Supporting Information (SI): "Youth Bulges and State Repression"
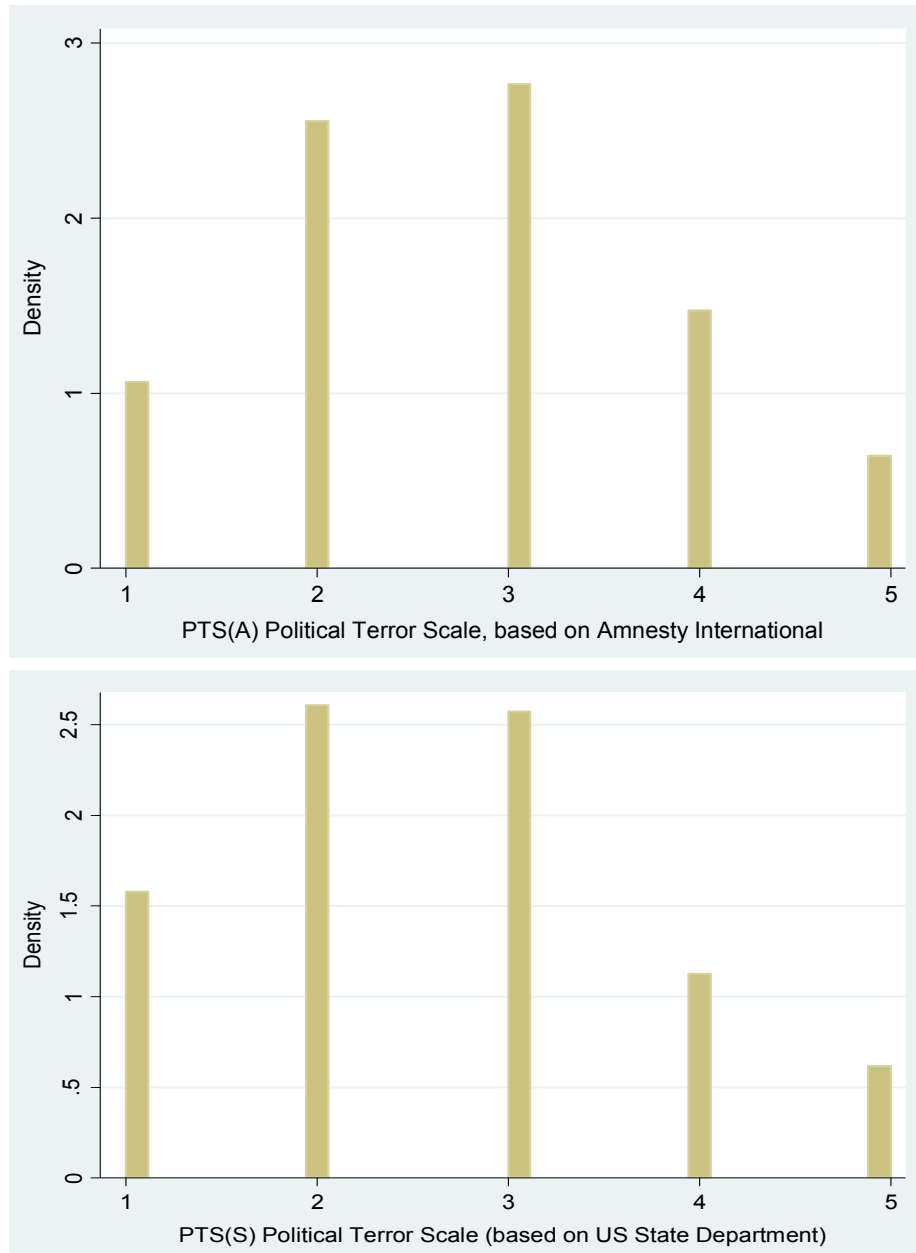
3 February 2012

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Histograms for main dependent variables

The histograms below show the distribution of the Political Terror Scale based on US State Department Reports PTS(S) and Political Terror Scale based on Amnesty International reports PTS(A) in the sample of the article. Both show a distribution that approaches a normal distribution.

