Mend it, don't end it: optimal mortality in affairs of honor*

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Abstract

Duels, also known as affairs of honor, were used to honorably settle disputes from ancient Rome until modern times, stopping in the United States around the time of the Civil War. Although barbaric by modern standards, dueling's widespread use and persistence suggest it must have yielded some social benefits. We examine the welfare implications of dueling by modeling a three stage game where two agents attempt to win a political contest. Agents may increase their probability of winning either by moderating their position or libeling their opponent. Either agent may reduce the effects of libel, however, by challenging his opponent to a duel and thus risking death. We find four major results: 1)

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allowing dueling deters agents from libeling their opponent, 2) when dueling deters libel, agents substitute toward moderation, 3) the benefits of less libel and more moderation are maximized for an intermediate mortality rate from dueling, and 4) if policy can affect the mortality rate, then it is always possible to choose an equilibrium where no dueling occurs, but the threat of dueling reduces libel and promotes moderation. Outlawing dueling is thus never optimal.

JEL Classification: C72, K40, N41.

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1 Introduction

> Years later, reflecting on the Southern "Code" of dueling, [US senator from Maryland] Charles Gibson maintained that as wicked as the code was, the vulgar public behavior following the demise of the practice was worse still. "The code preserved a dignity, justice and decorum that have since been lost," he argued, "to the great detriment of the professions, the public and the government. The present generation will think me barbarous but I believe that some lives lost in protecting the tone of the bar and the press, on which the Republic itself so largely depends, are well spent."
>
> —*Team of Rivals*, Doris Kearns Goodwin, pg. 65

> "...you do further solemnly swear that [you] have not fought a duel with deadly weapons within this State nor out of it, nor have you sent or accepted a challenge to fight a duel with deadly weapons, nor have you acted as a second in carrying a challenge, nor aided or assisted any person thus offending, so help you God."
>
> —Kentucky oath of office, as of January 15, 2010

Dueling, the elaborate and occasionally deadly ritual of settling disputes honorably, presents two puzzles to the modern eye. One, why was something so barbarous accorded such stature that senators, congressmen, future presidents, and sitting vice-presidents viewed it as an acceptable means of conflict resolution? Two, why did such an august institution use such inefficient and inferior weapons as smooth-bore, short-barreled, muzzle-loaded, flintlock handguns?

This paper offers the following arguments: one, the available evidence suggests that dueling was suprisingly common in the antebellum South. Two, while there were some deaths from dueling, this number is small relative to the number of total duels. Three, the threat of dueling had a deterrent effect on provocative behavior, and thus the number of deaths is even smaller relative to the population of potential duelers. Four, increasing the cost of a duel (for example

by outlawing it) leads to more political extremism. Five, given the beneficial deterrent effects of dueling, the optimal mortality rate is neither 0 nor 1. Six, if policy can affect the cost of dueling, then it is always possible to construct an equilibrium with no dueling but with less bad behavior than were dueling outlawed. It is thus possible that total welfare decreased when dueling fell out of public favor and use shortly after the Civil War.[1]

We begin with an overview of dueling as an institution. We then present descriptive statistics on the prevalence and deadliness of duels in the United States. Finally, we develop a model of competition between politicians of different viewpoints. Each politician wants to win some prize (e.g. an election), and has three tools available to potentially make winning more likely: he can moderate his position to put himself more in line with the median opinion, he can libel his opponent, or he can challenge his opponent to a duel. Politicians can reduce the effectiveness of their opponent's libel by challenging him to a duel. Because libel and moderation are substitutes, if the price of libel increases (as when the threat of a duel is higher), then moderation increases. While we are principally interested in dueling between politicians, our model can be adapted to study feuding between any two parties.

The literature on dueling is sparse. We know of two relevant papers on dueling. The first regards deterrence of the activity itself as Pareto improving and discusses legal solutions such as making dueling illegal, or increasing its social costs by making dueling dishonorable (Posner 1997). We know of only one paper, in an academic legal journal, which explores the possibility that dueling could be an efficient social solution to political and personal disputes (Schwartz, et al. 1984). This paper proposes dueling as an alternate civil legal system, but does not formally model the problem.

1.1 Overview of dueling

While the July 11, 1804 duel between Alexander Hamilton and Aaron Burr — which ended Hamilton's life and Vice-President Burr's career — is widely known, duels also claimed the

[1] As Schwartz et al. (1984) point out, the Southern elite were both those responsible for passing a series of tough anti-dueling laws through state legislatures in the antebellum South and those most enthusiastically participating in duels. One reasonable interpretation of this apparent inconsistency is that "the additional cost represented by the possibility of prosecution somehow added to the efficacy of the convention."

lives of three US senators (one sitting),[2] one signer of the Declaration of Independence,[3] one standing congressman,[4] and naval war hero Stephen Decatur.[5] Henry Clay[6] and Andrew Jackson[7] both participated in multiple duels. Abraham Lincoln narrowly avoided a duel by the maneuvering of his seconds, but the feud was serious enough that both parties did arrive at the agreed-upon location.[8]

It is impossible to track down precise estimates for the number of duels that took place in the United States. Contemporary newspapers "studiously refrained from mentioning" duels, regarding them as "strictly private affairs" (Stevens, pg. 15). Dueling was not uncommon. Though anathema in New England from the time of the founding (Stevens, pg. 31), and in the rest of the North after the death of Alexander Hamilton in 1804 (Eaton, pg. 110), the South felt no such restraint until after the Civil War. We know of 54 senators, former senators, and future senators, mostly from the South, who were involved in duels.[9] Even these 54 senators,

[2]Armistead T. Mason of Virginia was killed by his brother-in-law on 2/6/1819. George A. Waggaman of Louisiana was killed on 3/31/1843. David C. Broderick of California was shot on 9/13/1859 by David S. Terry, a chief justice of the California supreme court, who apparently resigned "to free himself from possible criticism" which might arise upon his shooting Sen. Broderick.

[3]Button Gwinnett, died 5/16/1777 at the hands of Lachlan Macintosh, a brigadier general in the Continental Army.

