Appendix for: Lasting Peace or Temporary Calm? Rebel Group Decapitation and Civil War Outcomes

The Appendix contains additional tests of the main results presented in Tables 1 and 2 in the paper, full results for the coefficient plot presented in Figure 2, results for whether leaders are captured or killed, and descriptive statistics for both the conflict termination and recurrence models.

Additional Tests of Leadership Decapitation on Termination

The first set of tables presents results for civil war termination. In the termination models presented in the main analysis, leadership decapitation is coded as 1 if there is a decapitation in the current or previous year. These results split those into two different variables, to test the impact of a current and lagged decapitation separately.

For the decapitations at time *t*, presented in Table A1 and Table A2, the results again violate the proportional hazard assumption when looking at all terminations (Models 1 and 6). To better interpret these results, combined coefficient graphs are included in Figure A1. These results are very similar to what was presented in the paper; the effect of leadership decapitation on civil war termination is statistically significant after about 1 year of conflict and increases over time. The impact of decapitation on low activity outcomes is in the predicted direction, but does not achieve statistical significance, while the coefficient for government victories is not significant and in the opposite-than-predicted direction. There continue to be no cases of rebel victories following a leadership decapitation.

Moving to the models for lagged leadership decapitation, the results presented in Table A3, which code termination as occurring after a one-year break in fighting, are very similar to what is presented in the main paper. Leadership decapitation increases the likelihood of termination in general and increases the likelihood of low activity outcomes. For three-year breaks, presented in Table A4, the results are in the predicted direction, but do not meet conventional levels of statistical significance across all termination types.

On the whole, the results are always in the same direction as those presented in the main analysis; however, the statistical significance of these results is less consistent across these models. Low activity outcomes are significantly more likely only for the one-year break and lagged models, while overall termination is statistically significant across all models except for the three-year lagged model. This provides the motivation to consider both the lagged and concurrent specifications together. It is reasonable that groups may weaken immediately, and quickly discover that they are unable to continue the fight. It may also take time for groups to determine that they are unable to keep fighting, perhaps after suffering additional government defeats or better gauging their capabilities, or put differently, collecting information about the balance of power and their chances of victory (e.g., Mason and Fett, 1996).

Table A1. Duration Models of the Effect of Leadership Decapitation on War Termination, One-Year Break

	1: All Conflicts	2: Gov't Victory	3: Low Activity	4: Settlements	5: Rebel Victory
Decapitation $_t$	1.112	0.983	1.560	1.481	0.000***
	(0.672)	(0.988)	(0.199)	(0.459)	(0.000)
Rebel Strength	1.154	0.847	0.514**	1.391†	3.290†
	(0.106)	(0.627)	(0.002)	(0.097)	(0.055)
Territorial Control	0.880	1.139	0.704	1.916**	0.674
	(0.240)	(0.749)	(0.115)	(0.003)	(0.462)
Gov't Military Size	0.965	0.779	1.090	0.956	0.966
	(0.553)	(0.253)	(0.395)	(0.664)	(0.898)
Regime Type	0.997	0.991	0.970*	1.075***	1.010
	(0.780)	(0.804)	(0.028)	(0.000)	(0.874)
Severity (log)	0.750***	0.938	0.683***	0.921	1.678*
	(0.000)	(0.693)	(0.000)	(0.296)	(0.020)
Secession	1.320†	0.832	1.165	0.987	0.318
	(0.061)	(0.653)	(0.485)	(0.951)	(0.157)
Active Dyads	1.075*	0.852	0.982	1.018	0.900
	(0.033)	(0.239)	(0.720)	(0.789)	(0.649)
Population (log)	0.910†	1.054	1.050	0.872†	0.796
	(0.077)	(0.762)	(0.474)	(0.095)	(0.348)
*TVC: * ln(time)*					
Decapitation $_t$	1.546*	–	–	–	–
	(0.024)				
Rebel Strength	–	–	–	1.214*	–
				(0.043)	
Secession	0.822	–	–	–	–
	(0.119)				
Active Dyads	–	0.544*	–	–	1.345**
		(0.039)			(0.005)
Population (log)	0.935	–	–	–	–
	(0.158)				
N	1,107	1,107	1,107	1,107	1,107
$N_{Conflicts}$ ($N_{Terminations}$)	350 (323)	350 (29)	350 (143)	350 (108)	350 (16)
χ^2	76.285***	14.278	75.689***	55.509***	1026.077***
Log-Likelihood	-1614.418	-162.376	-761.994	-585.054	-74.016

Cox hazard ratios displayed for Model 1; competing risks regression hazard ratios displayed for Models 2-5
p-values listed in parentheses. ***p<0.001, **p<0.01, *p<0.05, †p<0.10

Table A2. Duration Models of the Effect of Leadership Decapitation on War Termination, Three-Year Break

