American Economic Journal: Applied Economics 2021, 13(3): 102–133
https://doi.org/10.1257/app.20180521

A Network of Thrones: Kinship and Conflict in Europe, 1495–1918†

By Seth G. Benzell and Kevin Cooke*

We construct a database linking European royal kinship networks, monarchies, and wars to study the effect of family ties on conflict. To establish causality, we exploit decreases in connection caused by apolitical deaths of rulers' mutual relatives. These deaths are associated with substantial increases in the frequency and duration of war. We provide evidence that these deaths affect conflict only through changing the kinship network. Over our period of interest, the percentage of European monarchs with kinship ties increased threefold. Together, these findings help explain the well-documented decrease in European war frequency. (*JEL* D74, N33, N34, N43, N44, Z12, Z13)

> *Bella gerant alii; tu, felix Austria, nube. Nam que Mars aliis, dat tibi regna Venus.*[1]
>
> —Unofficial Habsburg Motto

> *Although marriages may secure peace, they certainly cannot make it perpetual; for as soon as one of the pair dies, the bond of accord is broken …*
>
> —Desiderius Erasmus, *Education of a Christian Prince* (1532)

Many theories of international conflict relying on system and state-level characteristics have been quantitatively investigated (e.g., balance of power, ideology, and national or class interests). These levels of analysis abstract from the role of individual "great men." This may be a grave omission in settings like early modern Europe. This period was characterized by increasingly centralized monarchies, a

* Benzell: Chapman University, Argyros School of Business and Economics (email: benzell@chapman.edu); Cooke: Analysis Group Dallas (email: kmcooke@bu.edu). Ilyana Kuziemko was coeditor for this article. We are grateful to Robert A. Margo, Christophe Chamley, Neil Cummins, Bill Dougan, Christopher Fettweis, Martin Fiszbein, Jack Levy, Matthew Gudgeon, Philip Hoffman, Murat Iyigun, Jonathan Pritchett, Laurence Kotlikoff, Krzysztof Pelc, and Pascual Restrepo for their many insightful comments. Detailed comments from two anonymous referees greatly improved this paper during the editorial process. We thank Brian Tompsett for providing access to his unique genealogical archive. We extend thanks to seminar participants at Boston University, Clemson University, the 2016 EHA meetings (University of Colorado Boulder), and the 2016 EH-Clio Conference (Pontificia Universidad Católica de Chile) for their very helpful comments. Diligent research assistance was provided by Holly Bicerano, Chen Gao, Nadeem Istfan, Anna Liao, Ardavan Sepehr, Shawn Tuttle, and Jessie Wang. Finally, we thank the game developers at Paradox Interactive and George R. R. Martin for the paper's inspiration.

† Go to https://doi.org/10.1257/app.20180521 to visit the article page for additional materials and author disclosure statement(s) or to comment in the online discussion forum.

[1] "Let others wage war; you, happy Austria, marry. For what Mars awards to others, Venus gives to thee." Traditionally attributed to fourteenth- or fifteenth-century statesmen, the motto was only popularized much later.

system of government that placed the personal relationships of monarchs at the center of politics. Dynastic marriages, strategically arranged by the Habsburgs and others, knit together ruling families across the continent. Using genealogical data, we provide evidence that the interpersonal kinship relationships among rulers played a critical role in interstate conflict, bringing individual-level theories into the realm of quantitative analysis. We show, ceteris paribus, that countries led by rulers with family ties were less likely to fight wars. This study adds to a growing literature supporting the view that individual leaders play an important role in political and macroeconomic outcomes.[2]

To study the relationship between kinship networks and war, we construct a unique dataset that combines genealogical records of European royalty with contemporaneous conflict data. Our dataset links three main components. First, we generate a list of sovereign Christian monarchies. For each monarchy, we document its history of rulers. Second, we combine and expand existing datasets on European states, conflicts, and related covariates. Finally, we build a dynamic kinship network between the royals of Europe based on Tompsett's (2014) genealogical data. Nodes in the network are individuals alive in a given year; edges exist between siblings, parents and children, and married couples. Pairs of monarchs may be connected more or less closely through these ties. The network evolves as individuals are born, marry, divorce, and die.

Due to the endogenous nature of marriage, estimating a causal relationship is not straightforward. The explicit purpose of many royal marriages was to end a conflict or reduce the likelihood of future conflict. Therefore, kinship ties may have been disproportionately formed between dynasties with a high propensity for war. This would introduce a positive bias in any OLS estimate of the effect of kinship on war. We provide a conceptual framework that captures this idea and helps to guide our analysis.

We overcome this challenge by exploiting exogenous negative variation in kinship ties caused by the deaths of individuals important to the kinship network. When a mutual relative along the shortest path between a pair of monarchs dies, that path is broken. The kinship distance between the pair of rulers (weakly) increases. The deceased individuals may be rulers themselves or other members of a royal family (although we never use a monarch's death as an instrument for their own country's political ties). To ensure deaths are exogenous with regard to the international political situation, we exclude deaths due to battle, assassination, and execution. Using variation in kinship network distance induced by these deaths, we show that increased kinship distance is associated with a higher rate of conflict between a pair of countries.

We find quantitatively large effects. Our results imply that a pair of monarchs whose only family connection is a pair of married children would see a 9.5 percentage point increase in their annual war probability if this marriage tie were dissolved. This finding is robust to different measures of kinship distance. This result is strong

[2] See, e.g., Jones and Olken (2005) on leaders and economic growth and Fisman (2001) on political connections.

evidence for the claim that kinship ties between rulers increase the likelihood of diplomatic resolutions to potential conflicts.

Using placebo analyses and other robustness checks, we exclude certain other mechanisms through which shortest path deaths could cause war. The death of a monarch's immediate relative *off-path* does not lead to an increased chance of war. Shortest path deaths only raise the chance of war between the pair of impacted countries; these deaths do not affect the pair's overall war propensity with third parties. We also show that deaths of mutual relatives from third-party states still increase the chance of war between dyads. Most importantly, the effect of on-path deaths on dyadic war is still large and significant even after excluding on-path deaths of monarchs from third countries. This indicates that the effect we detect is not solely driven by succession crises, economic shocks, or political vacuums introduced by monarchical death.

In reduced form, we show that dyadic war probability increases after the death of an on-path mutual relative.[3] The most conservative way to interpret such a finding is that on-path deaths raise the chance of war but tell us nothing about the effect of kinship connection itself. However, we believe that the historical and statistical evidence allows us to make a stronger claim. Our interpretation is that kinship ties between rulers lower negotiation costs and increase the peace dividend, increasing the likelihood of diplomatic resolutions to potential conflicts. This interpretation does not rule out the likely possibility that the effect of kinship ties on conflict is mediated by one or more interrelated channels. For example, tight kinship ties might increase trade or cultural diffusion between a pair of countries, increasing the peace dividend. Similarly, monarchs connected by kinship might trust each other more or be better able to observe each other's actions, either of which might lower negotiation costs. We leave disentangling these intermediate mechanisms connecting kinship and war to future research, should the necessary data ever become available.[4]

In line with previous literature, we observe a more than 50 percent decline in the prevalence of war after 1800 (Levy 1983, Gat 2013). We also document a new fact: kinship ties between European monarchs grew substantially over time. If one accepts our preferred interpretation, that kinship networks promote peace, growing kinship networks can explain 45 percent of the nineteenth-century decline in European war frequency.

I. Background

We limit our analysis to the monarchies of Christian Europe from 1495 to 1918.[5] Giving a complete account of this rich and fascinating period is far beyond the

[3] These deaths can be viewed as an "intent-to-treat" true underlying kinship, with our IV analysis being a way to put units on the concept of "kinship."

[4] A shock to kinship ties likely simultaneously changes many aspects of the relationship between countries. We measure the net effect of such a change to the international system on conflict. Unfortunately, no satisfactory long-term cross-country panels of bilateral trade, cultural diffusion, royal cohabitation, or courtly information gathering currently exist to study any of these mechanisms in sufficient detail to study the interrelation between these outcomes.

[5] Geographically, this roughly corresponds to continental Europe, the British Isles, the Mediterranean Islands, and Russia. While, for example, the Ottoman Empire played a major role in European conflict, we are not aware

scope of this paper. However, this section briefly describes some of the institutions relevant to our analysis.[6]

During the period from the end of the fifteenth century to the middle of the eighteenth century—typically referred to as "early modern"—monarchy was an ubiquitous form of government. While many monarchs aspired to absolute power, most early modern European dynastic governments were mixed systems with varying degrees of royal, aristocratic, and parliamentary power.[7] In the seventeenth and eighteenth centuries, the trend was toward centralization of power in the hands of the monarch. Toward the end of our sample, constitutional constraints limited the power of monarchs in many countries.[8] Whatever their de jure and de facto limitations, the monarch was always one of the most, if not the most, important leaders in any polity during our period. This was especially true when it came to matters of interstate conflict. For example, in Britain, even during periods when the Parliament and Cabinet decided whether to declare war, the king was in charge of the war's conduct (Hoffman 2012).

In most monarchies, rule was hereditary, although countries differed in the details of succession (especially regarding the possibility of women to inherit the throne).[9] A common norm was that in order to be eligible to inherit a throne, both parents of an heir must be royal. In some regions with stronger aristocracies (such as Poland), the monarch would be elected for life by a council of nobles. Importantly, even in these regions, new leaders were typically selected from a single great family.

Monarchs were not only political leaders but also patriarchs and matriarchs of their families. Close family members of the ruler were often selected to be ambassadors, advisers, and military leaders. Marriages of members of the royal family were typically arranged or approved by the monarch.[10]

These institutions made dynastic marriage a common way to build relatively stable political connections between polities. Fleming (1973) provides evidence that such marriage arrangements were greatly influenced by international and domestic political concerns. Studying the descendants of King George I of England, she finds that royals were more likely to marry foreigners, other royals, and close relatives when compared to the lower nobility. Royals were also less likely to marry commoners. In the data section of this paper, we comprehensively document the ubiquity of interdynastic ties.

---

of any examples of Christian and non-Christian royal intermarriage during this interval. Therefore, the exclusion of non-Christian states does not impact our results. For a more detailed explanation of inclusion criteria, see online Appendix A.

[6] For a one-volume history focused on international conflict, consider *Europe: The Struggle for Supremacy, from 1453 to the Present* (Simms 2014).

[7] Absolute monarchy was an ideal articulated by Jean Bodin and others. For more details on early modern government, see Bonney (1991), especially chapter 6, "The Rise of European Absolutism."

[8] Marshall and Gurr (2014) provide an index of the constraints on the authority of monarchs covering the last century of our sample. In 1816, they score 16 monarchies in our data. They find in 11 that the monarch had "unlimited authority." By 1900, only two monarchies maintain this status. On a scale of 1–7, the average constraint score increased from 1.875 in 1816 to 5.36 in 1900.

[9] Roca Fernández (2016) investigates the consequences of inheritance rules for the development of state capacity, arguing male primogeniture leads to more powerful states in the long run.

[10] Sometimes this principle was legally codified. For example, King George III, upset at the nonstrategic marriage of his brother, passed the Royal Marriages Act (1772) through Parliament, which required members of the English royal family to have their marriages approved by the reigning monarch. This law was only repealed in 2015.

The Habsburg Holy Roman Emperor and Austrian Archduke Maximilian I (r.1486–1519) was especially adept at marriage arrangements. Marrying Mary of Burgundy in 1477, he gained control of her principalities in the Low Countries. To secure an ally in the interminable Valois-Habsburg struggle with France in Italy, he married his son Philip "the Handsome" to Joanna "the Mad" of Castile in 1498. To reduce border tensions with East European neighbors, granddaughters and grandsons were married to Hungarian and Bohemian rulers. This series of marriages set the groundwork for one of the most successful dynasties in history. Habsburgs would go on to rule lands from the Philippines to Budapest.[11]

Fichtner (1976) uses the marriage negotiation letters of sixteenth-century Habsburgs to craft a broader anthropological theory of European royal marriage. She finds that royal marriages entailed marathon negotiations over dowries, inheritance rights, and international political obligations. The size of dowries involved (usually bidirectional) could rival the yearly maintenance of standing armies. These marriages allowed the Habsburgs to install spies and influencers in foreign courts and place Habsburgs in lines of succession.[12] These connections also created lines of communication that could remain active even when serious disruptions took place.