[4]Congressman Jonathan Cilley of Maine was killed by standing Congressman William Graves of Kentucky on 2/24/1838. Two other active congressmen served as the seconds (Stevens, pp. 219-227).

[5]Decatur was shot by a subordinate officer he had once court-martialed for 'unpreparedness' on 3/22/1820 (Seitz, 1966).

[6]Clay dueled former Sen. Humphrey Marshall, of Kentucky, on 1/19/1809. Both men were shot, but survived. Clay also dueled Sen. James Randolph on 4/8/1826, but managed only to shoot a hole in his coat.

[7]When Jackson announced his candidacy for the presidency, a political opponent published a pamphlet entitled "The Indiscretions of Andrew Jackson" which claimed Jackson was involved in 14 duels between the ages of 13 and 60 (Seitz, pg. 123). Only one is known to have resulted in a fatality; Jackson killed Charles Dickinson on 5/30/1806. Dickinson had himself killed 26 people in Duels (ibid.).

[8]Illinois state auditor James Shields had challenged Lincoln to a duel. Lincoln, as was his right as the challenged, selected heavy broadswords wielded while standing on a narrow plank as his preferred weapon. The duel was to take place on 9/22/1842. The two became friends and President Lincoln later appointed Shields a brigadier general in the Union army (Seitz, 1966).

[9]Henry Clay, Humphrey Marshall, David C. Broderick, Armistead T. Mason, Andrew Jackson, George A. Waggaman, James Shields, John Randolph, William H. Crawford, John Rowan, George M. Bibb, Thomas H. Benson, James D. Westcott, David Barton, James Gunn, James Jackson, Josiah Johnson, Thomas Clingman, John Fremont, Sam Houston, John Crittenden, Pierce Butler, Thomas Metcalfe, John Adair, Benjamin Gratz Brown, Henry Geyer, Henry Foote, Louis Wigfall, Alexander Buckner, Lewis Linn, Garrett Davis, Jonathan Dayton, George McDuffie, William Gwin, John Breckenridge, James Farley, George Wallace Jones, Harrison Riddleberger, James Hammond, Dewitt Clinton, Edward Lloyd, Robert Wright, Thomas Rusk, George Campbell, Jefferson Davis, William R. King, Gabriel Moore, Clement C. Clay, William C. C. Claiborne, Jeremiah Clemens, Ambrose Sevier, Solon Borland, Aaron Burr, and Judah Benjamin. Senators Bibb, Johnson, Crittenden, Adair, and Davis acted as seconds in duels, but may not have ever participated as principals. Senator Linn participated in a friend's duel as a surgeon. Senators Metcalfe, Davis, Dayton, Hammond, Rusk, King, and Benjamin issued calls to the field of honor, but were declined or otherwise unable to come to acceptable terms. Sen. Barton is not known to have been personally involved in a duel, but his brother Joshua was killed in one defending charges the senator had made in a newspaper against a rival. The other 41 acted as principals

surely only a fraction of all those who were involved in a duel at some point, comprise 20-25% of all senators from states where dueling was acceptable. Given that affairs of honor were an unremarkable occurrence in the antebellum South, the true number is surely considerably larger.

Dueling was commonplace in both the army and the navy; estimates for the army are elusive, but one source suggests that $\frac{2}{3}$ as many naval officers died on the field of honor as died from all naval conflicts between 1798 and the start of the Civil War (Stevens, 1940, pg. 73). Common though it was, there has not been one single court martial for dueling in the history of either service.[10]

Dueling was the preferred method of settling personal disputes honorably between Southern gentlemen. Indeed, duelers were given near-complete legal immunity.[11] We can find only a handful of duelers who were arrested, and their cases were generally dropped, often even without an indictment.[12] Though a series of anti-dueling measures were passed in the South in the early 19th century, including Kentucky amending its constitution to require the oath of office quoted above, these laws were dead letters, and there is almost no evidence of anyone being prosecuted under them (Stevens, 1940, pg. 13).[13] Even the principals who actually killed their antagonists were rarely bothered by the law — defending ones honor was considered by prosecutors, judges, and juries to be an acceptable cause for murder.[14]

Indeed, the court of public opinion not only protected dueling as sacrosanct, but contributed to its efficiency by punishing those who conducted themselves dishonorably on the field. For example, Aaron Burr was widely accused of murdering Alexander Hamilton in cold blood (most likely apocryphally), and his political relevance ended with the duel (Ellis, 2000).

on the field of honor. We do not count William Yancey, who was a confederate senator from Alabama.

[10]Though of course many court martials themselves led to duels, most famously when Stephen Decatur was killed in 1820 over a disagreement stemming from his court martial of a subordinate officer for 'unpreparedness'. The charge was almost certainly justified (Stevens, 1940, pg. 189).

[11]There is only one record of an execution resulting from a duel, in Illinois, and even this was more for dishonorable conduct than murder. The duel's seconds intended to stage a mock duel to test the challenged man's courage, so they gave the principals unloaded weapons. The man in question learned of this dastardly plot and loaded his weapon with his own bullet, allowing him to slay his adversary. For this he was executed (Stevens, 1940, pg. 93).

[12]See esp. John Rowan's experience in Kentucky; after killing Dr. Chambers, Rowan was arrested, but despite there being no disagreement as to the facts of the case, the judge declared there was "no evidence sufficient to hold the defendant to the grand jury" and released Rowan (Coleman, 1953, pg. 11).

[13]Schwartz et al. (1984), writing in a legal journal, find records of only 19 antebellum appellate cases pertaining to anti-dueling laws in 10 Southern states.

[14]Indeed, when Congressman William Yancey dueled Congressman Thomas Clingman, the Alabama state legislature passed a special bill immunizing Yancey from any prosecution (Eaton, pg. 397, 1975).

John Rowan, upon killing an adversary, had to flee an angry mob "bent on doing violence" to him by dressing "one of his Negro slaves in his hat and cloak, and starting him on his riding horse across the fields, while he hid himself in some neighboring cliffs" (Coleman pg. 9, 1953). Andrew Jackson, upon murdering Charles Dickinson after re-cocking his misfired pistol, faced "many who felt that the General had grossly violated the unwritten code of dueling; and the honor for which he risked his life was seriously tarnished" (Coleman pg. 29, 1953).[15] Certainly such harsh reactions were atypical, reserved only for those perceived as violating the *Code Duello*.

