Democracy, Hegemony, and War: New Data from the Ancient World

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Abstract

We examine the correlates of war by studying a large and newly compiled dataset on warfare in the ancient world (600 to 30 BCE). Our data allow us to test two main explanations for international peace: hegemony and democracy. First, we seek empirical support for the democratic peace outside of the modern period and find that the democratic peace is not an empirical regularity among Ancient Greek city-states. Second, we explore the relationship between relative state-sizes and war and find mixed results, both in and outside of Greece. [1]

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The republican constitution ... has also the prospect of attaining the desired result, namely, perpetual peace

- Kant *1795 - First Definitive Article of Perpetual Peace*

For States ... there can be, according to reason, no other way of advancing from that lawless condition which unceasing war implies, than by giving up their savage lawless freedom

- Kant *1795 - Second Definitive Article of Perpetual Peace*

I Introduction

Scholars posit opposing theories of why some states and some periods in history are more prone to violence and conflict than others. Central to this disagreement is the relative importance of state-specific vs international-level characteristics, such as democracy and hegemony, in determining the frequency and nature of war (Levy 1988). However, the quantitative literature generally focuses on the Napoleonic period onwards. A major concern with all empirical work of this kind is whether the insights generated by examining one period of history or set of countries can be applied to another period or part of the world. We introduce a new data set in a different setting to shed light on the debate.

International relations theorists have discussed whether or not the "democratic peace',' evident in the nineteenth and twentieth centuries, reflects the causal impact of democracy on the probability of war or is generated by some confluence of other factors (Gartzke 2007). Using the same dyadic regressions used in the modern period, we show that within ancient Greece the democratic peace is not an empirical regularity. Our findings are consistent with recent claims that the 'democratic' peace observed among developed economies since 1945 may be driven other factors, such as a liberal or capitalist peace, rather than a specifically democratic one.

Another major branch of scholars argue that the distribution of international power is the main determinant of war (Layne 1994). We systematically examine three different variations. First, we examine how violence correlates with the size difference between Greek city states

and find that violence is increasing, albeit statistically insignificant, with greater size asymmetry of city states.[2] Second, we examine the classical case of Roman hegemony within the Mediterranean, and document that non-Roman violence declined as Rome took over. However, we also explore how the sizes of other historical empires correlate to war and find conflicting results. Overall, there were more battles in the Mediterranean with a more concentrated size distribution of empires. These variations each paint a different picture of what we call the "hegemonic peace".

II Relationship to the Literature

A vast literature in international relations studies the causes of war and conflict (see Levy and Thompson 2010). In recent years there has been an amalgamation and synthesis of the different positions. The question remains as to whether certain types of international structures or the characteristics of individual states are more important in reducing conflict (Moravcsik 1997; Levy and Thompson 2010).[3] Our data allow us to compare the arguments for both sides. Specifically, we examine how democratic political regimes and how the size distribution of states determines affect the level of violence — i.e. the democratic peace and hegemonic peace.

Democratic Peace Theory

The democratic peace hypothesis is founded on the empirical observation that democracies rarely fight one another. This hypothesis originates with Immanuel Kant (1795), received renewed attention in a paper by Doyle (1986), and became the subject of a series of papers in the 1980s and 1990s, (e.g, Levy 1988; Bremer 1992; Maoz and Russett 1993; Dixon 1994; Gartzke 1998; Mesquita et al. 1999). However, the democratic peace hypothesis has come under criti-

[2]This is in line with modern findings (Webb and Krasner 1989).

[3]In the study of the causes of World War I, the influential Fischer hypothesis, for example, gave impetus to the view that Imperial Germany was a uniquely expansionist and destabilizing force in pre-1914 international politics (Fischer 1967, 1961). Similarly, in the study of the ancient world, historians have been decisively influenced by the arguments of Harris 1979. Examining the Roman elite of the high Republic—the period between the end of the Second Punic War and the rise of the Gracchi – Harris showed that this elite both benefitted materially and socially from conflict and portrayed Republican Roman culture as uniquely bellicose (see, also Harris 1984). In showing that Roman elite both celebrated war in it's culture, was inured to its hardships, and benefitted materially from its conduct, Harris and subsequent historians provide sufficient reasons for attributing the high level of violent conflict we observe to factors that are internal to the Roman state (e.g. see Neff 2005 Adams 2007)

cism (Buhaug 2005; Gartzke 2007). Rather than democratic institutions leading to peace, they propose that the presence of interlacing markets and commercial ties that is responsible for the absence of open warfare between advanced developed economies in the post-1945 period (see Gartzke 2007; Mousseau 2013).[4] Since market economies and democracies have coevolved together, disentangling these factors has been challenging. But yet, commercial ties are not the only alternative explanation, rising incomes coincide with democratization over time, as does the invention of the nuclear bomb (Gat 2005), and many other things. In this paper we argue that studying the ancient world allows us another way to examine the validity of the democratic peace in another setting without the presence of many of these confounding factors.

