Prospectus

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Abstract

While political philosophers have developed a rich literature on the importance of individual freedom, empirical social scientists have focused only on the aggregated effects of freedom, via state institutions. This work brings the individual back into quantitative international relations. Using a new data set of survey vignettes from 38 countries, it bridges political theory and practice by identifying features of individuals that explain variation in individuals' perceived freedom of speech within countries, in addition to the variation between countries. I find that education has a leveling effect: among individuals with a median level of education or less, men perceive more freedom of speech than women, but among individuals with a better than median level of education, men and women perceive similar levels of freedom of speech.

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1 Introduction

Empirical social scientists have traditionally left questions of personal freedom to political theorists, who have developed a rich literature discussing the boundaries and types of relationships between the state and individuals.

There is no practical or principled reason, however, why empiricists should not attempt to study what is perhaps the most important question in political science. Part of the struggle is defining what constitutes freedom. This work takes freedom to be freedom of speech, which is a logical prerequisite for other sorts of freedoms such as freedom of action, since speech allows individuals to articulate the choice sets over which they may exercise freedom of action.

Freedom of speech has two features, both of which exhibit some variation at the individual level. First, an individual has an *internal capacity* to form ideas and express them. Second, an individual confronts *external constraints*, whether in the form of state or social control, on the exercise or expression of his internal capacity. Although all individuals in a state are subject to the same political institutions, enforcement of speech laws, and hence the perception of repression, may vary across individuals within a state. Rather than assume that domestic institutions have an undifferentiated effect on individuals, this work quantifies and examines the variation in institutional interaction among individuals.

This work follows the suggestion of Moravcsik (1997), and takes the individual as the unit of analysis, examining variables that affect an individual's perception of his capacity for speech. Since individuals are nested within states and social structures that can circumscribe an individual's freedom of speech, this analysis will employ a multi-level model to account for individual-level and social-level variables.

2 Why individual freedom of speech?

In political philosophy, the importance of personal liberty with respect to the liberty of other individuals and with respect to the boundaries of state power have been a central topic of the modern debate since Locke's *Second Treatise on Government*. In the modern scholarship, Berlin's *Two Concepts of Liberty*, Rawl's *Theory of Justice*, and much of Sen's work discuss the importance of personal freedom. In particular, Sen (1979) introduces the concept of capacities, which define the set of actions over which an individual can choose. Developing this concept, Sen (1999*a*) and Sen (1999*b*) argue that income is a poor proxy for capabilities, but that equitable access to health care and education expand an individual's capabilities, hence that individual's choice set, and hence freedom.

In comparison, the empirical literature on individual freedom is relatively paltry. In one of the few studies of individual freedom in comparative politics, Gibson (1993) finds that in the post-communist Soviet Union, individuals who "lack confidence in their own political efficacy, who have little interest in politics, who perceive the government as repressive, and who are older" (p. 962) are more likely to voluntarily curb the expression of political views, irrespective of their perception of political freedom. While the collapse of communism made self-censorship particularly relevant in the for-

mer USSR, it also limits the direct applicability of these results to other developing democracies.

Scholars in comparative politics and international relations have a rich literature on the *aggregate* effects of freedom of speech on various state-level outcomes. Freedom of speech is important to the development of state institutions. Dahl (1971) posits that political contestation–of which freedom of speech is an essential component–is a prerequisite for the development of representative state institutions. The World Values Surveys are a potentially rich data source; Inglehart (1997) and more recently Welzel and Inglehart (2005) argue that mass liberty aspirations are an important role in democratization. Instead of asking how perceptions of freedom vary among individual respondents, their quantity of interest (regime transition) is observed at the state-level.

International relations scholars have argued that freedom of speech is important to the "democratic peace" phenomenon observed in international relations. Owen (1994) finds that even when leaders of a democracy are themselves illiberal, "if war is threatened with a state that the liberal opposition considers a fellow democracy, liberals agitate to prevent hostilities using the free speech allowed them by law." (p. 89) The freedom expressed by citizens in these countries, however, is usually proxied by institutional assessments of freedom of speech. Considering freedom of speech at the individual level provides a better measure of actual freedom within a state.

If democracy is the institutional manifestation of individual freedom, as Huntington (1993) suggests, the democratization literature suggests some aggregate- or country-level variables that may be relevant to individual freedom. First, education seems to play an important role in the creation of democracies. Lipset (1981) correlates literacy with democracy, and Przeworski et al. (2000) note that average years of education among the workforce, independent of wealth, makes existing democracies more stable. Second, many scholars have suggested a link between per capita income and democratization. Londregan and Poole (1996) and Boix and Stokes (2003) find that increasing income increases the probability of democratization, while Przeworski et al. (2000) find that increasing income increases the probability that a democracy will persist. Third, physical well-being may influence the type of political institutions that develop. Acemoglu, Robinson and Johnson (2001) suggest that the disease environment affects the type of colonial institutions that develop, which in turn determines the type of modern political institutions that develop. Lizzeri and Perisco (2004) argue that poor public health in Victorian England led elites to expand the suffrage in order to effect reforms that they would have been unable to bring about in a clientelistic Parliament.

Although education, wealth, and health may affect democratization at the aggregate (country) level, this does not mean that they affect freedom at the individual level. First, it is unclear whether democracy at the state level and freedom of speech at the individual level are directly analogous quantities. Second, as Robinson (1950) notes, correlations at the aggregate level do not necessarily reflect patterns among individuals. Thus, this work attempts to establish an empirical link between regime characteristics and individual freedom, and then assesses whether the key causal variables at the state level have an effect on individual freedom of speech at the individual level. Using an extensive survey dataset covering about 250,000 individuals in 69 countries, I examine the following hypotheses:

H_1 Increasing an individual's relative level of education increases his perception of freedom of speech.

H_2 Increasing an individual's absolute health status increases his perception of freedom of speech.

H_3 Increasing an individual's relative household income increases his perception of freedom of speech.

H_4 *Ceteris paribus*, men perceive more freedom than women.

The key causal variables are operationalized as

1. **Education**: observed relative to the prevailing median level of education attained by respondents within a country. An individual is "relatively uneducated" if his highest level of education is the country-level median level of education or less. An individual is "relatively educated" if he has a better than median level of education.
2. **Health status**: observed through vignettes in various health dimensions, such as mobility and pain.
3. **Household income**: observed through the number of durable goods that the household possesses.
4. **Gender**: as reported by the respondent.