One possible reason for dueling's general acceptance may be its relatively low mortality rate. The *Code Duello* prescribed the use of flintlock, short-barreled, smooth bore pistols (as opposed to percussion cap, long-barreled, and rifled), at great cost to accuracy. The flintlock weapons misfired often, wasting many shots in duels.[16] Precise estimates for the probability of injury or death in an affair of honor are hard to come by. One 1836 writer estimated that 1 in 6 duelers were injured, and 1 in 14 killed (Schwartz, et al., 1984). Another estimate puts the conditional probability of a naval officer dying on the field of honor at 20% (Stevens, 1940, pg. 71). Our own numbers on dueling senators are closer to the first figure — that is, we know of at least 41 senators who received fire on the field of honor, 3 of whom died, though it is quite likely that more than 41 senators were fired at, while it is unlikely that we are unaware of a senator who has fallen in an interview.

If the point of dueling were merely to legitimize murder, this could have been done much more efficiently, most notably with more effective weapons. Percussion cap pistols were developed around 1830, while rifling was invented hundreds of years earlier. Why, then, did Southerners persist with such inefficient weapons? The theoretical model to come suggests that the optimal mortality rate was likely to be somewhere in $(0, 1)$. Basically, most of the benefits of allowing dueling may have been achieved with a relatively low mortality rate, obviating the need to pay a higher 'cost' in blood.

In practice, duels between gentlemen were often little more than a convenient mechanism to settle a public dispute in a way that allowed both men to save face. Hamilton, for example,

[15] It should be noted that both Rowan and Jackson were able to rehabilitate their reputations so that each could be elected to both houses of Congress and Jackson to the presidency.

[16] Often enough that the term 'flash in the pan', referring to the gunpowder in the priming pan igniting, yet failing to ignite the powder in the barrel itself, permanently entered the lexicon.

intended to withhold fire in his duel with Burr, and there is considerable evidence that Burr's fatal wounding of Hamilton was an accident (Ellis, 2000). The most important result of many duels was that the men involved faced each other, risked death, and in doing so presumably saved their honor from any perceived libel. The *Code Duello* prescribed that challenged parties choose smooth-bore, short-barrel, flintlock pistols as the weapons, ensuring both a high rate of misfires[17] and wildly inaccurate bullets, making it unlikely that even a skilled handler could shoot a target at the customary ten to twenty paces (Ellis, 2000).

The first stage to a duel was an insult, real or perceived, often in the press.[18] The slighted party would then write to the originator of the insult demanding a full retraction. If the latter was unwilling, the aggrieved party would then choose between letting the matter drop or challenging his tormentor to a duel. Once challenged, refusing the duel was out of the question, as it would forever brand the refuser a coward.[19] Extensive negotiations between surrogates would then follow, in which the time and date of the interview would be chosen along with the weapons and rules. [20] These 'seconds' were also encouraged to seek a peaceful end to hostilities, which usually demanded finding a way for honor to be satisfied without either man loosing much face. On the day of the duel, the parties would arrive separately, usually accompanied by a doctor and between one and three seconds who would enforce the rules and ensure that both men's honor was preserved. The seconds and the doctor would array themselves so as to verify the duel took place honorably, but often so as to be unable to testify in court that they witnessed one dueler killing another (Ellis, 2000).[21] Rules varied from duel to duel, but typically it was agreed each combatant would be allowed to fire one shot at the other from 30 feet, at which point the seconds would meet to decide if an additional round was necessary (Stevens, 1940, pg. 133).

[17] A misfire would exhaust the combatant's turn.

[18] Burr, for example, was offended by reading a newspaper article in which the reporter alluded indirectly to Hamilton's "despicable opinion" of Burr (Ellis, 2000). John Rowan and James Chambers drunkenly began quarreling over "which understood some of the dead languages the best." The argument resulted in future Senator Rowan killing Chambers in a duel to defend his honor (Coleman, 1953).

[19] Declining a challenge gave the aggrieved party license to 'post' his antagonist, publicly declaring him a coward. For example, when John Randolph declined James Wilkinson's request for a meeting, Wilkinson posted flyers all over Washington saying 'Hector unmasked. In justice to my character I denounce John Randolph, a member of Congress, as a prevaricating, base, caluniating scoundrel, poltroon, and coward' (Stevens, 1940, pg. 43).

[20] The challenged party was responsible for choosing weapons, according to the *Code Duello*.

[21] It seems as dueling became more entrenched in the South, the need for secrecy vanished almost completely. As many as 100 people witnessed and wagered on some duels (Stevens, 1940, pg. 79).

We now turn to a model that addresses two important questions; one, what benefit did Southerners derive from this barbaric practice that allowed it to persist for so long? Two, why were more efficient weapons not used?

2 Model

Two politicians compete for a prize, which may be a political election, a more general political dispute, or simply the esteem of society. Each politician makes three choices that affect his probability of winning. One, he publicly commits to a political position. Two, he chooses the degree to which he libels his opponent.[22] Three, upon observing how much he has been libeled, he chooses whether or not to challenge his opponent to a duel.

A political position $s_i \in [0,1]$ closer to the median opinion (normalized to be $\frac{1}{2}$) increases a politician's probability of winning. However, committing to position s_i costs $\phi(|s_i - \theta_i|)$, where θ_i is the politician's true belief. ϕ is the disutility a politician gets from having to compromise his views. Assume ϕ is an increasing C^1 function. θ_i is known only to politician i, and is exogenously determined. Without loss of generality, $|\theta_1 - \frac{1}{2}| < |\theta_2 - \frac{1}{2}|$, meaning politician 1 is more moderate than politician 2.

