Appendix to "Disloyalty and Logics of Fratricide in Civil War"

In this Appendix, we provide further information on our coding procedures for the dataset underlying our analysis. We then provide the coefficient estimates underlying the tables and figures in the main paper. Finally, we pursue several alternative ways of estimating how arbitrary and narrowly selective violence vary by province, as well as several robustness checks.

1. Defining the datasets

Our data are largely the work of another. The late Carlos Engel Masoliver (1927-2015) was a chemist and amateur historian whose principal historical labor, over the last several decades, was a compilation of the careers of the Spanish officer corps who were serving at the onset of the Civil War. He generously shared the dataset with us, in 2013. Using muster rolls and military yearbooks to compile the list of officers and their basic demographic data, Engel combed through official publications such as the *Boletín Oficial del Estado* (on the Nationalist side), the *Gaceta de Madrid, Gaceta de la República*, and *Diario Oficial del Ministerio de la Guerra* (on the Republican), as well as through an enormous secondary literature, to gather data about what then happened to these officers. Engel added data as references to the officers came up, rather than, for example, conducting a systematic coding of one variable at a time. The dataset must therefore be considered essentially permanently incomplete: it was in a constant state of refinement, and it can still be refined. But Engel's tremendous work has produced a remarkably complete base of information.

Engel made an entry whenever these records indicated that an officer was posted to a unit, received a promotion, reward or punishment. The *source* of these records gives a sense of which army the officer belonged to, and roughly when. Engel made additional special entries when a secondary source indicated than an officer had defected. Finally, Engel made an overall classification of officers as Nationalist or Republican based on what happened to them in the war (published in Engel, 2008). If, for example, Engel finds that an officer was executed by the Republic, he attributes this officer to the Nationalist side.

Of the 17,312 officers in Engel's dataset, we included the 11,678 who served in the main land-army services: Infantry, Artillery, Cavalry, Engineers, General Staff, Transportation, and the very small Air Force, which served under the land forces. We include, as well, the three paramilitary police forces in Spain: the Civil Guard, tasked with local order in rural areas; the Assault Guard, an urban paramilitary police force created in part as a bulwark for the defense of the Republican regime; and the Carabineers, an armed customs enforcement agency under the Ministry of Finance.

In this analysis of executions by the Republican side, the critical initial question was: who *could* the Republican side have executed? This defines the scope of the execution dataset. We divide the 11,678 officers in the main services as follows (figure A.1). The Spanish Civil War began, as we note in the paper, with a coup attempt on 17-18 July 1936. There were uprisings in military garrisons posted across Spain as well as in its colonies in Morocco. The rebel side quickly seized control of all of Spain's colonies in Africa and the Canary Islands, most of northern Spain, and enclaves in garrisons in towns like Seville, Toledo and Oviedo. We excluded the 6,297 officers that Engel lists as being located in these rebel-controlled areas from our analysis of execution. Engel still listed ninety-eight of these 6,297 officers as executed by the

Republic, and we assume that these are exceptional circumstances of, for example, prisoner-of-war executions, and exclude them just the same.

In addition to these rebel-controlled areas, many officers attempted to join the rebel side from the very beginning even if they were in Republican-held territory, and many successfully crossed to Rebel-held territory. This is obviously not as straightforward to code as physical location. If an officer in Republican territory was not shot by anyone on the Republican side, did not appear at any time in Republican records, but *did* appear in Rebel records, we could not be sure that he ever was available to be executed. He might well have successfully joined the coup attempt at the outset. So we exclude such officers from the analysis of execution. We count 710 such officers, and we consider them successful coup participants as well.

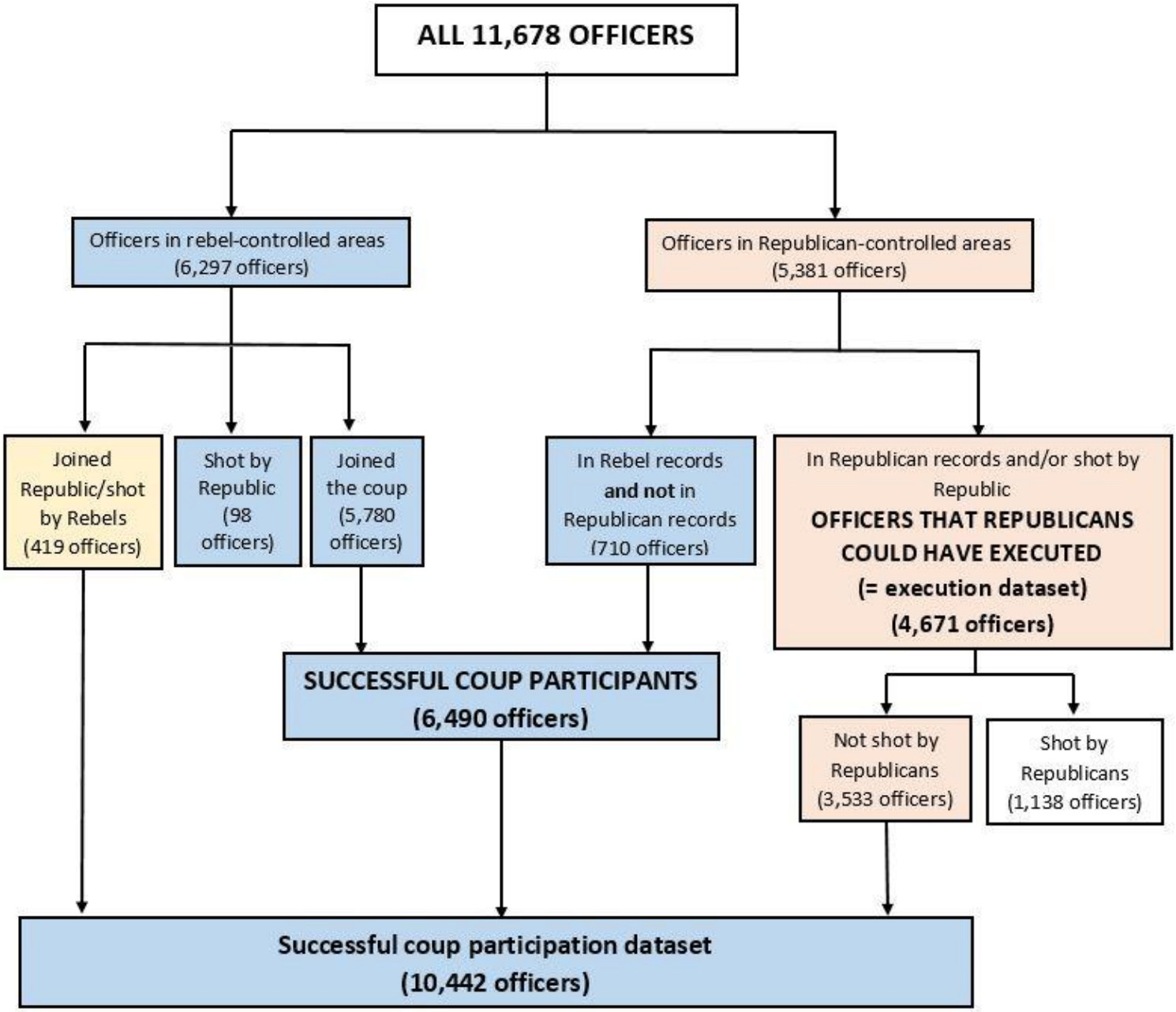
This left 4,671 officers on Republican territory who were shot and/or who appeared in Republican records at some point. Of these, 1,138 were executed by Republicans and 3,533 were not. Now, as the text makes clear, the executed officers include those who attempted to join the uprising from the very beginning and were caught and shot, as well as officers who actually did serve with the Republic and were shot later. Execution is the dependent variable for this analysis.

