THE DETERRENT EFFECT OF THE DEATH PENALTY? EVIDENCE FROM BRITISH COMMUTATIONS DURING WORLD WAR I

Daniel L. Chen*

Abstract During World War I, the British military condemned over 3,000 soldiers to death, but only executed 12% of them; the others received commuted sentences, unbeknownst to soldiers at the time. I verify that variation in commutations and executions is consistent with a random process. Using this result, I identify the effect of executions on subsequent desertions. There is limited evidence that executing deserters deterred absences, while executing Irish soldiers, regardless of the crime, spurred absences, particularly Irish absences. I present a model where perceived legitimacy of authority affects why people obey the law.

Keywords: Compliance, Legitimacy, Deterrence

JEL codes: N44, K14, K42, P48

*Daniel L. Chen, daniel.chen@iast.fr, Toulouse School of Economics, Institute for Advanced Study in Toulouse, University of Toulouse Capitole, Toulouse, France; dchen@law.harvard.edu, LWP, Harvard Law School. First draft: April 2008. Current draft: February 2017. Latest version at: http://nber.org/~dlchen/papers/The_Deterrent_Effect_of_the_Death_Penalty.pdf. I would like to thank assistance and comments from Julian Putkowski, British National Archives, Gerard Oram, Sonya Hymer, Markus Loecher, and many colleagues. Work on this project was conducted while I received financial support from the European Research Council (Grant No. 614708), Ewing Marion Kauffman Foundation, Institute for Humane Studies, Agence Nationale de la Recherche, John M. Olin Foundation, Petrie-Flom Center, Swiss National Science Foundation (Grant Nos. 100018-152678 and 106014-150820), and Templeton Foundation (Grant No. 22420).

Electronic copy available at: https://ssrn.com/abstract=2816255

"There are hooks on the post .. He is hooked on like dead meat in a butcher's shop. His eyes are bandaged — not that it really matters, for he is already blind" (Memoirs of Brigadier General Crozier 1930).

1 Introduction

Whether the death penalty deters is a classic legal and economic question that remains unanswered (Nagin and Pepper, eds 2012; Ehrlich 1975; Donohue and Wolfers 2005). What makes causal estimates challenging is that jurisdictions with death penalty differ from those that do not in ways that independently affect levels of crime, and executions are frequently delayed and hidden from public (Katz et al. 2003). Yet, as a skeptic of existing death penalty research stated, "if I was allowed 1,000 executions and 1,000 exonerations, and I was allowed to do it in a random, focused way ... I could probably give you an answer."[1] Such a scenario is thankfully unlikely to occur, but the British Army experience during World War I may have been a close approximation. This paper uses quasi-random application of the death penalty, whose randomness was unbeknownst to the soldiers, to test whether executions deterred—or spurred—desertion.

British WWI executions were designed for maximum deterrence—immediate, brutal, and often carried out by fellow soldiers from the deserter's battalion. Promulgation would occur on the same day, with many condemned soldiers paraded in public (Putkowski and Sykes 2007, p. 18). Relatively clear high-frequency variation randomizes whether (a person sees that) a crime leads to execution. Two preconditions for any deterrence are *perceptions of risk* of criminal sanctions (Apel and Nagin 2011; Lochner 2007; Sah 1991; Nagin and Pepper, eds 2012; Donohue and Wolfers 2005; Cohen-Cole et al. 2009; Manski and Pepper 2011), and whether capital crimes were premeditated. Deserting, quitting, sleeping, etc., occurred away from the front line (Peaty 1999, p. 200, 201, 206). Unlike cowardice (if a soldier turns his back on the enemy and runs away), desertion was *subsequent* absence from the scene of danger with intent of avoiding danger (Peaty 1999, p. 199).

Sentencing has undergone several intellectual revolutions—retribution, rehabilitation, deterrence, community policing, and fairness. In parallel to the behavioral economics revolution, legitimacy is perceived to impact criminal behavior more than sentencing severity. Legitimacy does not affect behavior if only deterrence drives the response to law (Becker 1968); but, as many argue, "if [citizens] regard legal authorities as more legitimate, they are less likely to break any laws, for they believe that they ought to follow them, regardless of potential for punishment" (Tyler 2006, p. 4). The existence of a large, subordinated minority—the Irish—allows exploring this channel. Like minorities elsewhere (Donohue 2013; Alesina and La Ferrara 2014), the Irish were disproportionately sentenced

[1] *Does Death Penalty Deter? A New Debate*, N. Y. Times, Nov. 18, 2007.

Electronic copy available at: https://ssrn.com/abstract=2816255

to death—but conditional on the sentence—they were equally likely to be executed, which allows separately identifying the role of legitimacy in non-compliance to law.

Section 2 describes courts martial, executions, and desertions. Convinced of the deterrent power of the death penalty (Oram 2003, pp. 39, 69; Putkowski and Sykes 2007, p. 11; Babington 1983, p. 19), British military officers sentenced over 3,300 soldiers to death,[2] but only a small fraction were executed. Commanders were reluctant to execute soldiers who might still make some contribution (Oram 2003, pp. 2, 4; Moore 1975, p. 70) and wary of popular anger.[3] These two concerns, balanced against the desire to deter, led to an almost literal decimation of around 12%. Figures 2A and 2B show each division line up along the 12% line, where the number of death sentences is the X-axis and the number of executions is the Y-axis. Figure 3A shows the constancy in the execution rate over time.[4] Historians assess the execution decision to be a pitiless lottery. Moreover, commutations disappeared into the night.[5] Soldiers whose sentences were commuted (to prison terms or hard labor after the war) returned to the trenches (Oram 2003, p. 69). No news of death sentences reached soldiers (not even to the sentenced) except in the case of execution. Some soldiers even did not believe executions took place (Johnson 2015, p. 110), which eliminates awareness of randomization from the outset.

Section 3 models the soldiers' reactions. That desertion was punishable by execution was common knowledge (Appendix Figure 1). Diaries, letters, and memoirs record the emotional impact of executions. Observing the execution has two theoretical effects: soldiers updated beliefs about the conditional probability of execution as well as the perceived legitimacy of authorities. Legitimacy is modeled as the perceived morality of following the law or not. Would-be deserters weigh the benefits of desertion against *economic costs* (probability of execution), *social costs* (shame), and *psychological costs* (violating duty) (Beckett and Simpson, eds 1985). A soldier only motivated by economic costs will be less likely to desert following an execution, but social and psychological costs can outweigh economic costs. Building on Bénabou and Tirole (2012), sanctions convey information about the number of rule-violators in general equilibrium. Shifts in beliefs about the number of rule-violators affects the legitimacy of the authority. If social/psychological costs fall far enough for one group, then those who desert might be admired for refusing

[2]Lower panel of Figure 1 shows executions (downward ticks) and commutations (upward ticks).

[3]During the war, under questioning by Parliament, the Under-Secretary of State for War, Harold Tennant, stated: "It is not in the public interest to give statistics" for those shot overseas. Hansard HC Deb. vol. 72, col. 1935, 01 July 1915. Retrieved from http://hansard.millbanksystems.com/commons/1915/jul/01/courts-martial-death-sentences

[4]Execution rate was higher in 1914 due to small numbers of death sentences issued and lower in 1918. Rates are smoothed using penalized splines. Alternative methods yield similar findings.

[5]Email on December 24, 2007 from Gerard Oram.

Electronic copy available at: https://ssrn.com/abstract=2816255

to submit to an unjust regime. This may be one reason why we regard "lawbreakers" such as Nelson Mandela, Rosa Parks, and Sophie Scholl as heroes. Their apprehension and treatment by authorities contributed to the collective view of the unjustness of the legal authorities they resisted. Backlash (spurring of desertion) can arise only if the sanctioner lacks full information on social/psychological costs (Chen and Yeh 2014c). Extending the model to two groups with different conceptions of duty renders opposing responses to state-imposed sanctions in different communities (Chen and Yeh 2014a). In this paper, even a fully-informed sanctioner yields backlash by one group and compliance by the other. Backlash may be a reason why insurgencies flourish when the crime is "resisting the state"; insurgency is when state legitimacy is in question and the (inverted) social shame response to nominally criminal behavior is likely to be strongest. Courting punishment by authorities to highlight the injustice and illegitimacy of those authorities was a stated strategy of Martin Luther King, famously in his letter from a Birmingham jail: "I am in Birmingham because injustice is here... Injustice anywhere is a threat to justice everywhere."[6] The period before the Irish War of Independence of 1919-1921 is likely one where Irish would have felt less loyalty to the British. To be sure, not all Irish would have felt less loyalty—religion may have been an important distinction—but I cannot distinguish between Catholics and Protestants in my data. I investigate birthplace instead and find that Northern Irish were less loyal than soldiers born in Britain. All groups of Irish were subordinated and explicitly denigrated by their non-minority counterparts (Oram 1998, 2003, pp. 9-10), so "Irish" refers to both groups.

Section 4 previews the eleven data sources that I digitize and link together (details are in Appendix A-C due to space constraints). The British kept detailed administrative records (and, unlike the records of France and Germany, were not largely destroyed in World War II[7]). Court martial records were not released for 75 years, but since their release, historians have pieced together (1) the universe of death sentences, executions, and commutations (Oram 2003). The high number of death sentences was due to the belief it was critical to maintain discipline (since branding and flogging were outlawed in 1879). I link this data to absentee lists collated after roll call every morning or more frequently and circulated among the military police searching for deserters. Lists are preserved in the British National Archives in (2) surviving war diaries, (3) Police Gazettes, and (4) handwritten trial registries of apprehended deserters. Virtually all deserters were caught because the British fought on foreign lands geographically separated by water. I link these

[6] http://kingencyclopedia.stanford.edu/encyclopedia/documentsentry/annotated_letter_from_birmingham.1.html

[7] Conversations with Putkowski during November 24-26, 2011. There is one analysis of German desertions (Jahr 1998), but other countries lack dates and locations of executions, commutations, and absences.

data by military unit and date using the (5) Order of Battle,[8] which I digitize to obtain troop movements—both physical and organizational—e.g., battalions moving to another division (Appendix B and C). I employ the (6) Soldiers Died in the Great War database of all casualties (which always mean deaths, since I have no database on injuries) to measure point-in-time unit combat danger. The Order of Battle of Divisions provides (7) commanding officers at each unit level and date and (8) lists of battles for each division, which I use to point-in-time geolocate each military unit. Additional covariates, such as soldiers' birthdates, enlistment dates, enlistment location, and birthplace, are preserved in (9) surviving portions of the Service and Pension Records—also known as the "Burnt Documents"[9] and "Unburnt Documents"[10]—which I link by soldier's name to the other datasets.[11] I use (10) a dictionary of Irish surnames to identify soldiers of probable Irish ethnicity. Any measurement error on "true Irishness" would tend to bias towards zero the difference in the effects of executing British vs. Irish soldiers. As shorthand, I interchange, "Irish soldiers," "soldiers with Irish surnames," or "soldiers with male Irish ancestry". I will also interchange "British" with "non-Irish", but it just means soldiers who lacked Irish surnames. Finally, I use the (11) Medal Rolls Index, which contains virtually all soldiers who served, to validate the use of the surname dictionary vis-à-vis official statistics regarding Irish enlistment. Some government sources quote national statistics that refer to Irish birthplace, while others refer to Irish regiments. Secondary references are not always clear, so I follow the historical citations to the original source.

Next, I evaluate the use of Irish surname as a marker of Irish identity in Appendix D (due to space constraints). First, I verify that deaths are representative of the enlisted population, rendering the casualties database my geographic baseline. I show that Northern-Irish born were twice as likely to desert as British-born soldiers, and that British-born soldiers with Irish surnames were 20% more likely to desert—but British-born without Irish surnames 15% less likely to desert—relative to the average soldier. Thus Irish identity was retained even for subsequent generations amid extensive migration from Ireland that spread Irish surnames across Great Britain in the 19th century. Also, I show the proportion of soldiers with Irish surnames is the same across the three absentee data sources, a consistency that is not present for Irish regiment. I show that 27% of soldiers in Irish regiments were born in Britain, which renders regiment a poor marker of Irish identity.[12]

Section 5 quantitatively assesses execution randomness. Over two death sentences per

[8]Order of Battle. The Long, Long Trail (Baker 1996). Retrieved from http://www.1914-1918.net/oob.htm.
[9]60% of the original 6.5 million Service Records were destroyed in a WW2 bombing raid on London.
[10]The Pension Records were not affected.
[11]I can only use age in balancing and robustness checks, due to missing data.
[12]Prior research relied on regiment since analyzing addresses "would take a lifetime" (Oram 1998, p. 59).

day precluded careful consideration by the Commander-in-Chief who made the final decision on every case. His daily task involved sending over 600 men on average to death every day, so the fate of a single "criminal" would not have had much consideration. Some historians believe in strong randomization, but others argue that Irish soldiers, non-commissioned officers, and those seen as physically weak or undesirable were more likely to be executed (Oram 2003, pp. 9, 56, 61, 74). Others surmise that certain units were targeted for perceived indiscipline (Babington 1983; Putkowski and Sykes 2007, p. 17; Putkowski and Dunning 2012, p. 212). I show that execution decisions are uncorrelated with Irish ethnicity, rank, and age and uncorrelated with unit-level casualties, desertion, execution rates, commanding officers' fixed effects and ethnicities, timing with respect to major battles, distance to the coast or to Germany, seasonality, and army type. I show the sequence of execution decisions within a unit is statistically indistinguishable from a random string of 1s and 0s. In doing so, I consider metrics of the Commander-in-Chief targeting perceived indiscipline (long runs of executions), feeling that certain units were "due" for an execution (negative autocorrelation), or addressing "groups of bad apples" (positive autocorrelation). Irish execution decisions are also consistent with randomization. My analysis sample includes 466 Irish and 1,942 non-Irish death sentences.

Section 6 adopts the language of potential outcomes: I observe what happened in a particular Army division following an execution — I would like to know what *would* have happened if that same unit had instead experienced a commutation (Rubin 1974). However, the within-unit design means that each division is essentially serving as its own control. This method is problematic if past events in a unit's history continue to affect outcomes in later time periods. I thus develop three sets of analyses. The first set of analyses assumes a strong form of SUTVA (stable unit treatment value assumption) where only the most recent event matters. This is a reasonable assumption based on theoretical models of rational inattention (Sims 2003; Caplin and Dean 2015) and experimental research indicating that recent events are more salient (Kahneman 2011; Hertwig et al. 2004). The second set of analyses assumes a weak form of SUTVA and parametrically models the effects of previous events. I explore whether or not the results are robust to the inclusion of prior events in the model specification. The third set of analyses uses a day-by-day maximum likelihood model of absence, where each unit has some probability of experiencing absence on any particular day. I model how this probability depends on all previous death sentences, their outcomes, and distance in time—this combines the effects of salience and the execution rate. Notably, the distribution of past events identifies exogenous shifts in the local execution rate in different divisions (represented by gray lines in Figure 3B, even in the 400-day time frame of the War Diaries) which can be used

to separately estimate the impact of the execution *rate*—across many events—from the impact of execution *salience*—the most recent event. To put this in context, random variation in the sequence of executions creates exogenous temporal variation in how strict the death penalty is applied, which is similar to existing studies using variation in execution rates (but summarized critically by Donohue and Wolfers (2005)).

Section 7 presents results. Casualties are positively associated with desertions, which align priors. Executing Irish spurred rather than deterred absences. In the temporally dense War Diaries, Irish executions increased the hazard of absence by 2-3 fold out of a median time of 2 weeks to the next absence; and after Irish executions, 19% of the immediately following absences were Irish whereas after a British execution, 11% of the next absences were Irish. After commutations of either ethnicity, 13% of the next absences were Irish, consistent with randomization and no commutation news reaching soldiers. The day-by-day framework also finds that Irish executions spurred Irish desertions.

There is mixed evidence of deterrence. If there is deterrence, it is the execution rate—but not the execution salience of the most recent event—that deters. To be sure, the differences between this study and contemporary criminal justice scenarios are vast, so a more nuanced understanding of the differences is warranted for rigorous policy lessons. One way to interpret the British experience during WWI is that it provides a low-bar test for the death penalty. Finding a deterrence effect would not be a strong argument, leaving aside moral issues, that the death penalty is good policy. Yet a negative result showing no deterrent effect might have more policy salience since executions took place almost immediately—in a manner purposefully designed to maximize their deterrent effect. Desertion is also certainly not analogous to murder, and criminals weighing potential homicidal undertaking are certainly different from soldiers weighing military desertion. However, all else equal, more executions should deter absences, and if we find this not to be the case, then we may doubt a behavioral response to contemporary death penalty, which is still in place for over 60% of the world's population. This is despite a lack of empirical evidence regarding the effects of the death penalty on compliance with the law. I provide evidence of a mechanism for legal compliance beyond deterrence that has received less attention in the formal literature, and that state-imposed sanctions can undermine state legitimacy. Understanding this fully is important for policymakers who are concerned with multiculturalism and integration of subcultures.

2 Historical Background

This section analyzes the historical record, which motivates the theoretical model and empirical framework. I focus on France and Flanders, the location of 322 of 346 soldiers executed during World War I (The War Office 1922, p. 648). I describe the data generating

process of desertion, apprehension, courts martial, conviction, sentence, and execution or commution (Figure 4). Three key discussions for identification are: 1) random executions, 2) unawareness of randomization, and 3) (estimated) costs and benefits of desertion.

2.1 Beliefs about Death Penalty The military made penalties common knowledge. "It is well known ... to all soldiers that desertion in the face of the enemy is liable to be punished by death" (Under-Secretary of State for War Harold Tennant, quoted in The Western Gazette, 28 January 1916). In some cases, soldiers who went absent, stayed away because of the fear of being shot (Babington 1983, p. 30; Putkowski and Sykes 2007, pp. 108-111). When recruits joined the army, they were informed that the death penalty could be inflicted upon anyone who deserted while on active service (Moore 1975, p. 50).[13]

Most British military officers from the World War I-era viewed the death penalty as essential to military discipline. Senior officers were, seemingly without exception, death penalty advocates, viewing it as their only recourse for maintaining discipline after corporal punishment, such as branding[14] and public flogging, was outlawed as inhumane in the preceding half-century (Oram 2003, p. 38). Sir Neville Macready, a former B.E.F. Adjutant-General, stated "if you abolish the death penalty you might as well abolish the army."[15] General Horace Smith-Dorrien wrote, "There is a serious prevalence of desertion to avoid duty in the trenches, ... and I am sure that the only way to stop it is to carry out some death sentences" (Oram 2003, p. 69; Babington 1983, p. 19).[16] Courts martial records also indicate many instances where military officers wrote, "the state of discipline of this unit requires an example" (Department of Foreign Affairs 2004, p. 38).[17]

Regardless of whether death sentences were used in a pro-active manner,[18] the *execution rate* appears constant around battles (Figure 3A) and uncorrelated to the severity

[13]Peacetime norms of a 2-year maximum sentence for desertion were obviated (Bowman 2006, p. 47).

[14]Soldiers were branded on their torso with a capital "D" (Oram 2003, pp. 21-26).

[15]Jahr 1998, p. 314.

[16]Australians were subject to the death penalty only for mutiny, desertion to or treacherous dealings with the enemy, but by law, could not be executed (Peaty 1999, p. 210), and had the highest absence rates.

[17]In recommending execution of a convicted deserter under his command, Brigadier General Douglas-Smith wrote, "There are still a few cases of this desertion and the full penalty is the only means by which it can be stopped" (4 Jul. 1915, trial proceedings of Private H. Burden, 1st Northumberland Fusiliers, WO 71/424, Retrieved from https://blindfoldandalone.wordpress.com/the-prosecuted/names-a-g/burden-3832-private-herbert-3832-1st-northumberland-fusiliers/).

[18]Military commanders may have used the death penalty to forestall desertions (Oram 2003, p. 38). Oram (2003) shows a time series of courts martial and casualties and suggests that death sentences peaked shortly before the start of British offensives but not German offensives (which would be less foreseeable by British commanders). Oram (2003)'s visual pattern is reproduced in Figure 5, with peaks in death sentences before British but not German offensives. However, no clear pattern emerges in Figure 1, which smooths the data differently and adds more battles. Neuve-Chapelle, Somme, and Third Ypres (i.e., Passchendaele) were British offensives; First Marne, Second Ypres, and Second Marne were German offensives; and Verdun was a major engagement between French and German troops.

of battle—Figure 6 Panel A displays casualties of German-initiated battles in red and of British-initiated battles in blue. Panel B displays all death sentences (red) and all executions (blue) and Panel C smooths the same data. If executions were being used pro-actively, we should have seen a sharp increase in executions before British-initiated offenses. Likewise, across divisions, execution rates appear constant. The Guards Division and Regular Army divisions were considered more professional, and used repeatedly in battle.[19] In Figures 2A (displaying War Diaries absences) and 2B (displaying Police Gazettes B.E.F. absences), the 12 Regular army divisions are indicated in red circles, the 14 Territorial divisions are indicated in tan circles, and the 30 New Army divisions are indicated in navy circles. The Territorial Army (which began as local part-time militia and were nicknamed "Saturday Night Soldiers") and New Army divisions were less professional.[20] As Figures 2A and 2B show, the Territorial Army and New Army divisions received fewer death sentences, but the execution rate was similar.

2.2 Desertions Many desertions were prompted by 'Dear John' letters from loved ones or news about ill children.[21] Deserters may have been optimistic and believed that they would be unlikely to be caught, or conversely, believed the battle environment to be more dangerous than it actually was. Importantly, soldiers would not know of impending offenses.[22] Infantry soldiers would typically have only 12-24 hours advance notice, even if they were in the front line or reserve trenches. Furthermore, when it came to a major offensive, they could not have anticipated anything about the scale of preparations until the artillery barrage commenced, at which point there would no doubt about what was going to happen.[23] Casualty totals were kept strictly secret (Ferguson 2008).

There was relatively little opportunity to desert on the front—a soldier would be shot immediately—moving soldiers was like squeezing toothpaste and the battle police were always close behind.[24] Barriers both prevented men from leaving the front line and collected stragglers for redistribution to their units forward (Sheffield 1996, p. 76).[25] The deserters who were shot immediately would not be in the lists of absentees collated after morning roll calls, which are more likely to include the soldiers who deserted overnight.

[19] Conversations with Putkowski and email on November 20, 2011. Divisions with good reputations received regular front-line or assault actions, while those with poor reputations were used less often or stationed in quieter sectors (Oram 2003; Department of Foreign Affairs 2004, p. 18).

[20] Both included conscripts after March 1916.

[21] The arrival of such letters should be uncorrelated with the execution decision of a previous deserter.

[22] Email from Putkowski on October 8, 2008.

[23] Email from Putkowski on October 8, 2008.

[24] Conversations with Putkowski during November 24-26, 2011.

[25] Behind the front line, the formations generally went as follows: battle police, straggler posts (separately arrayed by brigade, division, corps, and army, one behind the other), traffic control and military police patrols, and furthest from the front line, examination posts.

Battalions generally rotated 10 days in the front, 10 days in reserve, and 10 days at rest every month.[26] Because soldiers were moved at night,[27] the opportunity to desert was maximum during rotation. Though some soldiers fled during battle and were later convicted of desertion (Babington 1983), desertion can be considered relatively cool-headed in contrast with another capital crime—cowardice in the face of the enemy (Peaty 1999, p. 199).[28] The fact that desertions often took place far from the front line lead some historians to conclude that desertions cannot be deemed the result of shell shock (Peaty 1999, pp. 200, 201, 206). A soldier who went missing during battle would be categorized as a straggler (not a deserter).[29] However, to the extent that the desertions in my data do reflect shell shock, the desertions motivated by shell shock would be captured in the error term, which should be unrelated to randomness in the execution decisions. A larger error term would also make it more challenging to identify any significant effect of executions.

2.3 Apprehensions Essentially all absentees were caught and arrested within two weeks.[30] Jahr (1998, 2014) confirms this conclusion by analyzing the infantry records of seven divisions. He finds that many soldiers' absences ended after 1 or 2 weeks, but a few soldiers were not caught for at least four weeks. The prevalence of British and French military police in forward areas, and French civilians' general unwillingness to risk helping a deserter, rendered a deserter's discovery a virtual certainty.[31]

The high rate of apprehension is consistent with available statistics, which indicate that the number of absentees and deserters is close to the number of trials for absentees and deserters. The desertion rate at home and abroad was 10.26 per 1,000 men,[32] so that in an

[26] Conversations with Putkowski during November 24-26, 2011. The same 1:1:1 ratio ("4 days in the front line, then 4 days in close reserve and finally 4 at rest") is found in The Long, Long Trail (In the trenches. (n.d.). LLT. Retrieved from http://www.1914-1918.net/intrenches.htm), although this varied enormously depending on conditions (e.g., weather and availability of adequate reserve troops). Front line action can be subdivided further. Of the 120 days of front line action a year, "perhaps only 5-10 days were in intensive action [while] 60-100 days involved front-line trench activities without being in action" (The infantry battalion. (n.d.). LLT. Retrieved from http://www.1914-1918.net/whatbatt.htm).

[27] Conversations with Putkowski during November 24-26, 2011.

[28] For a list of definitions, see Graham-Harrison, ed 1907, p. 267, Retrieved from http://archive.org/stream/manualofmilitary00greauoft#page/267/mode/1up (with free login).

[29] Email with Putkowski on January 26, 2008.

[30] Email with Putkowski on January 3, 2008.

[31] Most British soldiers only had a rudimentary knowledge of French, and civilians would rarely risk knowingly helping a deserter because it was an offense for which they could be jailed or severely punished. Deserters were viewed as being, if not dangerous, a nuisance because they were compelled to live off the country, scavenging and stealing food, money, or clothing. Of those deserters who evaded detection for an extended period of time, most either enjoyed assistance from civilians or holed up in one of the larger Army bases. This latter strategy, however, was only successful at the beginning of the war when bases suffered from greater disorganization. Email with Putkowski on January 3, 2008.

[32] "Post-war statistics show that the overall desertion rate between 1914 and 1918 was 10.26 per 1,000 men - so that in an army of 1 million men, there were over 10,000 absentees ... The size of the problem was already becoming apparent by mid 1915, when instructions were issued by the War Office, drawing

army of 5.4 million serving in France and Flanders, there were roughly 55,400 deserters.[33] The estimated number of deserters may be too high, since the fog of war — stragglers, missing in action, poison gas, prisoner of war — would make it very hard to pin down the true number of deserters.[34] In addition, officers were required to report absences to the Police Gazette "as soon as it is known that a soldier has absented himself,"[35] which may further increase overcount. Historians are doubtful that officers would conceal absences: officers were certainly not going to allow anyone to accuse them of "bending" the rules because doing so would lay them open to being charged with an offense of not obeying routine orders.[36] If a deserter was captured far from his unit (e.g., by military police or an officer from another unit), a report would be sent to the commander of the division, and the resulting publicity would require the lower level commander to "acknowledge publicly his soldiers' crimes or to make an example" (Corns and Hughes-Wilson 2007, p. 89).[37] Thus if there was overcount of absences, the true number of absentees and deserters (nominally 55,400) would be closer to the number of trials (44,395) and consistent with

attention to the fact that there had been 1,251 desertions from the Expeditionary Force and over 20,000 desertions from the new army, reserve and other regular units." Corns and Hughes-Wilson 2007, p. 216. Since 146,730 members of the army were struck off as deserters from Aug 1914-March 1920 at home and abroad (https://archive.org/stream/statisticsofmili00grea#page/82/mode/2up. Free login available.), I infer that Corns and Hughes-Wilson (2007) was referring to deserters at home and abroad.

[33] This number may be higher if desertion rates were higher in France and Flanders than in the UK or other theatres of war (e.g., Mesopotamia, Egypt and Palestine, Salonika, Italy, and Gaillipoli).

[34] Defenses at trial included wandering into German trenches, being fired upon overnight and getting separated, an exploding latrine, or oversleeping in a dugout (Department of Foreign Affairs 2004).

[35] "When there is good ground for supposing an absentee to have deserted, the report should be rendered within 24 hours after the absence has been discovered, but in no case should it be delayed beyond 5 days." The King's Regulations and Orders for the Army (1914). London: His Majesty's Stationary Office, Para. 514, p. 117. After 21 days, an absentee was presumed to be a deserter and a court of inquiry called regarding "the illegal absence of a soldier." King's Regulations (1914), Para. 673, p. 149.

[36] Absence was formally noted in the company disciplinary book and would have been apparent in parades. There were circumstances when a soldier's excuse was accepted (e.g., illness) but it was up to the unit's commanding officer and the latter had to bear in mind that appearing "soft" would adversely affect his own military reputation and promotion prospects. Email with Putkowski on February 20, 2015.

[37] Apprehension may be even higher due to prosecutorial discretion. There is no direct evidence of officers actively concealing absences, though there is evidence that whenever possible, commanding officers did not report minor infractions outside their regiments (Corns and Hughes-Wilson 2007, pp. 88-90; van Emden 2010, p. 4259 of Kindle e-book). The commanding officer of a unit had wide discretion in any matter of discipline. Under Section 46 of the Army Act, the commanding officer could often deal with a case summarily by selecting a charge that was within his powers to punish (such as "Conduct to the Prejudice of Good Order and Military Discipline", Graham-Harrison, ed 1907, pp. 298-299 (Army Act Section 40), Retrieved from http://archive.org/stream/manualofmilitary00greauoft#page/298/mode/1up. A free login is necessary for viewing.), and imposing up to 28 days detention, Field Punishment, or forfeiture of pay, rather than escalating the matter to a court martial. Selective prosecution, whether due to officer whim (Sheffield 1996; Burrage 1930; Turner and Haigh 1969) or limited bandwidth around major battle, have led some to describe military discipline as "negotiable" (Rubin 2013). However, commander discretion was limited to trivial violations such as a late return back from a pass, drunken behavior, dirty rifle, or being unshaven on parade. Email with Putkowski on February 20, 2015.

deserters being invariably caught.[38] (Soldiers shot on the spot would reduce both the number of official deserters and the number of trials equally.[39])

To put this in historical perspective, only 40% of deserters during the U.S. Civil War were caught, and deserters faced a negligible risk of death if arrested (Costa and Kahn 2003). 14% of Union army soldiers deserted during the American Civil War, compared to 1% for the British Army during World War I. In addition, British Army deserters were not subject to the death penalty during World War II, and the desertion rate was high enough that the Army wanted to reintroduce the death penalty in 1942 but politically could not do so (Bond et al. 2010, p. 213).

2.4 Trials Courts martial in the field (Field General Courts Martial, henceforth FGCM) took place in private (Babington 1983, p. 13).[40] Private trials thus left the typical soldier with little news about death sentences or about deserters until an execution was promulgated, and so they would be unaware of randomization. Soldiers who deserted in the UK while their unit was based in France and Flanders would be returned to their unit and tried by FGCM.[41] Typically, these soldiers had failed to return to the front after furlough[42] or after convalescence in the UK.

The usual defense was a plea of extenuating circumstances (Graham-Harrison, ed 1907). Convicting a soldier for desertion required showing of *intent* (Corns and Hughes-Wilson 2007, pp. 44-5; Oram 2003; Department of Foreign Affairs 2004, p. 7). Intent to desert would be presumed if there was evidence to indicate intent of not returning (e.g., wearing civilian clothes or failing to report for a key deployment) or if the soldier had been

[38] Official records indicate 44,395 courts martial for absentees or deserters, of which 7,361 were for desertion and 37,074 were for absence (The War Office 1922, p. 667), which suggests that at least 80% were caught.

[39] The estimated number of deserters may be too low: some soldiers who tried to run away were driven back by officers threatening to kill them on the spot (Moore 1975, p. 66), and some actually were killed on the spot, with rumors of unjust executions circulating among soldiers (Oram 2003, p. 15).

[40] Most desertions in France and Flanders were handled by Field General Courts Martial (FGCM), which were less formal and easier to convene than a full General Court Martial (GCM). The GCM was generally reserved for officers, while the vast majority of deserters were non-officers. The FGCM was comprised of at least three officers, the president holding the rank of major or above. The court could only pass a death sentence if all members agreed (Department of Foreign Affairs 2004, p. 7). Prosecution was handled by the accused soldier's adjutant and defense handled by a junior regimental officer.

[41] There was also the District Court Martial (DCM), which handled UK desertions and absence without leave for (a) draft dodgers after conscription began and (b) those who deserted while their unit was based in the UK. Including these, the total number of soldiers and officers tried for desertion or absence at home or abroad was 126,818 from August 4, 1914 to March 31, 1920 (The War Office 1922, pp. 83-89). The 31,390 desertion and 51,249 absence DCM trials are *not* my subject. The DCM could only impose a maximum sentence of two years of imprisonment. Historical discussions of sentences for desertion often do not distinguish between DCM and FGCM, and make ambiguous statements, e.g., 46% of desertion trials in July 1915 resulted in sentences of less than three months (Corns and Hughes-Wilson 2007, p. 216). Citations to War Office statistics may not distinguish between DCM and FGCM trials.

[42] Officers had 3-4 furloughs a year; elite soldiers could get 10 days/year. All soldiers eventually received a furlough with 1 year's service, but leave would be cancelled if there was a military engagement.

absent for 21 days.[43] However, "in any case of doubt as to whether [desertion or absence without leave] has been committed, the court should find the accused guilty of the less[er] offense."[44] The offense of absence did not typically receive the death penalty.

Historians were previously unsure whether soldiers convicted for desertion were invariably sentenced to death in FGCM trials.[45] Only Jahr (1998)'s statistical analysis of 7 divisions (analyzing the same data source that I digitized) found that all FGCM trials for desertion resulted in conviction, but not every trial resulted in a death sentence.[46] My analysis of all 144,609 FGCM trials, of which, 13,309 are for desertion, is consistent with Jahr—all but 3% of soldiers tried for desertion were convicted, but a small fraction (13%) received the death sentence.[47] If the true conviction rate is somewhere near 100%, then the official statistics of 7,361 desertion trials and 2,004 desertion death sentences, suggests a death sentencing rate near 27%. (Since FGCM trial registrars were handwritten and hand-entered, my FGCM numbers may not match the official statistics.)

Regardless of the reason for issuing a death sentence, what is important for causal identification is whether executions, *conditional* on death sentences, are quasi-random. To put it another way, commutations serve as a control for factors associated with a death sentence when I examine the impact of executions.

Neither soldiers at the time nor British military historians knew about the low rate of death sentences for convicted deserters. I found only three pieces of the historical record that are relevant and they have ambiguous interpretation. First, on a deserter's charge sheet, an officer recommends the death sentence because the soldier had absented himself shortly after another soldier's conviction and lesser sentence was promulgated: "I am firmly of the opinion that the crime was deliberately committed with the intention of avoiding duty on the Redan, more particularly as he absented himself shortly after the case of another soldier had been promulgated for a similar crime. The Officer commanding the man's Company is of the same opinion. Sentence was remitted in the case mentioned to 2 years Hard Labour" (WO 71/450.). However, a conventional reading of the evidence would suggest that what was promulgated was a conviction for *absence* (as opposed to desertion) that resulted in a 2 years hard labor sentence.[48] In a second record, a First Di-

[43]Someone missing for 21 days was presumed to be a deserter (Putkowski and Sykes 2007, pp. 13-14; King's Regulations and Orders for the Army, 1914, Para. 673, p. 149, Para. 514, p. 117).

[44]Retrieved from http://archive.org/stream/manualofmilitary00greauoft#page/19/mode/1up. Graham-Harrison, ed 1907 III.20, p. 19. A free login is necessary for viewing.

[45]Email with Putkowski on February 20, 2015 stating the difficulty in knowing what happened to convicted deserters who were not sentenced to death as no one knows and it is otherwise speculation.

[46]By the end of 1917, sentences of over 5 years of imprisonment constituted an increasing share, while death sentences constitute a decreasing share of sentences for desertion.

[47]449 (3%) of desertion trials resulted in "not guilty" and 1720 (13%) resulted in a death sentence.

[48]Crimes of absence and desertion are described separately in the General Rou-

vision brigadier wrote: "Every infantry officer of experience will confirm my opinion that there comes a point when men will risk imprisonment or penal servitude rather than carry on their ordinary duty. They know that long sentences inflicted in war are whittled down as they pass up the military hierarchy and that if a sentence is not ended before the end of the war they may look forward to an amnesty at the end of hostilities" (Babington 1983, pp. 18-19). This quotation does not speak to the question of whether soldiers knew that *death sentences* would be whittled down as they passed up the military hierarchy (and therefore the existence of lesser sentences for desertions). Moreover, this writing occurred before the Suspension of Sentences Act (March 1915) that ensured any *imprisonment* or *penal servitude*, the topic of the quotation, would be served after the war. As for acquittals, they were not published in the general routine orders, nor were they promulgated on parade (Committee to Enquire into the Law and Rules of Procedure Regulating Military Courts-Martial/Chairman Lord Darling 1919, para. 87). Returns would not be formally announced. A third source is relevant to whether the low rate of death sentences for convicted deserters was public knowledge: "In a trial of a member of His Majesty's Forces, in which a conviction results, the result is always made public by means of the promulgation of the finding and sentence."[49] However, military regulations stated that informing the offender and no one else of the charge, finding, sentence, and confirmation will be sufficient promulgation to satisfy this rule (Army Act s. 53, note). Moreover, it is unlikely that the 130,936 FGCM convictions were circulated to the entire army—over 90 convictions a day would be unlikely to be remembered if circulated across the entire B.E.F.[50] Widely circulating a large number of convictions that did not lead to death sentences would be inconsistent with repeated admonishments that "it should be remembered that on active service the usual penalty is death" for leaving post, cowardice, sleeping on post, and violence to inhabitants among other offenses (GRO signed by Smith-Dorrien, Commander of 2nd Army B.E.F. France and Flanders, February 11, 1915 WO 95/646).[51]

tine Orders (GRO)—a sample of which is available at archive.org, e.g., https://archive.org/details/21stInfantryBattalionPartIiOrders1915-1919 and Appendix Figure 12C. Appendix Figures 12D and 12E display the relative frequency of these words.

[49] Undersecretary of State for War Military Harold Tennant, Hansard HC Deb. vol. 82 col. 2911, 1 June 1916. Retrieved from http://hansard.millbanksystems.com/commons/1916/jun/01/courts-martial-1.

[50] My and Jahr (1998)'s findings of the low rate of death sentences for convicted deserters appear not to have been publicly known, suggesting little attention was paid to these convictions even if circulated.

[51] Unit orders disseminated disciplinary information from higher to lower formations and divided into Part 1 and Part 2. Part 1 Orders addressed training, parades, tasks, duties, movements, attacks, and warnings about behavior. These were announced on parade and posted on notice boards. Part 2 Orders recorded everything affecting individual soldiers' status, pay, fines, punishments, promotion, and posting to other formations. These were circulated to the paymaster and officer in charge of records. A sample of the Part 2 Orders has been transcribed, but most Part 2 Orders were destroyed in WW2 bombings. A few samples are available for the Canadian Expeditionary Force, 21st Infantry Battalion:

I have not come across any primary or secondary source mentioning public knowledge of low rate of death sentences for convicted deserters, which would have been incredibly demoralizing if widely known.[52] Therefore, soldiers had no way to know that executions were random and had no doubt about executions of deserters.

2.5 Affirm or Commute? After a death sentence was issued, each of that soldier's commanding officers (in the battalion, brigade, division, corps, and army) had to submit his opinion to confirm or commute based on three factors: 1) a soldier's fighting character and general behavior, 2) discipline within his unit, and 3) whether the crime had been intentional. Once the paperwork was complete, the Commander-in-Chief made the ultimate decision, which some historians characterize as a "pitiless lottery" (Babington 1983).[53]

The leading alternative hypothesis, that the Irish were disproportionately targeted and executed, does not hold up, *conditional* on the death sentence. In my data, 19% of death sentences and 17% of executions were of Irish soldiers.[54] Likewise, divisions that had more Irish were not disproportionately targeted.[55] The data further reject speculations that soldiers who previously had a (suspended) death sentence were more likely to be executed, or that officers received special treatment.[56] One newspaper article alleges "frontline eu-

https://archive.org/details/21stInfantryBattalionPartIiOrders1915-1919 (free login). The sample shows a long daily list of soldiers across many pages (Appendix Figure 12B). A word search for "deserter" yields several men "struck off" the rolls after a court of inquiry and a search for "desertion" yields courts martial sentences and men put back on the rolls as returned "from desertion". In contrast, Part 1 Orders are often under a page and a subset marked as "published for information" (Appendix Figure 12A). Part 2 Orders were unlikely to be read on parade. Email from Putkowski on May 28, 2015. Unit orders meant to be confidential were not allowed to be distributed (The War Office 1914a, p. 58), which is consistent with returns not being formally announced. See also The War Office 1914b, p. 33, https://archive.org/stream/pt1fieldservicer00greauoft#page/32/mode/2up.

[52] Email from Geoff Bridger on October 24, 2015.

[53] Identical extenuating circumstances were accepted or rejected (Department of Foreign Affairs 2004, p. 3). Over 2 death sentences per day precluded careful consideration by Commanders-in-Chief (Oram 2003, p. 55). Each dossier had a one-page summary, outlining the offense, character, fighting qualities, disciplinary record, unit performance, and lower-level officers' opinions on whether to execute. Officers at the corps and army level could seal a man's fate, while lower-level officer recommendations (division and below), whose career concerns disincentivized reporting indiscipline, were basically ignored (Oram 2003, p.129; Babington 1983, pp. 78-79, 103). In most cases the court martial, in passing a sentence of death also recommended mercy (Oram 2003, p. 127). The Commander-in-Chief's disregard of clemency recommendations (Babington 1983, pp. 78-79) contributes to the retrospective view of executions as a pitiless lottery. No official commutation goals appear to have existed—no written statements and insufficient evidence of coordination of commutation fractions across all theatres or time.

[54] Overcount of Irish via surname dictionaries applies to both death sentences and executions.

[55] In Figures 2A and 2B, the green proportion of vertical tick marks for each division represents the Irish proportion of soldiers. Irish-heavy divisions do not appear to deviate from the 12% line.

[56] 92% of commutations and 95% of executions are of first-time death sentences. Some suggest class bias (Oram 2003; Department of Foreign Affairs 2004). Officers, who typically came from the elite (Department of Foreign Affairs 2004, p. 12), constitute 4.4% of death sentences and 7% of executions. Other observers claim the opposite bias: Commander-in-Chief Douglas Haig ordered more officers be executed (Burke 2001, Retrieved from http://theguardian.com/uk/2001/feb/11/jasonburke.theobserver),

genics" to explain a spike in death sentences of men from the 35th Division, because it was composed of unusually short men (Burke 2001). However, Figure 11 shows that while there was a spike in death sentences in the 35th Division, there was no spike in the execution rate. I present a full set of statistical tests in Section 5.[57]

Collective confirmations may have been decided jointly and be non-random. Commanders did appear to execute soldiers in pairs, for example, in the cases of two friends deserting together (see Putkowski and Sykes 2007, p. 64). In the data, all executed soldiers whose trials were held on the same day and came from the same division were also from the same battalion, and with one exception, they were also executed on the same day.[58] Chi-square tests also reject the independence of decisions in the rare instances of British and Irish soldiers being sentenced to death on the same day and in the same division. Therefore, based on the assessment of the history and the data, I treat multiple observations of executions on the same day in the same division as one execution when I assess serial correlation in execution decisions, and do the same with commutations.

2.6 Commutations Soldiers convicted of desertion were typically detained, awaiting final sentence (Babington 1983).[59] The final decision occurred within two weeks. Commuted sentences were suspended and served after the war, and the soldier sent back immediately to the trenches.[60] Military authorities were always very anxious to ensure that either a spell in jail or detention was not viewed by soldiers as a way of avoiding front line service. I do not have the date of commutation in the court martial registers. I therefore impute commutation dates in three ways: 14 days from trial, the nearest-execution's length of time between death sentence and execution date, or trial dates only.[61]

Commuted sentences basically slipped into the night.[62] Men were not told immediately

but conditional on death sentence, officers were not significantly more likely to be executed.

[57] Even strict randomness is not necessary, if the reasons to execute are uncorrelated with desertion.

[58] In 70% of the cases of commuted soldiers from the same division and whose trials were on the same day, the soldiers came from the same battalion. Chi-square tests with simulated p-values reject the hypothesis of independent decisions regarding death sentences on the same date and division.

[59] Major Christopher Lowther (Assistant Provost Marshall 1917-1919, Member of Parliament for North Cumberland 1918-1922), Hansard HC Deb. vol. 127, pp. 1603-4, 13 April 1920. Retrieved from http://hansard.millbanksystems.com/commons/1920/apr/13/new-clause-death-sentences-appeal#column_1603. In some cases, they were immediately thrown back into the trenches (Oram 2003) with the information that the sentence was being reviewed.

[60] Through good conduct, soldiers with sentences to be served after the war could reduce or completely eliminate their sentence. Undersecretary of State for War Military Harold Tennant, Hansard HC Deb. vol. 70, pp. 1212-3, 8 March 1915 (available at http://hansard.millbanksystems.com/commons/1915/mar/08/army-suspension-of-sentences-bill).

[61] Commuted sentences could be hard labor, penal servitude, imprisonment, being tied to a fixed object for several hours per day ("crucifixion"), or rank reduction; sometimes they were "quashed" (vacated). The soldier would be returned by military police or soldiers picking up reinforcements. Email from Putkowski on November 20, 2011. Since commutations were not known, I do not use this data.

[62] Email on December 24, 2007 from Gerard Oram.

what was their sentence – just that they had been guilty. This is supposedly because the sentence only became legal when it was confirmed by the Commander-in-Chief. The judges serving on a court martial had to swear "not to divulge the sentence of the court until it is duly confirmed."[63] A commutation is not an acquittal. According to the Army Act, s. 54(3)[64], acquittals were to be read out in open court. However, if he was convicted, a soldier would not know the nature of the conviction (e.g., on the charge of desertion, whether he was convicted for desertion or for the lesser offense of absence without leave) or sentence until the night before they were promulgated (Babington 1983, pp. 15, 17).

Officers would likely not have wanted to publicize commutations for fear of subsequent indiscipline in their unit and career concerns of perceived indiscipline.[65] Official statistics on death sentences, commutations, and executions were not made public until April 1920 (Corns and Hughes-Wilson 2007, p. 407).[66] Compared to the plentiful primary sources in diaries, letters, and memoirs indicating that executions were known, there is scarce evidence that commutations were known. The two exceptions to the rule are first-hand accounts from the Western Front of announcements of commutations of death sentences (Carrington 1965, p. 128; Arthur 2002, p. 173). Historians are doubtful regarding these accounts.[67] The first memoir is not correct in the recollection of crimes and dates.[68] The second account is written in a first-hand perspective but without primary source or interview.[69] A second-hand source attests that a convicted soldier would know about their death sentence before the execution or commutation decision: he would receive a secret envelope with the death sentence along with the information that the sentence was liable to revision by higher authority.[70] This would likely have only occurred after April 17, 1918

[63]Graham-Harrison, ed 1907, pp. 318-9, Retrieved from http://archive.org/stream/manualofmilitary00greauoft#page/319/mode/1up. A free login is necessary for viewing.

[64]Graham-Harrison, ed 1907, p. 322, Retrieved from http://archive.org/stream/manualofmilitary00greauoft#page/322/mode/1up. A free login is necessary for viewing.

[65]If soldiers knew about their own commutation, they would not want others to know. Known deserters would face social censure or worse. A Regimental Medical Officer wrote: "To gratify a mawkish humanitarianism two or three score mean fellows are encouraged to slip away every time there is risk to their skins, so more and more average men learn to shirk with impunity; attacks fail, and losses run into untold thousands, because the most dutiful of our men are not backed up" (Dunn 1987, p. 410).

[66]The Darling Report in Nov. 1919 revealed 89% of death sentences were commuted but not the numbers.

[67]Email from Putkowski on July 10, 2013.

[68]Carrington reports 3 deserters sentenced to death whose penalties were commuted to 3 months field punishment. But in Carrington's unit, 3 death sentences were given out on June 11, 1916, all for Quitting–not deserting–and all commuted to 2 years hard labor. Three death sentences in other battalions in his regiment were commuted to 3 months field punishment, but the death penalties were handed down on February 7, 1915, before Carrington's unit arrived in France on March 22, 1915.

[69]Arthur's account is more literary rather than historical. Email from Putkowski on July 10, 2013.

[70]Christopher Lowther (Assistant Provost Marshall 1917-1919, Member of Parliament for North Cumberland 1918-1922), Hansard HC Deb. vol. 127, pp. 1603-4, 13 April 1920.

when the Under Secretary for War, Macpherson, announced that those sentenced to death would be informed of the sentence prior to confirmation, rather than after confirmation, as had been the previous policy (Peaty 1999, pp. 208-209).

I have not found any general routine order that mentioned a commutation—or a lesser sentence—for a convicted deserter in primary or secondary sources. Despite the potential for commuted death sentences to be widely known for cases other than desertion,[71] there is nothing written of public outrage over commuted death sentences. Executions were likely the only news about death sentences transmitted to the typical soldier. The fact that there are no dates of commutations preserved in news circulars provides further evidence consistent with there being no public announcement of commutations of death sentences, and that commuted sentences basically did slip into the night, with little awareness of randomization.[72] In addition, some soldiers did not believe executions took place at all (Johnson 2015, p. 110), so their beliefs would be updated from a null prior.

2.7 Executions Executions typically occurred within a few days after a confirmation and the morning after the decision reached the soldier, within two weeks of the original death sentence.[73] After confirmation of a death sentence, there would be a special parade of the condemned man's unit on the evening before the soldier's execution, during which officers from the unit read extracts from the evidence at his trial, the findings and sentence of the court, and the order of confirmation by the Commander-in-Chief. Promulgation was to take place in front of as many men as could be made available (Babington 1983). Often, promulgation involved the entire battalion, sometimes other battalions in the brigade, but probably not the entire division, whose encampment could stretch for 15 miles.

Executions were usually carried out by a squad from the victim's battalion,[74] often witnessed by the entire battalion or whatever companies were at hand.[75] Hearsay, rumor, and newspapers (Sellers 2003) spread the word, once the shocked members of a firing

[71]Some GRO mention commuted death sentences for other crimes. However, GRO would be circulated in writing only to officers (usually a Captain) and unlikely to be passed to troops. A subset would be announced on parade, usually three per day, and written orders posted outside company headquarters or guardroom. Email from Putkowski on May 27, 2015. Execution threats were repeated: "for the following offences, it should be remembered that on active service the usual penalty is death" even when commutations were mentioned (GRO signed by Smith-Dorrien, Commander of 2nd Army B.E.F. France and Flanders, February 11, 1915 WO 95/646; Routine Orders signed by Major General H.F.M. Wilson, Commander of 4th Division, B.E.F. France & Flanders, March 23, 1915 WO 95/1449).

[72]The government kept death sentences quiet, and records were not public for 75 years. There are only soldiers' speculations that soldiers who would otherwise have been executed were instead compelled to take part in the forefront of the first available raid or assault on the enemy.

[73]Email from Putkowski on February 4, 2008.

[74]If the soldier did not die in the initial volley, an officer was on hand with a pistol to provide the coup de grâce (Department of Foreign Affairs 2004, p. 8).

[75]Email from Putkowski on December 24, 2007.

squad shared their feelings with comrades (Corns and Hughes-Wilson 2007). The number of references to executions in diaries, letters and memoirs is testament to their impact.[76]

By mid-1916, public spectacles like this declined for a number of reasons and, in some Army areas (e.g., the Ypres Salient and the Somme), a prison or detention center was used for the execution of men from many units, and the firing squads were not always composed of men from their own battalions.[77] While this presumably weakens any treatment effects, the condemned soldier's fellow soldiers would learn about the execution, even if they did not personally witness it. News about all executions was also formally circulated via Part 2 of Army Orders, so that the name, unit, offense, nature, time, and date of punishment was circulated throughout the theatre of operations. The details were read aloud on parade and were pinned up on notice boards (Sellers 2003). To the extent that soldiers paid attention to executions elsewhere, this would also tend to weaken the treatment effect since the treatment and control groups become more similar. By 1918, those executed were unlikely to have involved more than those immediately at hand for the killing or supervising the ritual.[78] Accordingly, the analyses that examine the day-by-day response to executions end the timeframe in January 1918.

Infrequency of executions likely made them more salient. My data indicate that a typical Regular infantry, New Army, and Territorial Force division saw 2.5, 1.25, and 0.5 executions per year, respectively. Only a small handful of soldiers were involved in the execution or eyewitness to the body.[79] Despite or because of the small number of executions actually observed by the typical soldier, an officer was quoted as saying, "it was only fear of death that kept them at their posts" (Moore 1975, p. 62).

As a point of comparison, an estimated 2,000 French soldiers were condemned to death and 35% executed. The French army required their divisions to march past the dead body.[80] 30,000 to 40,000 French soldiers in two-thirds of the divisions were involved in mutinies (Englander 1998, pp.192, 196-197; Beckett 2007, pp. 306-307). I next turn to the

[76]For many soldiers, the experience of witnessing an execution and the fear generated by the rumors circulating in the trenches were a profound part of the wartime experience (Oram 2003). One soldier wrote about shooting his comrades, "It's the only thing I look back on in my military career with shame." A witness to another execution wrote, "I witnessed a shooting. ... It shook me a bit" (Sellers 2003). Another wrote, "The discipline out here is very severe. Men found absent or drunk or found out of bounds are tried by Court Martial and several men have been shot for straying away from camp. One was shot this morning" (Adamson 1997). "The Corporal was shot in Happy Valley. For discipline's sake his whole Battalion was paraded to witness the proceeding. Other Battalions of the Brigade were close by. The Battalion was called to attention, and the firing party were ordered to fire" (Dalton 1986). Sometimes eyewitnesses felt sorry for the firing squad, likely not what the army intended.

[77]Email from Putkowski on December 24, 2007.

[78]Email from Putkowski on September 23, 2015.

[79]I cannot distinguish effects on firing squad, eyewitnesses, and those who heard about executions.

[80]Email from Putkowski on November 4, 2012.

question of whether observing executions could deter *or* spur desertions.

2.8 Duty, Shame, and Honor Soldiers' motivations differed. Patriotism drew some while monetary considerations like unemployment drove others (Beckett and Simpson, eds 1985). Annual pay for soldiers was twice the pay of agricultural laborers, at least circa 1886 (Karsten 1983). At the war's onset, pamphlets and posters used social pressure to increase enlistment. Women's groups encouraged their members to give white feathers (the sign of the coward) to men who appeared to be of military age to shame them into service (Gullace 1997). Recruitment posters also emphasized duty.[81] Duty, shame, honor were relevant even after conscription commenced in March 1916, as over 50% of conscripts successfully filed for exemption (The War Office 1922).

The Irish were less likely to be motivated by duty, shame, and honor.[82] An 1898 letter from an Irish recruit said, "'if her [Victoria] or her leaders ever turns with cruelty on the Irish race, I will be the first that will raise my sword to fight against her,' and in this regard he was sure that he would have 'plenty of Irishmen at my side, for they are known to be the bravest race in the world."' (Karsten 1983). During World War I, British commanding officers made explicit references to the Irish race as inferior and degenerate (Oram 1998, 2003, pp. 9-10) and Irish soldiers, in turn, perceived contempt and disregard from the British officers (Jahr 1998) and harsh treatment by the High Command for executing so many Irish (Walker 2007, pp. 63-64). Of the 206,000 Irishmen who served in the British forces (Campbell 2005; Jeffery 2000, pp. 6-7), one out of every 600 received a death sentence (Department of Foreign Affairs 2004, p. 12),[83] whereas of the 5.2 million British who served (The War Office 1922), one out of every 2000 received a death sentence. This disproportionate sentencing (which could reflect discrimination or different rates of indiscipline), in conjunction with separatist events back home, such as the Easter Rising of 1916 that left 450 dead and 2,614 wounded in Dublin (Foy and Barton 2001, pp. 210-

[81] Examples of Parliamentary Recruiting Committee posters: http://www.iwm.org.uk/collections/item/object/14592 and http://www.iwm.org.uk/collections/item/object/28450.

[82] From August 1914-December 1915, 7.8% of Irish men, 24.2% of English and Welsh, and 26.9% of Scots aged 15-49 enlisted. After January 1916 to the end of the war, an additional 3.8% of Irish, 22.1% of English and Welsih, and 14.6% of Scots aged 15-49 enlisted (Public Record Office 1920). Irish numbers are lower partly due to politics. Although recruiting in Ireland had "almost ceased" by mid-1916, conscription in Ireland, deemed as "politically unacceptable", was never introduced (Perry 1994, p. 81).

[83] "Death sentences can be grouped into countries by reference to the *regiment* (emphasis added) in which each soldier was serving, thus enabling a comparison with the numbers recruited." p. 10. The report relies on Oram (1998), p. 59: 134,202 men were recruited from Ireland and 239 men in Irish regiments were sentenced to death. If regiment proxies for nationality, then 1 in 561.5 Irish were sentenced to death. Oram uses regiment to proxy for ethnicity since, of the 125 executed soldiers' parent's addresses in the Imperial War Graves Commission database, 95 are within the traditional recruitment area of the executed man's regiment. He concludes that regiment proxies for origin in at least 76% of the cases. Perry (1994), p. 69, identified the nationalities of all Irish regiment fatalities and reports 30% were born outside Ireland. Appendix D analyzes all fatalities using Google Maps.

211),[84] suggests that the Irish felt less of a duty to fight.[85] Even before the Easter Rising, U.S. newspapers noted cases of Irish officers deserting to fight for the German forces.[86] Germany also attempted to supply arms to Irish nationalists for the Easter Rising.[87]

Irish identity was retained throughout service. Customs such as the wearing of shamrock sprigs on St. Patrick's Day were distinctive features of the Irish regiments, and sources of their pride and espirit de corps (Karsten 1983). Identity considerations likely increased the cost of following the law for the Irish soldiers who traded off the duty to fight with the material consequences for desertion. If punishment is perceived as unfair, then it can reduce the legitimacy of authority and the "ought" justification for following the law. The most extreme sanction available to authority was the death penalty. Since the death penalty was such a visible and extreme form of punishment, we might expect more executions to lead to a decrease in perceived legitimacy of the authority and consequently more Irish desertion. While the Irish were only 3.9% of UK soldiers in France and Flanders, they received 13.2% of death sentences according to official statistics (see Campbell 2005; Jeffery 2000, pp. 6-7; Oram 1998, p. 59). Using surname dictionaries, I identify Irish soldiers among 21% of the desertions, 20% of the FGCM desertion and absentee trials, 19% of the death sentences, and 17% of the executions. Even if surname dictionaries yield an over-estimate of the Irish proportion by 50%, adjusting for this would indicate that the Irish deserted at 3.5 times the rate of the non-Irish (4% of soldiers but 14% of deserters).[88]

2.9 Battle Conditions and Mortality While casualty rates were high, they were not as high (on average) as the probability of death conditional on desertion. Deserters were absent from the trenches for 4 weeks (2 weeks in hiding plus 2 weeks in detention). Of the 7,361 trials for desertion, 2,007 resulted in a death sentence, and of these, only

[84] Some attribute a drop in Irish recruitment to the Easter Rising, though a substantial drop began even before the Rising as noted in government reports (Cmd 8168 1916; House of Commons HMSO; Report on Recruiting in Ireland 1914-16, Cmd. 8168, vol. 39). The drop in recruitment led to the disbandment of 48% of Irish battalions and the remaining Irish battalions becoming comprised of only 56% Irish by the end of the war (Perry 1994, p. 69) as commanders began refilling divisions with people from any geographic background after the devastation of the Somme in order to prevent villages losing an entire cohort in a single battle (Fitzpatrick 1996). This also renders Irish regiment a poor analysis unit.

[85] This may still be true even after conscription began in March 1916 (Easter Rising being in April).

[86] Chi. Daily Trib., Mar. 20, 1916; Appendix Figure 2.

[87] News of the Rising took several weeks to reach the front. Some Irish suffered increased hostility (Leonard 1996) and Parliament became more reluctant to see Irish battalions being bailed out after the Rising (Perry 1994, pp. 70, 81). But the Rising did not weaken Irish morale (Denman 1992); loyalty to regiment and comrades insulated them from changing attitudes at home (Perry 1994, p. 89). When Germans opposite the Munsters held up signs indicating that Dubliners were being shot by "British" troops, the Munsters sang "God Save the King" (Karsten 1983). Appendix Figures 10A-10C shows no discontinuity on Irish desertion at April 29, 1916, the date the Easter Rising ended, using local polynomials.