Creating libel l costs a politician $c(l)$, where $c'(l) > 0$, $c'(0) = 0$, and $c''(l) > 0$. We consider severally two channels through which libel affects the contest's outcome. One, libel can "redefine" one's opponent, convincing the public that he is more extreme than his stated position. Two, libel can increase the entropy of the election, pushing both politician's win probabilities towards $\frac{1}{2}$, regardless of their publicly-stated positions. In the former case, both politicians will libel if the cost is low enough, while in the latter case only the more extreme politician has an incentive to libel.

In either case, player 1's probability of winning the contest is $\gamma(s_1, s_2, l_1, l_2)$. We assume γ is a C^1 function and that $\alpha \frac{\partial \gamma}{\partial L}(s_1, s_2, \alpha L) \leq \frac{\partial \gamma}{\partial L}(s_1, s_2, L)$ for all $\alpha \in (0,1)$.[23] Win or lose, each politician receives utility A from being alive. Should a politician win the prize, he receives additional utility B.

[22] We take "libel" to include slander or any other personal attacks on a politician. We do not intend the narrow legal definition.

[23] This assumption requires that γ not be "too concave" in L, and is needed to rule out the possibility that under extreme parameter values the marginal benefit of libel can increase after a challenge has been issued. For examples of such γ functions, see sections 3.1 and **??**.

Participation in an affair of honor potentially benefits a politician in that it reduces the effectiveness of all libel exchanged between the two contestants. Specifically, assume politician i's libel l_i is reduced to αl_i for $i = 1, 2$ and some $\alpha \in [0, 1)$. If a duel takes place, each politician dies with probability b and lives with probability $(1 - b)$.[24]

We interpret b as a policy parameter, influenced by both legislation and societal mores. The mortality rate b, was influenced by generally accepted principles affecting the mortality of dueling. For instance, under the Southern *Code Duello*, modern weapons were discouraged and duelers were encouraged to meet on the field of honor at no less a distance than 10 paces.[25]

The game proceeds in three stages. In stage 1, the politicians simultaneously announce their stances s_i. In stage 2, each politician observes his opponent's position, and decides on the level of libel l in which to invest. In stage 3, each politician observes (l_1, l_2) and chooses whether or not to challenge his opponent to a duel.[26] After stage three, the contest is resolved, and each politician receives payoff $A+B$, A, or 0, if he won, lost, or died in a duel, respectively.

3 Solving the model

3.1 Case I: libel redefines opponent's position

Throughout this section, we assume that player 1's probability of winning is

$$\gamma(s_1, s_2, l_1, l_2) = \frac{1}{2} + s_1 - \pi(s_1, l_2) - s_2 + \pi(s_2, l_1) \tag{1}$$

where $\pi(s_i, l_j)$ defines the effectiveness of j's libel against i. Assume π is differentiable in both arguments, $\pi(s_i, 0) = 0$, $\frac{\partial}{\partial l}\pi(s_i, l) > 0$, and $\lim_{l\to\infty} \pi(s_i, l) = s_i$.[27]

We begin in stage 3, where (s_1, s_2, l_1, l_2) are taken as given. Politician 1's utility from

[24] Note that the deliberate choice of inferior weapons helped eliminate any advantage from skill one opponent may have had over the other, equalizing the probabilities of death for each combatant.

[25] Were a challenged party to suggest a meeting at a closer distance, or that relatively more deadly weapons be used, the challenger had the right to suggest an arrangement even more likely to end in the death of at least one party. This rarely happened [cite].

[26] We assume that once the challenge is issued from either side, it must be accepted. While this is a simplification, it is consistent with the realities of societies in which duelings were frequent. A gentleman could not refuse a challenge without forfeiting all reputation and credibility, which would be equivalent to withdrawing from the political race or conceding the contentious matter at hand.

[27] One sensible function satisfying these conditions is $\pi(s_i, l) = s_i \frac{l}{1+l}$.

issuing a challenge and not, respectively, are

$$U_1^{ND} = A + B\left(\frac{1}{2} + s_1 - \pi(s_1, l_2) - s_2 + \pi(s_2, l_1)\right)$$
$$U_1^{D} = A(1-b) + B(1-b)\left(\frac{1}{2} + s_1 - \pi(s_1, \alpha l_2) - s_2 + \pi(s_2, \alpha l_1)\right)$$

Therefore, for any l_1, there is some level of l_2 above which a duel is optimal, below which one is not. Call this level $l_2^*(l_1)$. $l_2^*(l_1)$ is defined by equality (2):

$$B(1-b)\left(\frac{1}{2} + s_1 - s_2 - \pi(s_1, \alpha l_2^*(l_1)) + \pi(s_2, \alpha l_1)\right)$$
$$- B\left(\frac{1}{2} + s_1 - s_2 - \pi(s_1, l_2^*(l_1)) + \pi(s_2, l_1)\right) = bA \tag{2}$$

Politician 2 faces an analogous problem in deciding whether or not to issue a call to the field of honor, though in equilibrium only the more moderate politician 1 will ever issue such a call. Finally, note from (2) that as l_2^* increases, the LHS of (2) increases. It is direct that $l_2^*(l_1)$ is an increasing function.

Moving back to stage 2, politician i takes l_j as given and decides how much to libel by playing either $l_i^*(l_j)$, l_i^{ND}, or l_i^D, where the latter two are defined by:

$$B\frac{\partial}{\partial l}\pi(s_j, l_i^{ND}) = c'(l_i^{ND}) \tag{3}$$
$$B(1-b)\alpha\frac{\partial}{\partial l}\pi(s_j, \alpha l_i^{D}) = c'(l_i^{D}) \tag{4}$$

Specifically, if $l_i^{ND} < l_i^*(l_j)$, l_i^{ND} is i's optimal libel level. If $l_i^{ND} \geq l_i^*(l_j)$, i decides between playing l_i^D, knowing that this will lead his opponent to call for a meeting, or playing $l_i^*(l_j)$, and libeling his opponent the maximal amount possible before it becomes worthwhile to issue a challenge. Specifically, 2 plays $l_2^*(l_1)$ if (5) holds, and l_2^D otherwise:

$$U_2^{ND}(l_1, l_2^*(l_1)) \geq U^D(l_1, l_2^D)$$
$$\iff \frac{2bA + Bb}{B(1-b)} \geq \pi(\alpha l_2^D) - \pi(\alpha l_2^*(l_1)) \tag{5}$$

with an analogous condition for player 1. (5) says that if the difference between the dueling level of libel and the corner solution level of libel are not too great, 2 prefers the corner