3 Data and methods

Aggregated measures are only indirectly related to features that can be observed in a single individual, but country-level measures that are aggregated using a consistent methodology allow cross-national comparisons. As King et al. (2004) note, the largest effect in individual level data observed between countries is a cultural one, affecting individual survey responses in systematic ways that matter to the outcomes under consideration. For example, differing levels of self-reported of health between Japanese and Americans may be symptomatic of systematic differences in cultural norms, rather than actual differences in health status.

3.1 Data

In 2002, the World Health Organization (WHO) conducted the World Health Survey (WHS) among inhabitants in 69 countries in all parts of the world, including developed OECD countries, developing countries, and less developed countries from five continents.

- Sample sizes for each country range from about 2,000 (short form) to 40,000 respondents (long form).
- 33 survey vignettes (see King et al. (2004)) established the cross-cultural validity of individuals' responses.
- Each vignette set consists of 5-6 questions.

Each vignette question has ∼500–2,500 respondents per country, depending on the size of the country and whether the country received the long or short form. The vignette sets were administered in 10 panels:

- Health status (16 vignette sets in 4 panels)
- Quality and access to care (15 vignettes in 4 panels)
- Political efficacy (1 vignette set of 5 questions)
- Political freedom (1 vignette set of 6 questions)

Within a country, individual respondents were randomly assigned to panels using a factorial survey design. This implies that the overlap between vignette panels is much smaller than the sample assigned to any one vignette panel. For example, the overlap between the freedom vignette panel and the health status panel is only 2,561 individuals distributed unevenly over 25 countries (including 18 countries with fewer than 30 observations[1]). In contrast, the freedom vignette panel was administered to about 68,000 individuals, and the health status vignette panels to about 62,000 individuals.

3.2 Entropy

Entropy refers to the evenness in the distribution of survey respondents among the possible ordinal choice bins. As with a dichotomous response variable (see, e.g., King and Zeng (2001)), the data contain the most information when the responses are relatively evenly distributed among the possible bins. King and Wand (2007), drawing on the physics literature, refer to this distribution as "entropy" and propose two *ex post* adjustments to improve the accuracy of the vignette adjustment. For every permutation of vignettes, they propose to

1. Calculate the number of inconsistencies or ties in the vignette rankings
2. Calculate the entropy in the data

then using these additional information to drop vignette questions from each vignette set in order to reduce the number of inconsistencies among the vignette rankings, and to increase the overall entropy in the data.

[1] 30 observations is a common statistical threshold for identifying "large-n" versus "small-n" sample sizes, since for greater than 30 degrees of freedom, the t-distribution, on which many test statistics are based, closely approximates a normal distribution.

Table 1: Sample sizes by country for the freedom of speech and political efficacy vignette panels.

Country	Freedom of Speech	Political Efficacy
Bangladesh	2,755	2,711
Bosnia-Herzegovina	508	514
Burkina Faso	2,400	2,362
Chad	2,069	2,196
Comoros	893	859
Congo	495	474
Cote d'Ivorie	1,416	1,486
Croatia	470	475
Czech Republic	380	406
Dominican Republic	2,159	2,176
Ecuador	2,101	2,223
Estonia	496	492
Ethiopia	2,360	2,408
Georgia	684	796
Ghana	1,948	1,952
Guatemala	2,147	2,303
Kazakhstan	1,874	1,875
Kenya	2,137	2,210
Malawi	2,586	2,626
Mali	1,692	1,795
Mauritius	1,847	1,874
Morocco	2,484	2,498
Namibia	1,920	1,950
Nepal	4,194	4,486
Pakistan	879	2,110
Paraguay	2,285	2,290
Philippines	4,997	5,023
Russia	2,111	2,159
Senegal	1,227	1,283
Slovakia	826	928
Slovenia	280	289
South Africa	1,400	1,303
Spain	3,073	3,036
Sri Lanka	3,176	3,172
Swaziland	975	1,034
Ukraine	1,283	1,276
Uruguay	1,486	1,458
Zambia	2,073	2,035
China	–	3,013

3.3 Preserving the ordinalilty of the data

Since the survey responses are on an ordinal scale, any statistical findings must respect the fact that the data are ordinal and categorical. In order to preserve the ordinalilty of the data, I produce country-level summaries of the distribution of individual responses by employing medians repeatedly. For example, education is observed as seven ordered categorical responses in the data. For each category, I calculate the country level median level of education and then create a dummy variable to indicate whether an individual has attained the median level of education in his society or has a below median level of educational attainment. Similarly, renormalization of the vignette responses (when aggregated to the country-level) ranks the level of reported efficacy or freedom among the median respondent in each country.

4 Advantages and disadvantages of vignettes

While survey vignettes have some methodological advantages over looking at the self-response exclusively, they can only be used in certain situations. If the survey question can be defined without reference to specific domestic institutions, vignettes can provide valuable information in scaling individual responses. The freedom of speech question seems to produce well-behaved responses. In contrast, political efficacy is an issue that can *only* be operationalized in the context of specific domestic institutions, and correspondingly, survey vignettes provide little additional information over the self-response alone.

4.1 Freedom of speech as a universal concept

In order to conduct a cross-national comparison of individual perceptions of freedom of speech, the notion of freedom of speech must be measured in such a way as to account for differing cultural interpretations of "freedom of speech" and what constitutes "government reprisal". This is accomplished through a set of survey vignettes. Respondents are first asked to assess their own freedom of speech, and then asked to rank the freedom of speech of several vignettes, short stories describing fictitious individuals subject to certain levels of government sanction for their speech. Since the same vignettes are administered in each country, the vignette responses can be used to scale the individual's self-response relative to his vignette responses using the methods described in King et al. (2004).

The internal and external consistency of the freedom of speech data imply that after rescaling, freedom of speech is a universal concept, applicable to individuals who live under all sorts of regime types. The self-response question for freedom of speech asked individuals:

> How free do you think [name/you] [is/are] to express [him-her/your]self without fear of government reprisal?