	6: All Conflicts	7: Gov't Victory	8: Low Activity	9: Settlements	10: Rebel Victory
Decapitation $_t$	0.978	0.654	1.552	1.775	0.000***
	(0.950)	(0.547)	(0.276)	(0.288)	(0.000)
Rebel Strength	1.247*	0.804	0.961	1.705**	3.064†
	(0.032)	(0.504)	(0.903)	(0.008)	(0.054)
Territorial Control	0.942	1.197	0.655	2.080**	0.647
	(0.658)	(0.660)	(0.102)	(0.003)	(0.414)
Gov't Military Size	0.997	0.774	1.118	0.943	0.953
	(0.965)	(0.209)	(0.340)	(0.612)	(0.851)
Regime Type	1.031*	0.990	1.017	1.083***	1.010
	(0.035)	(0.774)	(0.517)	(0.000)	(0.870)
Severity (log)	0.859*	0.729	0.646***	0.868†	1.641*
	(0.014)	(0.104)	(0.000)	(0.091)	(0.022)
Secession	0.903	0.905	1.214	0.865	0.355
	(0.475)	(0.805)	(0.452)	(0.586)	(0.194)
Active Dyads	1.083*	0.828	1.007	1.001	0.888
	(0.029)	(0.187)	(0.912)	(0.987)	(0.597)
Population (log)	0.871**	1.052	1.001	0.916	0.822
	(0.004)	(0.758)	(0.989)	(0.347)	(0.389)
*TVC: * ln(time)*					
Decapitation $_t$	1.909**	–	–	–	–
	(0.009)				
Rebel Strength	–	–	0.498**	–	–
			(0.002)		
Regime Type	0.974**		0.943**	–	–
	(0.008)		(0.005)		
Severity (log)	0.878**	1.370**	–	–	–
	(0.007)	(0.010)			
Active Dyads	–	0.641*	–	–	1.331**
		(0.040)			(0.005)
N	1,194	1,194	1,194	1,194	1,194
$N_{Conflicts}$ ($N_{Terminations}$)	280 (294)	280 (28)	280 (92)	280 (87)	280 (16)
χ^2	88.519***	27.201**	60.673***	38.633***	751.948***
Log-Likelihood	-1187.072	-147.127	-461.213	-446.986	-72.819

Cox hazard ratios displayed for Model 1; competing risks regression hazard ratios displayed for Models 2-5
p-values listed in parentheses. ***p<0.001, **p<0.01, *p<0.05, †p<0.10

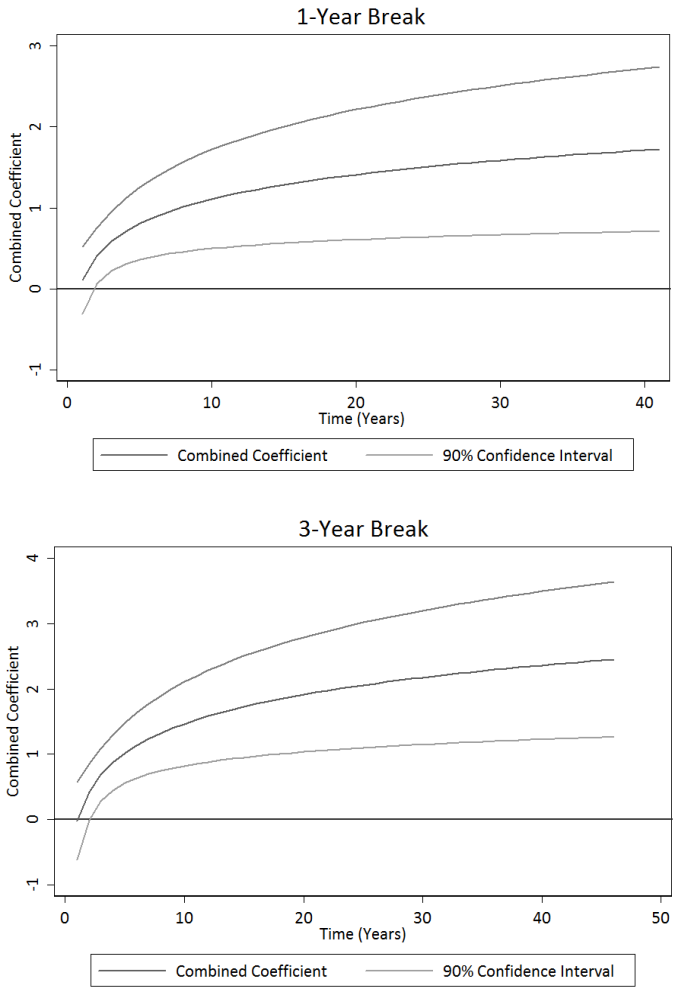

Figure A1. Combined Coefficient for Leadership Decapitation, All Termination Types

Table A3. Duration Models of the Effect of Leadership Decapitation on War Termination, One-Year Break