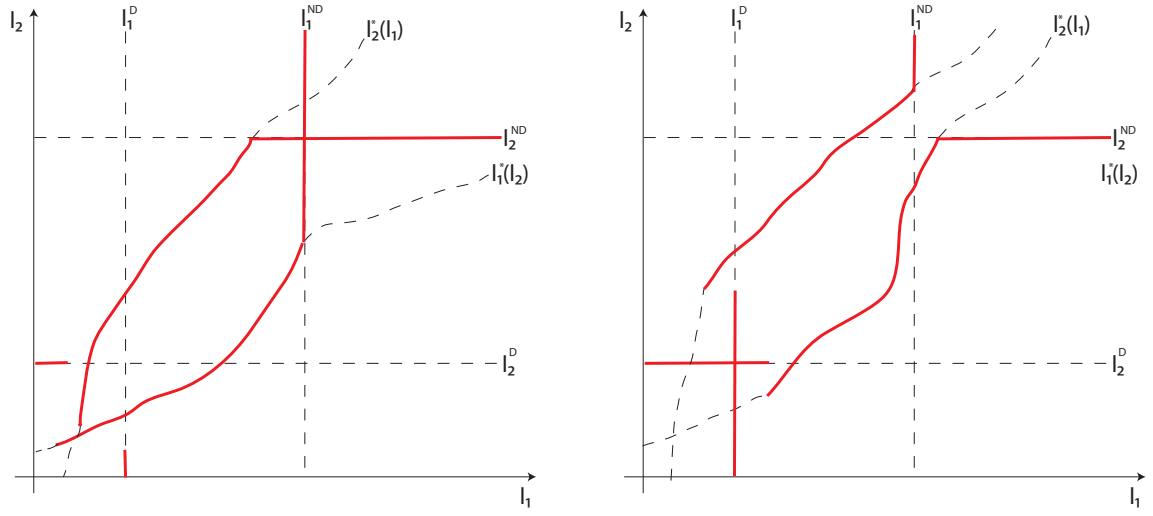
solution. Moreover, it is easy to see that for $b = 0$, (5) *will not* be satisfied so long as $l_2^* < l_2^{ND}$ (it is trivial that $l_2^D < l_2^{ND}$). It is direct to show that as b increases, the RHS of (5) increases. Moreover, as b increases, l_2^*, as defined by (2), increases, which decreases the LHS of (5). Finally, as b increases, l_2^D decreases, which further decreases the LHS of (5). The intuition is that as duels become more deadly, 2 is less likely to libel his opponent enough to prompt a duel. At the same time, 1 becomes more hesitant to challenge 2 to a duel as b increases.

If $l_i^*(l_j^{ND}) \geq l_i^{ND}$ for $i = 1, 2$, then the unique Nash equilibrium in stage 2 is (l_1^{ND}, l_2^{ND}). In this case, dueling has no deterrence effect. If, on the other hand, $l_i^*(l_j^{ND}) < l_i^{ND}$ for some i, then there is a Nash equilibrium at either (l_1^D, l_2^D) or at an intersection of $l_1^*(l_2)$ and $l_2^*(l_1)$ curves.[28] Figure 2 demonstrates. $l_i^*(l_j)$ is increasing in l_j, while l_i^D and l_i^{ND} are constant in l_j. For a given l_j, it is trivial that if $l_i^*(l_j) \geq l_i^{ND}$, l_i^{ND} is $i's$ optimal libel level. If $l_i^*(l_j) < l_i^{ND}$, then either $l_i^*(l_j)$ or l_i^D is optimal. The former is certainly optimal if $l_i^*(l_j) > l_i^D$, while, according to (5), the latter is optimal if l_i^D is "enough" above $l_i^*(l_j)$

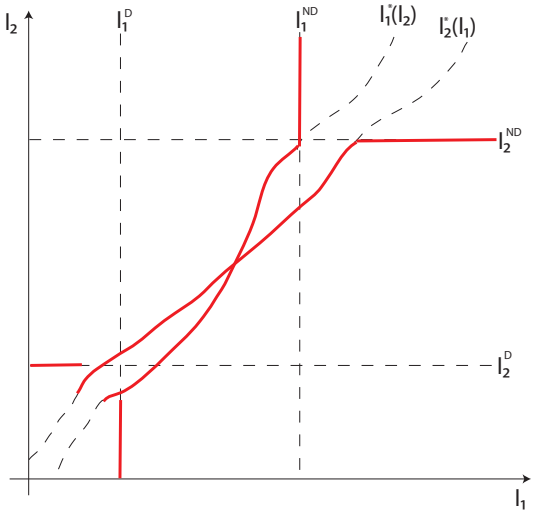
That a Nash equilibrium in libel levels exists is obvious; $l_2(0) > 0$ and $l_1(0) > 0$, and either $l_1^{ND}, l_2^{ND})$ is an equilibrium or $l_1(l_2)$ and $l_2(l_1)$ cross at some point. Both $l_1(l_2)$ and $l_2(l_1)$ are continuous at all but one spot (the point at which (5) is satisfied with equality). However, at this point, a politician is indifferent between libeling his opponent enough to prompt a meeting and merely libeling the maximum that will not result in a duel; he can mix between these two strategies to bridge the gap cause by the discontinuity in his libel best response curve here. It is possible that $l_1^*(l_2)$ and $l_2^*(l_1)$ cross more than once, leading to multiple deterrence equilibria.

We now turn to stage 1, where players choose levels of moderation s_1 and s_2. Consider the best response curve $s_1(s_2)$. Each politician considers two effects when considering where to set s_i. One, the more he is being libeled in period 2, all else equal, the less he moderates, as more libel means he gets to 'keep' less of his moderation. As there is the most libel in a no dueling equilibrium and the least in a dueling equilibrium, the direct effect of moderation will be largest in a no dueling equilibrium. Two, he recognizes that his moderation alters his rival's libel decision. For example, in a no dueling equilibrium, politician 1 moderating a little more causes l_2^{ND} to increase by a little bit. Proposition 1 states that, if α and b are low enough,

[28] It is also possible that one politician is constrained while his rival is unconstrained. Then, there will be an equilibrium at $l_1^{ND}, l_2^*(l_1^{ND})$.