With possible response categories (for the self-response, and for the vignettes that follow below):

1. Completely Free
2. Very Free
3. Moderately Free
4. Slightly Free
5. Not Free at All

The relevant vignettes (from most free to least) were as follows:

1. [Kay] does not like many of the government's policies. She frequently publishes her opinion in newspapers, criticizing decisions by officials and calling for change. She sees little reason these actions could lead to government reprisal.
2. [Michael] disagrees with many of the government's policies. Though he knows criticism is frowned upon, he doesn't believe the government would punish someone for expressing critical views. He makes his opinion known on most issues without regard to who is listening.
3. [Bob] has political views at odds with the government. He has heard of people occasionally being arrested for speaking out against the government, and government leaders sometimes make political speeches condemning those who criticize. He sometimes writes letters to newspapers about politics, but he is careful not to use his real name.
4. [Connie] does not like the government's stance on many issues. She has a friend who was arrested for being too openly critical of governmental leaders, and so she avoids voicing her opinions in public places.
5. [Vito] disagrees with many of the government's policies, and is very careful about whom he says this to, reserving his real opinions for family and close friends only. He knows several men who have been taken away by government officials for saying negative things in public.
6. [Sonny] lives in fear of being harassed for his political views. Everyone he knows who has spoken out against the government has been arrested or taken away. He never says a word about anything the government does, not even when he is at home alone with his family.

With five response categories and six survey vignettes, eliminating one vignette immediately improves entropy among the responses, such that four of the five vignette combinations have greater estimated entropy than using all six vignettes. In addition, a few of the vignettes provide situations that are quite similar, which may increase the number of inconsistencies in respondents' rank-ordering of the freedom of speech observed in the vignettes. For example, the difference between Kay (who "sees little reason" for government reprisal) and Michael (who "doesn't believe the government would punish someone") is difficult to differentiate. In addition, the difference between Connie and Vito (both of whom have known people who were arrested for speaking against the government, and who do not speak publicly), is also *ex ante* quite small. Thus, reducing the set of vignettes to four vignettes (Kay, Bob, Connie, and Sonny) reduces the number of inconsistent rankings in the data from 44,046 inconsistencies to 25,635 inconsistencies out of 66,074 total respondents.

Figure 1: Cross-tab of 2002 Freedom House freedom of speech categories with World Health Survey ranks of median freedom among respondents in each country survey.

Freedom of the Press (Freedom House)

World Health Survey Rank of Median Freedom	***Not Free***	***Partially Free***	***Free***
1 ***(least free)***	Swaziland	Comoros	
2	Bangladesh Chad Zambia Kazakhstan Sri Lanka	Burkina Faso Malawi Republic of Congo Ukraine	Mauritius
3	Cote d'Ivorie Ethiopia Kenya	Bosnia-Herzegovina Ecuador Georgia Guatemala Morocco Namibia Nepal Pakistan Russia Senegal	Czech Republic Philippines Slovakia South Africa
4		Croatia Paraguay	Dominican Republic Estonia Ghana Mali Slovenia Uruguay
5 ***(most free)***			Spain

Spearman's ρ is 0.59, with a p-value < 0.01, which provides strong evidence against the hypothesis that the null hypothesis that the true correlation coefficient is zero. A χ^2 test of independence returns a p-value of 0.05, which provides some statistical evidence against the hypothesis that the factors are independent.

To validate the WHS freedom data using an external measure, I compare freedom of press scores from the 2002 Freedom House survey to the country-level median levels of speech. Since the Freedom House measure is a function of institutional, legal, and economic variables observed at the country level, I produce a country-level measure of freedom of speech by finding the 50th percentile of respondents in a given country, then ranking the country-level medians to produce an ordinal measure of state freedom. Considering that the Freedom House survey measures freedom of the press, which may be different from the speech of an average citizen, the Freedom House measure correlates quite well with the country level medians (Spearman's $\rho = 0.59$).

4.2 Contextual definition of political efficacy

Although previous research by Gibson (1993) found that internal political efficacy was one of the strongest determinants of perceptions of political freedom, it is very difficult to assess political efficacy across multiple countries. Different institutional structures and social norms mean that political efficacy will be defined in terms of the mechanisms available in different societies. In contrast, survey vignettes establish the cross-cultural comparability of responses by using the *same* set of vignettes in each country. If the vignettes contain assumptions about political institutions that are not reflected in the political institutions of a particular country, then the vignettes cannot be used to scale individual responses across countries.

The self-response for political efficacy asked individuals:

> How much say [does/do] [name of person/you] have in getting the government to address issues that interest [him/her/you]?

With possible response categories (for the self-response, and for the vignettes that follow below):

1. Unlimited Say
2. A Lot of Say
3. Some Say
4. Little Say
5. No Say at All

The relevant vignettes (from most efficacious to least) were as follows:

1. [Alison] lacks clean drinking water. She and her neighbors are supporting an opposition candidate in the forthcoming elections that has promised to address the issue. It appears that so many people in her area feel the same way that the opposition candidate will defeat the incumbent representative.
2. [Imelda] lacks clean drinking water. She and her neighbors are drawing attention to the issue by collecting signatures on a petition. They plan to present the petition to each of the political parties before the upcoming election.
3. [Toshiro] lacks clean drinking water. There is a group of local leaders who could do something about the problem, but they have said that industrial development is the most important policy right now instead of clean water.

4. [Jane] lacks clean drinking water because the government is pursuing an industrial development plan. In the campaign for an upcoming election, an opposition party has promised to address the issue, but she feels it would be futile to vote for the opposition since the government is certain to win.

5. [Moses] lacks clean drinking water. He would like to change this, but he can't vote, and feels that no one in the government cares about this issue. So he suffers in silence, hoping something will be done in the future.

The sort of political efficacy in the vignettes *assumes* that political efficacy is reflected through democratic processes such as voting, representation, and a party system that consists of more than one party. Under non-democratic regime types or in clientelistic societies, this is likely an inaccurate interpretation of political efficacy. Unfortunately, Freedom House classifies only 15 of the 38 countries in the WHS as free and stable democracies. Correspondingly, the political efficacy questions do not contain much information on individual's perception of their ability to get the government to address issues that matter to them.

Furthermore, the differentiation between some of the vignettes is very small, such that respondents are unable to rank them accurately. The differentiation between Alison (who votes for the opposition candidate) and Imelda (who has started a petition to present to the opposition candidate) is quite a fine distinction since both vignettes seem to represent individuals who vote in robust party systems where citizens are not only free to organize, but are actually able to do so. The differentiation between Toshiro (whose needs are ignored in favor of central planning) and Jane (who feels that voting is futile) is also quite fine, as neither believes that they can accomplish their policy goals. In these situations, respondents are more likely to rank the vignette questions out of order, producing inconsistent responses or ties among their responses. The number of ties may be reduced by eliminating the ambiguous vignette. In other vignette sets in the WHS data, the number of inconsistencies can sometimes be reduced by 40% simply by removing one vignette. In the efficacy vignette set, however, there are 49,176 inconsistent sets of responses out of about 72,394 total. Removing one vignette can reduce this to about 40,551 to 44,663 inconsistencies (depending on the vignette removed), and removing two vignettes reduces the number of inconsistencies to 28,327 to 38,708 inconsistencies. This is still an incredibly high percentage of respondents who cannot assess the level of political efficacy among a reduced set of vignette questions, let alone their own level of political efficacy.