Other have also gone looking into the historical record for evidence of the Democratic Peace. Between 1200 and 1800, Blank, Dincecco, and Zhukov (2017) show that "early parliamentary regimes – the institutional predecessors of modern democracies - were disproportionately more likely to experience armed conflict than their absolutist counterparts". However, Russet (1992, 2006) has argued that the textual evidence from Ancient Greece suggest an imperfect Democratic Peace. Yet Bachteler 1997 and E. Robinson 2001 argue that the qualitative evidence points the other way. We contribute to this literature by providing a systematic empirical study of democracy and violence within Ancient Greece.

Hegemonic Peace

Such an internally focused approach has not gone uncriticized. Others contend that states do not exist in isolation and that their behavior can be decisively shaped by the state systems into which they are embedded.[5] The realist perspectives developed by Hans Morgenthau, Kenneth Waltz, and John Mearsheimer among others emphasize the centrality of the characteristics of the state *system* in determining an particularly states proclivity for conflict (Morgenthau 1948; Waltz 1979; Mearscheimer 2001). In particular, realism as proposed by Waltz argues that

[4]This tradition goes back to the *doux commerce* argument advanced by Montesquieu (see Hirschman 1977). For further recent assessments of this literature see Dafoe 2011.

[5]Eckstein observes that 'the hypothesis of a Roman *Sonderweg*—that Rome owed its success in the Hellenistic international system primarily to internally generated and exceptionally intense militarism and aggression—ought to be treated with skepticism, because it significantly distorts the world with which the Romans had to cope.' (Eckstein 2006, p. 185).

'war is a normal condition in an anarchic state system'. [6] However, (Snidal 1985) argues that "the common presumption of recent analyses that hegemony is widely beneficial rests on such special assumptions that it should be rejected". When applying realism to ancient Greece, Eckstein argues that 'inter-polis conflict was incessant; 'war was a constant' (Eckstein 2006, p. 42). While Eckstein (2006) provided detailed textual evidence, we present a systematic quantitative analysis.

An important variant is the hegemonic transition theory. Scholars such as Organski and Gilpin have identified power-transition crises as events that are likely to trigger large-scale warfare (Organski and Kugler 1980; Gilpin 1981). Even if one thinks that having a single world power creates peace, it is not clear that violence will decrease as an area transitions from multi-polar to bi-polar to mono-polar worlds. Examples given from the ancient world include the Peloponnesian War and Second Punic War. Eckstein identifies one such power transition crisis as arising at the end of 3rd BCE at the moment when the Roman Republic entered the Greek East to challenge Macedonian and Seleucid power (Eckstein 2006; Eckstein 2012). In our data set, war intensified both with the wars of Alexander the Great to build the empire and also with the collapse of the Macedonian Empire.

III Data

We compile a novel and comprehensive data set containing information on battles, political units and human settlements within the ancient world.

Battles

A battle is an armed political conflict with a death that was recorded by a historian. One source of data is Jaques (2007) who compiles the data from a large number of historians on battles and other events. Another source of data is Montagu (2000) who also compiles a data set from a large number of historians on battles. These data are merged and linked to a geographic location. [7] This definition of battle likely excludes many minor tribal and local conflicts that

[6] Robbins (1939) had similarly argued that "The ultimate condition giving rise to those clashes of national economic interest which lead to international war is the existence of independent national sovereignties. Not capitalism, but the anarchic political organization of the world is the root disease of our civilization."

[7] We do this with the mapped locations from the Pleiades data-set (Ancient World Mapping Center Accessed 2015).

were endemic among ancient powers but includes the major conflict episodes.

The dataset records 908 battles. Figure 2 is a summary plot of all the battles over time, comparing our dataset to what was openly available on wikipedia. Figure 2 is a summary plot of all the battles in the dataset over geographic space.