[88] Appendix D analyzing birthplace also reaches the conclusion that Irish soldiers were less inclined to fight. Previous historiography on Irish outcomes has not been conducted at the individual level.

12% were confirmed, so on net, a soldier had a 3.3% chance of dying because he deserted during this month. The other 96.7% of the time, a deserter would be sent back to the trenches and face the same continuation probability of death.

Using the number 552,471 for British deaths in France and Flanders and assuming a constant 11,500 soldiers dying per month, then a soldier had a 0.5%[89] chance of dying in any given month. Soldiers may also desert to avoid debilitating injury. I work backwards from aggregate statistics to calculate the monthly debilitation rate. The peak strength of the British Army in France and Flanders was 2 million, and 5.4 million saw some service in this theatre. Assuming 2 million served each year and a constant replacement of soldiers, then the typical soldier's length of service was 1.5 years. If the probabilities of debilitating injury or death in any given month are independent across months, and 50% of soldiers are out of commission by 18 months, then a soldier had a 4% chance[90] of leaving in any given month. Then we can allocate 3.5% chance of debilitating injury in any month.

In total, 12% of soldiers were killed serving on the Western Front, while an additional 37.6% were wounded (Urlanis 2003; The War Office 1922, p. 246).[91] Considering that for every front-line infantryman there were about three soldiers in support (artillery, supply, medical, etc.), then almost all fighting soldiers sustained some form of injury: If we assume that fighting soldiers, rather than support soldiers, constitute all of the casualties then, we may estimate that a soldier continuously in active and fighting mode faced a 48%[92] chance of being killed over his entire length of service and a nearly 100% chance of being injured.[93] But, *on the margin*, during the month of absence, a soldier would avoid 0.5% chance of death (on average) and face 3.3% chance of execution.

To be sure, the chance of dying was maximum at the front, so if my calculations of the casualty rate are conservative at the moment of desertion, the low overall rate of desertion (1%) is perhaps all the more surprising since the local probabilities might appear to favor desertion in every case. This in turn might suggest that duty or legitimacy played a more important role than material considerations (Beckett and Simpson, eds 1985). The degree of discipline and duty is suggested by a soldier's recollection of a man with a wound in the head asking for permission before falling out of line (Lt. Colonel John Lucy 1938).

[89] 11,500 divided by 2 million = 0.5%.

[90] To see this, (1-0.04)^18 = 50%.

[91] Disease was World War I's greatest killer. Medical services were primitive and there were no antibiotics. Poor sanitary conditions in the trenches led to dysentery, typhus, and cholera. In comparison, only 5% of soldiers were killed during the Second Boer War and 4.5% during World War II.

[92] One fighting solder with three supporting soldiers yields 4 x 12% = 48% probability of death.

[93] 4 x 37.6% > 100%. Many soldiers received more than one injury during the course of their service.

3 An Economic Theory of Legitimacy

3.1 Model A soldier makes the decision to fight ($f = 1$) or desert ($f = 0$). Assume that a soldier weighs the benefits of desertion, B (avoiding 1 month in the trenches, etc.), and the costs of desertion, broken down into: 1) Economic costs, C, including the probability of being executed, p; 2) Psychological costs, v_i, from not meeting one's duty ($i = I$ for Irish; B for British); and 3) Social costs, Δ_i, the inference that others make about the soldier's loyalty conditional on his action: $\Delta_i \equiv E(v_i \mid 1, i) - E(v_i \mid 0, i)$.[94] Agents put a positive weight μ on Δ_i. B and p are the same for both groups.[95]

Following Bénabou and Tirole (2012), I assume an inverted-U shaped distribution of loyalties v_i with cumulative distribution function G and density g. v_i is assumed to be always positive because of strong group loyalty developed in army units. I introduce a taste-shifter, θ_i, the perceived public good of fighting for the British crown ($\theta_I < \theta_B$).[96]

The soldier makes the decision to fight by maximizing: $U(f, i) = (v_i + \theta_i)f + (B - C(p))(1 - f) + \mu E(v_i \mid f, i)$. Then if $f = 1 : U(1, i) = v_i + \theta_i + \mu E(v_i \mid 1, i)$ and if $f = 0 : U(0, i) = B - C(p) + \mu E(v_i \mid 0, i)$. Normalize the benefits to deserting as $c = B - C(p)$, so: if $f = 1 : U(1) = v_i + \theta_i - c + \mu E(v_i \mid 1, i)$ and if $f = 0 : U(0) = \mu E(v_i \mid 0, i)$.

This expression provides a cutoff rule, since if a soldier chooses to fight $f = 1$ at some v_i, then he would also choose $f = 1$ at any $v > v_i$, holding others' actions fixed in equilibrium. This is because social and economic motivations are fixed, while the psychological motivation increases. The cutoff rule for ethnicity i will satisfy: $v^{*,i} + \theta_i - c + \mu E(v_i \mid 1, i) = \mu E(v_i \mid 0, i)$. Thus, social costs are: $\Delta(v^{*,i}) = E(v_i \mid v_i > v^{*,i}) - E(v_i \mid v_i < v^{*,i}) = \frac{\int_{v^{*,i}}^{\infty} v_i g(v_i) dv_i}{1 - G(v^*)} - \frac{\int_{-\infty}^{v^{*,i}} v_i g(v_i) dv_i}{G(v^*)}$. A fixed point solves the equation: $v^{*,i} + \theta_i - c + \mu\Delta(v^{*,i}) = 0$. A sufficient condition for a fixed point is if $1 + \mu\Delta'(v^{*,i}) > 0$. If $\Delta(v^{*,i})$ is increasing, then any tendency that increases the number of deserters (shifting the cutoff $v^{*,i}$ rightwards) faces the counterveiling force that raises the social esteem of fighting. The more that soldiers perceive others to be deserting, the greater honor there is to being a fighter.

[94] Δ_i is analogous to esteem (Ellingsen and Johannesson 2008) and can include self-image (Bénabou and Tirole 2011; Chen et al. 2014c; 2015b; 2016), if soldiers believed fog-of-war prevented identification.

[95] Casualty rates and the probability of execution conditional on absence were the same. The number of Irish deaths was 27,405, so their 13.3% casualty rate out of 206,000 enlisted is similar to the overall casualty rate of 12%. The Irish Divisions (the 10th, 16th and 36th) were not disproportionately targeted for harsh assignments. I cannot rule out the possibility that the Irish were assigned to harsher locations and better fighters. Also, soldiers with Irish surnames constituted 21% of the desertions and 17% of the executions. In any case, B and p only affect the cutoff rule, which is already allowed to be group-specific.

[96] Over 50% of conscripts successfully filed for exemption (The War Office 1922). Appendix Figure 11A shows no impact of conscription on the British share of UK deserters (e.g., during training). Instead, Appendix Figure 11B shows a marked reduction in the Irish share of UK deserters after the Easter Rising. I suspect the Easter Rising reduced Irish enlistment, so fewer would desert during training (perhaps to prove their loyalty). Home rule was suspended for Ireland in 1914. Irish served often for economic reasons; only a small fraction to demonstrate their loyalty to the British crown (Myers 2013).

If $\Delta\left(v^{*,i}\right)$ is decreasing, then desertion has strategic complementarities. The more that soldiers perceive others to be deserting, the more normalized it becomes, and the more likely he will desert as well. Since executions affect c, which affects the cutoff $v^{*,i}$, there is a social multiplier: $\left|\frac{\partial v^{*,i}}{\partial c}\right| = \frac{1}{1+\mu\Delta'(v^{*,i})}$.[97]

A soldier's response to an execution depends on three expressions: $\frac{g\left(v^{*,i}\right)}{G(v^{*,i})}\left|\frac{\partial v^{*,i}}{\partial c}\right|$, $\frac{g\left(v^{*,i}\right)}{G(v^{*,i})}\left|\frac{\partial v^{*,i}}{\partial \theta_i}\right|$, and $\frac{g\left(v^{*,i}\right)}{G(v^{*,i})}\left|\frac{\partial v^{*,i}}{\partial \mu}\right|$. These can be written as $\frac{g\left(v^{*,i}\right)}{G(v^{*,i})}\left|\frac{\partial v^{*,i}}{\partial c}\right| = \frac{g\left(v^{*,i}\right)}{G(v^{*,i})}\frac{1}{1+\mu\Delta'(v^{*,i})}$, $\frac{g\left(v^{*,i}\right)}{G(v^{*,i})}\left|\frac{\partial v^{*,i}}{\partial \theta_i}\right| = \frac{g\left(v^{*,i}\right)}{G(v^{*,i})}\frac{1}{1+\mu\Delta'(v^{*,i})}$, and $\frac{g\left(v^{*,i}\right)}{G(v^{*,i})}\left|\frac{\partial v^{*,i}}{\partial \mu}\right| = \frac{g\left(v^{*,i}\right)}{G(v^{*,i})}\frac{\Delta\left(v^{*,i}\right)}{1+\mu\Delta'(v^{*,i})}$. I assume μ is constant in what follows,[98] but my data cannot rule in or out direct shifts in preference parameters.[99]

3.2 Deter or Spur? In the absence of social and psychological considerations, an exogenous increase in p yields fewer desertions.

FACT 1 *If $\mu = 0$—the decision is only based on $C(p)$, then executions can only affect c, and increases in p yield fewer desertions.*

Suppose social and psychological considerations are present, but executions only affect c. The social multiplier reinforces the deterrent effect of executions, but the degree of reinforcement differs.[100] In my application, the New Army saw less battle (lower c) than the Regular Army, shifting the cutoff rule to the left. If $\Delta' < 0$ and $\Delta'' > 0$, the New Army would see greater deterrence than the Regular Army.[101]

FACT 2 *If $\mu > 0$, then executions have a social multiplier effect: greater deterrence in communities where non-compliance is rare.*

Thus far, executions only lead to deterrence. Spurring (backlash or delegitimization) occurs only with an expressive effect of executions on θ_i or μ. θ_i could fall by increasing the perceived number of deserters or decreasing the perceived fairness or value of the public good. If expressive effects exceed deterrence, then spurring occurs.

[97] Jewitt's (2004) lemma shows the shape of Δ mirrors the density g: if g is everywhere decreasing (increasing), then Δ is everywhere increasing (decreasing). If g has a unique interior maximum, then Δ has a unique interior minimum. This is because adding a small mass around the cutoff will shift one truncated mean more than the other. Illustrative Figure 7 is adapted from Bénabou and Tirole (2012).

[98] Even the Easter Rising did not increase (instead it decreased) Irish desertions in Figure 11B (Police Gazette desertions mostly in the UK) and Figure 10B (B.E.F. desertions). Nor do we see an increase in Irish desertions in the three different absentee datasets (Appendix Figures 10A-10C). Even Irish proportion of death sentences and executions were unaffected (Appendix Figures 10D-10E), further rendering unlikely a channel for differential treatment and μ shift.

[99] A complementary interpretation allows Irish executions to reduce $v_{f,I}$. The difference is semantic.

[100] This assumes that $\Delta' < 0$ and $\Delta'' > 0$ for which there is some evidence (Besley et al. 2015; Jia and Persson 2015). It also assumes that sanctioners rationally impose sanctions and that potential law-breakers rationally update on the cutoff, so an execution causes the cutoff to *decrease*.

[101] Heterogeneity in deterrence would be inconsistent with $\mu = 0$ and executions only affecting θ_i.

FACT 3 *The key expression for delegitimization is,* $\left|\frac{\partial v^{*,i}}{\partial c}\right| \frac{\partial c}{\partial E} + \left|\frac{\partial v^{*,i}}{\partial \theta_i}\right| \frac{\partial \theta_i}{\partial E} + \left|\frac{\partial v^{*,i}}{\partial \mu}\right| \frac{\partial \mu}{\partial E} < 0$, *where E represents execution (or execution rate).*

Executions could also reduce μ, but there are various reasons why this empirically appears not to have been the case. The Easter Rising did not weaken the morale of Irish soldiers (Denman 1992), so it may be that $\frac{\partial \mu}{\partial E} = 0$, which simplifies expressions. Also, we can suppress the social multiplier terms in the conditions for delegitimization.

FACT 4 *If* $\frac{\partial \mu}{\partial E} = 0$, *then delegitimization occurs only if:* $\frac{\partial c}{\partial E} + \frac{\partial \theta_i}{\partial E} < 0$.

Next, it is helpful to be precise about the effects for the ingroup and outgroup.

FACT 5 *Spurring among Irish and deterrence among British occurs if:* $\frac{\partial \theta_I}{\partial E} < -\frac{\partial c}{\partial E} < \frac{\partial \theta_B}{\partial E}$.

Soldiers may respond differently to executions of ingroup members. If executions of soldiers with ethnicity i primarily affects θ_i, then $\frac{\partial \theta_I}{\partial E_B} = \frac{\partial \theta_B}{\partial E_I} = 0$.[102]

FACT 6 *If soldiers are aware of the ethnicity of the executed soldier and* $\frac{\partial \theta_I}{\partial E_B} = \frac{\partial \theta_B}{\partial E_I} = 0$, *then Irish would be spurred by Irish executions if* $\frac{\partial \theta_I}{\partial E_I} < -\frac{\partial c}{\partial E_I}$ *and British would be deterred by British executions if* $-\frac{\partial c}{\partial E_B} < \frac{\partial \theta_B}{\partial E_B}$.

We may expect $\frac{\partial c}{\partial E_I} = \frac{\partial c}{\partial E_B}$, in which case the condition simplifies to $\frac{\partial \theta_I}{\partial E_I} < -\frac{\partial c}{\partial E} < \frac{\partial \theta_B}{\partial E_B}$. Since it is reasonable to think that an execution of a soldier of either ethnicity affects beliefs about p ($\frac{\partial c}{\partial E_I}, \frac{\partial c}{\partial E_B} > 0$), we can then make the following statement.

FACT 7 *Under the assumptions stated and* $\frac{\partial c}{\partial E_I}, \frac{\partial c}{\partial E_B} > 0$, *then Irish executions spur Irish desertions but deter British desertions, while British executions deter both.*

In sum, without the legitimacy term θ_i, in previous models of law and norms (Bénabou and Tirole 2011; Besley et al. 2015; Jia and Persson 2015), $\Delta'\left(v^{*,I}\right) < \Delta'\left(v^{*,B}\right)$ governs the magnitude, but not the sign—deter or spur—of the response to executions.

3.3 Commander-in-Chief's decisions The optimizing Commander-in-Chief taking into account the delegitimizing effects of executing Irish on Irish desertions might choose to execute Irish less and British more. Yet if this were to occur, Irish soldiers might perceive that the commander was not executing Irish, which would reduce the deterrent effect of the death penalty and reduce the effective p, leading to more Irish desertions. Furthermore, if British officers perceived that Irish death sentences were disproportionately commuted and perceived it as unfair, then $\frac{\partial \theta_B}{\partial E_B}$ may become negative (that is, $\frac{\partial^2 \theta_B}{\partial E_B^2} < 0$)

[102] I could introduce positive or negative correlation in θ_I and θ_B, changing the conditions for spurring.

or $\frac{\partial \theta_B}{\partial E_I} > 0$. Thus, an optimizing commander might randomize between executing Irish and executing British, and perhaps execute Irish at a lower rate to minimize the spurring of Irish desertions while maximizing the deterrence of British desertions.[103]

To be sure, spurring can also occur if the Commander-in-Chief systematically made mistakes without information on $\frac{\partial \theta_I}{\partial E_I} < -\frac{\partial c}{\partial E_I}$ and $\frac{g\left(v^{*,i}\right)}{G(v^{*,i})} \frac{1}{1+\mu\Delta'(v^{*,i})}$. Regardless, the decision-making becomes a game where the targets of deterrence must weigh the likelihood of being executed, conditional upon individual characteristics. As a result, a rational punisher must consider this reaction when setting his decision-rules, and deterrence becomes intimately tied to beliefs about how rules are applied and how beliefs evolve over time.[104]

4 Data

A full description of the data and the merging process is presented in Appendix A-C.

Death Sentences: My data includes 3,342 sentences and final decisions (Oram 2003). Figure 8A plots the distribution of crimes for those sentenced to death, and Figure 8B plots the distribution of crimes for commuted and confirmed death sentences.

War Diaries: Absentee lists are partially preserved in monthly war diaries. The bulk of what was preserved is from July 1916-June 1917. Military units took roll call and attendance every morning (or more frequently). Absentees would be aggregated and circulated as a printed list for the armies at the front.

Police Gazettes: A separate absentee list is preserved in the Deserters and Absentees (D&A) supplement to the (weekly) Police Gazette from 1914 to 1918. Compared to the War Diaries, the D&A supplement records are much more complete. However, they include absentees both at Home (where it was much easier to desert) and Abroad. The latter would be marked in notes, e.g., "from B.E.F." (e.g., see the "Marks and Remarks" column in Appendix Figure 4). To provide a sense of data quality, Figure 9A shows the plot of all 126,818 absences at Home or Abroad. The sharp spike in 1914 the day after the assassination of Archduke Ferdinand suggests that quite a few soldiers were reluctant to go to war. Other spikes are at Christmas, when I suspect soldiers are reminded of family.

FGCM: A third source of absentees is preserved in handwritten FGCM trial registers, recording roughly 144,609 trials. There are 28,754 trials for absence and 13,309 trials for desertion. The number of death sentences across all crimes was 2,858; the number of death sentences for accused deserters was 1,730. These data are registers (Appendix Figure 5), not the trial proceedings themselves, which do not exist except for executed soldiers. I merge and analyze the FGCM data assuming that the absence occurred one month earlier.

[103] The optimizing Commanders-in-Chief could also be modeled as having a distaste for Irish (Rao 2014; Chen et al. 2016c; 2016d), executing Irish more and spurring Irish absences.

[104] Different groups' normative commitments evolve onto separate paths (Chen et al. 2010; 2011; 2014).

Casualties: I utilize the Soldiers Died In the Great War database containing 658,555 casualties to proxy for point-in-time danger by unit and by date. Interactive version of this data can be viewed at http://tinyurl.com/hwx2ctf and http://tinyurl.com/j7wqt3n where casualties are compared with the execution rate.

Surnames: A list of 426 Irish surnames identifies soldiers of probable Irish ethnicity. Irish effects would be underestimated if surnames miscategorize.

Service and Pension: These were obtained from Ancestry.com, comprising roughly 2 million and 1 million non-unique records. Age is only recorded in the capital sentences data for soldiers who were executed, but age is recorded here for non-executed soldiers. I check for correlation between the execution decision and soldier's age.

It is necessary to choose an analysis unit.[105] According to historical accounts, the division commander was the highest-level commander whose commutation recommendation was ignored (Oram 2003, p.129; Babington 1983, pp. 78-79, 103). If higher-level commanders' discretion was impactful, then division is the highest level appropriate for analysis.[106] To be included in the analysis, units must contain at least 1 execution, 1 commutation, and 1 absence, which also compels using division as the lowest level appropriate for analysis.

From the War Diaries data, I identify 676 usable matches preserved mostly from July 1916 to June 1917–roughly one-third of the war. The upper panel of Figure 1 plots the distribution of matches from 700 to 1100 days after the assassination of Archduke Ferdinand on June 28, 1914. The median time between trial and next recorded desertion at the division level is about two weeks. From the Police Gazettes, I identify 3,009 B.E.F. deserters for all four years of the War; 1,319 of these are mergeable. From the trial data, I identify 45,824 usable matches (4,365 desertion trials) for all four years. By match, I mean that a soldier's battalion needs to be merged to his division, point-in-time.

Order of Battle: Battalions changed divisions throughout the war. I develop a time history of each battle unit and the movement among divisions and brigades. A sample appears in Appendix Figure 13. Appendix C documents how the Order of Battle was entered. I entered 7,800 associations between battalion to brigade to division, and 770 associations between division to corp to army. Appendix B describes the merging.

All datasets were scanned digitally and then checked, with the remaining non-scannable entries entered by hand. The inability to merge by name precludes balancing checks based on data stored in datasets other than the death sentences.[107]

Medal Rolls: I use Medal Rolls Index (WO 372) to make assessments about the Irish

[105] While there are exceptions, in general, the sequence of military units listed from lowest to highest was: Battalion → Regiment → Brigade → Division→ Corps → Army → Army Group.

[106] A division consisted of between 18,000 and 19,000 men (Corns and Hughes-Wilson 2007, p. 108).

[107] The one exception is age, because age is already included for all executed soldiers.

surname dictionary by comparing against the official statistics regarding Irish enlistment, which I am able to do since the Medal Rolls Index contains roughly the universe of all enlisted soldiers: 5,424,254 unique soldiers and a total of 7.8 million records.

Officers: I digitize a dataset of the 2,992 commanding officers and general staff officers for division, corps, army, and general headquarters and the dates of their assignments and reassignments (Becke 1935-1944). I merge these data into the Order of Battle.

Battles: The Order of Battle also contains battles and divisions associated with each battle (towns). The towns can be entered into Google Maps, which provides geographic coordinates. I make the albeit simple assumption that divisions travel linearly and incrementally between battles to interpolate the rough location of each division on any date. Finally, these coordinates yield calculations of distances between divisions, distance to the English Channel, and distance to Berlin, which serve as additional controls. This data allows estimating the approximate location of each soldier on the day of his absence.

I also use Google Maps to geolocate the enlistment towns, birthplaces, and residences of soldiers for analysis in Appendix D, where I make five inquiries: 1) Assess how closely Irish surname and Irish birthplace align, 2) Assess the relative loyalty of Irish and non-Irish by birthplace, 3) Assess differences between being born in Ireland or Britain vs. being enlisted in Ireland or Britain vs. having Irish vs. non-Irish surname, 4) Assess quality of geolocation, and 5) Assess population representativeness of casualties. Differences in distance-in-time to Irish roots can be related to differences between having male Irish ancestry vs. having Irish birthplace. Those born and raised in Britain with Irish male ancestry may be more loyal than those born and raised in Ireland, but those having male Irish ancestry may be less loyal than those without male Irish ancestry even among soldiers born and raised in Britain. I compare my statistics with the prior historical knowledge.

5 Assessment of Randomness

5.1 Are Decisions Correlated With Observable Characteristics? Table 1 shows the results of several regressions of observable characteristics for death sentences.[108] No specification reveals a relationship between Irish ethnicity and probability of execution. Figure 10A illustrates that Irish soldiers were not disproportionately executed, conditional on the death sentence. Moreover, the first column of Figure 10A shows that the Irish were not disproportionately sentenced to death relative to the proportion of Irish absences. The first bar shows the relative share of Irish soldiers in the War Diaries' absentee lists. Figure 10B shows there were no time periods when Irish capital sentences were disproportionately confirmed, for example, after the Easter Rising. This result is confirmed in the set of interactions between year and Irish displayed in Table 1 in Column 5.

[108]R-square increases in specifications including age because of the dummy for missing values.

Column 2 shows that Privates were not disproportionately executed, and in fact, they were somewhat less likely to be executed than officers. Column 3 shows that age does not predict the execution decision. Column 4 shows that year fixed effects are jointly significant. There appears to be a decline in execution rates over time, which is consistent with Figure 3A. Year fixed effects will be included in the analyses in Section 6. As for other time dimensions like seasonality and day of week, Columns 6 and 7 report that neither month fixed effects nor day of week fixed effects are jointly significant. Column 8 shows that division fixed effects are jointly significant—division fixed effects will also be included in the Section 6 analyses. Column 9 shows that the type of army—Regular, New, or Territorial, with Regular being the baseline category—do not predict execution rates. Column 10 shows that log of casualties do not predict execution rates. All log values are calculated as 1+ the underlying variable. Casualties do not predict execution rates regardless of whether it is measured in levels (e.g., measured 1-29, 30-59, or 60-89 days ago or 1-29 days in the future relative to the trial date) or in first-differences to address potential serial correlation in casualties. Column 11 shows that distance to coast and distance to Berlin also do not jointly predict execution rates. All regression analyses restrict to death sentences occurring in France & Flanders before the end of World War I. Death sentences recorded from the Labour Corps were also removed. Sample size varies for army and distance specifications because not all divisions were assigned to an army, and distance data is unavailable before the first battle and after the last battle.

Table 2 Panel A shows the results of several regressions of unit-level factors such as officer identity and recent military indiscipline (i.e., number of military trials, death sentences, or executions). Panel A shows that fixed effects for Brigade unit, Corp unit, and Army unit are not jointly statistically significant. Fixed effect for officers—General Officer Commanding (GOC) for Brigade, Division, Corps, Army, and General Headquarters, and First General Staff Officer (GSO) of Division, Corp, Army, and General Headquarters[109]—are also not jointly statistically significant with the exception of division commanding officer which is significant at the 5% level. We may expect one or more significant effects given the large number of tests reported. Officers and units that appear with less than 10 frequency were categorized in a separate "other" category.

Joint significance test of fixed effects for whether the officer is Irish and the soldier is Irish do not reveal systematic differential execution probability of Irish soldiers when their officers are British. The latter result is not due to the lack of Irish officers.[110] Lagged mea-

[109]Brigades did not have first staff officers.

[110]The proportions of Irish commanding officers for soldiers who deserted or had trials are 9% for Brigade, 12% for Division GOC, 11% for Division First GSO, 7% for Corps GOC, 15% for Corps GSO, 15% for Army GSO, 19% for General Headquarters GSO, and 0% for Army GOC and Commanders-in-Chief.

sures (30 and 60 days ago) of log of military trials, log of death sentences, and execution rates also do not reveal significant relationships with the current execution decision. All regressions include fixed effects for division, year, and Irish surname.

Table 2 Panel B examines autocorrelation in execution decisions. The string of events within each unit are stacked and the first event within each unit was excluded as a dependent variable. If more than one event occurred on a day within a unit, the average outcome was calculated. All regression models include year fixed effects and the leave-one-out (i.e. excluding the current decision) mean execution rate of the unit.[111] Separate ordinary least squares stacked autocorrelation regressions with different levels of aggregation (division, brigade, corp, army, army type, and global) do not show significant autocorrelation.

Table 3 repeats the exercise for all capital sentences regardless of crime. An exception to the randomization hypothesis is that murderers were more likely to be executed relative to other capital sentences, while privates were less likely to be executed. The lower panel of Figure 8B shows that the overwhelming majority of executions were for deserters. Table 4 repeats the specifications from Table 2 and two sets of fixed effects are jointly significant at the 10% level out of 16 tests. Analyses of Tables 1 through 4 in logit or probit specifications yield similar inferences. Finally, I report the same exercises for Irish capital sentences in Appendix Tables 15 and 16.[112]

5.2 Is the Sequence of Decisions Within a Unit Non-Random? Even if confirmation decisions are uncorrelated with observable individual and environmental characteristics, they may be correlated with unobservable time-varying characteristics within a division, such as time-varying perceived indiscipline, officer fixed effects, or lower-level groups or units of bad apples that may be correlated with subsequent absences. Confirmations may be mean reverting. Figure 11 shows that for each of the divisions separately, while there are concentrated periods of death sentences, there do not appear to be concentrated periods of executions. Two animated graphs to explore relationships over time are available at http://tinyurl.com/jbvws3f,[113] which displays the cumulative measure, and at http://tinyurl.com/gszd8m2,[114] which displays "last 120 day" measures.[115]

[111]Including division fixed effects would bias the estimated relationship between the current and previous decisions because the fixed effect is controlling for the mean (which includes the dependent variable), inducing negative autocorrelation between any two decisions (Chen et al. 2015b).

[112]Besides murderers being more likely to be executed, another two tests have $p < 0.05$ and four tests have $p < 0.1$ out of 28 individual tests and 29 joint tests of significance.

[113]https://dl.dropbox.com/u/64329541/divMotionChartcumSum2.html. Safari or Internet Explorer works best for viewing, and loading of scripts may need to be manually toggled.

[114]https://dl.dropbox.com/u/64329541/divMotionChartrollMean2.html.

[115]In the graphs, the axes can be chosen by the user. For example, the user can choose to display executions, execution rates, casualties, absences, death sentences, and time. Each division is labeled with the actual divisional number. The diameter of the circle around each division is proportional to

Figure 12A shows a static final snapshot indicating that execution rates in a division are uncorrelated with total casualties in that division. Figure 12B shows another snapshot indicating that execution rates in a division are uncorrelated with total absences (i.e., military discipline) in that division. This pattern is also visible in Figures 2A and 2B; the circle sizes correspond to the number of absentees recorded in the War Diaries and Police Gazettes respectively. The circle sizes are unrelated to deviations from the 12% line.

Figure 12C shows a snapshot of the "last 120 day" animation indicating that death sentences and executions are positively and tightly correlated. Figure 12D shows that absences and casualties in the last 120 days are also positively (though less tightly) correlated. This pattern is consistent with soldiers deserting more when battlefield danger is high. Importantly, Figure 12E shows that casualties in the last 120 days are uncorrelated with the execution rate in the last 120 days. This pattern is similar to with what was found in Tables 1 and 2. Moreover, Figure 12F indicates that absences in the last 120 days are uncorrelated with execution rates. Taken together, these figures suggest that even if the military command (more specifically, the panel of officers of field rank major, lieutenant colonel, or colonel) took into account point-in-time danger in *sentencing* soldiers to death, the Commander-in-Chief did not make the *execution* decision depend on point-in-time danger or discipline within a unit.

I next turn to a random strings test. This approach is analogous to a Fisher exact test, except I: 1) propose a statistic that can be computed from a sequence of 1s and 0s (executions and commutations) within a unit i. 2) compute the statistic for the actual sequence, s^*. 3) compute the statistic for each of 1,000 bootstrap samples from the actual sequence (i.e., $\hat{s}_1, \hat{s}_2, \hat{s}_3 \dots \hat{s}_n$). Since there were peaks and troughs in the execution rate, I treat the bootstrap samples as a vector of realized Bernoulli random variables, with the probability of a success (i.e., execution) equal to the global execution rate within fifty days of that trial time, not including the unit under consideration. 4) compute the empirical p-value, p_i by determining where s^* fits into $\hat{s}_1, \hat{s}_2, \hat{s}_3 \dots \hat{s}_n$. 5) repeat steps 1-4 for each i.

The statistics I use are: 1. Autocorrelation) I see if the decision made in the jth cases depends on the outcome in the $j-1$th case. This statistic can detect whether executions are "clustered," meaning a higher than expected number of back-to-back executions. This test tells me whether commanders executed soldiers in pairs, for example, in the cases of two friends deserting together (they do, and the historiographical record confirms this (Putkowski and Sykes 2007, p. 64), so in these assessments of randomization, I treat multiple observations of executions (commutations) of death sentences whose trials occurred on the same day and for the same division as 1 observation). The autocorrelation test also

the number of absences recorded for that unit. The colors correspond to army type.

tells me if commanders targeted divisions for poor discipline, or if lower level brigades or battalions generated a disproportionate share of desertions and death sentences and were targeted for discipline. 2. Mean-Reversion) I test whether there is any form of mean reversion in the sequence, meaning that the execution in the jth case is correlated with the deviation of the actual execution *rate* in previous $j-1$ cases from the expected execution rate. This test tells me whether the Commander-in-Chief was attempting to equilibrate his decisions, considering whether a unit was "due" for an execution or whether they became more lenient after an execution.[116] 3. Longest-Run) I test whether there are abnormally long "runs" without any executions or long runs without commutations. This test tells me whether certain units may have been favored with commutations during certain time periods, for example, if a unit's commanding officer always recommended commuting a death sentence, and the Commander-in-Chief was influenced by the lower level officer's recommendation, or if lower-level groups of bad apples were being targeted for executions.

I use a Kolmogorov-Smirnov (KS) Test to test whether the empirical distribution of p-values approaches the CDF of a uniform distribution using the one-sided critical value with $n = 46$.[117] Figure 13 plots the empirical distribution for my three test statistics and the corresponding table in that figure confirms the visual intuition that the p-values are uniformly distributed for all tests. Appendix Figures 7A and 7B display power tests.

Showing that residuals behave like a random string does not address the possibility that individual-level characteristics (randomly distributed over time) are correlated with executions. But only examining orthogonality between executions and individual-level characteristics could miss correlated temporal patterns in executions and desertions.

5.3 Stable Unit Treatment Value Assumption Even if treatment assignment is ignorable, valid causal inference is not necessarily possible: I have to be certain that the outcome in one unit is not affected by the treatment assignment in another unit, i.e., that SUTVA is satisfied. My within-unit design helps with ignorability but creates a SUTVA problem because each unit is essentially serving as its own control.

For the problem of past events affecting the effect of future events, one possibility is to include only those events between which there is sufficient elapsed time. Unfortunately, requiring a greater amount of time between events helps SUTVA but hurts the ignorability of treatment since treatment assignment is most likely to be ignorable when comparing capital cases that appeared before the commander at roughly similar times. The approach I use is to make a strong assumption, which is that past events are irrelevant. I then weaken

[116] Results are similar when examining whether execution in the jth case is correlated with the deviation of the actual cumulative sum of executions in previous $j-1$ cases from the expected sum.

[117] Imagine generating summary statistics for 1000 random strings. The 1001^{th} random string should have a summary statistic that is equally likely to be anywhere from 1 to 1000.

this assumption by assuming a parametric model for deterrence and condition out the past effects of previous events. With this approach, the effect of past treatment assignments on future outcomes is modeled explicitly rather than assumed to be zero.

6 Empirical Strategy

6.1 Duration Analysis My first modeling approach is to assume that the elapsed time from the most recent deterrence event to the next absence *in a particular unit* is a random variable drawn from some distribution parameterized by unit and time characteristics (i.e., y is drawn from a distribution with a pdf f). For exposition's sake I will use an exponential distribution, though other parametric distributions are possible. I assume that the likelihood of observing an elapsed time of y from a given deterrence event to the next absence is given by $f(y) = \lambda \exp(-\lambda y)$.

The hazard rate, λ, depends upon the characteristics of that particular deterrence event. $\lambda = \beta_0 + \beta_{ex} ex_{ij} + \beta_{exd} ex_{ij} \cdot des_{ij} + \beta_{des} \cdot des_{ij} + \gamma^C cas_{it} + \gamma^U_j + \gamma^T_{year(j)=T}$. Military units are indexed by i, observations by j. ex is an indicator for an execution, des is an indicator that the trial was for desertion, cas is the casualty rate and $\gamma^{\mathbf{U}}$ and $\gamma^{\mathbf{T}}$ are unit and year fixed-effects, respectively. Collectively, I refer to these parameters as a vector θ. The specification can also be interpreted within the theoretical model: cas controls for the cost of staying and ex creates exogenous variation in perceptions of costs.

It is possible, however, that an execution or commutation occurs at the end of the data frame, in which case the elapsed time y is no longer a realization of the time until an absence, but rather a censored value. I assume that, but for the intervention, I would have eventually observed an absence. In these censored cases, which I indicate with $d = 0$, the likelihood is not $f(y|\theta)$, but rather $1 - F(y|\theta)$. The log-likelihood function consistent with this censoring is given by: $L(\theta) = \sum_{j=1}^{N} d_j \log\left(f(y_j|\lambda(\theta)) + (1 - d_j)\left(1 - F(y_j|\lambda(\theta)\right)\right.$.

When analyzing the impact of the most recent event, the calculations treat desertions and capital sentences that occurred in pairs or groups as one observation since the decisions to execute or commute these soldiers were not independent: almost without exception, they were determined simultaneously and with identical outcome. If executions and commutations occurred on the same day, the time until next absence is calculated beginning on the following day. Absences that occurred on the day of an event are considered as occurring the previous night, so they do not count as the first absence after an event. Multiple absences or events on the same day from different ethnicities are considered as British as they constitute the modal soldier.[118]

[118] A date with an Irish execution (absence) means that only Irish were executed (absent).

The Weak-SUTVA Approach

I assume that past events matter, but that they fade out exponentially, according to some parameter k. I test values of k such that $k = -\frac{\log \frac{1}{2}}{\Delta t}$ where Δt takes values of 7, 14, 30, 60 and 90, corresponding to deterrence-effect half-lives of one week, two weeks, one month, two months, and three months. In the weak-SUTVA approach, I define two sets: $E_{ex}(t^*) \equiv$ times of all executions in the unit prior to t^* and $E_{cm}(t^*) \equiv$ times of all commutions in the unit prior to t^*.

These two terms measure the cumulative effects of past events, one for executions and one for commutations. They also measure idiosyncratic variation in execution rates over time within divisions, since the sequence is also exogenous. Differences in the effects of these two terms characterize the effect of exogenous variation in the application of the death penalty. Neither term by itself has a causal interpretation because the number of death sentences could be endogenous. To be consistent with the strong SUTVA parameter, multiple events on the same day and division are still treated as one event. $D_{ex}(k) = \sum_{t \in E_{ex}(t^*)} e^{-k(t^*-t)}$ and $D_{cm}(k) = \sum_{t \in E_{cm}(t^*)} e^{-k(t^*-t)}$. The hazard is the original hazard plus two terms for past executions and commutations: $\lambda'(k) = \lambda + \alpha_{ex} D_{ex} + \alpha_{cm} D_{cm}$.

Results of the hazard model are presented in the main tables with standard errors clustered at the division level[119] since the weak-SUTVA parameters are serially correlated within division. The appendix tables present two checks—one set of results without clustering (to see if the statistical significance is similar), and another set of results where time is run backwards and I calculate the time until the previous absence before a treatment event (to see if there is a null result). In the specification check with time run backwards, to minimize leakage, where the absence event that led to the death sentence is included by chance as an outcome, the clock begins 90 days into the past.[120]

6.2 Day-by-Day Probability, Maximum Likelihood Approach One difficulty of treating each death sentence as an observation, with an indicator for executions as the primary independent variable and absences as an outcome (either a count of absences or duration until the next absence) is that each unit experiences a whole sequence of executions and commutations. These past deterrent effects presumably affect the probability of future absences within that unit, and hence it is hard to see why they can be ignored. My response is to use a structural framework, where the effects of past events are explicitly modeled. I assume that each unit had some probability of experiencing absence on any particular day, and that this probability depends upon military unit and year fixed effects, all past death sentences, including the nature of the crime and outcomes, and their

[119] I have 47 divisions (Figure 11).

[120] I cannot match capital sentences by name to the absentee data to remove them.

distance in time from the present day and the instantaneous casualty rate.

Military Units: $i = 1 \dots I$

Time: $t = 1 \dots T$ Measured from 0-day, July 28th, 1914.

Absences: $a_i(t)$ is an indicator for whether there was an absence in unit i on day t.

Preceding Events: $K_i(t)$ is the set of past deterrence event dates in a unit i (executions or commutations) before time t; $|K_i(t)|$ is the number of events in the set.

Day: t_k is the day on which the k^{th} element of K occurred.

Execution or Commutation: x_k is an indicator for execution or commutation.

Crime Type: d_k is an indicator for desertion or some other crime.

I use the logit as my link function, so the probability of an absence in unit i on day t is: $p_i(t) = \frac{1}{1+e^{-z(i,t;\theta)}}$, where $z(i,t;\theta)$ is $z(i,t;\theta) = \left(\sum_{k=1}^{|K_i(t)|} e^{-\lambda(t-t_k)} D(k)\right) + X(t)\gamma$, $D(k) = \beta \cdot \mathbf{E(k)} = \begin{pmatrix} \beta_{exd} & \beta_{exo} & \beta_{sd} & \beta_{so} \end{pmatrix} \cdot \begin{pmatrix} x_k d_k \\ x_k \\ d_k \\ 1 \end{pmatrix}$, and $X(t)\gamma = \gamma^0 + \gamma^C cas_{it} + \gamma_i^U + \gamma_{year(t)}^T$.

$\beta_{exd} \equiv$ effect of executing a deserter, $\beta_{exo} \equiv$ effect of executing for any crime, $\beta_{sd} \equiv$ effect of a desertion death sentence, and $\beta_{so} \equiv$ effect of a death sentence for any crime.

I define a vector of parameters: $\theta = \left(\lambda, \beta_{exd}, \beta_{exo}, \beta_{cd}, \beta_{co}; \gamma^0, \gamma^C, \gamma^{\mathbf{U}}, \gamma^{\mathbf{T}}\right)$. $X(t)$ is a collection of covariates, such as the instantaneous, unit-specific danger rate (computed from casualties) and a unit fixed-effect. The effects of past events fade as time progresses. There is one λ for both executions and commutations — i.e., events are "forgotten" at the same rate since commutations serve as control for executions. (An attempt to infer λ from the data did not converge, so I present estimates using different values of λ instead.) F is the link-function whose range is $[0, 1]$. The log-likelihood is thus: $L = \sum_{i=1}^{I} \sum_{t=1}^{T} a_i(t) \log p_i(t) + [1 - a_i(t)] \log(1 - p_i(t))$. β_{exd} and β_{exo} have causal interpretation. I also introduce terms for Irish executions and Irish death sentences. Results are presented only with standard errors clustered at the division level since the treatment variable is serially correlated within division. The appendix tables present a specification check for null results where time is run backwards.

All analyses with the War Diaries data as outcome restrict the sample from day 670 to day 1085 (the 0-day is the start of World War I on July 28, 1914) when the vast majority of absence data is recorded (Figure 1). Appendix Figure 8A visually summarizes the duration model and Appendix Figure 8B visualizes the day-by-day approach.

7 Results

I begin by presenting the results graphically without controls. Figures 14A-14C present for each of the three datasets a univariate analysis of the duration model—Kaplan-Meier

survival rates (assuming an exponential hazard). The first of each pair of figures presents the effect of Irish executions and the second of each pair presents the effect of British executions. What is immediately apparent is the dispersion between the pairs of hazards in each figure, especially in the War Diaries data (Figure 14A).[121] The results suggest that Irish executions spurred absences and British executions deterred.

7.1 Duration Framework–Strong SUTVA I use three different hazard models: exponential distribution, Weibull, and Cox; I make three different imputations of commutation dates; I employ three different datasets. Across tables, I gradually add controls.[122]

A negative coefficient implies a positive effect on time until next absence—i.e., *a negative coefficient suggests deterrence, while a positive coefficient suggests spurring.*[123]

Table 5 cannot detect a deterrence effect, nor can it rule out such an effect. Consistent across specifications is a "spurring" due to casualties (whether or not this has a causal interpretation is not my purpose). In most specifications, the increase in casualties (both contemporaneous $\triangle$Log casualties and $\triangle$Log casualties 30 days ago) is strongly correlated with a spurring effect on time until next absence, significant at the 5% or 1% level.

While Table 5 finds limited evidence that executing deserters deters absence, Table 6 finds that Irish executions spur absence relative to British executions, as visualized in Figure 14. I add several interaction terms—whether the death sentence was for desertion, whether the deserter was executed, whether the death sentence was for an Irish soldier, and whether the Irish soldier was executed. The hazard interpretation—presented in Appendix Table 11 column 1 (7 and 13), which corresponds to Table 6 column 1 Panel A (B and C)—is that an Irish execution triples the hazard for the War Diaries (and increases by 50% or 100% for the Police Gazettes and trial registries respectively).[124] In some specifications, executing deserters significantly deterred absences relative to execution of non-deserters (Table 6 Panel A Columns 7-9).

The significant negative coefficients on Irish death sentence suggests that Irish death sentences occur when desertions are less frequent. The negative correlation could bias effects of Irish executions to be one of deterrence, so true spurring effects may be larger.

7.2 Duration Framework–Weak SUTVA Table 7 includes aggregate past effects in two separate terms, one for prior executions and one for prior commutations. It presents

[121] The hazard rate of absences after executions—displayed in the red—is generally pulled inwards to the origin, relative to the hazard rate of absences after commutations—displayed in blue.

[122] Many models are presented with recognition of model uncertainty (Leamer 1978; Sala-i Martin, Doppelhofer and Miller 2004; Hansen 2007; Cohen-Cole, Durlauf, Fagan and Nagin 2009).

[123] In the exponential distribution, the mean duration is $\frac{1}{\lambda}$, and the marginal effect of a coefficient $\hat{\beta}$ is $-\frac{\beta}{\hat{\lambda}^2}$, where $\hat{\lambda}$ is the average duration.

[124] This means that relative to the median time-to-next absence, which is about two weeks, an Irish execution cuts the time by about 66% in the War Diaries (less in the other two datasets).

across separate columns the results from assuming five different half-lives for an effect (7 days, 14 days, 30 days, 60 days, 90 days).[125]

Due to execution's randomness, the effect of the most recent event is invariant to inclusion of previous events. The effect of executing Irish on spurring absences is robust.

The difference between the execution and commutation measure of previous events represents the effect of the execution *rate.* The execution rate has a deterrence effect, and it is observed in models that assume a longer half-life. In terms of magnitudes, an execution instead of a commutation—evaluated on the day of the event—leads to a 10-15% decrease in hazard rate in the time to next absence (Appendix Table 11).

7.3 Ethnic Identity of the Subsequent Deserter I analyze the ethnic identity of the deserter subsequent to Irish and British executions and commutations. Examining the commutations separately assesses whether commutations slipped into the night.

I find that Irish executions double the likelihood that the next absentee is Irish. Using numbers reflecting the 466 Irish and 1,942 non-Irish death sentences in the analysis sample, the doubling of Irish proportion yields a Fisher's exact test that is statistically significant at the 5% level.[126] After Irish and British commutations, the immediately following absences are unaffected, consistent with unnoticed commutations.[127] Appendix E discuss results under different commutation imputations and datasets.[128]

7.4 Robustness Checks Appendix E reports further checks. I explore whether results may be spuriously significant by using specifications run backwards in time. I report analyses without clustering of standard errors. These analyses temper a strong inference that execution rates deter. I also include more controls (officers, location, etc.).

I explore whether the effects of execution differ depending on the current casualty rate, distance to coast or Berlin, officer status of the executed soldier, age of the executed solder, days since the war began, and army type. Only one analysis is statistically significant in each of the three absentee datasets: executions appear to deter desertions in the New Army. Since the New Army saw less battle than the Regular Army, the effectively lower c implies a greater deterrence effect of executions.[129] I conclude that the soldiers' response to executing Irish soldiers is special, since the other interactions are not robustly significant.

I pool all three absentee datasets, but treat a death sentence that occurs before another absence as censoring rather than as absence. Executing Irish still spurs absences.

[125] I focus on commutation imputation of 14 days and an exponential distribution.

[126] To be sure, the time frame of the War Diaries dataset makes necessary an analysis of a subset, whose sample size does not allow strong conclusions. This question is revisited with the day-by-day framework.

[127] After Irish and British commutations, 13% of immediately following absences are Irish. This is consistent with commutations serving as an adequate control for executions unnoticed by soldiers.

[128] Using the trial date introduces noise, so I use the 14-day imputation in the day-by-day framework.

[129] However, the prediction that higher casualties generally reduce the deterrence effect is not born out.

7.5 Day-by-Day Framework I now combine the effect of the salience of the most recent event with the delayed effects of all previous events using a day-by-day approach. Based on the previous robustness checks, I use the execution date and impute the commutation date of 14 days after the trial date. Table 9 uses as outcome variable an indicator for whether any absence occurred.[130] When aggregating Irish and non-Irish absences together, I usually cannot detect a deterrent or spurring effect.[131] Table 10 shows robust patterns of Irish (but not British) executions spurring rather than deterring Irish desertions.[132] Note that unlike the duration model, *positive coefficients indicate spurring and negative coefficients deterring*. The effect is observed across all half-life specifications in the War Diaries and Police Gazettes. In terms of magnitudes, an execution of an Irish soldier (relative to execution of a British soldier) on the day of an execution would cause an increase of around 2 percentage points in the probability of an Irish absence relative to a British absence. Appendix E explores whether results may be spuriously significant.

7.6 Death Sentences Following Executions as Potential Source of Bias In my final analysis, I examine what happened after an execution and whether military justice changed. It is entirely possible that judicial panels comprising of lower-level officers sought lesser sentences than capital punishment following an execution since they had already "made their point", consistent with models of residual deterrence.[133] With the FGCM data, we can assess how malleable the sentence charged at court martial could be, since the chances of being convicted of desertion was almost 100%, but the chances of being sentenced to death roughly 1 in 5.[134] Appendix Table 13 finds that British (but not Irish) desertion cases received temporary amnesty, particularly after Irish executions.[135]

This provides quantitative evidence that the Irish may have been differentially mistreated in their exclusion from what appears to be temporary amnesty that other soldiers in desertion trials received. Using death sentences as a measure of absence would bias towards finding deterrence, since after an execution, the likelihood of the next desertion trial resulting in a death sentence was lower. This mechanical bias towards finding deterrence would be greatest for Irish executions. Finally, if soldiers knew about temporary amnesty and acted on this knowledge, then this would bias towards finding a spurring

[130] Group desertions are not independent events, and it may be easier to desert in pairs or groups.

[131] In Panel B reporting on the Police Gazettes, some of the coefficients suggest a deterrence.

[132] The dependent variable in Table 10 takes the value of 1 if only Irish absences occurred on that day in that division, -1 if only British absences occurred, and 0 if neither or both occurred. An event that may spur the desertion of Irish soldiers may not affect British, or even deter British desertions.

[133] Endogenous justice could only appear at sentencing. Not reporting absences was abetting desertion.

[134] Executions could also affect lawyers' behavior.

[135] After a division executed an Irish, 14% of the next desertion trials resulted in a death sentence, whereas after a commutation, the figure was 22%. However, death sentencing rates of Irish desertion trials were 20% regardless of the previous execution event. Appendix E provides discussion.

effect among British soldiers; instead, I find a spurring effect among Irish.

8 Discussion

8.1 Death penalty This study offers some insights potentially capable of greater generalization. First, the granularity and richness of the data begets questions that are sometimes ignored in the standard time-series crime rate studies. The British experience presents a setting with exogenous shifts in risk perceptions (Apel and Nagin 2011; Lochner 2007; Sah 1991), and identifying its effects has been deemed a priority by critical summaries of the death penalty literature (Nagin and Pepper, eds 2012; Donohue and Wolfers 2005; Cohen-Cole et al. 2009; Manski and Pepper 2011). Thus one focus of Section 2 is soldiers' risk perceptions of capital punishment and how the military heightened these risk perceptions for potential law-breakers: Commutations were not promulgated and trials were not public, so soldiers had no way to know that executions were random.

8.2 Counterdeterrent effects Second, I contribute to a literature on counterdeterrent effects. Higher rates of incarceration among minorities have been attributed to the perceived illegitimacy of authority (Tyler and Huo 2002; Bowers and Pierce 1980; Bailey 2006), but the correlation between minority incarceration and mistrust of institutions is difficult to interpret.[136] An important limitation has been that legitimacy perceptions were not directly manipulated, which has "crucial implications not only for causal inference but public policy" (Nagin and Telep 2016). For example, punishment may be unequal across groups, which leads to higher rates of incarceration and perceived illegitimacy of the lawgiver. In addition, crime rates may be higher for other reasons that are unobserved, so attributing causality from perceptions of authority to crime rates faces the econometric challenge of controlling for omitted factors. The quasi-random application of the death penalty across British and Irish soldiers addresses both issues.

8.3 Residual deterrence Third, I contribute to a dynamic games literature on residual deterrence. Residual deterrence involves enforcement officials temporarily reducing their enforcement having 'made their point'. The related work is primarily qualitative, observational, or experimental with laboratory games (Sherman 1990; Nagin 1998; Dai et al. 2016; Banerjee et al. 2014). There are some formal dynamic models in the enforcement

[136] Legitimacy is said to drive expressive powers of law, tax compliance, and non-compliance to laws (McAdams 2000; Acemoglu and Jackson 2014; Bénabou and Tirole 2011; Kaplow and Shavell 2006; Hurd 1999; Chen et al. 2014; 2004). Much of the causal link (cf. Barkworth and Murphy 2015; Bottoms and Tankebe 2012; Tyler and Jackson 2014) rests on associations between perceptions of legitimacy and self-reported offending (Fagan and Tyler 2005; Fagan and Piquero 2007; Reisig et al. 2007, 2014; Papachristos et al. 2012; Tyler and Jackson 2014; Jackson et al. 2012), e.g., a two-wave panel survey (Tyler 2006) or cross-sectional survey (Sunshine and Tyler 2003; Tyler and Huo 2002). Experiments also suggest the relevance of legitimacy (Bohnet et al. 2001; Bohnet and Cooter 2003; Vertova and Galbiati 2010; Feld and Tyran 2002; McAdams and Nadler 2005, 2008; Chen et al. 2013; 2015; 2015a).

literature, with recent formal theories relating information about enforcement policies to the level of deterrence (Lazear 2006; Eeckhout et al. 2010; Dilmé and Garrett 2015), e.g., potential law-breakers presume that enforcement is still active when in fact it has actually declined. I find that trial judges (but not the Commander-in-Chief) appear to follow the predictions of what sanctioners do in these models, except when it came to Irish defendants—British (but not Irish) desertion trials received temporary 'amnesty' (being less likely to receive the death sentence) after the execution of another soldier.[137]

8.4 General deterrence Fourth, I build on a literature to estimate general deterrence. Drago et al. (2009) and Kuziemko (2012) use *one-time* mass commutations to estimate deterrence effects for prisoners who have *already committed* a crime and whose sentences were commuted. Donohue and Levitt (2001) uses the staggered introduction of abortion laws (*repeated* mass commutations) to estimate the impact of unwanted children (whose birth sentences were commuted). I use *repeated*, *random* commutations, to estimate *general deterrence* for individuals who (typically) *have not yet committed* a crime.

8.5 Legitimacy Fifth, I build on a large literature on legitimacy. Social scientists and philosophers have long speculated on the role of perceived legitimacy in judicial institutions, organizations, and nation-states (Lipset 1959; Suchman 1995; Gibson et al. 1998). Legitimacy is defined as an individual's *perceptions* of the "evaluation of the fairness of decision making (neutrality, transparency, factuality, allowing opportunities for input) and of interpersonal treatment (treatment with respect or dignity, respect for rights)" (Tyler 2010, p. 73), building on theoretical arguments on the study of justice in social relationships.[138] Legitimacy and procedural justice are foundational in the recent President's Task Force on 21st Century Policing's (2015) recommendations. I build a formal model of legitimacy, which increases rule compliance (Ostrom 1990). Would-be deserters weigh the benefits of military desertion, such as being reunited with family or avoiding the trenches, against *economic costs*, such as loss of freedom, money,[139] and physical well-being (execution), *psychological costs,* such as the pain from violating one's moral principles, and

[137]This contributes to a literature on variation in justice (Sunstein et al. 2006; Danziger et al. 2011; Shayo and Zussman 2011; Barry et al. 2016; Berdejo and Chen 2016; Chen and Eagel 2016; Chen et al. 2014b; 2016a; 2016b; Eren and Mocan 2016; Ash et al. 2016; Chen et al. 2011; 2014b; 2015a; 2016a).

[138]Motivations such as perceived fairness have entered economic models (Rabin 1993), so that people care about more than just material interests (Fehr and Schmidt 1999). Values have been cited as a rejection of markets and policies (Roth 2007; Mankiw and Weinzierl 2010). Legitimacy is conceptually closest to reference points in social preferences (Leventhal 1980; Thibaut and Walker 1975; Chen 2016c).

[139]Pay was deducted for every day "of absence either on desertion or without leave, or as a prisoner of war [if a Court of Inquiry finds that the soldier purposely allowed himself to be taken prisoner], and for every day of imprisonment awarded by a civil court or court-martial" (Graham-Harrison, ed 1907, pp. 385-6 (Army Act SS 136 & 138). Retrieved from http://archive.org/stream/manualofmilitary00greauoft#page/384/mode/1up, with free login.)

social costs, such as shame and loss of reputation (Beckett and Simpson, eds 1985).[140]

9 Conclusion

The prevailing strategy for addressing non-compliance is the imposition of harsh sanctions, and for most of the world's population this includes the death penalty, despite a lack of empirical evidence regarding the effects of the death penalty. This paper provides evidence of another mechanism for legal compliance beyond deterrence that has received less attention in the formal literature, namely that state-imposed sanctions can undermine state legitimacy. Moral issues aside, analysis of whether British executions during World War I deterred military desertions provides a test for the death penalty. With over two death sentences per day, historians believe that the decision to execute or commute was basically random, which I statistically corroborate. Using this result and archival data on desertions, I find that executing Irish soldiers spurred absences, especially Irish absences. I find limited evidence that executing deserters deterred British absences. Deterrence is observed primarily for execution rates and in the (less professional) New Army.

There are several aspects of the data I could not explore in this paper: 1) Simulate the battalion enlistment and investigate group attachment depending on ethnic composition of one's battalion. 2) Generate loyalty surname map by calculating frequency of appearance in Police Gazettes relative to the casualties database. 3) Generate an Irish surname map by calculating frequency of appearance with Irish relative to British birthplace.[141] 4) Uncover historical data on Catholic and Protestant birth parishes to check Irish Protestant loyalty. 5) Characterize eyewitness vs. rumor effects by exploiting battalion movement across divisions. 6) Estimate spatial effects by exploiting the distance between divisions. 7) Analyze other levels of unit aggregation subject to minimum of 1 execution, 1 commutation, and 1 absence. 8) Estimate effect of executions on other crimes using FGCM trial registries.[142] 9) Analyze the judicial response to different types of executions. 10) Explore socioeconomic differences by merging with surnames dictionaries by class. 11) Analyze physical descriptions of soldiers (youth, complexion, looks, occupation), especially outcome heterogeneity, e.g., do young soldiers respond more to executions? 12) Structurally estimate half-life of events or decision-making of optimizing Commanders-in-Chief. 13) Construct time from previous battle. 14) Construct physical topography. 15) Uncover trench maps detailing exact location of divisions. 16) Use diaries, letters, and memoirs to characterize pluralistic ignorance to number of deserters or perceived loyalty of comrades and their reactions to non-responses during roll call.

[140] In WW1, American deserters were required to wear a big waistband that had "deserter" on it.
[141] Subject to certain assumptions, both maps would create a continuous measure of loyalty or Irishness.
[142] However, other crimes' trials may be more discretionary and confound soldier and sanctioner behavior.

References

Acemoglu, Daron and Matthew O. Jackson, "Social Norms and the Enforcement of Laws," NBER Working Paper 20369, National Bureau of Economic Research August 2014.

Adamson, Agar, *Letters of Agar Adamson, 1914 to 1919: Lieutenant Colonel, Princess Patricia's Canadian Light Infantry*, first ed., CEF Books, 1997.

Alesina, Alberto and Eliana La Ferrara, "A test of racial bias in capital sentencing," *The American Economic Review*, 2014, *104* (11), 3397–3433.

Apel, Robert and Daniel S. Nagin, "General Deterrence," in "The Oxford Handbook of Crime and Criminal Justice," Oxford Uniersity Press, 2011, pp. 179–206.

Arthur, Max, *Forgotten Voices Of The Great War*, first ed., Ebury Press, 2002.

Ash, Elliott, Daniel L. Chen, and Suresh Naidu, "The Effect of Conservative Legal Thought on Economic Jurisprudence," Technical Report 2016.

Babington, Anthony, *For the Sake of Example: Capital Courts-martial, 1914-1920*, Secker & Warburg, 1983.

Bailey, William C., "Deterrence, Brutalization, and the Death Penalty: Another Examination of Oklahoma's Return to Capital Punishment," *Criminology*, 2006, *36* (4), 711–734.

Baker, Chris, "The British order of battle of 1914-1918," The Long, Long Trail 1996. Retrieved from http://www.1914-1918.net/oob.htm.

———— , "In the trenches," The Long, Long Trail 1996. Retrieved from http://www.1914-1918.net/intrenches.htm.

———— , "The infantry battalion," The Long, Long Trail 1996. Retrieved from http://www.1914-1918.net/whatbatt.htm.

———— , "The Long, Long Trail," http://www.1914-1918.net 1996.

Banerjee, Abhijit V, Esther Duflo, Daniel Keniston, and Nina Singh, "The efficient deployment of police resources: theory and new evidence from a randomized drunk driving crackdown in India," Technical Report, Working Paper, Massachusetts Institute of Technology 2014.

Barkworth, Julie M and Kristina Murphy, "Procedural justice policing and citizen compliance behaviour: The importance of emotion," *Psychology, Crime & Law*, 2015, *21* (3), 254–273.

Barry, Nora, Laura Buchanan, Evelina Bakhturina, and Daniel L. Chen, "Events Unrelated to Crime Predict Criminal Sentence Length," Technical Report 2016.

Becke, Archibald Frank, *Order of battle of divisions*, London: His Majesty's Stationery Office, 1935-1944.