The effect of these problems is that the responses to the political efficacy question do not contain much useful information. The country-level measures of political efficacy do not correlate well with any existing proxies for efficacy, such as Transparency International's Corruption Perceptions Index, the polity, polity2, and democracy scores from the POLITY4 data set (see Marshall and Jaggers (2003)), or Freedom House scores. (All external measures are for the relevant 2002 reports or scores.) The best correlate is the autocracy score from POLITY4, which has a Spearman's ρ of 0.3. That is, as a state becomes more autocratic, citizens feel more efficacious, but the empirical relationship is relatively weak, and counter-intuitive: Do citizens in non-democracies (who cannot vote, petition, or appeal to non-existent opposition parties) feel that they can accomplish more via petitions and supporting opposition candidates than citizens of

democracies? Since the empirical results cannot be externally validated, this gives some evidence to the need to define efficacy contextually, which undermines the statistical value of using survey vignettes to establish the cross-cultural compatibility of the self-response questions.

5 Preliminary results: Education and gender

Using a maximum-likelihood multiple-response ordinal probit model, as described in King et al. (2004), I estimate an individuals' perceived level of freedom of speech as a function of age, gender, education, and country-level fixed effects, with two- and three-way interaction terms between education, gender, and the country-level fixed effects. Ignoring regime characteristics for the moment (the aggregate effect of which are controlled for via the country fixed effects), I focus on the effect of education and gender on perceived freedom of speech. Using various combinations of male versus female, and relatively educated versus relatively uneducated, I calculate the predicted probability that an individual from a given country perceives that he can express himself without fear of government reprisal (e.g., possesses freedom of speech). Using these predicted probabilities, I then calculate risk ratios, defined as

$$\frac{\Pr(Y = \text{“free”}|X_1)}{\Pr(Y = \text{“free”}|X_0)} - 1$$

If the risk ratio is less than 0, the predicted probability of having freedom of speech is less under the vector of covariates X_1 than under X_0. If the risk ratio is greater than 0, the predicted probability of having freedom of speech is greater under covariates X_1 than under X_0. The deviation from 0 is the proportion increase or decrease experienced under covariate vector X_1, using the predicted probability under X_0 as a baseline.

For such a crude method, the results are remarkably consistent. In general terms, uneducated women feel less free than uneducated men, but educated women feel just as free as educated men. On average, a better than median level of education seems to increase the perception of freedom of speech among females more than the equivalent measure among males.

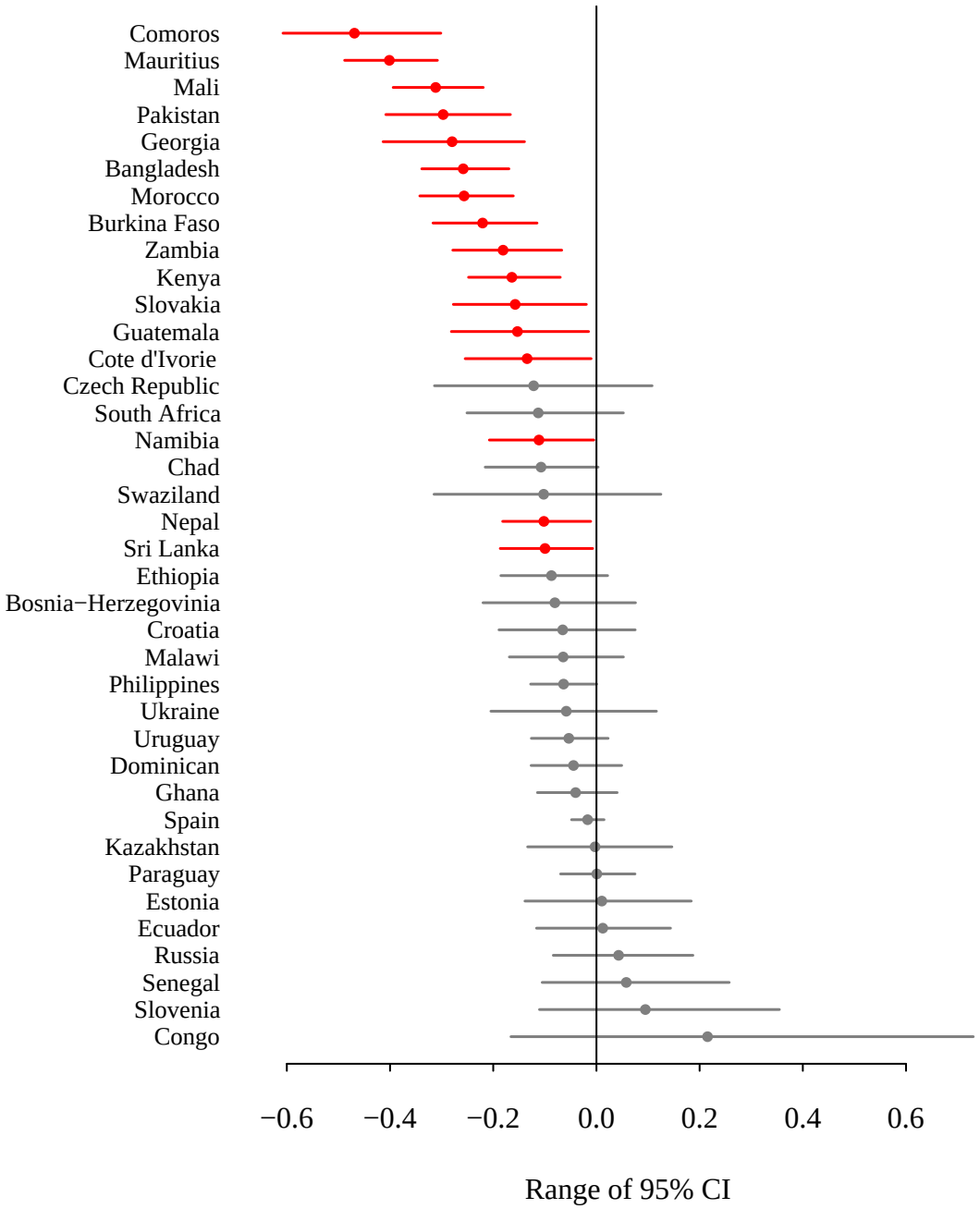
More specifically, Table 2 and Figure 2 summarize the risk ratios of uneducated women compared to uneducated men. The 95% confidence intervals for 16 countries out of 38 in the data set are is consistently less than 1, indicating that women in these countries perceive less freedom of speech than their male counterparts, and that this difference is statistically significant at the 5% threshold. In the remaining 22 countries, uneducated men and uneducated women perceive freedom of speech at rates that are statistically indistinguishable. Thus, there are no countries included in this survey in which men perceive less freedom of speech than their female compatriots.