Figure 1: Battles Over Time

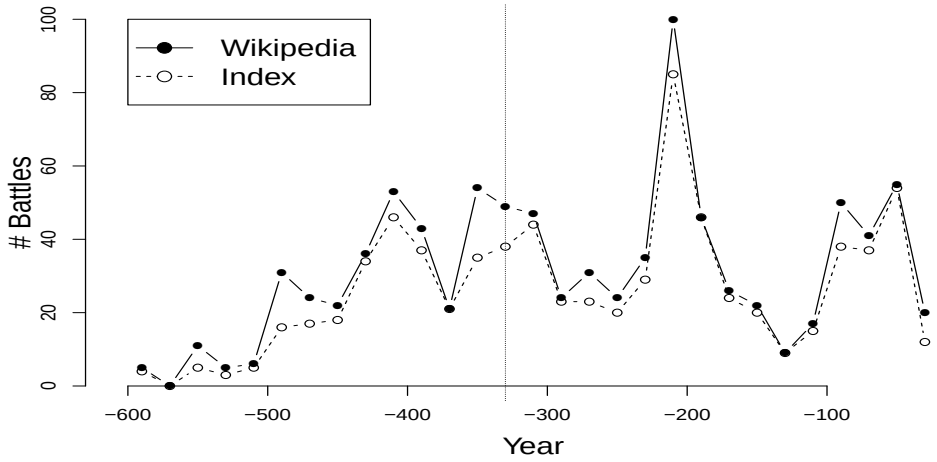
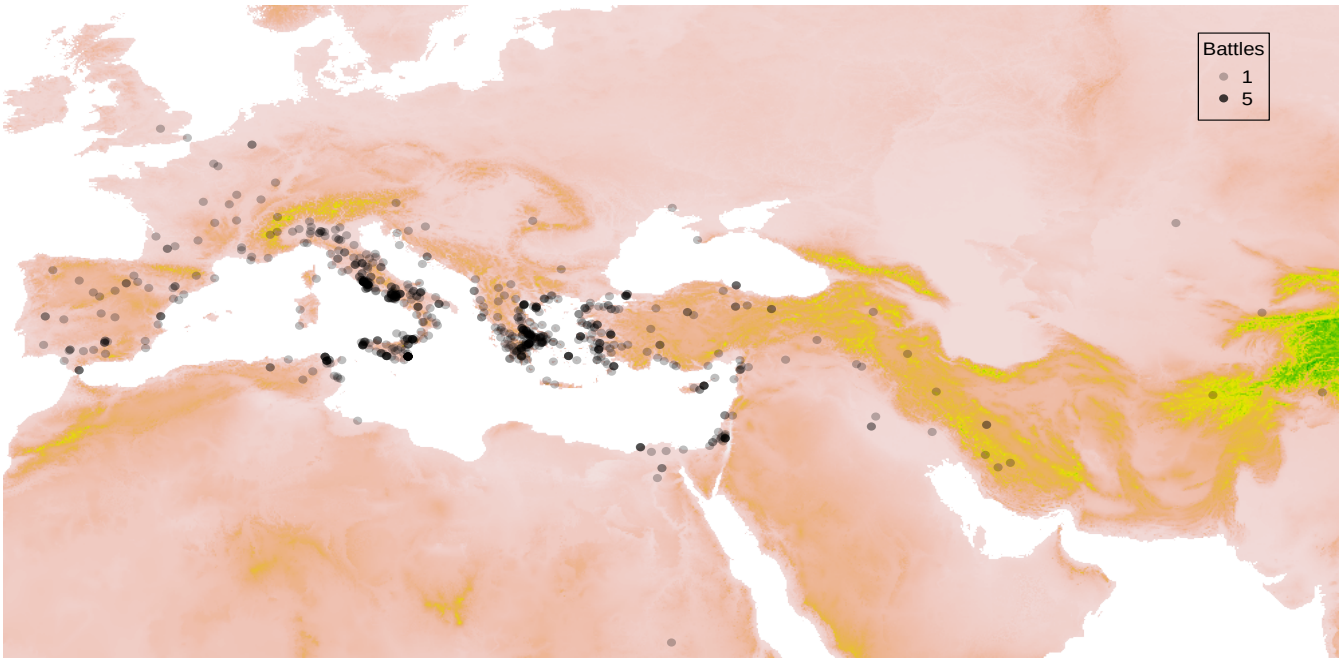


Figure 2: Battles over Space



Political Units

The battle dataset records many political entities which are detailed in Appendix Table A.1. We group these entities into the major political units studied by historians. Our data set includes larger states (such as Carthage and Rome), smaller states (such as Pergamon), city states (such as Athens and Sparta) and other grouped political entities that were rarely fixed (such as the Germanic, Gallic and Spanish tribes).[8] We seperately analyse the violence of larger Mediterranean empires and violence within Greek city states.