To check the reliability of these data, we cross-referenced the executions for Barcelona and Madrid (Spain's two largest cities) with Solé i Sabaté and Villarroya (1990) for the former and Casas de la Vega (1994) for the latter, finding a correspondence of 80% and 95% respectively. There were 114 officers (80% of those listed by Solé and Villarroya as executed in Barcelona) that were matched to Engel's dataset with identical place information. The analysis for Madrid is more difficult because Casas de la Vega only lists people executed by Republicans in the *province* of Madrid whereas Engel only provides the *city* where officers died. Among the 570 officers in Casas de la Vega that were matched to Engel's dataset, 542 (95.09%) were shot

somewhere in the province of Madrid according to Engel. Engel identifies 419 officers shot in Madrid, Paracuellos, or Ribas-Vaciamadrid before April 1939. Of those, 400 (95.47%) appear on Casas de la Vega's list.

Underlying our analysis of executions is an analysis of who successfully participated in the coup attempt. We analyze this outcome in order to estimate a propensity to defect, which we then attempt to link to executions. This includes the whole dataset of officers across Spain, with one major exception. Since we do not know whether any given officer that the Republicans executed actually attempted to join the rebels, we exclude Republican-executed officers entirely from this analysis. Here, the dependent variable is equal to 1 if the officer successfully joined the coup (i.e. was in Rebel territory and gave no indication of resisting the coup attempt, such as an execution by Rebel authorities or joining the Republic, or was on Republican territory but appeared in Rebel records without ever appearing in Republican records), and 0 otherwise.

Figure A.1. Dataset breakdown



2. Variable definitions and descriptive statistics

Variable definitions are given in Table A.1. below. They are generally straightforward, with one major exception, *recent career progress*. This variable uses information in Spanish military yearbooks between 1931 and 1936 to measure officers' changes on the rank scale. First, given officer *i*'s rank *r* and corps *c* in year *t*, the relative position of officer *i* in the scale can be obtained as follows:

$$RP_{i,t,r,c} = \frac{\text{Position}_{i,t,r,c}}{\text{Total_officers}_{t,r,c}}$$

where $\text{Position}_{i,t,r,c}$ is officer *i*'s ordinal position on the scale of rank r and corps c according to the military yearbook of year *t*. Military yearbooks in *t* reflect the changes on the scales and ranks that occurred during *t-1*. $\text{Total_officers}_{t,r,c}$ is the total number of officers that appear on the scale for rank *r* of corps *c* in the military yearbook of *t*. Note that those officers with a higher position on the scale (i.e. those closer to being promoted) have a lower RP. The numerator for the RP is the ordinal position on the scale, such that the most senior officer has a numerator of 1; the most junior officer has numerator = $\text{Total_officers}_{t,r,c}$. Hence, the officer in the last position of the scale has a RP equal to 1 whereas the first officer on the scale has a RP equal to $1/\text{Total_officers}_{t,r,c}$.

Officers' RP are computed for every year between 1931 and 1936. Change of position on the scale between t-1 and t is calculated as follows:

$$\Delta\,\text{Position}_{i,t,r,c} = \begin{cases} RP_{i,t-1,r,c} - RP_{i,t,r,c} \;\; if\; r\; in\; t-1 = r\; in\; t \\ \Delta r + RP_{i,t-1,r,c} \;\; if\; r\; in\; t-1 < r\; in\; t \\ \Delta r - \left(1 - RP_{i,t-1,r,c}\right) if\; r\; in\; t-1 > r\; in\; t \end{cases}$$

where Δ r = change in rank between military yearbook of *t* and military yearbook of *t-1* (Δ r = 1 if the officer is promoted one rank, Δ r = -1 if the officer is demoted one rank, Δ r = 2 if the officer is promoted two ranks, etc.).