Table 2: Risk ratios comparing perceptions of freedom of speech among uneducated men and uneducated women.

	Mean	SD	2.5%	97.5%
Comoros	-0.47	0.08	-0.61	-0.30
Mauritius	-0.40	0.05	-0.49	-0.31
Mali	-0.31	0.04	-0.39	-0.22
Pakistan	-0.30	0.06	-0.41	-0.17
Georgia	-0.28	0.07	-0.41	-0.14
Bangladesh	-0.26	0.04	-0.34	-0.17
Morocco	-0.26	0.05	-0.34	-0.16
Burkina-Faso	-0.22	0.05	-0.32	-0.12
Zambia	-0.18	0.05	-0.28	-0.07
Kenya	-0.16	0.05	-0.25	-0.07
Slovakia	-0.16	0.07	-0.28	-0.02
Guatemala	-0.15	0.07	-0.28	-0.02
Cote d'Ivorie	-0.13	0.06	-0.25	-0.01
Namibia	-0.11	0.05	-0.21	-0.01
Nepal	-0.10	0.04	-0.18	-0.01
Sri Lanka	-0.10	0.04	-0.19	-0.01

Negative risk ratios indicate that women feel less likely that they can speak without any fear of government reprisal, by the proportion indicated. The 95% confidence interval for uneducated women in Bangladesh indicates that the probability that they are between 17 and 34 percent less likely to perceive absolute freedom of speech than their uneducated male counterparts. In the remaining 22 countries, there is no statistically significant difference in the probability that uneducated men and uneducated women perceive that they have absolute freedom of speech. Thus, in countries where the risk ratio is different from zero in a statistically significant way, uneducated women perceive less freedom of speech than uneducated men.

Figure 2: 95% confidence intervals for risk ratios of uneducated men versus uneducated women.



Red lines indicate that the 95% CI does not include zero. The mean risk ratio (dot) is less than zero in 31 of 38 countries, indicating that uneducated women perceive less freedom than uneducated men. In countries where there exists a statistically significant difference, uneducated women perceive less freedom of speech than uneducated men.

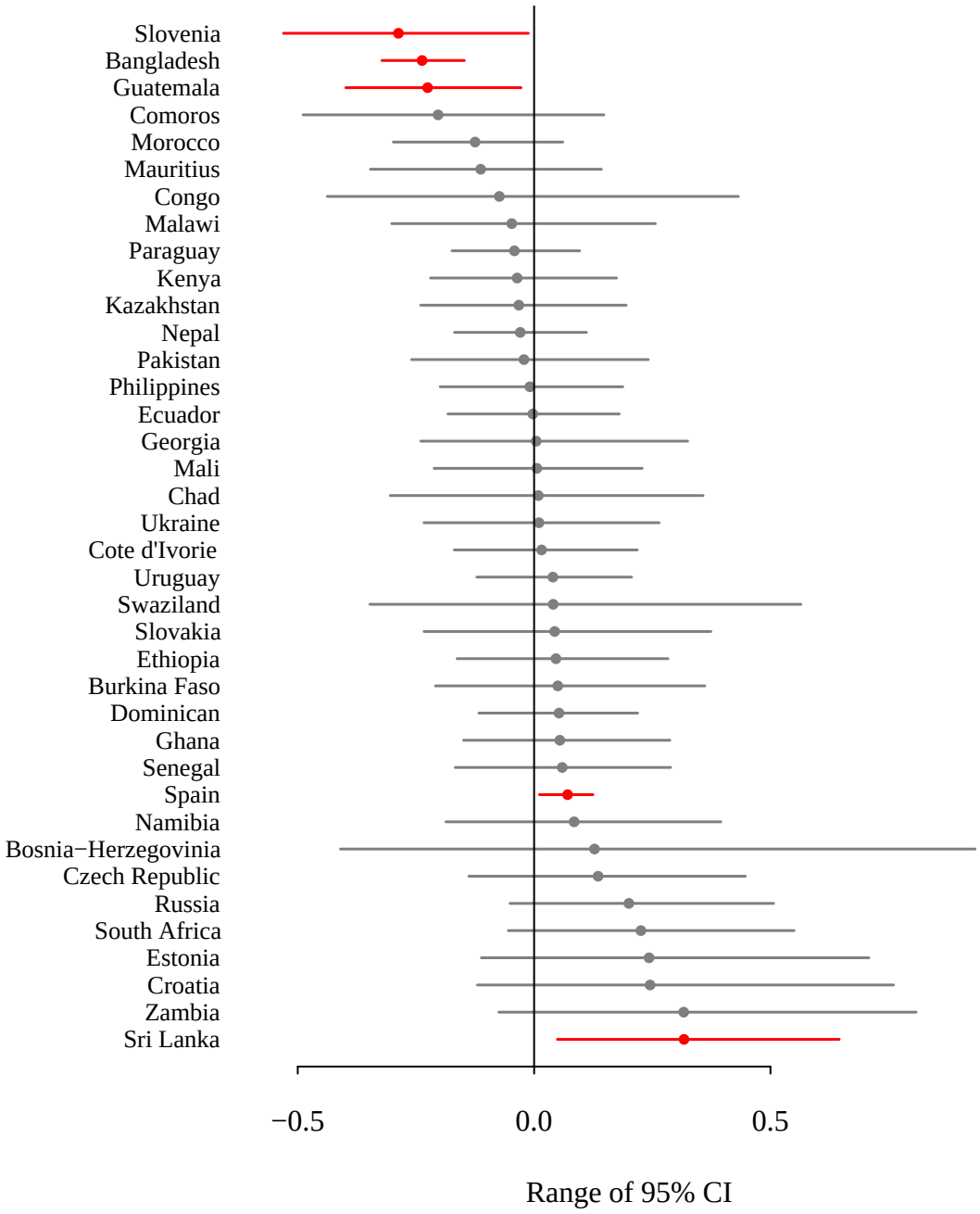
In contrast to the clear pattern among uneducated men and uneducated women, the perception of freedom of speech among educated men and educated women are much more mixed. As Table 3 and Figure 3 show, educated men and educated women in almost all of the 38 countries surveyed perceive about the same levels of freedom of speech. Among educated individuals, women in three countries perceive less freedom of speech, and in two countries, men perceive less freedom of speech. In the remaining 33 countries, perceived freedom of speech among educated men and educated women are statistically indistinguishable.