Becker, Gary S., "Crime and Punishment: An Economic Approach," *Journal of Political Economy*, 1968, *76* (2), 169–217.

Beckett, Ian Frederick William, *The Great War, 1914-1918* Modern Wars in Perspective, 2nd ed., Pearson/Longman, 2007.

———— **and Keith R. Simpson, eds**, *A Nation in arms: a social study of the British army in the First World War*, Manchester, U.K.: Manchester University Press, 1985.

Bénabou, Roland and Jean Tirole, "Identity, Morals, and Taboos: Beliefs as Assets," *The Quarterly Journal of Economics*, May 2011, *126* (2), 805–855.

Bénabou, Roland and Jean Tirole, "Laws and Norms," Discussion Paper series 6290, Institute for the Study of Labor (IZA), Bonn, Germany January 2012.

Berdejo, Carlos and Daniel L. Chen, "Electoral Cycles Among U.S. Courts of Appeals Judges," Technical Report 2016.

Besley, Timothy J, Anders Jensen, and Torsten Persson, "Norms, Enforcement, and Tax Evasion," 2015.

Bohnet, Iris and Robert Cooter, "Expressive Law: Framing or Equilibrium Selection?," Working Paper Series rwp03-046, Harvard University, John F. Kennedy School of Government November 2003.

———— **, Bruno S. Frey, and Steffen Huck**, "More Order with Less Law: On Contract Enforcement, Trust, and Crowding," *The American Political Science Review*, March 2001, *95* (1), 131–144.

Bond, Steve, Asli Leblebicioglu, and Fabio Schiantarelli, "Capital Accumulation and Growth: A New Look at the Empirical Evidence," *Journal of Applied Econometrics*, November 2010, *25* (7), 1073–1099.

Bottoms, Anthony and Justice Tankebe, "Beyond procedural justice: A dialogic approach to legiti-

macy in criminal justice," *The journal of criminal law and criminology*, 2012, pp. 119–170.

Bowers, William J. and Glenn L. Pierce, "Deterrence or Brutalization What Is the Effect of Executions?," *Crime & Delinquency*, 1980, *26* (4), 453–484.

Bowman, Timothy, *Irish Regiments in the Great War: Discipline and Morale*, Manchester University Press, 2006.

Burke, Jason, "War leader had officers shot 'to goad troops'," The Guardian news accessed from "http://www.theguardian.com/uk/2001/feb/11/jasonburke.theobserver" February 2001.

Burrage, Alfred McLelland, *War is War*, first ed., London: Victor Gollanczictor Gollancz, 1930.

Campbell, Fergus J. M., *Land and Revolution: Nationalist Politics in the West of Ireland, 1891-1921*, Oxford: Oxford University Press, 2005.

Caplin, Andrew and Mark Dean, "Revealed preference, rational inattention, and costly information acquisition," *The American Economic Review*, 2015, *105* (7), 2183–2203.

Carrington, Charles, *Soldier from the Wars Returning*, first ed., Hutchinson & Co Ltd, 1965.

Chen, Daniel and J.J. Prescott, "Implicit Egoism in Sentencing Decisions: First Letter Name Effects with Randomly Assigned Defendants," Technical Report 2016.

Chen, Daniel L., "Gender Violence and the Price of Virginity: Theory and Evidence of Incomplete Marriage Contracts," Working Paper, University of Chicago, Mimeo 2004.

———— , "Club Goods and Group Identity: Evidence from Islamic Resurgence during the Indonesian Financial Crisis," *The Journal of Political Economy*, April 2010, *118* (2), 300–354.

———— , "Markets and Morality: How Does Competition Affect Moral Judgment?," Working Paper, Duke Law School October 2011.

———— , "Can Markets Overcome Repugnance? Muslim Trade Reponse to Anti-Muhammad Cartoons," Working Paper, ETH Zurich, Mimeo 2014.

———— , "This Morning's Breakfast, Last Night's Game: Detecting Extraneous Factors in Judging," Working Paper, ETH Zurich 2014.

———— , "Can Markets Stimulate Rights? On the Alienability of Legal Claims," *RAND Journal of Economics*, Spring 2015, *46* (1), 23–65.

———— , "Egoism vs. Altruism: Intermediation Reduces Altruism," 2015.

———— , "Evolution of the Judiciary: Political Cycles in Judicial Exits from the U.S. Courts of Appeals," Technical Report 2016.

———— , "Priming Ideology: Why Presidential Elections Affect U.S. Courts of Appeals Judges," Technical Report 2016.

———— , "Tastes for Desert and Placation: A Reference Point-Dependent Model of Social Preferences," 2016.

———— **and Jasmin Sethi**, "Insiders and Outsiders: Does Forbidding Sexual Harassment Exacerbate Gender Inequality?," Working Paper, University of Chicago October 2011.

———— **and Jess Eagel**, "Can Machine Learning Help Predict the Outcome of Asylum Adjudications?," Technical Report 2016.

———— **and Jo Thori Lind**, "The Political Economy of Beliefs: Why Fiscal and Social Conservatives and Liberals Come Hand-in-Hand," Working Paper July 2014.

———— **and Martin Schonger**, "Social Preferences or Sacred Values? Theory and Evidence of Deontological Motivations," Working Paper, ETH Zurich, Mimeo August 2013.

———— **and** ———— , "A Theory of Experiments: Invariance of Equilibrium to the Strategy Method of Elicitation and Implications for Social Preferences," Working Paper, ETH Zurich January 2015.

———— **and Susan Yeh**, "The Construction of Morals," *Journal of Economic Behavior and Organization*, August 2014, *104*, 84–105.

———— **and** ———— , "Growth Under the Shadow of Expropriation? The Economic Impacts of Eminent Domain," Working Paper, ETH Zurich and George Mason University December 2014.

———— **and** ———— , "How Do Rights Revolutions Occur? Free Speech and the First Amendment," Working Paper, ETH Zurich December 2014.

———— **, Matt Dunn, Rafael Garcia Cano Da Costa, Ben Jakubowki, and Levent Sagun**, "Early Predictability of Asylum Court Decisions," Technical Report 2016.

———— **, Moti Michaeli, and Daniel Spiro**, "Ideological Perfectionism on Judicial Panels," Working Paper, ETH Zurich January 2015.

——— , **Motwani Kumar, Vishal Motwani, and Philip Yeres**, "Is Justice Really Blind? And Is It Also Deaf?," Technical Report 2016.

——— , **Tobias J. Moskowitz, and Kelly Shue**, "Decision-Making Under the Gambler's Fallacy: Evidence from Asylum Judges, Loan Officers, and Baseball Umpires," Working Paper, ETH Zurich March 2015.

——— , **Vardges Levonyan, and Susan Yeh**, "Do Policies Affect Preferences? Evidence from Random Variation in Abortion Jurisprudence," Working Paper, ETH Zurich May 2014.

Chen, Daniel, Yosh Halberstam, and Alan C. L. Yu, "Covering: Mutable Characteristics and Perceptions of (Masculine) Voice in the U.S. Supreme Court," Technical Report 2016.

——— , ——— , **and** ——— , "Perceived Masculinity Predicts United States Supreme Court Outcomes," Technical Report 2016.

Cohen-Cole, Ethan, Steven Durlauf, Jeffrey Fagan, and Daniel S. Nagin, "Model Uncertainty and the Deterrent Effect of Capital Punishment," *American Law and Economics Review*, 2009, *11* (2), 335–369.

Committee to Enquire into the Law and Rules of Procedure Regulating Military Courts-Martial/Chairman Lord Darling, "Report of the Committee Constituted by the Army Council to Enquire into the Law and Rules of Procedure Regulating Military Courts-Martial," Technical Report, Great Britain Army Council, London 1919.

Corns, Cathryn and John Hughes-Wilson, *Blindfold and Alone: British Military Executions in the Great War* Cassell Military Paperbacks Series, Orion Publishing Group, Limited, 1 April 2007.

Costa, Dora L. and Matthew E. Kahn, "Cowards and Heroes: Group Loyalty in the American Civil War," *The Quarterly Journal of Economics*, May 2003, *118* (2), 519–548.

Crozier, Brigadier Francis P, *A Brass Hat in No Man's Land*, Jonathan Cape, 1930.

Dai, Zhixin, Fabio Galeotti, and Marie Claire Villeval, "The efficiency of crackdowns: A lab-in-the-field experiment in public transportations," 2016.

Dalton, Hugh, *The political diary of Hugh Dalton, 1918-1940, 1945-1960*, London: Cape in association with the London School of Economics and Political Science, 1986.

Danziger, Shai, Jonathan Levav, and Liora Avnaim-Pesso, "Extraneous factors in judicial decisions," *Proceedings of the National Academy of Sciences of the United States of America*, 2011, *108* (17), 6889–6892.

Denman, Terence, *Ireland's Unknown Soldiers: The 16th (Irish) Division in the Great War*, first ed., Dublin: Irish Academic Press, 1992.

Department of Foreign Affairs, "Shot at Dawn: Report into the Courts-Martial and Execution of Twenty Six Irish Soldiers by the British Army during World War I," 2004.

Dilmé, Francesc and Daniel Garrett, "Residual Deterrence," Technical Report, CEPR Discussion Papers 2015.

Donohue, John J., "Capital Punishment in Connecticut, 1973-2007: A Comprehensive Evaluation from 4686 Murdes to One Execution," 2013.

——— **and Justin Wolfers**, "Uses and Abuses of Empirical Evidence in the Death Penalty Debate," *Stanford Law Review*, 2005, *58* (3), 791–845.

——— **and Steven D. Levitt**, "The Impact of Legalized Abortion on Crime," *The Quarterly Journal of Economics*, May 2001, *116* (2), 379–420.

Drago, Francesco, Roberto Galbiati, and Pietro Vertova, "The Deterrent Effects of Prison: Evidence from a Natural Experiment," *The Journal of Political Economy*, 2009, *117* (2), 257–280.

Dunn, Captain J.C., *The War the Infantry Knew 1914-1919*, first ed., Jane's Publishing Company, 1987.

Edmonds, James Edward, *History of the Great War: Military Operations, France and Belgium*, London: MacMillan and Co., Limited, 1922.

Eeckhout, Jan, Nicola Persico, and Petra E Todd, "A theory of optimal random crackdowns," *The American Economic Review*, 2010, *100* (3), 1104–1135.

Ehrlich, Isaac, "The Deterrent Effect of Capital Punishment: A Question of Life and Death," *The American Economic Review*, June 1975, *65* (3), 397–417.

Ellingsen, Tore and Magnus Johannesson, "Pride and Prejudice: The Human Side of Incentive Theory," *The American Economic Review*, 2008, *98* (3), pp. 990–1008.

Englander, David, "Mutinies and Military Morale," in Hew Strachan, ed., *The Oxford Illustrated History of the First World War*, Oxford University Press, 1998, chapter 14, pp. 191–203.

Eren, Ozkan and Naci Mocan, "Emotional Judges and Unlucky Juveniles," Working Paper 2016.

Fagan, Jeffrey and Alex R Piquero, "Rational choice and developmental influences on recidivism among adolescent felony offenders," *Journal of Empirical Legal Studies*, 2007, *4* (4), 715–748.

——— **and Tom R Tyler**, "Legal socialization of children and adolescents," *Social justice research*, 2005, *18* (3), 217–241.

Fehr, Ernst and Klaus M. Schmidt, "A Theory of Fairness, Competition, and Cooperation," *The Quarterly Journal of Economics*, August 1999, *114* (3), 817–868.

Feld, Lars P. and Jean-Robert Tyran, "Why People Obey the Law: Experimental Evidence from the Provision of Public Goods," CESifo Working Paper Series 651, CESifo Group Munich 2002.

Ferguson, Niall, *The pity of war: Explaining world war I*, Basic Books, 2008.

Fitzpatrick, David, "Militarism in Ireland, 1900-1922," in Thomas Bartlett and Keith Jeffery, eds., *A military history of Ireland*, Cambridge University Press, 1996, chapter 17, pp. 379–406.

Foy, Michael and Brian Barton, *The Easter Rising*, Sutton Publishing, 2001.

Gibson, James L., Gregory A. Caldeira, and Vanessa A. Baird, "On the Legitimacy of National High Courts," *The American Political Science Review*, 1998, *92* (2), 343–358.

Graham-Harrison, W. M., ed., *Manual of Military Law*, 5th ed., London: His Majesty's Stationery Office, November 1907. Great Britain War Office.

Great Britian War Office, *The King's Regulations & Orders for the Army*, first ed., London: His Majesty's Stationary Office, 1914.

Gullace, Nicoletta F., "White Feathers and Wounded Men: Female Patriotism and the Memory of the Great War," *Journal of British Studies*, 1997, *36* (2), 178–206.

Hansard, "House of Commons Debates," 1915. Retrieved from http://hansard.millbanksystems.com/commons/1915/jul/01/courts-martial-death-sentences.

Hansen, Bruce E, "Least squares model averaging," *Econometrica*, 2007, *75* (4), 1175–1189.

Hertwig, Ralph, Greg Barron, Elke U. Weber, and Ido Erev, "Decisions From Experience and the Effect of Rare Events in Risky Choice," *Psychological Science*, 2004, *15* (8), 534–539.

His Majesty's Stationery Office (HMSO), "Report on Recruiting in Ireland 1914-1916," House of Commons Report 1916. Cmd. 8168, Vol. 39.

Hurd, Ian, "Legitimacy and Authority in International Politics," *International Organization*, 1999, *53* (2), 379–408.

i Martin, Xavier Sala, Gernot Doppelhofer, and Ronald I. Miller, "Determinants of Long-Term Growth: A Bayesian Averaging of Classical Estimates (BACE) Approach," *The American Economic Review*, 2004, *94* (4), 813–835.

Jackson, Jonathan, Ben Bradford, Mike Hough, Andy Myhill, Paul Quinton, and Tom R Tyler, "Why do people comply with the law? Legitimacy and the influence of legal institutions," *British journal of criminology*, 2012.

Jahr, Christoph, *Gewöhnliche Soldaten: Desertion und Deserteure im deutschen und britischen Heer 1914-1918*, Vol. 123 of *Kritische Studien zur Geschichtswissenschaft / Kritische Studien zur Geschichtswissenschaft*, Ruprecht Gmbh & Company, 1998.

——— , "War, Discipline, and Politics," in Jean-Marc Berlière, Jonas Campion, Luigi Lacchè, and Xavier Rousseaux, eds., *Military Justices and World Wars (Europe 1914-1950)*, Presses universitaires de Louvain, 2014, pp. 73–105.

James, E. A., *British Regiments, 1914-1918*, London: Samson Books Limited, 1978.

Jeffery, Keith, *Ireland and the Great War* Lees Knowles lectures, Cambridge University Press, 2000.

Jewitt, Ian, "Notes on the Shape of Distributions," Technical Report, Mimeo, Oxford University, Summer 2004.

Jia, Ruixue and Torsten Persson, "Individual vs. Social Motives in Identity Choice: Theory and Evidence from China," 2015.

Johnson, David, *Executed at Dawn: British Firing Squads on the Western Front 1914-1918*, The History Press, 2015.

Kahneman, Daniel, *Thinking, Fast and Slow*, Farrar, Straus and Giroux, 2011.

Kaplow, Louis and Steven Shavell, *Fairness Versus Welfare*, Harvard University Press, 2006.

Karsten, Peter, "Irish soldiers in the British Army, 1792-1922: Suborned or subordinate?," *Journal of Social History*, 1983, *17* (1), 31–64.

Katz, Lawrence, Steven D. Levitt, and Ellen Shustorovich, "Prison Conditions, Capital Punishment, and Deterrence," *American Law and Economics Review*, 2003, *5* (2), 318–343.

Kuziemko, Ilyana, "How Should Inmates be Released from Prison? An Assessment of Parole versus Fixed-Sentence Regimes," *The Quarterly Journal of Economics*, 2012, *128* (1), 371–424.

Lazear, Edward P, "Speeding, terrorism, and teaching to the test," *The Quarterly Journal of Economics*, 2006, pp. 1029–1061.

Leamer, Edward E, *Specification searches: Ad hoc inference with nonexperimental data*, Vol. 53, John Wiley & Sons Incorporated, 1978.

Leonard, Jane, "The Reaction of Irish Officers in the British Army to the Easter Rising of 1916," in Hugh Cecil and Peter H. Liddle, eds., *Facing Armageddon: The First World War Experienced*, London: Leo Cooper/Pen & Sword, 1996, pp. 256–268.

Leventhal, Gerald S, "What should be done with equity theory?," in "Social exchange," Springer, 1980, pp. 27–55.

Lipset, Seymour Martin, "Some Social Requisites of Democracy: Economic Development and Political Legitimacy," *The American Political Science Review*, 1959, *53* (1), 69–105.

Lochner, Lance, "Individual Perceptions of the Criminal Justice System," *The American Economic Review*, 2007, *97* (1), 444–460.

Lucy, Lt-Colonel John Frederick, *There's a Devil in the Drum*, Faber and Faber, 1938.

Mankiw, N. Gregory and Matthew Weinzierl, "The Optimal Taxation of Height: A Case Study of Utilitarian Income Redistribution," *American Economic Journal: Economic Policy*, February 2010, *2* (1), 155–176.

Manski, Charles F. and John V. Pepper, "Deterrence and the Death Penalty: Partial Identification Analysis Using Repeated Cross Sections," NBER Working Papers 17455, National Bureau of Economic Research September 2011.

McAdams, Richard, "An Attitudinal Theory of Expressive Law," *Oregon Law Review*, 2000, *79*, 339–390.

McAdams, Richard H. and Janice Nadler, "Testing the Focal Point Theory of Legal Compliance: The Effect of Third-Party Expression in an Experimental Hawk/Dove Game," *Journal of Empirical Legal Studies*, 2005, *2* (1), 87–123.

——— **and** ——— , "Coordinating in the Shadow of the Law: Two Contextualized Tests of the Focal Point Theory of Legal Compliance," *Law & Society Review*, 2008, *42* (4), 865–898.

Moore, William, *The Thin Yellow Line*, St. Martin's Press, 1975.

Myers, Jason, "The Irish Soldier in World War I: A Complicated Dilemma," 2013.

Nagin, Daniel S, "Criminal deterrence research at the outset of the twenty-first century," *Crime and justice*, 1998, *23*, 1–42.

Nagin, Daniel S. and Cody W. Telep, "Procedural Justice and Legal Compliance," Technical Report 2016.

——— **and John V. Pepper, eds**, *Deterrence and the Death Penalty*, Washington, D.C.: The National Academies Press, 2012. Committee on Deterrence and the Death Penalty; Committee on Law and Justice; Division on Behavioral and Social Sciences and Education; National Research Council.

Oram, Gerard Christopher, *Worthless Men: Race, eugenics and the death penalty in the British Army during the First World War*, London: Francis Boutle Publishers, 1998.

——— , *Military Executions During World War I*, New York: Palgrave Macmillan, 2003.

Ostrom, Elinor, *Governing the Commons: The Evolution of Institutions for Collective Action* Political Economy of Institutions and Decisions, Cambridge University Press, 1990.

Papachristos, Andrew V, Tracey L Meares, and Jeffrey Fagan, "Why do criminals obey the law? The influence of legitimacy and social networks on active gun offenders," *The Journal of Criminal Law and Criminology*, 2012, pp. 397–440.

Peaty, John, "Haig and Military Discipline," in Brian Bond and Nigel Cave, eds., *Haig: A Reappraisal Seventy Years On*, Pen & Sword Books, Ltd., 1999.

Perry, Nicholas, "Nationality in the Irish Infantry Regiments in the First World War," *War and Society*, May 1994, *12* (1), 65–95.

Putkowski, Julian and Julian Sykes, *Shot at dawn : executions in World War One by authority of the British Army act*, new & revised ed., London: Leo Cooper, 2007.

——— **and Mark Dunning**, *Murderous Tommies: The Courts Martial of Thirteen British Soldiers Executed for Murder During the First World War*, Pen & Sword Books Ltd., 2012.

Rabin, Matthew, "Incorporating Fairness into Game Theory and Economics," *The American Economic Review*, December 1993, *83* (5), 1281–1302.

Ramsey, C and L Robinson, "Interim report of the President's task force on 21st century policing," *Washington, DC: Office of Community Oriented Policing Services*, 2015.

Rao, Gautam, "Familiarity does not breed contempt: Diversity, discrimination and generosity in Delhi schools," *Job Market Paper*, 2014.

Reisig, Michael D, Jason Bratton, and Marc G Gertz, "The construct validity and refinement of process-based policing measures," *Criminal justice and behavior*, 2007.

——— **, Justice Tankebe, and Gorazd Mesko**, "Compliance with the law in Slovenia: The role of procedural justice and police legitimacy," *European Journal on Criminal Policy and Research*, 2014, *20* (2), 259–276.

Roth, Alvin E., "Repugnance as a Constraint on Markets," *The Journal of Economic Perspectives*, 2007, *21* (3), 37–58.

Rubin, Donald B., "Estimating Causal Effects of Treatments in Randomized and Non-Randomized Studies," *Journal of Educational Psychology*, October 1974, *66* (5), 688–701.

Rubin, Gerry, "The Last Word on the Capital Courts Martial Controversy in Britain?," in Jean-Marc Berlière, Jonas Campion, Luigi Lacchè, and Xavier Rousseaux, eds., *Justices militaires et guerres mondiales (Europe 1914-1950)/Military Justices and World Wars (Europe 1940-1950)*, Presses Universitaires de Louvain, 2013, pp. 39–56.

Sah, Raaj K., "Social Osmosis and Patterns of Crime," *The Journal of Political Economy*, 1991, *99* (6), 1272–1295.

Sellers, Leonard, *Death for Desertion: The Story of the Court Martial and Execution of Sub Lt. Edwin Dyett*, Barnsley: Leo Cooper, July 2003.

Shayo, Moses and Asaf Zussman, "Judicial Ingroup Bias in the Shadow of Terrorism," *The Quarterly Journal of Economics*, 2011, *126* (3), 1447–1484.

Sheffield, Gary, "Officer-Man Relations, Discipline and Morale in the British Army of the Great War," in Hugh Cecil and Peter H. Liddle, eds., *Facing Armageddon: The First World War Experienced*, Leo Cooper/Pen & Sword, 1996, pp. 413–424.

Sherman, Lawrence W, "Police crackdowns: Initial and residual deterrence," *Crime and Justice*, 1990, pp. 1–48.

Sims, Christopher A., "Implications of Rational Inattention," *Journal of Monetary Economics*, April 2003, *50* (3), 665–690.

Suchman, Mark C., "Managing Legitimacy: Strategic and Institutional Approaches," *The Academy of Management Review*, 1995, *20* (3), 571–610.

Sunshine, Jason and Tom R Tyler, "The role of procedural justice and legitimacy in shaping public support for policing," *Law & society review*, 2003, *37* (3), 513–548.

Sunstein, Cass R., David Schkade, Lisa M. Ellman, and Andres Sawicki, *Are Judges Political?: An Empirical Analysis of the Federal Judiciary*, Brookings Institution Press, 2006.

The Generations Network, "Surnames of Irish Origin," Last Name Meanings Dictionary 2009. Retrieved from http://www.last-names.net/origincat.asp?origincat=Irish.

The War Office, "Field Service Pocket Book," His Majesty's Stationary Office 1914.

——— , "Field Service Regulations, Part II, Organization and Administration," His Majesty's Stationary Office 1914.

——— , *Statistics of the military effort of the British Empire during the Great War, 1914-1920*, London: His Majesty's Stationery Office, March 1922.

Thibaut, John W and Laurens Walker, *Procedural justice: A psychological analysis*, L. Erlbaum Associates, 1975.

Turner, P. W. and R. H. Haigh, *Not for Glory*, first ed., London: Maxwell, 1969.

Tyler, Tom R., *Why People Obey the Law*, Princeton University Press, 2006.

Tyler, Tom R, *Why people cooperate: The role of social motivations*, Princeton University Press, 2010.

——— **and Jonathan Jackson**, "Popular legitimacy and the exercise of legal authority: Motivating compliance, cooperation, and engagement.," *Psychology, Public Policy, and Law*, 2014, *20* (1), 78.

Tyler, Tom R. and Yuen J. Huo, *Trust in the Law: Encouraging Public Cooperation with the Police and Courts* Russell Sage Foundation Series on Trust, Russell Sage Foundation, 2002.

Urlanis, Boris, *Wars and Population*, University Press of the Pacific, 2003.

van Emden, Richard, *The Soldiers' War: The Great War through Veterans' Eyes*, A&C Black, 2010.

Vertova, Pietro and Roberto Galbiati, "How Laws Affect Behavior: Obligations, Incentives and Cooperative Behavior," Working Paper, Bocconi University, CNRS (umr EconomiX) Paris May 2010.

Walker, Stephen, *Forgotten Soldiers: The Irishmen Shot at Dawn*, Gill & MacMillan, Limited, 2007.

Wilson, Carolyn, "Irish Soldiers Train to Fight in German Army," Chicago Daily Tribune March 20 1916.

ONLINE PUBLICATION

A Appendix: Data

A.1 Court Martial Death Sentences and Commutation Data My death sentence data includes all 3,342 sentences, complete with name, unit, offense, sentencing date, rank, and outcome (execution with date or commutation),reference number in national archives, age (if soldier was executed), and theatre of war, from August 1914 to September 1923 (Oram 2003). Original data sources include War Office (WO) records of the trials of soldiers who were executed (WO 71), registers of field general court martial (FGCM) trials (WO 213/2-26), and general court martial (GCM) trials (WO 90).

In my data, the date refers to date of death sentence, which is usually the trial date. It invariably differs from date of execution, which is listed separately.[143] The categories of offenses with the highest number of sentences are: desertion (2,005), sleeping at post (449), cowardice (213), disobedience (120), and murder (118). The other offenses are: Irish rebellion, quitting post (leaving guard duty), striking senior officer, mutiny (which could involve absence but was more related to collective act or conspiracy), offense against inhabitant (i.e., rape), espionage, treason, hostile act, violence, insubordination, absence, sedition, aiding the enemy, casting away arms, possessing firearms, armed robbery, plundering, drunkenness, threatening senior officer, offense against martial law, conspiracy, robbery, theft, attempted assassination, attempted murder, attempted desertion, housebreaking, losing army property, pillaging, aiding enemy while POW, and unspecified/other. In total there are over 30 types of offenses.

Final sentences in the dataset are those punishments (if any) ultimately confirmed by the Commander-in-Chief. Of the 3,342 sentences, 2,724 are from the B.E.F., the remainder coming from other countries like Canada, New Zealand, etc. If the soldier's original death sentence was not confirmed, then the soldier was either given a reduced sentence (hard labor, penal servitude, imprisonment, tied to a fixed object, or reduced in rank) or the sentence was sometimes "quashed" (i.e., vacated). Figure 8A plots the distribution of crimes for those sentenced to death and Figure 8B plots the distribution of crimes for commuted and confirmed death sentences.

A.2 War Diaries Data Absentee lists are partially preserved in monthly war diaries of the Assistant Provost Marshal (APM) for the four-year period from 1914 to 1918. They come from the National Archive Files: a) WO 154 Series — WO 154/112: Monthly War Diary APM, September 1915 - May 1917; b) WO 154/114: Monthly War Diary APM, August 1914 - November 1916; c) WO 154/8: Monthly War Diary APM 9th Army Corps, December 1916 - May 1918.

Lists and descriptions of absentees were printed and circulated with ID Number, Rank, Name, Unit (Battalion Number, Battalion, and Regiment), Date of Absence, Reported by, and Description (usually including age and height, and sometimes also hair color, build, lips, complexion, eyes, teeth, facial hair, and accent; see Appendix Figure 3 for a sample image). The War Diaries span four years, but the bulk of what was preserved in absentee lists is from July 1916-June 1917.

The absentee list was generated in the following manner:[144] The APM was responsible for the military police and the oversight of general military discipline and order. They maintained war dairies and sent reports to the Provost-Marshall at General Headquarters in France. Among his duties for the area of his particular jurisdiction, the APM noted the number of absentees from regiments broadly on a weekly basis. Military units took roll call and attendance every morning (or more frequently). Those not present had to be categorized: killed in action, wounded, missing (prisoner-of-war or wounded), sick or straggler (lost or awaiting return from a "stragglers post" or "battle stop," where they had been gathered up by either

[143] I remove 1 death sentence whose execution precedes the trial date.
[144] Conversations with Putkowski and the British National Archives.

regimental or Military Police). After a month, the names of those who were still absent and not accounted for were forwarded to the Provost Marshall at headquarters where the information was collated with other APM reports. The Provost Marshall would aggregate the material and circulate a printed updated list of the names of men absent for a month by unit for the armies at the front. The APM could then match names/descriptions to any soldier arrested. On occasion, three-month lists seemed to have appeared. These lists revised known absentees making earlier lists redundant.

A.3 Police Gazettes Data A separate absentee list is preserved in the Deserters and Absentees (D&A) supplement to the (weekly) Police Gazette from 1914 to 1918. This data includes: Office Number, Name, Rank, Regiment Number, Corps (Battalion Number, Battalion, and Regiment), Age, Height, Complexion, Hair, Eye Color, Trade (civilian occupation), Enlistment Date, Enlistment Place, Birth Place (Parish and County), Desertion Date, Desertion Place, Marks and Remarks (see Appendix Figure 4). Additional biographical characteristics were merged in from soldiers' attestation papers completed upon joining the Army.

Compared to the War Diaries, the D&A supplement records are much more complete. However, they include absentees both at Home (where it was much easier to desert) and Abroad (in the notes, e.g., "from B.E.F."; for an example, see the "Marks and Remarks" column in Appendix Figure 4).

To provide a sense of data quality, Figure 9A shows the plot of all 126,818 absences at Home or Abroad. The sharp spike in 1914 is the day after the assassination of Archduke Ferdinand, which suggests that quite a few soldiers were reluctant to go to war. In 1916 and 1917, spikes are observed around Christmas, when soldiers are likely reminded of family. Another spike is observed at the end of the war in November 1918, consistent with exhaustion or a belief that there was no death penalty for desertion during peacetime.

Although this paper digitizes the entire database, absences at Home are not subject to the death penalty, so I gleaned 3,009 B.E.F. desertions from this data source by searching for the terms "en route" or "from B.E.F." in the notes field. Figure 9B shows that these B.E.F. desertions occur throughout the war. The majority of these absentees were likely en route from B.E.F. to the UK.[145]

A.4 Trial Records A third source of absentees is preserved in handwritten FGCM registers (WO 213/2-26), dating from January 1914 to November 1919, recording roughly 144,609 trials. The data includes: Date the Record was received, Rank, Name, Battalion Number, Regiment, Place of Trial, Date of Trial, Nature of Charge, Nature (and length) of Sentence, Acquittal (or Not Guilty), Remittance (i.e., commutation to a different sentence or sentence length), and Remarks (e.g., Suspended to serve after the war).

The charges include: Offense to Inhabitants, Mutiny, Cowardice, Absence (including absence from parade or Breaking out from barracks or camp), Striking or violence to a superior officer (and during superior officer's execution of office), Insubordinate or threatening language to a superior officer, Disobeying lawful command of superior officer, Leaving post (sentry or picquet) or asleep on sentry, Drunkenness (and while on duty), Injury and receiving (stolen) property, Losing equipment (and clothing, necessaries, etc.), Stealing and theft, Indecency, Resisting or escaping escort, Escaping confinement, and Other offenses.

The range of sentences includes: Death, Penal servitude, Imprisonment, Detention, Field punishment, Ignominy, Reduction in Rank and Seniority, Fine, Reduction (of pay), and Stoppages (of leave or other privileges).

Sometimes another field, Appeal from Summary Award of C.O., is present. In trials unrelated to desertion, the commanding officer could immediately dispose of the case, but the disposal was subject to

[145]Email from Putkowski on November 4, 2012.

the right of the accused, in certain cases, to demand trial. In the data, only 0.5% of desertion trials and 3% of absence trials come from an appeal. I do not make a different calculation of dates of absence for trials that come from an appeal since both the initial judgment and the soldier's exercise of his right to demand a trial instead of summary judgment were likely to have been immediate.

There are 28,754 trials for absence and 13,309 trials for desertion. The number of death sentences across all crimes was 2,858; the number of death sentences for accused deserters was 1,730. 449 of the accused deserters were not guilty, but the remaining received some kind of sentence. Some of the difference from the official statistics may be attributed to data entry errors as handwriting is notoriously difficult to transcribe. For all crime variables, I interpret any mark in the column in the affirmative. Note that these data are registers (see Appendix Figure 5) and not the trial proceedings themselves, most of which no longer exist. The trial proceedings that survive are primarily of those where the accused was executed, and these have already been previously analyzed by historians.

All three absentee records represent different samplings of the true desertion rate. When I compare post-execution outcomes to post-commutation outcomes within a particular unit, I minimize the potential bias that results from error in measuring outcomes. For example, if desertion and absentee lists are under-inclusive because of poor preservation or if they are over-inclusive because they include those who were killed, were prisoner of war by accident, or were stragglers, these measurement errors would affect both treatment and control groups equally. Or, since only the trial date is recorded, the time delay between desertion and apprehension should be similar in both treatment and control. I merge the FGCM data into the Order of Battle assuming that the absence occurred one month earlier and analyze the data accordingly.

A.5 Casualties Data I utilize the Soldiers Died In the Great War database containing 658,555 casualties to proxy for point-in-time danger by unit and by date. Casualties predict desertion (Costa and Kahn 2003). This data includes: regiment, battalion, surname, first (and middle) name, birthplace town and county, enlistment town and county, regimental number, rank, killed in action, died of wounds, died, theatre of war of death, date of death and supplementary notes. Thus, I can match this data to desertion dates by military unit to control for high frequency changes in perceived danger.

An interactive version of this data can be viewed at http://tinyurl.com/hwx2ctf.[146] B.E.F. casualties over the course of the war are displayed in the top panel and France-Flanders casualties in the bottom panel. The estimated casualties (in thousands) are expressed as number pairs in the format (German/Allies) in red and blue. Red indicates casualties from battles initiated by Germany.

Another interactive version allows comparing casualties with the execution rate and is available at http://tinyurl.com/j7wqt3n.[147] France-Flanders casualties are displayed in the top panel and death sentences in the format (execution/sentences) in the bottom panels. Figure 6 presents a screenshot. Casualties and casualty rates are positively related since officers tried to fill in the divisions in a manner such that the divisions were roughly constant in size.

[146] https://dl.dropboxusercontent.com/u/8089659/DPdeterrence/AnimatedCharts/Casualties.FranceBEF.html. Safari or Internet Explorer works best for viewing, and loading of scripts may need to be manually toggled.

[147] https://dl.dropboxusercontent.com/u/8089659/DPdeterrence/AnimatedCharts/FranceBEF.html. Safari or Internet Explorer works best for viewing, and loading of scripts may need to be manually toggled.

A.6 Irish Surnames A list of 426 Irish surnames identifies soldiers of probable Irish ethnicity.[148] The use of this data is subject to the caveats of potential measurement error. Differences between Irish and British soldiers would be underestimated to the extent soldiers are sometimes mis-categorized.

A.7 Service and Pension Records The Service and Pension Records were obtained from Ancestry.com, which digitized the original records held at the British National Archives (WO 363 and WO 364). The Service and Pension Records generally include name, age of enlistment, birth parish, birth county, residence address, regimental number, and date of attestation.

The Service Records (WO 363) comprise roughly 2 million non-unique records. Of the original 6.5 million Service Records, only 40% survive from destruction during a German bombing raid on London during World War II. These records are also known as the "Burnt Documents" or "Burnt Records" due to charring and water damage in the records that survived. These records are for soldiers who were discharged, demobilized at the end of the war, who died between 1914 and 1920 and who were not eligible for an Army pension. Some soldiers who were in the regular army before the outbreak of war in August 1914 may, however, be included in this class of records. The Service Records do not include soldiers who continued to serve in the military after 1920. Their records are not available for public access.

In addition to the 2 million or so "Burnt Documents", there are the Pension Records (WO 364), comprising roughly 1 million non-unique records, which contain information on soldiers who were discharged from the army and claimed disability pensions, so some records also include date and place of injury. These records are for soldiers who were discharged for medical reasons (illness or wounds) during the First World War. These records also include soldiers who were in the British Army before August 1914 and who were eligible for an Army pension because their term of service came to an end in or before 1920. This group of records are known as the "Unburnt Documents". These records are unlikely to contain information on three non-exclusive groups of individuals: (1) those who did not claim a pension, (2) those who were discharged from demobilization at the end of the war (since they were generally not eligible for pension), (3) those who were killed in action and had no dependents (as there would have been no one to claim a pension).

I match the Service and Pension Records by name, where possible, to the death sentences dataset. This provides additional covariates for checks of random assignment. Together, they provide 2.7 million unique records identified by name, regiment, and residence. Even though the data is incomplete, age is useful to merge in because age is only recorded in the capital sentences data for soldiers who were executed, but age is recorded in the Service and Pension Records for non-executed soldiers. Therefore, the combined data can serve to check for correlation between the execution decision and soldier's age. In this kind of analysis, missing data is dummied out and an indicator for whether age is missing is included. The Service and Pension Records are also useful to examine the Irish surname database.

A.8 Unit of Analysis It is necessary to choose a unit of analysis for the study. Military organizations are obviously hierarchical and there is a great deal of discretion in choice of unit-size. The casualty data and absence data are at the battalion level, so I could in principle choose any unit from this level up to the Corps. While there are exceptions, in general, the sequence of military units listed from lowest to highest was: Battalion → Regiment → Brigade → Division→ Corps → Army → Army Group. Each higher level of organization contains three or four subordinate units plus headquarters and higher-level assets. A battalion consisted of 1,000 men, with 3 to 4 battalions per brigade and 3 to 4 brigades per division. With

[148]Surnames of Irish Origin. (2009) Last Name Meanings Dictionary. Retrieved from http://www.last-names.net/origincat.asp?origincat=Irish.

the addition of support, a division consisted of between 18,000 and 19,000 men and would occupy up to 15 miles of road while moving (Corns and Hughes-Wilson 2007, p. 108). According to historical accounts, the division commander was the highest-level commander whose commutation recommendation was ignored (Oram 2003, p.129; Babington 1983, pp. 78-79, 103). I do not know anything about ignored execution recommendations, because the records of the commuted cases were destroyed. If higher-level commanders did target based on discipline or show discretion, then the division is the highest level appropriate for analysis.

The thinness of the outcome data also compels a fairly high level of organization, even though the salience of an execution and hence its deterrence effect (if any) would be strongest at lower levels of organization. To be included in the analysis, units must contain at least 1 execution, 1 commutation, and 1 absence. From the War Diaries data, I identify 676 usable matches preserved mostly from July 1916 to June 1917–roughly one-third of the war. The upper panel of Figure 1 plots the distribution of matches from 700 to 1100 days after the assassination of Archduke Ferdinand on June 28, 1914. World War I officially began one month later on July 28. The median time between trial and next recorded desertion at the division level is about two weeks. From the Police Gazettes, I identify 3,009 B.E.F. deserters for all four years of the War; 1,319 of these are merge-able with the Order of Battle. From the trial data, I identify 45,824 usable matches for all four years; 4,365 of these matches are desertion trials.

A.9 Order of Battle and Merging To conduct the analysis, each event (death sentence, desertion, or casualty) must be assigned a particular division. But most of the sources list the battalion of a soldier, not his division. To determine the division, I developed a table of division assignments for each battalion. Complicating this effort was the fact that battalions changed divisions throughout the war—in response to particular strategic goals or needs of the divisions. The Order of Battle dataset provides the means to determine, for a given battalion on a given date, which division was commanding. To develop this dataset, I relied primarily on the Long, Long Trail (LLT) website. The website, available at http://www.1914-1918.net, is based on James (1978). A sample appears in Appendix Figure 13. This website gives, in mostly paragraph form, a time history of each battle unit and, in particular, the movement among divisions and brigades. Appendix C documents how the Order of Battle was entered.

The website gives this data in two main forms. The first form focuses on the battalion (or other unit), and describes in chronological order the movements of that unit. The second form focuses on the division, and describes the movement of units into and out of the division. Combining these two data sources and focusing on the mergeable units (some units like Army Service Corps are impossible to merge) yields over 7,800 associations between battalion to brigade to division. Appendix B describes the process of merging and additional challenges, such as different spellings or abbreviations. I also track higher-level unit transfers (e.g., transfers from divisions to corps to army), constituting an additional 770 associations between the divisions to corps to army. The two data sources are LLT and Edmonds (1922).

With the exception of Service and Pension Records, I do not merge by soldier name across datasets. All datasets were scanned digitally and then checked, with the remaining non-scannable entries entered, by hand. The trial registers were written in cursive handwriting. The lack of computerized records from this time period makes prohibitively difficult the linking of absentees by name to their trial and to their death sentence date, if any. Absentee lists are only a sample of the universe of absentees. So any conclusion about the deserters being invariably caught (thus potentially appearing in the trial registers) rests on historians' statements and on the inferences rendered from the aggregate data. The inability to merge by name also precludes extensive balancing checks based on demographic data stored in datasets other than

the lists of executions and commutations.

A.10 Medal Rolls The inability to match by name precluded the use of the Medal Rolls Index (WO 372), which I obtained in digital form from the British National Archives. Virtually all soldiers who served received at least the British War Medal for "entering a theatre of war or rendering approved service overseas" and there are 5,424,254 unique soldiers and a total of 7.8 million records (some soldiers received multiple medals). This data provides the name, rank, regiment, regimental number, medal entitlement, first theater of war and date of entry, information on soldiers who forfeited their medal entitlement because of disciplinary infringement, and additional remarks (e.g., date of death or discharge). Merging by Medal Rolls Index would regularize the spelling of the military unit for ease of merging into the Order of Battle, but merging the absentee, casualty, and trial data directly into the Order of Battle proved more effective. Instead, I use this data to make assessments about the Irish surname dictionary by comparing against the official statistics regarding Irish enlistment, which I am able to do since the Medal Rolls Index contains roughly the universe of all enlisted soldiers.

A.11 Officers I digitize a dataset of the 2,992 commanding officers and general staff officers for division, corps, army, and general headquarters and the dates of their assignments and reassignments throughout the war (Becke 1935-1944). Officer data enables additional checks of whether the decision to execute or commute was correlated to officer identity and ethnicity and whether the soldier's decision to desert is correlated with his officer's identity and his officer's ethnicity inferred using the surname dictionary. These data are merged into the Order of Battle.

A.12 Geographic Location The Order of Battle also contains major battles and the divisions associated with each battle. In the great majority, battles are named after the town or city in which, or near which, they took place. The towns can be entered into Google Maps, which provides geographic coordinates. I make the albeit simple assumption that divisions travel linearly and incrementally from one battle to the next to interpolate the rough location of each division on any date. Finally, these coordinates yield calculations of distances between divisions, distance to the English Channel, and distance to Berlin, which serve as additional controls. This data allows estimating the approximate location of each soldier on the day of his absence. I also use Google Maps to geolocate the enlistment towns, birthplaces, and residences of soldiers when this data is available and I analyze this data in Appendix D.

B Appendix: Description of Merging Process

To recapitulate, the data is the outcome of the following data generating process: absentees, which led to –> trials, which led to –> convictions, which led to –> death sentences, which led to –> executions or commutations, which led to a potential causal effect on subsequent absentees. Absentees are measured in the War Diaries, Police Gazette (B.E.F. subset), and Trials (absentee and deserters subset).

Each event (death sentence, absence, or casualty) needs to be assigned a particular division. Each of six datasets:

1. Absentees-War Diaries,
2. Absentees-Police Gazettes,
3. Trials,
4. Death sentences,
5. Casualties, and
6. Officer lists,

is merged into the Order of Battle. Each dataset has a different set of keys, the most important of which is date, because the lower level military units moved between different higher level units throughout the war. Each of the six datasets is also merged into the Irish surname dictionary. The Order of Battle is itself merged into a list of battle locations to yield geocodes. The Service and Pension Records is merged by name into each of the six datasets to obtain a handful of its covariates like age and birthplace. No attempt is made to merge any other datasets by soldier name because of the difficulty in the merge due to spelling and non-unique names.

The original sources are typed, with the exception of the trial registers, which are hand written. This paper digitizes absentees, trials, officers, battle locations, and the Order of Battle. Casualties, capital sentences, Irish surnames, Medal Rolls Index, and Services and Pensions Records were previously digitized. Unit names were not the same in different data sources because of data quality and different ways of spelling or abbreviation. As a first step in the data cleaning, names of military units were disabbreviated with the help of historical sources and historians. For instance, the short form (ASC, RFA, DAC, KRRC, MGC, RAMC, RAOC, RE, RGA, RHA) is changed to the respective long form (e.g. Army Service Corps, Royal Field Artillery, etc.). More examples of abbreviations are at: http://www.1914-1918.net/abbrev.htm. The Order of Battle also is entered with some difficulty. Battalions are recorded both on regimental pages and divisional pages. Regiment pages appear to be more complete and reliable and are given priority in data entry. Additional information on the Order of Battle digitization is provided in Appendix C.

Linking the datasets to the Order of Battle is based on up to three variable keys: 1) Battalion name (sometimes company or platoon name) and/or battalion number, 2) Regiment name, and 3) Date (absence, casualty, or trial date). A regiment name typically refers to a geographic location in the UK. Each regiment has many numbered battalions. The battalions usually travelled in different divisions. All three variable keys are necessary for an exact match. In addition, matching on only battalion number and regiment string is possible because battalions within a regiment typically had unique battalion numbers.

The data linkages are generated through two steps: exact matching and algorithms. For exact matching, all datasets employed a manual look-up table to serve as an exact translation of a unit to a combination of regiment and battalion in the Order of Battle. Cross-checking with historical sources and historians

yielded a manual look-up table linking the battalion/regiment string in each of the six datasets to the equivalent battalion/regiment in the Order of Battle.

The exact lookup is composed of two steps: the actual exact lookup of the unit followed by a date matching in the Order of Battle. If both conditions yield a match, then the first round is deemed successful. Most matches were derived from this exact lookup. In a few instances, battalions are formed from existing battalions that do not have an official separate entry in Order of Battle or are renamed into new battalions that also do not have a separate entry, resulting in the soldier being listed as deserting or dying on a date when the battalion does not exist in the Order of Battle. In these instances, the nearest date on which the brigade and division is affiliated with the named battalion is used. Where a precise date is identified, it usually refers to only the headquarters arrival or departure.[149] The nearest-date assumption allows time for a unit to reorganize during relocation. If the battalion is not listed affirmatively as not having a brigade/division in some date range (for instance, headquarters may be moving from one location to another), the battalion will be assigned to the nearest brigade/division by date. If the battalion is listed affirmatively as not having a brigade/division in some date range (for instance, the battalion is in another part of the world when the war began) but the soldier's date falls in that range, he will be un-assigned.

For example, if a battalion is stated as being part of a brigade/division and does not mention a date, it will be associated for the entire war. If a battalion is stated as being part of a brigade/division and forming on December 1914, the Order of Battle will not have an entry for this battalion before December 1914 and the soldier will also have that association for dates prior to December 1914. On the other hand, if the battalion is stated as forming in August 1914 and then arrives in December 1914 as part of a brigade/division, then the Order of Battle will have an entry of "null" for this battalion before December 1914 and it will not be associated with anything before December 1914. Further, if it is first mentioned on December 1914 as being affiliated with that brigade/division but the Order of Battle does not state a date of formation, then the battalion will have an entry of "null" in the Order of Battle prior to December 1914 and will not be associated with anything before December 1914. Previous analyses making different assumptions about the dates of battalion associations do not seem to be material to the final inference. In addition, the first date of the war and the last date of the war are assumed when the first date at the beginning of the war and last date at the end of the war for a battalion's association with a brigade and division are not explicitly stated.

In some instances, the military unit could not be identified easily by hand for an exact lookup. An algorithm is then used, which involves approximate string distance matching and the prioritization of variable keys to allow for minor typos in the original record or data entry. For example, the Order of Battle occasionally lists battalions together as a single record. In some datasets, battalion and regiment are not separated into separate variables in the original raw data. The raw data would leave the information in such an abbreviated form that the entire string was used to match against the battalion and regiment keys. This algorithmic step extracts the battalion number and separates it from the regiment, because in most cases, battalions can be uniquely identified simply by its number within a regiment. Some inference can also be made if the best possible matches all locate the battalion in the same division. In the algorithmic step, the nearest date is not used to facilitate the merge; an exact match for the date is required. Matching the regiment string also involved de-abbreviations, or if no de-abbreviation, a manual look-up. A Jaro-Winkler string distance score was calculated comparing the closest OOB regiment match with the extracted regiment. When multiple matches were available within a string distance of 0.20, it was

[149]Email from Putkowski on September 14, 2015.

checked whether all potential matches yielded the same division and brigade. If only a single match was available, then any match with string distance worse than 0.05 was discarded. Records without absence dates or battalion numbers were discarded.

Finally, after merging the records into the Order of Battle brigade and division, the brigades and divisions are assigned unique identifiers because the Order of Battle occasionally uses different names to refer to the same division or same brigade. One form of measurement error is unavoidable: when the Order of Battle does not record the exact day of month when a battalion moves to another division, I assume the transition occurs on the first day of the month. Other measurement errors in the merging process are assumed to be orthogonal to the execution or commutation decision.

Duplicates are also removed during the data cleaning process. Any soldier with the same first name, last name, regiment number, and record date are made unique in the following datasets. Any soldier's record without a date is also dropped.

B.1 Capital Sentences merge to Order of Battle The capital sentences dataset already provides a numerical code for brigade and division, so linking to the Order of Battle merely required decoding. However, brigade data was often not included in the original data, so these were looked up and entered manually by searching for the regiment and battalion, checking that the original division data is correct for the record's date, and entering the brigade that is correspondingly listed in the Order of Battle.

B.2 Absentees-War Diaries merge to Order of Battle The War Diaries dataset is merged using the Unit (which contains battalion name, battalion number, and regiment name) to the Order of Battle. The units are first matched manually as best as possible, using historical consultations, de-abbreviations, and a look-up table. Units where there is no possible way to uniquely identify the match are dropped (e.g., a unit listed as, 1st Engineers, would be impossible to disambiguate). The second round of matching uses the Jaro string distance between the combination of battalion number, battalion name, and regiment name with its equivalent in the Order of Battle. The algorithm makes pairwise comparisons between every possible match in the Order of Battle and takes the best match if the distance is below a threshold. Battalion and regiment string distances are given equal weight in priority. However, the battalion number is required to be an exact match.

B.3 Absentees-Police Gazettes merge to Order of Battle The Police Gazettes dataset is merged using Corps (which contains battalion name, battalion number, and regiment name) to the Order of Battle. The units are first matched manually as best as possible, using historical consultations, de-abbreviations, and a look-up table. The second round of matching uses the Jaro string distance between the combination of battalion number, battalion name, and regiment name with its equivalent in the Order of Battle. The algorithm makes pairwise comparisons between every possible match in the Order of Battle and takes the best match if the distance is below a threshold. Battalion and regiment string distances are given equal weight in priority. However, the battalion number is required to be an exact match.

Dates in the Police Gazettes did not include calendar year. Calendar year is inferred from the publication date of the newspaper gazette. For example, December absence recorded in a January gazette would have the year be set as the year prior to the publication date.

B.4 Trials merge to Order of Battle The FGCM dataset contains only Regiment name and Battalion Number. The regiment name is first matched manually as best as possible, using historical consultations, de-abbreviations, and a look-up table, to the regiment in the Order of Battle. Then, additional records with spellings that are close to the matchable FGCM regiment strings are replaced with the matchable spellings via algorithm to address minor errors in the handwriting transcription. Next,

the battalion number and regiment string are used to find its equivalent in the Order of Battle. The second round of matching uses string distance between the combination of battalion number and regiment name to find its equivalent in the Order of Battle. The algorithm makes pairwise comparisons between every possible match in the Order of Battle and takes the best match if the distance is below a threshold. Because these strings are noisier than in the other datasets, both the Jaro string distance and the Levenshtein string distance are employed. The battalion number is sometimes missing in FGCM. In this scenario, all possible matches are examined and checked to see if they all yield the same brigade/division, if so, then that brigade/division is assigned. Note that because the exact date of absence is not recorded, I assume that the absence occurred one month before the trial date and deduct this month accordingly before merging with the Order of Battle. This ensures that the news a potential deserter responds to is merged in from the correct division in case the battalion has moved divisions in the meantime. However, the true trial date is kept for all analyses.

B.5 Casualties merge to Order of Battle The casualties dataset contains battalion, regiment, and battalion number. This dataset was previously digitized, so linking to the Order of Battle merely required decoding. However, some records are lost in linking to Order of Battle because the Order of Battle did not provide information on the brigade and division for some battalions. These casualties are dropped.

B.6 Officer List merge to Order of Battle The officers are already organized by each of the higher level units (Brigade, Division, Corp, Army, and General Headquarters).

B.7 Merging to Service and Pension Records Linking to the Service and Pension Records requires the soldier name. The first name is often abbreviated. If so, only the first letter of the first name is used in the merge. Sometimes the raw data includes first and middle initials in capital letters without punctuation separating the two initials. The two initials would be separated before merging by name.

The matching algorithm involves a mix of exact-match requirements and minimum distance calculations. Battalion number and first letter of the first name are required to match exactly. Matching based on unit names and the remainder of a soldier name is based on approximate string distance: Levenshtein distance is used for soldier names and the Jaro distance is used for unit name. The reason for using Jaro when matching military units is that the *number* of strings describing the military unit often differs across datasets. These extra strings do not impose as much of a penalty when using the Jaro distance.

The **Levenshtein** distance counts the number of deletions (d), insertions (i) and substitutions (s) necessary to turn two strings, A and B, in the other. All characters, including spaces and punctuations, count. This distance is bounded, for instance if A contain n_A characters and B contains n_B characters, the lower bound is $n_A - n_B$ and the upper bound is n_A (if $n_A > n_B$) or n_B (if $n_B > n_A$). This distance metric is more appropriate for a single string, like a surname.

The **Jaro** distance is a heuristic measure. Let n_{AB} be the number matching characters between A and B and n_t the number of transpositions of the n_{AB} matching characters. Two characters c_A and c_B are said to be matching in A and B if and only if $c_A = c_B$ and the index (position) of c_A in A is less or equal to $\lfloor 0.5 \cdot \max(n_A, n_B) - 1 \rfloor$. Then, the Jaro distance is:

$$d_{A,B} = 1 - \frac{1}{3}\left(\frac{n_{AB}}{n_A} + \frac{n_{AB}}{n_B} + \frac{n_{AB} - n_t}{n_{AB}}\right). \tag{1}$$

This distance is bounded between 0 (exact match) and 1 (complete dissimilarity). It is also defined as 1

when there are no characters in common between A and B.

Given two vector of strings $\underline{A}$ and $\underline{B}$, each element of $\underline{A}$ is compared with each element of $\underline{B}$. Let A_1, B_1, and B_2 be strings. A_1 matches B_1 better than B_2 if and only if $d_{A_1,B_1} < d_{A_1,B_2}$. In declaring a string match of one element A_j of $\underline{A}$ with one element B_k of $\underline{B}$, two conditions must be satisfied:

1. A_j matches better to B_k than how it matches to any other element of $\underline{B}$: $d_{A_j,B_k} = \min\left\{d_{A_j,B_s},\ s = 1,\ldots,m_B\right\}$, where m_B is the number of elements in $\underline{B}$.

2. $d_{A_j,B_k} < \tau$, where τ is a deterministic threshold

A higher threshold is allowed for merging Service and Pension Records than for merging Order of Battle because the data is recorded with poor quality. Data that was hand-entered as "[?]" could have been treated as a wildcard for the purposes of matching, which would have greatly increased computation time. Wildcards are dropped instead since dropping them does not affect the string distance functions much.

B.8 Irish Indicator Each of the six datasets is also merged into the Irish surname dictionary. This is based on an exact name match. A second Irish indicator is imputed using the merge with Service and Pension Records. The place of birth is matched to Ireland. The second indicator is used in robustness checks but is not the main indicator because the Service and Pension Records merge is not strong, but it is used to conduct validity checks on the surname dictionary.

B.9 Merging with Higher Order Units (Corps, Army, and General Headquarters) Linking the division to the higher order units is more straightforward because it does not involve data external to the Order of Battle. However, sometimes the Order of Battle does not report for some dates the association of a division to a particular corps or army. In this case, a match is made to the chronologically closest corps or army that the division is part of. This is because the official dates of association typically refer to the headquarters' relocation, but given the size of the unit, the soldiers themselves could take quite awhile to relocate. If the previous hierarchy is unknown for matching divisions to corps, a match is made by looking forward in time and for the next corps that the division is associated with. If the previous hierarchy is unknown for matching corps to army, a match is made by looking forward in time and for the next army that the corps is associated with, with exceptions noted below. In a handful of cases, the Order of Battle reports that the division is associated with more than one corps/army. In those cases, a match is made to the corps/army that has the longest association with the division.

Corps outside of France and Flanders are linked directly to a general headquarter. The four other general headquarters whose officers are recorded are located in Salonika, Egypt (Palestine), Gallilopi (Mediterranean), and Italy. Some corps fought first in Italy and then in France. Only corps in Italy have an associated army unit. Units associated with these corps are assigned to the appropriate army while they are fighting outside France. Army units are associated to general headquarters on exact dates.

B.10 Geolocation Linking to the battle is straightforward because it does not involve data external to the Order of Battle. A battalion is not assigned a geolocation before its first battle or after its last battle and is assumed to travel incrementally from one battle to the next. The air distance is calculated to the English Channel and to Berlin.

B.11 Final Dataset The final dataset contains 14,466 unique records of soldiers who were absent or sentenced to death. Observable individual, unit, and environmental characteristics are merged from all other datasets. The variables are summarized below:

Environmental characteristics are derived as follows:

- **Battle environment**: Number casualties in each division and brigade at each point in time. One number for British and one for Irish.
- **Morale**: Number of absentees in each division and brigade at each point in time. One number comes from each of War Diaries, Police Gazettes, and FGCM. These numbers are further broken down by British and Irish.
- **Disciplinary environment**: Number of death sentences and number of trials in each division and brigade at each point in time. The death sentences number comes from the capital sentences dataset and the number of trials comes from the trial dataset. These numbers are further broken down by British and Irish.
- **Executions environment**: Number of executions in each division and brigade at each point in time. This number comes from the capital sentences dataset. These numbers are further broken down by British and Irish.

The environmental factors are calculated in and around a time window of 30, 60, and 90 days before, after, or before and after the current day, never including the current day (so a 30 day window is really a 29 day window before and after the current day).

The final list of variables are:

- Name - Name of the soldier
- Unit - Unit of the soldier, typically battalion
- Rank - Rank of the soldier, typically private but in some cases also specific officer rank
- Date - Absence date (War Diaries and Police Gazette), sentence date (Capital Sentences), or trial date minus 30 (FGCM dataset)
- CaseType - Crime such as desertion, absence, or quitting (FGCM dataset)
- Sentence - Commutation or execution
- Location - The city name (FGCM dataset) or a general indication such as B.E.F. (War Diaries and Police Gazette) or F&F
- OtherType - Other crimes the soldier was tried for or miscellaneous info about the sentence
- Brigade, Division, Regiment, Battalion - Name of each unit the soldier was part of on that date
- Dataset - Name of the dataset where the record comes from
- LastName, FirstName, FirstLetterLastName - Soldier's name
- DeathSent - Indicator for whether the soldier is sentenced to death (FGCM dataset)
- CorpName, ArmyName, GHQName - Name of additional units the soldier was part of on that date
- BrigOfficerName, BrigOfficerRank - Name and rank of the 1st officer in command of the soldier's brigade
- DivGOCName, DivGOCRank, DivGSO1Name, DivGSO1Rank - Name and rank of the Division General Officer Commanding (GOC) and Division 1st grade staff officer (SO)

- CorpGOCName, CorpGOCRank, CorpBGGSName, CorpBGGSRank - Name and rank of the Corps GOC and Corps staff officer
- ArmGOCName, ArmGOCRank, ArmMGGSName, ArmMGGSRank - Name and rank of the Army GOC and Army staff officer
- GHQChiefName, GHQChiefRank, GHQCGSName, GHQCGSRank - Name and rank of the C-in-C and the staff officer of the B.E.F.
- LastName_SP, BirthParish, BirthCounty, Residence, Age, DocYear_SP, regiment_SP, FirstName_SP - Information from the Service and Pension Records
- Irish - Indicator of whether the soldier's surname is Irish
- DistCoast, DistBerlin - The air distance of the division of the soldier record to the English Channel and to Berlin, obtained from linking with the Geo Location dataset

C Order of Battle

This section describes some of the assumptions and procedures used when entering the entire Order of Battle from The Long, Long Trail (http://www.1914-1918.net/). Battalions are recorded both on regimental pages and divisional pages. Regiment pages appear to be more complete and reliable and are given priority in data entry.