The Thirty Years' War (1618–1648) provides an illuminating example of the relationship of kinship networks to conflict. In the preceding century, Lutheranism and Calvinism had spread across the Holy Roman Empire. A series of wars of religion rocked the continent. With religion so politically charged, interconfessional royal marriages became very rare. An important tool for the de-escalation of dynastic conflict was eliminated.

Protestant Bohemian nobles, concerned about the erosion of Protestant rights, brought the lingering conflict to a head. They did so by throwing the Habsburgs' representatives out a window in 1618 (in the Second Defenestration of Prague) and calling for the election of a Protestant prince. The ruler they chose in 1619 was Frederick V, elector of The Palatinate (r.1610–1623). This outcome was unacceptable to the Habsburgs (Bohemia being a pivotal voter in the electoral college that selected the Holy Roman Emperor), and a steadily escalating conflict ensued.

Figure 1 shows the family and ancestral relationships between the states of Europe in 1618, just prior to the outbreak of the Thirty Years' War. From this figure alone, one can predict the two primary blocs that would take shape during the war. On the left, note three main clusters of connections: the Catholics of France, Spain, and Southern Italy; a second cluster of Catholic states in Austria, Bohemia, and Poland; and a Protestant cluster, containing England, the Netherlands, Denmark, and the Protestant electorates of the empire (Prussia, Saxony, and the Palatinate). The division between these camps is clearly centered in modern Germany and the

[11] The seminal paper in network analysis of political connections comes from just before our period of interest. Padgett and Ansell (1993) use network centrality to explain how the Medici, a noble family of no particular note in 1400, rose to the pinnacle of Florentine politics in 1434. Their thesis is that Cosimo de' Medici forged a series of marriages and business ties that placed his family "between" the other great families of Florence. This allowed the Medici the opportunity to be involved in nearly all decisions of consequence.

[12] "In an age when accurate information from abroad was at a premium, a child at a foreign court could keep one apprised of events there. Ferdinand's daughter Catherine reported to her father regularly about dealings between her husband, King Sigismund Augustus of Poland, and Muscovy…." (Fichtner 1976, 245).

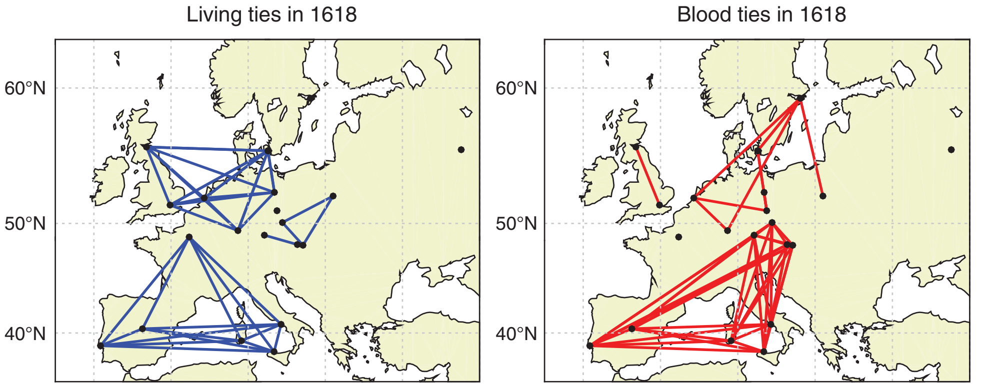


FIGURE 1

Notes: The figures above report kinship and genetic ties between rulers in 1618, the beginning of the Thirty Years' War. Black dots represent capitals. In the left figure, lines connect any pair of capitals ruled by monarchs with a living kinship connection. We say a pair of monarchs are connected by a living kinship tie if there is a path of edges connecting them. An edge exists between any living parent/child, sibling, and married pair of individuals. In the right figure, lines connect capitals ruled by a pair of monarchs who share a great-grandparent. Connections display clear Catholic/Protestant and Habsburg/Non-Habsburg divisions.

Netherlands, which was to be the battlefield for the conflict. The second map displays the ancestral Habsburg ties linking the family's Austrian and Spanish branches.

Arguably, it was Frederick V's centrality in the international system that led "The Bohemian Revolt" to escalate into a century-defining war. The lands controlled directly by Frederick V were relatively weak, but he was at the center of Protestant politics. Frederick V was the son of the founder of the Protestant Union, which contained many other Protestant-leaning principalities of the Holy Roman Empire. He was closely connected by ancestry and marriage to the most important Protestant states in Europe. King James I of England (r.1567–1625) was his father-in-law, William the Silent of Orange (r.1544–1584) (first Stadtholder of the independent Netherlands) was his grandfather, the elector George William of Brandenburg (r.1619–1640) was his brother-in-law, and Christian IV of Denmark (r.1588–1648) was his uncle-in-law. All of these states would eventually be drawn into the war. The Habsburgs too drew in familial allies. Phillip III (r.1598–1621) of the Spanish Habsburgs begrudgingly rallied to his cousins' cause.

Figure 2 displays the time trends in war and connectedness. It suggests an inverse relationship, driven by a decrease in conflict and increase in connections in the nineteenth century. The years between the Napoleonic Wars and World War I, sometimes known as "The Concert of Europe," were atypically peaceful. A "Holy Alliance" of the major monarchs of Europe was declared, dedicated to defending royal prerogatives and conservative values against the new ideas sweeping Europe. This alliance, explicitly a fraternity, may have only been possible because of their increasing sense of kinship.[13]

[13] The text of the Holy Alliance (1815) declares that "… the three contracting Monarchs will remain united by the bonds of a true and indissoluble fraternity, and, considering each other as fellow-countrymen, they will, on all occasions and in all places, lend each other aid and assistance; and, regarding themselves toward their subjects

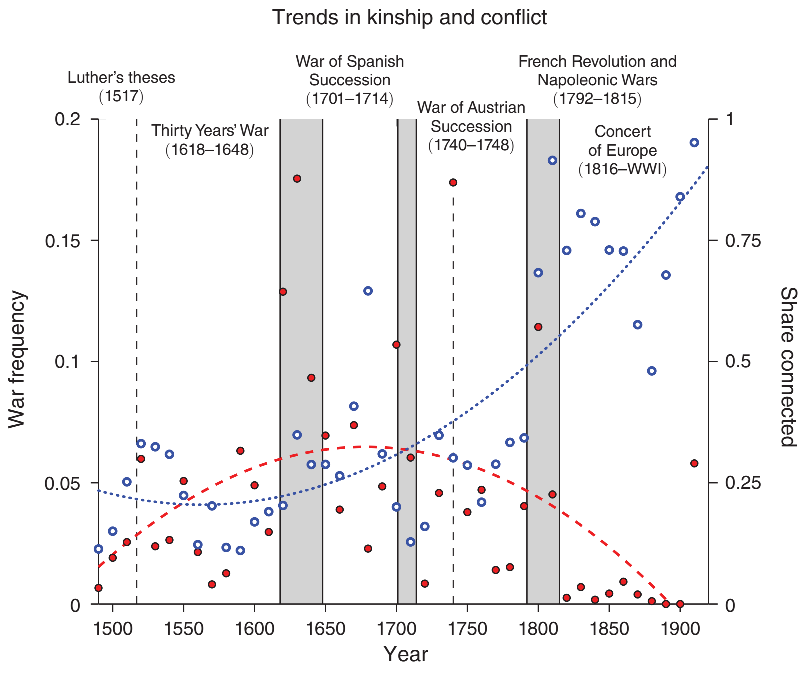


FIGURE 2

Notes: Hollow circles report the share of monarchy-pairs (dyads) ruled by monarchs with kinship ties by decade. A pair of monarchs are connected by a kinship tie if there is a path of edges connecting them. An edge exists between any parent/child, sibling, or married pair of living individuals. Solid circles report share of years these country pairs were at war, left axis. Second-order polynomials are fitted to each data series. Important political events indicated. War frequency and kinship connection, averaged by decade, are negatively correlated, $\rho = -0.197$.

On the eve of World War I, after a century of peace, levels of royal connection were extremely high. King George V of the United Kingdom (r.1910–1936), Czar Nicholas II of Russia (r.1894–1917), and Kaiser Wilhelm II of Germany (r.1888–1918) were all first cousins, grandchildren of Queen Victoria of England (r.1819–1901).[14] At the same time, powerful geopolitical, technological, and social trends pressured the continent toward war. World War I is a classic example of an event in international relations that was *overdetermined*.[15]

In the context of these strong forces, the question is not why the system of personal relationships between the rulers failed, but how they were able to preserve peace for so long. Kaiser Wilhelm II and Czar Nicholas remained important

and armies as fathers of families, they will lead them, in the same spirit of fraternity with which they are animated, to protect Religion, Peace, and Justice" (retrieved from https://www.napoleon-series.org/research/government/diplomatic/c_alliance.html#:~:text=All%20the%20powers%20who%20shall,which%20belongs%20to%20them%2C%20will).

[14] George V and Wilhelm II were her biological grandchildren. Nicholas II was a grandson-in-law, having married Victoria's granddaughter Alix of Hesse in 1894.

[15] Identifying the source of World War I is something of a cottage industry, with scores of hypothesized causes including imperialism, French revanchism, pan-Slavism, social Darwinism, a polarized and secretive alliance network, arms races on land and sea, and military technologies that favored strategic surprise (the "Cult of the Offensive").

decision-makers, but democracy in the United Kingdom had developed to the point that King George V had limited influence. On the eve of the war, the German and Russian rulers exchanged a series of personal telegrams signed "Willy" and "Nicky," desperately trying to de-escalate the conflict. However, since their grandmother's death, the two had grown into mutual distrust and suspicion.[16] This last gesture toward brotherhood proved too little too late, and with the war came the end of a Europe dominated by kings and czars.[17]

II. Connecting Kinship and Conflict

Our paper is motivated by a clear historical record demonstrating that European monarchs and their advisers treated dynastic marriage negotiations, papal annulments, lines of succession, and the bonds of kinship between rulers as central to foreign policy. Uniting these considerations are their origins in family networks. Changes in these familial network connections are therefore likely to be associated with political outcomes and, ultimately, war.

Kinship ties between monarchs might directly help them to resolve disputes amicably, either through creating trust or promoting information exchange.[18] Alternatively, kinship ties between rulers could have an indirect effect. For example, individuals who are closely connected to a pair of rulers might be well placed to create and manage trade ties between their nations. Surplus from this trade might tend to promote peace, an effect that would dissipate with the well-connected magnate's death.[19] We wish to emphasize that our paper makes no serious effort to distinguish between these mechanisms. A causal connection between royal kinship ties and peace is interesting whether kinship's effect is direct or operates indirectly through creating economic or cultural ties.

In order to understand whether there is any causal relationship between royal kinship and war, direct or otherwise, we sketch a conceptual framework. This framework highlights the endogenous nature of dynastic ties and motivates the need for a source of exogenous variation. We study country-pairs (dyads) as our basic unit of

[16] While signing the mobilization order, Kaiser Wilhelm II remarked, "To think George and Nicky should have played me false! If my grandmother had been alive, she would never have allowed it."

[17] Although at least one Polish royal did not believe this at the time. Princess Radziwill's fascinating handbook to the royal marriage market discusses the politics and culture of royal marriages leading up to the war and predicts the consequences of the war for future marriages. In 1915, she writes, "It is probable however, that, after the present war has come to an end, Royal alliances will become once more subjects of general interest, and of greater importance than has been the case during the last twenty years or so. This fact has led me to include in my book a review of the personages eligible to become one day the consorts of European rulers" (Radziwill 1915, vi).