	1: All Conflicts	2: Gov't Victory	3: Low Activity	4: Settlements	5: Rebel Victory
Decapitation $_{t-1}$	1.570*	2.309	3.368***	0.826	0.000***
	(0.043)	(0.426)	(0.000)	(0.798)	(0.000)
Rebel Strength	1.191	0.827	0.488*	1.825*	3.086
	(0.143)	(0.696)	(0.012)	(0.014)	(0.124)
Territorial Control	1.016	1.577	0.997	1.466	0.959
	(0.895)	(0.492)	(0.991)	(0.143)	(0.959)
Gov't Military Size	0.980	0.270***	1.087	1.034	2.448†
	(0.776)	(0.001)	(0.534)	(0.793)	(0.077)
Regime Type	0.987	0.970	0.955**	1.073**	1.052
	(0.185)	(0.662)	(0.005)	(0.001)	(0.621)
Severity (log)	0.765***	1.025	0.669***	0.971	1.735†
	(0.000)	(0.928)	(0.000)	(0.755)	(0.087)
Secession	0.924	0.610	1.020	0.795	0.109
	(0.563)	(0.474)	(0.938)	(0.384)	(0.204)
Active Dyads	1.142***	0.593*	0.960	1.041	1.675*
	(0.000)	(0.033)	(0.489)	(0.619)	(0.048)
Population (log)	0.834**	0.954	1.110	0.850	0.717
	(0.002)	(0.865)	(0.198)	(0.104)	(0.332)
*TVC: * ln(time)*					
Gov't Military Size	–	2.336*	–	–	0.570**
		(0.014)			(0.009)
N	872	872	872	872	872
$N_{Conflicts}$ ($N_{Terminations}$)	254 (229)	254 (13)	254 (104)	254 (85)	254 (9)
χ^2	58.857***	36.749***	60.4012***	34.994***	1954.903***
Log-Likelihood	-1618.764	-59.590	-761.994	-586.031	-33.5866

Cox hazard ratios displayed for Model 1; competing risks regression hazard ratios displayed for Models 2-5
p-values listed in parentheses. ***p<0.001, **p<0.01, *p<0.05, †p<0.10

Table A4. Duration Models of the Effect of Leadership Decapitation on War Termination, Three-Year Break

	1: All Conflicts	2: Gov't Victory	3: Low Activity	4: Settlements	5: Rebel Victory
Decapitation $_{t-1}$	1.447	2.159	2.059	0.810	0.000***
	(0.189)	(0.472)	(0.122)	(0.788)	(0.000)
Rebel Strength	1.269†	0.790	1.164	1.775*	2.866
	(0.069)	(0.625)	(0.660)	(0.028)	(0.120)
Territorial Control	1.155	1.699	0.982	1.736†	0.965
	(0.354)	(0.472)	(0.950)	(0.059)	(0.965)
Gov't Military Size	0.982	0.619	1.150	0.937	2.266†
	(0.797)	(0.106)	(0.347)	(0.628)	(0.084)
Regime Type	0.990	0.964	0.930***	1.085**	1.047
	(0.395)	(0.593)	(0.000)	(0.002)	(0.664)
Severity (log)	0.769***	0.519†	0.617***	0.897	1.675†
	(0.000)	(0.052)	(0.001)	(0.294)	(0.095)
Secession	0.715*	0.812	0.605	0.767	0.123
	(0.037)	(0.752)	(0.224)	(0.386)	(0.241)
Active Dyads	1.147**	0.517**	0.981	1.009	1.639†
	(0.002)	(0.003)	(0.796)	(0.925)	(0.058)
Population (log)	0.830**	0.859	1.097	0.877	0.752
	(0.005)	(0.465)	(0.423)	(0.218)	(0.387)
*TVC: * ln(time)*					
Gov't Military Size	–	–	–	–	0.583**
					(0.009)
Severity (log)	–	1.569*	–	–	–
		(0.012)			
Rebel Strength	–	–	0.458**	–	–
			(0.001)		
Secession	–	–	1.662	–	–
			(0.115)		
N	959	959	959	959	959
$N_{Conflicts}$ ($N_{Terminations}$)	196 (168)	196 (12)	196 (63)	196 (67)	196 (9)
χ^2	51.606***	37.426***	63.424***	25.297**	2682.539
Log-Likelihood	-667.686	-51.661	-261.087	-297.466	-32.91433

Cox hazard ratios displayed for Model 1; competing risks regression hazard ratios displayed for Models 2-5
p-values listed in parentheses. ***p<0.001, **p<0.01, *p<0.05, †p<0.10

Killed or Captured?

An important debate within the leadership decapitation literature surrounds the relative benefits of killing versus capturing group leader. Some argue that arresting leaders can be more effective (Cronin, 2006, 2011; Hepworth, 2014), due to fewer moral and legal issues, the ability to obtain information, and the demonstration that the rule of law ultimately triumphs over terror tactics (Price, 2012). Others argue that killing a leader acts as a deterrent to future leaders, disrupts operational flow, forces the group to spend resources on selecting a new leader, and may lead to the group channeling resources towards protecting its leadership (Ganor, 2006; Wilner, 2010).