Battalions, brigades, and divisions also had multiple spellings, e.g., Highland Division and 51st Highland Division and 51st Division. Priority was given to the longest spelling and, in general, to make all identifiers unique even when the original data did not provide a unique string for a single military unit. The division pages sometimes have a lot more specific information than the regiment page on the exact name of the brigade or division. The division page would be relied upon for the more complete information. Geography or unit number often uniquely identify the military unit. However, some data records needed to be dropped because there was either contradictory geography and unit number identifiers (e.g., 55th 2nd West Lancashire Division would be dropped because there was a 57th 2nd West Lancashire Division) or the information was not specific enough to identify the unit (e.g., Welsh Division).

Interpreting the Order of Battle also required several assumptions. The regimental pages are organized by battalion. For each battalion, each of its association to a particular brigade and division would come with the identity of the brigade and division and the beginning and end date of the association. If the start or end date of a battalion is not listed and the association is chronologically the first or last for the battalion, then the first and last date of World War I is assumed. When only month and year are provided, the 1st of the month is assumed.

Sometimes, a battalion is amalgamated with or absorbed or formed into another battalion. In this case, the division and brigade of the new battalion is entered for the old absorbed battalion from the date of absorption all the way to its end date to ensure that data was not lost in merging. The other datasets would sometimes record a soldier as being part of the absorbed battalion after the battalion was absorbed. For example, 11th service battalion pioneers of the King's Liverpool Regiment was absorbed by the 15th Battalion of the Loyal North Lancashire Regiment on 17 June 1918. The details for the 11th service battalion June 17 onwards would be entered from information for the 15th battalion, because now the 11th service battalion is part of the 15th battalion.

If a battalion is formed on a certain date, say 1 Aug 1914, but is assigned a division and brigade at a later date, say 1 September 1914, the first entry for this battalion would be 1 Aug 1914-1 September 1914, and the division and brigade would be null. If a battalion was disbanded on a particular date, the date of disbandment would be the end date. In practice, this means any soldier attached to the battalion before it got assigned to a division and brigade or after the battalion was disbanded would not merge into the other datasets. This is because if a soldier deserted or was sentenced on a particular date in this unit, we affirmatively know that the soldier should not be part of a division or brigade. In contrast, if the Order of Battle simply has no information for a battalion, the soldier is attached to the division or brigade nearest in date (see Appendix B), because we do not know affirmatively that the soldier should not be part of a division or brigade.

Continuous connections to brigade or division are assumed unless the original data said explicitly that the battalion left the division or brigade and there is no information on another division or brigade assigned. For example, if the battalion was assigned to another division without any information on brigade, the previous brigade information was assumed. Similarly, previous division information was assumed if the battalion was assigned to a new brigade without any new information being provided on

division. In all instances, the divisional page would be cross-checked for more information. Sometimes, a battalion may move to another division as "divisional troops", in which case no brigade would be recorded in the data entry.

As long as there is information available on the original battalion, this information would be tracked in data entry. For instance, if a battalion is reduced to cadre strength, and personnel are transferred to another battalion (hence, usually to another division) and the cadre is reported to be in a different division, information on the cadre is entered for the battalion, i.e., entries reflect the division and brigade information of the cadre.

Sometimes, the Order of Battle would report the battalion assignments to be "same as" or "similar to" another battalion. Sometimes battalions would be listed together with identical battalion assignments. These information would be, as best as possible, carefully separated out to facilitate merges. Sometimes the location assignments were not detailed enough for data entry, e.g., data on cyclist units. Occasionally, absentees would be recorded as part of training reserve battalions, which were in the UK, so these absentees were also dropped during the merge. Cavalry divisions were also ambiguous so if a battalion was listed as being associated with a numbered cavalry division and then an unnumbered cavalry division, the numbered cavalry division was assumed. Finally, sometimes the battalion has different names but are identical as far as one can tell from the Order of Battle (e.g., 483$^{\text{rd}}$ field company and 1 ea anglian field company); they are listed in the Order of Battle under each name in case the raw data lists soldiers as being part of one battalion or the other.

D Assessing Irish Ethnicity

There are three ways to assess Irish ethnicity: surname dictionary, regiment, and birthplace. Each source of data on absentees, death sentences, and casualties has name and regiment, but only three databases–Service and Pension Records, Casualties, and Police Gazettes–have birthplace and enlistment location. For reasons described below, I use surname instead of regiment to infer Irish ethnicity. Linking by name to access these location data is presently infeasible because of slight differences in spelling, typographical errors in the originals or in transcriptions, large number of people with shared names, and the fact that the Service and Pension Records are incomplete samples of the universe of soldiers who served.

However, the availability of these datasets with surname and birthplace allows five inquiries:

1. Assess how closely Irish surname and Irish birthplace align
2. Assess the relative loyalty of Irish and non-Irish by birthplace (I can do this because the birthplace data is available in conceptually distinct datasets)
3. Assess differences between being born in Ireland or Britain vs. being enlisted in Ireland or Britain vs. having Irish vs. non-Irish surname
4. Assess quality of geolocation
5. Assess population representativeness of casualties

Differences in distance-in-time to Irish roots can be related to differences between having male Irish ancestry vs. having Irish birthplace. Those born and raised in Britain with Irish male ancestry may be more loyal than those born and raised in Ireland, but those having male Irish ancestry may be less loyal than those without male Irish ancestry even among soldiers born and raised in Britain.

D.1 Irish Regiment Some previous researchers have relied on regiment to infer Irish ethnicity and use regiments to base their analysis of how the World War I experience differed for Irish and non-Irish soldiers. The casualties database has both regiment and birthplace, so, assuming that those who died are a representative sample, it can be used to assess the validity of using regiment to infer Irish ethnicity—or more precisely, birthplace, which I will take to be the best measure of Irish ethnicity. I proceed in two steps to identify the geographic location of every birthplace and enlistment location. The first step uses a list of counties. I first construct a single address string if both parish and county are available. I then look for exact string matches with the list of counties. For example, "down" and "derry", which are Irish counties, would have to appear as a separate string. Occasionally the address would have multiple strings that match the county list. To address this, if the data has "co" or "co.", the string that appears right after would be prioritized in the matching, or if the string comes after a comma, it would be prioritized. The second step uses Google Map's API to locate the remaining locations.

Previous analysis (Perry 1994, p. 67) and my own analysis of the casualties database indicate that some regiments are disproportionately composed of soldiers whose birthplaces were in Ireland. Northern Irish regiments were: Royal Irish Rifles, Royal Inniskilling Fusiliers, and Royal Irish Fusiliers. Southern Irish regiments were: Irish Guards, Royal Irish Regiment, Connaught Rangers, Royal Dublin Fusiliers, Leinster Regiment, and Royal Munster Fusiliers. Among soldiers whose birthplaces could be appropriately located by the API (82% of the 660,585 casualties had birthplaces that could be located in the UK using the two-step algorithm), the Northern Irish regiment that had the fewest soldiers born in Northern Ireland had 38% of its casualties born in Northern Ireland and the one with the largest proportion was 62%. Between

67-74% of casualties in Southern Irish regiments were born in Southern Ireland. Before proceeding, it is important to note that all percentages discussed in this section are reported as a percent of the soldiers whose birthplaces could be located in the UK. 19,241 casualties were marked as being born in Southern Ireland and 10,189 were marked as being born in Northern Ireland.

About 30% of those whose birthplaces were in Ireland were assigned to non-Irish regiments. While many soldiers were allocated to their regiments according to their birthplace, the military command changed its policy during the war. It began allocating soldiers according to need instead of by geography, which avoided the decimation of entire youth cohorts of villages. Using regiments to base the analysis of how the World War I experience differed for Irish and non-Irish soldiers may be confounded with changes in military policy.

An analysis using surnames to infer ethnicity (99,433 soldiers have Irish surnames) would be unaffected by policy changes in allocation of soldiers to regiment. Moreover, disparate treatment of–and response by–minorities need not be limited to soldiers being born in Ireland. Disparate treatment can affect soldiers who had Irish male ancestry. British-born soldiers without Irish ancestry but assigned to Irish regiments are unlikely to have experienced disparate treatment of the kind that soldiers with male Irish ancestry would have experienced. If they experienced advantaged treatment, then using regiment would render a greater violation of monotonicity (if we analogize the use of Irish regiment as an instrumental variable for Irish identity).

Thus, my analysis relies on Irish surnames rather than Irish regiment since counting British-born soldiers without Irish ancestry as "Irish" for statistical analysis can lead to a qualitatively different kind of measurement error. Finally, a more practical concern that precludes the use of regiments is simply that they are not always cleanly available in different datasets due to idiosyncratic abbreviations, spelling error in the originals, or typographical errors in data entry.

D.2 Medal Rolls Using the Medal Rolls Index, which contains the near universe of all soldiers who enlisted in World War I, I compare the identification of soldiers with male Irish ancestry as a percentage of overall enlistment with the official government statistics reported on Irish enlistment by place of birth (which is 3.9%). The Medal Rolls Index does not contain county of origin, but contains last name, first name (and, if available, middle name or initials), rank, regiment, and regiment number. There is no battalion number, battalion string, or date. Merging the Irish surname dictionary with the Medal Rolls yields an estimate of 14.1% having male Irish ancestry out of 5.4 million soldiers. The figure, 14.1%, is 250% higher than the 3.9% of the UK soldiers in France and Flanders as reported in government statistics as being born in Ireland, as extensive migration from Ireland spread Irish surnames across Great Britain in the 19th century.

D.3 Casualties Using the casualties database, I compare the identification of soldiers with male Irish ancestry with the identification of soldiers born in Ireland. Roughly 15.1% or 99,433 of the 658,616 casualties are identified as having male Irish ancestry according to the surname dictionary. A similar 15% of the 549,884 listed as dying in France and Flanders are also identified as Irish according to surname. This 15% ratio is similar to the 14.1% of the Medal Rolls identified as having male Irish ancestry. Those with Irish surnames appear to have been dying at the same rate at which they were enlisted, which suggests that soldiers with Irish male ancestry were not sent to more dangerous areas or that they were better fighters if they were. Three-month aggregates of Irish and non-Irish casualty rates are correlated at 0.9 in my data, so I use overall casualties as proxy for battle environment.

Turning to an analysis of birthplace, according to the Irish National War Memorial[150], only 49,000 of the casualties were Irish and most estimates range from 30,000 to 50,000. In a separate analysis of birthplace, 29,739 men in the casualties database were born in Ireland (Jeffery 2000, p. 150). Another source, analyzing the Irish census, reports 27,405 Irish deaths, a rate of 14% out of the enlisted Irish and "the same proportion as for the British army overall" (Fitzpatrick 1996, p. 392), which was 12%. My geolocation algorithm yields 29,430 Irish deaths. The 27,405 Irish census deaths account for 4.1% of the casualties database, which is close to the 3.9% reported in government statistics of the percent of all enlistees being born in Ireland.

On the basis of the analysis of casualties according to surname or casualties according to birthplace, one may assume—as other historical researchers like Perry (1994) and Oram (1998) have assumed—that the casualties reflect a representative sample of the overall enrollment. Moreover, three analyses of birthplace and surnames—government statistics and the Medal Rolls Index surnames, Irish census (Fitzpatrick 1996) and casualties surnames, and geolocation and casualties surnames—suggest that the surname dictionary results in a similar 240-250% more soldiers being identified with male Irish ancestry compared to soldiers who were born in Ireland, so the "measurement error"–if we think of surname as measuring birthplace with error–when using Irish surname is at least similar across enlistment and casualties statistics. Next we examine desertions.

D.4 Police Gazettes Using the entire Police Gazettes database on 152,699 deserters and absentees (including those who deserted in the UK), I compare the identification of Irish soldiers using the surname dictionary with the Irish identification based on county of origin in a large sample. Among the Police Gazettes' deserters, 21.7% have Irish surnames. Among the B.E.F. sub-sample of deserters, 22.7% have Irish surnames. In the sample of deserters recorded in the War Diaries, 21% have Irish surnames.

The higher percentage of soldiers counted as Irish in these desertion samples is consistent with the Irish having a lower morale and deserting at a higher rate than the British. Using birthplace data, 13.4% of B.E.F. deserters were born in Southern Ireland and 4.4% were born in Northern Ireland. (All percentages are reported as a fraction of geolocateable soldiers.) In this dataset, 62% of soldiers could be geolocated. The higher rates of desertion from Southern Ireland would be consistent with priors.

The increase in the share of soldiers with Irish birthplace in this database (13.4 + 4.4 = 17.8% of geolocateable birthplaces) as opposed to the casualties database (5.4% of geolocateable birthplaces[151]) is notable as it indicates that the Irish-born were more inclined to desert in the field. Dividing 17.8 by 5.4 indicates that the Irish-born were deserting at roughly 3.3 times the rate at which they enlisted (using the reasonable assumption that the casualty statistics are representative of enlistment statistics).

Those with Irish surnames were deserting at 1.5 times the rate at which they enlisted. The ratio of 22.7% to 17.8% indicates that, among deserters, Irish surnames are only 28% more frequent than Irish birthplace, not 240-250% as found in the analysis of enlistment and casualties. The dramatic decrease in the ratio of the number of soldiers with Irish surname to the number of soldiers with Irish birthplace is notable because it suggests that length of time from Irish roots is predictive of morale. We next examine this further.

[150]http://imr.inflandersfields.be/index.html

[151]Note that the figure 5.4% differs from 4.1% in the previous sub-section because only 82% of casualties are geolocateable and I geolocated about 2,000 additional casualties as being born in Ireland than the 27,405 reported in the Irish census.

D.5 Irish Loyalty and Length of Time from Irish Roots Analysis of birthplace data across these datasets provides additional evidence that the Irish were probably less loyal than the British. The casualties database has 1.9% of its soldiers being born in Northern Ireland and 3.6% of its soldiers being born in Southern Ireland. The Police Gazettes has 4.5% of its soldiers being born in Northern Ireland and 9.8% of its soldiers being born in Southern Ireland. In the sub-sample of B.E.F. deserters, 4.4% were born in Northern Ireland and 13.4% were born in Southern Ireland. Since B.E.F. deserters are those who deserted in the field, whereas Police Gazette desertion can be interpreted as desertion that occurred during training, the higher share of Southern Irish-born in the B.E.F. sub-sample suggests that lower morale among Irish soldiers was more relevant for Southern Irish when choosing to desert in the field of battle than when choosing to desert in the UK.

Comparing desertion statistics with enlistment statistics suggests that lower duty to fight is also observed among the enlisted Irish-born soldiers compared to enlisted British-born soldiers. As a share of enlistment, Irish-born soldiers were 170% (dividing 4.5% + 9.8% by 1.9% + 3.6%) more likely to desert during training in the UK, but Southern Irish-born were 270% times more likely to desert in France and Flanders (dividing 13.4% by 3.6%) while Northern Irish-born were 130% more likely to desert in the field (dividing 4.4% by 1.9%). This finding suggests that, despite Northern Ireland remaining part of Britain after World War I, the Northern Irish-born were over twice as likely to desert as British-born enlistees.

Next, I analyze enlistment location data. Analysis of enlistment location suggests that the gradient in the duty to fight is similar according to enlistment location than according to birthplace: 1.8% of casualties, 4.1% of Police Gazette, and 3.8% of Police Gazette B.E.F. deserters were enlisted in Northern Ireland while 2.2% of casualties, 7.2% of Police Gazette, and 8.1% of Police Gazette B.E.F. deserters were enlisted in Southern Ireland. As a share of enlistment, soldiers who enlisted in Ireland were 180% (dividing 4.1% + 7.2% by 1.8% + 2.2%) more likely to desert during training in the UK, but Southern Irish-enlistees were 270% times more likely to desert in France and Flanders (dividing 8.1% by 2.2%) while Northern Irish-enlistees were 110% more likely to desert in the field (dividing 7.2% by 1.8%). In sum, desertion in the field was also higher for soldiers who enlisted in Ireland relative to those who enlisted elsewhere. These results suggest that birthplace is a stronger predictor of loyalty, but enlistment location and surname are also strong predictors.

Together, the fact that both the Northern Irish-born and the Northern Irish-enlistees were over twice as likely to desert assuages the concern that the use of the Irish surname does not distinguish between Southern and Northern Irish. Therefore, not distinguishing between the two groups in the main analyses is unlikely to be problematized by the potential for the Northern Irish to have equal or heightened loyalty compared to the British. At present, I do not have historical information on Catholic or Protestant birth parishes to ascertain whether Protestant Irish had heightened loyalty, but there is little in the discriminatory statements made by British officers indicating that they made a distinction on the basis of religion. The use of surnames is still likely superior to the use of regiment to mark "Irish" because 27% of soldiers in Irish regiments were born in Britain. The mix of Protestant and Catholic Irish would also still exist in the regiments.

Finally, even though British-born soldiers were far more loyal, British-born soldiers with Irish surnames, were disproportionately, slightly disloyal. This further supports the use of Irish male ancestry as a proxy for "Irishness". In the data, soldiers with Irish surnames and Irish birthplaces comprise 2.0% of casualties and–with the assumption of population representative death rate–2.0% of enlistment, but 6.5% of the Police Gazette (225% more likely to desert). Soldiers with Irish surnames and British birthplaces comprise

13.2% of casualties and 15.6% of the Police Gazette (20% more likely to desert). Soldiers without Irish surnames and with Irish birthplaces comprise 3.4% of casualties and 8.2% of the Police Gazette (140% more likely to desert). Soldiers without Irish surnames and with British birthplaces comprise 81.4% of casualties and 69.7% of the Police Gazette (15% less likely to desert).

D.6 FGCM Notably, the proportion of soldiers with Irish surnames is 20% in the desertion and absence trials, 23% in the B.E.F. Police Gazette sample of deserters, 21% in the War Diaries sample of deserters, and 19% of the death sentences (and 17% of executions). Assuming that the Police Gazette and War Diaries sample represent the true desertion rate, the consistency in the share with Irish surnames suggests that the military command did not disproportionately target or disfavor Irish soldiers in the apprehension and trial stage nor in the sentencing and execution stage.

D.7 Irish Surname vs. Irish Regiment The consistency in the proportion of soldiers deemed Irish is not present when I use Irish regiment. In the B.E.F. Police Gazette sample of deserters, 17.5% are from Irish regiments. This is close to the 16.5% with Irish birthplaces. However, in the War Diaries sample of deserters, only 10.5% come from Irish regiments. The reason is partly due to the fact that names are recorded better than regiments, which often appear inside an idiosyncratic spelling or abbreviation of the military unit, which can be merged to brigade and division but not always cleanly to regiment. Further corroborating the difficulty of using regiments to identify Irish ethnicity: In the capital sentences data, 8.1% come from Irish regiments. The lower percentage could mean that those from Irish regiments were treated very favorably by the military justice system conditional on deserting, but no historical evidence suggests that this is the case. Alternatively, the quality of the spelling of regiments could be lowest in the capital sentences data, which used very short abbreviations, relative to the War Diaries and Police Gazette data sources. Thus, for the many reasons described in this section, I use surname instead of regiment to identify Irish soldiers.

Notably, despite the potentially poor transcription of regiment, within the capital sentences dataset, 7.1% of executed soldiers, 7.1% of deserters with capital sentences, and 7.4% of executed deserters come from Irish regiments. The consistency of proportion of soldiers deemed Irish within-dataset—regardless of how Irishness is measured—is consistent with the hypothesis that the decision to execute or commute any soldier was quasi-random and unrelated to, for example, the soldier's Irish identity.

D.8 Service and Pension Records Finally, I investigate the Service and Pension Records, a large sample based on pension eligibility, which also contains data on birthplace. The quality of location data here is particularly low. Only 815,000 soldiers or 29% could be geolocated, unlike the 82% geolocation rate for the casualties data. This low rate is largely due to the fact that 1.9 million soldiers did not have birth location data. All soldiers have surnames, however. In this data, 15.3% of the 2.7 million soldiers have Irish surnames, which is consistent with the percentage found for the Medal Rolls and Casualties databases. On the basis of this consistency, one might infer that the data destruction during WW2 bombings was effectively random.

Interestingly, 9.1% of geolocateable soldiers are identified as born in Ireland. This would seem to suggest a larger proportion of Irish-born soldiers who joined after 1914 but left before 1920 (and thus not eligible for pension) in the Service Records (a.k.a. "Burnt Documents") or a larger proportion of Irish-born soldiers who were discharged for medical reasons during the war, or who were killed and whose dependents claim a pension in the Pension Records (a.k.a. "Unburnt Documents"). I have no good reason to think that Irish-born would been more likely to suffer illness or wounds leading to medical discharge, since the Irish-born constitute a fraction of the casualties database representative of their enrollment. I have no

strong reason to think they would be more likely to have dependents. One possible reason for the higher proportion of Irish-born, then, is they were more likely to demobilize at the end of the war. This would be consistent with their falling enlistment rates throughout the war, and the fact that the Irish war for independence commenced in 1919.

Besides the birth location, another possibility to geolocate the soldiers is the residence data, though this variable is also missing for 1.3 million records. Of the geolocateable soldiers, 2.4% are identified as residing in Ireland. However, many Irish soldiers who served in the British army chose not to or could not live in Ireland after Ireland declared independence. In fact, this analysis provides quantitative evidence suggesting that only 26% of soldiers born in Ireland returned after the war, which would be consistent with their original country no longer welcoming them or viewing their service in the war as particularly legitimate. To be sure, they may have simply found better economic opportunities elsewhere.

Irish surname is still predictive of being born in Ireland and is also predictive of residing in Ireland. Pairwise regressions yield coefficients of 0.21 for residence and 0.23 for birthplace (and pairwise regressions in Police Gazettes and casualties yield 0.25 and 0.24 respectively). Irish surname is more strongly correlated with Southern Irish locales. In casualties, 0.3 and 0.29 for Southern Irish enlistment and birthplace and 0.14 for Northern Irish enlistment and birthplace. In Police Gazettes, 0.28 and 0.29 for Southern Irish enlistment and birthplace and 0.12 for Northern Irish enlistment and birthplace. In Service and Pension Records, 0.28 and 0.25 for Southern Irish birthplace and residence and 0.12 and 0.15 for Northern Irish birthplace and residence. This would be consistent with Irish surname being a decent proxy for Irish ethnicity.

E Additional Discussion

E.1 Power of random strings test In Appendix Figure 7A, m_1 represents the assumed autocorrelation between successive execution decisions (if p is the correct marginal probability of an execution, the transition probability from one execution to the next is $m_1 p$). For autocorrelation as low as 1.5, the distribution of p-values in one simulation is significantly different from the uniform CDF at the 10% level. In order to estimate the type-II error rate, thousands of strings are simulated. For each individual realization, the Null $H_0 : no\, autocorrelation$ is rejected if the p-value from the KS test is less than $\alpha = 0.05$. The fraction of incorrect decisions (failures to reject H_0) serves as an estimate for the type-II error. Appendix Figure 7B displays the distribution of the KS p-values for 4 different values of m_1, which for convenience have already been translated into the corresponding values of the autocorrelation coefficient. For values of autocorrelation between 0.13 and 0.17, the estimated power lies between 0.74 and 0.9. For example, for autocorrelation, I show the degree of autocorrelation that would show statistically significant KS-tests of deviation from a uniform distribution. I then show the distribution of KS-test statistics for many simulations of autocorrelated strings.

E.2 Commutation date Assuming that commutation dates occur on the upper end of the time range, 14 days after the trial date, would tend to magnify the estimated deterrent effect, since time between commutation and subsequent absence is minimized. Assuming that only the original trial date is relevant could reduce the chance to detect either deterrence or spurring effects, since an intervening absence after the trial (but before the execution or commutation) can occur. This interpretation is somewhat consistent with the patterns in the data. Table 5 Panel A displays a slight spurring effect of executions (as we can see from the positively-signed coefficients) in Columns 7 and 8 and Panel C displays a slight deterring effect in Columns 1-3. These coefficients are significant at the 10% level; more generally, 4 of 27 specifications display a significant impact of executions at the 10% level (and 1 of 27 at the 5% level), but they do so in opposite ways, which cautions against strong conclusions in either direction.

E.3 Execution rates When the half-life is assumed to be short (7 days), the two coefficients in Table 7 tend to be of the same sign and not statistically significantly distinguishable from each other. However, as the half-life is extended, the coefficient on the cumulative measure of executions becomes significantly more negative *relative* to the coefficient on commutations. The significant difference can be inferred from fact that the coefficient for commutations is positive and significant at the 5% level while the coefficient for executions is negative and not significantly different from 0. This means that the execution rate has a deterrence effect and it is observed in models that assume a longer half-life. This pattern is observed for the Police Gazette and FGCM data, while the pattern is less statistically significant in the War Diaries data, though the coefficient on the execution term is always more negative relative to the commutation term.

The reader can interpret any of the specifications in Appendix Table 11, but to take just one, for illustrative purposes, in the specification assuming a half-life of one month, the difference between the cumulative execution measure (-0.027) and commutation measure (0.105) is 0.12–or 12%–decrease in hazard rate for executions relative to commutations. Another way to interpret the coefficient magnitudes would involve the counterfactual of *no* death penalty—the difference between all death sentences leading to execution vs. all death sentences leading to commutations. Such an extrapolation involves re-calculating the cumulative half-life measure (sum of the execution and commutation measures), and multiply this sum by 0.12. Taking the product, then averaging for all divisions and all days, would yield the counterfactual effect of having the death penalty on time to next absence.

E.4 Ethnic identity of the subsequent deserter Beginning with Panel A of Table 8 Column 1, which uses the +14 imputation date for a commutation trial, we see that after the execution of an Irish soldier, 19% of the War Diaries absences that immediately follow are Irish, but after executing a non-Irish soldier, 11% of the immediately following War Diaries absences are Irish. That is, Irish executions double the likelihood the following absentee is Irish. A similar pattern is observed for desertion death sentences (9.5% increasing to 20.0%).

Focusing still on War Diaries absentees and moving to the another imputation assumption in Panel B, a difference is also visible for Irish vs. British executions—and no difference observed for Irish vs. British commutations—when using the nearest-neighbor imputation. The doubling reported in the execution rows should be unaffected since the execution date is not being changed moving from Panel A to B. Commutation statistics change slightly and are consistent with their still being invisible.

Turning to the other datasets, we see similar–but muted–patterns in FGCM in Column 3, where a difference is also visible for Irish vs. British executions (e.g., 15.3% increasing to 21.6%) and no difference observed for Irish vs. British commutations, at least for Panels A and B. However, in Column 2 we no longer see that Irish—more than British—executions spurred absences of the Irish—more than British. I have no theoretical reason for this to be the case, but an explanation for the weaker Police Gazette result is its density of absences is far lower than the other datasets, which would result in more measurement error. From the War Diaries data, I identify 676 usable matches for one-third of the war. From the Police Gazettes, 1,319 of these are merge-able for the entire war. Indeed, one might interpret the greater differences in ethnic composition subsequent Irish vs. British *commutations* to be consistent with greater measurement error.

In Panel C, the execution and commutation dates are both set to the trial date. The increase in Irish absences subsequent Irish execution is muted though still sizable. Interestingly, the percentage of next absences that are Irish become more dissimilar after Irish and non-Irish commutations when the trial date is used (e.g., 9.1% vs. 14.0%). This suggests that the third imputation method may be the worst one in introducing noise to the control (whereas 2 weeks after a trial is a good metric for the time between sentence and confirmation/commutation decision; alternatively if military events for some reason made it possible to hold the the trial—but delayed the confirmation/commutation decision—the nearest-neighbor assumption is also a good one). In addition, using the trial date instead of execution date introduces noise to the treatment variable. On this basis, we might rely less on estimates using this imputation.

E.5 Robustness checks Appendix Tables 1-2 report falsification checks where the analysis is run backwards in time. I start the clock 90 days before the treatment event to ensure the subject of the death sentence does not affect the outcome variable. A handful of significant coefficients appear, in particular, 13 of 81 coefficients that would have a causal interpretation (executions or their interactions) are significant at the 10% level in Appendix Table 1. Appendix Table 2 is mirror to Table 7 (which may arguably be the preferred specification–assuming a 14-day commutation imputation and using exponential hazard–and including weak SUTVA coefficients). None of the execution salience coefficients are statistically significant. Several of the execution rate coefficients–by coefficient, I mean the difference between the prior executions coefficient and the prior commutations coefficient–are statistically significant, in the FGCM data. Notably the casualties coefficient is still positive, as we would expect with associations between casualties and temporally local rates of absence, in War Diaries. However it becomes negative in FGCM. This would be consistent with FGCM being a poorer measure of absences, since in order for the field trials to be conducted, there should not be pitched battle. In Tables 5 and 7, the associations between casualties and

FGCM absences were also not as large as the associations observed for War Diaries.

To see if some of the significant placebo results are due to inappropriate clustering of standard errors, Appendix Tables 3-5 report results without clustering of standard errors, where similar inferences are obtained as in the main tables. Appendix Table 3 indicates no robust deterrent effect of execution salience. Consistent spurring effects of Irish executions are found in Appendix Tables 4 and 5. Deterrent effects of execution rates are found in Appendix Table 5 for Police Gazettes and FGCM under longer half-life assumptions.

Appendix Tables 6-7 report the backwards analysis without clustering. What is worth noting is that 6 of 81 coefficients that would have a causal interpretation are significant at the 10% level in Appendix Table 6. In Appendix Table 7, only the execution salience coefficients would be worth interpreting and here there are no significant coefficients. To be sure, any interpretation of weak-SUTVA coefficients without accounting for clustering warrants strong caution. These are cumulative measures so are, by definition, positively serially correlated. Thus not accounting for the correlation could render results that are artificially significant. The fact that this does not seem to be materially relevant (comparing Appendix Table 7 with Appendix Table 2)–and the fact that placebo deterrence is observed for FGCM trials, which constitute half of the evidence in favor of deterrence of execution rates in Table 7–warrants further caution on strong inferences regarding the deterrence of execution rates.

Appendix Table 10 shows that the results of Table 7 are robust to including the following variables: Irish indicators for each officer in the chain-of-command, whether the executed soldier was an officer, the executed soldier's age, distance to coast, distance to Berlin, fixed effects for the identities of the Division Commanding Officer and Division 1st General Staff Officer (Officers that appear with less than 10 frequency are categorized in an Other category), and lag measures of absences and of death sentences (the log of absences and the log of death sentences in the time window 30-59 Days Ago and 60-89 Days Ago). As before, when officer or age data is missing, it is dummied out (i.e., set to a constant and another variable indicating whether it is missing is included). To speed calculations, the exponential models do not include officer identity fixed effects, but the Weibull and Cox models do. The results of this table would support the earlier inferences.

In Appendix Table 12, as always, missing data is dummied out (i.e., set to a constant and another variable indicating whether it is missing is included), and for interaction analysis, that means that interactions with the dummy are included.

Appendix Table 14 reports these robustness to pooling the data. There are relatively few absences that follow a death sentence event when each absentee dataset is used individually as can be seen in the visual univariate analyses of Appendix Figures 9A-9C. However, the graphical intuition of Irish executions spurring rather than deterring is still present in these figures as in Figures 14A-14C.

E.6 Day-by-day framework The size of the effects are largest with the smaller half-life assumptions. They are larger in the War Diaries dataset, but more statistically significant in the Police Gazettes dataset. One might interpret the sum of the level term (on execution) and interaction term (with Irish) as still suggesting a net spurring effect, despite any potential deterrent effect of British executions as articulated in the theory section. The FGCM data suggest some spurring of Irish desertion relative to non-Irish desertion but only when it comes to the execution of deserters. Again, the size of the effects are largest with the smaller half-life assumptions.

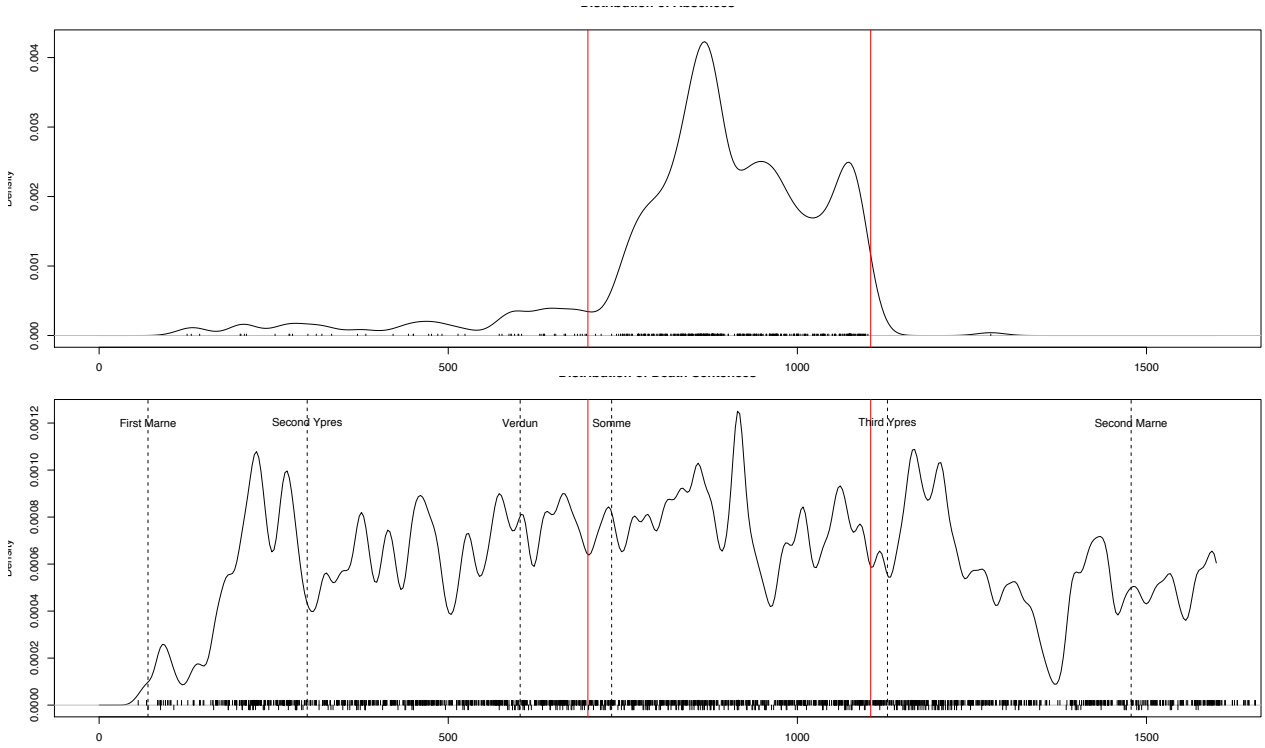
Another way to interpret the magnitudes, the average value of the outcome is -0.002 in the Police Gazettes, and the average value of the Irish execution variable is 0.003. So multiplying the coefficient

0.012 by 0.003 yields roughly 2% of the average outcome. The standard deviation of the Irish execution variable is 0.045 and the standard deviation of the outcome is 0.057, so multiplying by the coefficient would yield roughly 1% of the standard deviation of the outcome.

Finally, to assuage concerns that these treatment variables are measured in a cumulative fashion–thus strong positive serial correlation may affect inference, in Appendix Tables 8 and 9, I run the clock backwards and examine the effect of future events on previous absences. I again shift the absence data by 90 days earlier to ensure the subject of the death sentence are excluded from the outcome variable. For example, consider March 1, 1916. I do not correlate the absence on March 1 with executions and commutations beginning on March 1, 1916. This is because an absence on March 1 could appear in the treatment data–up to three months, say–and would be on both the left- and right-hand side of the specification. Instead, I correlate the absence on December 1, 1915 with forward-treatment (future executions and commutations) beginning on March 1, 1916 in the placebo check for null results. What emerges is that 5 out of 90 coefficients on an execution term are significant at the 10% level, which is consistent with the low rate of significant coefficients in prior randomization and placebo checks.

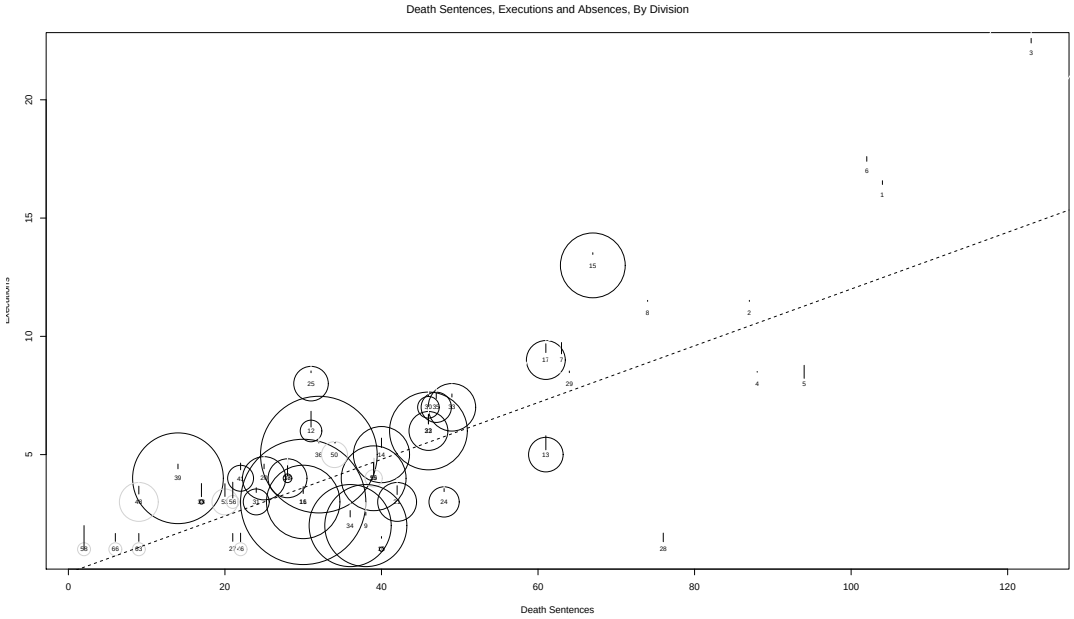
E.7 Death Sentences Following Executions as Potential Source of Bias Appendix Table 13 reports that after an execution, the percentage of next desertion trials resulting in a death sentence was lower, and it was particularly likely to be lower after an Irish execution. After a division executed an Irish soldier, roughly 14% of the next desertion trials resulted in a death sentence, whereas after a commutation, roughly 22% of the next desertion trials resulted in a death sentence. This pattern of temporary 'amnesty'–lower rates of death-sentencing after a recent execution–emerges across different imputation assumptions for the commutation dates in Panels B and C. In this analysis, the numbers differ slightly across Panels for the execution rows because if the next event was a capital sentence, a "1" was coded. The capital sentence data is treated as data that should be a subset of the FGCM. However, temporary amnesty did not seem to exist for Irish desertion trials, whose death sentencing rates were roughly the same (around 20%) regardless of the previous death sentence being executed or commuted. This is certainly observed in the 14-day imputation assumption of Panel A. In Panels B and C, the average death-sentencing subsequent Irish and British executions vs. average death-sentencing subsequent Irish and British commutations would also render muted any temporary amnesty.

It is important to emphasize that endogenous justice or temporary amnesty could not have been known to soldiers (and affect $C(p)$ in the opposite direction of what was intended). Informing the offender and no one else of the charge, finding, sentence, and confirmation was sufficient promulgation to satisfy the military laws. It was unlikely that the 130,936 FGCM convictions were circulated to the entire army (90 per day would likely reduce their impact). Public knowledge of lesser sentences for deserters would be inconsistent with repeated admonishments that "it should be remembered that on active service the usual penalty is death" for leaving post, cowardice, sleeping on post, etc. And, neither soldiers at the time nor British military historians of World War I analyzing qualitative records knew about the low rate of death sentences for convicted deserters.



Note: This figure shows the distribution of death sentences during the course of the war. The dotted vertical lines indicate the start of major British offensives. The sequence of tick marks along the bottom axis represent each death sentence, with upwards pointing ticks indicating a commutation and downward pointing ticks indicating an execution.

Figure 2: British Army Divisions



Note: This Þgure summarizes death sentences, executions and absences by British Army division. The x-axis the number of death sentences passed in a division, while the y-axis is the count of executions. Each division is labeled with its actual divisional number. The diameter of the circle around each division is proportional to the number of absences recorded for that unit, though the exact size of the circle is not directly interpretable in terms of the axes. Regular army divisions are indicated with red circles, new army divisions (KirchnerÕs Army) are indicated with navy circles and territorial divisions by tan circles. The upward sloping dashed line indicates an execution rate of 12%. For each division, there is a tick above the division name indicating the estimated fraction of absences and death sentences of Irish soldiers in that division. The tick full tick represents 50% of the division, with the green portion indicating the proportion of that 1/2 that was Irish e.g., a solid green tick would indicate that 50% of the death sentences and absences were passed on / committed by Irish soldiers.

Figure 2B (Absences fromPolice Gazettes)

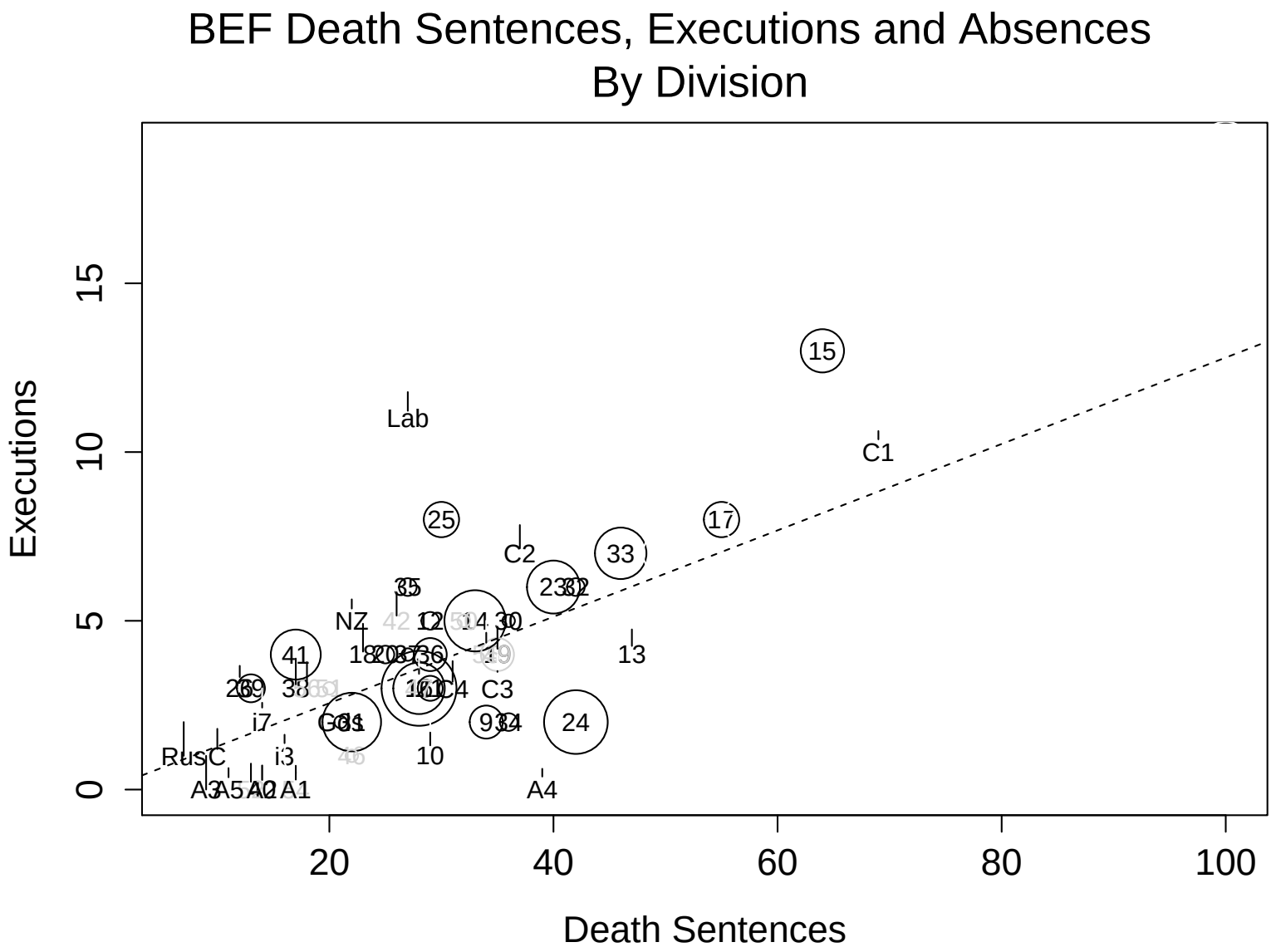


Figure 3

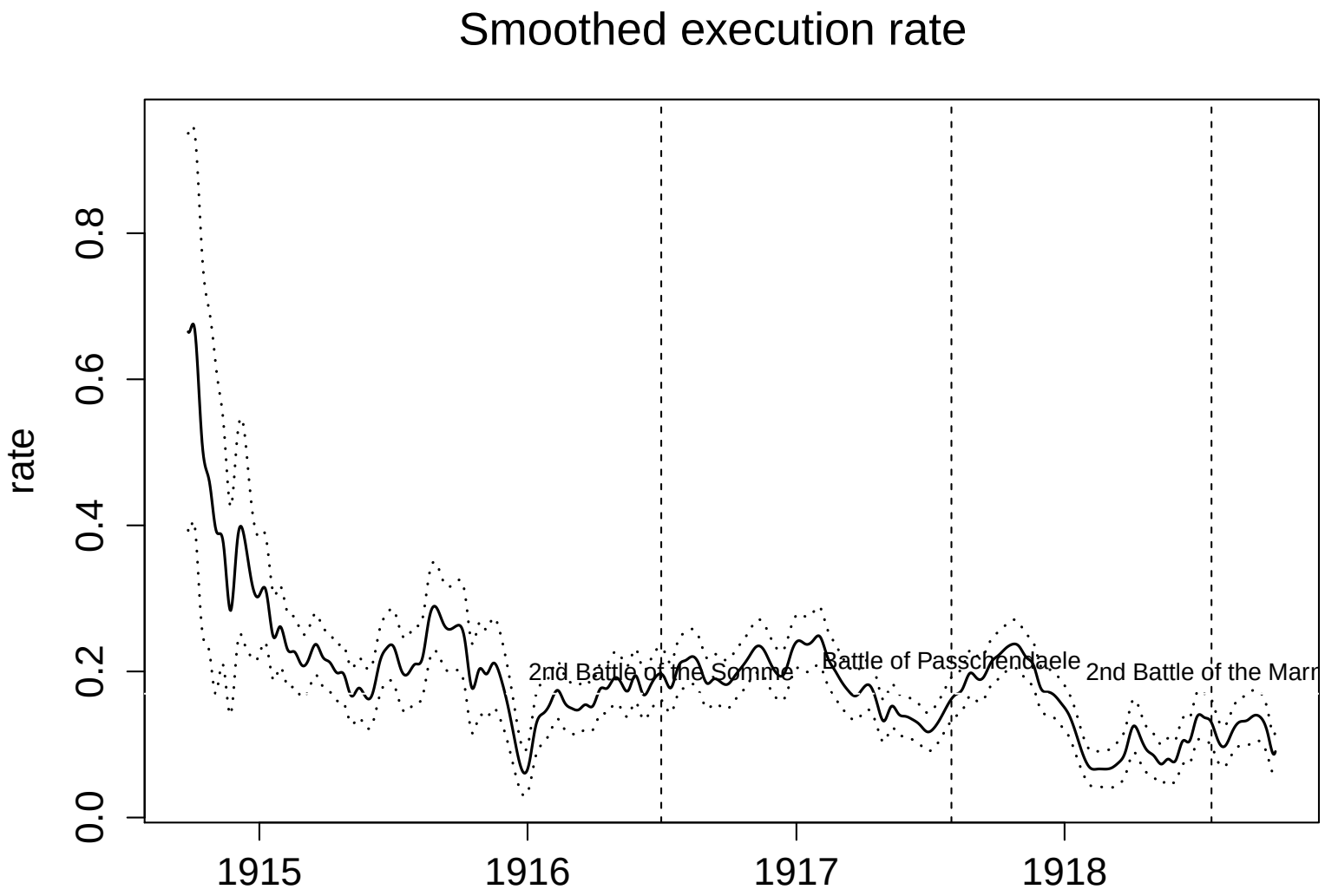


Figure 3B: Local Execution Rate by Division (War Diaries)

Figure 4

Figure 5

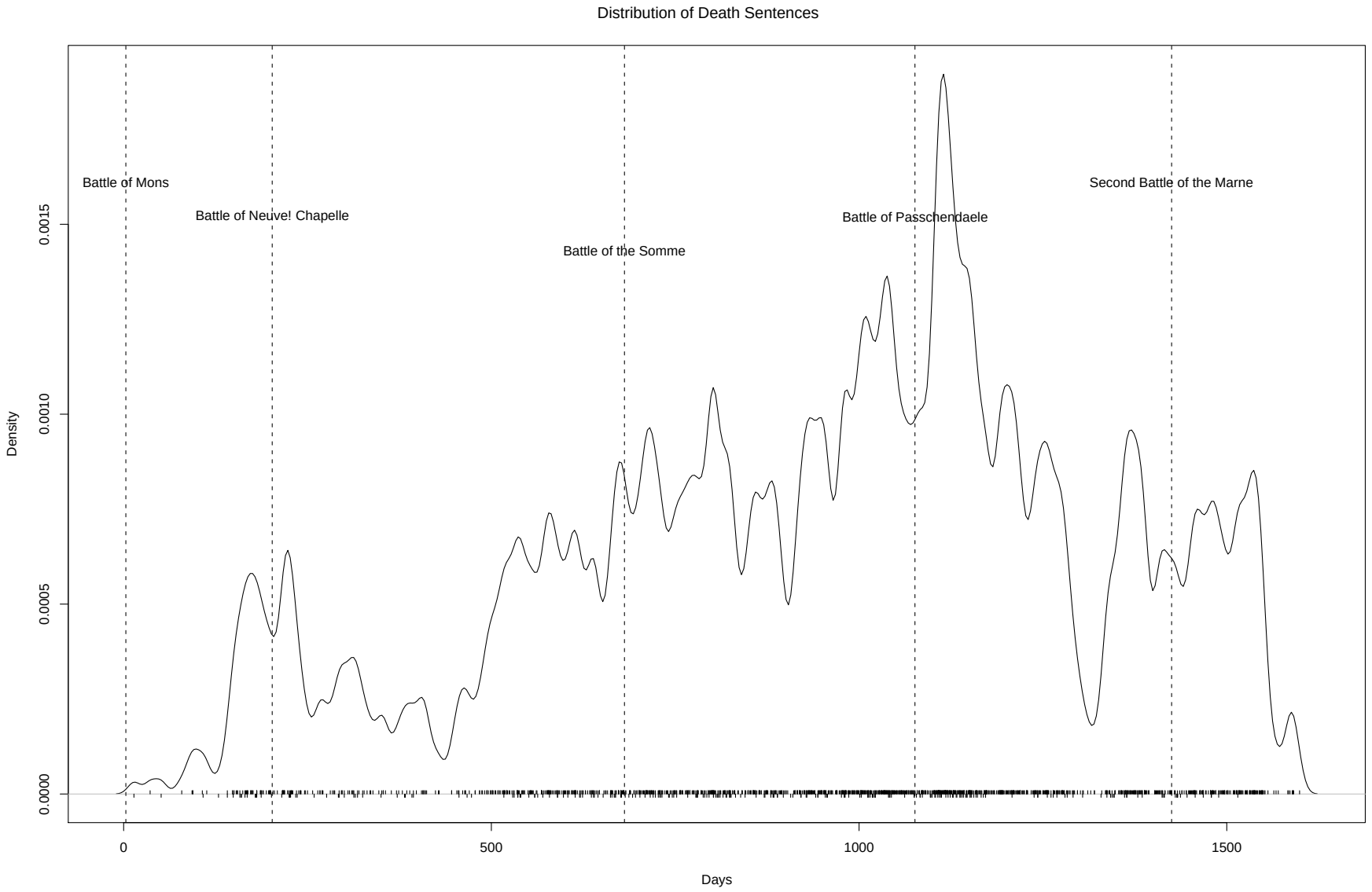
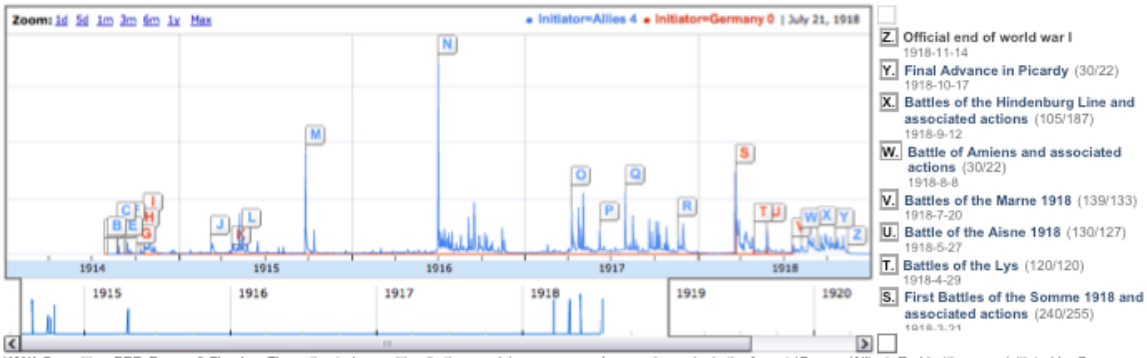
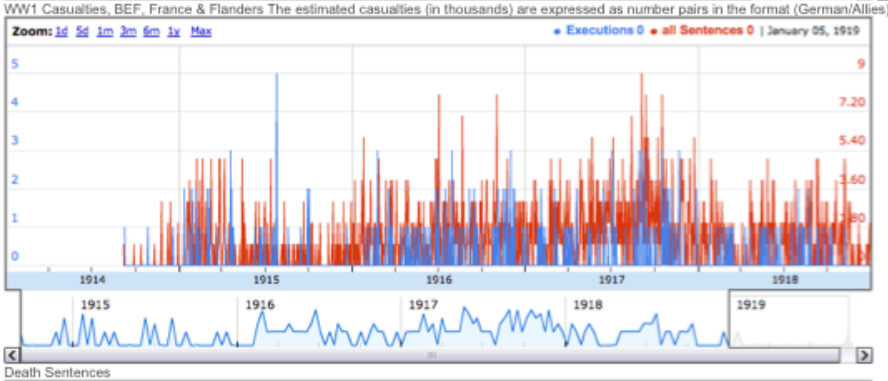


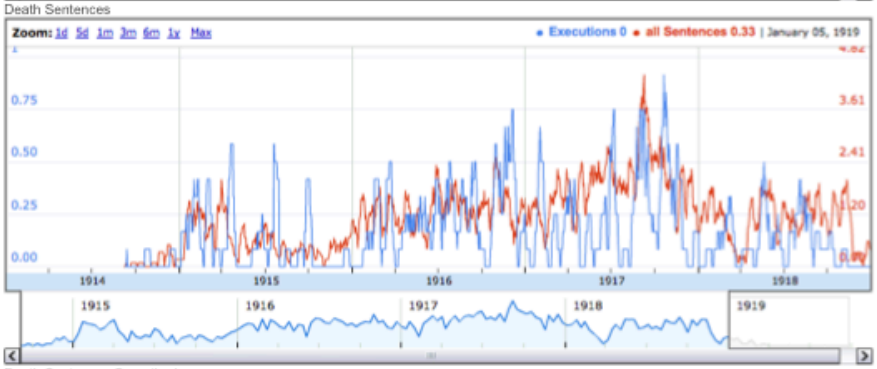
Figure 6



WW1 Casualties, BEF, France & Flanders The estimated casualties (in thousands) are expressed as number pairs in the format (German/Allies). Red battles were initiated by Germany.