(a) (b)



(c)

Figure 1: There are three possible types of equilibrium; unconstrained, dueling, and deterrence. An actual duel results only in the second case. In the first, dueling has no effect on equilibrium libel, while in the third, one or both politicians libel just enough to leave their opponent indifferent between a call to the field of honor and doing nothing; they would libel more were it not for the threat of a duel.

outlawing dueling unambiguously results in more extreme politicians. While proposition 1 gives sufficient conditions for dueling to increase moderation, it is likely these conditions can be relaxed considerably. Section **??** investigates this numerically.[29]

Proposition 1 *Outlawing dueling results in more extreme politicians, if α and b are low enough and $c(l)$ is quadratic.*

Proof. Consider the best response curve $s_i(s_j)$; for a given s_j, any s_i will result in either a dueling equilibrium, a deterrence equilibrium, or a no dueling equilibrium. In any type of equilibrium, to set s_i politician i considers the effect on period 2 libel of increasing his moderation as well as the explicit cost of moderation and the explicit increase in win probability of moderation.

First, from equation (2), an increase in s_i decreases $l_j^*(l_i)$ for all values of l_i, if α and b are low enough, and so in a deterrence equilibrium an increase in moderation leads to less libel at the margin. Second, we have that

$$\Rightarrow \frac{\partial}{\partial s_1} l_2^{ND}(s_1) = \frac{B\left(\frac{\partial^2}{\partial s_1 \partial l_2}\pi(s_1, l_2^{ND})\right)}{c''(l_2^{ND}) - \frac{\partial^2}{\partial l^2}\pi(s_1, l_2^{ND})} \tag{6}$$

$$\Rightarrow \frac{\partial}{\partial s_1} l_2^{D}(s_1) = \frac{B(1-b)\alpha\frac{\partial^2}{\partial s_1 \partial l_2}\pi(s_1, \alpha l_2^{D})}{c''(l_2^{D}) - \alpha\frac{\partial^2}{\partial l^2}\pi(s_1, \alpha l_2^{D})} \tag{7}$$

with (6) greater than (7) for low α and b and a quadratic cost function $c(l)$. Therefore, at the margin, second-period libel increases more in response to increased first-period moderation in a no dueling equilibrium than in a dueling equilibrium. Third, it is clear that the level of libel is highest in a no dueling equilibrium.

Politician i sets s_i so that the marginal benefit of moderation equals the marginal cost, for any s_j. It is clear from the above discussion that s_i will be lowest in a dueling equilibrium, and strictly higher in a no dueling or deterrence equilibrium. Should the field of honor be removed as an option, as when dueling is outlawed, it is then clear that the first-period equilibrium has (weakly) more extreme politicians. ■

Figures 2a and 2b summarize the intuition of proposition 1.

[29] Note: this section does not yet exist.

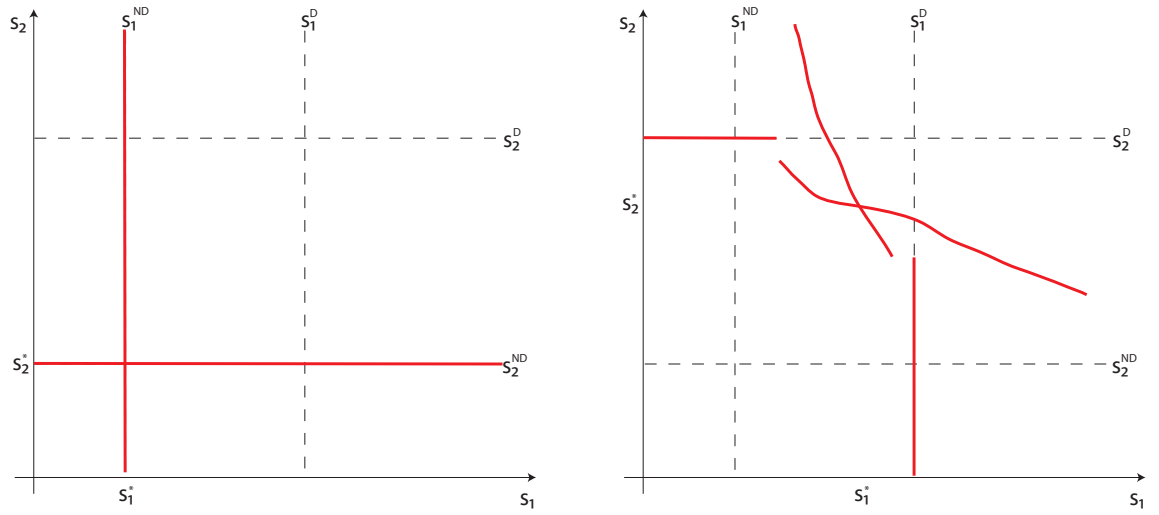


Figure 2: If a meeting on the field of honor is not an option, both politicians know they will be libeled at l_j^{ND} in period 2 and set s_i accordingly (subfigure 2a. If, however, the field of honor is available (subfigure 2b), then moderation weakly increases, as for at least some (s_1, s_2) pairs, a deterrence or dueling equilibrium will obtain in period 2, which induces more moderation in period 1.

Finally, proposition 2 states that there is less libel in any equilibrium when dueling is allowed.