If $0 < \Delta \text{Position}_{i,t,r,c} < 1$, officer *i* did not change his rank in t-1 but improved his RP in the scale with respect to *t-2*. If $1 < \Delta \text{Position}_{i,t,r,c} < 2$, officer *i* was promoted one rank in *t-1*. When $-1 < \Delta \text{Position}_{i,t,r,c} < 0$, officer *i* did not change his rank in *t-1* but worsened his RP with respect to *t-2*. If $-2 < \Delta \text{Position}_{i,t,r,c} < -1$, officer *i* was demoted one rank in the year *t-1*.[1]

The expression to compute $\Delta \text{Position}_{i,t,r,c}$ can be better understood through an example. In 1931, Infantry colonel José Moscardó Ituarte held the 129th position among the 177 officers that formed the scale for Infantry colonels. Therefore, Moscardó's RP in 1931 was 0.729 (=129/177). In 1932 the revision of promotions under the Republic resulted in officer Moscardó's demotion to the rank of Lieutenant Colonel. He occupied the 14th position out of 160 Infantry Lieutenant Colonels. This implied a change in position between 1931 and 1932 equal to -1.271 (= -1-(1-0.729)). The (1-0.729) reflects the "fall" down the Infantry Colonel scale. The "-1" (Moscardó's Δ r between 1931 and 1932) reflects the punishment or economic and psychological costs of being demoted one rank. In 1933 Moscardó regained the rank of Colonel reaching the 67th position out of the 79 colonels on the scale. The resulting change in position between 1932 and 1933 equaled 1+0.0875. The 0.0875 reflect his progress in the Infantry Lieutenant Colonel scale (note that Moscardó's RP in 1932 was 14/160=0.0875). The "+1" (Moscardó's Δ r between 1932 and 1933) represents Moscardó's promotion to the rank of Colonel. The RP in the 1933 scale for Infantry colonels was 0.848. In 1934, Moscardó maintained his rank of colonel and

[1] Our sample does not contain any case of one officer being promoted or demoted more than 2 ranks over two consecutive years.

progressed to the 49th position in a year in which 71 officers formed the scale for Infantry colonels. Therefore, Moscardó's RP in 1934 was 0.69. This implied a change in position in 1934 equal to 0.158 (=0.848-0.69).

We create the variable Δ Position$_{,1931\text{-}1936}$ to measure changes in officers' relative positions under the Second Republic. Δ Position$_{i,1931\text{-}1936}$ measures officer i's change in relative position during the Republic by aggregating the changes that officers experienced in each year between 1931 and 1936:

$$\text{Career Progress 1931-1936} = \Delta \text{Position1931-1936}_i = \sum_{t=1931}^{t=1936} \Delta\, Position_{i,t,r,c}$$

Table A.1. Variable definitions

Variable	Description
Individual Level	
Age	Source: Coded from Engel (2008). Age in years on 18 July 1936.
Recent career progress	Source: [AUTHOR]. Change over the period 1931 to 1936 in rank and in relative position on the seniority scale *within* a rank within a corps. See variable definition in text.
Corps	Source: Coded from Engel (2008). Categorical variable for officer's service branch.
Rank	Source: Coded from Engel (2008). Rank at the start of the war in 1936. Increases by one for every rank, from *alférez* (2nd lieutenant) to *teniente general* (lieutenant general).
Posted	Source: Coded from Engel (2008). Dummy variable equal to 1 if the officer was posted to a garrison and 0 if listed as "*disponible*" (on call).
Unit leader	Source: Coded from Engel (2008). Dummy variable equal to 1 if the officer held the highest rank in his garrison and 0 otherwise.
Rebel territory	Source: Coded from Engel (2008). Dummy variable equal to 1 if officer was located in Rebel territory in 1936 and 0 if in Republican territory. We modified this to include Toledo, Álava, Granada, Córdoba, Sevilla, and Zaragoza in Rebel territory.
Provincial Level	
Rate of successful coup participation	Source: Coded from Engel (2008). Number of officers in province who successfully participated in the coup, divided by the total

	number of officers in the province.
Rate of unionization	Source: Herreros and Criado (2009). Number of militants of the *Confederación Nacional del Trabajo* (CNT) and *Unión General de Trabajadores* (UGT) in province in 1936, per capita.

Descriptive statistics are given in the tables below. Specifically, we give descriptive statistics for each of our samples: the coup participation dataset (table A.2); the overall execution dataset (Table A.3); and the subsample of the execution dataset that informs the geographic analyses in the paper (Table A.4). As a reminder, this last analysis looked only at the bottom two ranks, at posted officers and at officers who were not unit leaders, in order to hold constant the effects of the costs of defection to the army so as to isolate the relationship between the *predicted probability* of defection and the probability of execution.

Table A.2. Descriptive statistics (successful coup participation dataset, figure 2 in paper)

Variable	Mean	SD	Min	Max	N
Age	40.2	8.46	20	66	10,442
Recent career progress	.866	.645	-2.78	3.09	10,442
Rank	1.51	1.25	0	8	10,442

Variable	Value	Count	Percent
Corps	Assault Guards	329	3.15
N=10,442	Air Force	71	0.68
	Transportation	102	0.98
	Major General & Lieutenant General	19	0.18
	General Staff	194	1.86
	Carabineers	663	6.35
	Engineers	868	8.31
	Civil Guards	1,206	11.55
	Artillery	1,872	17.93
	Cavalry	827	7.92
	Infantry	4,291	41.09
Posted	Not posted	777	7.44
N=10,442	Posted	9,665	92.56
Unit leader	Not a unit leader	9,696	92.86
N=10,442	Unit leader	746	7.14
Rebel territory	Republican territory	4,243	40.63
N=10,442	Rebel territory	6,199	59.37

Table A.3. Descriptive statistics (execution, full sample)

Variable	Mean	SD	Min	Max	N
Age	41.3	8.61	20	66	4,671
Recent career progress	.892	.655	-1.70	2.95	4,671
Rank	1.66	1.35	0	8	4,671

Variable	Value	Count	Percent
Corps	Assault Guards	239	5.12
N=4,671	Air Force	38	0.81
	Transportation	62	1.33
	Major General & Lieutenant General	14	0.30
	General Staff	121	2.59
	Carabineers	354	7.58
	Engineers	521	11.15
	Civil Guards	657	14.07
	Artillery	816	17.47
	Cavalry	335	7.17
	Infantry	1,514	32.41
Posted	Not posted	400	8.56
N=4,671	Posted	4,271	91.44
Unit leader	Not a unit leader	4,318	92.44
N=4,671	Unit leader	353	7.56