Death Sentences



Death Sentences Smoothed

Figure □

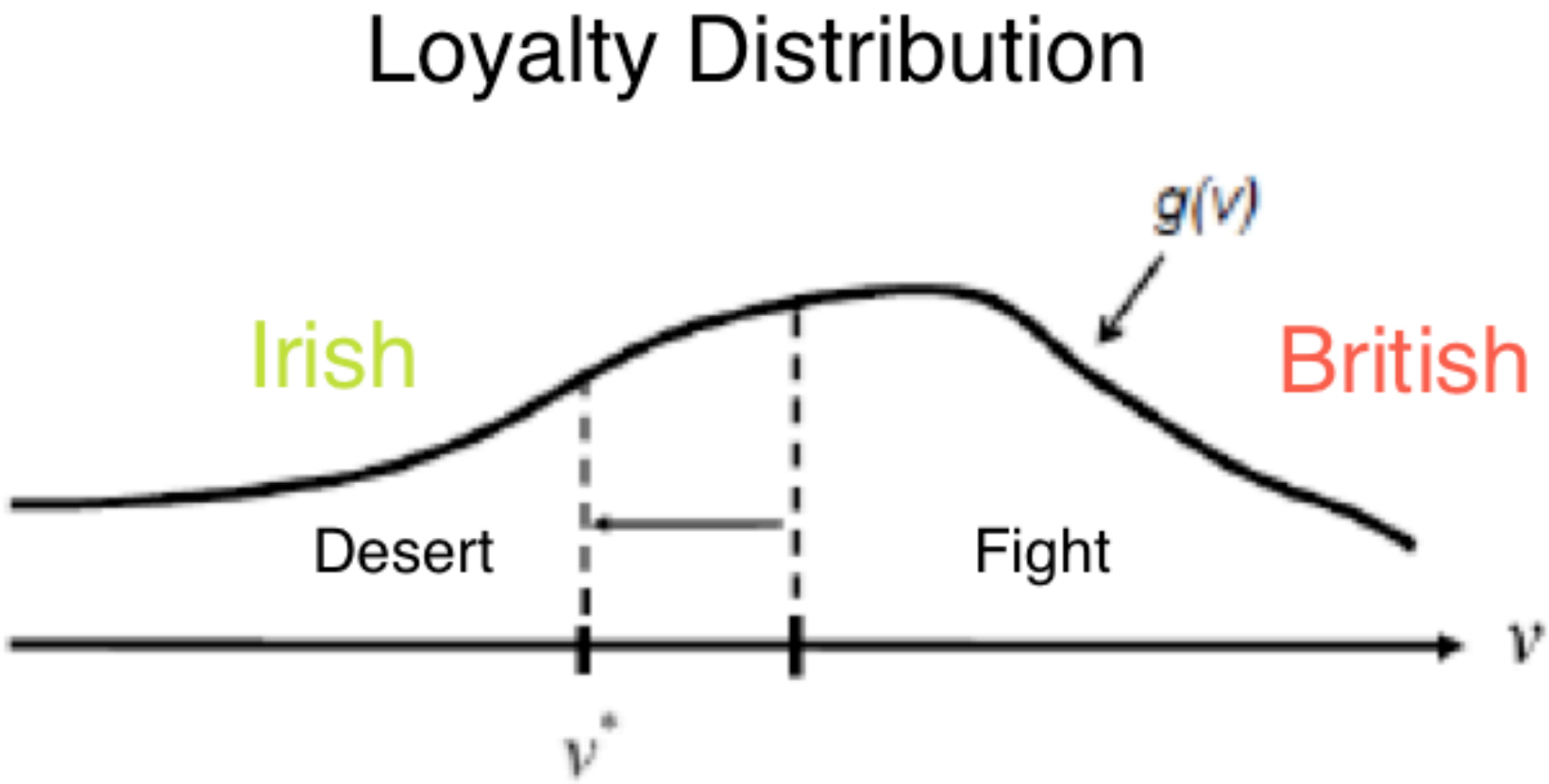


Figure 8A

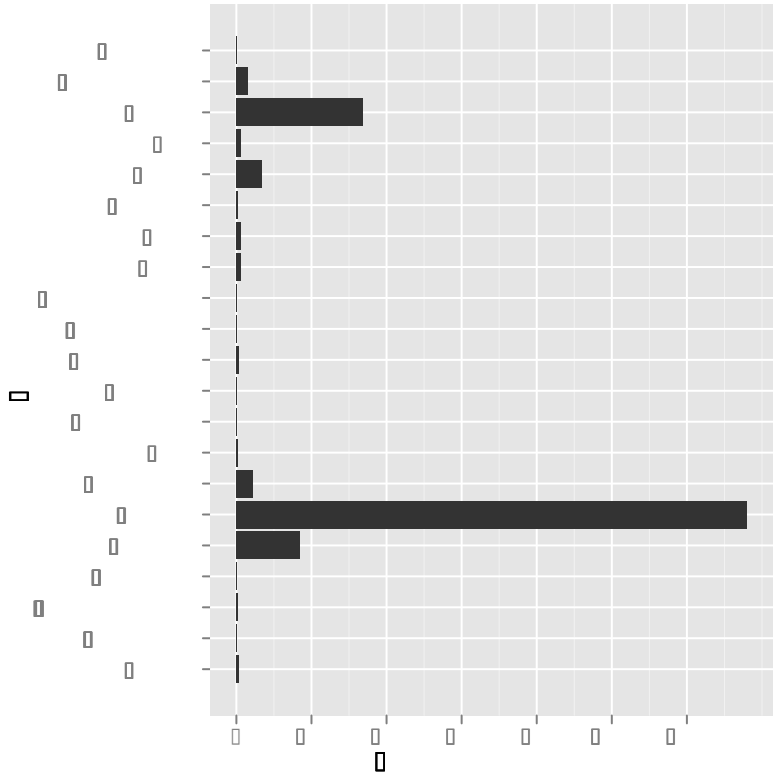
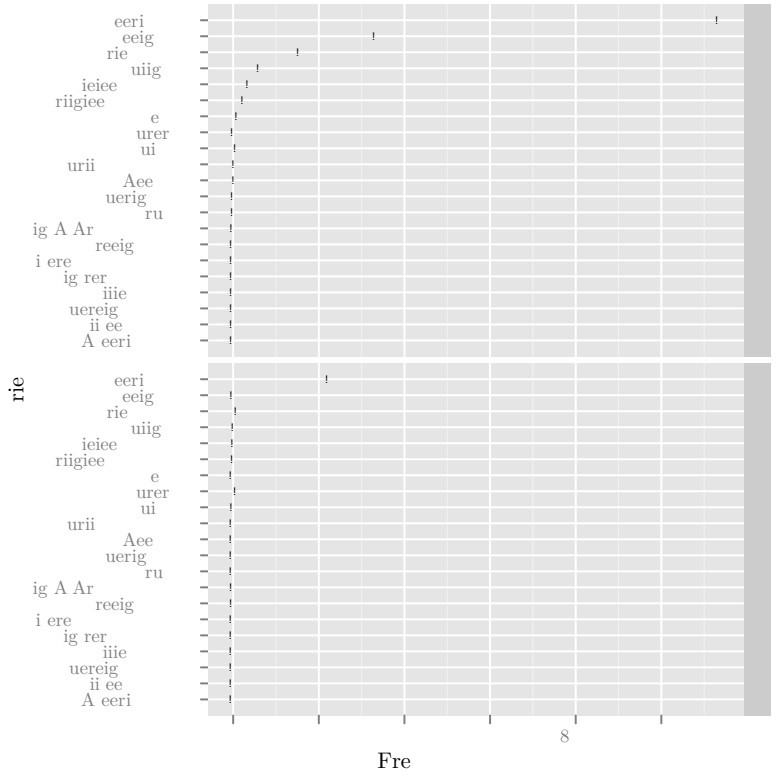
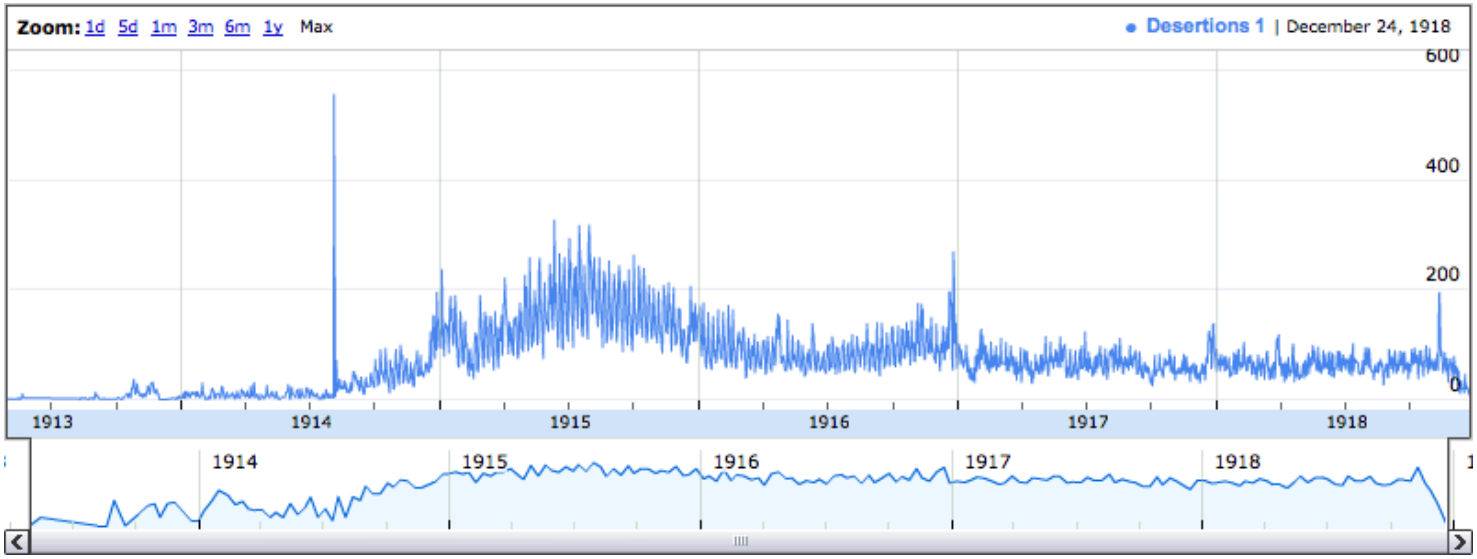


Figure 8B





Data: DesTS ¥ Chart ID:AnnotatedTimeLineID142fa67e8691b
R version 2.15.1 (2012-06-22) ¥googleVis-0.2.17 ¥Google Terms of Use ¥Data Policy

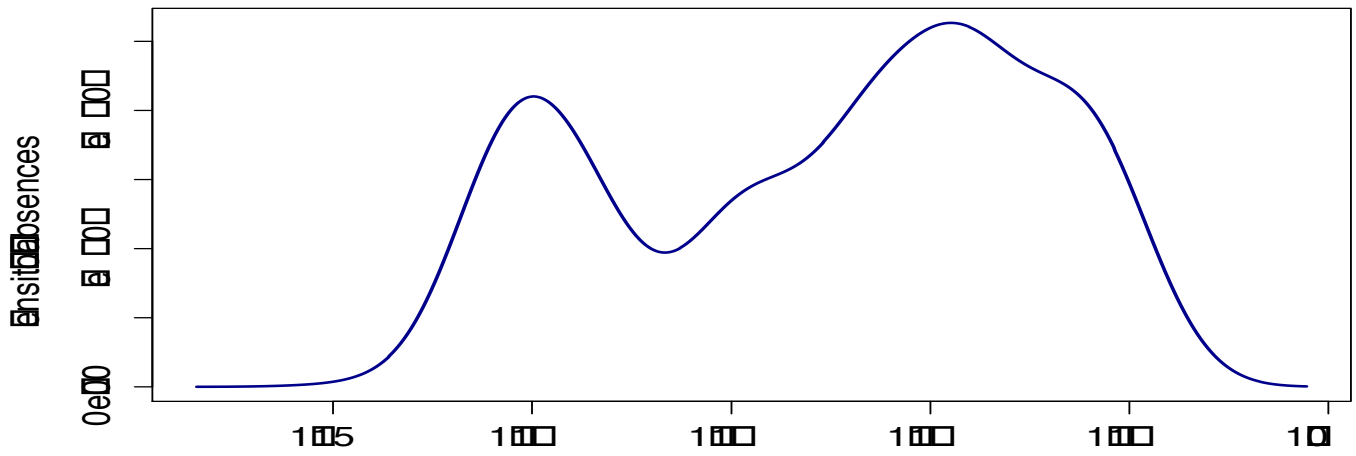


Figure 1

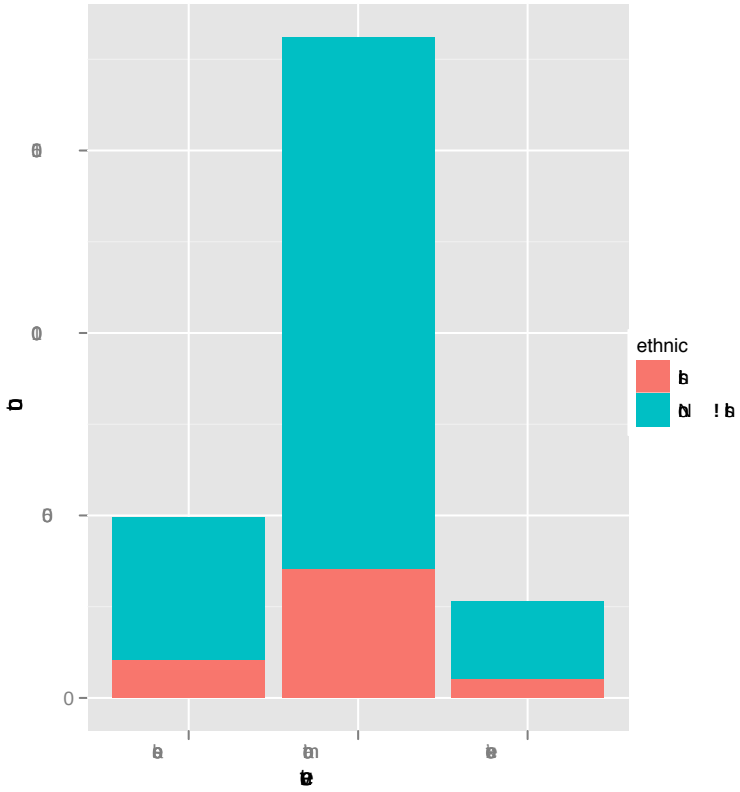
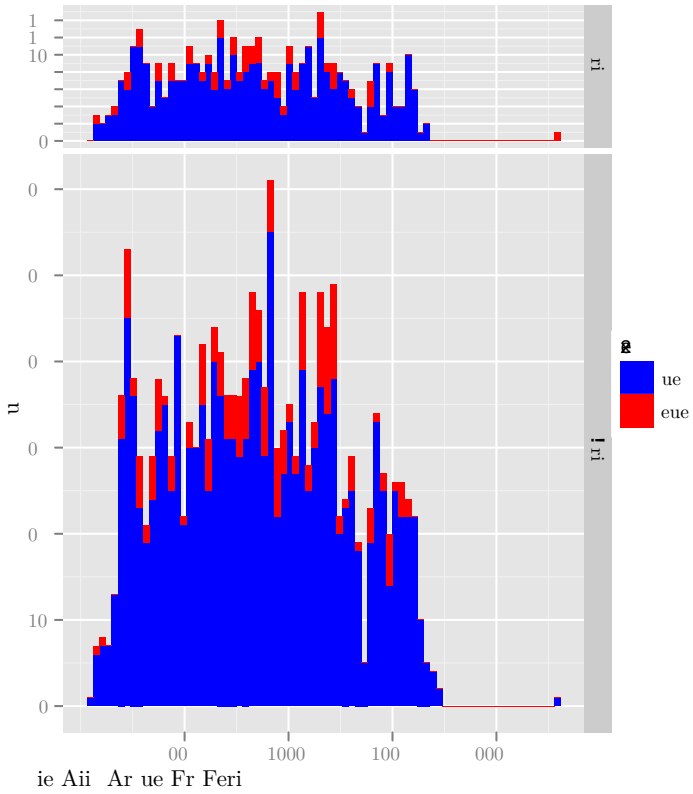
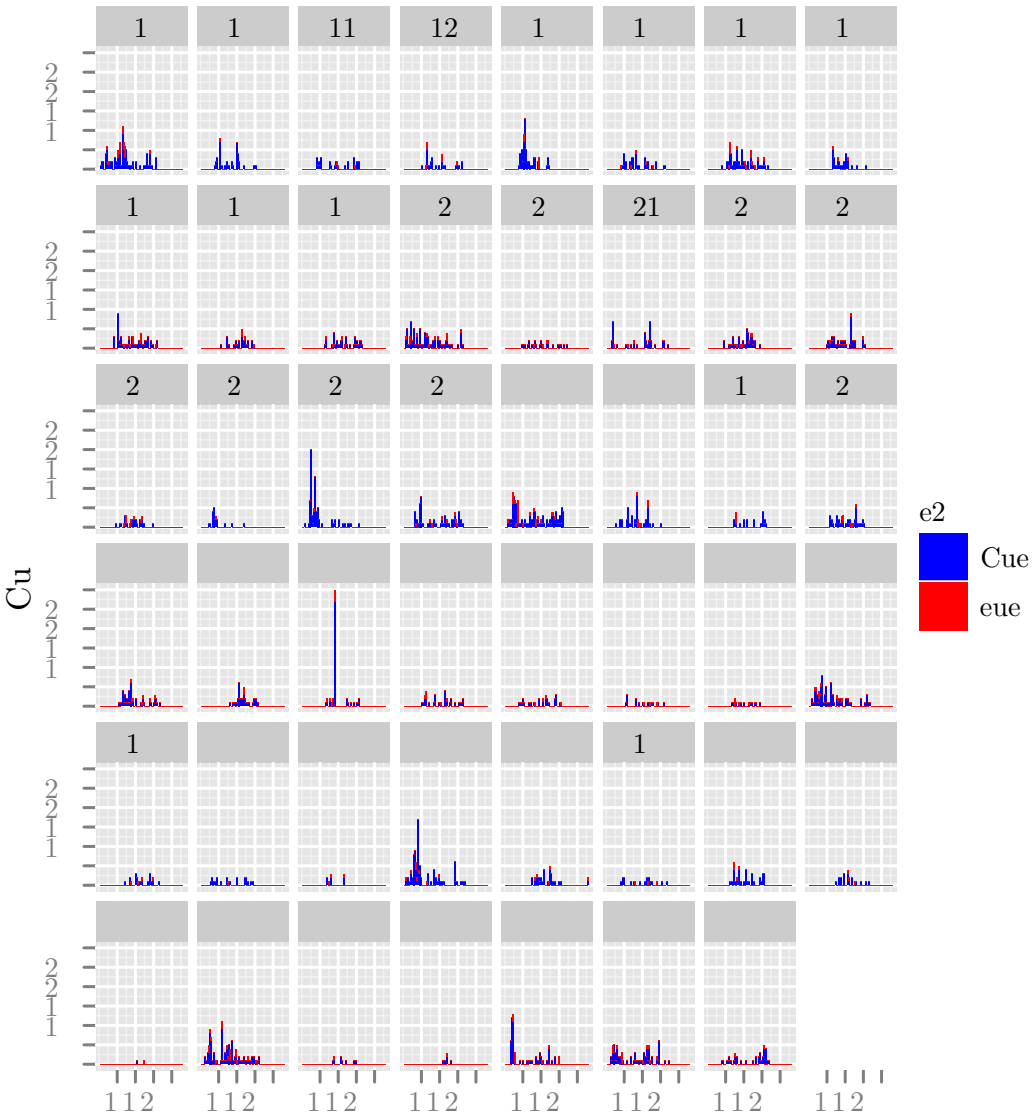


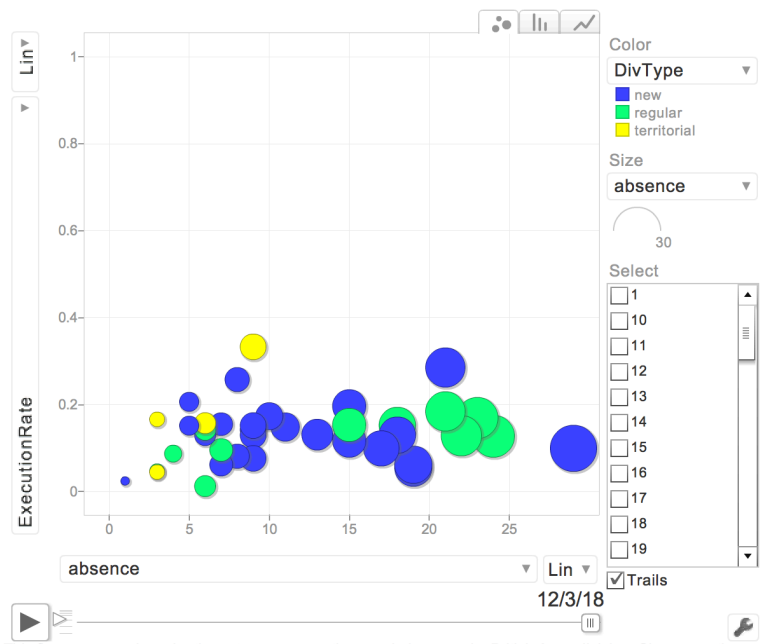
Figure 1



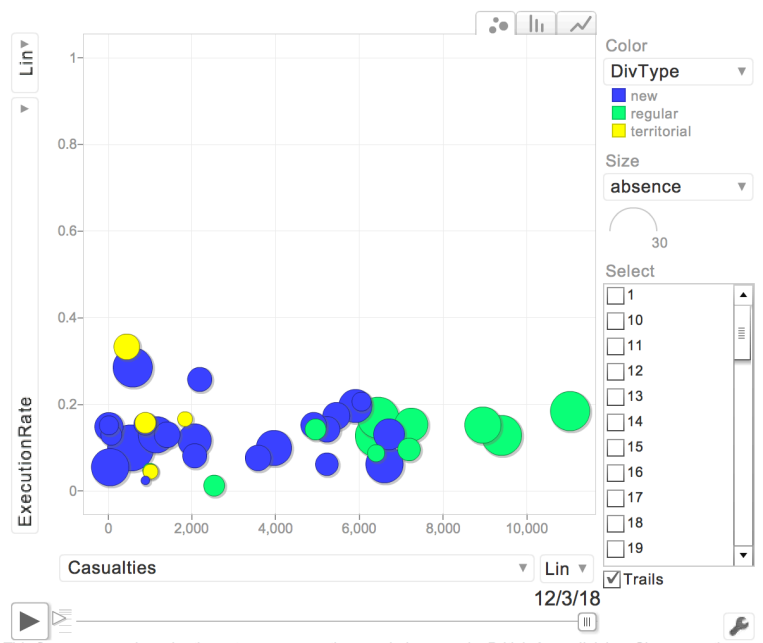
ie Aii Ar ue Fr Feri

Figure 11



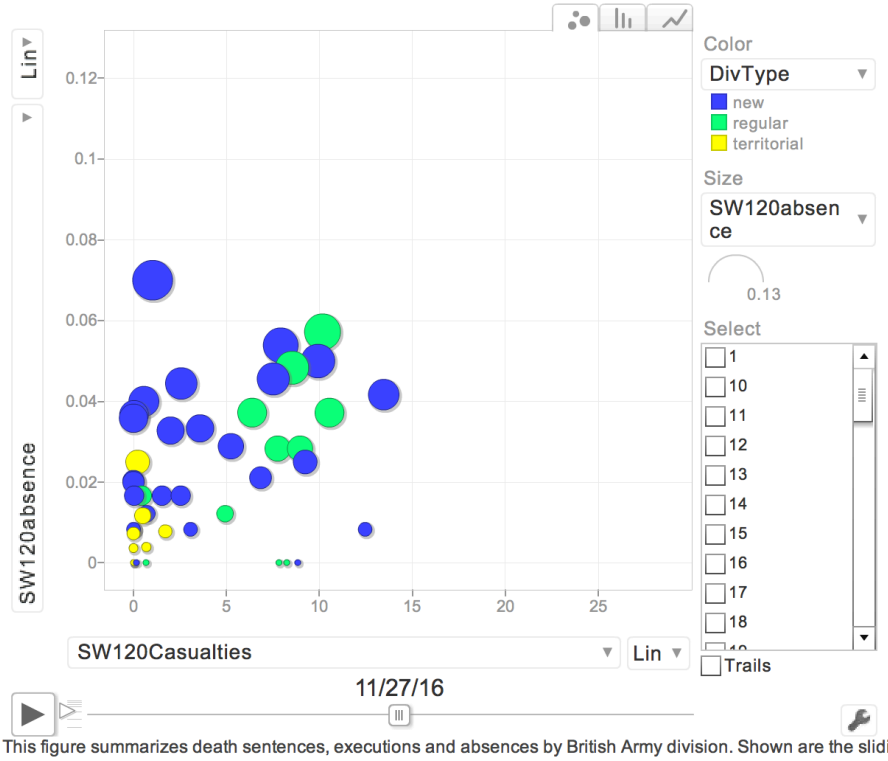


This figure summarizes death sentences, executions and absences by British Army division. Shown are the cumulative sums



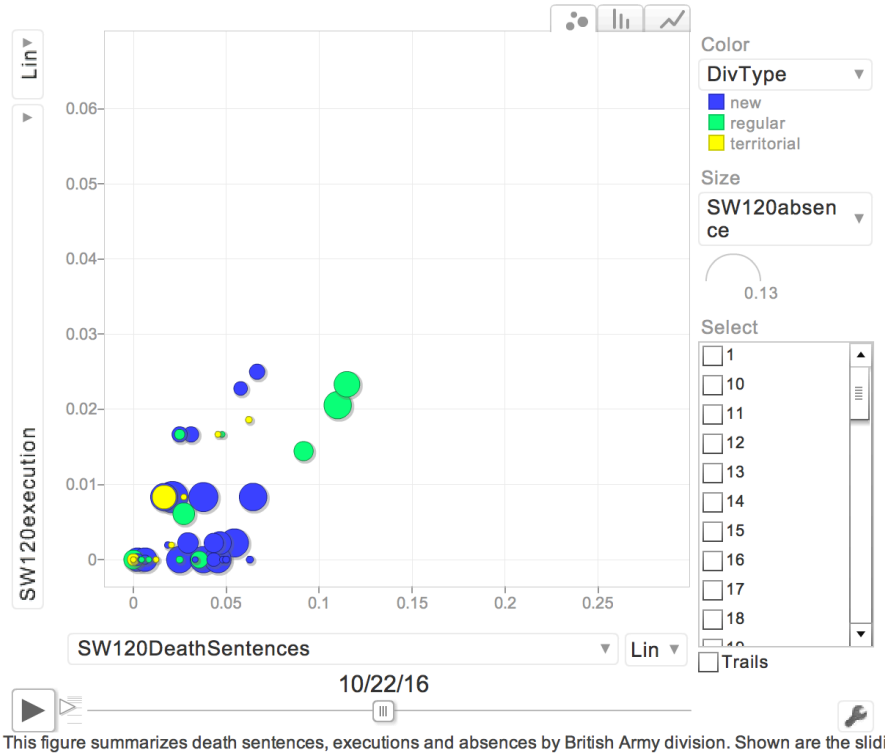
This figure summarizes death sentences, executions and absences by British Army division. Shown are the cumulative sums

Figure 1



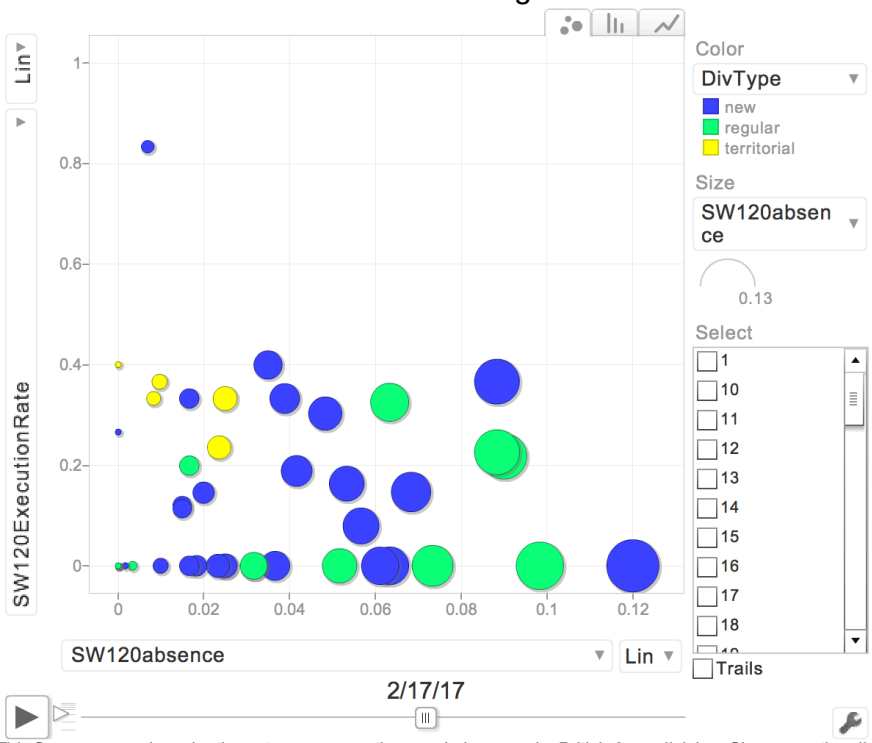
This figure summarizes death sentences, executions and absences by British Army division. Shown are the sliding window averages (120 days)

Figure 1



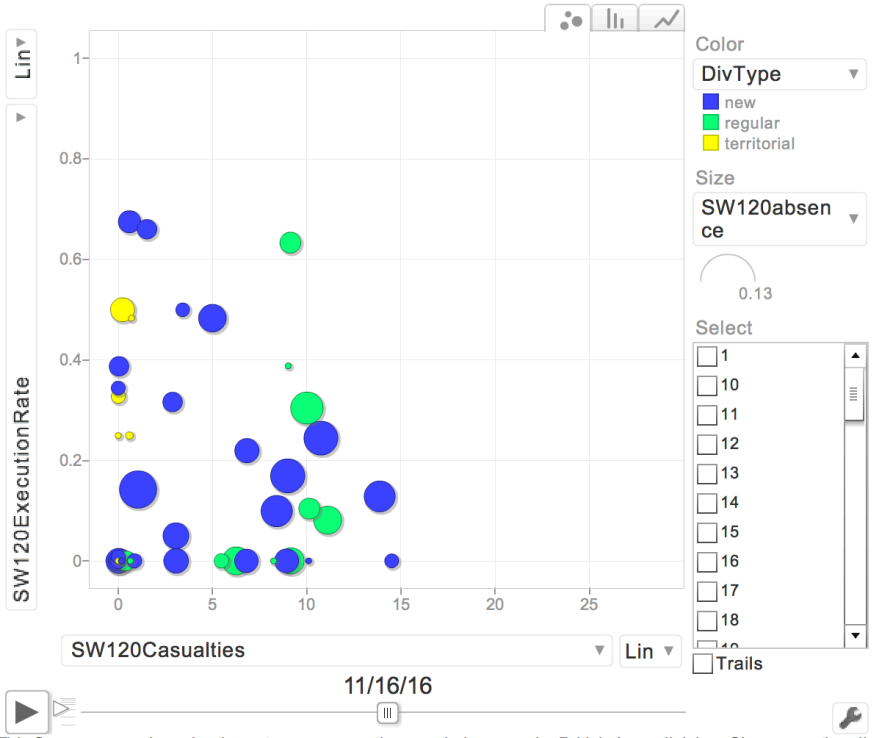
This figure summarizes death sentences, executions and absences by British Army division. Shown are the sliding window averages (120 days)

Figure 12E

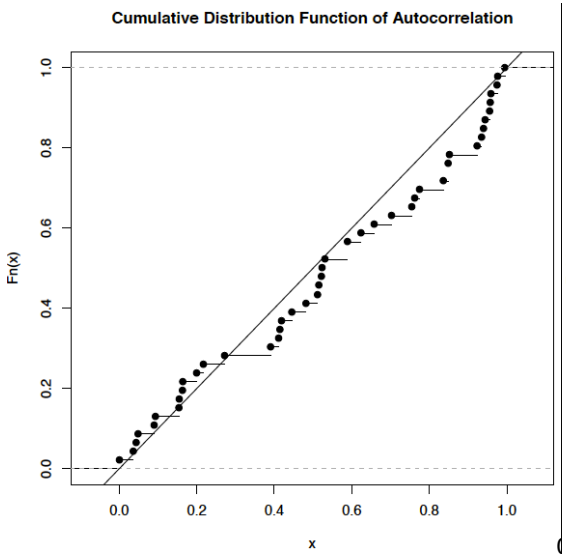


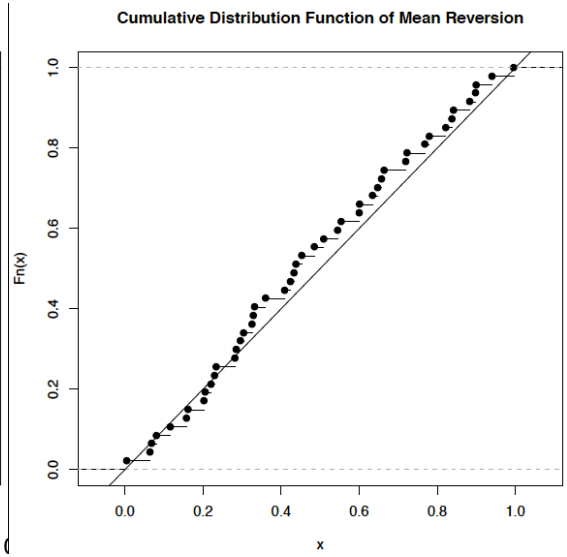
This figure summarizes death sentences, executions and absences by British Army division. Shown are the sliding window averages (120 days)

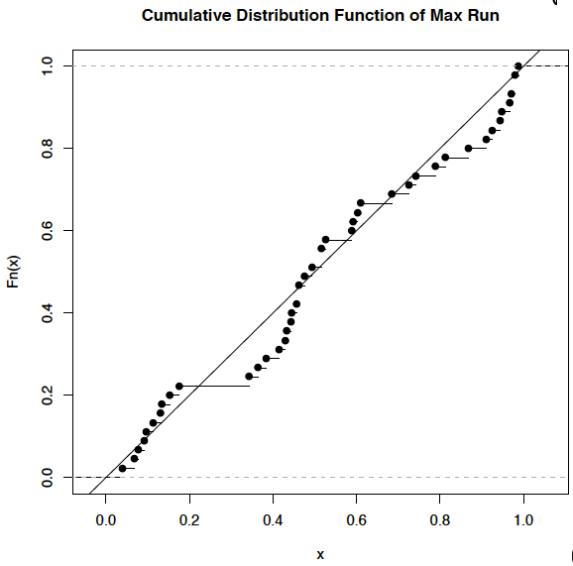
Figure 12F



This figure summarizes death sentences, executions and absences by British Army division. Shown are the sliding window averages (120 days)

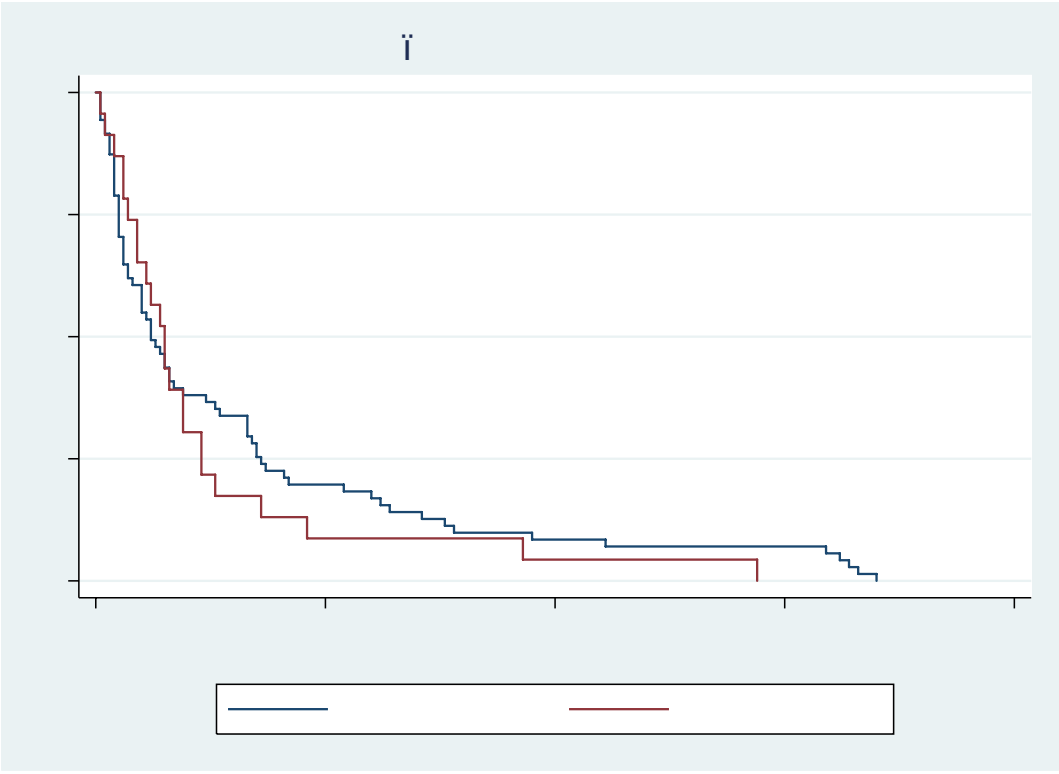


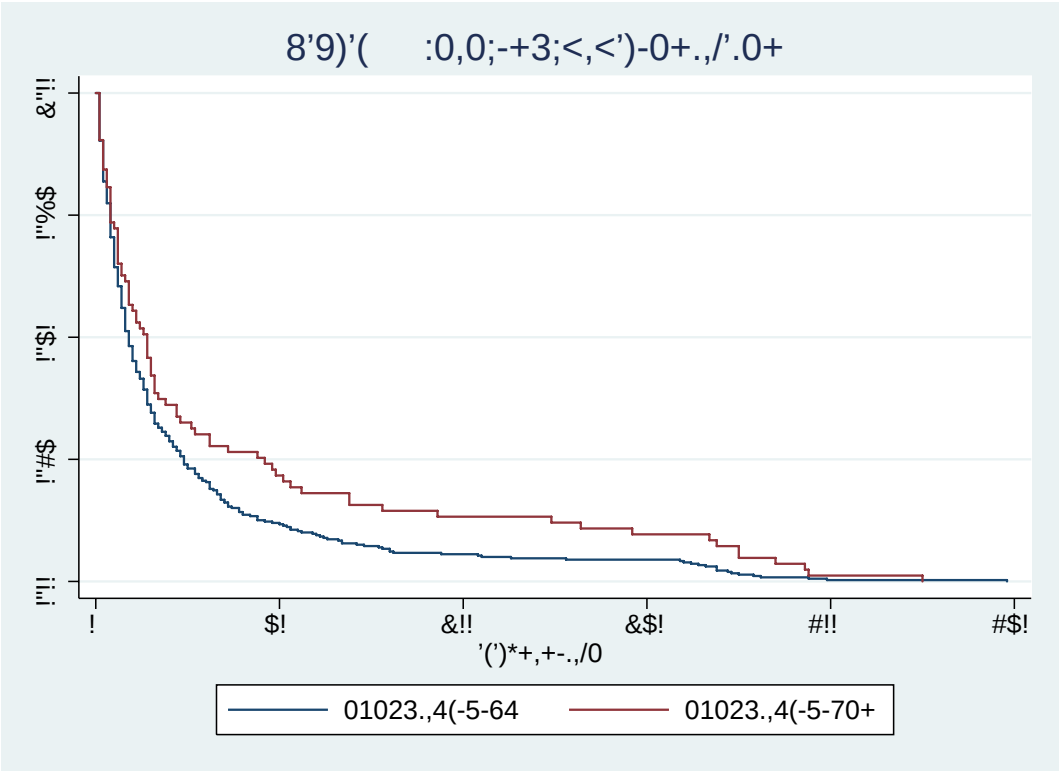


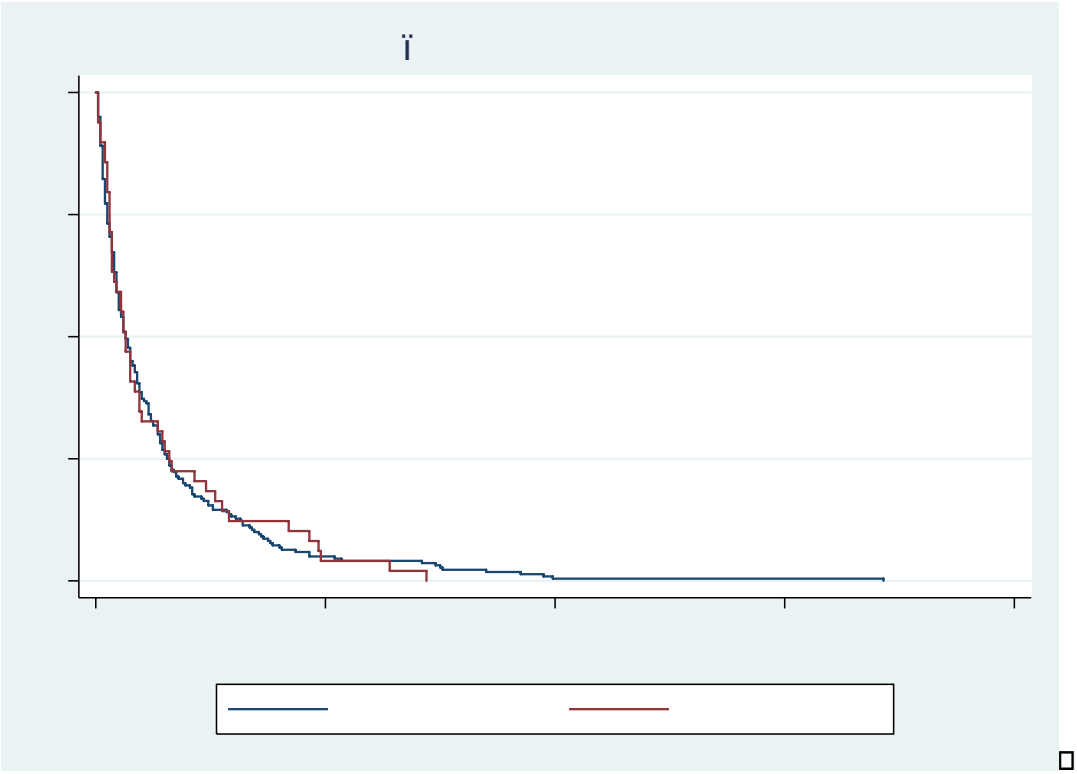


Kolmogorov-Smirnov Test - Randomness Check of P-Values

	Distance	Size	90%	95%	99%
Autocorrelation	0.1403913	46	0.1545	0.1767	0.2195
Mean Reversion	0.08068085	47	0.153	0.1748	0.2171
Longest Run	0.12611111	45	0.1562	0.1786	0.2219







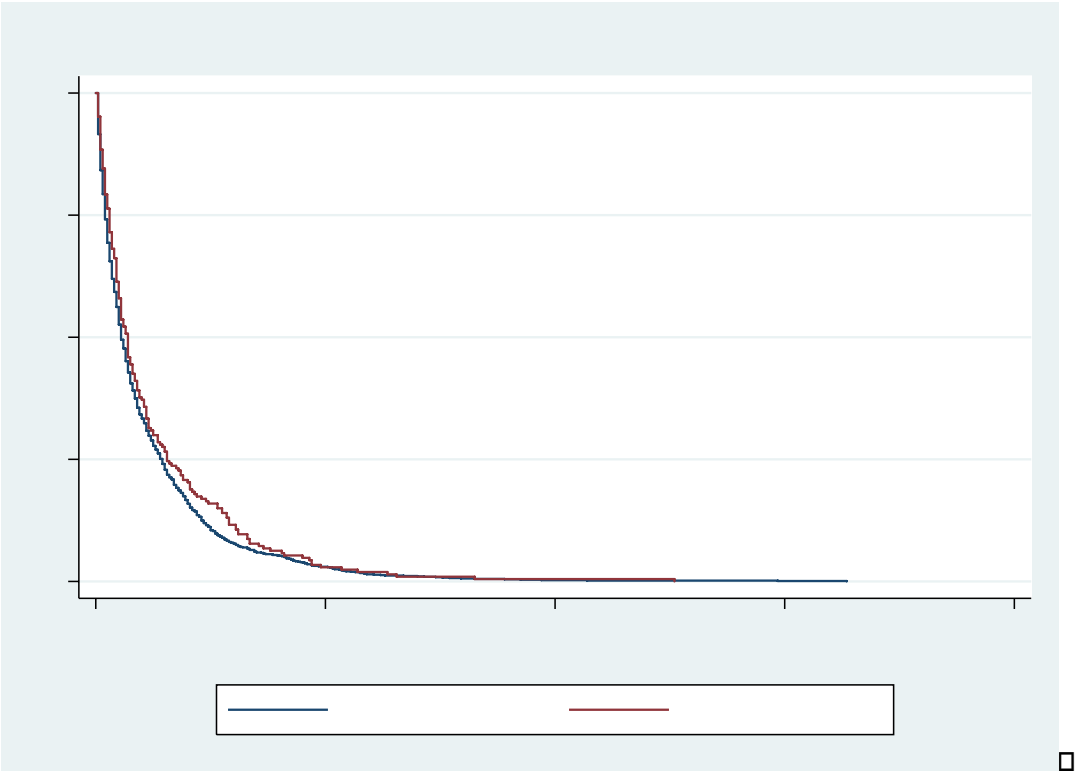
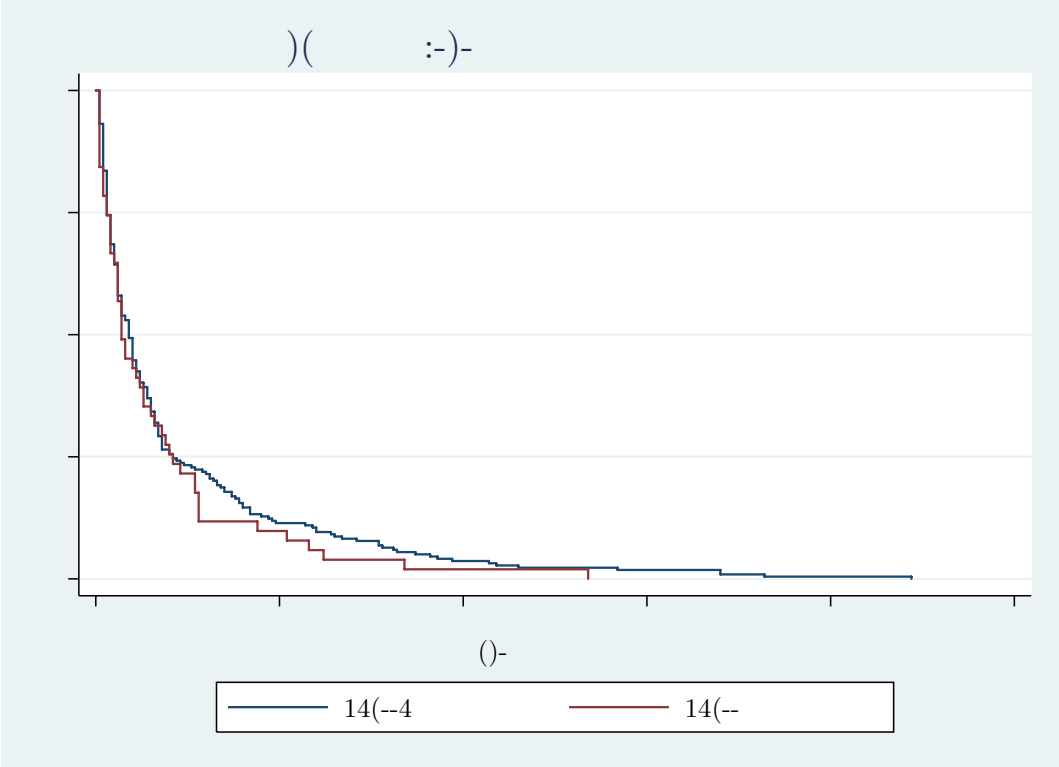
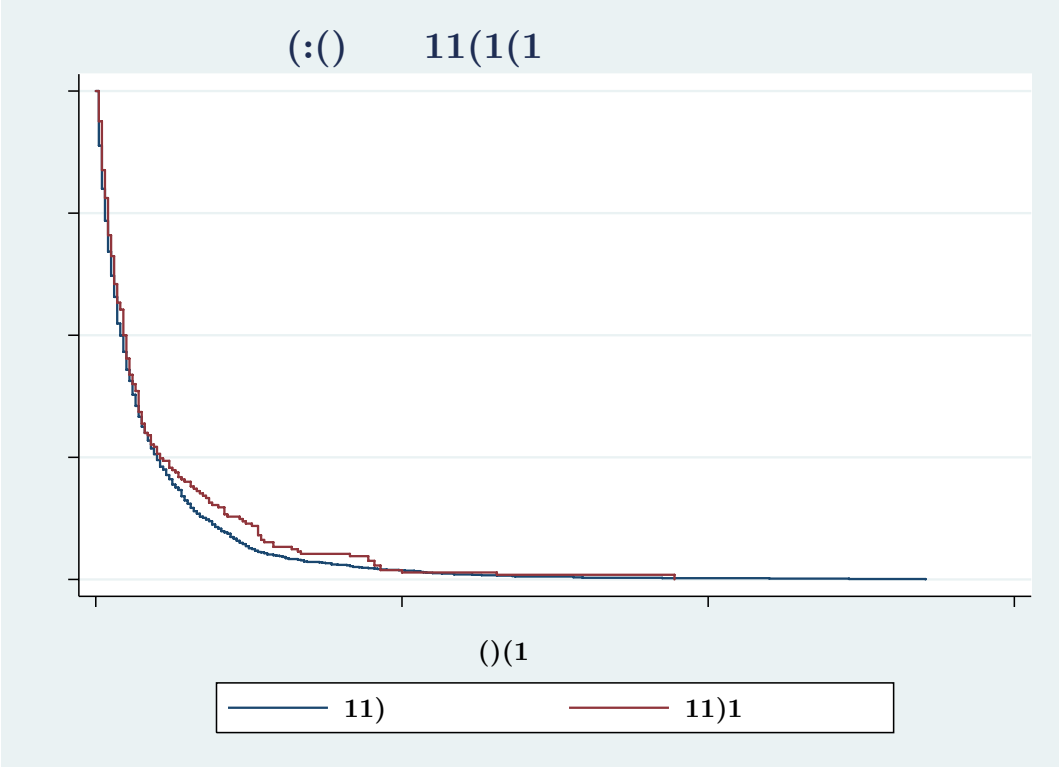


Figure 14C: Non-Parametric Survival Distributions (FGCM)



(a) Irish Executions Only



(b) Non-Irish Executions Only

	()	(2)	()	()	()	()	()	()	()	()	()
rish		2		2	e	2					
	(2)	(2)	()	(2)	(2)	(2)	(2)	(2)	(2)	(2)	()
rivate											2
		()									()
Ae											2
			()								()
										2	
				()	()					()	()
										2	2
				()	()					()	()
				2	2					2	
				()	()					()	()
				222	2					2	
				()	()					()	()
rish x					2						
					(2)						
rish x											
					(2)						
rish x											
					(2)						
rish x											
					(2)						
ew Ar											
									(2)		
Territorial Ar											
									()		
o Casualties											
										(2)	()
o Casualties Das Ao										2	22
										()	()
Distance to Coast											
											(2)
Distance to erlin											2
											()
ear ixed Eects											
onth ixed Eects											
Da o ee ixed Eects											
Division ixed Eects											
oint Test o ixed Eects							2	22			
oint Test o rish x ear E											
oint Test o Casualties											
oint Test o Distance											2
Constant		2							2		
	()	()	()	(2)	()	()	(2)	()	()	()	()
s											

otes: All reressions use ordinar least suares on death sentences occurrin in rance landers beore the end o orld ar Death sentences record without Divisions or ro the abour Cors were reoved o Casualties is calculated as lo(Casualties) o Casualties is deined as the dierence in o Casualties to 2 Das Ao vs to Das Ao o Casualties Das Ao is deined as the dierence in o Casualties to Das Ao vs to Das Ao Distances are set to issin beore the irst battle and ater the last battle Territorialeweular Ar status is not assined or ndian Australian Canadian or ew ealand Divisions eressions includin ae also du out ae when it is issin (ie assin a constant and include an indicator or ae bein issin) tandard errors in arentheses esults are siilar with oit or robit

Table 2: Are Observable Characteristics Correlated with Execution Decisions (Deserters)

anel A:	oint Test o Siniicance
riade nit	
Cor nit	3
Ar nit	
riade Coandin Oicer	
Division Coandin Oicer	
Division st eneral Sta Oicer	
Cor Coandin Oicer	
Cor st eneral Sta Oicer	
Ar Coandin Oicer	
Ar st eneral Sta Oicer	
Coandin Oicer	
st eneral Sta Oicer	
rish Soldier x rish Oicer E	
ilitar ndisciline 3 das ao	
Death Sentences 3 das ao	3
Execution ate 3 das ao	

anel :	
Areation level	Correlation with a Decision
Division	
	(33)
riade	3
	(3)
Cor	
	(33)
Ar	
	(3)
Ar Te	33
	(3)
All	3
	()

otes: Data is restricted to death sentences occurrin in rance landers beore the end o orld ar Death sentences recorded without Divisions or ro the abour Cors were reoved n anel A each row reorts a searate ordinar least suares reression and tests o oint siniicance o the ixed eects or easures o the recent battle environent ilitar indisciline and death sentences are calculated as lo(nuber) ilitar indisciline is the averae o absentees and trials easured ro the ar Diaries olice aettes and C trial reistries a execution rates is a set o controls corisin the nubers o executions and coutations within each tie window nits or oicers that aeared with less than reuenc were cateoried in a searate other cateor All reression odels include ear division and rish ixed eects n anel each row reorts a searate ordinar least suares staced autocorrelation reression The strins o events within each unit were staced and the irst event within each unit was excluded as a deendent variable ore than one event occurred on a a unit the averae outcoe was calculated or that da All reression odels include ear ixed eects and the leaveoneout ean execution r o the unit Standard errors in arentheses esults are siilar with oit or robit

Table : Are bservable Caracteristics Correlated it Execution Decisions (All Deat entences)

	()	()	()	(4)	()	()	()	()	()	()	()	()
rish							4					
	()	()	()	()	()	()	()	()	()	()	()	(4)
rivate		4										
		()									()	()
Ae												
			()									()
ew Ar												
									()			
Territorial Ar									4			
									()			
Desert											4	
										()	(4)	()
Coward												4
										()	(4)	()
Disobedience												
										()	()	()
urder												
										()	()	(4)
utin												
										()	()	()
uit												
										()	()	()
Slee												
										()	()	(4)
Striin										4	4	
										()	()	()
ae										4	4	
										(4)	(4)	()
o Casualties												
											()	(4)
o Casualties											4	4
Das Ao											()	(4)
Distance to Coast												4
												()
Distance to erlin												
												()
ear ixed Eects												
onth ixed Eects												
Da ixed Eects												
Division ixed Eects												
oint Test o ixed Eects						4		4				
oint Test o rish x ear E					4							
oint Test o Casualties												
oint Test o Distance												
Constant		4		4	4			e				
	()	()	()	(4)	(44)	()	()	()	()	()	()	()
	4	4	4	4	4	4	4	4	44	4	4	
s				4	4		4	4				

otes: All reressions use ordinar least suares on death sentences occurrin in rance landers beore the end o orld ar Death sentences record without Divisions or ro the abour Cors were reoved o Casualties is calculated as lo(Casualties) o Casualties is deined as the dierence in o Casualties to Das Ao vs to Das Ao o Casualties Das Ao is deined as the dierence in o Casualties to Das Ao vs to Das Ao Distances are calculated based on the soldiers units articiation in battles and are interolated between battles Distances are s issin beore the irst battle and ater the last battle Territorialeweular Ar status is not assined or ndian Australian Canadian or ew ealand Divisions eressions includin ae also du out ae when it is issin (ie assin a constant and include an indicator or ae bein issin) Standard errors in arentheses esults are siilar with oit or robit

Table 4: Are Observable Characteristics Correlated with Execution Decisions (All Death Sentences)

	()	()	()	()	()	(6)	()	()	()
	Exp	Wb	Cox	ExpNN	WbNN	CoxNN	ExpCT	WbCT	CoxCT
Execution	.	.	.	.	.6	.	.	.	.
	(.)	(.)	(.)	(.)	(.)	(.6)	(.)	(.)	(.)
og Casualties	.	.	.6	.	.	.	.	.	.
	(.6)	(.)	(.6)	(.)	(.)	(.6)	(.6)	(.6)	(.)
og Casualties	.	.	.	.	.	.	.	.	.
Days Ago	(.6)	(.6)	(.)	(.6)	(.)	(.)	(.6)	(.)	(.)
N	6	6	6	6	6	6	6	6	6
Execution	.	.	.66	.	.	.6	.	.	.
	(.)	(.)	(.)	(.)	(.)	(.6)	(.)	(.6)	(.)
og Casualties	.6	.6	.	.	.	.	.	.	.
	(.)	(.)	(.)	(.)	(.)	(.6)	(.)	(.)	(.)
og Casualties	.6	.6	.	.6	.66	.66	.	.6	.6
Days Ago	(.)	(.6)	(.6)	(.6)	(.)	(.6)	(.)	(.)	(.)
N	6	6	6	6	6	6	6	6	6
Execution	.6	.	.	.	.	.	.	.	.
	(.)	(.6)	(.)	(.)	(.)	(.)	(.6)	(.)	(.6)
og Casualties	.6	.	.	.6	.	.6	.6	.	.6
	(.)	(.6)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
og Casualties	.6	.	.6	.	.6	.	.	.	.
Days Ago	(.)	(.6)	(.)	(.)	(.)	(.)	(.)	(.)	(.6)
N	6	6	6	6	6	6	6	6	6

Notes: utcome is elapsed time from death sentence resolution (execution or commutation) until next absence. Exp Wb and Cox use the Weibull and Cox models respectively to parameterize the baseline hazard. In columns subtitled the announcement of the commutation to occur days after trial. In columns subtitled NN the nearestneighbor method is used which means the imputed announcement of the is same as the most nearby execution announcement while in columns labeled CT the trial date is used as the announcement date of th and commutation. og Casualties is calculated as log(Casualties)g Casualties is defined as the difference in og Casualties to Days Ago v to Days Ago. og Casualties Days Ago is defined as the difference in og Casualties to Days Ago vs. 6 to Days Ago. All specification include division and year fixedeffects. War Diaries analysis restricts to uly 6une which is the time window for the surviving data. Stanc errors clustered at the division level in parentheses p . p . p .

Table : Effects of Executions vs. Commutations on Elapsed Time Until Next Absence Differing b eter Case as a Desertion Trial and eter Soldier as ris

Panel A: War Diaries

Panel : Police Gazette

Panel C: FGCM Trial Registries (Time Until Next Desertion Trial)

Table 7: Effects of Execution vs. Commutation on Elapsed Time ntil Next Absence, ull Sample, Weak STA

	War Diaries							olice aettes					C Trial egistries (Desertion Trials)					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Execution	-0.417	-0.390	-0.378	-0.368	-0.374	-0.389	-0.372	-0.544	-0.513	-0.475	-0.432	-0.411	-0.709	-0.919	-0.895	-0.856	-0.791	-0.752
	0.736	0.798	0.781	0.742	0.701	0.679	0.387	0.527	0.497	0.447	0.407	0.393	0.522	0.699	0.675	0.622	0.566	0.541
Desert	-0.0429	-0.0203	-0.0188	-0.0253	-0.0517	-0.0763	-0.0459	-0.0711	-0.0804	-0.0656	-0.0458	-0.0412	0.0535	0.0272	0.0179	0.0317	0.0559	0.0630
	0.305	0.300	0.302	0.300	0.298	0.297	0.0938	0.0879	0.0859	0.0851	0.0882	0.0912	0.136	0.127	0.123	0.122	0.127	0.132
Ex-Desert	-0.00330	-0.0249	-0.0306	-0.0251	0.000868	0.0202	0.251	0.312	0.284	0.258	0.234	0.228	0.442	0.518	0.504	0.474	0.430	0.411
	0.746	0.782	0.762	0.728	0.697	0.683	0.422	0.562	0.529	0.480	0.441	0.426	0.555	0.741	0.716	0.663	0.607	0.580
Irish	-0.727	-0.769	-0.784	-0.822	-0.850	-0.836	-0.179	-0.158	-0.172	-0.186+	-0.189+	-0.185+	-0.353	-0.351	-0.365	-0.373	-0.366	-0.358
	0.179	0.181	0.190	0.212	0.226	0.220	0.109	0.110	0.109	0.107	0.108	0.108	0.141	0.143	0.144	0.145	0.144	0.143
Ex-Irish	1.179	1.258	1.262	1.310	1.359	1.347	0.431	0.432	0.440	0.437	0.424	0.420	0.718	0.726	0.750	0.778	0.775	0.761
	0.285	0.323	0.308	0.282	0.270	0.268	0.196	0.210	0.202	0.196	0.196	0.196	0.243	0.260	0.255	0.253	0.251	0.249
og Casualties	0.0870	0.0812	0.0781	0.0721	0.0626	0.0574	0.0537+	0.0738	0.0774	0.0748	0.0682	0.0629	0.0422	0.0597	0.0658+	0.0662+	0.0605	0.0543
	0.0602	0.0602	0.0599	0.0595	0.0597	0.0603	0.0301	0.0269	0.0281	0.0292	0.0294	0.0293	0.0413	0.0371	0.0380	0.0389	0.0394	0.0398
og Casualties	0.170	0.173	0.170	0.163	0.153	0.148	0.0652	0.0619	0.0681	0.0719	0.0709	0.0689	0.0856	0.0826	0.0924	0.100	0.0987	0.0944
30 Days go	0.0569	0.0596	0.0599	0.0613	0.0634	0.0641	0.0286	0.0276	0.0272	0.0275	0.0275	0.0274	0.0370	0.0358	0.0350	0.0344	0.0342	0.0343
Exs - 7d		-0.194						0.214						0.356				
		0.214						0.0939						0.116				
Cms - 7d		-0.0304						0.214						0.183				
		0.158						0.0562						0.0453				
Exs - 14d			-0.146						0.0840						0.172+			
			0.155						0.0788						0.0901			
Cms - 14d			-0.0439						0.156						0.140			
			0.108						0.0383						0.0328			
Exs - 30d				-0.147						-0.0270						0.0216		
				0.130						0.0703						0.0738		
Cms - 30d				-0.0653						0.105						0.0990		
				0.0722						0.0267						0.0255		
Exs - 60d					-0.193						-0.0734						-0.0390	
					0.132						0.0643						0.0667	
Cms - 60d					-0.0856						0.0651						0.0623	
					0.0546						0.0211						0.0206	
Exs - 90d						-0.222+						-0.0857						-0.0569
						0.132						0.0624						0.0650
Cms - 90d						-0.0887+						0.0455						0.0425
						0.0480						0.0190						0.0181
N	536	536	536	536	536	536	1640	1640	1640	1640	1640	1640	1654	1654	1654	1654	1654	1654

Notes: ll specifications use the "+14" commutation date imputation method and all specifications use exponential models to parameterie baseline haard rates. ll specifications include division and year fixed-effects. og Casualties is calculated as log1+Casualties. og Casualties is defined as the difference in og Casualties 1 to 29 Days go vs. 30 to 59 Days go. og Casualties 30 Days go is defined as the difference in og Casualties 30 to 59 Days go vs. 60 to 89 Days go. The regressors labeled exs-d or cms-d measure the cumulative effects of previous deterrence events in the unit. is the half-life of the effect. War Diaries analysis restricts to July 1916-June 1917, which is the time window for the surviving data. tandard errors clustered at the division level in parentheses + p 0.10, p 0.05, p 0.01

Irish ection	**1**		**1**
on-Irish ection	**111**	**0**	**1**
Irish Commtation	**1**	**1**	**10**
on-Irish Commtation	**11**	**1**	**1**
Irish ection	**00**		
on-Irish ection		**1**	**1**
Irish Commtation	**10**	**1**	**1**
on-Irish Commtation	**1**	**1**	**1**

Irish ection	**1**		**1**
on-Irish ection	**111**	**0**	**1**
Irish Commtation	**1**	**1**	**1**
on-Irish Commtation	**1**	**1**	**1**
Irish ection	**00**		
on-Irish ection		**1**	**1**
Irish Commtation	**10**	**1**	**1**
on-Irish Commtation	**11**	**1**	**1**

Irish ection	**1**		**1**
on-Irish ection	**10**	**100**	**1**
Irish Commtation	**1**	**1**	**110**
on-Irish Commtation	**10**	**1**	**11**
Irish ection	**10**	**0**	**1**
on-Irish ection		**10**	**1**
Irish Commtation		**0**	**10**
on-Irish Commtation	**1**	**1**	**11**

otes: In anels sb-title 1, the annoncement o the commtation is assme to occr 1 ays ater trial In anels sbtitle the nearest-neighbor metho is se, which means the imte annoncement o the commtation is same as the most nearby eection annoncement, while in anels labele CT, the trial ate is se as the annoncement ate o the eection an commtation War Diaries analysis restricts to ly 11-ne 11, which is the time winow or the sriing ata

Table 9: Day-by-Day ramework, All Absences

anel A: War Diaries

anel : olice aettes

anel C: C Desertion Trial egistries

! !

