indicating more support to fix direction. The difficulty β of "not so bad" (on a four-point scale ranging from "very bad" through "fairly bad" and "not so bad" to "not at all bad") of reactions to "a sexual relationship between two adults of the same sex" is set to 1 to identify location, and for each question q the difficulties for increasing response categories r are constrained to be increasing. The sum of δ_{kq} across all countries k is set to zero for each question q:

$$\sum_{k=1}^{K} \delta_{kq} = 0 \qquad (5)$$

Finally, the logistic function is used to transform $\bar{\theta}'_{kt}$ to the unit interval and so give the bounded mean of latent support for gay rights, $\bar{\theta}_{kt}$, which is our parameter of interest here (see Solt 2020c, 3–8).

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increasing the error of the model by any country-item bias that is present. Questions that are asked repeatedly over time in only a single country pose no risk of country-specific item bias, so δ_{kq} in such cases are also set to zero.

[4]The dispersion parameters α_q are drawn from standard half-normal prior distributions, that is, the positive half of N(0, 1). The first difficulty parameters for each question, β_{q1}, are drawn from standard normal prior distributions, and the differences between βs for each r for the same question q are drawn from standard half-normal prior distributions. The item-bias parameters δ_{kq} receive normally-distributed hierarchical priors with mean 0 and standard deviations drawn from standard half-normal prior distributions. The initial value of the mean unbounded latent trait for each country, $\bar{\theta}'_{k1}$, is assigned a standard normal prior, as are the transition variances $\sigma^2_{\bar{\theta}'}$ and σ^2_{σ}; the initial value of the standard deviation of the unbounded latent trait for each country, σ_{k1}, is drawn from a standard lognormal prior distribution. The overall dispersion, ϕ, receives a somewhat more informative prior drawn from a gamma(4, 0.1) distribution that yields values that are well scaled for that parameter.

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