Table A.4. Descriptive statistics (execution, restricted sample for Table 1 in paper)

Variable	Mean	SD	Min	Max	N
Age	39.0	8.26	20	54	2,247
Recent career progress	.931	.687	-1.70	2.68	2,247
Rank	.606	.489	0	1	2,247

Variable	Value	Count	Percent
Corps	Assault Guards	140	6.23
N=2,247	Air Force	36	1.60
	Carabineers	191	8.50
	Engineers	256	11.39
	Civil Guards	389	17.31
	Artillery	433	19.27
	Cavalry	134	5.96
	Infantry	668	29.73

Province-level variable	Mean	SD	Min	Max	N
Coup participation	.232	.209	.037	.729	23
Unionization	.049	.032	.011	.164	22

3. Coefficient estimates underlying main models from paper

Table A.5. Overall models of coup participation and execution

VARIABLES	(1) DV: Officer Successfully Participated in Coup	(2) DV: Officer Executed
Age	-0.035***	-0.036***
	[0.005]	[0.005]
Recent career progress	-0.125**	-0.166***
	[0.059]	[0.063]
Assault Guards	-1.518***	-0.894***
	[0.206]	[0.211]
Air Force	-2.425***	-2.327**
	[0.355]	[1.020]
Transportation	-1.702***	-2.908***
	[0.381]	[1.024]
Major General & Lt General	-1.150*	-0.302
	[0.685]	[0.574]
General Staff	-0.391	-0.541**
	[0.253]	[0.234]
Carabineers	-0.024	-0.694***
	[0.152]	[0.180]
Engineers	0.286**	-0.149
	[0.131]	[0.129]
Civil Guard	0.177	-0.094
	[0.125]	[0.129]
Cavalry	0.322**	0.159
	[0.144]	[0.144]
Infantry	0.382***	-0.005
	[0.096]	[0.100]
Rank	0.003	0.300***
	[0.033]	[0.036]
Posted	-0.652***	0.095
	[0.129]	[0.137]
Leader	-0.510***	0.025
	[0.146]	[0.149]
In Rebel territory	4.354***	
	[0.071]	
Constant	0.383*	-0.003
	[0.228]	[0.237]
Observations	10,442	4,671

Standard errors in brackets *** p<0.01, ** p<0.05, * p<0.1

In this section, we give three sets of coefficient estimates that serve as the basis of some of the results in the paper. The first, in Table A.5., are the coefficient estimates underlying Figure

2 in the paper: the overall models of coup participation (including all officers across Spain, save those who were shot by the Republic) and execution by the Republic (including only those officers who were available to be executed, as defined above.

Table A.6. A model of coup participation

VARIABLES	DV: Officer Successfully Participated in Coup
Age	-0.032***
	[0.008]
Recent career progress	-0.133
	[0.096]
Assault Guards	-1.515***
	[0.282]
Air Force	-2.446***
	[0.387]
Carabineers	-0.043
	[0.225]
Engineers	0.461**
	[0.192]
Civil Guards	0.373**
	[0.179]
Cavalry	0.408*
	[0.231]
Infantry	0.413***
	[0.140]
Rebel territory	4.707***
	[0.106]
Constant	-0.585**
	[0.286]
Observations	5,500
Standard errors in brackets	*** p<0.01, ** p<0.05, * p<0.1

In Table A.6, we give the model used to generate our measure of an underlying propensity to defect. Here, the dependent variable is successful coup participation. The sample includes soldiers across Spain, but only those in the bottom two ranks, with a posting, and who are not unit leaders, and who were not executed by the Republic. We then use this model to generate a predicted probability of coup participation *for those officers who did not successfully participate in the coup*, and use this as a measure of underlying propensity to rebel; the correspondence

between this propensity and actual execution is then the object of our analysis in Table 2 in the paper.

4. Testing differences in predictive power across provinces

One key result of the paper is that a model of coup participation is worse at predicting executions in provinces with a low rate of coup participation and a high rate of unionization. Here, we assess whether these differences across provinces were statistically significant, and whether each holds when controlling for the other. Our strategy to do this is a logit analysis of execution at the level of individuals, nested within provinces, in which the individual's predicted probability of coup participation is included as a predictor of execution, in interaction with the provincial covariates.[2] The interaction term is the key for assessing whether the relationship changes across provinces. However, the main effect of each provincial variable is also of substantive interest. It gives the estimated relationship between this variable and execution when the individual's predicted probability of coup participation was zero. In practice, no one had a predicted probability of zero; the minimum in the sample was .011. However, the coefficient estimate gives an indication of whether an officer who was extremely unlikely to defect was more likely to be shot if a province had a lower coup participation rate or a higher unionization rate. It shows, in effect, whether these officers were safer from being killed—that is, safer from arbitrary violence—in some provinces than others. Finally, when we include both provincial correlates and their respective interactions with the predicted probability of successful coup participation, we can assess whether each has significant effects on execution when controlling for the other. This is especially important since provinces with a stronger union movement

[2] We continue to restrict our sample to low-ranked posted officers who were not unit leaders so that the analysis is unaffected by these variables.

generally had lower coup participation (r = -.325; this is not statistically significant, p >.1, but there are only 22 provinces for which there is data on both). It is worth analyzing whether one provincial trait is driving the results.

Table A.7 Explaining Arbitrary Violence

VARIABLES	(1) Officer Executed	(2) Officer Executed	(3) Officer Executed
Predicted prob of coup participation	7.057***	17.145***	13.802***
	[1.476]	[1.963]	[2.626]
Provincial coup participation rate	-5.654***		-3.548*
	[1.970]		[2.053]
Pred prob coup participation X	25.507***		16.817*
provincial coup participation rate	[8.522]		[9.164]
Unionization		12.227*	9.511
		[6.486]	[6.921]
Pred prob coup participation X		-67.288***	-56.239***
unionization		[16.524]	[17.534]
Constant	-2.314***	-4.244***	-3.509***
	[0.396]	[0.496]	[0.667]
Province-level variance in constants	-0.184	-0.244	-0.223
	[0.218]	[0.225]	[0.225]
Observations	2,245	2,223	2,223
Number of provinces	23	22	22

Standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

In Models 1 and 2, assessing each provincial correlate individually, the results suggest, first, that the model of coup propensity does indeed get better at predicting executions in high-coup participation and low-unionization provinces. The key results in the paper hold up as statistically significant. In particular, these models show as well that low-probability officers are more likely to be executed in low-coup-participation and high-unionization provinces than in other provinces. In other words, these provinces do pose greater dangers than others to officers who were unlikely coup participants. This can be seen pretty clearly as a problem of arbitrary violence.