Proposition 2 *If dueling is outlawed, libel (weakly) increases.*

Proof. Follows directly from preceding discussion. ■

3.2 Case II: libel increases the entropy of the contest

We now consider an alternate version of the model where libel, $L(l_1, l_2)$, introduces noise into the contest rather than redefining an opponent's position. In this case, the effect of libel is random. The public may be persuaded by it, increasing the libeler's chances of winning, or it may be disgusted by it, to the benefit of the libelee. Libeling thus increases the entropy of the election. Formally, if the probability of politician 1 winning is $\gamma(s_1, s_2, L)$, an increase in L decreases the quantity $|\gamma(s_1, s_2, L) - \frac{1}{2}|$. We further assume diminishing marginal effects of libel, $\frac{\partial^2 \gamma}{\partial L^2} < 0$, and that the marginal effect of libel increases with the difference between the two politicians' positions, $\frac{\partial^2 \gamma}{\partial L \partial(|s_1 - \frac{1}{2}| - |s_2 - \frac{1}{2}|)} < 0$.

We now investigate the properties of the model's subgame perfect Nash equilibria. We continue to assume that politician 1 is more moderate than politician 2, $|s_1 - \frac{1}{2}| < |s_2 - \frac{1}{2}|$.[30] Starting in stage 3, define the utility of politician 1 from dueling as $U^D(s_1, s_2, L)$ and from not dueling as $U^{ND}(s_1, s_2, L)$, where

$$U^D(s_1, s_2, L) = A(1-b) + B(1-b)\gamma(s_1, s_2, \alpha L) - c(l_1) - \phi(|s_1 - \theta_1|)$$
$$U^{ND}(s_1, s_2, L) = A + B\gamma(s_1, s_2, L) - c(l_1) - \phi(|s_1 - \theta_1|)$$

Assume that politician 1 breaks a tie in favor of not dueling. Then, politician 1 will challenge his opponent to a duel if $U^D(s_1, s_2, L) > U^{ND}(s_1, s_2, L)$, or if the following condition holds:

$$B[(1-b)\gamma(s_1, s_2, \alpha L) - \gamma(s_1, s_2, L)] > bA \tag{8}$$

If B, the gains from winning the prize are large, or if the mortality rate b is low, then politician 1 is more likely to issue a challenge. In addition, if the gains from a duel (moving from $\gamma(s_1, s_2, L)$ to $\gamma(s_1, s_2, \alpha L)$) are large, then politician 1 will be more enthusiastic about defending his honor. Because dueling reduces the benefits of libel, politician 2 will challenge politician 1 to a duel.

We now consider stage 2, the decision to libel. Increasing the entropy of the contest harms politician 1 and he therefore always chooses $l_1 = 0$. Equation (8) may hold for zero, one, or two values of L. Define L^* as the minimal value of l_2, if one exists, such that equation (8) holds with equality.[31] Define l^{ND} and l^D by:

$$-B\frac{\partial}{\partial l}\gamma(s_1, s_2, l^{ND}) = c'(l^{ND})$$
$$-\frac{\partial}{\partial l}\gamma(s_1, s_2, \alpha l^D)B(1-b) = c'(l^D)$$

Politician 2 then maximizes over the set $\{l^D, L^*, l^{ND}\}$, with libel level l^D resulting in a duel and l^{ND} or L^* resulting in no duel. If equation (8) does not hold for l^{ND}, then politician 2 chooses l^{ND} and no duel occurs. If equation (8) does hold for l^{ND}, however, politician 2 chooses either L^*, if it exists, or l^D. If he optimally chooses L^*, then the threat of being

[30] It can be shown that, under general conditions, $s_1 > s_2$ if and only if $|\theta_1 - \frac{1}{2}| < |\theta_2 - \frac{1}{2}|$.

[31] Under our distributional assumptions on γ, when equation (8) holds for two values of L, politician 2 will never choose the higher value.

challenged to a duel has deterred him from further libel; absent this possibility he would choose $l^D > L^*$. If politician 2 optimally chooses l^D over L^*, then both politicians take the field of honor.

In stage 1, both politicians simultaneously choose s_1 and s_2.

$$B[\frac{\partial}{\partial s_1}\gamma(s_1, s_2, L) + \frac{\partial}{\partial s_1}L(s_1, s_2)\frac{\partial}{\partial L}\gamma(s_1, s_2, L)] = \phi'(|s_1 - \theta_1|)$$
$$-B[\frac{\partial}{\partial s_2}\gamma(s_1, s_2, L) + \frac{\partial}{\partial s_2}L(s_1, s_2)(\frac{\partial}{\partial L}\gamma(s_1, s_2, L) - c'(L))] = \phi'(|s_2 - \theta_2|)$$

We now provide an illustrative example of our model.[32] We assume that $\theta_i \in [0, \frac{1}{2})$ and that $\bar{\theta} = \frac{1}{2}$. This implies that the contest depends on each politician's extremism, but not the direction of their extremism. We assume that both politicians possess the following utility function:

$$u_i(S_i, \theta_i, l_i) = A + B\gamma_i(s_i, s_j, L) - \kappa l_i^2 - \frac{1}{\lambda}(\frac{s_i - \theta_i}{\frac{1}{2} - s_i})^2 \tag{9}$$

A politician killed in a duel, however, obtains zero utility. This functional form assures that both agents will partially, but not completely, moderate their positions. We assume the following functional form for γ:

$$\gamma(s_1, s_2, l_1, l_2) = \frac{1}{2} + \frac{s_1 - s_2}{I(l_1 + l_2) + 1} \tag{10}$$

where I is an indicator that equals α if a duel occurs, and 1 otherwise. Note that (10) satisfies our general assumptions on γ.

We now numerically solve the model using the following baseline calibration: $b = 0.025$, $\delta = 0.5$, $\alpha = \beta = 100$, $\lambda = 0.1$, $\kappa = 0.1$, and $\alpha = 0.5$. We calculate equilibrium over a lattice where θ_1, and θ_2 vary between 0 and $\frac{1}{2}$. Figure 1 illustrate the three types of equilibria that occur over the lattice. When the difference in politicians' types is large, so is the marginal benefit of libel to politician 2. He therefore chooses a sufficiently large amount of libel to induce a dueling equilibrium. If the difference between types is small, however, then politician

[32] It is difficult to obtain analytical results because multiple equilibria may generally exist. If, however, s_1 and s_2 are chosen sequentially instead of simultaneously, and if $\gamma(s_1, s_2, L)$ and $c(L)$ are close enough to being linear, then the propositions from the previous section are also true for this version of the model.