[18] This could be because the rulers are more disposed to trust connected rulers (as in Lévi-Strauss's 1949 theories of marriage alliance among primitive tribes). Alternatively, close family ties might aid dispute resolution by facilitating the spread of information. This information spread may be overt (as connected rulers spend more time interacting with each other, for example, during family events and holidays) or covert (as a daughter married abroad might serve as a spy at a foreign court, as in Fichtner 1976). Close family ties could also prevent conflict by raising the expected cost of war or the surplus from peace. For instance, a shared interest in a mutual relative might prompt cooperation between rulers. The possibility that a mutual relative would serve as a hostage, and therefore provide insurance against aggression, is a more cynical version of that idea. The fact that a pair of closely connected rulers (or their heirs) have a chance of inheriting each other's domains may also give them a further interest in promoting bilateral prosperity.

[19] Jackson and Nei (2015) advance a theoretical argument that alliance networks without a peace surplus from trade are inherently unstable. They argue that the post-eighteenth-century rise in international trade decline contributed to a decrease in war frequency.

analysis. In each period, we assume that a given dyad experiences a potential conflict with a fixed probability, p. This represents the idiosyncratic latent war propensity of the dyad. Dyads have different latent war propensities for a variety of reasons, including religious tensions or compatibility, their degree of cultural similarity, trading proclivity, border friction, or historical acrimony.

However, political friction does not necessarily have to lead to war. Diplomatic intervention can prevent these potential conflicts from escalating. Conditional on a potential conflict arising, we assume that a dyad is able to successfully reach a diplomatic solution with probability q. The chance of war in a given year is therefore $p(1-q)$.

To capture the role of family ties, we posit that q is a function of the level of kinship connection between the leaders of the country-pair. We hypothesize that the probability a dyad reaches a peaceful settlement is an increasing function of inverse kinship distance.[20] We denote this by $q(1/d)$.

This framework suggests that an exogenous increase in kinship network distance, d, lowers q and thus leads to more frequent wars. However, endogenous marriage decisions can obscure this effect. To see why, suppose war is socially inefficient and that a dyad can reduce war frequency by exerting costly effort to lower d. In this setting, dyads with a large p have a correspondingly large (Coasian) incentive to form tighter kinship bonds (e.g., through strategic marriage). Therefore, we are likely to observe pairs with the highest latent war propensity forming the tightest kinship ties. This means a simple regression of war frequency on $1/d$ will produce a coefficient with positive bias.

Therefore, our study requires a source of exogenous variation in network structure to recover the causal effect of kinship networks on war frequency. The ideal experiment would take two ex ante identical country pairs and randomly vary one of the pair's level of connection. Any subsequent difference in conflict behavior would be attributed to the changed kinship network. Our empirical strategy will approximate this by using variation in a dyad's kinship distance following the apolitical deaths of individuals important to the network.[21]

Before turning to a description of our data, we draw attention to a key feature of this conceptual framework. In it, wars are multicausal events. Many different geopolitical, economic, technological, or social circumstances can lead countries to the precipice of conflict. Still more factors determine whether these potential conflicts erupt into violence. We interpret family ties as being among the second set of factors that determine whether potential conflicts become actual wars. This has an important implication for timing in our empirical analysis. Specifically, this framework implies that shocks to kinship ties should be expected to have an *immediate* effect on conflict frequency at the margin. Analogously, removing a safety net does not slowly build pressure toward a circus performer being injured.

[20] Inverse kinship distance, $1/d$, is a convenient measure of connectivity that varies between zero and one and deals with disconnected dyads in a natural way by defining $1/\infty$ to be zero.

[21] Earlier versions of this paper used the gender of firstborn children as an instrument for the probability of royal marriage. This approach yields point estimates that are consistent with our main results but not statistically significant.

Rather, the removal of a safety net *immediately* increases the odds of injury, conditional on a fall occurring.[22]

III. Data Description

Our analysis is based on a newly constructed dataset on royal kinship networks and wars.[23] The final dataset takes the form of an unbalanced panel of country dyads. Our analysis is restricted to sovereign Christian European monarchies from 1495 to 1918. This limitation focuses on the types of states for which dynastic connections are important and aids in collecting a comprehensive dataset. For a complete description of the data and its construction, as well as variables collected but not used in this analysis, see online Appendix A.

A. *Summary Statistics*

Our raw data consist of 92,321 country-pair (dyad) years. Monarchs are matched to these countries primarily using Spuler (1977). Of these dyads, 3,895 dyad-years are in personal union, where the same ruler controlled two crowns (i.e., countries) simultaneously. By construction, personal unions are never at war, so these pairs are not included in the analysis.

There are 865 country pairs in our sample. In Table 1, we report summary statistics for our data. The first group of variables measure conflict activity. These variables are primarily based on Wright (1942), but we expand and reconcile this data with other sources. War is a dummy variable that indicates whether a pair of countries are at war in a given year. War Start (Continue) is a dummy for whether a pair begins (continues) a war, conditional on being at peace (war) in the previous year.

Wars start in approximately 0.9 percent of previously peaceful dyads. Conditional on being at war in a given year, 81.4 percent of dyads continue into the next year. Together, this implies an overall war frequency of 4 percent of dyad-years. Dyads are very heterogeneous in their bellicosity. Some never fight wars, while others are longtime rivals. For example, France and the Archduchy of Austria (and its successor states), which coexist for 363 years in our data, are at war in 25 percent of years.[24] Generally, our analysis focuses on bilateral measures of conflict. However, for a robustness check, we also make use of a measure of whether either member of a dyad is engaged in any inter-monarchical European war at all in a given year (either with each other or with a third party)—"Any War."

[22] Note also that an expert performer might be less likely to request a net, thereby obscuring the relationship between nets and safety.

[23] Three recent papers use data similar to ours. Iyigun (2008) uses Brecke's "Conflict Catalogue" and finds strong evidence that Ottoman invasions aided the spread of Protestantism in Europe in the sixteenth century. Iyigun, Nunn, and Qian (2017) use Brecke and other conflict data to study the effect of climate change on European war. Dube and Harish (2020) study the effect of ruler gender on conflict. Like us, they construct a dataset matching Wright's (1942) war data to Tompsett's genealogical data. Dube and Harish use the genealogical data to identify the gender of rulers' close relatives. They use this information to make a compelling case that female rulers were more bellicose than men. In the online data construction Appendix, we discuss the advantages of our dataset versus these similar ones.

[24] See Table 11 in online Appendix D for additional dyads of interest.

Table 1—Summary Statistics

	Observations	Mean	SD	Min	Max
War	88,426	0.040	0.196	0	1
War Start	84,992	0.009	0.093	0	1
War Continue	3,434	0.815	0.389	0	1
Any War	88,426	0.483	0.500	0	1
ln(1 + Battle Deaths)	88,148	0.462	2.455	0	16.792
ln(1 + (Battle Deaths/Dyad-Years))	88,148	0.294	1.575	0	15.302
Shortest Path Length	34,810	7.265	4.690	1	30
Resistance Distance	34,810	2.799	2.022	0.19538	15.752
Genetic Distance	54,122	4.616	1.680	1	7
Number of Immediate Relatives	88,426	10.266	5.231	0	34
Same Religion	88,426	0.449	0.497	0	1
ln(Distance)	88,426	6.921	0.678	3.2793	9.335
Neither Landlocked	88,426	0.603	0.489	0	1
Adjacent	88,426	0.137	0.344	0	1

Notes: This table summarizes three categories of variables: conflict measures, network measures, and dyadic covariates. We provide several measures of conflict frequency and severity. Our network measures describe a pair of rulers' current level of bilateral connection (Shortest Path and Resistance), shared ancestral ties (Genetic Distance), and overall number of connections (Immediate Relatives). The remaining variables include religious and geographic controls.

In addition, we present two measures of conflict severity based on Brecke (2012). For most of the wars in our data (i.e., sets of dyad-years of conflict), Brecke reports the number of deaths in battle from the war; however, Brecke does not assign these deaths to particular countries or years within the larger conflict. Although this is imperfect, Brecke's data are the best available for measuring the relative severity of conflicts during this period. Our first measure of conflict severity is simply ln(1 + Battle Deaths). However, this does not take into account conflict duration or the number of participants. It is essentially an upper bound on the number of deaths that are associated with a particular dyad-year of conflict. We also present a second measure, ln(1 + (Battle Deaths/Dyad-Years)), which adjusts for the length and breadth of the conflict. Effectively, this measure assumes that battle deaths were evenly distributed among dyad-years within each of Brecke's wars. Both of these measures are equal to zero for dyads not at war in a year.

The second class of variables are pairwise covariates. Primarily, these are geographic variables that are derived from Reed (2016). Reed provides maps of Europe for our entire time period at very high frequency. The variables "Neither Landlocked" and "Adjacent" are self-explanatory dummy variables, which vary over time with border changes. We also record the natural log of the distance between two countries' capitals in kilometers. Additionally, we construct a dummy for whether the pair of rulers are members of the same religious group (Catholic, Protestant, or Orthodox).

The final class of variables are based on Tompsett's (2014) genealogical data. The genealogy has 872 individuals alive in the median year, but this amount increases strongly in later years. Figure 10 in the online Appendix plots the number of living nobles in our data by year. The average pair of rulers have 10.3 immediate family connections (i.e., parents, spouses, siblings, or children) between them. Rulers sometimes share immediate family members, so this corresponds to somewhat more than 5.1 immediate family members per ruler. We reconstruct these data as a dynamic kinship network.

B. *Kinship Network Definitions*

We define our kinship network in the following way. Nodes in the network are individuals alive in a given year. Edges exist between immediate family members. Immediate family relations are parent/child, sibling, and spousal. Each year, the set of nodes is updated based on births and deaths. Links are added for births and marriages and removed after deaths and divorces. Using this network, we calculate measures of kinship distance.

Shortest Path is our primary measure of kinship distance between rulers. The shortest path between two rulers is simply the minimum number of network links that must be traversed to get from one ruler to the other. We also measure the Resistance Distance between rulers. While shortest path distance only looks at one path between rulers, resistance distance is an all-path measure inspired by electrical resistance. This measure is decreasing in the number of paths between two rulers and increasing in the length of each of these paths. If no path exists, both of these measures are defined to be infinity. Only finite values are summarized in the table above. A total of 39.3 percent of dyad-years are connected by living kinship ties. This is mostly driven by within-dyad variation. Of 274 dyads with more than 100 years of coexistence, only 12 are never connected.

The share of states connected by living ties trends upward over time after a slight dip in the decades after Luther's Theses. In the 1580s, only 11 percent of states are connected, the lowest share on record. In the 1910s, the last decade in our data (albeit a partial one), over 95 percent are. A positive trend is still observed when looking only at close connections of fewer than eight steps. A larger share of monarchs share a common ancestor. There is no long-term trend in the share of dyads with a close genetic connection.

Genetic Distance is a different type of bilateral relationship measure. Instead of relying on the dynamic network of living kinship relations, this measure is calculated from a static directed network in which links run only from children to parents. Using this network of genetic connections, we report the maximum number of steps from two rulers to their most recent common ancestor. We search the genealogical data up to seven generations. Like our kinship measures, this measure is defined as infinity if no common ancestor exists.

For more information on our genealogical data and demographic trends, see online Appendix B. Online Appendix C provides a detailed description of the network construction and corresponding measures. For tables and figures further describing the evolution of network ties and conflict, see online Appendix D. Online Appendix D also reports results relating war propensity to genetic distance.