Table 3: Risk ratios comparing educated men and educated women.

	Mean	SD	2.5%	97.5%
Slovenia	-0.29	0.14	-0.53	-0.01
Bangladesh	-0.24	0.05	-0.32	-0.15
Guatemala	-0.23	0.09	-0.40	-0.03
Spain	0.07	0.03	0.01	0.12
Sri Lanka	0.32	0.15	0.05	0.65

There is substantially less gender inequality in the perception of freedom of speech among educated men and women. The three risk ratios statistically less than zero at the 5% level indicate that women are less likely to perceive freedom of speech in Bangladesh, Guatemala, and Slovenia. The two risk ratios that are statistically greater than 0 indicate that educated women in Spain and Sri Lanka perceive more freedom of speech than their educated male counterparts. In the remaining 33 countries, there is no statistical difference at the 5% level in the perception of freedom of speech among educated men and women.

Figure 3: 95% confidence intervals for the risk ratio comparing educated men and women.



Red lines indicate that the 95% CI does not include zero. There are no clear patterns among the risk ratios: In 15 countries, the mean effect (dot) of being female decreases perceived freedom of speech, and in 3 countries, the effect is statistically significant. In 23 countries, the mean effect of being female is to increase perceived freedom of speech, and in 2 countries, the effect is significant.

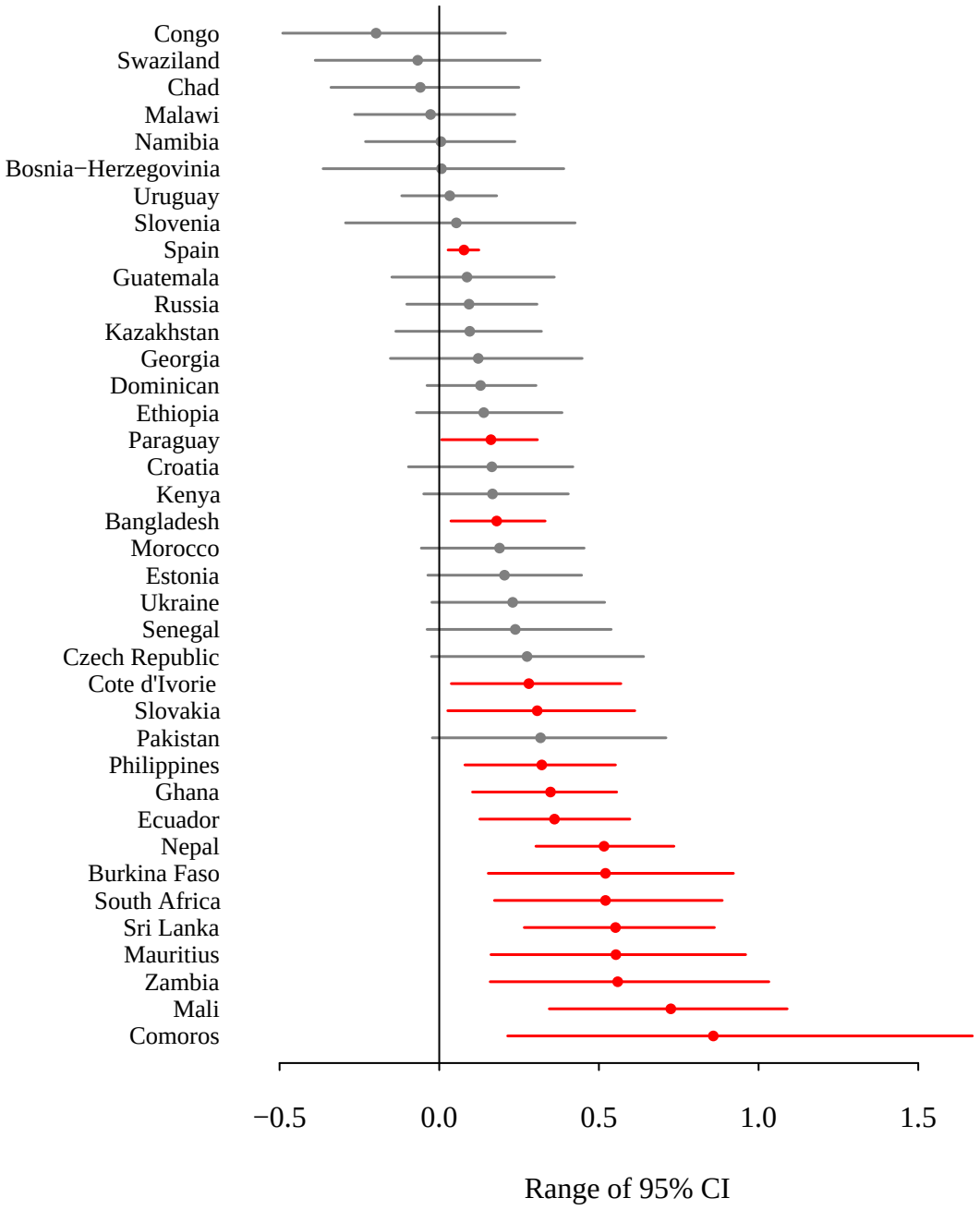
The difference between the country-level results for educated and uneducated men and women indicate that education has a differential effect on perceptions of freedom of speech among men and women. Women are more likely than men have a positive effect of education on their perceived freedom of speech. When comparing women who have a higher than median level of education to those who have a median level of education or less, the risk ratios show an unambiguous improvement in perceived freedom of speech. As Table 4 shows, in 16 of 38 countries, educating women produces a risk ratio that is significantly greater than zero at the 5% level, and as Figure 4 shows, the mean difference is greater than zero in 34 of 38 countries. In no country does educating women decrease perceived freedom of speech among women in a statistically significant way.

Table 4: Risk ratio comparing educated women to uneducated women.