SI Figure 1. Histograms of main dependent variables in analyses

Descriptive statistics

Below, Table SI 1 report the descriptive statistics for all variables used in the article.

Variable	N	Mean	Std. Dev.	Min	Max
PTS(A)	3,148	2.754	1.110	1	5
PTS(S)	3,827	2.312	1.173	1	5
Youth bulge	4,014	29.922	7.027	12.9	45
Youth bulge (to total pop.)	4,014	18.456	2.465	10.9	25.4
Dissent	3,539	1.257	3.464	0	49
Dissent*Youth bulge	3,486	8.720	13.883	0	40.6
Democracy tricotomy	4,123	0.437	0.759	0	2
Democracy tricotomy*Youth bulge	4,014	6.720	11.427	0	39.9
Civil conflict	4,590	0.160	0.367	0	1
GDP per capita, ln	4,123	8.314	1.041	5.620	10.738
Population, ln	4,123	8.663	1.874	4.060	14.060

Correlation matrix

Below is the correlation matrix for the variables used in the tables in the article. The two dependent variables are quite highly correlated, as are the two measures of youth bulges (measured as 15-24 years olds to the total adult population or measured against the total population, respectively), which is to be expected.

	PTS(A)	PTS(S)	Youth bulge	Youth bulge (tp)	Dissent	Demo-cracy	Civil conflict	GDP per cap., ln
PTS(A)	1.0000							
PTS(S)	0.7898	1.0000						
Youth bulge	0.4268	0.4177	1.0000					
Youth bulge (tot. pop.)	0.4148	0.3961	0.8709	1.0000				
Dissent	0.1203	0.0831	-0.0471	0.0432	1.0000			
Democracy tricotomy	-0.4363	-0.4684	-0.5771	-0.4555	0.0373	1.0000		
Civil conflict	0.5373	0.5465	0.2083	0.1814	0.1116	-0.1189	1.0000	
GDP per capita, ln	-0.3694	-0.4344	-0.7154	-0.4967	0.0577	0.5654	-0.2379	1.0000
Population, ln	0.2452	0.2154	-0.0772	0.0311	0.2941	0.0841	0.2400	-0.0072

The other correlations are mostly not very high. One exception is the correlation between GDP per capita and the measure of youth bulges relative to the adult population, which is at 0.7154. This could suggest that there is some effect of GDP per capita on demography, whereby youth bulges are in part a product of the development levels in a country. Although this is outside the focus of the article, the source of youth bulges is a potential future research area which could add insights into the demography-repression nexus. Interestingly, as well, is the fact that the measure of youth bulges to the total population is not very highly correlated with

GDP per capita (0.4967), which suggests that it is those countries with a very high child population that are associated with lower GDP, which again is not surprising- the least developed countries often have elevated fertility rates, but many children in these societies do not survive early childhood due to high infant mortality.

Models with Alternative Control Variables

Additional controls or alternative specifications are introduced to some models for robustness checks. These are not included in the models in the main article for reasons of parsimony, because they are less established in the literature, or because they restrict our sample.

As a robustness test, we ran Model 1 (from Table 1) using different control variables than the ones reported in the article. Supporting Information Table 1 (below) shows results with the first three alternative controls. All models show that the main finding of the relationship between youth bulges and state repression remains robust with these controls included:

First, as an alternative measure of development we use a measure of Infant Mortality Rate (IMR), as was done by Urdal (2006). Infant mortality has been used as an alternative to GDP per capita or similar measures in quantitative studies in the conflict literature and elsewhere (Urdal 2006; Achvarina et al. 2009). The two are very highly correlated typically (in our sample the correlation is -0.7583) and believed to capture the same phenomenon of general development. IMR is closer to being a poverty measure than GDP per capita, which is sometimes seen as a proxy for state capacity, and might be a preferred measure of development to capture variations among poorer countries.