IV. Main Results

A. *OLS Analysis*

We are interested in the relationship between network distance and war. We begin by estimating a baseline specification, equation (1). This equation models the probability of war as a linear function of inverse kinship network distance, $(1/d)$. The measure d is either shortest path length or resistance distance. For shortest path length, using inverse distance has the attractive property of being bounded between zero and one. In addition, this inverse measure captures the intuition that a unit increase in network distance will be more important for more closely connected rulers. Taking the inverse of our distance measures allows us to deal with unconnected pairs $(d = \infty)$ in a natural way. This inverse distance measure takes a value of zero when the pair is unconnected. Formally,

$$(1) \qquad War_{(i,j),y} = \alpha + \beta \cdot \left(\frac{1}{d}\right)_{(i,j),y} + \delta \cdot X_{(i,j),y} + \theta_{(i,j)} + \theta_y + \epsilon_{(i,j),y}.$$

The outcome variable, $War_{(i,j),y}$, is a dummy for whether countries i and j are at war in year y. We regress this on inverse network distance $(1/d)$. Tables refer to this variable as $(\text{Path})^{-1}$ or $(\text{Resistance})^{-1}$ as appropriate. We also include a vector of dyad-year controls $X_{(i,j),y}$ (including log of capital distance as well as dummies for close genetic connection, adjacency, same religion, and neither landlocked), and fixed effects for dyad $(\theta_{(i,j)})$ and year (θ_y).

Estimating the baseline model with OLS reveals no significant relationship between kinship network distance and conflict. These results are reported in Table 12 in online Appendix D. This null result holds with and without covariates and using either shortest path length or resistance as the measure of distance.[25]

In Table 12 of online Appendix D and throughout the paper, we report standard errors clustered two-way by country. This method is standard in the country-level network literature, employed in papers such as Jackson and Nei (2015). This form of clustering helps to account for correlation among observations that share a country, both contemporaneously and over time.

Two-way clustering allows for, for example, France's fighting a war with Austria to be correlated with it fighting a war with Hungary. This is important both because of the presence of stable alliance blocks and because our causal results will rely on identifying variation based on events that are correlated between dyads that share a country. Cameron and Miller (2015) show that this clustering procedure can miss some relevant correlations, thus potentially underreporting standard errors. To show our results are not driven by incorrect standard errors, we conduct Monte Carlo simulations in our robustness section.

B. *Shortest Path Deaths*

For reasons explained above, OLS estimates of the relationship between kinship and conflict are likely to be biased due to the endogeneity of marriage. We therefore use apolitical deaths of individuals on the shortest path between a pair of rulers as

[25] These OLS regressions also suggest some interesting and intuitive relationships. Controlling for dyad fixed effects, countries are more likely to fight wars when they share a border. Countries that share a religion group are significantly less likely to fight wars. This latter relationship disappears in our subsequent section, where we instrument for connectedness. This suggests that a shared religion primarily lowers war probability by making it easier to form marriage ties. Capital distance exhibits little variation within dyad. Therefore, it is not estimated precisely when dyad fixed effects are included.

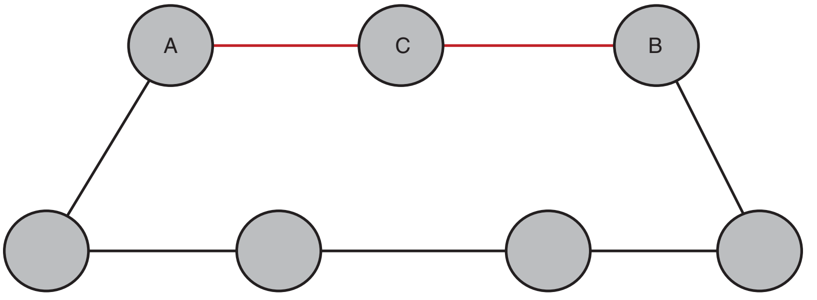


Figure 3

Notes: In this simple network, the shortest path from A to B is two. The resistance distance is $\left(\frac{1}{2}+\frac{1}{5}\right)^{-1} = \frac{10}{7}$. This graph is consistent with ruler A being married to ruler B's daughter and ruler A's niece being married to ruler B's grandson. Following C's death, both distance measures increase to five.

an instrument. To motivate our instrumental variable analysis, we first describe the deaths we are interested in and demonstrate their relationship to connectivity and conflict.

Our primary kinship network measure is inverse shortest path distance. Figure 3 illustrates a hypothetical kinship network between monarchs A and B. In this figure, the shortest path from A to B is length two and passes through individual C. If C were to die, the shortest path length would increase to five. Note that deaths along the shortest path mechanically weakly increase the network distance between A and B whether measured by shortest path or resistance. These "on-path" deaths act as a source of variation with which to identify the effect of kinship.

Of 88,426 dyad-years in the final data, 34,810 are observed to be connected by living kinship ties. These connected dyads are the only ones that can be affected by on-path deaths. We observe 4,498 dyad-years with an on-path death.

Figure 4 reports, for the ten years before and after an on-path death, the yearly mean inverse path length across the affected dyads. Formally,

$$\hat{E}\left[\left(\frac{1}{d}\right)_{(i,j),y+t}\middle| Death_{(i,j),y} = 1\right] \quad \text{for } t \in [-10, 10].$$

Figure 4 shows that these on-path deaths produce a substantial and sustained decrease in inverse shortest path length. These events result from the deaths of 274 distinct individuals, who are on—on average—the shortest paths of 16.4 dyads at the time of their deaths. Interestingly, but unsurprisingly, these 274 key individuals played a disproportionate role in connecting the rulers of Europe. Table 2 summarizes characteristics and causes of death for each of these individuals.

We document the cause of death for 74.1 percent of the 274 shortest path deaths in our sample. Overwhelmingly, these deaths are peaceful and nonviolent. The leading causes of death are old age (13.5 percent), unspecified illness (10.6 percent), and childbirth (9.9 percent), followed by a variety of specific illnesses. Of the 203 individuals with identified causes of death, only 12 died for reasons that could be plausibly tied to the interstate political situation. Seven were assassinated, four were executed, and

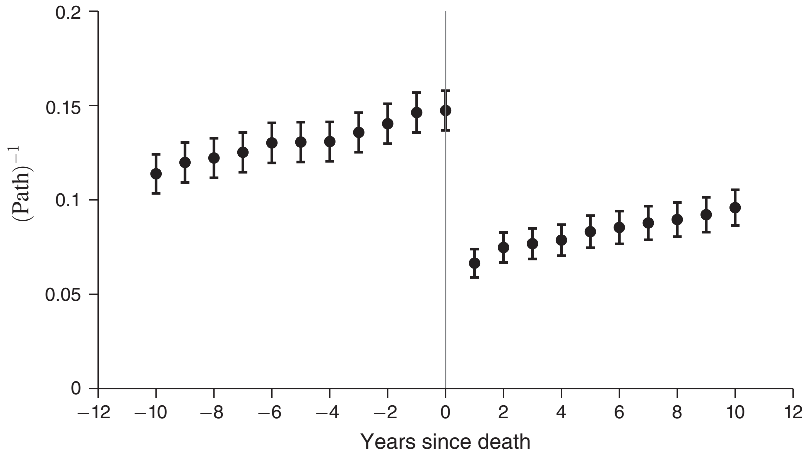


Figure 4

Notes: The *on-path* death of a mutual relative along the shortest path between rulers leads to a substantial decrease in the dyad's kinship connection as measured by inverse shortest path length. A path consists of a series of edges in the royal kinship network. An edge exists between any parent/child, sibling, or married pair of living individuals.

Table 2—Causes of Death and Related Characteristics for 274 Individuals Dying on a Shortest Path

Shortest path deaths	Observations	Percent
Death cause		
Unknown	71	25.9
Old unremarkable	37	13.5
Childbirth	27	9.9
Tuberculosis	11	4.0
Pneumonia	9	3.3
Stroke	8	2.9
Smallpox	7	2.6
Cancer	7	2.6
Accidental	7	2.6
Heart attack	2	0.7
Fever (cause unspecified)	3	1.1
Genetic	3	1.1
Unspecified/final illness	29	10.6
Other infection	19	6.9
Other noninfectious	14	5.1
Nonstroke brain	8	2.9
Assassination	*7*	*2.6*
Execution	*4*	*1.5*
Battle death	*1*	*0.4*
Individual was a monarch	76	27.7
Unexpected death	73	26.6
Stress-related death	40	14.6

Note: Potentially political death causes in italics.

one was hit by a cannonball (the unlucky Frederick IV, Duke of Holstein-Gottorp). This is consistent with Hoffman's (2012) evidence that early modern rulers, even those who lost wars, faced little to no personal risk from international conflicts. Cummins (2017) provides complementary evidence that the proportion of violent deaths among European elites substantially declined (to about 5 percent) after 1500. While our main results are very similar with and without these 12 potentially politically motivated deaths, our subsequent analysis will be based on the remaining 262 apolitical on-path deaths.

In further robustness checks, designed to avoid reverse causality and exclude some nonkinship related mechanisms, we distinguish shortest path deaths by other characteristics of the deceased individual. Specifically, we find 76 of the on-path deaths were monarchs, 73 were likely unexpected by contemporaries, and 40 can be linked to stress related to tense political situations, either international or domestic. Online Appendix Table 10 gives a full list of the names, year of death, cause of death, and other covariates for these 274 individuals. Online Appendix A.9 and the associated data files give more detail on how this information was collected and categorized.

C. *Event Study*

On-path deaths weaken kinship ties and thus potentially influence conflict frequency. To examine this relationship, we perform an event study analysis of war in years before and after an on-path death. To avoid double counting of dyads, we restrict attention to the subsample in which exactly 1 on-path death occurs in a 21-year window. Thus, the solid dots in Figure 5 report

$$\hat{E}\left[War_{(i,j),y+t}\,\middle|\,Death_{(i,j),y} = 1, \sum_{i=-10}^{10} Death_{(i,j),y+i} = 1\right] \quad \text{for } t \in [-10, 10].$$

While on-path deaths may influence the chance of war between a pair of monarchs by lowering their level of connection, they conceivably have a direct effect as well. To explore this possibility, we also report war frequencies before and after the deaths of any immediate relative (child, parent, sibling, or spouse) of either monarch, excluding those on-path. These "close" or off-path deaths are more frequent than on-path deaths, and thus a smaller 13-year window is reported so that the requirement of only 1 such death in the window is not overly demanding. The hollow dots in Figure 5 represent

$$\hat{E}\left[War_{(i,j),y+t}\,\middle|\,Death^{Close}_{(i,j),y} = 1, \sum_{i=-6}^{6} Death^{Close}_{(i,j),y+i} = 1\right] \quad \text{for } t \in [-6, 6].$$

In the years following an on-path death, there is a significant increase in war frequency. There is no increase in war propensity after the deaths of *off-path* individuals closely connected to one of the pair of monarchs. This elevated conflict propensity persists for about eight years.[26]

[26] In both this figure and Figure 6, there is a clear decline in war frequency nine years after the on-path death. This decrease is due in part to the ending of two large conflict episodes. The Schmalkaldic Wars and the War of Austrian Succession both ended eight years after the deaths of a very well-connected ruler (King Francis I in 1547 and Holy Roman Emperor Charles VI in 1740, respectively). In the main event study, about 32 percent of the postdeath dyadic wars are related to these two large conflicts. However, these two conflicts are not essential to

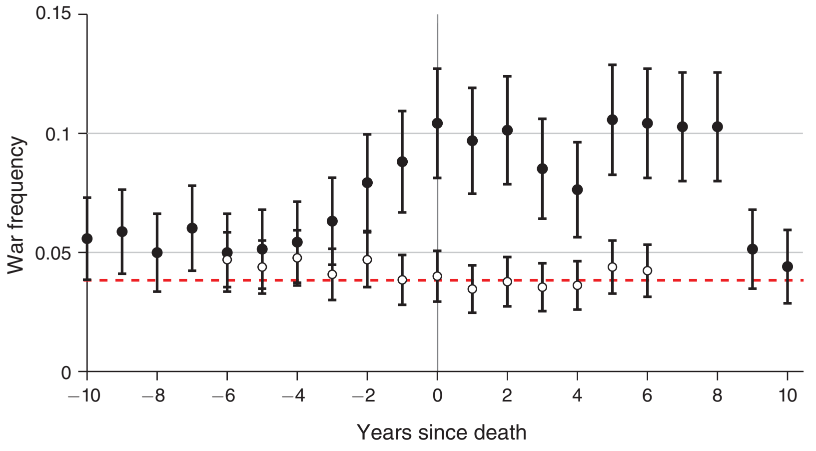


FIGURE 5

Notes: This figure plots the mean war frequency between dyads in the years before and after they experience the death of a relative. Solid dots indicate war frequency before and after an *on-path* death. Hollow dots are conditioned on close family deaths that are not on-path. The dashed line indicates overall average dyadic war frequency. The sample is restricted to dyads that experience only one death within the time horizon. Ninety-five percent confidence intervals (based on binomial statistics) are indicated by error bars.