	Mean	SD	2.5%	97.5%
Comoros	0.86	0.38	0.21	1.67
Mali	0.73	0.19	0.34	1.09
Zambia	0.56	0.23	0.16	1.03
Mauritius	0.55	0.21	0.16	0.96
Sri Lanka	0.55	0.16	0.27	0.86
South Africa	0.52	0.18	0.17	0.89
Burkina	0.52	0.20	0.15	0.92
Nepal	0.52	0.11	0.30	0.73
Ecuador	0.36	0.12	0.13	0.60
Ghana	0.35	0.12	0.10	0.56
Philippines	0.32	0.12	0.08	0.55
Slovakia	0.31	0.15	0.03	0.61
Cote d'Ivorie	0.28	0.13	0.04	0.57
Bangladesh	0.18	0.08	0.04	0.33
Paraguay	0.16	0.07	0.01	0.31
Spain	0.08	0.03	0.03	0.12

In 16 of 38 countries, educating women produces a risk ratio that is significantly greater than zero. In the remaining 22 countries, the effect is statistically indistinguishable from zero. Thus, where education has a statistically clear effect, it increases perceived freedom among women.

Figure 4: 95% confidence interval for the risk ratio comparing educated to uneducated women.



Red lines indicate that the 95% CI does not include zero. In all but four countries, the mean effect (dot) of educating women is to increase their perceived freedom of speech.

In contrast, the gains from educating men are less clear. In three countries, educating men reduces their perceived freedom of speech in a statistically significant manner. In 10 countries, educating men increases their perceived freedom of speech in a statistically significant manner. In the remaining countries, the effect is statistically indistinguishable from no effect at all.

As 5 shows, the mean estimates for the risk ratios are also ambiguous. In 15 of 38 countries, education has a mean negative effect on perceived freedom of speech among men. In the remaining 23 countries, a mean positive effect.

The differential gains from education between men and women can be seen more clearly when we compare the mean risk ratios of men and women. Figure 6 shows the mean risk ratios among men and among women, comparing counter-factual levels of education. The x- and y-axes represent percentage change in perceived freedom of speech for below average education compared to better than average education. If the gains from eduction were symmetrical between the genders, we would expect to see countries along the 45 degree line (the point at which men and women have equivalent gains or losses from education), or about the same number of countries above the 45-degree line as below the 45-degree line. There are many more countries below the 45-degree line as above it, however, indicating that women have larger gains with respect to education than men.

6 Advances in data analysis

In contrast to the results from the previous section, the existing literature uses aggregate measures of state characteristics, formed usually from the educated guess of a single expert (or less frequently from some aggregation of the expertise of several researchers), and the data used to form the expert opinion are usually based on several sources, themselves aggregates in some way. The most commonly used measures in international relations, including POLITY4 regimes scores (Marshall and Jaggers 2003), Transparency International's corruption perception index, and Freedom House scores, are produce point estimates at the country-level based on aggregate features such as the competitiveness of the party system, free speech laws, and the independence of the courts. This cross-national variation in external constraints certainly affects estimates of freedom between individuals living in different countries. Coding these regime characteristics at the individual, then pooling individuals across countries establishes a cross-national comparison from a given regime characteristic, but the standard errors will be too small because there is no variation in individuals within a country.

There are substantive reasons why perceived levels of freedom among individuals in the same country should vary as well. As demonstrated in the previous section, gender and education affect individuals' perception of freedom. Since internal capacities may vary between individuals, such that individuals who are more educated, wealthier, or healthier may perceive different levels of personal freedom based on their internal capacities.

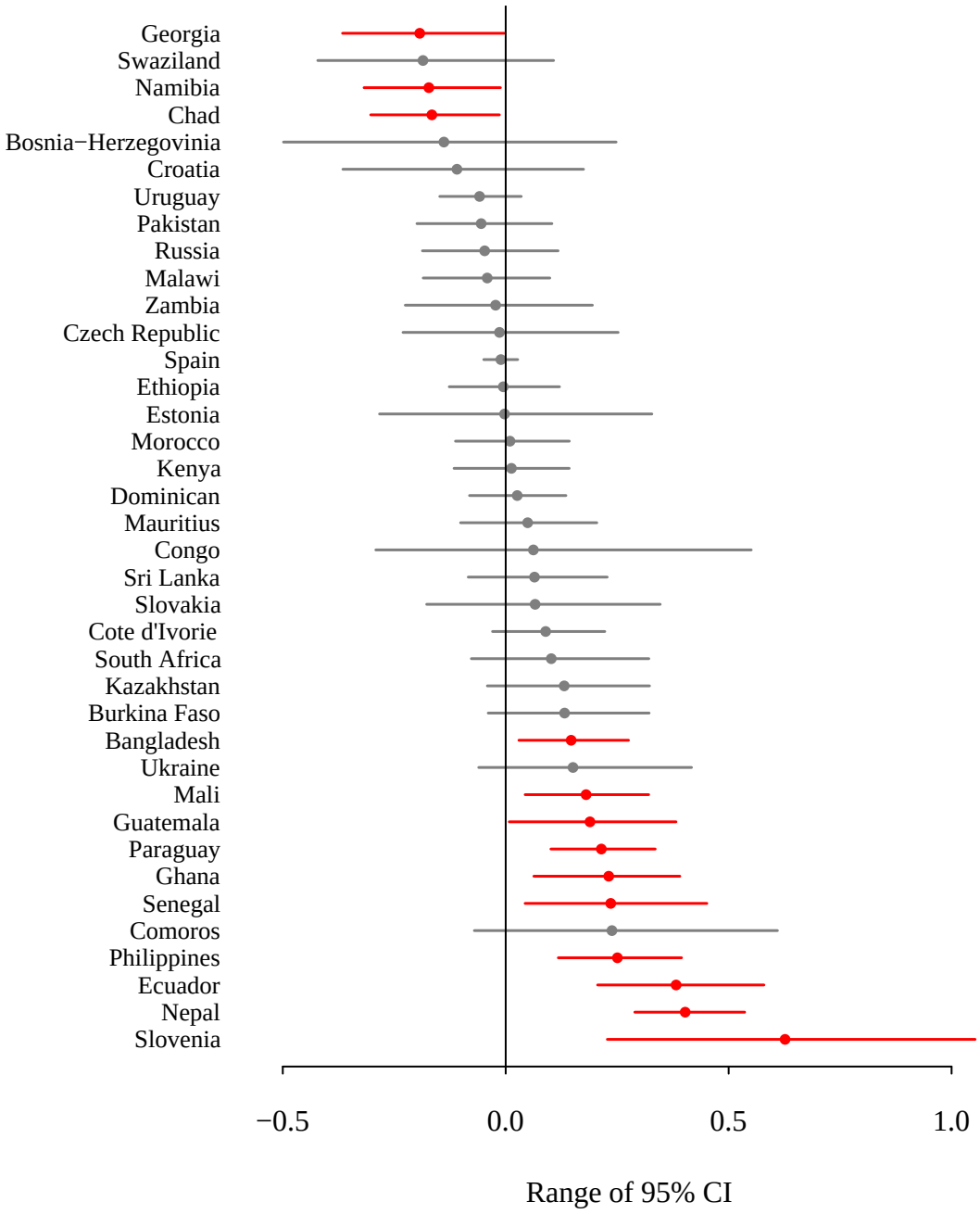
Furthermore, because education and health care are usually provided by the state to some extent, an individual's access to these domestic institutions may influence the freedom that he perceives. An individual privileged by some social metric may have