Of the 54 leadership decapitation events coded here, it was possible to determine if the leader was killed or captured for 51. About 75% of decapitation efforts involved killing the top leader. The main results from the paper are reproduced in Tables A5 through A10, separating the leadership decapitation variable into two different variables. For the models on conflict termination, the *killed* indicator records whether a rebel group leader was killed in the current or previous year, and the *captured* indicator records whether a rebel group leader was captured in the current or previous year. For the models on conflict recurrence, *killed* indicates that the rebel group leader was killed in the last or second-to-last year of the war, and *captured* indicates that the rebel group leader was captured in the last or second-to-last year of the war.

For the models on conflict termination that do not differentiate by termination types (Table A5 and Table A7), both capturing and killing a rebel group leader is statistically significantly more likely to bring a war to its end. The effect appears to be stronger for leaders who are killed, which can also be seen graphically in Figure A2 and Figure *A3*; however, an important caveat throughout this analysis is the relative infrequency of capturing leaders. There is less information available for this type of leadership removal and thus greater uncertainty surrounding the results.

In examining the different termination types (Table A6 and Table A8), neither killing nor capturing leaders significantly decreases the time to government victory, and in these data there are no cases of government victories if a rebel leader was captured in the last or second-to-last year of the conflict. However, this may be the result of relatively rare events (government victories and leaders being captured) rather than a true relationship. For low activity outcomes, there is some support that killing and capturing a leader increases the likelihood of termination through inactivity, but results depend on how termination is coded. If termination is coded as a one-year break from fighting, killing a rebel leader significantly increases the time to a low activity outcome, while capturing a leader has no real effect. If termination is coded as a three-year break from fighting, capturing a rebel leader significantly increases the time to a low activity outcome, while killing a leader has no real effect. A potentially interesting finding is that capturing a rebel leader has a statistically significant impact on decreasing the time to settlement. This may be an avenue for future research; however, this finding is largely driven by only three cases – the captures of Sankoh in Sierra Leone, Daimary in India, and Yoach in South Sudan – and should be treated with caution.

Moving to the effect of killing and capturing on civil war recurrence, the results are very similar to those presented in the main paper (Table A9 and Table A10). Neither killing nor capturing a rebel leader decreases the likelihood of civil war recurrence, while there are no cases of recurrence after a group leader has been killed in conjunction with government victory. Finally, as with the main results, only conflicts that end in low activity without either a leader being killed or captured are more likely to recur.

Table A5. Effect of Killing/Capturing Leaders on Conflict Duration, One-Year Break

	1: All Conflicts	2: All Conflicts
Killed $_{t \text{ or } t-1}$	1.252	–
	(0.370)	
Killed $_{t \text{ or } t-1}$ * ln(t)	1.507†	–
	(0.072)	
Captured $_{t \text{ or } t-1}$	–	0.913
		(0.856)
Captured $_{t \text{ or } t-1}$ * ln(t)	–	1.442
		(0.144)
Rebel Strength	1.163†	1.134
	(0.089)	(0.156)
Territorial Control	0.890	0.871
	(0.288)	(0.212)
Gov't Military Size	0.960	0.966
	(0.493)	(0.571)
Regime Type	0.997	0.997
	(0.744)	(0.762)
Severity (log)	0.750***	0.753***
	(0.000)	(0.000)
Secession	1.325†	1.320†
	(0.058)	(0.062)
Active Dyads	1.073*	1.076*
	(0.038)	(0.035)
Population (log)	0.916	0.906†
	(0.103)	(0.064)
*TVC: * ln(time)*		
Secession	0.815	0.815
	(0.097)	(0.103)
Population (log)	0.931	0.943
	(0.136)	(0.224)
N	1,107	1,107
$N_{Conflicts}$ ($N_{Terminations}$)	350 (323)	350 (323)
χ^2	77.937***	68.121***
Log-Likelihood	-1613.406	-1616.313

Cox hazard ratios with p-values in parentheses.
***p<0.001, **p<0.01, *p<0.05, †p<0.10

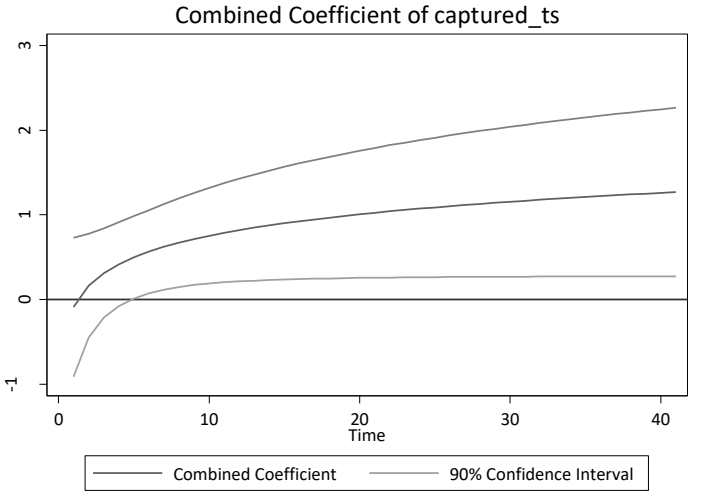

Figure A2. Combined Coefficient for Killed and Captured, All Termination Types

Table A6. Effect of Killing/Capturing Leaders on Conflict Duration, One-Year Break