We also run a model with the Polity scale for -10 (full autocracy) to 10 (full democracy) as an alternative measure of regime type, as this was previously the most commonly used democracy measure in repression models (e.g., Davenport 1999; Hafner-Burton 2005; Saideman et al. 2002). The data is from the Polity IV dataset (Marshall and Jaggers 2003). As alternative and additional measure of conflict, we also include a dummy for ongoing international war (from UCDP/PRIO dataset) in one model (Gleditsch et al. 2002). Although arguments have been made about international wars increasing the probability that we will see repression (Poe et al. 1999), the empirical evidence here is mixed (Richards et al. 2001; Landman, 2005). Last, we include a dummy for the Cold War period as was done by Wood (2008). This variable helps control for difference in the measures of the dependent variables over time, as the two sources of information on state repression have been found to be biased particularly during the Cold War period (Poe, Vasquez, and Carey 2001). Cold War is a dummy variable coded 1 for all years prior to 1991.

	w/IMR (Urdal 2006)	w/Polity scale - 10/+10 (Marshall & Jaggers 2005)	w/International war dummy (Gleditsch et al. 2002)	w/Cold war dummy
Youth bulge	0.029***	0.036***	0.027***	0.028***
	(0.006)	(0.006)	(0.006)	(0.006)
Polity 8-9 (dummy)	-0.212**		-0.182**	-0.212**
	(0.087)		(0.084)	(0.086)
Polity 10 (dummy)	-0.953***		-0.904***	-0.960***
	(0.136)		(0.140)	(0.139)
Civil conflict	0.789***	0.766***	0.833***	0.778***
	(0.083)	(0.087)	(0.081)	(0.080)
Dissent	0.013*	0.018**	0.016**	0.013*
	(0.007)	(0.007)	(0.008)	(0.007)
Population, ln	0.079***	0.076***	0.090***	0.084***
	(0.022)	(0.022)	(0.023)	(0.022)
GDP per capita, ln		0.014	0.021	0.042
		(0.041)	(0.045)	(0.043)
IMR	*-0.001*			
	(0.001)			
Polity scale		*-0.018***		
		(0.005)		
International war			*0.239*	
			(0.203)	
Cold War				*-1.414***
				(0.161)
LDV=2	1.228***	1.426***	1.330***	1.228***
	(0.163)	(0.168)	(0.188)	(0.163)
LDV=3	2.283***	2.536***	2.399***	2.287***
	(0.190)	(0.189)	(0.218)	(0.190)
LDV=4	3.332***	3.574***	3.448***	3.334***
	(0.204)	(0.201)	(0.233)	(0.204)
LDV=5	4.449***	4.695***	4.489***	4.449***
	(0.226)	(0.224)	(0.249)	(0.225)
Pseudo R^2	.387	.379	.395	.387
N	2,586	2,586	2,275	2,586

Robust standard errors in parentheses. Models run with year dummies (not reported).
*** p<0.01, ** p<0.05, * p<0.1

More additional variables are included in some models based on Model 1 in Table 1 in the article. We enter a dummy variable that takes the value 1 if oil exports are greater than 1/3 of GDP and 0 if not, taken from Fearon and Laitin's (2003) replication dataset, as this was found to be an important predictor of repression in a study of assessing Islam's effects on repression (de Soysa and Nordås 2007). Resource wealth can raise the stakes for state capture and lower the incentive of rulers to reform (Jensen and

Wantchekon 2004; Acemoglu and Robinson 2006). We expect, therefore, that states that are resource wealthy, such as oil-rich ones, will be more willing to resort to human rights violations than those that are not (de Soysa and Binningsbø 2005). As Muslim countries have been argued to be more repressive, we also control for religion by measures of the relative size of the Protestant, Catholic, and Muslim, using measures from de Soysa and Nordås (2007). Wood (2008) finds sanctions and trade to matter for state repression. We also include his measures of trade (lagged) and sanctions (binary indicator of all sanction events) as a robustness test.