For our within-Greece analysis we use data on the size and political structure of Greek city states from Nielsen (2005). Records exist for 159 city states from $600BC$ to $300BC$. We report the data in 20-year intervals, as done in Fleck and Hanssen (2017). A city state is categorized according to three regime types: tyranny, oligarchy and democracy by Nielsen (2005).[9] For

[8]These entities in the last category are grouped together because they are not the main focus of our examination.

[9]"the overall character of a constitution that was taken into account when a politeia was classified as a tyrannis or an oligarchia or a demokratia. As appears from all the sources cited above, the generally accepted view was that every constitution would belong to one of the three basic types" Nielsen, p.84 (2005)

many city-states we also have information of the surface area controlled by a city state, which Ober (2015) uses as a proxy for population. For our Mediterranean analysis, we also employ data on the surface area of the larger empires with data from Chase-Dunn, Álvarez, and Pasciuti (2005). To obtain other covariates we use R's geospatial capabilities.

IV Testing Theories of War and Peace in the Ancient World

Democratic Peace

We first consider whether democratic peace theory holds in the ancient world. Our dataset contains 186 Greek vs Greek battles. In our baseline analysis we focus on battles between Greek city states.[10] The data are organized so that the unit of observation is dyad-period, i.e. Athens and Sparta from 400BC-380BC. In the body, we exclude civil wars and this yields an unbalanced panel of 713 observations.

Each polis is coded "Democracy=1" for each 20 year time period if the polis was ever a democracy in that period.[11] Thus, for a polis that went from either [a] democracy to tyranny back to democracy or [b] from democracy to oligarchy would be recorded as a democracy within that 20-year interval. This means "Ever Tyranny" and "Ever Democracy" are not mutually exclusive. We also consider "Always Tyranny" vs. "Always Democracy" in the appendix.[12] Furthermore, about one quarter of dyadic observations have political transitions. In the appendix we also explore the temporal changes in Democracies.[13]

Figure 3 is a time-series plot of Democracy and war for Greek city states. The white histogram measures the amount of political information we have in each 20-year interval (i.e. 7 city states were ever a tyranny and 5 were ever a democracy). The dark histogram measures the number of city states that were ever democracies within the corresponding 20 year interval. The red line is a time-series of the number of battles in that period. There appears to be positive correlation between democracy and the number of battles over time, but this is not

[10] Kingdoms and Leagues of city states are excluded. We therefore exclude Macedon (which accounts for over 50% of the recorded Greek battles and the Delian and Aetolian leagues). In our robustness analysis we include these larger political units.

[11] The 20 year intervals are the finest bins available and in line with Fleck and Hanssen 2017

[12] See Appendix Table A.2

[13] See Appendix Table A.3

decisive.

The literature on the democratic peace in the modern era relies on the analysis of dyadic relationships. Table 1 summarizes the data as a cross section at the dyadic level to conduct a comparable exercise with the modern findings.

Dyad's that contain at least 1 democracy are involved in more battles and have a higher rate of conflict than dyads that contain at least 1 Tyranny or dyads that contain at least 1 Oligarchy. Democracy vs. Oligarchy is the most common dyad, has the most battles and the highest rate of conflict. Democracy vs. Democracy has the second highest number of battles and the second highest rate. The raw data do not suggest that democracies are more peaceful than non-democracies, rather the opposite. To explore this more, we conduct a regression analysis.