FROM THE
The Manchester Guardian (1821 - 1901); Jan 22, 1916;
ProQuest Historical Newspapers: The Guardian (1821-2003) and The Observer (1791-2003)
pg. 9

EXECUTION OF A BRITISH PRIVATE.

SHOT AS A DESERTER FROM THE TRENCHES.

Mr. Tennant, Under Secretary for War, in Parliamentary papers, informs Mr. Farrell that Private T. Hope, of the 2nd Battalion Leinster Regiment, was tried by field general court-martial on February 14, 1915, on a charge of desertion and other minor charges. The evidence showed that he absented himself from the trenches on December 23 until February 9, when he was arrested.

"It is well known to all soldiers (adds Mr. Tennant) that desertion in the face of the enemy is liable to be punished by death. Private Hope was informed of his sentence more than twelve hours before it was carried out. The sentence was passed on February 14, and was most carefully reviewed before it was confirmed by the Commander-in-Chief on February 27. Such confirmation was strictly in accordance with law. It is obvious that counsel cannot be employed on courts-martial which take place in the field.

"The accused called no evidence such as is referred to in the latter part of the question (Mr. Farrell had asked whether it was brought to the notice of the court that on several occasions Hope had exposed himself gallantl in trench warfare), nor was any such evidenc before the court."

Appeals from Death Sentences.

In reply to Mr. King's suggestion that te days should elapse between the dismissal c the appeal of a man sentenced to be shc upon conviction on indictment and the execu tion of the sentence, Mr. Tennant says he i not sure that it would be desirable. When man has been sentenced to death and all th possible means of obtaining a reprieve hav been exhausted, to defer the execution undul does not appear to be at all desirable in th interests of the condemned.

eprdued i periin e prig ner Furer reprduin priied iu periin

Appendix Figure

A F A A eerer ger ue ngndegrd eun
in rn
ig i riune r
rue iri epper ig riune 4
pg

IRISH SOLDIERS TRAIN TO FIGHT IN GERMAN ARMY

Deserters Eager to Humble England—Regard Teutons as Their Friends.

By CAROLYN WILSON.

[Copyright, 1916, By The Tribune Company.]

What would you say if you were to see a handsome blue eyed fighter with black hair and a smile full of mischief and trouble, and dressed in a fine German uniform with a harp on either side of his collar, embroidered with tiny colored pieces, and then you heard this same subject of the kaiser say in Irish you could thicken a stew with, "Bhring me a drink, ye imp o' Satan, whether I be in uniform or no, an' put it in a ginger ale glass, me bye, for good luck."

Allow me to introduce Capt. Robert Monteith, erstwhile servant of his majesty in Egypt, Africa, and India, independent follower of fortune in South American revolutions, and now captain of a company of grass-green Irishmen in the German army doing the goose-step to the tune of "They're hangin' men and women for the wearin' o' the green."

I think the tune is singularly well chosen and there would certainly be some hanging if these same wearers of the green—and what a green—ever came within the boundaries of the British empire again.

Most Are German Prisoners.

Most of them are Irish prisoners taken during the early days of the war and now exercising a pleasant freedom rehearsing for the downfall of England.

I'm sorry—they don't appeal to me. So we'll leave them out there at Zozzen, a huge training camp for 7,000 soldiers, doing the goose step, while we proceed to Capt. Monteith, a gentleman of adventurous past, a colorful imagination and an amazing awe inspiring facility for emptying in quick succession ginger ale glasses filled with whisky and soda.

"I've been fighting since I was a lad," he said, "at first with the English because I knew no better. I came from the loyal Irish, ye see. But I don't believe in war—it's murder. There's no such thing as honor or fair fighting or international laws in war. I'm a Socialist, really. I believe in complete disarmament for every country. That's the only way you could ever stop it. War is the curse of the poor man."

To the hint that troops were sometimes necessary to quell riots, enforce military law in ruined cities, or catastrophes, he answered:

"Yes, but who are they out to protect—not the poor but the rich. It is always the rich man that gets the benefit of an army and pays the least proportionately toward it. That is the reason I'm fighting with the Germans—because they have the most democratic government in the world and because they protect their poor.

"God give my sword power to run down a tyrant!" and he looked fondly at it. "It should bring me luck, to be sure. One of the prettiest girls in the world kissed it and bade me Godspeed, herself an American. Ye see, I escaped from England and took my wife and babies to America for safekeeping—then I stowed away on a steamer to Christiania. There was little of the ground they didn't go over at Kirkwall, but they didn't discover me.

"In Norway, however, somebody found out about me an' a most excitin' time I had makin' my escape to Germany. An' now it's the interest of me life, knowing on which front I'm to fight. We've been training out there so long. I'm aching to be at it again. And all we boys are a bit restless with inaction.

Has Hatred for England.

"O, for a whack at England. You know what they should do, the Germans? Give Alsace and Lorraine back to France and make a separate peace, then go to it and lick England. Of course, they'd take Alsace-Lorraine back again as soon as their job was finished, but that'd keep the French quiet."

"Is that your idea of the honor of the country you are now serving?" I asked him.

"It's me idea of the honorable intentions of every country under the sun who's at war," he answered. "There is no such thing as honor or clean fighting in war—it's all murder and murderers aren't particularly honorable or fair gentlemen."

"Do you think you represent the feeling of Ireland, then, in coming here and joining the Germans?"

"There's not an Irishman living but would like to be free of England, and those of us who have come here believe this is our only chance. People call Ireland poor and decaying. Why, it's a rich country. Under proper rule it would be a wonderful country. Look at the way its literature is coming to life again. O, after the war, we'll be strong."

"Have you talked to the Irishmen interned here?"

"Have I, indeed, and what did they say to me? Nothing that I could repeat in your presence."

Company of Deserters.

At that time I didn't know that almost all the men under Capt. Monteith were deserters, although I noticed the determined evasion of my repeated questions as to their methods of reaching Germany after the war began.

Although they are a part of the German army, they seem to be existing under lax discipline, for the corporal Capt. Monteith had intended to bring with him had left camp Saturday afternoon and on Monday had not returned. I heard afterward that this handful of Irishmen cause more trouble at the camp than all the 7,000 other men. When the spirit comes upon them they go forth in a body and make life miserable for all about them.

Monteith himself was at the Adlon bar most of the time when he wasn't hunting up Sir Roger Casement or St. John Gaffney, who arrived early in February full of words against the American administration and the tyranny of the British.

Referring again to this Irish company doing the German goose step, I spoke of them rather disparagingly to an official of the war ministry.

"Probably they will never fight," he said. "In the first place, the condition on which they were accepted was that they might fight on Irish or English soil. It was merely a small courtesy paid the Irish and Irish sympathy for us through them. The Irish have done much for us, and may do more, and we haven't so many friends in the outside world today that we can afford to overlook some sincere admirers."

British Troops in Ireland.

I had with me the official figures of Irish emigration since the war began, Irish recruiting by county and month, also the number and division of English troops in Ireland, but some one who searched my cabin on the Rotterdam for notes took them all away, and I can only give you round numbers. The total recruiting of Ireland was about 97,000, of which half is from Protestant Ireland. In spite of the fact that the Irish were not included in the conscription bill, it has still been thought necessary to keep a force of between 50,000 and 60,000 British troops in Ireland, either to quell a possible revolution or for fear of a German landing, or to hunt for German submarine stations, two of which were discovered on the west coast.

In Cork a committee appointed to organize St. Patrick's day celebrations was offered the use of several companies of Irish soldiers, but refused the offer with the words: "The British army is in hostile occupation of Ireland, and it would be as absurd for Belgians to invite a contingent from the German army to participate in a Belgian national celebration."

Well informed Englishmen fear that Ireland is very near revolt.

[The tenth article by Carolyn Wilson on the conditions in Germany and its aspirations will appear in tomorrow's "Tribune."]

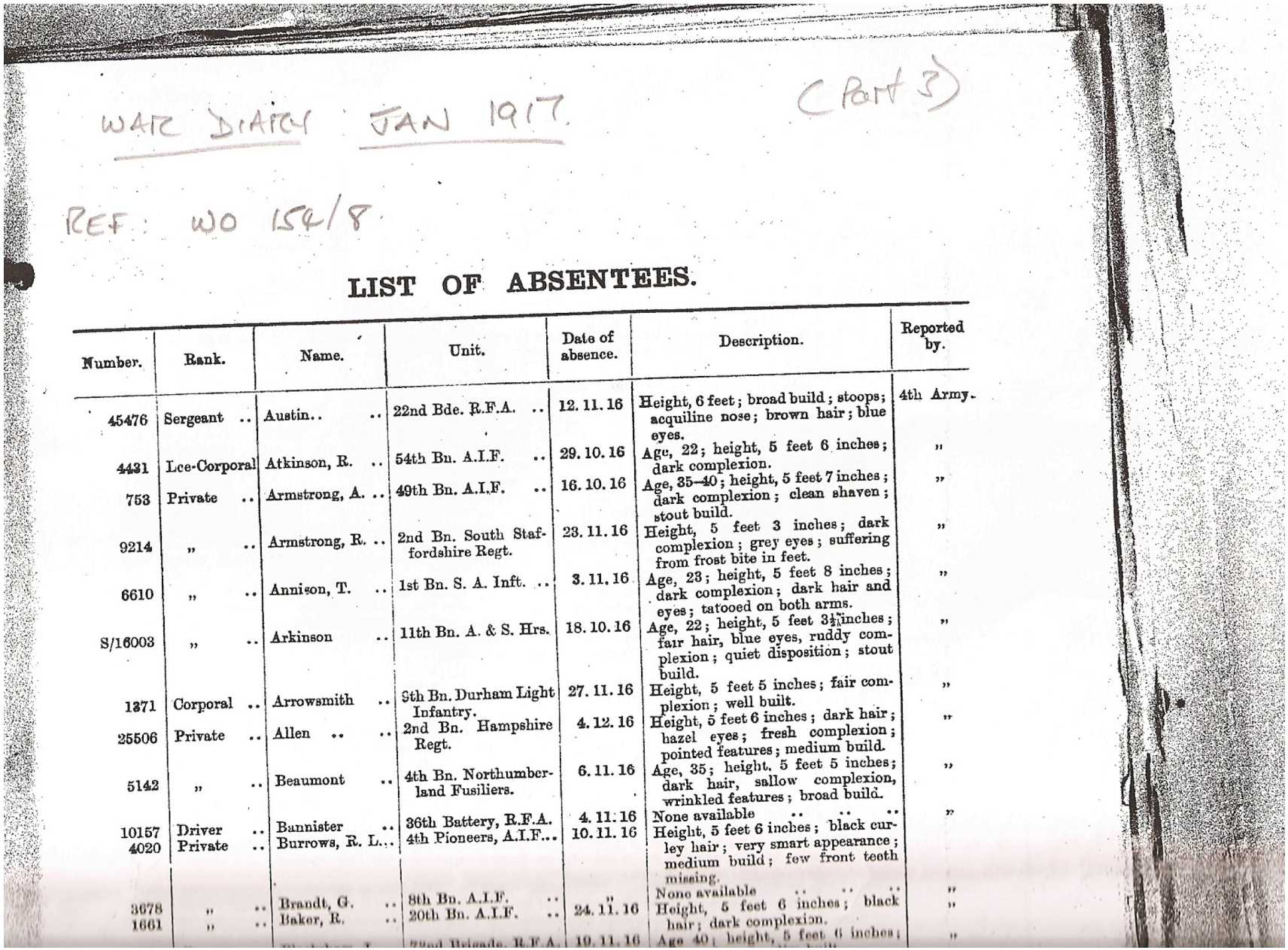
An Irish Captain Serving Germany.

Capt. Robert Monteith.

Capt. Robert Monteith, soldier of fortune, is commander of an Irish company training to fight for Germany. He doesn't believe in war, but nevertheless longs to deliver a blow against England.

eprdued i periin e prig ner Furer reprduin priied iu periin

Appendix Figure 3



WAR DIARY JAN 1917. (Part 3)

REF: WO 154/8.

LIST OF ABSENTEES.

Number.	Rank.	Name.	Unit.	Date of absence.	Description.	Reported by.
45476	Sergeant ..	Austin.. ..	22nd Bde. R.F.A. ..	12. 11. 16	Height, 6 feet; broad build; stoops; acquiline nose; brown hair; blue eyes.	4th Army.
4431	Lce-Corporal	Atkinson, R. ..	54th Bn. A.I.F. ..	29. 10. 16	Age, 22; height, 5 feet 6 inches; dark complexion.	,,
753	Private ..	Armstrong, A. ..	49th Bn. A.I.F. ..	16. 10. 16	Age, 35–40; height, 5 feet 7 inches; dark complexion; clean shaven; stout build.	,,
9214	,, ..	Armstrong, R. ..	2nd Bn. South Staffordshire Regt.	23. 11. 16	Height, 5 feet 3 inches; dark complexion; grey eyes; suffering from frost bite in feet.	,,
6610	,, ..	Annison, T. ..	1st Bn. S. A. Inft. ..	3. 11. 16	Age, 23; height, 5 feet 8 inches; dark complexion; dark hair and eyes; tatooed on both arms.	,,
S/16003	,, ..	Arkinson ..	11th Bn. A. & S. Hrs.	18. 10. 16	Age, 22; height, 5 feet 3½ inches; fair hair, blue eyes, ruddy complexion; quiet disposition; stout build.	,,
1371	Corporal ..	Arrowsmith ..	8th Bn. Durham Light Infantry.	27. 11. 16	Height, 5 feet 5 inches; fair complexion; well built.	,,
25506	Private ..	Allen	2nd Bn. Hampshire Regt.	4. 12. 16	Height, 5 feet 6 inches; dark hair; hazel eyes; fresh complexion; pointed features; medium build.	,,
5142	,, ..	Beaumont ..	4th Bn. Northumberland Fusiliers.	6. 11. 16	Age, 35; height, 5 feet 5 inches; dark hair, sallow complexion, wrinkled features; broad build.	,,
10157	Driver ..	Bannister ..	36th Battery, R.F.A.	4. 11. 16	None available	,,
4020	Private ..	Burrows, R. L..	4th Pioneers, A.I.F..	10. 11. 16	Height, 5 feet 6 inches; black curley hair; very smart appearance; medium build; few front teeth missing.	
3678	,, ..	Brandt, G. ..	8th Bn. A.I.F. ..	,,	None available	,,
1661	,, ..	Baker, R. ..	20th Bn. A.I.F. ..	24. 11. 16	Height, 5 feet 6 inches; black hair; dark complexion.	,,
			22nd Brigade, R.F.A.	19. 11. 16	Age 40; height, 5 feet 6 inches;	,,

Appendix Figure 4

PUBLISHED BY AUTHORITY.

NEW SERIES. TUESDAY, JUNE 6, 1916. VOL. XXXII., No. 3258.

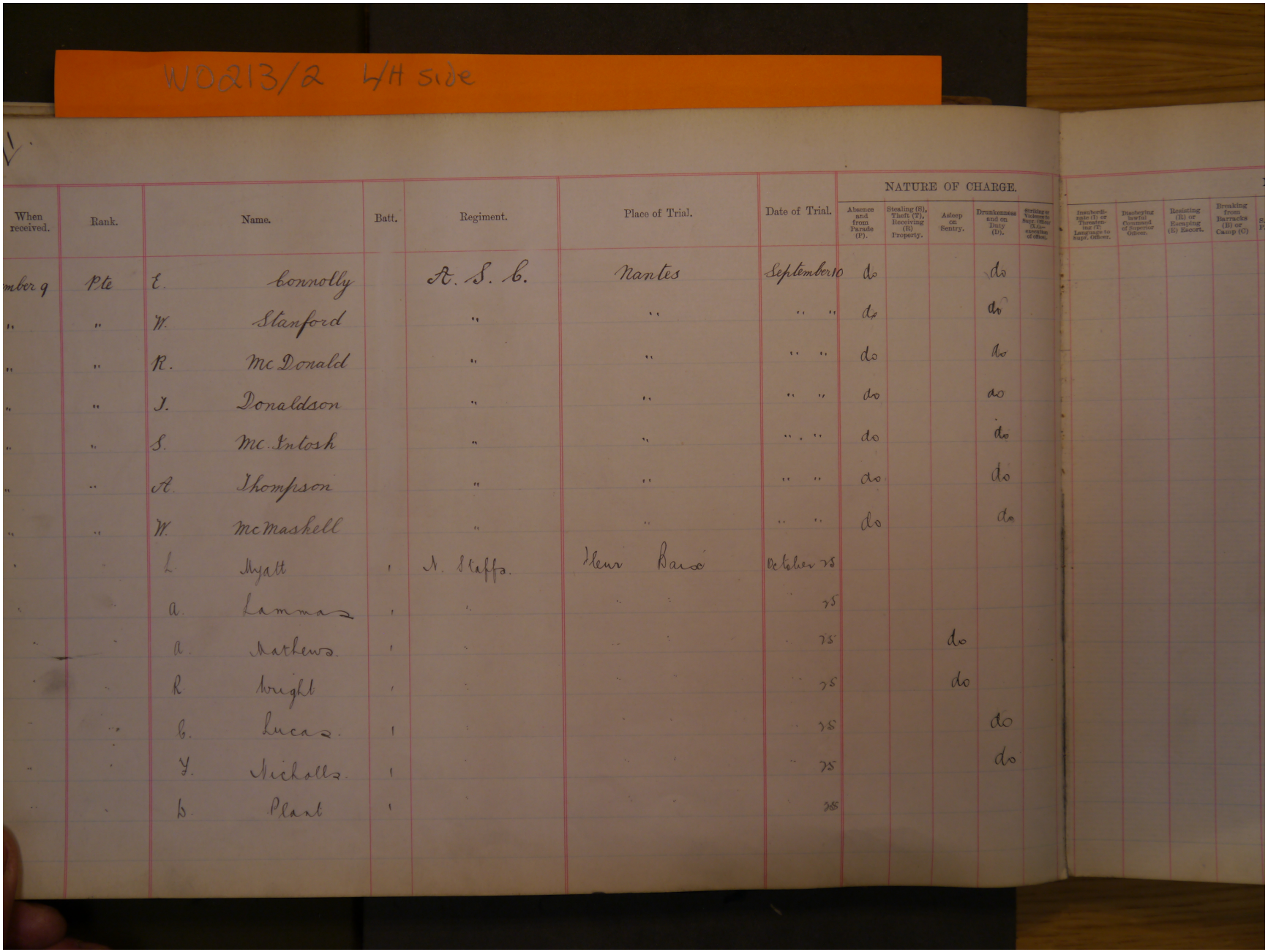
It is requested that the Admiralty and War Office Forms giving descriptions of Deserters, &c., from His Majesty's Naval and Military Services for insertion in the POLICE GAZETTE, and all communications in connection therewith, shall be addressed to THE EDITOR of the POLICE GAZETTE, New Scotland Yard, London, S.W.

WAR OFFICE, JUNE 6, 1916.

DESERTERS AND ABSENTEES FROM HIS MAJESTY'S SERVICE.

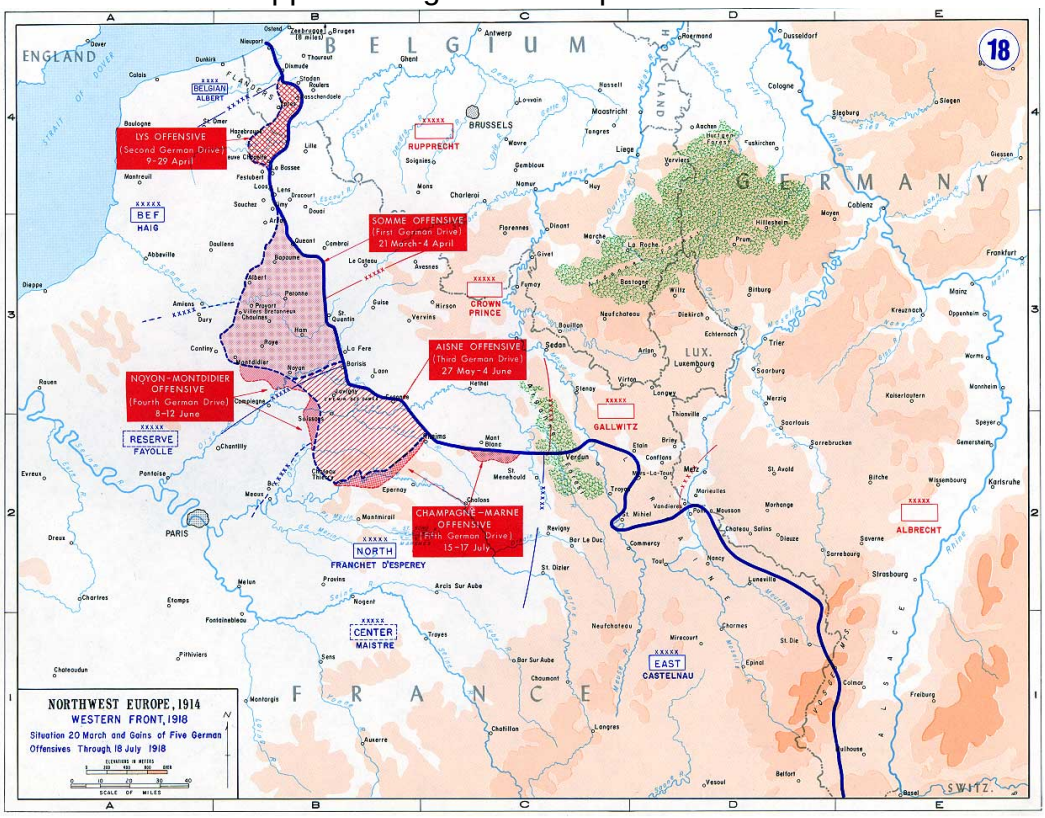
Office No	NAME.	Reg. No.	Corps.	Age.	Height.	Com-plxn.	Hair.	Eyes.	Trade.	ENLISTMENT. DATE OF	ENLISTMENT. PLACE OF	PARISH AND COUNTY IN WHICH BORN.	DESERTION. DATE OF	DESERTION. PLACE OF	MARKS AND REMARKS
1	Abbott, C.	1312	6th K.R. Rifles	—	—	—	—	—	—	—	—	—	21 May	Sheerness	
2	Alexander, J. R.	10310	W. Cav. Depôt	—	—	—	—	—	—	—	—	—	16 May	St. Helens	
3	Allwood, Herbert	8516	3rd E. Yorks R	29¼	5 4	fresh	dk brn	brn	groom	17 May '07	Beverley	Eaton, Notts	27 May	Withrnsea	2 scs chst
4	Anderson, B.	11829	3rd Highlnd Lt	—	—	—	—	—	—	—	—	—	27 May	Malleny	
5	Andrews, J.	1 07915	ArmySer.Corps	38	5 7	—	—	—	labourer	15 May '15	Holloway	Chapel Tn, Sheffield	28 May	Catterick	mole back
6	Anscombe, C.	69533	R. Engineers	38	5 8¾	fresh	grey	grey	bricklayer	6 Mar. '15	Southwark	Southwark	23 May	Newark	star l frm portwine stn cross
7	Armour, Daniel	8962	Dpt Seaf Hghrs	32	5 7½	—	—	—	pro footblr	8 June '15	—	—	15 May	Ft. George	scs chks knees ttd frms
8	Armstrong, R.	1 50954	InldWtrTrnRE	26	5 6	ruddy	dk brn	brn	lighterman	—	Leeds	Leeds, Yorks	27 May	Poplar	
9	Asple, M.	19460	5th R. Dub. Fs	19½	5 7	—	—	—	gen labr	18 Mar. '15	Kilkenny	Borris, Carlow	26 May	CurraghCp	
10	Atkinson, Stanley	16565	5th CldstrmGds	27	5 8½	—	—	—	miner	31 July '15	Hackney	Durham	22 May	Windsor	cntrctd ltl fngr rt
11	Avery, C.	938	3rd R.Sussex R	42	5 7½	—	—	—	painter	3 Nov. '14	Chichester	—	26 May	Newhaven	
12	Bagge, N.	13982	Dpt S. Staffs R	21	5 11	fresh	brn	blue	choclte mkr	8 Sept. '14	Birmnghm	Birmingham	24 May	Lichfield	
13	Baillie, Henry G.	1 47600	ArmySer.Corps	31½	5 6½	—	dark	—	chauffeur	8 Nov. '15	Whiteball	Clerkenwell	26 May	Avnmouth	
14	Bain, Michael	10210	11th GordnHgh	25	5 5	—	—	—	carter	22 May '15	Dundee	Dundee, Forfar	15 May	Cambsbrrn	CF MB hrt l frm JM JD MA
15	Bain, Peter	1 66075	Can. Pionr Dpt	32½	5 8	dark	black	hazel	plumber	1 Oct. '15	Ontario	Leith	28 May	Cromarty	6 scs rt frm
16	Bain, Wm.	6802	3rd R.Mun.Fus	30	5 7½	—	—	—	stoker	11 Jan. '16	Limerick	Vizers Fields, Limrk	10 May	Shornclife	ttd arms
17	Bankes, P.	9779	3rd R.Mun.Fus	27	5 5½	fresh	dk brn	hazel	labourer	1 Mar. '12	Cork	St. Anns, Cork	22 May	Aghada	sc rt thigh l elbow
18	Banks, Thos	9939	5th Res Cav. R.	38¾	5 4¾	—	—	—	shell gangr	17 Jan. '16	Barrw-i-F.	Stockton-o-Tees	24 May	Aghada	mole back
19	Barber, J.	34485	178th Bde RFA	22	5 3½	dark	brn	dark	hawker	22 July '15	Ashtn-u-L.	Hulme, Lancs	21 May	York	
20	Barker, Herbert												24 May	Deepcut	
21	Bateman, A.	26141	15th NrthlndFs	36	5 4½	—	—	—	collier	24 May '15	Leicester	—	24 May	RugeleyCp	man l arm
22	Bates, John	1493	28th Northd Fs	21	5 8	—	—	—	waiter	7 June '15	Nwcstl-o-T	Newcastle-on-Tyne	15 May	Nwcstl-o-T	
23	Batty, Owen	6858	3rd K.O.Sc.Bds	39¾	6 1	fair	brn	grey	gen labr	11 Aug. '14	Warrngtn	Barnsley	22 May	Inchkeith	
24	Beagleigh, E.	247	3rd R.W.Surr.R	35½	5 3½	—	brn	brn	casual labr	31 Aug. '14	London	Lambeth	21 May	Shoreham	TB l frm hrseshoe gd lck rt
25	Beddowes, —	2667	5th Yorks L.I.	—	5 6	fresh	lt brn	—	miner	31 Aug. '14	—	—	19 May	ClipstneCp	scs nose
26	Bellamy, George	19572	3rd E. Yorks R	31¼	5 5½	—	—	—	labourer	29 June '15	Hull	—	24 May	Withrnsea	l lve Maggie clspd hnds tr lve
27	Bellhouse, E.	1 70264	M.T. A.S.C.	23	5 5½	—	—	—	traveller	—	Leeds	—	22 May	Osterley Pk	
28	Billington, T.	746	ArmySer.Corps	29	5 5	fresh	dark	blue	labourer	4 Sept. '14	Accrington	Glasgow	23 May	*leave* *	* from B.E.F.
29	Blackburn, S.	36415	3rd R.WelshFus	37	5 5½	—	—	—	painter	27 Oct. '15	Birmnghm	Leeds, Yorks	9 May	Litherland	
30	Blackburrow, F. G.	34517	ArmySer.Corps	24	5 6½	fair	fair	hazel	driver	13 Aug. '14	Islington	New Southgte, Mdx	20 May	Catterick	ttd frms sc back
31	Blake, Jeremiah	70702	R. Engineers	48	5 10	—	—	—	fitter	3 Feb. '15	Westmnstr	Headford, Galway	27 May	Hghtn Rgs	
32	Bolan, William	7409	4th Scottish Rif	43½	5 5	fresh	brn	hazel	labourer	14 Aug. '14	Glasgow	Kilmarnock, Ayr	25 May	Ft. Matilda	sc rt sde chn
33	Boot, James	55764	HvArtDptRGA	28½	5 11	—	—	—	caster	3 Dec. '14	Birmnghm	—	21 May	Woolwich	ttd rt frm blu mk l eye sc r
34	Booth, Alfred	18887	3rJS. WalesBds	32	5 7½	—	—	—	miner	21 Dec. '14	Newport	Abergavenny, Mon.	28 May	Hightown	coal sc l eyebrw
35	Booth, Geo. Wm.	15576	22nd Lancs Fus	23½	5 1	—	—	—	collier	5 Jan. '15	Farnworth	—	27 May	Prees Hth	
36	Boothroyd, Walter	502	21stW.Yorks R	37½	5 4	light	lt brn	blue	woolcombr	11 Dec. '15	Bradford	Bradford, Yorks	20 May	Skipton	
37	Bottomley, R.	63901	Remounts ASC	38	5 5	—	—	—	horsekeepr	9 Apr. '15	London	Deptford	24 May	Ormskirk	sc rt knee
38	Bowles, L. S.	15226	28th Middl-x R.	30	5 4	fresh	brn	blue	silversmth	7 June '15	Holloway	—	26 May	Aldershot	
39	Bradley, Thomas	15974	4th A.&S. Hghs	21½	5 4½	—	—	—	baker	3 Jan. '16	Belfast	St. Annes, Antrim	6 May	Edinburgh	ttd arms chst nckle rnd m
40	Brady, Chas.	6369	3rd R. Ir. Fus	23	5 4½	—	—	—	labourer	14 Sept. '15	Cork	Cork	26 May	Aghada	
41	Brailsford, Fredk.	11975	11thYk.&Lcs R	30	5 6½	dark	black	brn	miner	28 Aug. '14	Rotherhm	Wrsbro' Dle, Brnsly	28 May	RugeleyCp	
42	Brandon, H.	15828	6th Royal Fus	20½	—	fresh	brn	brn	vanguard	17 Oct. '13	Hounslow	Hammersmith	13 May	Shoreham	buffalo hd love Flo wound
43	Brannon, Patrick	28841	3rd Highlnd Lt	25	5 5	—	—	—	labourer	12 Jan. '15	Stirling	Stirling	27 May	Malleny	sc rt elbw
44	Brayshaw, W. G.	24606	3rd W. Yorks R	30½	5 5	—	—	—	labourer	11 Jan. '16	Leeds	Leeds	21 May	WhitleyBy	
45	Brennan, Patrick	—	R. Irish Regt	36	5 6¾	—	—	—	gen labr	22 May '16	Dublin	St. Michaels, Wxfrd	23 May	*en route**	sc ovr rt eyebrw * to Clon
46	Brett, Samuel	6159	R. Angiesey RE	33¾	5 5½	—	brn	dk brn	platelayer	17 Nov. '11	Hyde	St. Annes, Lancs	19 May	Beaumaris	
47	Brodie, A.	64338	1a Rs Bde RFA	—	—	—	—	—	—	—	—	—	27 May	Nwcstl-o-T	
48	Brophy, P.	23741	6th Res Cav. R.	21	5 4	—	—	—	—	1 May '16	Curragh	—	19 May	Dublin	
49	Bruce, N. L. McG.	2498	Dpt Gord. Hghs	24	5 8	—	—	—	clerk	15 May '16	London	Dundee	18 May	*en route**	* to Aberdeen
50	Bryan, A. E.	27652	1st GnYorks L.I	20¾	5 6¾	—	—	—	labourer	9 Dec. '15	Derby	Derby	22 May	Stattngbro	
51	Bryan, Patrick	8305	3rd R. Irish Rgt	30	—	fresh	brn	blue	groom	7 Sept. '14	Dublin	St. James, Dublin	24 May	Dublin	
52	Buchan, W.	24010	26thSq R.Fly.C	24	—	fresh	—	—	fitter	28 Feb. '16	—	—	26 May	Turnhouse	
53	Bunyan, Sydney	13571	Dpt S.Staffs R.	44	5 7	brn	grey	blue	labourer	7 Sept. '14	Lichfield	Crewe, Cheshire	13 May	France	
54	Burgess, Geo. Wm	25173	10th S.Staffs R.	39	5 4½	—	—	—	surveyor	2 May '16	Leicester	Long Eaton, Derby	20 May	RugeleyCp	
55	Burke, P.	25569	5th R. Dub. Fs	22	5 5	—	—	—	gen labr	28 Dec. '15	Dublin	S. Augustne, L'pool	17 May	Curragh Cp	scs chst rt shldr lmbr regn
56	Burton, E.	27843	ArmySer.Corps	29	5 6	fresh	brn	blue	—	27 Jan. '16	Manor Pk.	Forest Gate	13 May	Ashford	
57	Burton, W.	40653	51st RsBtyRFA	26½	5 6¾	fresh	dk brn	grey	gen dealer	12 Oct. '14	Tottenhm	Tottenham	6 May	BshpsStrfd	snke womn clspd hnds rt ar
58	Bushby, Thomas	11999	ArmySer.Corps	39	5 3½	—	—	—	labourer	12 May '15	London	Brixton	25 May	B.E.F.	
59	Butcher, G.	1 24211	48thRsBtyRFA	21¾	5 7	—	—	—	van boy	28 Feb. '16	Lambeth	Lambeth	27 May	Weedon	
60	Butler, E.	24194	28th Middlsx R.	23	5 7	fresh	brn	fair	tailor	8 Dec. '15	Finsbury	Southampton	21 May	Aldershot	
61	Butti, Charles J.	1082	3rd Essex R.	23¼	5 7½	—	brn	grey	labourer	31 Oct. '10	Stratford	—	24 May	Felixstowe	
62	Byrne, J.	18259	Dpt R.Dub.Fus	19¾	5 5¾	fresh	fair	blue	shoemaker	8 Jan. '15	Dublin	—	1 May	Naas	
63	Cagney, M.	7756	Dpt R. Mon.RE	40	5 5	—	—	—	engne drvr	29 July '15	Monmouth	Mertbyr, Glam.	20 May	Monmouth	
64	Cahill, Thomas	—	Dpt R. Irish Rif	22	5 7¼	fresh	lt brn	blue	labourer	24 May '16	Glasgow	Cork	24 May	*en route**	sc cntre frhd * to Be
65	Cain, Samuel	27053	4th Lancs Fus	30½	5 7¾	—	—	—	labourer	10 Dec. '15	Bury	Bolton, Lancs	27 May	Barrow	
66	Caines, Thomas	10503	11th S.Staffs R.	42	5 6	fresh	lt brn	grey	labourer	1 Sept. '14	Birmnghm	St. James, Brmghm	22 May	RugeleyCp	ttd frms sc rt groin
67	Calderwood, J.	22931	3rd R.Scots Fus	23¼	5 4½	—	—	—	pithd man	9 Mar. '16	Ayr	Drogborn, Ayr	2 May	Ft. Matilda	sc l elbw
68	Callaghan, H.	1 27083	ArmySer.Corps	43	4 11½	—	—	—	—	10 Aug. '15	London	Shoreditch	26 May	Aldershot	strwbrry mk nck
69	Cameron, George	15080	19th Highlnd Lt	22	5 5	ruddy	dark	dk gry	shps stwrd	4 Nov. '14	Glasgow	Woodside, Glasgow	22 May	Montrose	ttd frms l ttl toe overlaps
70	Camis, F.	4749	19th K.R. Rifles	32	5 4½	sallow	black	brn	—	— Nov. '15	Woolwich	—	19 May	Wimbledn	wears glasses
71	Campbell, Allen	17072	Dpt N. Lancs R	35	5 5½	fresh	dk brn	blue	sailor	11 Oct. '14	Cardiff	Glasgow	12 Apr.	Irvine	
72	Campbell, John	3905	10th Seaf. Hghs	28¾	5 6¼	fresh	fair	blue	shoemakr	4 Sept. '14	Perth	Dundee	25 May	Dunfrmlne	sbrpnl wnd bnd
73	Carey, Michael	18641	12th Royal Fus	20	5 1	fresh	black	brn	musician	28 June '15	Grays	St. James, London	21 Apr.	Dover	2 scs nr l scapula
74	Carlin, John	—	Dpt R.Innis Fs	19¾	5 6¼	—	—	—	machinist	9 Dec. '15	Paisley	Johnstone	23 May	*en route**	mole rt cheek * to Ou
75	Carrahar, James L.	549	21st DurhamLI	31	5 6	fair	red	blue	labourer	24 Oct. '15	Sunderlnd	Sunderland	16 May	Hornsea	squint l eye
76	Carter, Alfred	8591	11th Yorks R.	21¾	5 8¾	—	brn	grey	labourer	31 Aug. '14	Thornaby	Middlesbro', Yorks	25 May	Rugeley Cp	
77	Carter, Evans	23131	14th E. Yorks R	25¾	5 5½	—	—	—	coal heavr	12 Dec. '15	Hull	Hull, Yorks	28 May	SeatnDelvl	
78	Carter, J.	6276	Dpt R. Mon.RE	23	5 4	—	brn	blue	coal miner	14 Apr. '13	Newport	Bristol	27 May	Monmouth	ttd stdies—beauty & lve
79	Chamberlain, W. R.	2923	Yorks L.I.	32	5 6	—	—	—	fitter	13 Sept. '15	Killinghall	Hammersmith	5 May	Pontefract	
80	Chaney, Oscar J.	35780	R.A.Med.Corps	21¼	5 5	fresh	brn	brn	newsvendr	17 Sept. '14	Holborn	St. Pancras	19 May	Aldershot	
81	Chappell, Charles	62.8	ArmySer.Corps	44	5 3¾	—	—	—	labourer	29 Jan. '15	London	Marylebone	23 May	B.E.F.	ttd rt frm
82	Chrichton, Wm.	—	23rd Durhm LI	26¾	5 0½	—	—	—	labourer	14 Feb. '16	Nwcstl-o-T	Glasgow	14 Feb.	Nwcstl-o-T	
83	Clark, A.	80763	Signal Dpt RE	32	5 10	—	—	—	gen labr	6 Mar. '15	Enfield	Enfield, Midlsx	22 May	Haynes Pk	
84	Clark, H.	11469	5th Res Cav. R.	18¼	5 4½	—	—	—	driver	13 Mar. '16	Prtsmouth	Kensington	22 May	York	
85	Clark, John Pearson	15987	3rd E. Yorks R.	38¾	5 5	—	—	—	compositor	1 Dec. '14	Hull	—	27 May	Withrnsea	
86	Clarke, A.	11268	11th GordnHgh	—	—	—	—	—	—	—	—	—	19 May	Cambsbrrn	
87	Clarke, William	42385	Dpt Nts&Dby R	19	5 9½	—	—	—	farm labr	15 Apr. '16	Derby	Newark, Nottnghm	26 Apr.	Derby	
88	Clifton, —	132	6th Rifle Bde	38	5 7½	—	brn	brn	groom	3 Sept. '14	London	St. Giles, Midlsx	16 May	Shoreham	
		28507	3rd R.Innis.Fus	29¼	5 2½	—	—	—	pantryman	31 Mar. '16	Belfast	—	6 May	Londonderry	

Appendix Figure 5



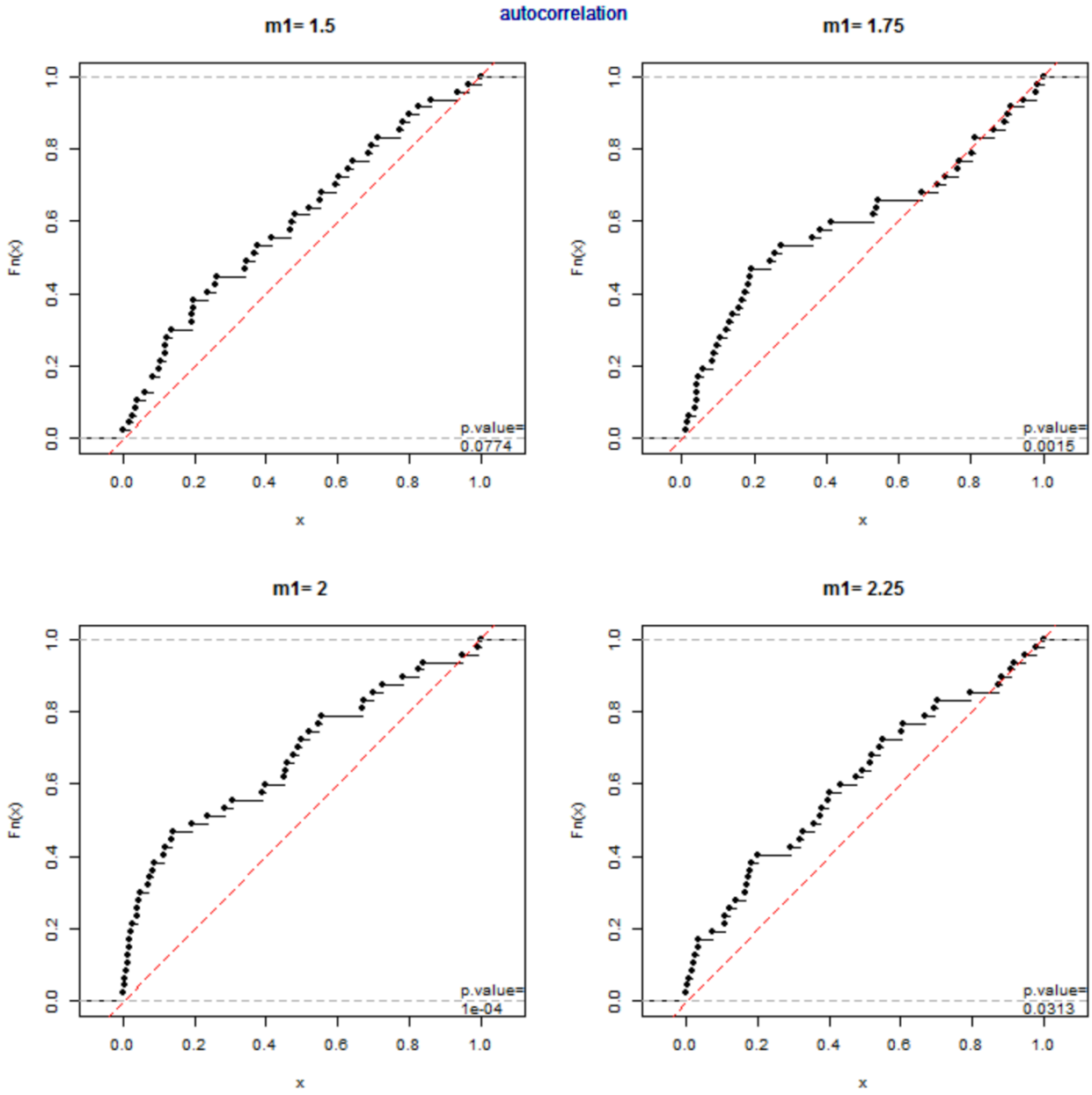
When received.	Rank.	Name.	Batt.	Regiment.	Place of Trial.	Date of Trial.	NATURE OF CHARGE. Absence and from Parade (F).	Stealing (S), Theft (T), Receiving (R) Property.	Asleep on Sentry.	Drunkenness and on Duty (D).	Striking or Violence to Supr. Officer (L)—exceeding of office.	Insubordinate (I) or Threatening (T) Language to Supr. Officer.	Disobeying lawful Command of Superior Officer.	Resisting (R) or Escaping (E) Escort.	Breaking from Barracks (B) or Camp (C)
mber 9	Pte	E. Connolly		R. S. B.	Nantes	September 10	do			do					
"	"	W. Stanford		"	"	" "	do			do					
"	"	R. Mc Donald		"	"	" "	do			do					
"	"	J. Donaldson		"	"	" "	do			do					
"	"	S. Mc Intosh		"	"	" "	do			do					
"	"	A. Thompson		"	"	" "	do			do					
"	"	W. Mc Maskell		"	"	" "	do			do					
		L. Myatt		N. Staffs.	Hers Barracks	October 25									
		A. Lamma				25									
		A. Mathews				25			do						
		R. Wright				25			do						
		C. Lucas				25				do					
		J. Nicholls				25				do					
		D. Plant				25									

Appendix Figure 6A: Map of Trenches

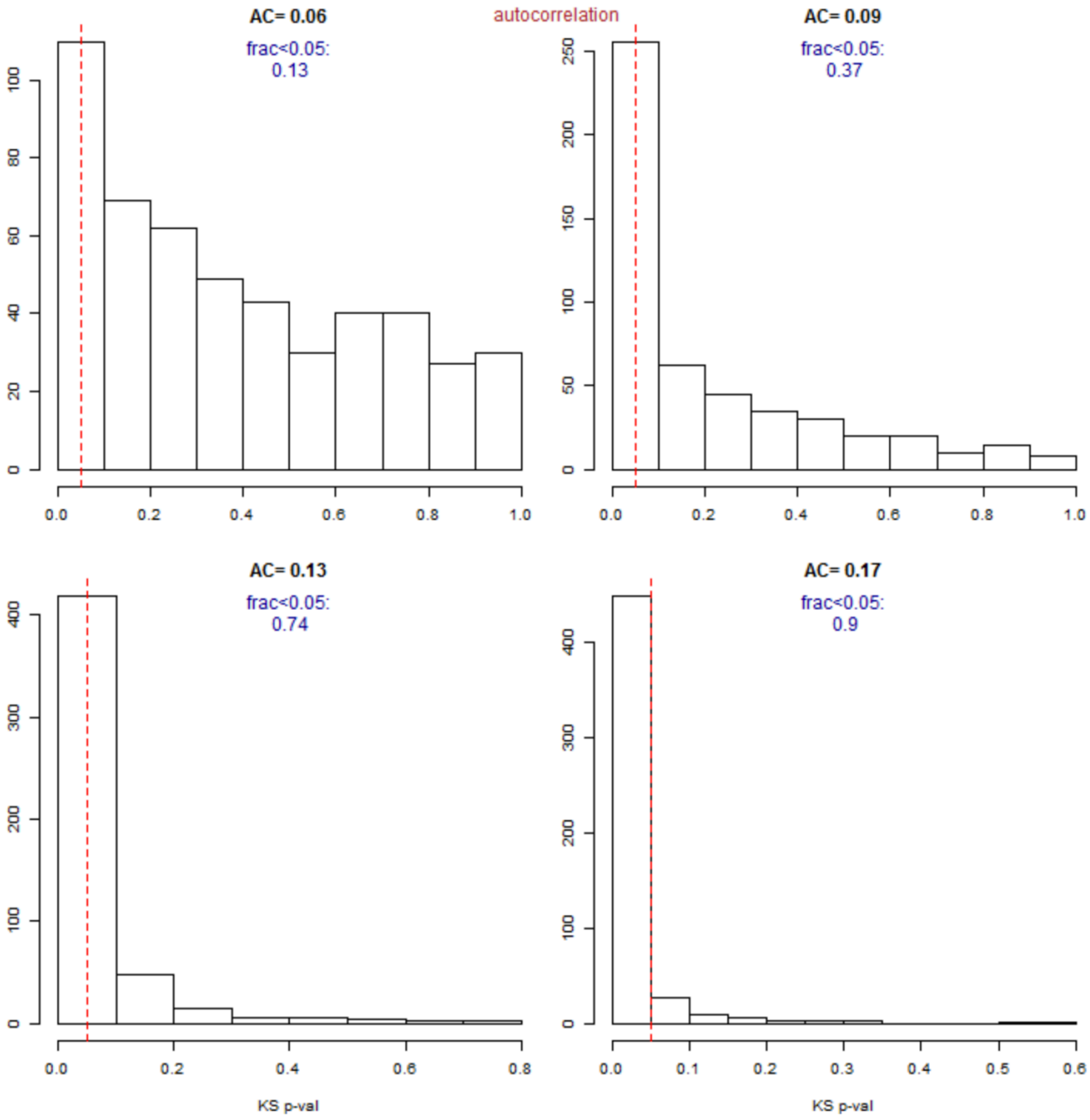


Appendix Figure 6B: Distance to Coast

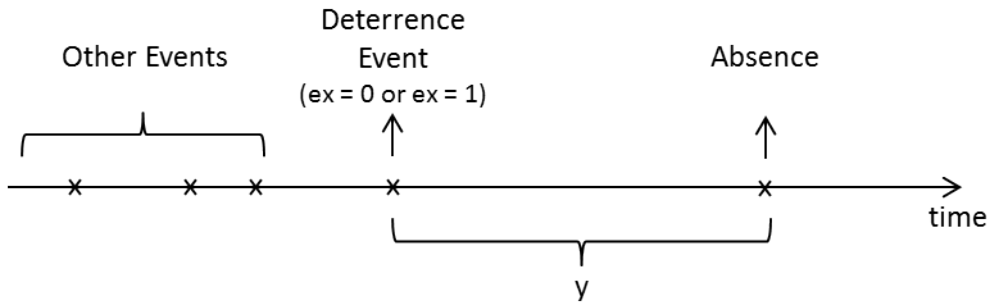
Appendix Figure 7A



Appendix Figure 7B

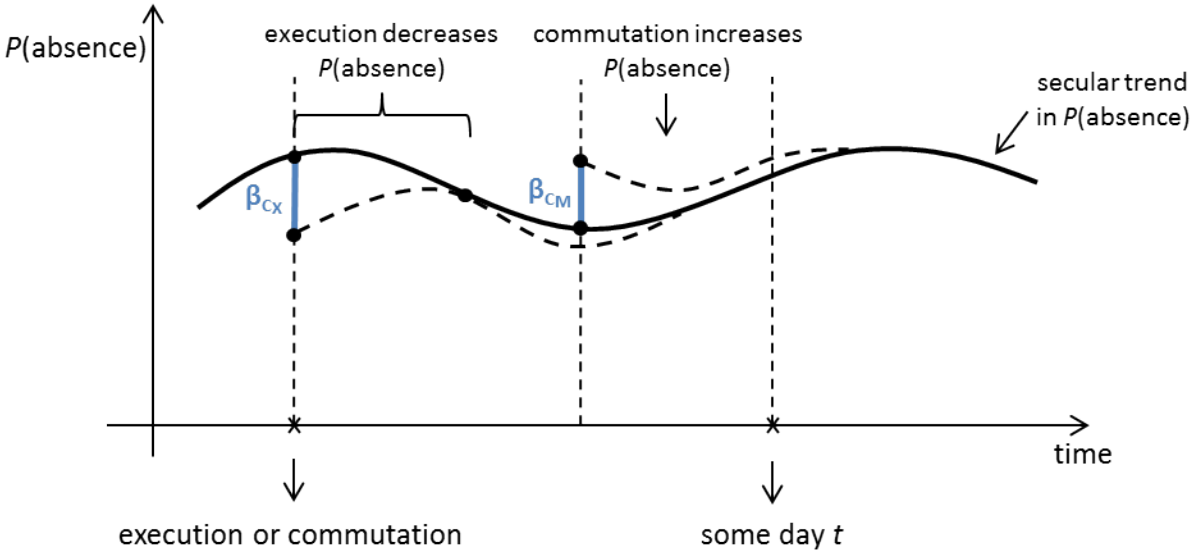


Appendix Figure 8A



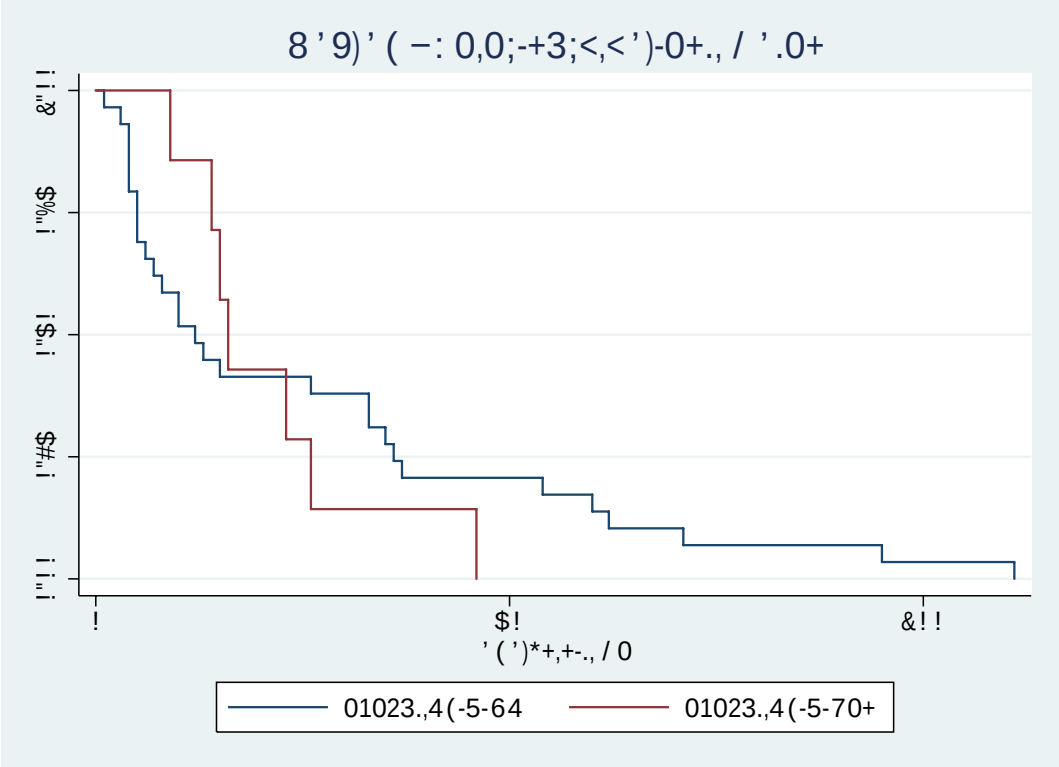
y ≡ time from event (either execution of commutation) to absence

Appendix Figure 8B

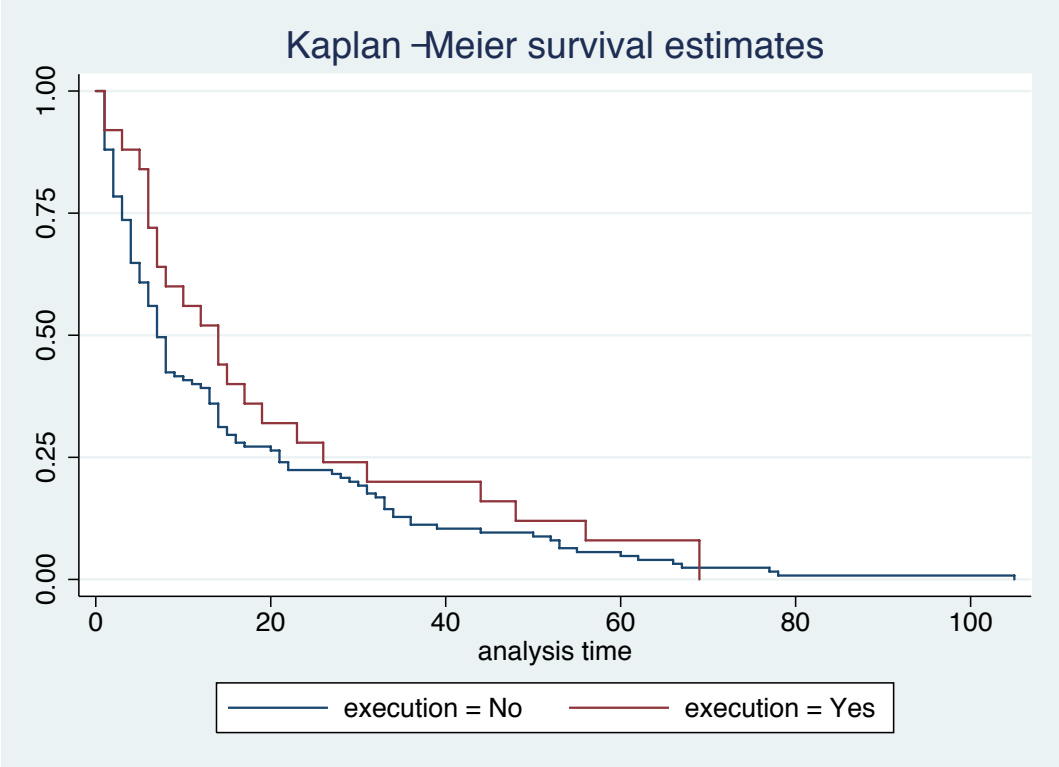


Past events influence current probability, but this influence wanes over time.

Appendix Figure 9A: Non-Parametric Survival Distributions (War Diaries)



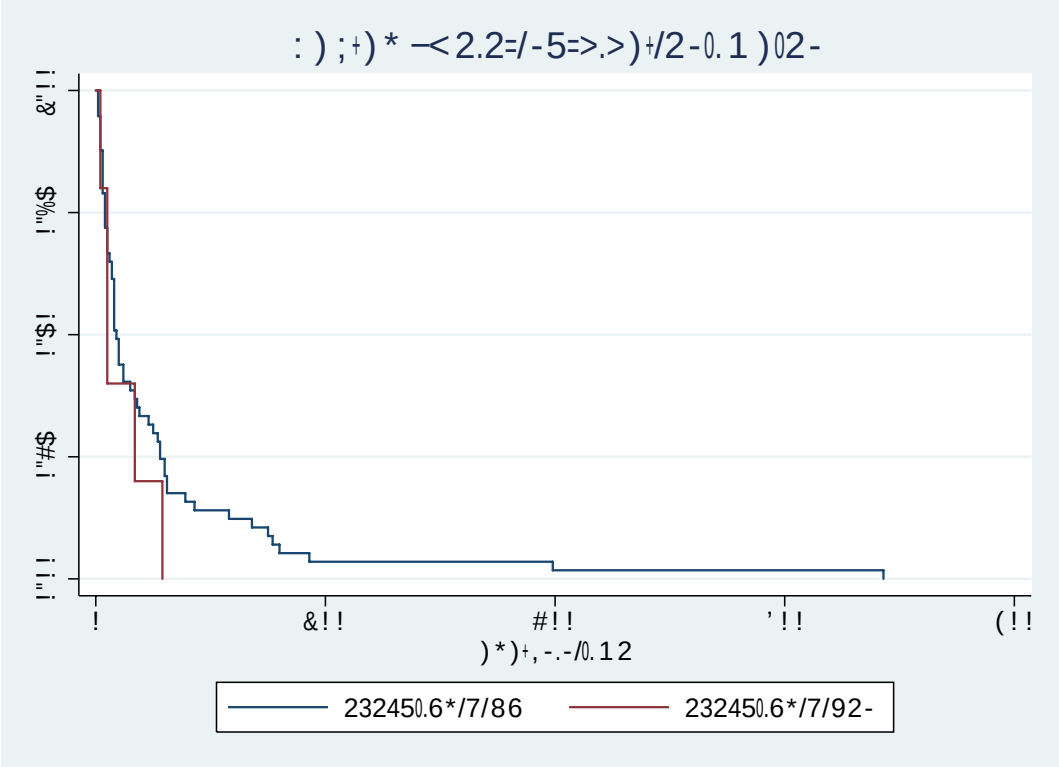
(a) Irish Executions Only



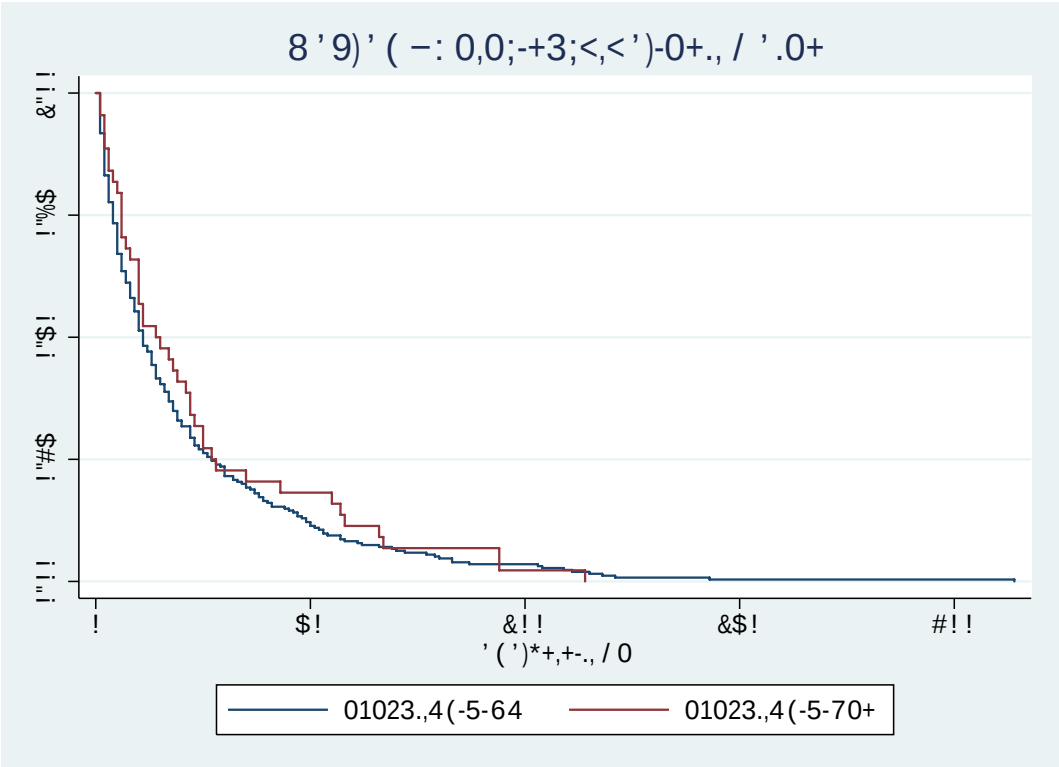
(b) Non-Irish Executions Only

Notes: Death sentences that occur before another absence are treated as a censored event.