It is important to note that war frequency is elevated in the two years preceding on-path deaths. This raises the question of reverse causality, the concern that wars are causing deaths rather than vice versa. We rule out the most direct version of this possibility since we exclude assassinations, executions, and battle deaths. However, it remains possible that a bellicose international environment may increase the rate of royal deaths.

If it were indeed the case that royal deaths are more likely during periods of elevated conflict, an increased war frequency should be present in the years before close deaths as well. However, the close death event study (hollow dots in Figure 5) indicates that close deaths are not associated with an elevated chance of war (pre- or postdeath). Therefore, it would need to be that war conditions increase "on-path" mortality but do not affect the mortality rate of a monarch's close relatives "off-path." Since on-path and off-path individuals are all royals, such a differential impact is implausible.

The anticipatory effect of on-path deaths on war can be readily accounted for without appealing to reverse causality. Many deaths are due to chronic conditions that allow the death to be anticipated and often incapacitate the individual (perhaps leaving them incapable of performing their network functions) in the years prior to the actual date of death. These anticipated deaths might account for the ex ante treatment effect.

the main results. Figure 5 only utilizes 16 percent of the 4,386 on-path deaths due to the restriction to 1 death in a 21-year window, a restriction designed to focus on the episodes with cleanest variation. In our main IV analysis, these two conflicts play a smaller role. Several of our robustness specifications drop these wars entirely.

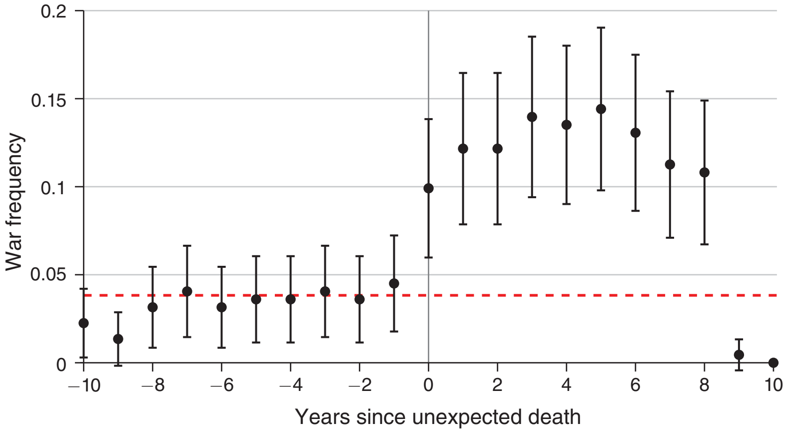


FIGURE 6

Notes: Mean war frequency of dyads in the years before and after they experience the *unexpected* death of an on-path relative. The dashed line indicates overall average war frequency. This sample is restricted to dyads that experience only one death within the time horizon. Ninety-five percent confidence intervals (based on binomial statistics) are indicated by error bars.

In Figure 6, we repeat the event study, focusing on *unexpected* deaths. Unexpected deaths are those with causes that did not manifest until within 365 days of the death date. Focusing on unexpected deaths, we see that war frequency remains relatively constant prior to the unexpected death and only increases once the death has occurred.

Another possible concern is that the deaths of network important individuals increase the risk of war between all impacted countries, not just the pair that are disconnected. Figure 7 reports the same event study, except the outcome is whether either country in the dyad impacted by the death is involved in any war, including a war with a third party. There is no change in the frequency of war participation generally for dyads involved in a shortest path death.

Together, these four event studies provide strong evidence that on-path deaths of mutual relatives are associated with an increased likelihood of war specific to the impacted pair of countries. However, this simple event study analysis focuses on a subset of the data with the cleanest variation and does not control for any covariates, time trends, or dyad-specific effects. Similarly, these event studies do not quantitatively answer the question of how strongly kinship connections impact conflict frequency. The remainder of our paper develops an instrumental variable approach based upon variation in kinship connection induced by on-path deaths. Unlike the event study, this instrumental variable approach provides a quantitative answer to the question of how changes in kinship connection affect war frequency, controlling for a variety of important covariates.

D. *Instrument Definition and Identification*

To estimate the causal effect of living kinship ties on conflict, we return to our OLS regression specification from Section IV. However, we modify the model by

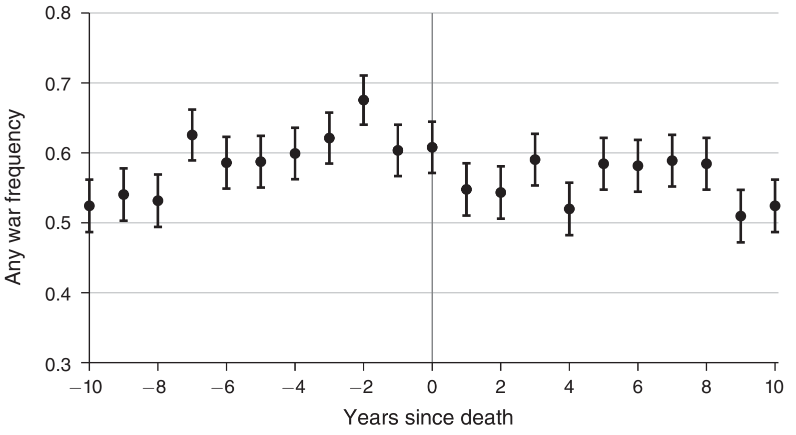


Figure 7

Notes: The proportion of dyads with at least one country at war (including, but not necessarily with, each other) for the ten years before and after an on-path death. This sample is restricted to dyads that experience only one on-path death within the time horizon. Ninety-five percent confidence intervals (based on binomial statistics) are indicated by error bars.

instrumenting for inverse kinship distance with lagged on-path deaths. Our instrument, $Z_{(i,j),y}$, is a dummy for whether an on-path death occurred in the previous five years. Specifically, $Z_{(i,j),y}$ is

$$Z_{(i,j),y} = \max_{t \in [1,5]} Death_{(i,j),y-t}, \tag{2}$$

where $Death_{(i,j),y}$ is a dummy for whether a nonpolitical death occurred along the shortest network path between rulers i and j in year y (ignoring contemporaneous deaths).[27]

This is a somewhat coarse instrument, given that some on-path deaths change connectivity more than others. This coarseness is necessary in order to satisfy the stringent conditions for instrument validity. The reason we require an instrument in the first place is that the level of living kinship connection is endogenously determined. Any instrument constructed using information about connectivity prior to the on-path death will also be endogenous and therefore invalid. We provide further discussion of the validity of our instrumental variable approach and related identification concerns as part of our robustness analysis in Section V.

[27] Results are robust to alternate specifications of the instrument. The pooled dummy produces similar results, including up to eight lags of death. Similar results can also be obtained using separate dummies for each lag of death. We prefer the pooled specification because it eliminates worries of overfitting.

TABLE 3—MAIN RESULTS FIRST STAGE

	$(\text{Path})^{-1}$ (1)	$(\text{Path})^{-1}$ (2)	$(\text{Resistance})^{-1}$ (3)	$(\text{Resistance})^{-1}$ (4)
On-Path Death	−0.0563	−0.0593	−0.162	−0.169
	(0.00920)	(0.00937)	(0.0270)	(0.0271)
Genetic Tie		0.0846		0.202
		(0.0186)		(0.0393)
Same Religion		0.0677		0.168
		(0.0132)		(0.0494)
Adjacent		−0.000389		0.0159
		(0.0130)		(0.0547)
Neither Landlocked		0.0316		0.0719
		(0.0138)		(0.0314)
ln(Distance)		−0.0265		−0.0855
		(0.0271)		(0.0862)
Pair fixed effects	X	X	X	X
Year fixed effects	X	X	X	X
Observations	87,236	87,236	87,236	87,236
F-statistic	37.48	40.11	35.91	38.78

Notes: This table reports first-stage estimates of the relationship between kinship connections and apolitical deaths along the shortest network path between rulers in the previous five years. All specifications include fixed effects for dyad and year. Columns 2 and 4 include controls for geographic characteristics and each dyad's genetic relationship and religious similarity. Standard errors clustered two-way by country are reported in parentheses.

E. *Main IV Estimates*

With our instrument in hand, we use two-stage least squares (2SLS) to estimate the following model:

$$(3) \qquad War_{(i,j),y} = \alpha + \beta \cdot \widehat{\left(\frac{1}{d}\right)}_{(i,j),y} + \delta \cdot X_{(i,j),y} + \theta_{(i,j)} + \theta_y + \epsilon_{(i,j),y},$$

$$(4) \qquad \left(\frac{1}{d}\right)_{(i,j),y} = c + \phi Z_{(i,j),y} + \gamma \cdot X_{(i,j),y} + \omega_{(i,j)} + \omega_y + \xi_{(i,j),y}.$$

This follows our OLS specification, except it treats inverse network distance as an endogenous variable and instruments for it using a dummy for recent on-path deaths. First-stage estimates (of equation (4)) are reported in Table 3, and causal estimates for the impact of inverse kinship distance on war incidence are reported in Table 4. Columns 2 and 4 of Table 3 correspond to equation (3) above, where kinship distance is measured by shortest path length and resistance distance, respectively. Columns 1 and 3 exclude $X_{(i,j),y}$, the vector of controls.

We find that our instrument (recent deaths) displays a strong negative correlation with both measures of inverse kinship distance. The strength of the instrument is evidenced by large (>10) Kleibergen-Paap *F*-statistics.[28] Pair fixed effects control

[28] One may be worried about serial correlation in our setting. In that case, Montiel Olea and Pflueger's (2013) weak instrument test is the appropriate one. Applying this test to our main specification (column 2 of Tables 3 and 4), we find an effective *F*-statistic of 41.4 and a critical value of 37.4 for ($\alpha = 0.05, \tau = 0.05$). This means that, with 95 percent confidence, the worst-case bias induced by our instrument is less than 5 percent.

Table 4—Main Results

	War (1)	War (2)	War (3)	War (4)
$(\text{Path})^{-1}$	−0.297	−0.285		
	(0.0732)	(0.0667)		
$(\text{Resistance})^{-1}$			−0.104	−0.1000
			(0.0291)	(0.0271)
Genetic Tie		0.0333		0.0294
		(0.0123)		(0.0128)
Same Religion		−0.00416		−0.00664
		(0.00863)		(0.00895)
Adjacent		0.0303		0.0320
		(0.0199)		(0.0216)
Neither Landlocked		0.000446		−0.00136
		(0.00435)		(0.00407)
ln(Distance)		−0.0116		−0.0126
		(·)		(·)
Pair fixed effects	X	X	X	X
Year fixed effects	X	X	X	X
Observations	87,236	87,236	87,236	87,236

Notes: This table reports estimates of a linear probability model explaining dyadic war frequency as a function of living kinship connection between rulers. To account for potentially endogenous kinship connections, we instrument for kinship connection using variation induced by apolitical deaths along the shortest network path between rulers in the previous five years. All specifications include fixed effects for dyad and year. Columns 2 and 4 include controls for geographic characteristics and each dyad's genetic relationship and religious similarity. Standard errors clustered two-way by country are reported in parentheses. Omitted standard errors are due to insufficient variation (within dyad).

for the fact that dyads with different average connectedness will have different frequencies of on-path death. With these included, our identification is based on the short-term deviation from a country pair's average level of connectedness generated by on-path deaths. Our estimates are not sensitive to the inclusion of other dyad-level covariates.