2's optimal choice of libel does not result in a duel, and (8) is not binding. Intermediate differences in types result in a deterrence equilibrium. In this case, (8) is binding, but the reduced effectiveness of libel and the risk of death make it optimal for politician 2 to avoid a duel. He therefore selects L^*, the maximum amount of libel that does not induce a duel. The threat of libel therefore deters libel and makes him substitute toward moderation by increasing s_2.

We now compare the equilibrium properties of each region to an alternative regime where dueling is effectively outlawed. We assume that θ_1 and θ_2 are uniformly distributed between 0 and $\frac{1}{2}$. Table 1 reports the results.

When a deterrence equilibrium arises, society is unambiguously better off by allowing dueling. The deterrence of libel induces both politicians to substitute toward moderation. In addition to increasing moderation, however, less libel increases the probability that the more moderate politician wins the contest. When a dueling equilibrium arises, the effects on social welfare are ambiguous relative to a model without dueling. Because dueling reduces the effectiveness of libel, politician 2 selects less libel and there is more moderation. These benefits, however, are possibly offset by the occasional dueling death.

The size of these three regions depends on the model's parameters. We interpret policy as influencing b, the likelihood of dying in a duel, through explicit regulation or implicit codes of conduct. As b increases, the likelihood of a duel declines. Very large values of b are therefore isomorphic to a policy that effectively outlaws dueling.[33] Table 2 reports the results.

When b is very low, duels are very likely to occur. As b increases, the parameter spaces resulting in unconstrained or deterrence equilibria grow, libel is minimized, and dueling deaths are maximized. For large b, however, the more extreme politician is able to choose a high level of libel knowing that his opponent will not choose to risk death on the field of honor. Libel thus increases as dueling deaths decline. For some intermediate levels of b (including $b = 0.045$ in the simulations), deterrence equilibria exist, but dueling equilibria never occur. For such a b, there thus exists less libel and more moderation relative to a regime without the threat of dueling. A society that is unwilling to accept any positive probability of its leaders being shot dead in a duel is therefore unambiguously worse off by outlawing dueling.

[33] Setting $\alpha = 1$ is also isomorphic to outlawing dueling.

4 Conclusion

It is easy to argue that dueling was an undesirable and barbarous aspect of pre-Civil War Southern society. The costs were evident. Not only did duels frequently end in death, but those dying were usually prominent politicians, soldiers, and other respected figures in society. In addition, many of the disputes seem of minor importance. It all seems a terrible waste. However, this is only half of the story, as dueling had significant benefits for the South as well. We show that dueling may have been an efficient method of maintaining civility in society.

Dueling served to moderate personal and political attacks by introducing a potentially costly punishment. In modern society, conduct detrimental to society is prohibited by law, and the enforcement of the punishment if the law is broken is the purview of the government. In the antebellum South, a society which was reluctant to expand the powers of the government, genteel society policed its own. In this sense, dueling served as a substitute for the legal means of addressing grievances available today, when such institutions did not exist, or were simply too weak to be effective. As society evolved and the government became an effective enforcer of the law, the need for dueling declined.

We further show that the 'barbarous' aspect of dueling, that it could end in the death of the participants, was necessary for it to be effective. Duels had to be potentially deadly to the libeler for it to be an effective deterrent. It had to be dangerous to the libeled to ensure that it was not used quell normal, spirited criticism and discourse. Viewed in this light, the popularity and persistence of dueling as a means of allowing the society to police itself is unsurprising.

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5 Appendix

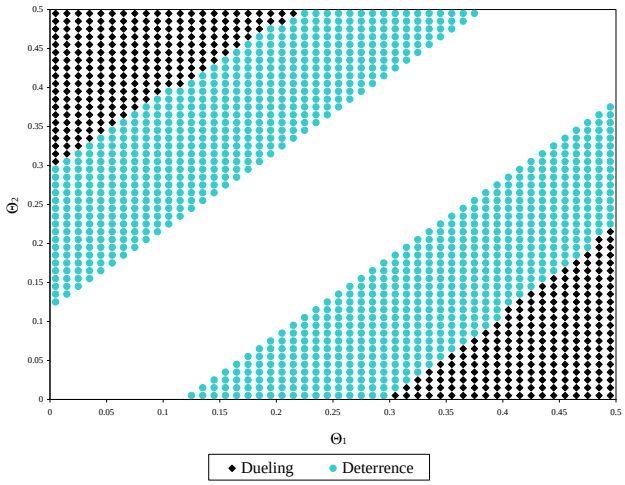

Figure 3: Equilibrium Types over θ_i and θ_j

Table 1: Effects of Banning Dueling by Equilibrium Type

	Unconstrained	**Deterrence**		**Dueling**		**All**	
	Both	Allowed	Banned	Allowed	Banned	Allowed	Banned
s_i (winner)	.268	.306	.286	.328	.306	.286	.278
Libel	.830	.507	1.61	2.06	1.97	.904	1.20
Dueling Deaths	.000	.000	.000	.050	.000	.007	.000
% of Space	58.8%	27.9%		13.3%		100.0%	

Table 2: Effects of Dueling Mortality on Social Welfare

b	**p(Uncon)**	**p(Deter)**	**p(Duel)**	s_i **(winner)**	**Libel**	**Dueling Deaths**
0.000	0.000	0.000	1.000	0.287	1.17	0.0000
0.005	0.177	0.101	0.721	0.287	1.14	0.0072
0.010	0.289	0.202	0.509	0.287	1.06	0.0101
0.015	0.392	0.261	0.347	0.287	0.98	0.0104
0.020	0.493	0.281	0.226	0.287	0.93	0.0090
0.025	0.588	0.279	0.133	0.286	0.90	0.0037
0.030	0.677	0.261	0.063	0.286	0.90	0.0038
0.035	0.757	0.221	0.021	0.285	0.93	0.0015
0.040	0.830	0.169	0.001	0.284	0.98	0.0001
0.045	0.892	0.108	0.000	0.282	1.06	0.0000
0.050	0.943	0.057	0.000	0.280	1.13	0.0000