Appendix Figure 9B: Non-Parametric Survival Distributions (Police Gazettes)



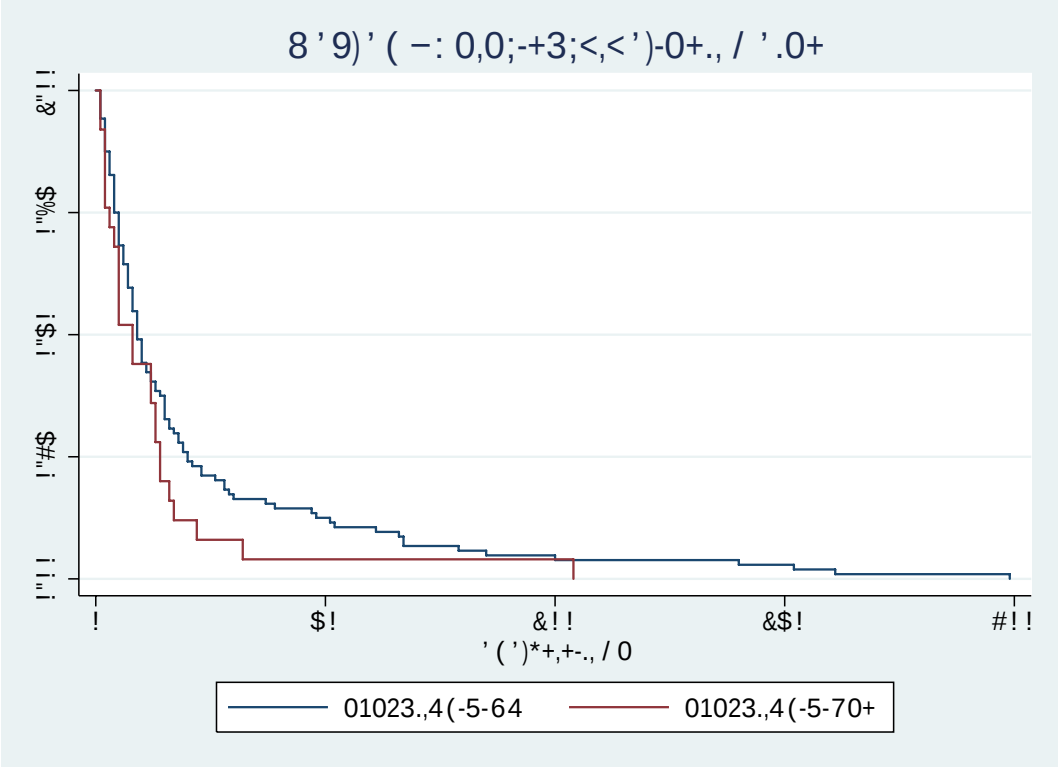
(a) Irish Executions Only



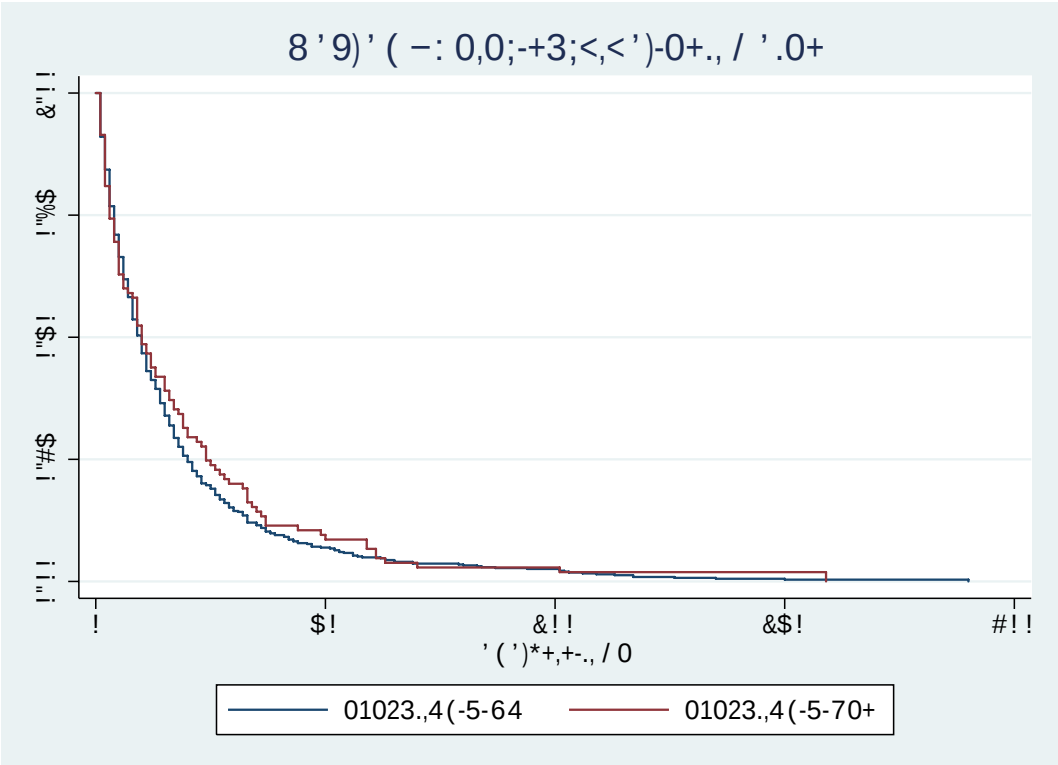
(b) Non-Irish Executions Only

Notes: Death sentences that occur before another absence are treated as a censored event.

Appendix Figure 9C: Non-Parametric Survival Distributions (FGCM)



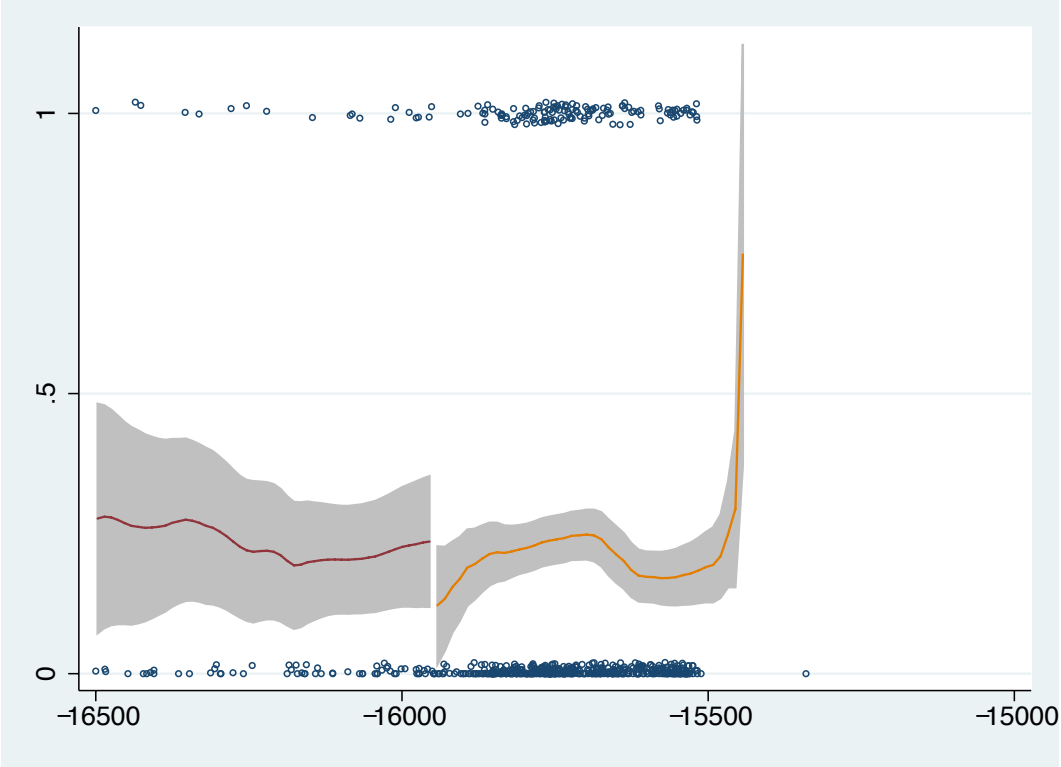
(a) Irish Executions Only



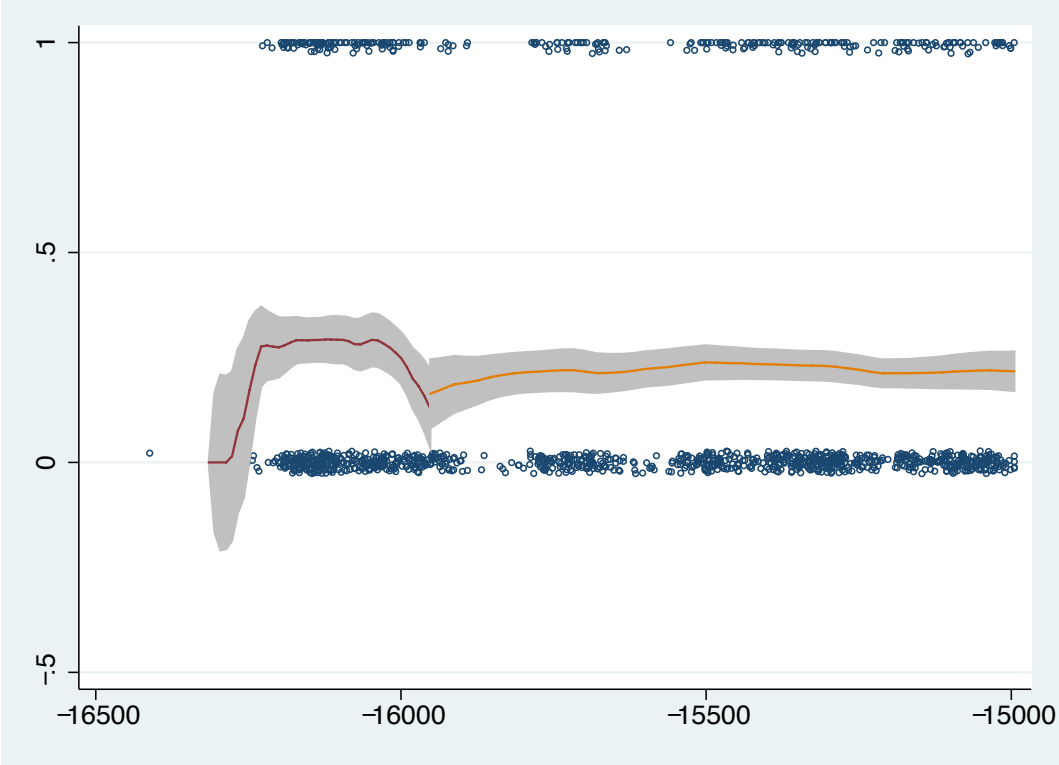
(b) Non-Irish Executions Only

Notes: Death sentences that occur before another absence are treated as a censored event.

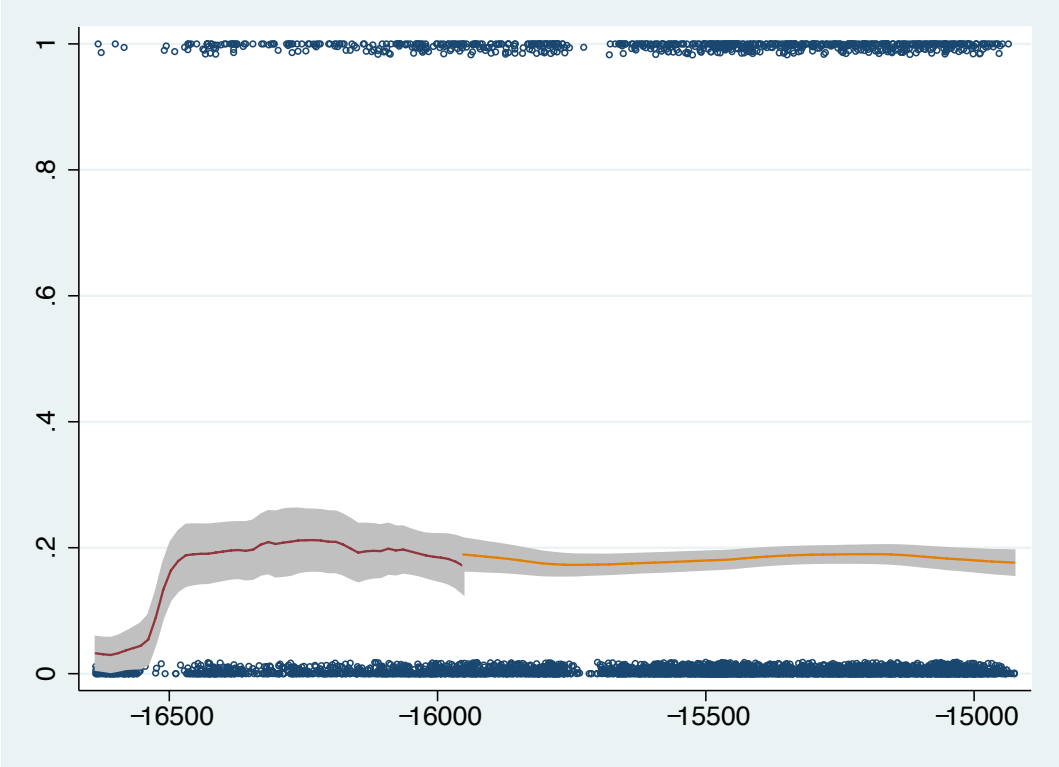
Appendix Figure 10A: Impact of Easter Rising on Irish Desertion (War Diaries)



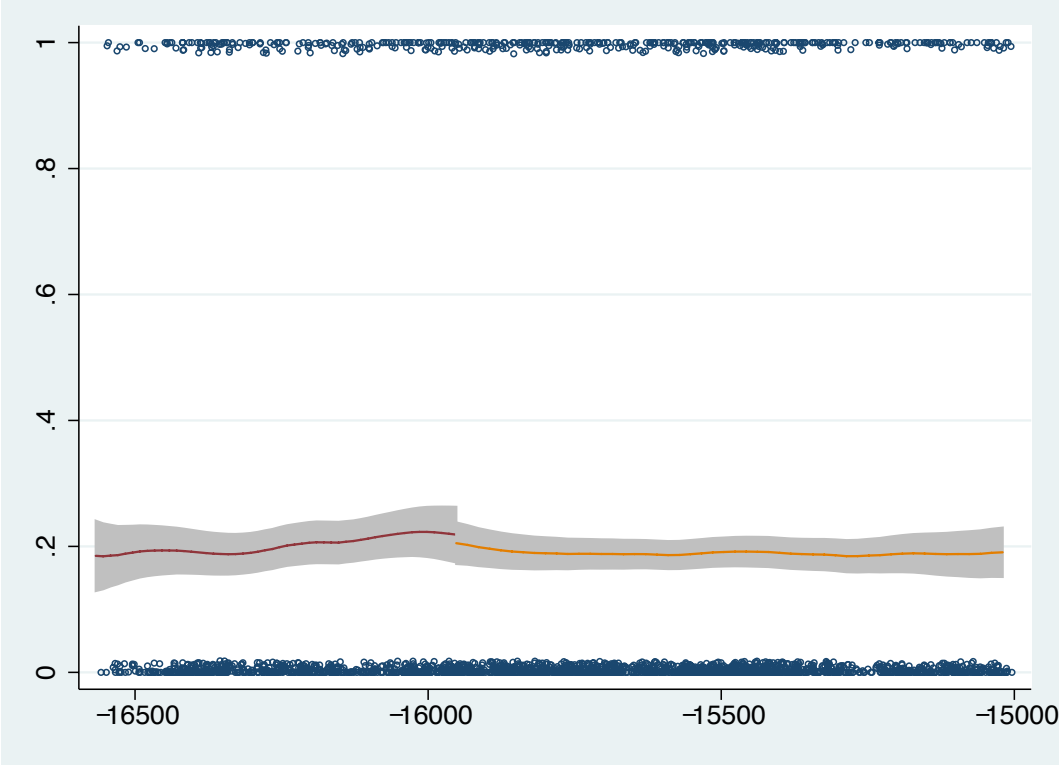
Appendix Figure 10B: Impact of Easter Rising on Irish Desertion (Police Gazettes)



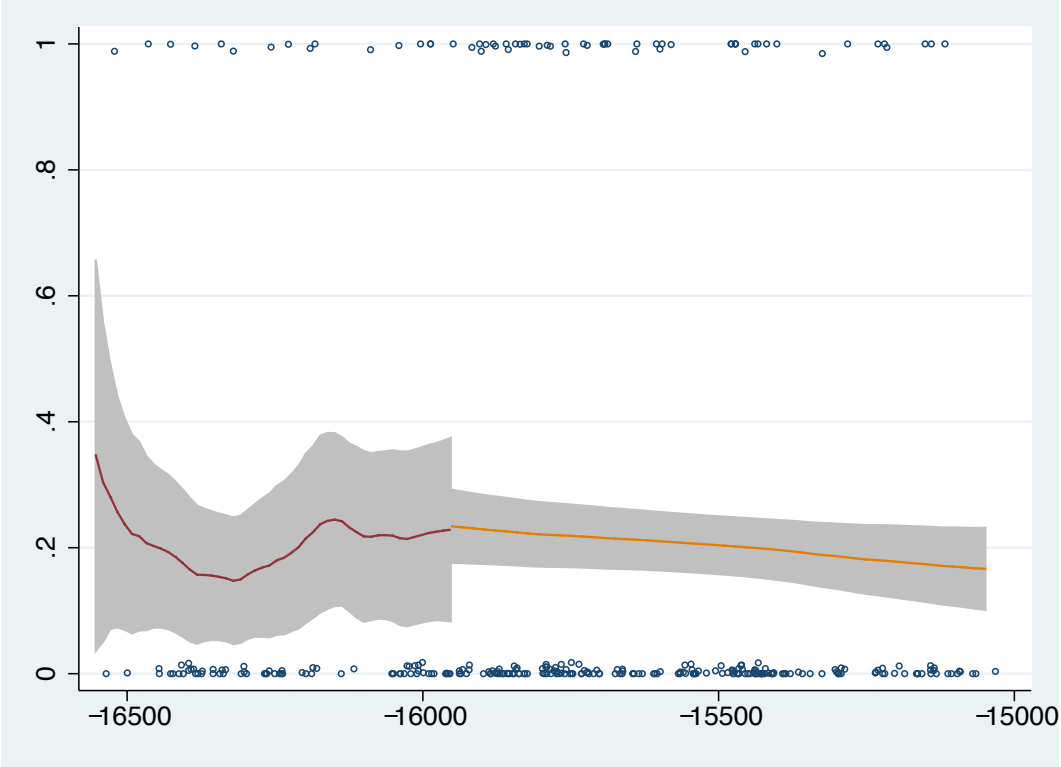
Appendix Figure 10C: Impact of Easter Rising on Irish Desertion (FGCM Trials)



Appendix Figure 10D: Impact of Easter Rising on Irish Death Sentences

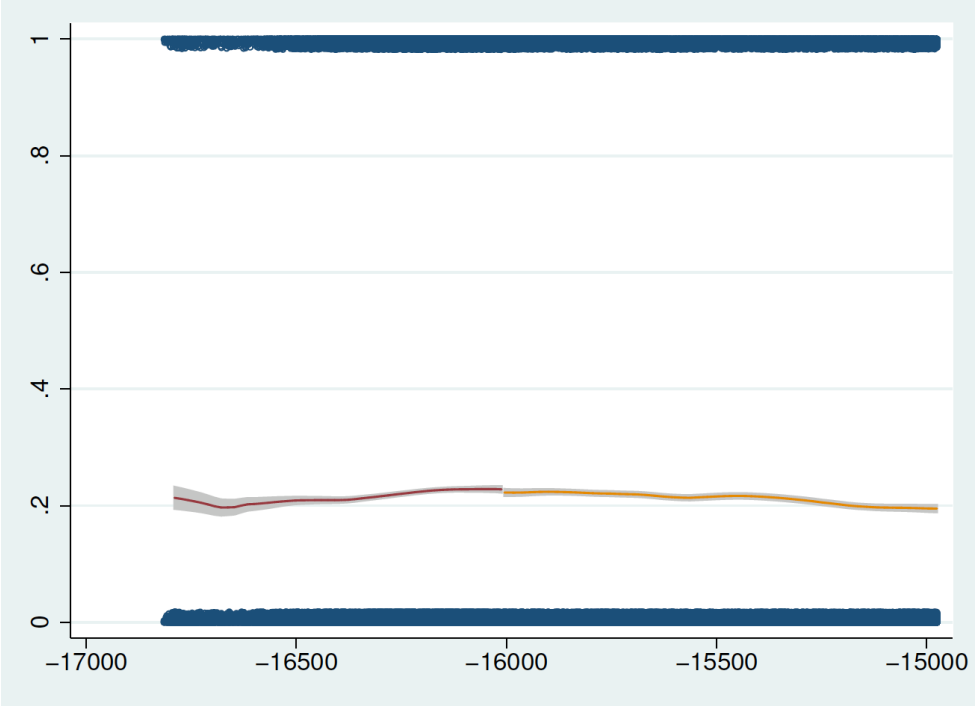


Appendix Figure 10E: Impact of Easter Rising on Irish Executions

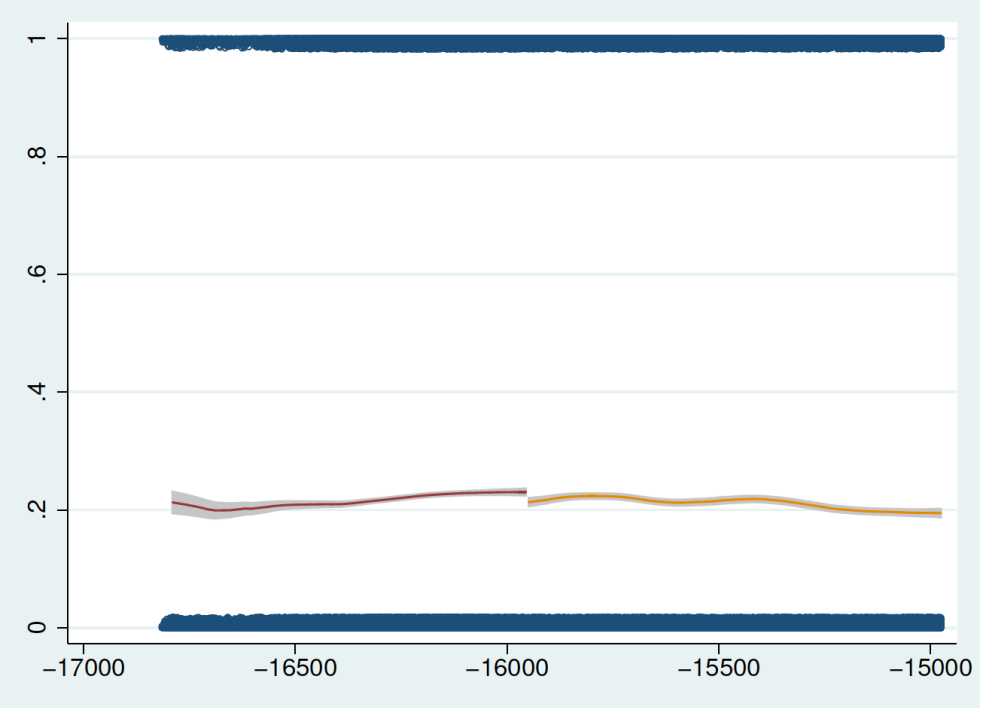


Notes: April 29, 1916 is the end date of the Easter Rising. All graphs display kernel-weighted local polynomial regressions. X-axis is days from January 1, 1960 and Y-axis is the Irish indicator.

Appendix Figure 11A: Impact of Conscription on Irish Desertion in the UK



Appendix Figure 11B: Impact of Easter Rising on Irish Desertion in the UK



Notes: March 2, 1916 is the date that the Military Service Act of 1916 came into force to conscript in Britain. April 29, 1916 is the end date of the Easter Rising. All graphs display kernel-weighted local polynomial regressions. X-axis is days from January 1, 1960 and Y-axis is the Irish indicator. Data comes from the Police Gazettes.

Appendix Figure 12A: Samples of General Routine Part 1 Orders

Part 1

No 166
Station Sandling Camp
Date June 1st, 1915

Item	Particulars	
1 Duties	Orderly Officer for duty tomorrow	Lieut Black
	Orderly Officer next for duty	Lieut Morrison
	Field Officer for 3-6-15	Major CC Bennett
	Quarter Master for day 3-6-15	Capt A McCully
2 Leave	Lieut Cooper is granted leave of absence from m.n. 1-6-15 to m.n. 6-6-15	
3 Parades	The Parades for tomorrow morning will be the same as to-day except that the Parade will be dismissed at 11.30 Dinners will be at 12 o'clock sharp The afternoon parades will be a route march. The Battalion will fall in at 1 o'clock Dress will be drill order with Khaki Service Shirts. Braces will be worn inside the Shirts This order of Dress will apply to all parades in future unless special orders are given Putties in future must be turned in putting on and must have a uniform three turns in front. Pants to be turned down over tip of putties OC Platoons will be held responsible that all orders regarding dress on parade or otherwise are carried out.	
4 Batmen	All extra Batmen in excess of the War Establishment will be returned to duty from this date	
5 Quarters	NCO's in charge of Huts will be held responsible for the carrying out of all instructions in connection with their respective Huts and for the condition of area surrounding same	

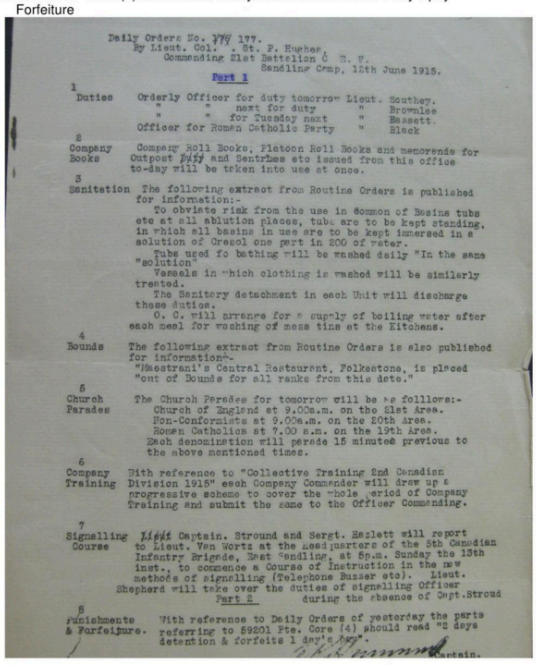
Daily Orders Part 1

No 177
Station Sandling Camp
Date 12th June 1915

Item	Particulars	
1 Duties	Orderly Officer for duty tomorrow	Lieut Southey
	Orderly Officer next for duty	Lieut Brownlee
	Orderly Officer for Tuesday next	Lieut Bassett
	Officer for Roman Catholic Party	Lieut Black
2 Company Books	Company Roll Books, Platoon Roll Books and memoranda for Outpost and Sentries etc issued from this office to-day will be taken into use at once	
3 Sanitation	The following extract from Routine Orders is published for information: To obviate risk from the use in common of Basins tubs etc at all ablution places, tubs are to be kept standing, in which all basins in use are to be kept immersed in a solution of Cresol one part in 200 of water. Tubs used for bathing will be washed daily "In the same solution" Vessels in which clothing is washed will be similarly treated The Sanitary detachment in each Unit will discharge these duties OC will arrange for a supply of boiling water after each meal for washing of mess tins at the Kitchens	
4 Bounds	The following extract from Routine Orders is also published for information: "Maestrani's Central Restaurant, Folkestone, is placed "out of Bounds for all ranks from this date."	
5 Church Parades	The Church Parades for tomorrow will be as follows: Church of England at 9.00 am on the 21st Area Non-Conformists at 9.00 am on the 20th Area Roman Catholics at 7.00 am on the 19th Area Each denomination will parade 15 minutes previous to the above mentioned times	
6 Company Training	With reference to "Collective Training 2nd Canadian Division 1915" each Company Commander will draw up a progressive scheme to cover the whole period of Company Training and submit the same to the Officer Commanding	
7 Signalling Course	Captain Stroud and Sergt Hazlett will report to Lieut Van Wortz at the Headquarters of the 5th Canadian Infantry Brigade, East Sandling, at 5 pm Sunday the 13th inst, to commence a Course of Instruction in the new methods of signalling (Telephone Buzzer etc). Lieut Shepherd will take over the duties of signalling Officer during the absence of Capt Stroud	

Part 2

8 Punishments & Forfeiture	With reference to Daily Orders of yesterday the parts referring to 59201 Pte Core (4) should read "2 days detention & forfeits 1 day's pay"



Daily Orders No. 177.
By Lieut. Col. . St. P. Hughes
Commanding 21st Battalion C. E. F.
Sandling Camp, 12th June 1915.

Part 1

1 Duties — Orderly Officer for duty tomorrow Lieut. Southey.
" " next for duty " Brownlee
" " for Tuesday next " Bassett.
Officer for Roman Catholic Party " Black

2 Company Books — Company Roll Books, Platoon Roll Books and memoranda for Outpost Duty and Sentries etc issued from this office to-day will be taken into use at once.

3 Sanitation — The following extract from Routine Orders is published for information:-
To obviate risk from the use in common of Basins tubs etc at all ablution places, tubs are to be kept standing, in which all basins in use are to be kept immersed in a solution of Cresol one part in 200 of water.
Tubs used for bathing will be washed daily "In the same "solution"
Vessels in which clothing is washed will be similarly treated.
The Sanitary detachment in each Unit will discharge these duties.
O. C. will arrange for a supply of boiling water after each meal for washing of mess tins at the Kitchens.

4 Bounds — The following extract from Routine Orders is also published for information:-
"Maestrani's Central Restaurant, Folkestone, is placed "out of Bounds for all ranks from this date."

5 Church Parades — The Church Parades for tomorrow will be as follows:-
Church of England at 9.00a.m. on the 21st Area.
Non-Conformists at 9.00a.m. on the 20th Area.
Roman Catholics at 7.00 a.m. on the 19th Area.
Each denomination will parade 15 minutes previous to the above mentioned times.

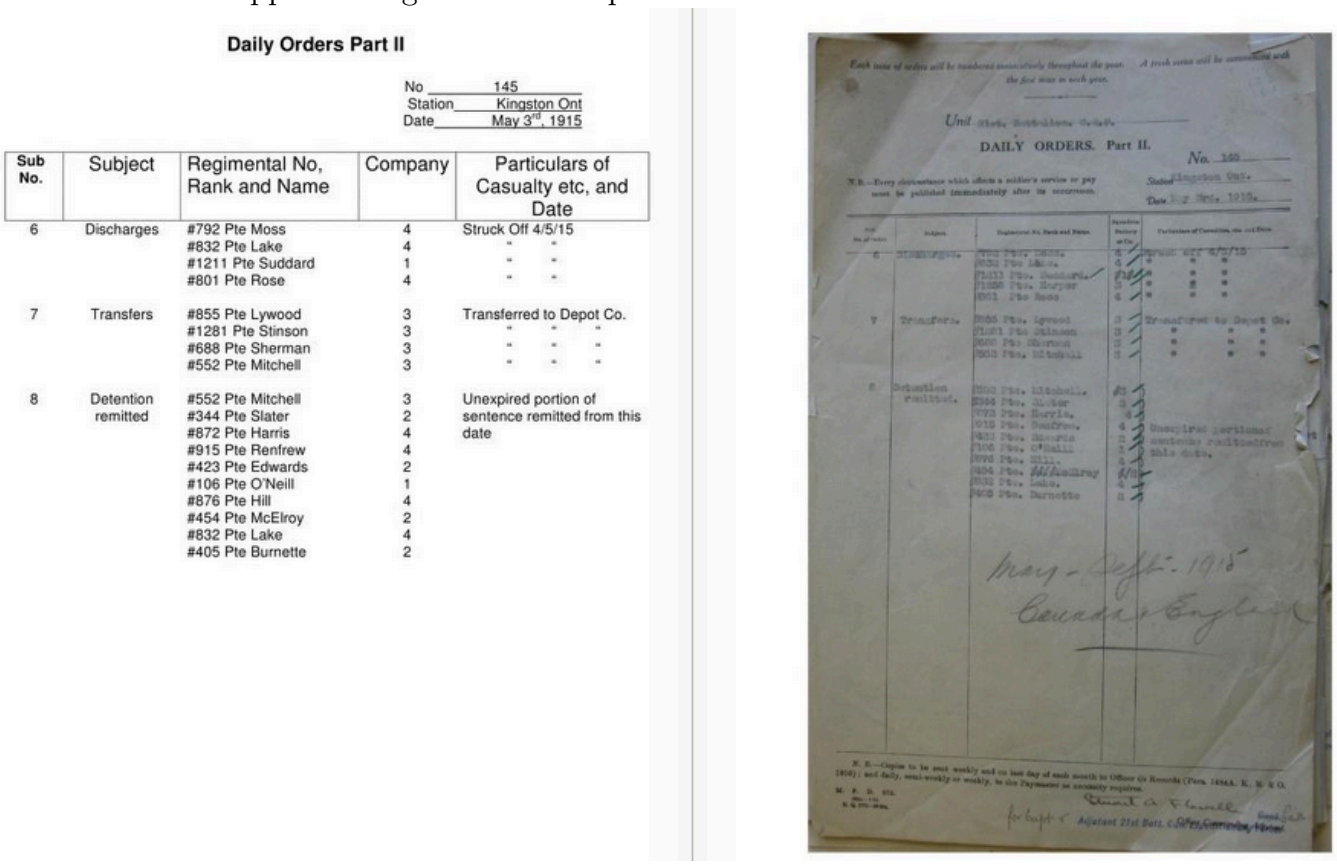
6 Company Training — With reference to "Collective Training 2nd Canadian Division 1915" each Company Commander will draw up a progressive scheme to cover the whole period of Company Training and submit the same to the Officer Commanding.

7 Signalling Course — Captain. Stround and Sergt. Hazlett will report to Lieut. Van Wortz at the Headquarters of the 5th Canadian Infantry Brigade, East Sandling, at 5p.m. Sunday the 13th inst., to commence a Course of Instruction in the new methods of signalling (Telephone Buzzer etc). Lieut. Shepherd will take over the duties of signalling Officer during the absence of Capt.Stroud

Part 2

8 Punishments & Forfeiture. — With reference to Daily Orders of yesterday the parts referring to 59201 Pte. Core (4) should read "2 days detention & forfeits 1 day's pay".

Appendix Figure 12B: Sample of General Routine Part 2 Orders

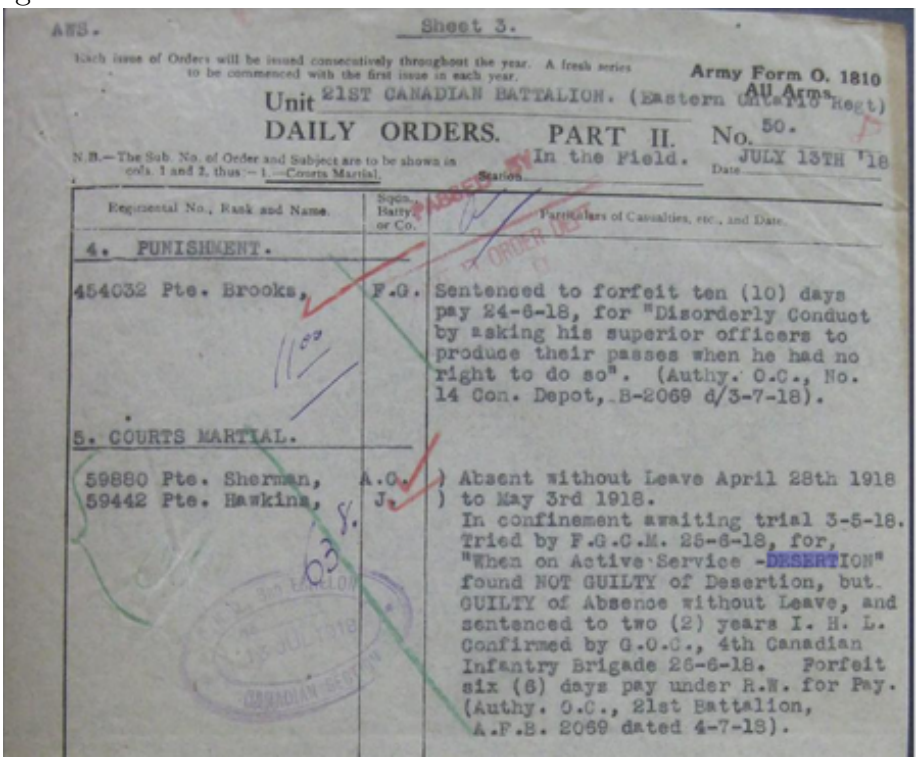


Daily Orders Part II

No 145
Station Kingston Ont
Date May 3rd, 1915

Sub No.	Subject	Regimental No, Rank and Name	Company	Particulars of Casualty etc, and Date
6	Discharges	#792 Pte Moss	4	Struck Off 4/5/15
		#832 Pte Lake	4	" "
		#1211 Pte Suddard	1	" "
		#801 Pte Rose	4	" "
7	Transfers	#855 Pte Lywood	3	Transferred to Depot Co.
		#1281 Pte Stinson	3	" " "
		#688 Pte Sherman	3	" " "
		#552 Pte Mitchell	3	" " "
8	Detention remitted	#552 Pte Mitchell	3	Unexpired portion of sentence remitted from this date
		#344 Pte Slater	2	
		#872 Pte Harris	4	
		#915 Pte Renfrew	4	
		#423 Pte Edwards	2	
		#106 Pte O'Neill	1	
		#876 Pte Hill	4	
		#454 Pte McElroy	2	
		#832 Pte Lake	4	
		#405 Pte Burnette	2	

Appendix Figure 12C: General Routine Part 2 Orders Desertion vs. Absence Distinction



A.F.S. Sheet 3.

Each issue of Orders will be issued consecutively throughout the year. A fresh series to be commenced with the first issue in each year.

Army Form O. 1810
All Arms.

Unit 21ST CANADIAN BATTALION. (Eastern Ontario Regt)

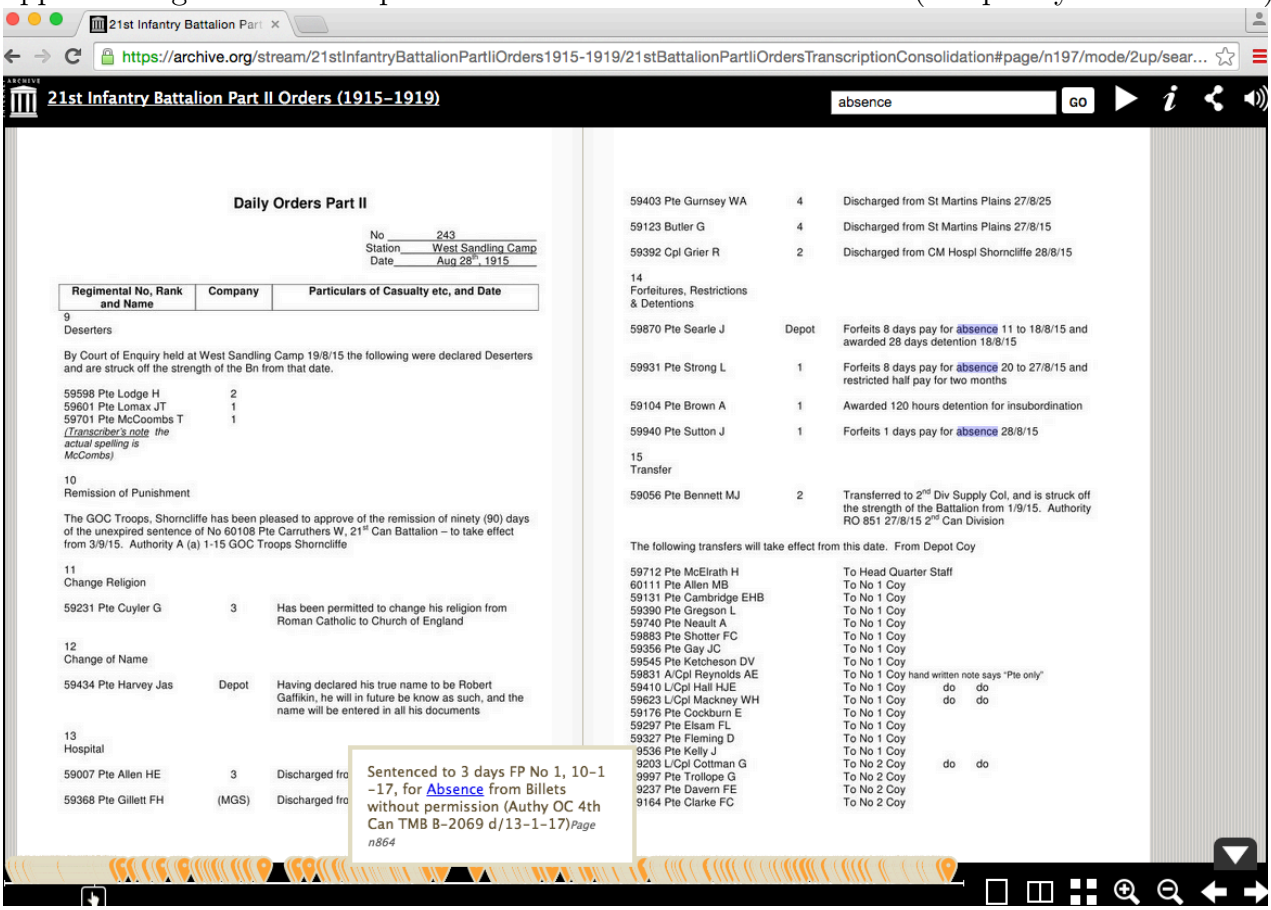
DAILY ORDERS. PART II. No. 50.

N.B.—The Sub. No. of Order and Subject are to be shown in ords. 1 and 2, thus:—1.—Courts Martial.

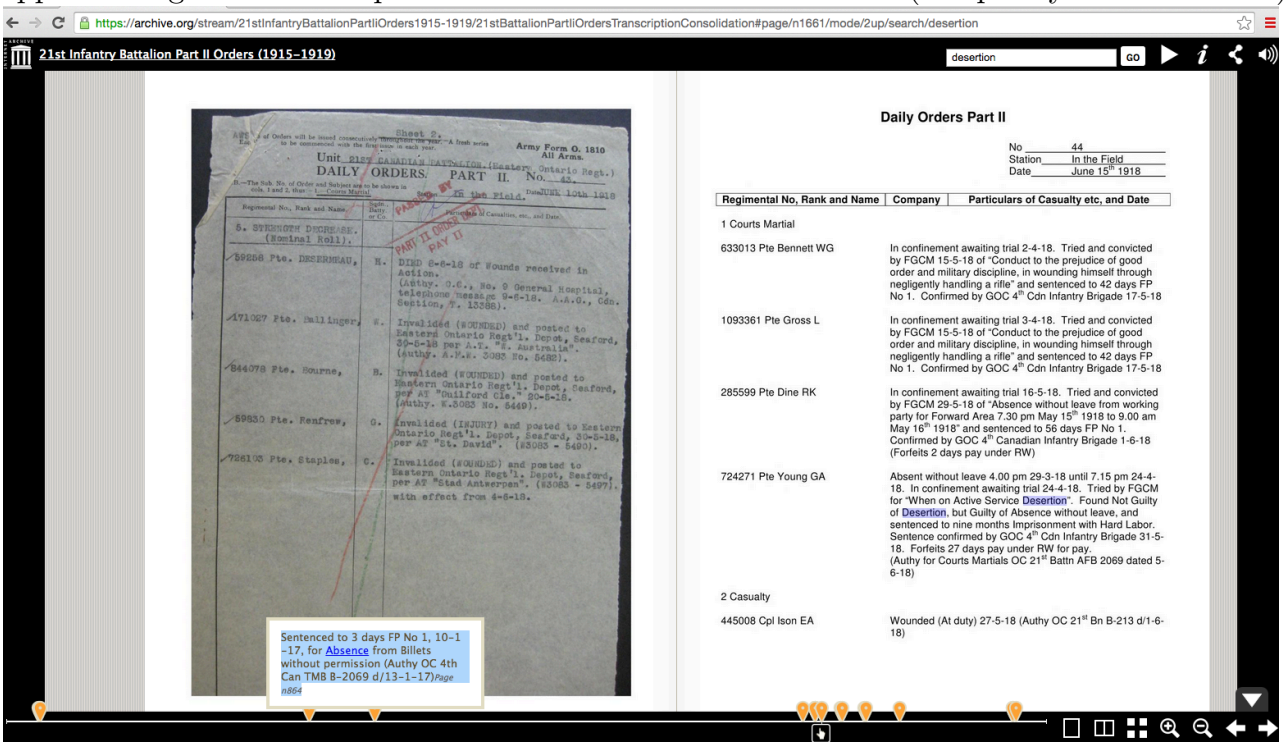
Station In the Field. Date JULY 13TH '18

Regimental No., Rank and Name.	Sqdn., Battery or Co.	Particulars of Casualties, etc., and Date.
4. PUNISHMENT.		
454032 Pte. Brooks,	F.C.	Sentenced to forfeit ten (10) days pay 24-6-18, for "Disorderly Conduct by asking his superior officers to produce their passes when he had no right to do so". (Authy. O.C., No. 14 Con. Depot, B-2069 d/3-7-18).
5. COURTS MARTIAL.		
59880 Pte. Sherman, J. 59442 Pte. Hawkins,	A.C.	Absent without Leave April 28th 1918 to May 3rd 1918. In confinement awaiting trial 3-5-18. Tried by F.G.C.M. 25-6-18, for, "When on Active Service -DESERTION" found NOT GUILTY of Desertion, but GUILTY of Absence without Leave, and sentenced to two (2) years I. H. L. Confirmed by G.O.C., 4th Canadian Infantry Brigade 26-6-18. Forfeit six (6) days pay under R.W. for Pay. (Authy. O.C., 21st Battalion, A.F.B. 2069 dated 4-7-18).

Appendix Figure 12D: Sample of General Routine Part 2 Orders (Frequency of "Absence")



Appendix Figure 12E: Sample of General Routine Part 2 Orders (Frequency of "Desertion")



Appendix Figure 13: Order of Battle Sample

The West Yorkshire Regiment

Battalions of the Regular Army

1st Battalion
August 1914 : in Lichfield. Part of 18th Brigade in 6th Division. Moved on 7 August to Dunfermline then six days later to Cambridge.
Landed St Nazaire (France) on 10 September 1914.

2nd Battalion
August 1914 : in Malta.
Returned to England and landed at Southampton on 25 September 1914.
25 September 1914 : came under orders of 23rd Brigade, 8th Division, forming up at Hursley Park near Winchester.
Landed at Le Havre 5 November 1914.

3rd (Reserve) Battalion
August 1914 : in York. A training unit, it remained in UK throughout the war. Moved in August 1914 to Whitley Bay and played a part as Tyne Garrison.

4th (Extra Reserve) Battalion
August 1914 : in York. A training unit, it remained in UK throughout the war. Moved in August 1914 to Falmouth, going on in December 1915 to Redcar and in April 1916 to West Hartlepool, where it played a part as Tees Garrison.

Battalions of the Territorial Force

1/5th Battalion
August 1914 : in York. Part of West Riding Brigade, West Riding Division. Moved on 10 August to Selby, end of the month to Strenshall and late October to York. In March 1915 moved to Gainsborough.
15 April 1915 : landed at Boulogne.
15 May 1915 : formation became 146th Brigade, 49th (West Riding) Division.

1/6th Battalion
August 1914 : in Bradford. Part of West Riding Brigade, West Riding Division. Moved on 10 August to Selby, end of the month to Strenshall and late October to York. In March 1915 moved to Gainsborough.
Record same as 1/5th Bn.

1/7th (Leeds Rifles) Battalion
Carlton Barracks, Leeds. Part of West Riding Brigade, West Riding Division. Moved on 10 August to Selby, end of the month to Strenshall and late October to York. In March 1915 moved to Gainsborough.
Record same as 1/5th Bn.

1/8th (Leeds Rifles) Battalion
Carlton Barracks, Leeds. Part of West Riding Brigade, West Riding Division. Moved on 10 August to Selby, end of the month to Strenshall and late October to York. In March 1915 moved to Gainsborough.
Record same as 1/5th Bn.
30 January 1918 : transferred to 185th Brigade, 62nd (2nd West Riding) Division, absorbing 2/8th Bn and renamed 8th Bn.

Appendix Table 1: Effects of Executions vs. Commutations on Elapsed Time Until *Previous* Absence Differing by whether Case was a Desertion Trial and whether Soldier was Irish

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: War Diaries	Exp/+14	Wb/+14	Cox/+14	Exp/NN	Wb/NN	Cox/NN	Exp/C=T	Wb/C=T	Cox/C=T
Execution	0.0983	-0.0543	-0.168	0.0404	0.334	0.567	0.329+	0.425	0.556
	(0.173)	(0.251)	(0.290)	(0.257)	(0.349)	(0.439)	(0.185)	(0.281)	(0.348)
Desert	-0.0630	-0.103	-0.133	-0.0341	-0.0359	-0.0738	0.0629	0.0153	-0.0542
	(0.0957)	(0.125)	(0.151)	(0.0885)	(0.138)	(0.176)	(0.105)	(0.135)	(0.168)
Ex-Desert	-0.115	-0.0948	0.0129	-0.0608	-0.313	-0.543	-0.317+	-0.391	-0.555
	(0.193)	(0.307)	(0.368)	(0.270)	(0.351)	(0.448)	(0.186)	(0.274)	(0.340)
Irish	0.00526	-0.0540	-0.0829	0.0267	-0.0417	-0.0852	0.165+	0.137	0.135
	(0.112)	(0.132)	(0.169)	(0.110)	(0.142)	(0.164)	(0.1000)	(0.132)	(0.159)
Ex-Irish	0.126	0.316	0.405	0.0677	0.0383	0.0520	0.0120	-0.0612	-0.0820
	(0.210)	(0.243)	(0.302)	(0.240)	(0.353)	(0.412)	(0.196)	(0.303)	(0.372)
N	435	435	435	438	438	438	413	413	413
Panel B: Police Gazette									
Execution	0.0293	0.135	0.104	0.244*	0.221	0.509*	0.166+	0.0692	0.220
	(0.109)	(0.330)	(0.232)	(0.118)	(0.330)	(0.257)	(0.0878)	(0.456)	(0.291)
Desert	-0.0133	0.0375	0.0177	0.0505	0.0420	0.106	0.0266	0.110	0.0745
	(0.0371)	(0.0908)	(0.0698)	(0.0532)	(0.162)	(0.0951)	(0.0288)	(0.105)	(0.0759)
Ex-Desert	-0.0245	-0.291	-0.185	-0.247*	-0.304	-0.521*	-0.130	-0.221	-0.300
	(0.116)	(0.294)	(0.221)	(0.124)	(0.324)	(0.248)	(0.0920)	(0.424)	(0.291)
Irish	-0.0384	-0.230	-0.172	-0.0332	-0.0868	-0.0822	-0.00815	-0.188	-0.158
	(0.0466)	(0.162)	(0.108)	(0.0572)	(0.141)	(0.107)	(0.0424)	(0.161)	(0.109)
Ex-Irish	0.0594	0.215	0.200	0.0306	0.278	0.135	0.0715	0.620**	0.460*
	(0.0915)	(0.315)	(0.219)	(0.119)	(0.223)	(0.188)	(0.0870)	(0.240)	(0.190)
N	1481	1481	1481	1500	1500	1500	1479	1479	1479
Panel C: FGCM Trial Registries (Time Until Next Desertion Trial)									
Execution	-0.177	0.0193	-0.0555	0.335*	0.303	0.517*	-0.133	0.118	0.00467
	(0.262)	(0.385)	(0.351)	(0.154)	(0.331)	(0.252)	(0.242)	(0.369)	(0.349)
Desert	-0.0196	0.0557	-0.0206	0.0171	0.0717	0.0787	0.0936	0.259	0.132
	(0.0934)	(0.173)	(0.101)	(0.0677)	(0.106)	(0.0844)	(0.0810)	(0.175)	(0.108)
Ex-Desert	0.174	0.110	0.137	-0.463**	-0.427	-0.580*	0.0957	-0.0744	0.00106
	(0.261)	(0.385)	(0.352)	(0.164)	(0.331)	(0.252)	(0.256)	(0.388)	(0.377)
Irish	-0.0586	-0.0378	-0.0570	0.0165	0.0232	-0.0468	-0.0146	-0.0319	-0.0504
	(0.0910)	(0.173)	(0.121)	(0.0811)	(0.145)	(0.123)	(0.0907)	(0.162)	(0.125)
Ex-Irish	-0.0397	-0.125	-0.119	-0.00562	0.0560	0.0490	0.0572	0.0739	0.142
	(0.208)	(0.308)	(0.250)	(0.222)	(0.314)	(0.209)	(0.241)	(0.355)	(0.284)
N	1648	1648	1648	1526	1526	1526	1642	1642	1642

Notes: Outcome is elapsed time from death sentence resolution (execution or commutation) until previous absence at least 90 days before the death sentence. "Exp", "Wb" and "Cox" use the exponential, Weibull and Cox models respectively to parameterize the baseline hazard. In columns sub-titled "+14", the announcement of the commutation is assumed to occur 14 days after trial. In columns subtitled "NN" the nearest-neighbor method is used, which means the imputed announcement of the commutation is same as the most nearby execution announcement, while in columns labeled "C=T", the trial date is used as the announcement date of the execution and commutation. All specifications include division and year fixed-effects and ΔLog Casualties and ΔLog Casualties 30 Days Ago. War Diaries analysis restricts to July 1916-June 1917, which is the time window for the surviving data. Standard errors clustered at the division level in parentheses; + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Appendix Table 2: Effects of Execution vs. Commutation on Elapsed Time Until *Previous* Absence, Full Sample, Weak SUTVA

	War Diaries								Police Gazettes				FGCM Trial Registries (Desertion Trials)					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Execution	0.0983	0.0960	0.0432	-0.0189	-0.0629	-0.0830	0.0293	0.0271	0.0327	0.0383	0.0396	0.0385	-0.177	-0.193	-0.205	-0.206	-0.200	-0.195
	(0.173)	(0.190)	(0.198)	(0.205)	(0.211)	(0.213)	(0.109)	(0.109)	(0.110)	(0.110)	(0.110)	(0.110)	(0.262)	(0.260)	(0.263)	(0.265)	(0.264)	(0.263)
Desert	-0.0630	-0.0575	-0.0495	-0.0481	-0.0553	-0.0606	-0.0133	-0.0146	-0.0144	-0.00981	-0.00266	0.00162	-0.0196	-0.0158	-0.0171	-0.0247	-0.0310	-0.0323
	(0.0957)	(0.0947)	(0.0949)	(0.0959)	(0.0961)	(0.0957)	(0.0371)	(0.0367)	(0.0365)	(0.0362)	(0.0356)	(0.0354)	(0.0934)	(0.0889)	(0.0872)	(0.0871)	(0.0887)	(0.0898)
Ex-Desert	-0.115	-0.116	-0.0840	-0.0505	-0.0280	-0.0166	-0.0245	-0.0225	-0.0239	-0.0240	-0.0257	-0.0267	0.174	0.143	0.152	0.163	0.173	0.175
	(0.193)	(0.202)	(0.212)	(0.221)	(0.225)	(0.226)	(0.116)	(0.116)	(0.116)	(0.116)	(0.117)	(0.117)	(0.261)	(0.259)	(0.261)	(0.263)	(0.262)	(0.261)
Irish	0.00526	0.00545	-0.00151	-0.00423	-0.00138	0.000996	-0.0384	-0.0379	-0.0383	-0.0377	-0.0359	-0.0354	-0.0586	-0.0632	-0.0587	-0.0537	-0.0532	-0.0535
	(0.112)	(0.111)	(0.110)	(0.110)	(0.109)	(0.109)	(0.0466)	(0.0465)	(0.0471)	(0.0472)	(0.0457)	(0.0446)	(0.0910)	(0.0867)	(0.0865)	(0.0869)	(0.0881)	(0.0889)
Ex-Irish	0.126	0.129	0.146	0.140	0.115	0.101	0.0594	0.0620	0.0607	0.0532	0.0499	0.0519	-0.0397	-0.0107	-0.0143	-0.0212	-0.0293	-0.0339
	(0.210)	(0.208)	(0.207)	(0.212)	(0.218)	(0.220)	(0.0915)	(0.0916)	(0.0920)	(0.0915)	(0.0893)	(0.0881)	(0.208)	(0.213)	(0.211)	(0.208)	(0.207)	(0.208)
ΔLog Casualties	0.0552	0.0552	0.0527	0.0506	0.0497	0.0493	-0.0218	-0.0220	-0.0212	-0.0212	-0.0219	-0.0218	-0.0448+	-0.0485*	-0.0498*	-0.0499*	-0.0479*	-0.0466*
	(0.0347)	(0.0353)	(0.0361)	(0.0366)	(0.0364)	(0.0364)	(0.0149)	(0.0151)	(0.0150)	(0.0146)	(0.0142)	(0.0142)	(0.0235)	(0.0220)	(0.0217)	(0.0219)	(0.0225)	(0.0228)
ΔLog Casualties	0.0783*	0.0795*	0.0749*	0.0697+	0.0662+	0.0647+	-0.00676	-0.00650	-0.00572	-0.00595	-0.00658	-0.00660	-0.0302	-0.0371+	-0.0382+	-0.0371+	-0.0337	-0.0318
30 Days Ago	(0.0321)	(0.0339)	(0.0349)	(0.0358)	(0.0360)	(0.0361)	(0.0151)	(0.0149)	(0.0150)	(0.0149)	(0.0149)	(0.0149)	(0.0220)	(0.0205)	(0.0206)	(0.0210)	(0.0216)	(0.0219)
Ex's - 7d		-0.108						0.0398						-0.209*				
		(0.148)						(0.0433)						(0.0982)				
Cm's - 7d		0.00111						-0.00178						0.126**				
		(0.0663)						(0.0266)						(0.0359)				
Ex's - 14d			-0.155						0.0197						-0.169*			
			(0.132)						(0.0381)						(0.0821)			
Cm's - 14d			0.0453						-0.00956						0.0974**			
			(0.0541)						(0.0197)						(0.0266)			
Ex's - 30d				-0.146						-0.0124						-0.0909		
				(0.117)						(0.0357)						(0.0651)		
Cm's - 30d				0.0847+						-0.0167						0.0616**		
				(0.0495)						(0.0155)						(0.0202)		
Ex's - 60d					-0.115						-0.0323						-0.0338	
					(0.107)						(0.0339)						(0.0514)	
Cm's - 60d					0.107*						-0.0193						0.0342*	
					(0.0461)						(0.0127)						(0.0167)	
Ex's - 90d						-0.0991						-0.0387						-0.0125
						(0.104)						(0.0316)						(0.0456)
Cm's - 90d						0.113*						-0.0195+						0.0232
						(0.0441)						(0.0112)						(0.0154)
N	435	435	435	435	435	435	1481	1481	1481	1481	1481	1481	1648	1648	1648	1648	1648	1648