Putting the two together in Model 3, the interaction terms remain statistically significant. In other words, the model of coup participation remains a much better predictor of execution in high-participation and low-unionization provinces. Further, the main-effects estimate remains statistically significant for the provincial coup participation rate but not for local unionization. In other words, on the face of it, it appears that unlikely coup participants were, indeed, in greater danger the lower the local rate of coup participation, but that we cannot conclude that this holds for unionization. However, one caveat is that precisely with a high correlation between the two variables and with interaction terms, the standard error for each is inflated, and it is still possible that there is a meaningful relationship between unionization and arbitrary violence. Ultimately, then, we do not have a strong reason to believe that it is either low coup participation or unionization that is, on its own, driving the whole result.

5. Interaction effects with specific covariates

The main paper's analysis of the variation in arbitrary violence across provinces focuses on the predictive power of the overall *model* of coup participation, and how that varies from province to province. In addition, however, the individual correlates of disloyalty should be especially weaker at predicting executions if violence is arbitrary (due to either stereotypes or other unsystematic logics), and especially strong at predicting executions where violence is narrowly selective. This is particularly true for two of our predictors, *age* and *career progress*; it is less so for *corps*, because unlike the former, the latter were subject to more specific stereotypes: cavalry officers, for example, were regarded as pro-Franco while Assault Guards were seen as Republican. These correspond to real differences in coup participation rates, as we found in the paper, but because there was a stereotype as well, there are two plausible mechanisms linking corps to executions. Any relationship could reflect the real propensity of

officers from a given corps to try to defect (and hence to be caught doing so and executed), or it could reflect a selection process by which members of that corps were treated with suspicion regardless of their individual intentions. Therefore, we expect *age* and *career progress* to have contingent relationships with execution: stronger in provinces with higher coup participation rates and lower unionization rates, and weaker in provinces with lower coup participation rates and higher unionization rates. In contrast, it is hard to have a strong expectation about how the relationship between corps and execution might change across provinces.

Analyzing the individual relationships of these variables to execution also allows us to deal partially with a concern that our model of coup participation is just incomplete, so that the error term includes omitted variables that have an important role in low-coup-participation and high-unionization provinces. While we cannot discount this possibility entirely, it is less of a concern if the substantive relationship between these correlates and execution varies as well. In other words, if key predictors of coup participation have a weaker relationship with execution in low-coup-participation and high-unionization provinces, it lends further credence to our claim that the selection process in these provinces was not based on actually disloyal behavior.

We estimate models of execution that include *age*, *career progress*, and the corps-level coup participation rate, each interacted with the local coup participation rate and by unionization in turn. These are multilevel models grouping (in a non-nested structure) by province and by corps. Coefficient estimates are in Table A.8. Drawing on each of these models, Figure A.2 displays simulations that show how the association of four covariates with execution changes by provincial coup participation patterns (based on Brambor, Clark, and Golder 2006, adapted for logit).

Figure A.2 shows that, as expected, the differences across provinces in the predictive power of the model of coup participation are mostly driven by career progress and age, the indicators of disloyalty least subject to stereotypes and thus most likely to really reflect the individual's propensity to join the coup. Each of these variables has a much stronger relationship with execution in areas with a higher coup participation rate and lower unionization rate (and each of these interaction terms is statistically significant, $p<.001$).