	1: Gov't Victory	2: Gov't Victory	3: Low Activity	4 : Low Activity	5: Settlements	6: Settlements	7: Rebel Victory	8: Rebel Victory
Killed $_{t \text{ or } t-1}$	3.169	–	2.639**	–	1.004	–	0.000***	–
	(0.106)		(0.002)		(0.994)		(0.000)	
Captured $_{t \text{ or } t-1}$	–	0.000***	–	1.557	–	3.787**	–	0.000***
		(0.000)		(0.429)		(0.005)		(0.000)
Rebel Strength	0.881	0.841	0.543**	0.500**	1.380	1.385	3.326	3.232*
	(0.713)	(0.611)	(0.004)	(0.001)	(0.106)	(0.105)	(0.059)	(0.047)
Territorial Control	1.190	1.115	0.717	0.700	1.898**	1.909**	0.676	0.719
	(0.667)	(0.785)	(0.140)	(0.106)	(0.003)	(0.003)	(0.472)	(0.523)
Gov't Military Size	0.784	0.777	1.092	1.087	0.962	0.952	0.965	0.991
	(0.265)	(0.251)	(0.387)	(0.412)	(0.708)	(0.627)	(0.895)	(0.975)
Regime Type	0.990	0.986	0.968*	0.971*	1.076***	1.079***	1.010	1.015
	(0.786)	(0.705)	(0.017)	(0.036)	(0.000)	(0.000)	(0.883)	(0.809)
Severity (log)	0.922	0.936	0.674***	0.685***	0.925	0.927	1.666*	1.652*
	(0.620)	(0.689)	(0.000)	(0.000)	(0.328)	(0.340)	(0.021)	(0.025)
Secession	0.823	0.826	1.176	1.159	0.992	1.023	0.320	0.311
	(0.632)	(0.642)	(0.466)	(0.494)	(0.970)	(0.917)	(0.160)	(0.147)
Active Dyads	0.849	0.840	0.972	0.988	1.022	1.032	0.907	0.912
	(0.231)	(0.202)	(0.557)	(0.813)	(0.746)	(0.635)	(0.670)	(0.673)
Population (log)	1.076	1.074	1.080	1.037	0.867	0.858	0.795	0.789
	(0.682)	(0.686)	(0.263)	(0.601)	(0.083)	(0.056)	(0.351)	(0.328)
*TVC: * ln(time)*								
Rebel Strength	–	–	–	–	1.210*	1.221*	–	–
					(0.048)	(0.039)		
Active Dyads	0.536*	0.541*	–	–	–	–	1.339**	1.315**
	(0.040)	(0.038)					(0.005)	(0.007)
N	1,107	1,107	1,107	1,107	1,107	1,107	1,107	1,107
$N_{Conflicts}$ ($N_{Terminations}$)	350 (29)	350 (29)	350 (143)	350 (143)	350 (108)	350 (108)	350 (16)	350 (16)
χ^2	14.960	926.580***	80.025***	74.456***	53.927***	59.342***	857.329***	505.699***
Log-Likelihood	-161.504	-161.660	-758.966	-762.387	-585.362	-583.645	-74.052	-74.601

Competing risks regression hazard ratios with p-values in parentheses. ***p<0.001, **p<0.01, *p<0.05, †p<0.10

Table A7. Effect of Killing/Capturing Leaders on Conflict Duration, Three-Year Break

	1: All Conflicts	2: All Conflicts
Killed $_{t \text{ or } t-1}$	0.838	–
	(0.671)	
Killed $_{t \text{ or } t-1}$ * ln(t)	1.924*	–
	(0.027)	
Captured $_{t \text{ or } t-1}$	–	1.909*
		(0.045)
Rebel Strength	1.244*	1.225
	(0.034)	(0.051)
Territorial Control	0.956	0.931
	(0.734)	(0.600)
Gov't Military Size	0.996	0.993
	(0.940)	(0.898)
Regime Type	1.031*	1.032*
	(0.031)	(0.027)
Severity (log)	0.857*	0.859*
	(0.012)	(0.015)
Secession	0.896	0.900
	(0.444)	(0.463)
Active Dyads	1.084*	1.090*
	(0.028)	(0.022)
Population (log)	0.868**	0.863**
	(0.004)	(0.003)
*TVC: * ln(time)*		
Regime Type	0.974**	0.974**
	(0.007)	(0.008)
Severity (log)	0.883**	0.885*
	(0.009)	(0.018)
N	1,194	1,194
$N_{Conflicts}$ ($N_{Terminations}$)	279 (248)	279 (248)
χ^2	88.634***	57.216***
Log-Likelihood	-1188.078	-1190.666

Cox hazard ratios with p-values in parentheses.
***p<0.001, **p<0.01, *p<0.05, †p<0.10