Columns 1–4 of Table 4 estimate the effect of kinship ties on war incidence. So long as dyad fixed effects are included, we estimate a large and significant negative relationship between inverse network distance, no matter how measured, and war. Column 2 reports our preferred specification.

Given that the estimate is a local average treatment effect (LATE), care is necessary when interpreting the coefficients. A naïve reading of our results would suggest that a change from being immediately connected, $(\text{Path})^{-1} = 1$, to unconnected, $(\text{Path})^{-1} = 0$, causes a 28.5 percentage point increase in war incidence. However, variation of that magnitude is never observed because a pair of rulers with a shortest path of length one cannot have an individual between them die.

Rather, the coefficient measures a marginal effect and should be understood with respect to the typical identifying variation. From the first-stage regressions, we see that a recent on-path death produces an average change in inverse shortest path length of -0.06. That reduction is roughly the difference between a shortest path length of four and five. The results indicate that this variation causes (with 95 percent confidence) a 1.69 ± 0.9 percentage point increase in (yearly) war incidence.

Table 5—Alternate Outcomes First Stage

	$(\text{Path})^{-1}$ (1)	$(\text{Path})^{-1}$ (2)	$(\text{Path})^{-1}$ (3)	$(\text{Path})^{-1}$ (4)
On-Path Death	−0.0576	−0.0838	−0.0593	−0.0593
	(0.00922)	(0.0114)	(0.00943)	(0.00943)
Genetic Tie	0.0853	0.0117	0.0823	0.0823
	(0.0184)	(0.0338)	(0.0181)	(0.0181)
Same Religion	0.0677	0.0714	0.0681	0.0681
	(0.0132)	(0.0403)	(0.0131)	(0.0131)
Adjacent	−0.00115	0.00317	0.000156	0.000156
	(0.0137)	(0.0217)	(0.0129)	(0.0129)
Neither Landlocked	0.0316	0.0335	0.0317	0.0317
	(0.0140)	(0.0390)	(0.0138)	(0.0138)
ln(Distance)	−0.0309	0.0187	−0.0286	−0.0286
	(0.0277)	(0.0497)	(0.0265)	(0.0265)
Pair fixed effects	X	X	X	X
Year fixed effects	X	X	X	X
Observations	83,801	3,372	86,958	86,958
F-statistic	38.95	54.14	39.47	39.47

Notes: This table reports first-stage estimates of the relationship between kinship connections and apolitical deaths along the shortest network path between rulers in the previous five years. Columns 1 and 2 restrict the sample such that dyads were respectively at peace or war in the previous year. Standard errors clustered two-way by country are reported in parentheses.

That is a 42.3 ± 17.5 percent increase over the overall dyadic war frequency of approximately 4.0 percent. Alternatively, consider a pair of monarchs who move from having their children married to being disconnected. This would correspond to a decrease in inverse shortest path length of $1/3$ and a 9.5 percentage point increase in war frequency in each year until the network connection is rebuilt.

These estimates suggest the role of living kinship ties in reducing conflict is substantial. Similarly large effects are estimated when we use resistance as our measure of kinship distance. These effect sizes help justify the huge amount of energy exerted over dynastic marriage negotiations. It also helps explain the central role of marriage in peace negotiations to end wars.

The estimated reduction in war incidence could either be from fewer wars starting or from the wars that do occur lasting fewer years. To differentiate between these channels, we change our outcome variable. We consider the effect of inverse network distance on whether a dyad starts (continues) a war, conditional on previously being at peace (war). We also consider a nonbinary measure of war intensity, log of battle deaths, as an outcome.

Estimates of these regressions are reported in Table 6. We find that increases in inverse network distance cause decreases in both the rate at which conflicts start and the duration of conflicts that do start. We again interpret the estimated coefficients with respect to the typical variation in path length induced by observed on-path deaths. From columns 1 and 2 of Table 5, we see this variation is -0.058 when a dyad was at peace in the previous year and -0.084 following a year of war. So, a typical on-path death increases the probability of war onset by 0.29 percentage points. This is roughly a 33 percent increase over a base war onset frequency

Table 6—Alternate Outcomes

	War start (1)	War continue (2)	Conflict severity (3)	Conflict severity (4)
$(\text{Path})^{-1}$	−0.0506	−0.543	−3.905	−2.318
	(0.0135)	(0.224)	(1.036)	(0.592)
Genetic Tie	0.00520	0.0150	0.462	0.288
	(0.00165)	(0.0180)	(0.138)	(0.0806)
Same Religion	−0.00483	0.0198	−0.0616	−0.0425
	(0.00289)	(0.0235)	(0.101)	(0.0629)
Adjacent	0.0104	−0.0405	0.426	0.288
	(0.00448)	(0.0223)	(0.261)	(0.162)
Neither Landlocked	0.0113	−0.892	−0.141	−0.0882
	(0.00625)	(0.0396)	(0.136)	(0.0818)
ln(Distance)	−0.00523	0.0311	−0.119	−0.0859
	(0.00306)	(·)	(·)	(·)
Pair fixed effects	X	X	X	X
Year fixed effects	X	X	X	X
Observations	83,801	3,372	86,958	86,958
Notes			Battle deaths	Battle deaths per dyad-year

Notes: This table reports estimates of our main specification (Table 4, column 2) with alternate outcome variables. Columns 1 and 2 restrict the sample such that dyads were respectively at peace or war in the previous year. Column 3 measures conflict severity as $\ln(1 + \text{Battle Deaths})$. Column 4 evenly distributes battle deaths in war among all dyad-years involved in that war. All specifications include fixed effects for dyad and year. Standard errors clustered two-way by country are reported in parentheses. Omitted standard errors are due to insufficient variation (within dyad).

of 0.87 percent. Similarly, the probability of a war continuing from the previous year increases by 4.6 percentage points following a typical on-path death. This is a proportionally smaller effect since wars continue at a rate of 81.4 percent.

Column 3 of Table 6 reports the effect of changes in network distance on conflict severity, $\ln(1 + \text{Battle Deaths})$. Conflict severity is measured at the war level (rather than by dyad-year), assigning the total amount of battle deaths in the war to all dyad-years associated with the conflict. Column 4 adjusts the conflict severity measure by the number of dyad-years involved in a war (i.e., it evenly distributes battle deaths from the war across dyad-years). These results suggest that a typical on-path death would increase conflict severity (as measured by battle deaths) by 14.7 percent to 26.1 percent depending on the measure used. As with our main results, a more severe shock would have a larger effect.

V. Identification and Robustness

In this section, we first discuss the key assumptions underlying our IV analysis and the potential threats to identification in this setting. We then present a variety of alternate specifications of the IV analysis to address these identification concerns. Finally, we conduct Monte Carlo simulations on a comparable set of placebo deaths to allow for robust randomization inference. Randomization inference helps address concerns that our analytic standard errors are not sufficiently conservative or that our results are driven by bias in our estimator.

A. *Identification and the Exclusion Restriction*

In order for our instrument to be valid, it must be strongly correlated with $1/d$ and satisfy the exclusion restriction. The necessary strong correlation is directly verified in first-stage regressions and can be seen in Figure 4. In this setting, the exclusion restriction can be written as

$$\text{(ER)} \qquad War_{(i,j),y} \perp\!\!\!\perp Z_{(i,j),y} \,|\, \left\{ \left(1/d\right)_{(i,j),y}, X_{(i,j),y}, \theta_y, \theta_{(i,j)} \right\}.$$

The exclusion restriction cannot be directly tested and faces an array of potential concerns. Note that (ER) requires that the on-path deaths we use to construct our instrument are independent of war probability conditional on observables. In other words, our identifying assumption is that recent on-path deaths relate to war only through their impact on network distance. Violations of (ER) can be thought of in three classes: reverse causality, effects through nonnetwork channels, and omitted variables.

The most obvious threat to (ER) is reverse causality. In other words, one might worry that on-path deaths are caused by wars and not vice versa. This concern is partially dealt with by only using lagged deaths to construct our instrument. We also exclude politically motivated on-path deaths from our analysis. Indirect channels such as war increasing the likelihood of death by cutting supply lines or otherwise affecting environmental factors are implausible given the close-death placebo null result. We can also address reverse causality by selectively excluding deaths that are possibly caused by a tense political situation. The default instrument already excludes violent political deaths. In the next subsection, our robustness analysis investigates further restrictions on the list of deaths used for identification.

A second concern is that deaths directly affect war frequency through nonnetwork channels. For instance, these deaths could have a direct effect on war by creating political instability. For example, they may alter lines of succession, install inexperienced individuals in senior leadership positions, or simply have a psychological effect on one of the rulers. Our "any war" event study rules out the possibility that on-path deaths create political vacuums that increase the chance of war generally rather than bilaterally. The event study section also established that the deaths of close relatives "off-path" are not correlated with increased war frequency. In principle, this rules out the possibility that deaths of individuals closely connected to a ruler have a direct effect on war incidence. Admittedly, the deaths of close relatives are not a perfect placebo. For example, close relatives may be more or less likely to be in positions of responsibility than on-path royals. To address these issues, our robustness analysis investigates the effects of nonmonarch deaths and deaths of individuals from third-party countries.

Third, we might face an omitted variable problem. For instance, a major epidemic or famine might cause both noble deaths and political turmoil. Regarding these specific examples, none of our royals with identified causes of death died of starvation and only a single one died of plague. While epidemics did occur during our time period, these were localized to a single city or region. The two major continent-wide epidemics, the Black Death (peaking c.1346–1353) and the Spanish Flu (1918),

Table 7—Robustness: Cause of Death

	War (1)	War (2)	War (3)
$(\text{Path})^{-1}$	−0.336	−0.321	−0.323
	(0.134)	(0.133)	(0.0869)
Genetic Tie	0.0375	0.0363	0.0365
	(0.0166)	(0.0111)	(0.0121)
Same Religion	−0.000767	−0.00174	−0.00160
	(0.0103)	(0.0124)	(0.00850)
Adjacent	0.0303	0.0303	0.0303
	(0.0201)	(0.0201)	(0.0201)
Neither Landlocked	0.00179	0.00140	0.00146
	(0.00473)	(0.00475)	(0.00437)
ln(Distance)	−0.0128	−0.0125	−0.0125
	$(\cdot)$	$(\cdot)$	$(\cdot)$
Pair fixed effects	X	X	X
Year fixed effects	X	X	X
Observations	87,236	87,236	87,236
Notes	Known cause deaths	Unexpected deaths	Nonstress deaths

Notes: This table reestimates the main specification (Table 4, column 2) using alternate lists of on-path deaths. All specifications include fixed effects for dyad and year. Standard errors clustered two-way by country are reported in parentheses. Omitted standard errors are due to insufficient variation (within dyad).

lie outside our analysis period. Of course, there are potentially many other omitted variables. We partially address this issue through the use of fixed effects. The inclusion of dyad fixed effects removes any persistent, dyad-specific unobservables, while year fixed effects remove temporary, widespread shocks. In addition, as a robustness test, we study a model with country-year fixed effects that accounts for time-varying, country-specific unobservables that might cause both royal deaths and wars.