Figure 3: Greek Battles and Democracy over Time

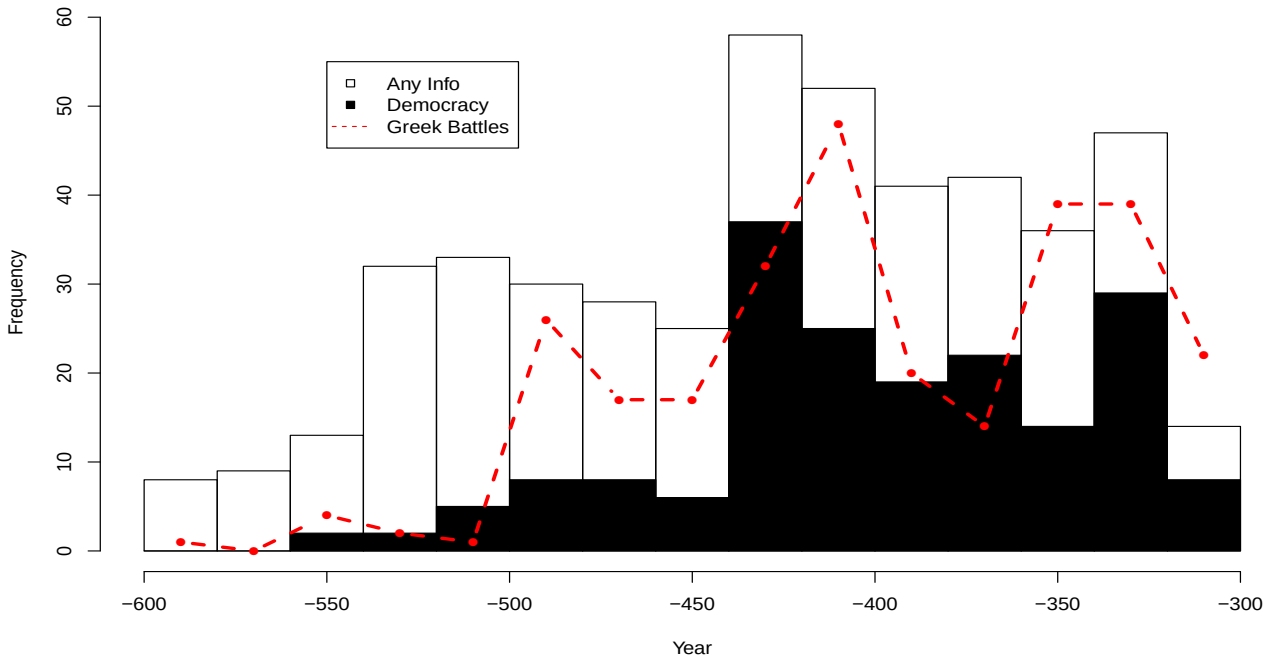


Table 1: Summary of Greek Regime and Battle Dyads

	Either D	Either O	Either T	D vs D	O vs O	T vs T	D vs T	D vs O	O vs T
# Dyads	27516	31518	22601	1999	1792	852	1912	3175	2180
# BattleDyads	359	202	75	64	17	3	19	79	16
Rate	0.013	0.0064	0.0033	0.032	0.0095	0.0035	0.0099	0.0249	0.0073

We want to know the marginal effect of being democratic is in this historical context. To that end, our baseline empirical specification is:

$$\text{Battle}_{i,j,t} = f\left(\text{Democracy}_{i,t}, \text{Democracy}_{j,t}\right) + \mathbf{X}'_{i,j,t}\beta + \epsilon_{i,j,t} \tag{1}$$

for dyad i, j in period t where $\mathbf{X}$ is a set of controls and ϵ an error term. Our data contains 613 dyads with battles and 10121 dyads for which we have both political information for both units. [14]

To address the proponents of hegemonic peace, we also incorporate information on state-size. Specifically, we include the size asymmetry between contestants (SizeDifference= $\text{Size}_i - \text{Size}_j$). The effect of asymmetric polis size is discussed in more detail under hegemonic peace theory.[15]

We also control for selection biases. First, we address an observational bias with battles, i.e. only observe battles for larger entities, by controlling for the scale of the contest (MinSize= $\min\{\text{Size}_i, \text{Size}_j\}$).[16] Second, we address an observational bias for politics, i.e. Athens recorded more data about fighting, with a variable termed *AnyInfo* that indicates if there was any political information for the city state in the dyad. These are the main source of potential selection bias in our data set, which we have addressed given limited data. However, since proximity is more likely to generate conflicts over land and territory, we also control for

[14]There are 201589 undirected Dyad-20Year observations all together. The dyadic data contains many observations with 0 violence.