Figure A3. Combined Coefficient for Killed and Captured, All Termination Types

Table A8. Effect of Killing/Capturing Leaders on Conflict Duration, One-Year Break

	1: Gov't Victory	2: Gov't Victory	3: Low Activity	4 : Low Activity	5: Settlements	6: Settlements	7: Rebel Victory	8: Rebel Victory
Killed $_{t \text{ or } t-1}$	2.408	–	1.368	–	1.164	–	0.000***	–
	(0.155)		(0.411)		(0.789)		(0.000)	
Captured $_{t \text{ or } t-1}$	–	0.000***	–	2.999*	–	3.754**	–	0.000***
		(0.000)		(0.041)		(0.005)		(0.000)
Rebel Strength	0.849	0.805	0.953	0.942	1.679**	1.712**	3.099	3.010*
	(0.615)	(0.504)	(0.883)	(0.857)	(0.010)	(0.009)	(0.059)	(0.046)
Territorial Control	1.208	1.172	0.655	0.654	2.056**	2.053**	0.651	0.692
	(0.646)	(0.697)	(0.103)	(0.099)	(0.004)	(0.003)	(0.426)	(0.471)
Gov't Military Size	0.771	0.772	1.122	1.108	0.952	0.945	0.951	0.978
	(0.201)	(0.207)	(0.323)	(0.377)	(0.671)	(0.617)	(0.846)	(0.935)
Regime Type	0.987	0.985	1.016	1.023	1.084***	1.089***	1.010	1.015
	(0.708)	(0.662)	(0.543)	(0.395)	(0.000)	(0.000)	(0.877)	(0.800)
Severity (log)	0.726	0.729	0.648***	0.644***	0.872	0.876	1.629*	1.616*
	(0.101)	(0.101)	(0.000)	(0.000)	(0.103)	(0.116)	(0.024)	(0.028)
Secession	0.878	0.891	1.215	1.237	0.872	0.902	0.355	0.348
	(0.751)	(0.775)	(0.448)	(0.411)	(0.607)	(0.698)	(0.196)	(0.185)
Active Dyads	0.830	0.818	1.002	1.023	1.005	1.018	0.895	0.899
	(0.197)	(0.160)	(0.979)	(0.727)	(0.949)	(0.820)	(0.621)	(0.614)
Population (log)	1.066	1.072	1.009	0.970	0.910	0.899	0.821	0.816
	(0.699)	(0.670)	(0.918)	(0.719)	(0.316)	(0.242)	(0.389)	(0.372)
*TVC: * ln(time)*								
Rebel Strength	–	–	0.502**	0.491**			–	–
			(0.002)	(0.002)				
Regime Type			0.944**	0.939**				
			(0.006)	(0.003)				
Severity (log)	1.330**	1.352*	–	–				
	(0.006)	(0.015)						
Active Dyads	0.654*	0.643*	–	–	–	–	1.325**	1.302**
	(0.048)	(0.042)					(0.005)	(0.008)
N	1,194	1,194	1,194	1,194	1,194	1,194	1,194	1,194
$N_{Conflicts}$ ($N_{Terminations}$)	279 (28)	279 (28)	279 (92)	279 (92)	279 (87)	279 (87)	279 (28)	279 (28)
χ^2	21.743*	795.939***	58.782***	59.128***	36.353***	41.847***	620.537***	442.847***
Log-Likelihood	-146.721	-146.388	-461.468	-460.145	-447.565	-445.919	-72.863	-73.384

Competing risks regression hazard ratios with p-values in parentheses. ***p<0.001, **p<0.01, *p<0.05, †p<0.10

Table A9. Effect of Killing Rebel Leaders on Conflict Recurrence

	1: One-Year Break	2: One-Year Break	3: One-Year Break	4: Three-Year Break	5: Three-Year Break	5: Three-Year Break
Killed	0.927	0.757	–	0.838	0.611	–
	(0.846)	(0.471)		(0.805)	(0.527)	
Gov't Victory	–	0.750	–	–	1.134	–
		(0.465)			(0.815)	
Gov't Victory + Killed	–	–	0.000***	–	–	0.000***
			(0.000)			(0.000)
Gov't Victory, No Kill	–	–	0.839	–	–	1.245
			(0.650)			(0.681)
Low Activity	–	2.101***	–	–	2.318*	–
		(0.000)			(0.030)	
Low Activity + Killed	–	–	1.743	–	–	0.907
			(0.198)			(0.919)
Low Activity, No Kill	–	–	2.116***	–	–	2.460*
			(0.000)			(0.019)
Secession	2.194**	2.090***	2.118***	3.364***	3.188***	3.253***
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
Severity (log)	0.871*	0.938	0.941	0.861	0.947	0.964
	(0.044)	(0.353)	(0.394)	(0.145)	(0.633)	(0.761)
Duration (log)	1.747***	1.647***	1.651***	1.261	1.211	1.211
	(0.000)	(0.000)	(0.000)	(0.141)	(0.294)	(0.293)
Population (log)	1.087	1.048	1.047	1.025	0.986	0.976
	(0.201)	(0.450)	(0.463)	(0.800)	(0.902)	(0.823)
Regime Type	0.995	1.006	1.007	0.988	1.001	1.004
	(0.724)	(0.655)	(0.629)	(0.606)	(0.979)	(0.864)
Active Dyads	0.941	0.942	0.940	0.950	0.944	0.949
	(0.235)	(0.225)	(0.212)	(0.556)	(0.547)	(0.573)
N	3,451	3,451	3,451	3,345	3,345	3,345
$N_{Conflicts}$ ($N_{Terminations}$)	357 (130)	357 (130)	357 (130)	276 (49)	276 (49)	276 (49)
χ^2	95.378***	118.331***	2023.744***	29.499***	33.653***	33.982***
Log-Likelihood	-699.668	-691.070	-690.359	-250.882	-247.664	-246.890