Supposing the instrument is valid, it is important to think carefully about what this source of variation allows us to identify. On-path deaths can only occur along existing network paths, and the variation is always in the direction of reducing connectivity. Our estimates are of the marginal impact of increases in network distance on conflict activity within dyads that share kinship ties. Thus, the correct interpretation of results based on this instrument is as a local average treatment effect. In principle, changes in living kinship ties may be directionally asymmetric. Thus, our analysis does not provide direct evidence on how an unconnected dyad would respond to the formation of a new kinship tie.[29] In future work, this could potentially be addressed through a structural model of the specific mechanism through which kinship networks reduce conflict.

[29] Earlier versions of this paper explored potential instruments for *increases* in connectivity. However, these tend to suffer from a lack of power. For instance, we attempted to leverage the occurrence of opposite gender first-born children of rulers to instrument for the probability of royal marriage. While point estimates are consistent with a symmetric effect, there are too few prince-princess marriages to yield statistical significance.

Table 8—Robustness: Alternate Mechanisms

	War (1)	War (2)	War (3)	War (4)
$(\text{Path})^{-1}$	−0.484	−0.161	−0.138	−0.124
	(0.123)	(0.0653)	(0.0516)	(0.0583)
Genetic Tie	0.0497	0.0231	0.0178	0.0156
	(0.0145)	(0.0146)	(0.0110)	(0.00913)
Same Religion	0.00908	−0.0124	−0.00296	−0.0233
	(0.00906)	(0.00902)	(0.0104)	(0.00732)
Adjacent	0.0304	0.0302	0.0270	0.0146
	(0.0210)	(0.0193)	(0.0123)	(0.0112)
Neither Landlocked	0.00568	−0.00280	−0.00218	−0.00208
	(0.00433)	(0.00466)	(0.00475)	(0.00632)
ln(Distance)	−0.0165	−0.00850	−0.0310	−0.0105
	(·)	(·)	(0.00797)	(0.0220)
Pair fixed effects	X	X		X
Year fixed effects	X	X		
Country-year fixed effects			X	X
F-statistic	87,236	87,236	87,281	87,236
Notes	Third-party	Nonruler		

Notes: The first two columns of this table modify the main specification (Table 4, column 2) by excluding certain on-path deaths that might change war probability through a mechanism other than kinship ties. The first column restricts attention to the deaths of individuals not known to be close associates of the rulers of the impacted dyads. The second column restricts attention to the on-path deaths of nonrulers. Columns 3 and 4 include country-year fixed effects alone and in combination with pair effects, respectively. Omitted standard errors are due to insufficient variation (within dyad).

B. *IV Robustness*

In order to address the concerns discussed above, we investigate how our main IV result (Table 4, column 2) is affected by various alternative specifications. In particular, we restrict attention to different subsets of the data and alternate definitions of the instrument. Tables 7, 8, and 9 report these robustness checks.[30]

Table 7 reports estimates using alternate instruments that remove deaths of certain types. All three of these specifications produce very similar point estimates and are not significantly different than our main result. Column 1 restricts attention to deaths of known cause. Column 3 removes any death that appears to have been related to stress induced by either domestic or international political concerns. This helps to address the concern that a tense geopolitical situation might be an omitted variable that leads to both on-path death and war. Finally, there were a significant number of individuals whom we were unable to identify causes of death for. Column 2 uses only unexpected deaths.

In Table 8, we attempt to exclude alternate mechanisms that could be driving our results. For example, the death of a monarch's close relative may mean the loss of an important advisor or removal of a key political ally. This, in turn, could increase the chance of war. Column 1 shows that focusing exclusively on deaths of mutual relatives from third-party countries actually *increases* the size of our effect. Third-party

[30] All first-stage regressions pass weak instrument tests and are omitted for brevity.

Table 9—Sample Restriction Robustness

	War (1)	War (2)	War (3)	War (4)
$(\text{Path})^{-1}$	−0.281	−0.179	−0.310	−0.256
	(0.0951)	(0.0609)	(0.116)	(0.120)
Genetic Tie	0.0361	0.00810	0.0356	0.0329
	(0.0191)	(0.00784)	(0.0132)	(0.0106)
Same Religion	−0.0104	0.0161	−0.00462	−0.00356
	(0.0126)	(.)	(0.0112)	(0.0106)
Adjacent	0.0612	0.00728	0.0345	0.0335
	(0.0293)	(0.0283)	(0.0253)	(0.0280)
Neither Landlocked	−0.00598	0.00271	0.00636	
	(0.00850)	(0.00350)	(0.00363)	
ln(Distance)	−0.0412	−0.00119	0.0115	
	(0.0130)	(0.00500)	(.)	
Pair fixed effects	X	X	X	X
Year fixed effects	X	X	X	X
Observations	57,814	29,272	53,307	25,082
Notes	Pre-1800	Post-1800	Drop Habsburgs	Long-lived polities

Notes: This table reestimates the main specification (Table 4, column 2) using various restricted samples. Column 3 drops all dyads including at least one Habsburg ruler. Column 4 includes only countries that existed for at least 85 percent of sample years. All specifications include fixed effects for dyad and year. Standard errors clustered two-way by country are reported in parentheses. Omitted standard errors are due to insufficient variation (within dyad).

deaths are on-path deaths with two additional characteristics. First, the individual is not known to have died in either of the dyad countries. Second, the individual is not known to be a member of a dynasty currently ruling either of the two countries.

Another possibility is that the death of monarchs causes power vacuums that lead to more frequent war. To address this possibility, column 2 restricts attention to on-path deaths of nonmonarchs. We see this somewhat reduces the measured effect size; however, the change in network distance remains an important and statistically significant predictor of war incidence in this specification. Finally, one might be concerned that the effect we observe is not bilateral but instead that the death of a relative affects a ruler's likelihood of fighting wars with all parties without regard to the kinship network structure. We address this issue in columns 3 and 4. These specifications show that our result still holds when using country-year fixed effects. In other words, even controlling for potential short-run increases in a country's overall bellicosity following network disruptions, we still find that the effect is differentially stronger within the dyad. This final result is consistent with the null relationship between on-path death and "Any War" in event study Figure 7.

Finally, Table 9 reports our analyses for different subsets of the data. Columns 1 and 2 suggest that the effect of kinship on conflict is time varying, with a more substantial effect in the earlier part of our sample. This is unsurprising since the centralization of power in the hands of monarchs decreased and diplomacy increasingly professionalized in the modern period (corresponding roughly to the last century of our data). Column 3 shows that the estimated effect is roughly unchanged when dyads including Habsburg rulers are dropped. To create a more balanced panel, column 4 restricts attention to polities that are in our sample in at least 85 percent of observed years.[31] The estimated coefficient is similar to our main specification. This should assuage concerns that our estimates are biased due to endogenous entrance and exit from our sample as the result of war outcomes, or due to our country inclusion criteria.

C. *Robust Randomization Inference*

A final potential issue for our estimates is the correlation structure of the death shocks. An important feature of our data is that a single death typically leads to many shortest path disruptions. These disruptions change a single ruler's connection with many other states. Because our instrument is based on these disruptions, correlation of this type would cause standard errors to be too small. Two-way clustered standard errors are meant to be robust to these correlations. With those standard errors, our main results are highly significant—often at the 0.1 percent level. However, Cameron and Miller (2015) show this clustering procedure fails to account for some possible types of correlation.

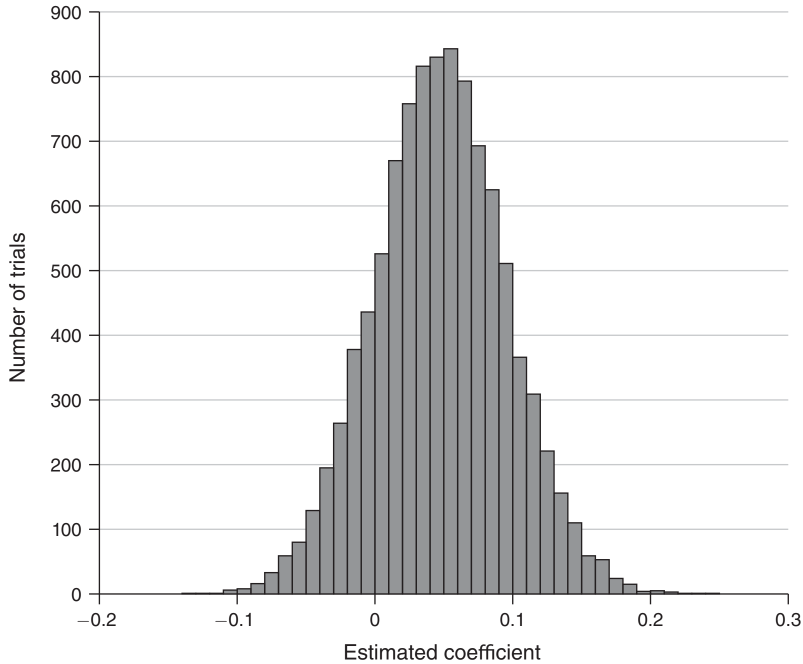
To confirm that our analytic standard errors are not overconfident, we conduct robust randomization inference based on Monte Carlo analysis. We do this by randomly generating a series of placebo instruments and reestimate our main IV specification.

To make our placebo simulations comparable to the true instrument, we use the following procedure. We begin by randomly assigning "base" treatment events to specific ruler-years. We use Bernoulli draws with a parameter calibrated to generate an expected 274 base events (the number of nonpolitical deaths in the data). This mimics the individual deaths underlying our instrument. We then flip a coin to decide which of the two rulers the placebo "death" was closer to. We assign placebo on-path death events to every dyad that ruler is connected to in that year. This procedure makes the simulated instrument even more correlated across specific ruler-years than the true instrument. Therefore, this approach is robust in the sense that it produces a more dispersed distribution of coefficient estimates. This exercise yields the distribution of estimates an instrument like ours would produce by chance.

This procedure is performed 10,000 times. For each iteration, we replicate the instrumental variable analysis from Table 4, column 2. The parameter of interest is the 2SLS estimated coefficient on inverse path length generated by instrumenting with these placebo treatments. Summary statistics and the histogram of estimated values are presented in Figure 8.

The mean estimate in these simulations is 0.0475. This alleviates concerns that our main estimator is negatively biased. The standard deviation of the simulated estimates, 0.0478, is smaller than our analytic standard error (0.0667). The coefficient estimated on the real data, −0.285, is more negative than any of the 10,000 simulated estimates. We conclude it is highly unlikely that our main estimate was produced by chance.

[31] Ninety percent or 95 percent thresholds produce qualitatively similar results. Eighty-five percent is the lowest natural threshold, which excludes France, a country that became a republic (and thus exited our sample) several times, the last of which as a result of a defeat in war.



Trials	Mean	Standard deviation	Min	Max
10,000	0.0475	0.0478	−0.136	0.246

FIGURE 8

Note: Distribution of simulated estimates of the effect of inverse shortest path length on war, instrumented using placebo shortest path deaths.

VI. Conclusion

We construct a dataset that links a genealogy of European royals to lists of sovereign monarchies, interstate wars, and several covariates. The data provide a rich environment to study the influence of interpersonal relationships on long-run macroeconomic, political, and institutional outcomes. This paper focused on the relationship between kinship and conflict. However, the same data and network tools might well be applied to more traditional economic questions. We think future work investigating the long-run implications of leaders' kinship networks for trade, growth, cultural diffusion, and development will be fruitful.

The data reveal a dramatic increase in kinship connections between European monarchs over time. Viewing the genealogy as a kinship network, we use exogenous variation in network structure to provide evidence that close living kinship ties substantially reduced the frequency and duration of war.

Consistent with existing literature, we document a decline in conflict in Europe after 1800. Specifically, we observe 3.01 percent of dyad-years at war from 1495 to 1600 compared to only 1.38 percent from 1800 to 1918. Given these findings, it is natural to ask how much of this decline can be attributed to increased kinship ties. While it is difficult to say definitively, our results allow a back-of-the-envelope analysis. Suppose we replaced the nineteenth century's kinship network with its sixteenth-century counterpart. This would result in average inverse shortest path length falling from 0.118 to 0.073. In the post-1800 subsample, we estimate a reduction in connectivity of this magnitude would cause war incidence to increase by 0.73 percentage points. Thus, our results suggest that roughly 45 percent of the decline in war can be attributed to growing kinship ties between rulers. While we acknowledge this sort of extrapolation is imperfect, it suggests that royal family networks played a significant role in keeping the peace.