preferential access to institutions that can in turn increase his internal capacities, or may demand a disproportionate share of state resources be devoted to the services that will benefit him.

Despite these hurdles, individual-level analysis still has several advantages over aggregate comparisons. Any country-level estimates produced will have associated measures of uncertainty. Rather than conjecturing that results from aggregate measures are asymptotically equivalent to an individual analysis, this claim can be evaluated empirically. Rather than positing that results from a limited set of countries (or one country) are generalizable, the generalizability of a result can be tested and quantified in a systematic way. In short, more data is better, and the individual is the smallest holistic unit of analysis in social science.

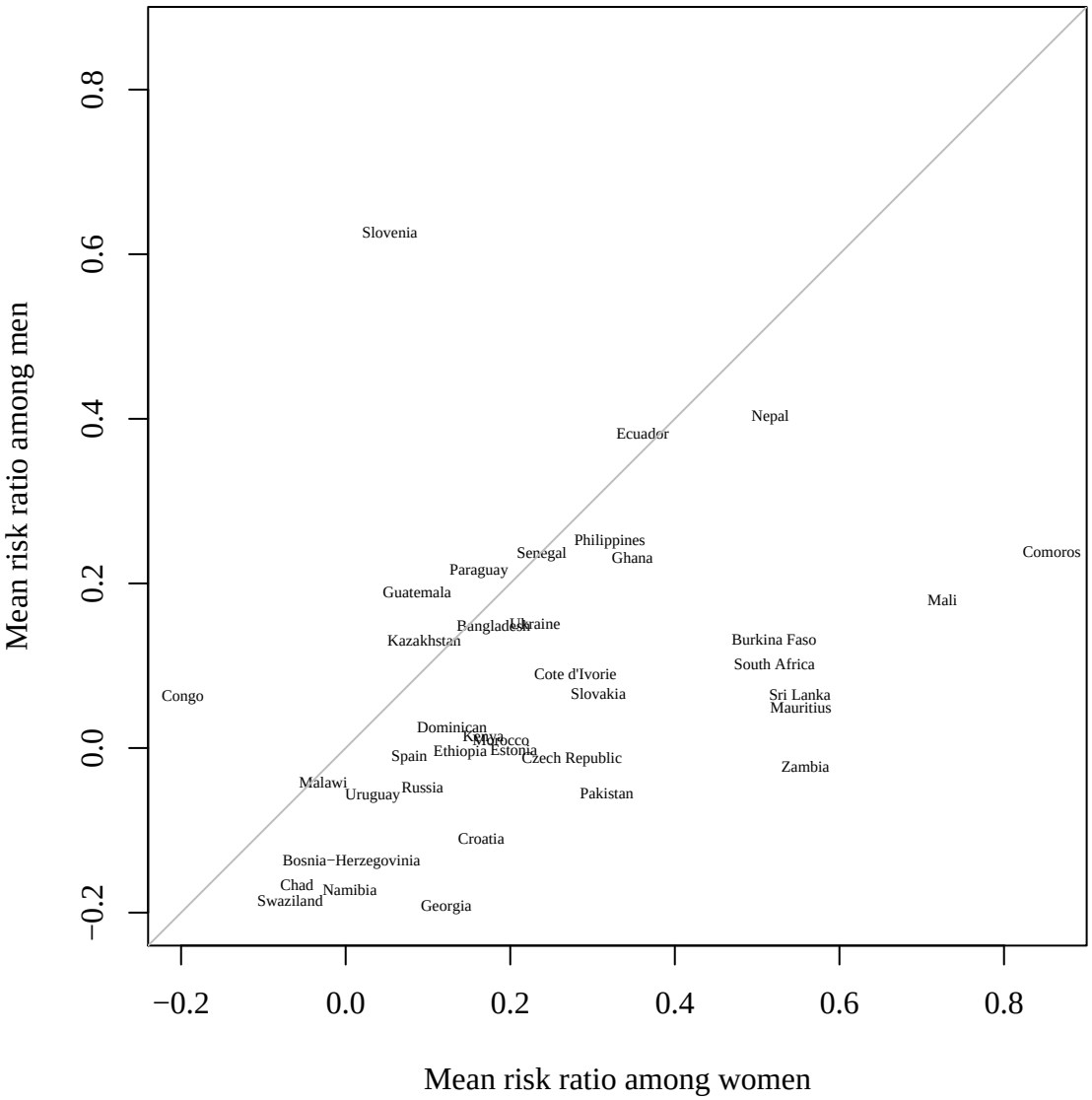
Variation in internal capacities among individuals, variation in state institutions, and variation in individual interaction with state institutions imply that the effects of state institutions on individual freedom are not homogeneous. These methodological challenges imply a multi-level model that takes individuals, nested within states, as the unit of analysis.

Figure 5: 95% confidence intervals for the risk ratios for educated versus uneducated men.



Red lines indicate that the 95% CI does not include zero. Among men, the effect of education on perceived freedom of speech is less clear than the pattern in among women (in Figure 4): In 15 countries, the mean effect (dot) is negative, but in the remaining 23 countries, the mean effect is positive. While the effect of education is on balance positive, there are some indications that it is not uniformly so among men.

Figure 6: Effect of education on each gender, by country.



The 45-degree line represents equal effects from education. In countries above the 45-degree line, men perceive a greater increase in their freedom of speech as a result of education than women. In countries below the 45-degree line, women perceive a greater increase in their freedom of speech than men.

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