Cox hazard ratios with p-values in parentheses. ***p<0.001, **p<0.01, *p<0.05, †p<0.10

Table A10. Effect of Capturing Rebel Leaders on Conflict Recurrence

	1: One-Year Break	2: One-Year Break	3: One-Year Break	4: Three-Year Break	5: Three-Year Break	5: Three-Year Break
Captured	0.744	0.612	–	2.237	1.874	–
	(0.627)	(0.363)		(0.174)	(0.228)	
Gov't Victory	–	0.722	–	–	1.101	–
		(0.410)			(0.853)	
Gov't Victory + Captured	–	–	–	–	–	–
Gov't Victory, No Capture	–	–	0.839	–	–	1.087
			(0.650)			(0.872)
Low Activity	–	2.065***	–	–	2.161*	–
		(0.000)			(0.031)	
Low Activity + Captured	–	–	1.680	–	–	5.110**
			(0.316)			(0.003)
Low Activity, No Capture	–	–	2.063***	–	–	2.088*
			(0.000)			(0.042)
Secession	2.173**	2.040**	2.063**	3.439***	3.254***	3.285***
	(0.002)	(0.002)	(0.002)	(0.000)	(0.000)	(0.000)
Severity (log)	0.870*	0.929	0.928	0.855	0.927	0.927
	(0.036)	(0.288)	(0.279)	(0.135)	(0.504)	(0.501)
Duration (log)	1.749***	1.657***	1.659***	1.263	1.214	1.211
	(0.000)	(0.000)	(0.000)	(0.143)	(0.292)	(0.294)
Population (log)	1.090	1.055	1.052	1.017	0.992	0.994
	(0.192)	(0.396)	(0.418)	(0.862)	(0.937)	(0.951)
Regime Type	0.995	1.005	1.005	0.987	0.997	0.997
	(0.719)	(0.709)	(0.720)	(0.576)	(0.886)	(0.900)
Active Dyads	0.939	0.935	0.937	0.958	0.946	0.949
	(0.221)	(0.176)	(0.195)	(0.624)	(0.560)	(0.580)
N	3,451	3,451	3,451	3,345	3,345	3,345
$N_{Conflicts}$ ($N_{Terminations}$)	357 (130)	357 (130)	357 (130)	276 (49)	276 (49)	276 (49)
χ^2	95.792***	115.943***	114.204***	31.299***	34.491***	38.305***
Log-Likelihood	-699.594	-691.057	-691.284	-250.431	-247.603	-247.345

Cox hazard ratios with p-values in parentheses. ***p<0.001, **p<0.01, *p<0.05, †p<0.10

Full Results for Decapitation Success Coefficient Plots

Table A11 displays full results for the coefficient plot presented in Figure 2 in the main paper. The coefficient plot only showed results that were derived from significant models. Table A11 also shows results for models that were not significant.

Models were constructed for each of the three mechanisms identified in the paper as factors that affect the impact of leadership decapitation. First, the role of a group's leader is proxied using a variable that indicates if the leader was the group's founder. Founders are expected to be more central to the functioning of the group, likely to have an important role in carrying the group's ideological message as well as operational function. These data were collected by Tiernay (2015), and updated for all groups through 2014. Results in Model 1 indicate that founders are indeed important to group survival – decapitation effects are over 6 times more likely to lead to conflict termination if the removed leader was the group's founder.

For organizational structure, three indicators were taken from the Non-State Actor Data (NSAD) (Cunningham et al., 2009), including whether the group has central control, a political wing, and group size. Leadership decapitation is expected to have a greater impact on groups that are centrally controlled. While this finding in Model 2 is in the predicted direction, it is not significant. The presence of a political wing and group size, measured in the logged number of soldiers, are included as a proxies for bureaucratization. Both are expected to decrease the likelihood that decapitation will lead to conflict termination. Both are also in the predicted direction, but neither is statistically significant. On the whole, the organizational variables are in the predicted direction, but fail to reach conventional levels of statistical significance, which may point to noisy proxies or difficulty in capturing these organizational traits.