Table A8. Provincial Interactions

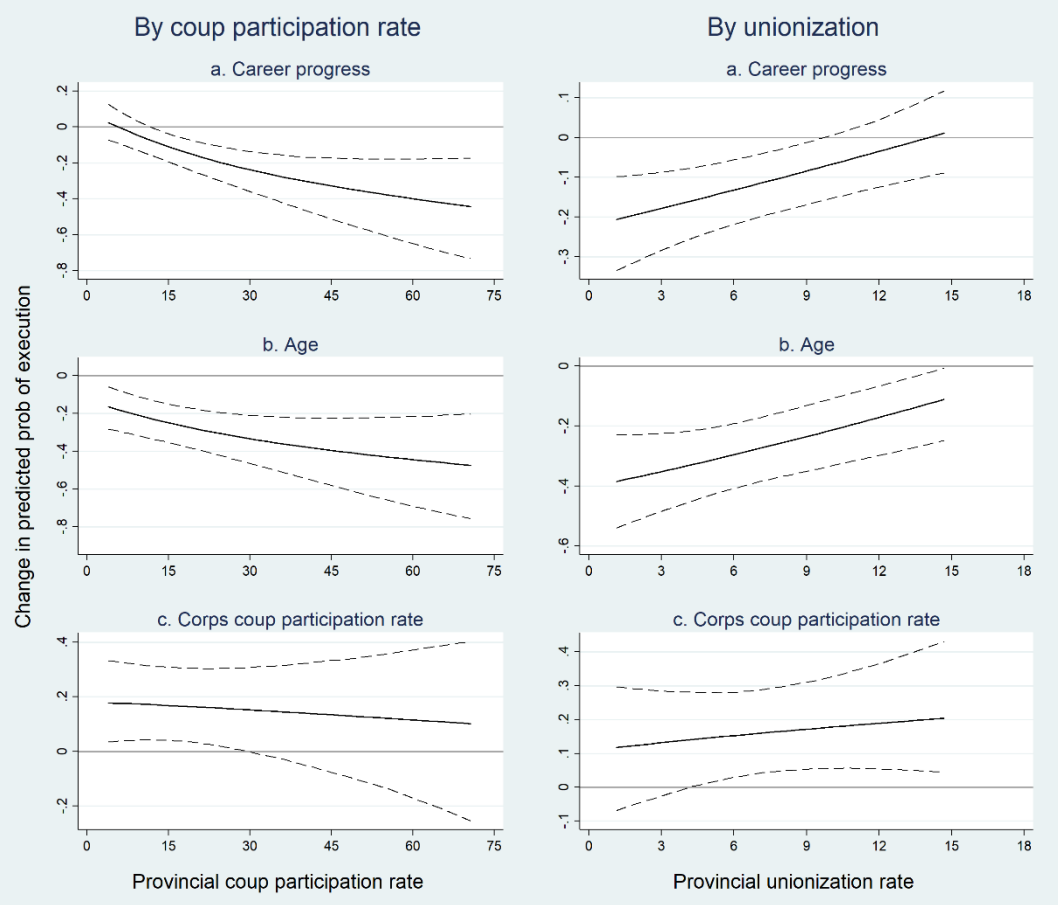
VARIABLES	(1) Officer Executed	(2) Officer Executed	(3) Officer Executed	(4) Officer Executed	(5) Officer Executed	(6) Officer Executed
Age	-0.055***	-0.026**	-0.057***	-0.058***	-0.099***	-0.056***
	[0.010]	[0.013]	[0.010]	[0.010]	[0.015]	[0.010]
Recent career progress	0.210	-0.287**	-0.294**	-0.724***	-0.324***	-0.296***
	[0.156]	[0.112]	[0.115]	[0.172]	[0.113]	[0.115]
Corps coup participation rate	3.748***	3.941***	3.348**	3.611***	3.899***	2.044
	[1.099]	[1.130]	[1.512]	[1.059]	[1.120]	[1.871]
Provincial coup participation rate	1.438	6.290***	-0.858			
	[1.209]	[2.323]	[3.564]			
Career progress×provincial coup rate	-3.683***					
	[0.828]					
Age×provincial coup rate		-0.206***				
		[0.061]				
Corps coup rate×provincial coup rate			0.070			
			[6.153]			
Unionization				-3.960	-18.267**	-8.757
				[6.363]	[7.802]	[10.438]
Career progress×unionization				5.146***		
				[1.525]		
Age×unionization					0.503***	
					[0.124]	
Corps coup rate×unionization						15.528
						[17.036]
Constant	-1.165	-1.936**	-0.603	-0.445	0.596	-0.030
	[0.756]	[0.820]	[0.925]	[0.788]	[0.890]	[1.102]
Variance in constants (by corps)	-1.230***	-1.184***	-1.179**	-1.292***	-1.208***	-1.309**
	[0.448]	[0.434]	[0.573]	[0.461]	[0.442]	[0.650]
Variance in constants (by province)	-0.089	-0.129	-0.295	-0.164	-0.148	-0.362
	[0.207]	[0.210]	[0.268]	[0.214]	[0.214]	[0.284]
Variance in constants (by province-corps)			-0.677**			-0.671**
			[0.317]			[0.314]
Observations	2,245	2,245	2,245	2,223	2,223	2,223

Number of provinces	23	23	23	22	22	22
Number of corps	8	8	8	8	8	8
Number of province-corps			97			93

Standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

Figure A.2. Interaction effects across provinces

The graphs show how the predicted probability of execution changes as each covariate (career progress, age, corps coup participation rate) changes from the 5th to 95th percentile for different levels of local coup participation and unionization rates (horizontal axis).



In contrast, the corps-level coup participation rate is, on average, no more or less associated with execution as the coup participation rate or the unionization rate change. Moreover, Figure A.2 suggests that if anything, corps membership might be *more* distinguishing in low-coup-participation and high-unionization provinces. Indeed, corps membership has a

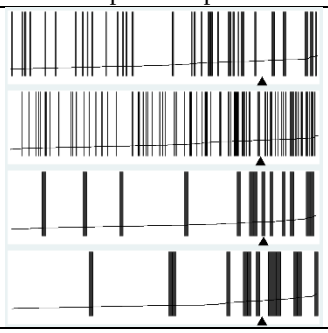
statistically significant relationship to execution where unionization was high but *not* where it was low, and where coup participation was low but *not* where it was high (though clearly this is partly due to lower standard errors in these provinces, where a larger share of officers was concentrated). This intriguing difference corresponds to the distinction between corps membership, on the one hand, and age and career progress on the other: the former was subject to widespread stereotypes while the latter, as far as we can tell, were not. This raises the interesting possibility that corps was used as a stereotype in low-information and highly unionized settings.

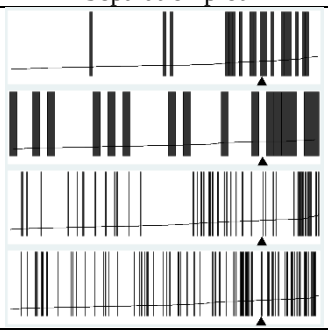
6. Robustness check: isolating corps

Indeed, including *corps* in our predictive model of execution raises the potential concern that what is happening when our predictive model performs better in some provinces is just that the army starts relying on stereotypes at the level of corps, not that it is committing violence more systematically. We have just seen that when we pull the three variables apart, it becomes clear that it is age and career progress that are driving the differences in predictive power across provinces. But here we have moved to a regression framework in which coefficients vary to fit the dependent variable, rather than the prediction framework in which the coefficients derived from the model of *coup participation* are used to predict *execution*, which better matches the concept of the accuracy of executions. To confirm that predicting executions from coup participation still varies across provinces in the hypothesized way and is not sensitive to the stereotypes of different corps, we reproduce the analyses in the paper focusing only on the largest corps, the Infantry, and thus on two predictors alone: age and career progress. Again, we use the area under the ROC curve and the separation plots to measure predictive power across provinces, focusing especially on executions of those who were unlikely to have tried to defect.

The results, in Table A.9, mirror the overall and more general results: the predictive model is better in provinces with high rates of coup participation and low rates of unionization, with, in particular, fewer officers executed who had a low probability of defecting in the first place.