Supporting Information Table 2. Alternative Controls 2: Oil, Religion, Trade, and Sanctions

DV: PTS(A)	w/Oil dummy (Fearon & Laitin 2003)	w/Religion shares (de Soysa & Nordås 2007)	w/Trade (Wood 2008)	w/Sanctions (Wood 2008)
Youth bulge	0.025***	0.026***	0.028***	0.028***
	(0.006)	(0.007)	(0.006)	(0.006)
Polity 8-9 (dummy)	-0.176**	-0.204***	-0.213**	-0.185**
	(0.082)	(0.079)	(0.086)	(0.092)
Polity 10 (dummy)	-0.866***	-0.898***	-0.948***	-0.915***
	(0.140)	(0.154)	(0.139)	(0.145)
Civil conflict	0.832***	0.836***	0.777***	0.776***
	(0.082)	(0.078)	(0.081)	(0.085)
Dissent	0.018**	0.016**	0.013*	0.010
	(0.008)	(0.008)	(0.007)	(0.007)
GDP per capita, ln	0.001	0.012	0.080	0.028
	(0.046)	(0.047)	(0.065)	(0.042)
Population, ln	0.094***	0.096***	0.112***	0.082***
	(0.024)	(0.025)	(0.036)	(0.022)
Oil 1/3 of GDP	*0.178***			
	(0.075)			
Share pop. Muslim		*0.001*		
		(0.001)		
Share pop. Catholic		*0.002*		
		(0.001)		
Share pop. Protestant		*-0.000*		
		(0.002)		
Trade (lag)			*-0.031*	
			(0.033)	
Sanctions (lag)				*0.241****
				(0.064)
LDV=2	1.329***	1.307***	1.228***	1.237***
	(0.191)	(0.190)	(0.163)	(0.164)
LDV=3	2.375***	2.358***	2.280***	2.273***
	(0.220)	(0.220)	(0.190)	(0.190)
LDV=4	3.431***	3.395***	3.321***	3.284***
	(0.235)	(0.238)	(0.205)	(0.206)
LDV=5	4.457***	4.421***	4.435***	4.373***
	(0.251)	(0.257)	(0.224)	(0.228)
Pseudo R^2	.394	.392	.388	.390
N	2,253	2,230	2,573	2,585

Robust standard errors in parentheses. All models run with year dummies (not reported).
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Supporting Information Table 2 (above) shows results with these alternative controls. Youth bulges remain significant and positively related to state repression in all models. Out of the added controls, oil is statistically significant (at the 5% level) and in the expected direction, and there is a significant positive relationship (at the 1% level) between sanctions and repression, in line with findings by Wood (2008). The other variables in the models perform akin to in the original Model 1.

Alternative Models with CIRI as Dependent Variable

Below, we provide models using the Cingranelli & Richards (2004) measure of human rights violations – infringements on physical integrity rights, as an alternative measure of state repression. The findings are the same as those found when using the Political Terror Scale (PTS) measures: Youth bulges are associated with a higher level of state repression of physical integrity rights of its citizens; and the effect is linear – showing no indication of a threshold effect.

Supporting Information Table 3. Youth Bulges and State Repression, 1976-2000. Dependent Variable: Cingranelli and Richards (2004) Infringements on Physical Integrity Rights Scale (0-8)

	Youth Bulges and State Repression, 1976-2000	Non-linear/ threshold effects of youth bulges, 1976-2000
Youth bulge 15-24 y.o. / adult pop.	0.022*** (0.006)	0.018*** (0.007)
Youth bulge, squared		-0.001 (0.001)
Polity= 8/9	-0.223*** (0.074)	-0.236*** (0.075)
Polity=10	-0.925*** (0.119)	-0.895*** (0.116)
Ln(Population)	0.124*** (0.020)	0.127*** (0.020)
Ln(GDP/cap)	-0.026 (0.042)	-0.028 (0.042)
Civil conflict	0.783*** (0.069)	0.774*** (0.068)
Dissent	0.017** (0.008)	0.016** (0.008)
LDV Repression $_{t-1}$	0.502*** (0.022)	0.501*** (0.022)
Pseudo R^2	0.313	.314
Countries	147	147
N	2,448	2,448

Robust standard errors in parentheses, Huber-White clustering on country.
All models with year dummies (not reported).
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

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