Two measures are included for popular support, mobilization capacity and Islamist ideology. Mobilization capacity is taken from the NSAD, and measures the ability of the rebel group to mobilize personnel, relative to the government. It is expected that the better able a group is to mobilize recruits, the more popular support they have, and as a result decapitation should be less likely to lead to conflict termination. This indicator is in the predicted direction, but not statistically significant. An Islamist ideology is also included as a measure of popular support, although this indicator may be picking up on a number of potential group characteristics of these groups other than popular support. Islamist groups are significantly less likely to be affected by leadership decapitation.

Finally, three measures of external support are included, also taken from the NSAD. These include both military and non-military non-state support, as well as any kind of support from a government. External support is expected to make rebel groups more resilient, decreasing the likelihood of conflict termination after leadership decapitation. Both indicators for non-state support are significant and in the predicted direction, while government support is in the predicted direction but doesn't meet conventional levels of statistical significance.

Table A11. Determinants of Successful Decapitation Efforts

	1: Leader Role	2: Org. Structure	3: Org. Structure	4: Org. Structure	5: Popular Support	6: Popular Support	7: External Support	8: External Support	9: External Support
Founder	6.038**	–	–	–	–	–	–	–	–
	(0.010)								
Central Control	–	1.772	–	–	–	–	–	–	–
		(0.200)							
Political Wing	–	–	0.914	–	–	–	–	–	–
			(0.909)						
Group Size	–	–	–	0.757	–	–	–	–	–
				(0.369)					
Mobilization Capacity	–	–	–	–	0.602	–	–	–	–
					(0.427)				
Islamist	–	–	–	–	–	0.187*	–	–	–
						(0.015)			
Non-State, Non-Military Support	–	–	–	–	–	–	0.326**	–	–
							(0.003)		
Non-State, Military Support	–	–	–	–	–	–	–	0.137**	–
								(0.006)	
Government Support	–	–	–	–	–	–	–	–	0.407
									(0.151)
Population (log)	1.031	0.833	0.893	0.968	0.918	0.884	1.026	0.768	0.978
	(0.929)	(0.411)	(0.643)	(0.891)	(0.714)	(0.618)	(0.936)	(0.237)	(0.929)
Severity (log)	0.762	0.742	0.766	0.926	0.820	0.773	0.970	1.173	0.735
	(0.174)	(0.178)	(0.152)	(0.717)	(0.323)	(0.269)	(0.892)	(0.690)	(0.119)
Duration (log)	0.921	0.758	0.941	1.202	0.893	0.885	0.867	0.678	0.986
	(0.773)	(0.383)	(0.840)	(0.558)	(0.710)	(0.736)	(0.702)	(0.357)	(0.960)
Constant	1.643	69.192	41.107	18.664	37.876	90.476	2.769	255.911	16.990
	(0.933)	(0.309)	(0.395)	(0.553)	(0.382)	(0.293)	(0.851)	(0.195)	(0.514)
N	54	48	53	45	53	48	51	43	51
χ^2	9.576*	6.165	2.503	1.650	2.559	8.724†	9.518*	13.464**	4.611
$p > \chi^2$	0.048	0.187	0.644	0.800	0.634	0.068	0.049	0.009	0.330
Log-Likelihood	-31.045	-30.119	-34.882	-30.150	-34.590	-28.437	-29.573	-19.97	-32.430

Logit odds-ratios, with p-values in parentheses. ***p<0.001, **p<0.01, *p<0.05, †p<0.10

Descriptive Statistics

Descriptive statistics are available in Table A12 and Table A13, which correspond to the analyses on civil war termination and civil war recurrence, respectively. There are a total of 54 decapitations, 30 of which are "successful", in that they led to the end of the conflict in the concurrent or next year.

Table A12. Descriptive Statistics for Termination Models

	N	Mean	St. Dev	Min	Max
Decapitation	1,269	0.06	0.245	0	1
Rebel Strength	1,174	0.63	0.64	0	2
Territorial Control	1,147	0.39	0.49	0	1
Military Personnel (log)	1,266	1.55	0.96	-1.57	4.38
Regime Type	1,228	1.60	6.05	-9	10
Severity (log)	1,269	5.12	1.55	3.22	10.90
Secession	1,269	0.43	0.50	0	1
Active Dyads	1,269	2.54	1.71	1	9
Population (log)	1,269	17.40	1.60	13.14	21.00

Table A13. Descriptive Statistics for Termination Models

	N	Mean	St. Dev	Min	Max
Decapitation	3,923	0.07	0.26	0	1
Secession	3,923	0.38	0.49	0	1
Severity (log)	3,923	5.64	1.79	3.26	11.01
Duration (log)	3,923	0.84	0.95	0	3.83
Population (log)	3,923	16.64	1.58	12.91	21.00
Regime Type	3,805	0.147	5.80	-9	10
Active Dyads	3,923	2.47	1.68	1	9
Low Activity Outcome	3,923	0.32	0.47	0	1
Gov't Victory	3,923	0.16	0.37	0	1

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