Table A.9. How well a model of coup participation predicts execution in the infantry alone, across provinces

Rate of successful coup participation	Area under the ROC curve (s.e.)	Separation plot
First quartile (3.7%–8.6%)	.573 (.055)	
Second quartile (8.6%–16.3%)	.671 (.034)	
Third quartile (16.3%–27.4%)	.735 (.085)	
Fourth quartile (27.4%–72.9%)	.808 (.062)	

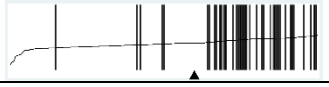
Rate of unionization	Area under the ROC curve (s.e.)	Separation plot
First quartile (1.1%–2.9%)	.831 (.049)	
Second quartile (2.9%–4.4%)	.630 (.100)	
Third quartile (4.4%–6.0%)	.652 (.050)	
Fourth quartile (6.0%–16.4%)	.654 (.038)	

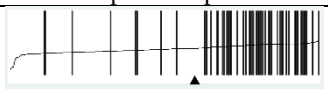
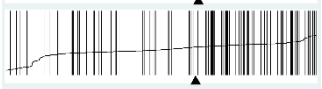
7. Robustness check: trying to abstract from local conditions

The paper confronts a major data problem: we cannot observe actual attempts to join the rebels among executed officers. We can only infer them from an underlying propensity to defect, which we estimate from a model of successful coup participation (which we can and do observe). But of course decisions to join the coup are based not only on this underlying propensity but also on contingent factors, of which the most important is the general tendency in the armed forces

and specifically in one's own location, so as not to be caught on the wrong side of a coup attempt. In the main paper, we draw on decisions to join the coup attempt from officers across Spain, and this should take care of many different random contingencies. Those models also include a dummy for being on territory that falls to the rebel side, which should isolate some of the effect of following the crowd. But omitted variables that capture these contingencies could, in principle, invalidate our efforts to isolate a general propensity to defect.

Table A.10. How well a model of coup participation predicts execution; model trained on contentious provinces only

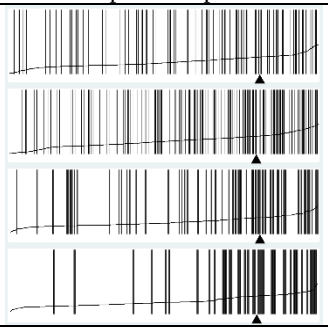
Rate of successful coup participation	Area under the ROC curve (s.e.)	Separation plot
First quartile (3.7%–8.6%)	.638 (.032)	
Second quartile (8.6%–16.3%)	.667 (.018)	
Third quartile (16.3%–27.4%)	.618 (.044)	
Fourth quartile (27.4%–72.9%)	.819 (.034)	

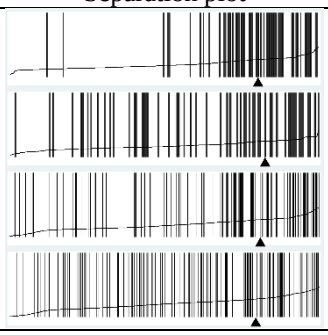
Rate of unionization	Area under the ROC curve (s.e.)	Separation plot
First quartile (1.1%–2.9%)	.815 (.034)	
Second quartile (2.9%–4.4%)	.641 (.044)	
Third quartile (4.4%–6.0%)	.678 (.025)	
Fourth quartile (6.0%–16.4%)	.644 (.021)	

To be more certain of this, in the next two tables we estimate a model of coup participation in two different ways in order to generate predicted probabilities of coup participation, and then use these, as usual, to predict executions. (In each case, we continue, as in the paper, to restrict the sample to posted non-leader officers in the lowest two ranks, to remove

the effect of the costs of defection from the analysis.) First, we use only the provinces in the middle third of coup participation rates, to focus just on those provinces where the pressure to join one side or another was not overwhelming, and so where officers' own free choice may plausibly have had more weight (leading possibly to more accurate assessments of a tendency to defect). We then use the predicted probabilities of coup participation generated in this way to predict execution across all of the Republic; the idea here is that successful coup participation in the contentious provinces may better reflect a free choice. Results are in Table A.10; they are essentially unchanged.

Table A.11. How well a model of coup participation predicts execution, with provincial fixed effects

Rate of successful coup participation	Area under the ROC curve (s.e.)	Separation plot
First quartile (3.7%–8.6%)	.654 (.032)	
Second quartile (8.6%–16.3%)	.657 (.018)	
Third quartile (16.3%–27.4%)	.683 (.042)	
Fourth quartile (27.4%–72.9%)	.824 (.036)	

Rate of unionization	Area under the ROC curve (s.e.)	Separation plot
First quartile (1.1%–2.9%)	.860 (.029)	
Second quartile (2.9%–4.4%)	.676 (.043)	
Third quartile (4.4%–6.0%)	.701 (.025)	
Fourth quartile (6.0%–16.4%)	.621 (.021)	

Second, we include province-level fixed effects in estimating the model of coup participation. The idea here is to eliminate province-level unobserved heterogeneity and focus

just on the tendency to defect regardless of local conditions. Then, to estimate the underlying propensity to defect for all officers regardless of location, we generate predicted probabilities of coup participation for all officers as if they all came from the same province (using Ciudad Real, the Republican province with the median coup participation rate, of 15.5%). Results are in Table A.11. They are essentially the same as the main result of the paper.

This method has the drawback that ten of the 56 geographic units studied (all of continental Spain's provinces, plus its African colonies where many officers were posted and rose in revolt) drop out of the analysis because all of the officers concerned had the same outcome on the dependent variable (they all participated in the coup). This results in the listwise deletion of 296 officers. In particular, the result is still a bias in which the coefficient estimates are given for any officer not in a province with a homogeneous outcome, which does not quite arrive at our purpose. We therefore grouped together these provinces with others close by (for example, two of the affected provinces were in Galicia, so we group all Galician provinces together; two more are in western Old Castile, i.e. León, Zamora, Salamanca, Caceres, and Ávila, so we grouped these all together) and reran the same analysis; the results, not shown here, are again essentially unchanged.