This important quantitative role for dynastic marriage in international politics is consistent with its historical reach. Dynastic marriages and marriage alliance were not just a feature of early modern European politics but are a recurrent phenomenon across regions of the world and levels of development. Dynastic marriages are mentioned in the Bible (between King Solomon and a Pharaoh's daughter), are used to settle disputes between warring primitive tribes (Lévi-Strauss 1949), and are invoked today in debates around Chinese sovereignty over Tibet (Princess Wencheng of the Tang Dynasty was married to the King of Tibet in 641).

One broad takeaway from this project is that international relations models that eschew the role of individuals in favor of the collective state are likely ignoring important variables. Rather than being solely driven by abstract geostrategic imperatives, we show that international political outcomes are greatly influenced by a leader's personal identity and interpersonal relationships. This is in line with the public choice tradition, which emphasizes the role of the individual in politics. It is also consistent with Jones and Olken (2005), who find that the identity of autocratic world leaders has been an important determinant of economic growth in the modern age.

While our study is focused on a specific region and bygone era, its key message is universal and timeless. Close lines of communication and tight personal relationships between leaders are vital to preserving peace. In the past, these ties took the form of royal family relationships. Today, professional diplomats may play the same role. Interruptions of these linkages can have devastating consequences, and thus redundancy in these systems is highly desirable.

REFERENCES

Ancestry.com. 2018. The Ancestry.com Online Genealogy – Multiple Entries. Retrieved December 3, 2018. www.ancestry.com. See data for detailed tabular citations.

Banerjee, Abhijit, Arun G. Chandrasekhar, Esther Duflo, and Matthew O. Jackson. 2016. "Gossip: Identifying Central Individuals in a Social Network." Stanford Working Paper 515.

Benzell, Seth G. and Kevin Cooke. 2021. "Replication data for: A Network of Thrones: Kinship and Conflict in Europe, 1495–1918." American Economic Association [publisher], Inter-university Consortium for Political and Social Research [distributor]. https://doi.org/10.3886/E117045V1.

Bonney, Richard. 1991. *The European Dynastic States, 1494–1660*. Short Oxford History of the Modern World. New York: Oxford University Press.

Brecke, Peter. 2012. "Violent Conflicts 1400 AD to the Present in Different Regions of the World." Unpublished.

Cameron, A. Colin, and Douglas L. Miller. 2015. "A Practitioner's Guide to Cluster-Robust Inference." *Journal of Human Resources* 50 (2): 317–72.

Cokayne, George Edward, ed. 1890. *Complete Peerage of England, Scotland, Ireland, Great Britain and the United Kingdom: Extant, Extinct, or Dormant*. London: George Bell and Sons.

Cummins, Neil. 2017. "Lifespans of the European Elite: 800–1800." *Journal of Economic History* 77 (2): 406–39.

Curzon, Catherine. 2018. Madame Gilflurt's Guide to Life: Glorious Georgian Gossip from the Quill of Catherine Curzon. Notable Deaths – Multiple Entries. Retrieved December 3, 2018. www.madamegilflurt.com. See data for tabular citations.

de la Croix, David, and Omar Licandro. 2015. "The Longevity of Famous People from Hammurabi to Einstein." *Journal of Economic Growth* 20 (3): 263–303.

Dube, Oeindrila, and S.P. Harish. 2020. "Queens." *Journal of Political Economy* 128 (7): 2579–2652.

Egan, E.W., Constance B. Hintz, and Leonard F. Wise, ed. 1976. *Kings, Rulers and Statesmen*. New York: Sterling.

Encyclopædia Britannica Eleventh Edition. 2018. Multiple entries. Retrieved December 3, 2018. www.britannica.com. See data for detailed tabular citations.

Encyclopedia.com. 2018. People: History – Multiple Entries. Retrieved December 3, 2018. www.Encyclopedia.com. See data for detailed tabular citations.

Erasmus, Desiderius. *The Education of a Christian Prince*. Translated by Lester K. Born. New York: W.W. Norton, 1968. Originally published as *Institutio Principis Christiani*. (1532).

Fichtner, Paula Sutter. 1976. "Dynastic Marriage in Sixteenth-Century Habsburg Diplomacy and Statecraft: An Interdisciplinary Approach." *American Historical Review* 81 (2): 243–65.

Fisman, Raymond. 2001. "Estimating the Value of Political Connections." *American Economic Review* 91 (4): 1095–1102.

Fleming, Patricia H. 1973. "The Politics of Marriage among Non-Catholic European Royalty." *Current Anthropology* 14 (3): 231–49.

Gat, Azar. 2013. "Is War Declining—and Why?" *Journal of Peace Research* 50 (2): 149–57.

Geneanet. 2018. The Genealogy Library – Multiple Entries. Retrieved December 3, 2018. www.en.geneanet.org. See data for detailed tabular citations.

Geni.com. 2018. Geni Online Genealogy – Multiple Entries. Retrieved December 3, 2018. www.geni.com. See data for detailed tabular citations.

Gibler, Douglas M. 2008. *International Military Alliances, 1648–2008*. Washington, DC: CQ Press.

Heritage History. 2018. Resources – Multiple Entries. Retrieved December 3, 2018. www.heritage-history.com. See data for detailed tabular citations.

Hoffman, Philip T. 2012. "Why Was It Europeans Who Conquered the World?" *Journal of Economic History* 72 (3): 601–33.

Hooker, David. 2018. The Hooker Family Genealogy Page – Multiple Entries. Retrieved December 3, 2018. www.djhooker.com. See data for detailed tabular citations.

Iyigun, Murat. 2008. "Luther and Suleyman." *Quarterly Journal of Economics* 123 (4): 1465–94.

Iyigun, Murat, Nathan Nunn, and Nancy Qian. 2017. "Winter Is Coming: The Long-Run Effects of Climate Change on Conflict, 1400–1900." NBER Working Paper 23033.

Jackson, Matthew O. 2008. *Social and Economic Networks*. Princeton, NJ: Princeton University Press.

Jackson, Matthew O., and Stephen Nei. 2015. "Networks of Military Alliances, Wars, and International Trade." *PNAS* 112 (50): 15277–84.

Jones, Benjamin F., and Benjamin A. Olken. 2005. "Do Leaders Matter? National Leadership and Growth since World War II." *Quarterly Journal of Economics* 120 (3): 835–64.

Klein, D.J., and M. Randić. 1993. "Resistance Distance." *Journal of Mathematical Chemistry* 12 (1): 91–95.

Koenig, Marlene Eilers. 2018. Royal Musings – Multiple Entries. Retrieved December 3, 2018. royalmusingsblogspotcom.blogspot.com. See data for detailed tabular citations.

Langer, William L. 1972. *An Encyclopedia of World History*. 5th ed. Boston: Houghton Mifflin.

Lévi-Strauss, Claude. *The Elementary Structures of Kinship*. Translated by James Harle Bell. Boston: Beacon Press, 1969. Originally published as *Les Structures Élémentaires de la Parenté*. (Paris: Presses Universitaires de France, 1949)

Levy, Jack S. 1983. *War in the Modern Great Power System: 1495–1975*. Lexington: University Press of Kentucky.

Levy, Jack S., and William R. Thompson. 2005. "Hegemonic Threats and Great-Power Balancing in Europe, 1495–1999." *Security Studies* 14 (1): 1–33.

Mad Monarchist. 2018. Multiple entries. Retrieved December 3, 2018. See data for detailed tabular citations.

Marshall, Monty G., and Ted Robert Gurr. 2014. "Polity IV Project: Political Regime Characteristics and Transitions, 1800–2013." Center for Systemic Peace. https://www.systemicpeace.org/polity/polity4x.htm (accessed December 3, 2018).

Montiel Olea, José Luis, and Carolin Pflueger. 2013. "A Robust Test for Weak Instruments." *Journal of Business and Economic Statistics* 31 (3): 358–69.

Oman, Carola. 2000. *The Winter Queen: Elizabeth of Bohemia*. New Haven: Phoenix.

Padgett, John F., and Christopher K. Ansell. 1993. "Robust Action and the Rise of the Medici, 1400–1434." *American Journal of Sociology* 98 (6): 1259–1319.

Parker, Geoffrey, ed. 1997. *The Thirty Years' War*. 2nd ed. New York: Routledge.

Phillips, Charles, and Alan Axelrod. 2004. *Encyclopedia of Wars*. New York: Facts on File.

Radziwill, Catherine. 1915. *The Royal Marriage Market of Europe*. New York: Funk and Wagnalls Co.

Reed, Frank. 2016. "Centennia Historical Atlas Map Series, Version 3.10." Historical Atlas. http://historicalatlas.com/ (accessed December 3, 2018).

Roca Fernández, Eric. 2016. "Inheritance Systems and the Dynamics of State Capacity in Medieval Europe." https://www.google.com/search?client=firefox-b-1-d&q=Inheritance+Systems+and+the+Dynamics+of+State+Capacity+in+Medieval+Europe.

Sarkees, Meredith Reid, and Frank Wayman. 2010. *Resort to War: 1816–2007*. Washington, DC: CQ Press.

Schwennicke, Detlev. 1980–2013. *Europäische Stammtafeln: Stammtafeln zur Geschichte der Europäischen Staaten, Neue Folge*. [*European Family Trees: Family Trees for the History of European States, New Series*.] First series by Wilhelm Karl, Prinz zu Isenburg, continued second series by Frank, Baron Freytag von Loringhoven. 29 vols. Marburg, Germany: Verlag von J. A. Stargardt.

Simms, Brendan. 2014. *Europe: The Struggle for Supremacy, from 1453 to the Present*. New York: Basic Books.

Smith, Preserved. 1920. *The Age of Reformation*. New York: Henry Holt and Company.

Sorokin, Pitirim A. 1937. *Social and Cultural Dynamics: Fluctuation of Social Relationships, War, and Revolution*, Vol. 3. Woodstock, GA: American Book Company.

Spolaore, Enrico, and Romain Wacziarg. 2016. "War and Relatedness." *Review of Economics and Statistics* 98 (5): 925–39.

Spuler, Bertold. 1977. *Rulers and Governments of the World*, Vol. 2. London: Rr Bowker.

Tapsell, R.F. 1983. *Monarchs, Rulers, Dynasties and Kingdoms of the World*. London: Thames and Hudson.

Tipton, Jim, Russ Dodge, A.J. Marik, and Mark. 2018. Find A Grave – Multiple Entries. Retrieved December 3, 2018. www.findagrave.com. See data for detailed tabular citations.

Tompsett, Brian C. 2014. Directory of Royal Genealogical Data. Department of Computer Science, University of Hull. Provided by author. Accessible online at Open IPCSR https://www.openicpsr.org/openicpsr/project/117045/version/V1/view.

Voost, Geraldine. 2018. Unofficial Royalty: The Site for Royal News and Discussion. Monarchs, Heirs and Successions and Royal Illnesses and Deaths – Multiple Entries. Retrieved December 3, 2018. www.unofficialroyalty.com. See data for detailed tabular citations.

Wikipedia, The Free Encyclopedia. 2018. Multiple entries. Retrieved December 3, 2018. wikipedia.org. See data for detailed tabular citations.

WikiTree, Where Genealogists Collaborate. 2018. Wikitree Online Genealogy – Multiple Entries. Retrieved December 3, 2018. www.wikitree.com. See data for detailed tabular citations.

Wright, Quincy. 1942. *A Study of War*, Vols. 1–2. 2nd ed. Chicago: University of Chicago Press.