Notes: Outcome is elapsed time from death sentence resolution (execution or commutation) until previous absence at least 90 days before the death sentence. All specifcations use the "+14" commutation date imputation method and all specifications use exponential models to parameterize baseline hazard rates. All specifications include division and year fixed-effects and ΔLog Casualties and ΔLog Casualties 30 Days Ago. The regressors labeled ex's-Yd or cm's-Yd measure the cumulative effects of previous deterrence events in the unit. Y is the half-life of the effect. War Diaries analysis restricts to July 1916-June 1917, which is the time window for the surviving data. Standard errors clustered at the division level in parentheses; + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Appendix Table 3: Effects of Executions vs. Commutations on Elapsed Time Until Next Absence

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: War Diaries	Exp/+14	Wb/+14	Cox/+14	Exp/NN	Wb/NN	Cox/NN	Exp/C=T	Wb/C=T	Cox/C=T
Execution	-0.177	-0.144	-0.158	0.183	0.167	0.129	0.280*	0.250+	0.209
	(0.141)	(0.139)	(0.140)	(0.144)	(0.141)	(0.141)	(0.139)	(0.137)	(0.137)
ΔLog Casualties	0.0928*	0.0802+	0.0648	0.0494	0.0372	0.0159	0.124**	0.110*	0.0992*
	(0.0470)	(0.0461)	(0.0458)	(0.0473)	(0.0462)	(0.0456)	(0.0468)	(0.0461)	(0.0454)
ΔLog Casualties	0.151**	0.139**	0.108*	0.140**	0.132**	0.107*	0.208**	0.190**	0.159**
30 Days Ago	(0.0457)	(0.0449)	(0.0447)	(0.0457)	(0.0444)	(0.0441)	(0.0456)	(0.0451)	(0.0447)
N	536	536	536	536	536	536	536	536	536
Panel B: Police Gazette									
Execution	-0.0770	-0.0715	-0.0662	0.0503	0.0535	0.0567	-0.0179	-0.0133	-0.0114
	(0.0783)	(0.0781)	(0.0779)	(0.0761)	(0.0759)	(0.0758)	(0.0782)	(0.0780)	(0.0780)
ΔLog Casualties	0.0569*	0.0546*	0.0517*	0.0518*	0.0502*	0.0495*	0.0584*	0.0571*	0.0558*
	(0.0228)	(0.0227)	(0.0226)	(0.0226)	(0.0225)	(0.0225)	(0.0229)	(0.0228)	(0.0228)
ΔLog Casualties	0.0620**	0.0601**	0.0584**	0.0685**	0.0664**	0.0646**	0.0719**	0.0706**	0.0695**
30 Days Ago	(0.0199)	(0.0199)	(0.0200)	(0.0201)	(0.0201)	(0.0201)	(0.0203)	(0.0203)	(0.0203)
N	1640	1640	1640	1638	1638	1638	1640	1640	1640
Panel C: FGCM Trial Registries (Time Until Next Desertion Trial)									
Execution	-0.206+	-0.198+	-0.191+	0.135	0.121	0.114	0.0282	0.0283	0.0235
	(0.105)	(0.104)	(0.104)	(0.0991)	(0.0986)	(0.0983)	(0.107)	(0.106)	(0.106)
ΔLog Casualties	0.0476	0.0387	0.0298	0.0563+	0.0472+	0.0386	0.0369	0.0339	0.0296
	(0.0291)	(0.0289)	(0.0287)	(0.0288)	(0.0286)	(0.0283)	(0.0310)	(0.0309)	(0.0307)
ΔLog Casualties	0.0796**	0.0740**	0.0684**	0.0840**	0.0796**	0.0757**	0.0272	0.0248	0.0227
30 Days Ago	(0.0261)	(0.0260)	(0.0259)	(0.0259)	(0.0258)	(0.0258)	(0.0278)	(0.0277)	(0.0277)
N	1654	1654	1654	1654	1654	1654	1654	1654	1654

Notes: Outcome is elapsed time from death sentence resolution (execution or commutation) until next absence. "Exp", "Wb" and "Cox" use the exponential, Weibull and Cox models respectively to parameterize the baseline hazard. In columns sub-titled "+14", the announcement of the commutation is assumed to occur 14 days after trial. In columns subtitled "NN" the nearest-neighbor method is used, which means the imputed announcement of the commutation is same as the most nearby execution announcement, while in columns labeled "C=T", the trial date is used as the announcement date of the execution and commutation. Log Casualties is calculated as log(1+Casualties). ΔLog Casualties is defined as the difference in Log Casualties 1 to 29 Days Ago vs. 30 to 59 Days Ago. ΔLog Casualties 30 Days Ago is defined as the difference in Log Casualties 30 to 59 Days Ago vs. 60 to 89 Days Ago. All specifications include division and year fixed-effects. War Diaries analysis restricts to July 1916-June 1917, which is the time window for the surviving data. Standard errors in parentheses; + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Appendix Table 4: Effects of Executions vs. Commutations on Elapsed Time Until Next Absence Differing by whether Case was a Desertion Trial and whether Soldier was Irish

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: War Diaries	Exp/+14	Wb/+14	Cox/+14	Exp/NN	Wb/NN	Cox/NN	Exp/C=T	Wb/C=T	Cox/C=T
Execution	-0.417	-0.394	-0.308	0.219	0.182	0.239	0.723+	0.627	0.689+
	(0.446)	(0.441)	(0.439)	(0.418)	(0.414)	(0.411)	(0.397)	(0.396)	(0.393)
Desert	-0.0429	-0.0218	-0.00996	0.0470	0.0531	0.0511	0.138	0.146	0.133
	(0.176)	(0.174)	(0.172)	(0.172)	(0.169)	(0.167)	(0.178)	(0.175)	(0.172)
Ex-Desert	-0.00330	0.0467	-0.0154	-0.241	-0.161	-0.218	-0.650	-0.555	-0.627
	(0.468)	(0.464)	(0.461)	(0.439)	(0.435)	(0.431)	(0.417)	(0.415)	(0.412)
Irish	-0.727**	-0.629**	-0.464**	-0.646**	-0.541**	-0.391*	-0.475*	-0.407*	-0.263
	(0.181)	(0.182)	(0.180)	(0.178)	(0.178)	(0.177)	(0.186)	(0.185)	(0.182)
Ex-Irish	1.179**	1.003**	0.805*	0.768*	0.579	0.399	0.619+	0.537	0.355
	(0.356)	(0.357)	(0.355)	(0.359)	(0.358)	(0.355)	(0.340)	(0.340)	(0.341)
N	536	536	536	536	536	536	536	536	536
Panel B: Police Gazette									
Execution	-0.372	-0.355	-0.340	0.0857	0.0890	0.0811	0.206	0.197	0.163
	(0.232)	(0.231)	(0.230)	(0.213)	(0.213)	(0.213)	(0.219)	(0.219)	(0.219)
Desert	-0.0459	-0.0409	-0.0341	-0.0245	-0.0228	-0.0212	-0.0510	-0.0488	-0.0454
	(0.0795)	(0.0794)	(0.0792)	(0.0783)	(0.0781)	(0.0781)	(0.0780)	(0.0779)	(0.0778)
Ex-Desert	0.251	0.241	0.235	-0.0773	-0.0747	-0.0611	-0.327	-0.309	-0.267
	(0.248)	(0.247)	(0.245)	(0.231)	(0.230)	(0.229)	(0.236)	(0.236)	(0.235)
Irish	-0.179*	-0.172+	-0.164+	-0.187*	-0.175*	-0.169+	-0.119	-0.116	-0.114
	(0.0895)	(0.0892)	(0.0891)	(0.0892)	(0.0890)	(0.0890)	(0.0902)	(0.0900)	(0.0899)
Ex-Irish	0.431*	0.410*	0.387*	0.219	0.203	0.196	0.408*	0.392*	0.382+
	(0.198)	(0.197)	(0.197)	(0.198)	(0.198)	(0.197)	(0.198)	(0.198)	(0.197)
N	1640	1640	1640	1638	1638	1638	1640	1640	1640
Panel C: FGCM Trial Registries (Time Until Next Desertion Trial)									
Execution	-0.709*	-0.648*	-0.588*	0.0476	0.0296	0.0233	0.0772	0.0703	0.0526
	(0.286)	(0.283)	(0.281)	(0.260)	(0.259)	(0.258)	(0.254)	(0.253)	(0.253)
Desert	0.0535	0.0411	0.0235	0.110	0.0816	0.0482	-0.0590	-0.0656	-0.0855
	(0.0990)	(0.0982)	(0.0977)	(0.0981)	(0.0976)	(0.0972)	(0.103)	(0.103)	(0.103)
Ex-Desert	0.442	0.397	0.351	-0.0496	-0.0232	-0.00214	-0.164	-0.148	-0.116
	(0.306)	(0.303)	(0.301)	(0.281)	(0.280)	(0.279)	(0.281)	(0.280)	(0.279)
Irish	-0.353**	-0.326**	-0.297*	-0.221*	-0.196+	-0.172	-0.252*	-0.243+	-0.218+
	(0.116)	(0.116)	(0.115)	(0.113)	(0.112)	(0.112)	(0.124)	(0.124)	(0.123)
Ex-Irish	0.718**	0.639*	0.560*	0.651**	0.566*	0.480+	0.556*	0.525+	0.465+
	(0.271)	(0.271)	(0.270)	(0.252)	(0.251)	(0.250)	(0.269)	(0.268)	(0.268)
N	1654	1654	1654	1654	1654	1654	1654	1654	1654

Notes: Outcome is elapsed time from death sentence resolution (execution or commutation) until next absence. "Exp", "Wb" and "Cox" use the exponential, Weibull and Cox models respectively to parameterize the baseline hazard. In columns sub-titled "+14", the announcement of the commutation is assumed to occur 14 days after trial. In columns subtitled "NN" the nearest-neighbor method is used, which means the imputed announcement of the commutation is same as the most nearby execution announcement, while in columns labeled "C=T", the trial date is used as the announcement date of the execution and commutation. All specifications include division and year fixed-effects and ΔLog Casualties and ΔLog Casualties 30 Days Ago. War Diaries analysis restricts to July 1916-June 1917, which is the time window for the surviving data. Standard errors in parentheses; + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Appendix Table 5: Effects of Execution vs. Commutation on Elapsed Time Until Next Absence, Full Sample, Weak SUTVA

	War Diaries								Police Gazettes				FGCM Trial Registries (Desertion Trials)					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Execution	-0.417	-0.386	-0.374	-0.363	-0.370	-0.384	-0.372	-0.542*	-0.512*	-0.475*	-0.432+	-0.411+	-0.709*	-0.919**	-0.895**	-0.856**	-0.791**	-0.752**
	(0.446)	(0.453)	(0.452)	(0.451)	(0.450)	(0.450)	(0.232)	(0.245)	(0.242)	(0.237)	(0.234)	(0.233)	(0.286)	(0.305)	(0.301)	(0.295)	(0.290)	(0.288)
Desert	-0.0429	-0.0205	-0.0188	-0.0251	-0.0512	-0.0756	-0.0459	-0.0711	-0.0804	-0.0656	-0.0458	-0.0412	0.0535	0.0272	0.0179	0.0317	0.0559	0.0630
	(0.176)	(0.177)	(0.177)	(0.176)	(0.175)	(0.175)	(0.0795)	(0.0800)	(0.0799)	(0.0796)	(0.0795)	(0.0795)	(0.0990)	(0.0998)	(0.0997)	(0.0994)	(0.0993)	(0.0992)
Ex-Desert	-0.00330	-0.0293	-0.0343	-0.0282	-0.00235	0.0168	0.251	0.310	0.283	0.258	0.235	0.229	0.442	0.518	0.504	0.474	0.430	0.411
	(0.468)	(0.472)	(0.470)	(0.467)	(0.465)	(0.464)	(0.248)	(0.260)	(0.257)	(0.253)	(0.250)	(0.249)	(0.306)	(0.323)	(0.320)	(0.315)	(0.311)	(0.309)
Irish	-0.727**	-0.766**	-0.782**	-0.821**	-0.849**	-0.836**	-0.179*	-0.158+	-0.172+	-0.186*	-0.189*	-0.185*	-0.353**	-0.351**	-0.365**	-0.373**	-0.366**	-0.358**
	(0.181)	(0.184)	(0.185)	(0.186)	(0.185)	(0.183)	(0.0895)	(0.0898)	(0.0897)	(0.0896)	(0.0896)	(0.0896)	(0.116)	(0.117)	(0.117)	(0.117)	(0.117)	(0.117)
Ex-Irish	1.179**	1.250**	1.256**	1.305**	1.355**	1.343**	0.431*	0.432*	0.440*	0.437*	0.424*	0.421*	0.718**	0.726**	0.750**	0.778**	0.775**	0.761**
	(0.356)	(0.361)	(0.361)	(0.361)	(0.359)	(0.358)	(0.198)	(0.199)	(0.198)	(0.198)	(0.198)	(0.198)	(0.271)	(0.273)	(0.273)	(0.272)	(0.272)	(0.272)
ΔLog Casualties	0.0870+	0.0811+	0.0781+	0.0721	0.0624	0.0571	0.0537*	0.0744**	0.0776**	0.0747**	0.0681**	0.0628**	0.0422	0.0597*	0.0658*	0.0662*	0.0605*	0.0543+
	(0.0465)	(0.0466)	(0.0468)	(0.0470)	(0.0474)	(0.0477)	(0.0229)	(0.0233)	(0.0234)	(0.0233)	(0.0231)	(0.0230)	(0.0291)	(0.0296)	(0.0298)	(0.0298)	(0.0296)	(0.0295)
ΔLog Casualties	0.170**	0.171**	0.168**	0.162**	0.151**	0.146**	0.0652**	0.0620**	0.0681**	0.0719**	0.0709**	0.0689**	0.0856**	0.0824**	0.0923**	0.100**	0.0987**	0.0944**
30 Days Ago	(0.0457)	(0.0456)	(0.0456)	(0.0458)	(0.0461)	(0.0462)	(0.0199)	(0.0202)	(0.0203)	(0.0203)	(0.0202)	(0.0201)	(0.0261)	(0.0263)	(0.0264)	(0.0267)	(0.0266)	(0.0265)
Ex's - 7d		-0.174						0.217**						0.355**				
		(0.170)						(0.0841)						(0.113)				
Cm's - 7d		-0.0348						0.214**						0.183**				
		(0.0909)						(0.0328)						(0.0408)				
Ex's - 14d			-0.133						0.0852						0.172*			
			(0.137)						(0.0632)						(0.0832)			
Cm's - 14d			-0.0468						0.156**						0.140**			
			(0.0670)						(0.0236)						(0.0299)			
Ex's - 30d				-0.138						-0.0264						0.0213		
				(0.114)						(0.0475)						(0.0615)		
Cm's - 30d				-0.0673						0.105**						0.0991**		
				(0.0502)						(0.0168)						(0.0219)		
Ex's - 60d					-0.186+						-0.0731+						-0.0392	
					(0.104)						(0.0386)						(0.0497)	
Cm's - 60d					-0.0872*						0.0651**						0.0623**	
					(0.0412)						(0.0130)						(0.0169)	
Ex's - 90d						-0.216*						-0.0855*						-0.0570
						(0.100)						(0.0354)						(0.0455)
Cm's - 90d						-0.0902*						0.0454**						0.0425**
						(0.0375)						(0.0116)						(0.0149)
N	536	536	536	536	536	536	1640	1640	1640	1640	1640	1640	1654	1654	1654	1654	1654	1654

Notes: All specifcations use the "+14" commutation date imputation method and all specifications use exponential models to parameterize baseline hazard rates. All specifications include division and year fixed-effects. Log Casualties is calculated as log(1+Casualties). ΔLog Casualties is defined as the difference in Log Casualties 1 to 29 Days Ago vs. 30 to 59 Days Ago. ΔLog Casualties 30 Days Ago is defined as the difference in Log Casualties 30 to 59 Days Ago vs. 60 to 89 Days Ago. The regressors labeled ex's-Yd or cm's-Yd measure the cumulative effects of previous deterrence events in the unit. Y is the half-life of the effect. War Diaries analysis restricts to July 1916-June 1917, which is the time window for the surviving data. Standard errors in parentheses; + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Appendix Table 6: Effects of Executions vs. Commutations on Elapsed Time Until *Previous* Absence Differing by whether Case was a Desertion Trial and whether Soldier was Irish

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: War Diaries	Exp/+14	Wb/+14	Cox/+14	Exp/NN	Wb/NN	Cox/NN	Exp/C=T	Wb/C=T	Cox/C=T
Execution	0.0983	-0.0543	-0.168	0.0404	0.334	0.567	0.329	0.425	0.556
	(0.388)	(0.394)	(0.400)	(0.436)	(0.434)	(0.438)	(0.451)	(0.453)	(0.458)
Desert	-0.0630	-0.103	-0.133	-0.0341	-0.0359	-0.0738	0.0629	0.0153	-0.0542
	(0.170)	(0.171)	(0.173)	(0.169)	(0.175)	(0.179)	(0.193)	(0.196)	(0.200)
Ex-Desert	-0.115	-0.0948	0.0129	-0.0608	-0.313	-0.543	-0.317	-0.391	-0.555
	(0.413)	(0.422)	(0.427)	(0.453)	(0.457)	(0.464)	(0.468)	(0.473)	(0.478)
Irish	0.00526	-0.0540	-0.0829	0.0267	-0.0417	-0.0852	0.165	0.137	0.135
	(0.185)	(0.189)	(0.195)	(0.185)	(0.191)	(0.195)	(0.199)	(0.205)	(0.208)
Ex-Irish	0.126	0.316	0.405	0.0677	0.0383	0.0520	0.0120	-0.0612	-0.0820
	(0.386)	(0.392)	(0.403)	(0.382)	(0.390)	(0.398)	(0.392)	(0.399)	(0.406)
N	435	435	435	438	438	438	413	413	413
Panel B: Police Gazette									
Execution	0.0293	0.135	0.104	0.244	0.221	0.509*	0.166	0.0692	0.220
	(0.234)	(0.239)	(0.237)	(0.215)	(0.221)	(0.221)	(0.222)	(0.231)	(0.226)
Desert	-0.0133	0.0375	0.0177	0.0505	0.0420	0.106	0.0266	0.110	0.0745
	(0.0823)	(0.0839)	(0.0831)	(0.0849)	(0.0916)	(0.0885)	(0.0832)	(0.0846)	(0.0834)
Ex-Desert	-0.0245	-0.291	-0.185	-0.247	-0.304	-0.521*	-0.130	-0.221	-0.300
	(0.248)	(0.255)	(0.253)	(0.231)	(0.239)	(0.238)	(0.236)	(0.247)	(0.242)
Irish	-0.0384	-0.230*	-0.172+	-0.0332	-0.0868	-0.0822	-0.00815	-0.188*	-0.158+
	(0.0901)	(0.0939)	(0.0912)	(0.0905)	(0.0936)	(0.0917)	(0.0899)	(0.0941)	(0.0911)
Ex-Irish	0.0594	0.215	0.200	0.0306	0.278	0.135	0.0715	0.620**	0.460*
	(0.209)	(0.216)	(0.213)	(0.215)	(0.220)	(0.218)	(0.204)	(0.212)	(0.209)
N	1481	1481	1481	1500	1500	1500	1479	1479	1479
Panel C: FGCM Trial Registries (Time Until Next Desertion Trial)									
Execution	-0.177	0.0193	-0.0555	0.335	0.303	0.517*	-0.133	0.118	0.00467
	(0.285)	(0.293)	(0.290)	(0.235)	(0.242)	(0.240)	(0.307)	(0.316)	(0.313)
Desert	-0.0196	0.0557	-0.0206	0.0171	0.0717	0.0787	0.0936	0.259*	0.132
	(0.0930)	(0.0997)	(0.0945)	(0.0980)	(0.100)	(0.0986)	(0.0989)	(0.108)	(0.102)
Ex-Desert	0.174	0.110	0.137	-0.463+	-0.427	-0.580*	0.0957	-0.0744	0.00106
	(0.303)	(0.309)	(0.308)	(0.260)	(0.270)	(0.267)	(0.326)	(0.334)	(0.333)
Irish	-0.0586	-0.0378	-0.0570	0.0165	0.0232	-0.0468	-0.0146	-0.0319	-0.0504
	(0.108)	(0.113)	(0.110)	(0.107)	(0.112)	(0.110)	(0.112)	(0.117)	(0.114)
Ex-Irish	-0.0397	-0.125	-0.119	-0.00562	0.0560	0.0490	0.0572	0.0739	0.142
	(0.260)	(0.266)	(0.263)	(0.261)	(0.271)	(0.267)	(0.266)	(0.274)	(0.270)
N	1648	1648	1648	1526	1526	1526	1642	1642	1642

Notes: Outcome is elapsed time from death sentence resolution (execution or commutation) until previous absence at least 90 days before the death sentence. "Exp", "Wb" and "Cox" use the exponential, Weibull and Cox models respectively to parameterize the baseline hazard. In columns sub-titled "+14", the announcement of the commutation is assumed to occur 14 days after trial. In columns subtitled "NN" the nearest-neighbor method is used, which means the imputed announcement of the commutation is same as the most nearby execution announcement, while in columns labeled "C=T", the trial date is used as the announcement date of the execution and commutation. All specifications include division and year fixed-effects and ΔLog Casualties and ΔLog Casualties 30 Days Ago. War Diaries analysis restricts to July 1916-June 1917, which is the time window for the surviving data. Standard errors in parentheses; + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Appendix Table 7: Effects of Execution vs. Commutation on Elapsed Time Until *Previous* Absence, Full Sample, Weak SUTVA

	War Diaries								Police Gazettes				FGCM Trial Registries (Desertion Trials)					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Execution	0.0983	0.0960	0.0432	-0.0189	-0.0629	-0.0830	0.0293	0.0271	0.0327	0.0383	0.0396	0.0385	-0.177	-0.193	-0.205	-0.206	-0.200	-0.195
	(0.388)	(0.393)	(0.395)	(0.397)	(0.397)	(0.396)	(0.234)	(0.235)	(0.235)	(0.235)	(0.235)	(0.235)	(0.285)	(0.285)	(0.285)	(0.285)	(0.285)	(0.285)
Desert	-0.0630	-0.0575	-0.0495	-0.0481	-0.0553	-0.0606	-0.0133	-0.0146	-0.0144	-0.00981	-0.00266	0.00162	-0.0196	-0.0158	-0.0171	-0.0247	-0.0310	-0.0323
	(0.170)	(0.171)	(0.171)	(0.171)	(0.171)	(0.170)	(0.0823)	(0.0824)	(0.0824)	(0.0826)	(0.0827)	(0.0828)	(0.0930)	(0.0931)	(0.0931)	(0.0930)	(0.0931)	(0.0931)
Ex-Desert	-0.115	-0.116	-0.0840	-0.0505	-0.0280	-0.0166	-0.0245	-0.0225	-0.0239	-0.0240	-0.0257	-0.0267	0.174	0.143	0.152	0.163	0.173	0.175
	(0.413)	(0.415)	(0.416)	(0.417)	(0.416)	(0.415)	(0.248)	(0.248)	(0.248)	(0.248)	(0.248)	(0.248)	(0.303)	(0.303)	(0.303)	(0.303)	(0.303)	(0.303)
Irish	0.00526	0.00545	-0.00151	-0.00423	-0.00138	0.000996	-0.0384	-0.0379	-0.0383	-0.0377	-0.0359	-0.0354	-0.0586	-0.0632	-0.0587	-0.0537	-0.0532	-0.0535
	(0.185)	(0.186)	(0.186)	(0.185)	(0.185)	(0.185)	(0.0901)	(0.0901)	(0.0901)	(0.0901)	(0.0901)	(0.0901)	(0.108)	(0.109)	(0.109)	(0.108)	(0.108)	(0.108)
Ex-Irish	0.126	0.129	0.146	0.140	0.115	0.101	0.0594	0.0620	0.0607	0.0532	0.0499	0.0519	-0.0397	-0.0107	-0.0143	-0.0212	-0.0293	-0.0339
	(0.386)	(0.387)	(0.386)	(0.386)	(0.386)	(0.386)	(0.209)	(0.209)	(0.210)	(0.210)	(0.210)	(0.210)	(0.260)	(0.261)	(0.261)	(0.261)	(0.260)	(0.260)
ΔLog Casualties	0.0552	0.0552	0.0527	0.0506	0.0497	0.0493	-0.0218	-0.0220	-0.0212	-0.0212	-0.0219	-0.0218	-0.0448	-0.0485+	-0.0498+	-0.0499+	-0.0479+	-0.0466+
	(0.0498)	(0.0500)	(0.0502)	(0.0505)	(0.0509)	(0.0511)	(0.0250)	(0.0251)	(0.0251)	(0.0250)	(0.0250)	(0.0250)	(0.0275)	(0.0277)	(0.0277)	(0.0278)	(0.0278)	(0.0278)
ΔLog Casualties	0.0783+	0.0795+	0.0749	0.0697	0.0662	0.0647	-0.00676	-0.00650	-0.00572	-0.00595	-0.00658	-0.00660	-0.0302	-0.0371	-0.0382	-0.0371	-0.0337	-0.0318
30 Days Ago	(0.0465)	(0.0479)	(0.0477)	(0.0473)	(0.0469)	(0.0467)	(0.0228)	(0.0230)	(0.0230)	(0.0230)	(0.0230)	(0.0230)	(0.0249)	(0.0252)	(0.0253)	(0.0253)	(0.0253)	(0.0252)
Ex's - 7d		-0.108						0.0398						-0.209+				
		(0.221)						(0.0976)						(0.124)				
Cm's - 7d		0.00111						-0.00178						0.126**				
		(0.0993)						(0.0387)						(0.0416)				
Ex's - 14d			-0.155						0.0197						-0.169+			
			(0.167)						(0.0706)						(0.0883)			
Cm's - 14d			0.0453						-0.00956						0.0974**			
			(0.0783)						(0.0276)						(0.0305)			
Ex's - 30d				-0.146						-0.0124						-0.0909		
				(0.133)						(0.0524)						(0.0631)		
Cm's - 30d				0.0847						-0.0167						0.0616**		
				(0.0618)						(0.0196)						(0.0226)		
Ex's - 60d					-0.115						-0.0323						-0.0338	
					(0.117)						(0.0425)						(0.0499)	
Cm's - 60d					0.107*						-0.0193						0.0342+	
					(0.0514)						(0.0151)						(0.0177)	
Ex's - 90d						-0.0991						-0.0387						-0.0125
						(0.112)						(0.0382)						(0.0447)
Cm's - 90d						0.113*						-0.0195						0.0232
						(0.0471)						(0.0133)						(0.0155)
N	435	435	435	435	435	435	1481	1481	1481	1481	1481	1481	1648	1648	1648	1648	1648	1648

Notes: Outcome is elapsed time from death sentence resolution (execution or commutation) until previous absence at least 90 days before the death sentence. All specifcations use the "+14" commutation date imputation method and all specifications use exponential models to parameterize baseline hazard rates. All specifications include division and year fixed-effects and ΔLog Casualties and ΔLog Casualties 30 Days Ago. The regressors labeled ex's-Yd or cm's-Yd measure the cumulative effects of previous deterrence events in the unit. Y is the half-life of the effect. War Diaries analysis restricts to July 1916-June 1917, which is the time window for the surviving data. Standard errors in parentheses; + p < 0.10, * p < 0.05, ** p < 0.01

Appendix Table 8: Day-by-Day Framework, Future Events and Previous Absences

Panel A: War Diaries	(1)	(2)	(3)	(4)	(5)
Half-life	1 week	2 weeks	1 month	2 months	3 months
Execution	0.0171	0.0127	0.00897	0.00550	0.00318
	(0.0218)	(0.0156)	(0.0118)	(0.0102)	(0.00921)
Death Sentence	-0.0000876	-0.000565	-0.000739	-0.000570	-0.000497
	(0.00143)	(0.00127)	(0.00111)	(0.000977)	(0.000942)
Ex-Irish	0.0127	0.0121	0.0124	0.0144	0.0158
	(0.0137)	(0.0102)	(0.00928)	(0.00953)	(0.00958)
Irish	-0.0137*	-0.0123*	-0.00919+	-0.00765	-0.00724
	(0.00511)	-0.0049	(0.00465)	(0.00457)	(0.00440)
Ex-Desert	-0.0190	-0.0147	-0.0122	-0.0101	-0.00839
	(0.0197)	(0.0147)	(0.0117)	(0.0101)	(0.00893)
Desert	0.00204	0.00298	0.00279	0.00250+	0.00239+
	(0.00196)	(0.00196)	(0.00181)	(0.00144)	(0.00130)
N	20750	20750	20750	20750	20750
Panel B: Police Gazettes					
Execution	0.00273	-0.00634	-0.00989	-0.00994	-0.00857
	(0.0214)	(0.0182)	(0.0139)	(0.0106)	(0.00915)
Death Sentence	0.00741	0.00596	0.00414	0.00250	0.00167
	(0.00452)	(0.00414)	(0.00312)	(0.00207)	(0.00160)
Ex-Irish	0.0124	0.00621	-0.000201	-0.00325	-0.00353
	(0.0161)	(0.0125)	(0.00906)	(0.00699)	(0.00599)
Irish	-0.00154	0.00198	0.00371	0.00390	0.00352
	(0.00586)	(0.00506)	(0.00443)	(0.00382)	(0.00333)
Ex-Desert	-0.00454	0.00626	0.00954	0.00830	0.00629
	(0.0206)	(0.0169)	(0.0128)	(0.00949)	(0.00818)
Desert	-0.00729	-0.00703	-0.00569	-0.00364	-0.00237
	(0.00454)	(0.00419)	(0.00341)	(0.00256)	(0.00215)
N	50465	50465	50465	50465	50465
Panel C: FGCM Desertion Trial Registries					
Execution	-0.0308*	-0.0245+	-0.0133	-0.00607	-0.00400
	(0.0141)	(0.0122)	(0.0110)	(0.00890)	(0.00705)
Death Sentence	0.00367	0.00350	0.00288+	0.00196+	0.00144+
	(0.00313)	(0.00233)	(0.00167)	(0.00111)	(0.000793)
Ex-Irish	-0.00701	-0.00497	-0.00283	-0.000694	0.000834
	(0.0167)	(0.0134)	(0.00998)	(0.00725)	(0.00612)
Irish	0.0152*	0.0122**	0.00857*	0.00532*	0.00366+
	(0.00611)	(0.00456)	(0.00345)	(0.00249)	(0.00199)
Ex-Desert	0.0231	0.0178	0.00644	0.000998	0.000752
	(0.0143)	(0.0124)	(0.0118)	(0.00979)	(0.00785)
Desert	0.00102	0.000660	0.00261	0.00364*	0.00345*
	(0.00468)	(0.00322)	(0.00227)	(0.00168)	(0.00136)
N	54855	54855	54855	54855	54855

Notes: Outcome is whether there was any absence on that day and division. All specifcations use the "+14" commutation date imputation method and include division and year fixed-effects, ΔLog Casualties, and ΔLog Casualties 30 Days Ago. The half-life row indicates the assumed exponential half-life of the effect of future events beginning 90 days in the future. War Diaries analysis restricts to July 1916-June 1917, which is the time window for the surviving data. War Diaries analysis restricts to July 1916-June 1917, which is the time window for the surviving data. Standard errors clustered at the division level in parentheses; + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Appendix Table 9: Day-by-Day Framework, Future Events and Previous Irish - non-Irish Absence

Panel A: War Diaries	(1)	(2)	(3)	(4)	(5)
Half-life	1 week	2 weeks	1 month	2 months	3 months
Execution	-0.00885	-0.00633	-0.00499	-0.00447	-0.00374
	(0.0110)	(0.00899)	(0.00544)	(0.00531)	(0.00562)
Death Sentence	0.000503	0.000822	0.000949	0.000954	0.000943
	(0.00153)	(0.00119)	(0.000903)	(0.000834)	(0.000819)
Ex-Irish	0.00699	0.00319	0.00103	-0.00117	-0.00298
	(0.0145)	(0.00875)	(0.00680)	(0.00696)	(0.00706)
Irish	0.00239	0.00102	-0.000630	-0.000713	-0.000241
	(0.00447)	(0.00279)	(0.00254)	(0.00278)	(0.00273)
Ex-Desert	0.00150	0.00128	0.00256	0.00430	0.00474
	(0.0130)	(0.0105)	(0.00544)	(0.00435)	(0.00468)
Desert	0.00167	0.000528	-0.000378	-0.00109	-0.00135
	(0.00281)	(0.00218)	(0.00151)	(0.00116)	(0.00106)
N	20750	20750	20750	20750	20750
Panel B: Police Gazettes					
Execution	-0.0282	-0.0199	-0.0114	-0.00543	-0.00315
	(0.0178)	(0.0129)	(0.00849)	(0.00568)	(0.00453)
Death Sentence	0.000329	0.000108	-0.000266	-0.000187	-0.00000606
	(0.00221)	(0.00164)	(0.00122)	(0.000866)	(0.000701)
Ex-Irish	0.00120	0.00495	0.00567+	0.00449+	0.00339
	(0.0103)	(0.00605)	(0.00330)	(0.00249)	(0.00232)
Irish	-0.000198	-0.00167	-0.00158	-0.00139	-0.00133
	(0.00532)	(0.00397)	(0.00297)	(0.00214)	(0.00172)
Ex-Desert	0.0269	0.0187	0.0113	0.00639	0.00450
	(0.0179)	(0.0130)	(0.00874)	(0.00599)	(0.00487)
Desert	-0.00338	-0.00169	-0.000409	-0.000265	-0.000454
	(0.00262)	(0.00175)	(0.00133)	(0.00103)	(0.000886)
N	50465	50465	50465	50465	50465
Panel C: FGCM Desertion Trial Registries					
Execution	0.0332**	0.0259*	0.0148	0.00739	0.00475
	(0.0121)	(0.0109)	(0.00949)	(0.00725)	(0.00563)
Death Sentence	-0.00265	-0.00240	-0.00207	-0.00157	-0.00121
	(0.00266)	(0.00191)	(0.00133)	(0.000948)	(0.000748)
Ex-Irish	-0.00942	-0.00784	-0.00677	-0.00461	-0.00361
	(0.0122)	(0.00976)	(0.00774)	(0.00620)	(0.00553)
Irish	-0.00851+	-0.00807*	-0.00398	-0.000594	0.000457
	(0.00441)	(0.00338)	(0.00263)	(0.00218)	(0.00192)
Ex-Desert	-0.0248*	-0.0174	-0.00559	-0.000398	0.0000879
	(0.0123)	(0.0108)	(0.00925)	(0.00727)	(0.00597)
Desert	-0.00206	-0.000792	-0.00226	-0.00319*	-0.00308**
	(0.00333)	(0.00218)	(0.00155)	(0.00122)	(0.00104)
N	54855	54855	54855	54855	54855

Notes: Outcome is whether there was any Irish absence on that day and division minus whether there was any non-Irish absence on that day and division. All specifcations use the "+14" commutation date imputation method and include division and year fixed-effects, ΔLog Casualties, and ΔLog Casualties 30 Days Ago. The half-life row indicates the assumed exponential half-life of the effect of past events. War Diaries analysis restricts to July 1916-June 1917, which is the time window for the surviving data. War Diaries analysis restricts to July 1916-June 1917, which is the time window for the surviving data. Standard errors clustered at the division level in parentheses; + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Appendix Table 10: Effects of Execution vs. Commutation on Elapsed Time Until Next Absence, Full Sample, Weak SUTVA

	War Diaries						Police Gazettes						FGCM Trial Registries (Desertion Trials)					
	Exp		Weibull		Cox		Exp		Weibull		Cox		Exp		Weibull		Cox	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Execution	-0.368	-0.394	-0.359	-0.213	-0.278	-0.118	-0.475	-0.432	-0.457	-0.414	-0.434	-0.421	-0.855	-0.498	-0.779	-0.577	-0.688	-0.539
	(0.742)	(0.625)	(0.694)	(0.619)	(0.682)	(0.618)	(0.447)	(0.394)	(0.427)	(0.482)	(0.387)	(0.451)	(0.622)	(0.500)	(0.559)	(0.572)	(0.483)	(0.507)
Desert	-0.0253	-0.0511	-0.0103	-0.283	-0.00336	-0.245	-0.0656	-0.0815	-0.0608	-0.0788	-0.0514	-0.0700	0.0317	0.0299	0.0246	-0.0607	0.0118	-0.0489
	(0.300)	(0.308)	(0.269)	(0.243)	(0.235)	(0.231)	(0.0851)	(0.0855)	(0.0823)	(0.0998)	(0.0767)	(0.0925)	(0.122)	(0.126)	(0.113)	(0.132)	(0.103)	(0.123)
Ex-Desert	-0.0250	0.0408	0.0317	-0.0144	-0.0314	-0.0884	0.258	0.191	0.249	0.117	0.241	0.134	0.474	0.299	0.425	0.414	0.366	0.374
	(0.728)	(0.619)	(0.688)	(0.534)	(0.663)	(0.540)	(0.480)	(0.415)	(0.459)	(0.471)	(0.417)	(0.440)	(0.663)	(0.539)	(0.600)	(0.570)	(0.520)	(0.499)
Irish	-0.822**	-0.702**	-0.717**	-0.755**	-0.549**	-0.573**	-0.186+	-0.140	-0.180+	-0.211+	-0.174+	-0.206+	-0.374**	-0.349*	-0.346**	-0.420*	-0.314**	-0.391**
	(0.212)	(0.219)	(0.204)	(0.229)	(0.173)	(0.196)	(0.107)	(0.114)	(0.102)	(0.119)	(0.0951)	(0.112)	(0.145)	(0.146)	(0.133)	(0.166)	(0.120)	(0.146)
Ex-Irish	1.310**	1.118**	1.127**	1.058**	0.925**	0.863**	0.437*	0.445*	0.423*	0.554*	0.402*	0.536*	0.778**	0.712**	0.702**	0.608+	0.612**	0.566+
	(0.282)	(0.334)	(0.253)	(0.333)	(0.242)	(0.291)	(0.196)	(0.203)	(0.186)	(0.233)	(0.167)	(0.217)	(0.253)	(0.270)	(0.234)	(0.328)	(0.214)	(0.292)
Ex's - 30d	-0.147	-0.204+	-0.152	-0.299*	-0.176+	-0.302*	-0.0270	-0.0674	-0.0257	-0.158*	-0.0247	-0.148*	0.0227	-0.0513	0.0197	-0.158	0.0203	-0.145
	(0.130)	(0.112)	(0.115)	(0.124)	(0.102)	(0.117)	(0.0703)	(0.0611)	(0.0678)	(0.0754)	(0.0634)	(0.0699)	(0.0738)	(0.0663)	(0.0687)	(0.105)	(0.0626)	(0.0972)
Cm's - 30d	-0.0654	-0.121+	-0.0574	-0.184*	-0.0532	-0.149+	0.105**	0.0967**	0.101**	-0.0177	0.0926**	-0.0170	0.0988**	0.0877**	0.0898**	-0.0850*	0.0775**	-0.0780*
	(0.0722)	(0.0697)	(0.0646)	(0.0888)	(0.0562)	(0.0821)	(0.0267)	(0.0355)	(0.0248)	(0.0470)	(0.0234)	(0.0432)	(0.0255)	(0.0258)	(0.0235)	(0.0414)	(0.0218)	(0.0374)
ΔLog Casualties	0.0721	0.0552	0.0618	0.0471	0.0448	0.0423	0.0748*	0.0829**	0.0726*	0.113**	0.0689*	0.108**	0.0663+	0.0751*	0.0574	0.106**	0.0466	0.0901**
	(0.0595)	(0.0596)	(0.0539)	(0.0663)	(0.0501)	(0.0597)	(0.0292)	(0.0267)	(0.0284)	(0.0275)	(0.0268)	(0.0262)	(0.0388)	(0.0342)	(0.0365)	(0.0362)	(0.0334)	(0.0344)
ΔLog Casualties	0.163**	0.148*	0.150**	0.175**	0.113*	0.142**	0.0719**	0.0739**	0.0704**	0.116**	0.0684**	0.114**	0.100**	0.108**	0.0934**	0.141**	0.0848**	0.128**
30 Days Ago	(0.0613)	(0.0602)	(0.0529)	(0.0566)	(0.0472)	(0.0498)	(0.0275)	(0.0273)	(0.0266)	(0.0292)	(0.0248)	(0.0279)	(0.0344)	(0.0391)	(0.0334)	(0.0439)	(0.0321)	(0.0410)
Division and Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Additional Controls	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y
N	536	536	536	536	536	536	1640	1640	1640	1640	1640	1640	1654	1654	1654	1654	1654	1654

Notes: All specifications use the "+14" commutation date imputation method. All specifications include division and year fixed-effects. Log Casualties is calculated as log(1+Casualties). ΔLog Casualties is defined as the difference in Log Casualties 1 to 29 Days Ago vs. 30 to 59 Days Ago. ΔLog Casualties 30 Days Ago is defined as the difference in Log Casualties 30 to 59 Days Ago vs. 60 to 89 Days Ago. Additional controls are Irish indicators for each officer in the chain-of-command, whether the executed soldier was an officer, the executed soldier's age, distance to coast, distance to Berlin, fixed effects for the identities of the Division Commanding Officer and Division 1st General Staff Officer, and lag measures of absences and of death sentences (the log of absences and the log of death sentences in the time window 30-59 Days Ago and 60-89 Days Ago). When officer or age data is missing, it is dummied out (i.e., set to a constant and another variable indicating whether it is missing is included). Officers that appear with less than 10 frequency are categorized in an Other category. Exponential models do not include officer identity fixed effects to speed calculations. The regressors labeled ex's-Yd or cm's-Yd measure the cumulative effects of previous deterrence events in the unit. Y is the half-life of the effect. War Diaries analysis restricts to July 1916-June 1917, which is the time window for the surviving data. Standard errors clustered at the division level in parentheses; + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Appendix Table 11: Effects of Execution vs. Commutation on Elapsed Time Until Next Absence, Full Sample, Weak SUTVA (Hazard coefficients)

	War Diaries								Police Gazettes				FGCM Trial Registries (Desertion Trials)					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Execution	0.659	0.680	0.688	0.695	0.691	0.681	0.689	0.580	0.599	0.622	0.650	0.663	0.492	0.399	0.408	0.425	0.454	0.471
	(0.485)	(0.541)	(0.536)	(0.515)	(0.484)	(0.462)	(0.267)	(0.306)	(0.297)	(0.278)	(0.264)	(0.260)	(0.257)	(0.279)	(0.276)	(0.264)	(0.257)	(0.255)
Desert	0.958	0.980	0.981	0.975	0.950	0.927	0.955	0.931	0.923	0.937	0.955	0.960	1.055	1.027	1.018	1.032	1.058	1.065
	(0.292)	(0.294)	(0.296)	(0.293)	(0.283)	(0.275)	(0.0896)	(0.0818)	(0.0792)	(0.0797)	(0.0842)	(0.0875)	(0.143)	(0.130)	(0.125)	(0.126)	(0.134)	(0.141)
Ex-Desert	0.997	0.971	0.966	0.972	0.998	1.017	1.285	1.366	1.329	1.294	1.264	1.257	1.556	1.679	1.655	1.607	1.537	1.508
	(0.743)	(0.757)	(0.735)	(0.708)	(0.695)	(0.695)	(0.543)	(0.767)	(0.703)	(0.621)	(0.557)	(0.535)	(0.864)	(1.245)	(1.184)	(1.065)	(0.933)	(0.874)
Irish	0.483**	0.465**	0.457**	0.440**	0.428**	0.434**	0.836	0.854	0.842	0.830+	0.828+	0.831+	0.702*	0.704*	0.695*	0.688**	0.693*	0.699*
	(0.0867)	(0.0840)	(0.0867)	(0.0931)	(0.0964)	(0.0951)	(0.0910)	(0.0936)	(0.0914)	(0.0886)	(0.0890)	(0.0901)	(0.0992)	(0.101)	(0.100)	(0.0997)	(0.0999)	(0.100)
Ex-Irish	3.252**	3.492**	3.511**	3.689**	3.877**	3.833**	1.539*	1.541*	1.553*	1.548*	1.528*	1.522*	2.050**	2.066**	2.117**	2.177**	2.170**	2.141**
	(0.926)	(1.126)	(1.078)	(1.038)	(1.045)	(1.026)	(0.302)	(0.324)	(0.313)	(0.304)	(0.299)	(0.298)	(0.498)	(0.537)	(0.541)	(0.551)	(0.544)	(0.533)
ΔLog Casualties	1.091	1.084	1.081	1.075	1.064	1.059	1.055+	1.077**	1.080**	1.078*	1.071*	1.065*	1.043	1.062	1.068+	1.068+	1.062	1.056
	(0.0657)	(0.0653)	(0.0648)	(0.0639)	(0.0635)	(0.0638)	(0.0318)	(0.0289)	(0.0303)	(0.0315)	(0.0315)	(0.0312)	(0.0431)	(0.0394)	(0.0406)	(0.0416)	(0.0418)	(0.0420)
ΔLog Casualties	1.185**	1.187**	1.184**	1.176**	1.164*	1.157*	1.067*	1.064*	1.070*	1.075**	1.073**	1.071*	1.089*	1.086*	1.097**	1.106**	1.104**	1.099**
30 Days Ago	(0.0675)	(0.0697)	(0.0702)	(0.0717)	(0.0735)	(0.0740)	(0.0305)	(0.0293)	(0.0291)	(0.0295)	(0.0295)	(0.0294)	(0.0403)	(0.0388)	(0.0384)	(0.0381)	(0.0378)	(0.0377)
Ex's - 7d		0.840						1.239*						1.428**				
		(0.177)						(0.116)						(0.166)				
Cm's - 7d		0.966						1.239**						1.201**				
		(0.152)						(0.0696)						(0.0544)				
Ex's - 14d			0.876						1.088						1.188+			
			(0.134)						(0.0857)						(0.107)			
Cm's - 14d			0.954						1.169**						1.150**			
			(0.102)						(0.0448)						(0.0378)			
Ex's - 30d				0.871						0.973						1.022		
				(0.112)						(0.0685)						(0.0755)		
Cm's - 30d				0.935						1.111**						1.104**		
				(0.0672)						(0.0296)						(0.0282)		
Ex's - 60d					0.830						0.929						0.962	
					(0.109)						(0.0597)						(0.0642)	
Cm's - 60d					0.917						1.067**						1.064**	
					(0.0499)						(0.0225)						(0.0219)	
Ex's - 90d						0.806						0.918						0.945
						(0.106)						(0.0573)						(0.0615)
Cm's - 90d						0.914+						1.047*						1.043*
						(0.0437)						(0.0199)						(0.0189)
N	536	536	536	536	536	536	1640	1640	1640	1640	1640	1640	1654	1654	1654	1654	1654	1654

Notes: All specifications use the "+14" commutation date imputation method and all specifications use exponential models to parameterize baseline hazard rates. All specifications include division and year fixed-effects. Log Casualties is calculated as log(1+Casualties). ΔLog Casualties is defined as the difference in Log Casualties 1 to 29 Days Ago vs. 30 to 59 Days Ago. ΔLog Casualties 30 Days Ago is defined as the difference in Log Casualties 30 to 59 Days Ago vs. 60 to 89 Days Ago. The regressors labeled ex's-Yd or cm's-Yd measure the cumulative effects of previous deterrence events in the unit. Y is the half-life of the effect. War Diaries analysis restricts to July 1916-June 1917, which is the time window for the surviving data. Standard errors clustered at the division level in parentheses; + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Appendix Table 12: Effects of Executions vs. Commutations on Elapsed Time Until Next Absence Differing by Individual or Environmental Characteristics

	War Diaries							Police Gazette							FGCM Trial Registries (Desertion Trials)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
Execution	0.109	0.240	0.261	-1.040	13.53+	-27.20		0.0463	-0.357	-0.448	-0.454	2.367	-4.031		-0.200	-0.321	-0.483	-2.128+	1.870*	4.112	
	(0.260)	(0.222)	(0.214)	(0.778)	(7.019)	(21.87)		(0.156)	(0.239)	(0.385)	(0.605)	(1.506)	(2.908)		(0.295)	(0.309)	(0.506)	(1.096)	(0.743)	(4.648)	
Ex-Casualties	-0.0629							-0.0493							-0.0204						
	(0.0672)							(0.0464)							(0.0638)						
Ex-Distance to Coast		-0.00492							0.00287							0.000282					
		(0.00312)							(0.00298)							(0.00424)					
Ex-Distance to Berlin			0.000654-							0.000414							0.000255				
			(0.000390							(0.000519							(0.000703				
Ex-Private				0.990							0.302							1.919+			
				(0.760)							(0.623)							(1.121)			
Ex-Age					-0.620*							-0.0913							-0.0506+		
					(0.279)							(0.0558)							(0.0260)		
Ex-Time						-0.00172							-0.000244							0.000281	
						(0.00139)							(0.000184							(0.000294	
Ex-Regular Army							0.441*							-0.0889							-0.202
							(0.192)							(0.188)							(0.181)
Ex-New Army							-0.583+							-0.275+							-0.578**
							(0.307)							(0.146)							(0.210)
Ex-Territorial Army							0.0560							-0.232+							-0.0432
							(0.350)							(0.127)							(0.222)
N	536	536	536	536	536	536	536	1640	1640	1640	1640	1640	1640	1640	1654	1654	1654	1654	1654	1654	1654

Notes: Outcome is elapsed time from death sentence resolution (execution or commutation) until next absence. All specifications use exponential models to parameterize the baseline hazard, assume the commutation occurred 14 days after the trial, and include division and year fixed-effects and ΔLog Casualties and ΔLog Casualties 30 Days Ago. All specifications include the level term for the respective heterogeneity being examined. Indicator for missing age data is also included along with the interaction with execution. Time is days from the start of World War 1. War Diaries analysis restricts to July 1916-June 1917, which is the time window for the surviving data. Standard errors clustered at the division level in parentheses; + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Appendix Table 13: Effects of Execution vs. Commutation on Death Sentencing of Next Desertion Trial

	% of Next Desertion Trial Resulting in a Death Sentence	
Panel A: +14 Imputation	**All Desertion Trials**	**Irish Desertion Trials**
All Death Sentences		
Irish Execution	13.8%	19.6%
Non-Irish Execution	18.3%	20.1%
Irish Commutation	22.5%	22.0%
Non-Irish Commutation	22.9%	18.7%
Desertion Death Sentences		
Irish Execution	14.6%	19.1%
Non-Irish Execution	19.4%	20.8%
Irish Commutation	22.2%	22.6%
Non-Irish Commutation	22.3%	17.9%
Panel B: NN Imputation		
All Death Sentences		
Irish Execution	12.1%	16.1%
Non-Irish Execution	17.4%	19.1%
Irish Commutation	21.6%	19.6%
Non-Irish Commutation	22.0%	17.0%
Desertion Death Sentences		
Irish Execution	12.5%	14.9%
Non-Irish Execution	18.3%	19.7%
Irish Commutation	21.8%	19.8%
Non-Irish Commutation	20.6%	15.4%
Panel C: C=T Imputation		
All Death Sentences		
Irish Execution	13.8%	14.3%
Non-Irish Execution	23.3%	18.0%
Irish Commutation	19.5%	21.2%
Non-Irish Commutation	19.9%	16.6%
Desertion Death Sentences		
Irish Execution	14.6%	12.8%
Non-Irish Execution	23.0%	18.4%
Irish Commutation	18.0%	22.6%
Non-Irish Commutation	19.5%	15.3%

Notes: In panels sub-titled "+14", the announcement of the commutation is assumed to occur 14 days after trial. In panels subtitled "NN" the nearest-neighbor method is used, which means the imputed announcement of the commutation is same as the most nearby execution announcement, while in panels labeled "C=T", the trial date is used as the announcement date of the execution and commutation.

Appendix Table 14: Effects of Executions vs. Commutations on Elapsed Time Until Next Absence Differing by whether Case was a Desertion Trial and whether Soldier was Irish

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Pooled Data	Exp/+14	Wb/+14	Cox/+14	Exp/NN	Wb/NN	Cox/NN	Exp/C=T	Wb/C=T	Cox/C=T
Execution	-0.365	-0.314	-0.243	0.00152	0.00389	0.0187	0.147	0.124	0.0877
	(0.316)	(0.274)	(0.224)	(0.267)	(0.232)	(0.186)	(0.162)	(0.153)	(0.133)
Desert	-0.141	-0.122	-0.0970	-0.0858	-0.0784	-0.0609	0.0322	0.0315	0.0386
	(0.108)	(0.0940)	(0.0804)	(0.101)	(0.0890)	(0.0767)	(0.0944)	(0.0887)	(0.0792)
Ex-Desert	0.243	0.197	0.119	-0.0475	-0.0520	-0.0863	-0.309	-0.279	-0.250
	(0.351)	(0.303)	(0.250)	(0.297)	(0.258)	(0.210)	(0.192)	(0.182)	(0.158)
Irish	-0.0554	-0.0510	-0.0559	-0.0759	-0.0706	-0.0698	0.143+	0.132+	0.0939
	(0.0964)	(0.0812)	(0.0616)	(0.0783)	(0.0675)	(0.0500)	(0.0764)	(0.0699)	(0.0615)
Ex-Irish	0.344+	0.300+	0.262+	0.347+	0.316+	0.292*	0.0314	0.0331	0.0558
	(0.206)	(0.179)	(0.140)	(0.197)	(0.173)	(0.137)	(0.174)	(0.164)	(0.145)
N	2228	2228	2228	2228	2228	2228	2228	2228	2228

Notes: Outcome is elapsed time from death sentence resolution (execution or commutation) until next absence. "Exp", "Wb" and "Cox" use the exponential, Weibull and Cox models respectively to parameterize the baseline hazard. In columns sub-titled "+14", the announcement of the commutation is assumed to occur 14 days after trial. In columns subtitled "NN" the nearest-neighbor method is used, which means the imputed announcement of the commutation is same as the most nearby execution announcement, while in columns labeled "C=T", the trial date is used as the announcement date of the execution and commutation. All specifications include division and year fixed-effects and ΔLog Casualties and ΔLog Casualties 30 Days Ago. Death sentences that precede another death sentence instead of an absence and death sentences that precede the end of the war are treated as censored events. Standard errors clustered at the division level in parentheses; + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Appendix Table 15: Are Observable Characteristics Correlated with Execution Decisions? (All Irish)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Private	-0.0989									0.0100
	(0.0742)									(0.0576)
Age		-0.00746								0.00201
		(0.00631)								(0.00726)
New Army							0.0585			
							(0.0535)			
Territorial Army							0.0252			
							(0.0538)			
Desert								0.247		0.116
								(0.165)		(0.114)
Coward								0.103		0.0158
								(0.174)		(0.119)
Disobedience								0.0226		-0.0116
								(0.195)		(0.133)
Murder								1.096**		0.561**
								(0.235)		(0.163)
Mutiny								0.131		0.0181
								(0.238)		(0.164)
Quit								0.125		0.00325
								(0.204)		(0.141)
Sleep								0.0551		0.0602
								(0.171)		(0.118)
Striking								0.229		0.178
								(0.211)		(0.144)
Rape								0.0123		0.0275
								(0.216)		(0.149)
ΔLog Casualties									0.0332*	0.0136
									(0.0141)	(0.00950)
ΔLog Casualties									0.0121	0.00114
30 Days Ago									(0.0133)	(0.00898)
Distance to Coast										-0.130
										(0.501)
Distance to Berlin										0.848
										(0.874)
Year Fixed Effects	N	N	Y	N	N	N	N	Y	Y	Y
Month Fixed Effects	N	N	N	Y	N	N	N	N	N	N
Day Fixed Effects	N	N	N	N	Y	N	N	N	N	N
Division Fixed Effects	N	N	N	N	N	Y	N	Y	Y	Y
Joint Test of Fixed Effects			0.399	0.731	0.0428	0.624	0.462			
Joint Test of Casualties									0.0638	
Joint Test of Distance										0.221
Constant	0.227**	1.083**	0.133	0.161**	0.174**	0.333+	0.0962*	0.302	0.383+	0.217
	(0.0724)	(0.167)	(0.0878)	(0.0613)	(0.0497)	(0.197)	(0.0472)	(0.267)	(0.230)	(0.684)
N	466	466	466	466	466	466	406	466	466	466
R-sq	0.004	0.531	0.009	0.017	0.028	0.130	0.004	0.219	0.148	0.650

Notes: All regressions use ordinary least squares on death sentences occurring in France & Flanders before the end of World War I. Death sentences recorded without Divisions or from the Labour Corps were removed. Log Casualties is calculated as log(1+Casualties). ΔLog Casualties is defined as the difference in Log Casualties 1 to 29 Days Ago vs. 30 to 59 Days Ago. ΔLog Casualties 30 Days Ago is defined as the difference in Log Casualties 30 to 59 Days Ago vs. 60 to 89 Days Ago. Distances are calculated based on the soldier's unit's participation in battles and are interpolated between battles. Distances are set to missing before the first battle and after the last battle. Territorial/New/Regular Army status is not assigned for Indian, Australian, Canadian, or New Zealand Divisions. Regressions including age also dummy out age when it is missing (i.e., assign a constant and include an indicator for age being missing). Standard errors in parentheses; + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$. Results are similar with Logit or Probit.

Appendix Table 16: Are Observable Characteristics Correlated with Execution Decisions? (All Irish)

Panel A:	Joint Test of Significance
Brigade Unit	0.426
Corp Unit	0.628
Army Unit	0.143
Brigade Commanding Officer	0.542
Division Commanding Officer	0.897
Division 1st General Staff Officer	0.843
Corp Commanding Officer	0.654
Corp 1st General Staff Officer	0.690
Army Commanding Officer	0.784
Army 1st General Staff Officer	0.366
GHQ Commanding Officer	0.194
GHQ 1st General Staff Officer	0.209
Irish Soldier x Irish Officer FE	0.112
Military Indiscipline 30-59 & 60-89 days ago	0.990
Death Sentences 30-59 & 60-89 days ago	0.0409
Execution Rate 30-59 & 60-89 days ago	0.132
Panel B:	
Aggregation level	Correlation with Lag Decision
Division	-0.110+
	(0.0636)
Brigade	-0.172+
	(0.0930)
Corp	0.0257
	(0.0601)
Army	0.0168
	(0.0555)
Army Type	-0.0985+
	(0.0547)
All	0.0445
	(0.0577)

Notes: Data is restricted to Irish death sentences occurring in France & Flanders before the end of World War I. Death sentences recorded without Divisions or from the Labour Corps were removed. In Panel A, each row reports a separate ordinary least squares regression and tests of joint significance of the fixed effects or measures of the recent battle environment. Military indiscipline and death sentences are calculated as log(1+number). Military indiscipline is the average of absentees and trials measured from the War Diaries, Police Gazettes, and FGCM trial registries. Lag execution rates is a set of controls comprising the numbers of executions and commutations within each time window. Units or officers that appeared with less than 10 frequency were categorized in a separate "other" category. All regression models include year, division, and Irish fixed effects. In Panel B, each row reports a separate ordinary least squares stacked autocorrelation regression. The strings of events within each unit were stacked and the first event within each unit was excluded as a dependent variable. If more than one event occurred on a day within a unit, the average outcome was calculated for that day. All regression models include year fixed effects and the leave-one-out mean execution rate of the unit. Standard errors in parentheses; + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$. Results are similar with Logit or Probit.