These results give us confidence that we have indeed assessed an underlying propensity to defect that abstracts from local conditions. However, there is still a second possible problem from our use of indirect indicators of the likelihood of defection. It is possible that those who were generally unlikely to defect (i.e. older, better-promoted officers in Republican-friendly corps) were more likely to defect in response to local conditions, such that their executions would be miscoded if classified as arbitrary. In order to invalidate our central result, however, it would have to be the case that these low-probability officers would be systematically more likely

to try to defect the lower the initial coup participation rate and the higher the unionization rate. It is difficult to see why this would be the case. In contrast, we provide clear reasons why these officers would be more likely to *suffer violence* in these provinces despite *not* trying to defect.

8. Robustness checks: endogeneity

Two of the paper's key results are that a high local rate of coup participation and a low rate of unionization are related to more narrowly selective executions. Could these results be endogenous? There are two principal endogeneity concerns. First, it might be that the provinces with a high coup participation rate or unionization rate systematically have officers with slower career progress and younger officers. If so, then targeting those officers may not indicate any greater degree of systematic violence in these provinces than anywhere else, but instead arbitrary violence that happened to sweep up young officers with slower career progress. In fact, however, as Table A.12 shows, there is very little correlation between coup participation rate and age or change in position; if anything, officers had slightly *faster* career progress in coup-prone provinces. As for unionization, there are statistically significant pairwise correlations, but these are, again, in a direction that does not threaten the initial finding: in less-unionized provinces, where we contend that violence was more selective, officers were older and had had faster career progress (possibly reflecting career shifts over time to the union and military centres of Madrid and Barcelona). Arbitrary violence in these provinces would actually be more likely to victimize officers who did *not* fit the profile of coup participants.

Table A.12. Correlations of age and career progress with provincial characteristics

	Age	Career progress
Coup participation rate	-.0047	-.0329
Unionization rate	-.1496***	-.0413*

*** p<0.01, ** p<0.05, * p<0.1

Second, were officers more likely to participate in the coup if there were more systematic executions in the province? To be sure, in other work, we [AUTHOR] find that executions drove defections *later* in the conflict, of officers who did not participate in the coup initially and instead initially served the Republic. This dynamic could potentially apply to some officers we see as coup participants as well, if they had intended to stay loyal but were driven to join the coup by acts of violence, not staying long enough for their initial decision to remain to be registered in Republican records. If the result is being driven by this endogeneity, it would undermine our argument considerably. It would suggest that the link runs only from violence to coup participation and not vice versa (the latter is the mechanism we explore in the paper). It would further suggest that—if our measure of narrowly selective violence is valid—that it is narrowly selective *but not* arbitrary violence that drives subsequent disloyal behavior. This would be anomalous both for part of our motivation for studying different logics of violence and indeed for the whole argument that indiscriminate violence is more counterproductive than selective violence.

This endogeneity concern turns on the possibility that officers reacted to violence by joining the coup attempt. In order to be coded as coup participants, they had to rebel early, before generating records on the Republican side. The only violence that could generate this type of scenario would therefore have to be even earlier, at the very outset of the civil conflict. This permits us a test. By examining the incidence of executions occurring after some time has elapsed in the conflict, we can focus only on violence that could not reasonably have provoked this early coup participation (even if it could have provoked subsequent *defection*). Therefore,

we re-run our analyses with executions after August 31, 1936 (that is, six weeks into the war) as the dependent variable, excluding those officers shot on or before that date. Results are in Tables A.13 and A14. They show no meaningful differences from the main results in Table 2 in the paper and for Table A.8 above. There is the same pattern in which a model of coup participation has greater predictive power for execution as the local rate of successful coup participation increases, the same decline in executions that such a model would *not* predict, and the same negative and statistically significant interaction effect for key private, non-stereotyped indicators of likelihood of disloyalty. The only discrepant result is the positive and statistically significant coefficient for the interaction term between local coup participation rate and corps coup participation rate (the same term, with all executions included, was positive but not statistically significant), but this does not really change the result much. Taken together, this analysis suggests that the paper's main result is not an artifact of reverse causation.

Table A.13. How well a model of coup participation predicts execution from September 1936 on, across provinces

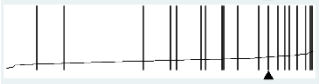
Rate of successful coup participation	Area under the ROC curve (s.e.)	Separation plot
First quartile (3.7%–8.6%)	.630 (.043)	
Second quartile (8.6%–16.3%)	.645 (.021)	
Third quartile (16.3%–27.4%)	.736 (.062)	
Fourth quartile (27.4%–72.9%)	.794 (.060)	

Table A.14. Executions from September 1936 on: provincial interactions

VARIABLES	(1) Officer Executed	(2) Officer Executed	(3) Officer Executed

Age	-0.045***	-0.018	-0.047***
	(0.011)	[0.015]	[0.011]
Recent career progress	0.102	-0.373***	-0.373***
	(0.207)	[0.132]	[0.134]
Corps coup participation rate	3.175***	3.279***	0.485
	(1.174)	[1.190]	[1.761]
Provincial coup participation rate	0.741	6.008**	-15.490**
	(1.043)	[3.063]	[7.855]
Career progress×provincial coup rate	-4.097***		
	(1.439)		
Age×provincial coup rate		-0.224**	
		[0.091]	
Corps coup rate×provincial coup rate			23.114*
			[12.732]
Constant	-1.654**	-2.344***	0.275
	(0.773)	[0.864]	[1.101]
Variance in constants (by corps)	-1.147***	-1.123***	-1.110**
	(0.438)	[0.431]	[0.514]
Variance in constants (by province)	-0.991***	-1.045***	-1.309
	(0.383)	[0.389]	[0.802]
Variance in constants (by province-corps)			-1.123*
			[0.671]
Observations	2,019	2,019	2,019
Number of provinces	23	23	23
Number of corps	8	8	8
Number of province-corps			97

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

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