[15]In Figure A.2a we see that the oligarchic and democratic regimes are roughly balanced over poleis size, although tyrannies tend to be smaller.

[16]The sizes of the contestants is a good control for other reasons. Larger states can be expected to go to war more often both because their territory abuts the territory of other states or because size is correlated with some other state specific but unobserved characteristic.

the great-circle distance between poleis.[17]

The results of dyadic regressions are shown in Table 2. The Y variable is $\#Battles$ and the main X variable is BothDemocracy. Column 1 shows that more conflict is positively correlated with both states being democratic when controlling for size and distance. Columns 2 includes additional variables which explores the marginal effect. Column 2 shows the coefficient on "Both Democracy" is positive but statistically insignificant at the 10% level. The data in Tables 1 and 2 suggest evidence against the Democratic Peace for the Greek city states.

Appendix Table A.7 excludes conflicts which had contestants from the same political entity. Appendix Table A.2 uses a more exclusive definition of political regime, i.e. Democracy means if the polity was a democracy and not anything else during the time period. These robustness checks find qualitatively similar results. Appendix Table A.3 uses an alternative data-set, which exploits political variation over time amongst democracies, and also finds evidence against the democratic peace.

[17] As not all poleis have a location, some dyads do not have distance information.

Table 2: Greek City-State Conflicts

	(1)	(2)	(3)	(4)
EitherDemocracy		1.51^{***}	1.51^{***}	1.87^{***}
		(0.41)	(0.43)	(0.35)
BothDemocracy	2.17^{***}	0.86^{***}	0.77^{***}	1.43^{***}
	(0.38)	(0.32)	(0.25)	(0.31)
MinSize		0.37	0.27	0.38
		(0.33)	(0.32)	(0.34)
SizeDifference	-0.01	0.32	0.28	0.30
	(0.12)	(0.25)	(0.25)	(0.23)
Distance	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
AnyInfo				-0.36
				(0.58)
Year FE	N	N	Y	Y
No.Battles	713	713	713	713
Observations	191,573	191,573	191,573	191,573

Notes: Y variable is # of battles for models (1)(2)(4) and Ever Battle for model (3). Standard errors are heteroskedastic and autocorrelated consistent corrected by double-clustering on Poleis ID's. $(*, **, ***)$ denote $p < (0.05, 0.01, 0.001)$.

While there is a too great a variety and too few records on the type of government across empires to replicate this analysis for the entire Mediterranean, one great rivalry does seem to stand in the face of a Democratic peace within the ancient world. The Punic Wars of 3rd century BC, fought between Rome and Carthage, involved a large number of large scale battle (see Appendix Table A.4 for the most common dyad in each century). During this time, Carthage had some democratic institutions, including elected legislators and Rome was a republic. Although certainly not democratic by the modern definition, these polities can be seen as democratic compared to others in that time. Neither of these states was less bellicose that their monarchic neighbors. The discussion of Rome naturally leads into a discussion of hegemony.

Hegemonic Peace

We first consider hegemony in the original terms of one city-state over another, ἡγεμονία. Table 2 examines whether Greek city states with greater size differences were more likely to battle.[18] Columns 2,3, and 4 control for distance between polis, the size of the smallest polis, and democratic variables. Column 4 controls for whether we observe any political information. These columns report positive coefficients, meaning that greater asymmetry in size is associated with more violence, ceteris paribus. However, these results are not statistically significant. Appendix Table A.8 shows the rate of battles between Polis for each combination of pair sizes. Since the democratic non-peace is robust to including these controls, it also appears that this variant of hegemony is not a confounding explanation.

Second, we consider hegemony in terms of the Roman empire. We test the realist argument of Eckstein (2006) and examine whether there was less violence in the Mediterranean with the rise of Rome. Figure 4 shows both all battles that involved Rome and all battles that did not involve Rome over the time of Rome's rise.[19] Roman violence was increasing, but Non-Roman violence was also decreasing. Later, the celebrated Pax-Romana would occur while Rome was the ruler of the mediterranean. But this is not the hegemonic peace per-se. One concern with this type of analysis is that other things are also changing over time, and a failure to account for variables like technological progress that could be reducing violence may paint a misleading picture.

[18]This operationalization of hegemony comes from Geller (1993)

[19]Note that this includes civil and non-civil war.

Figure 4: Roman Battles Over Time

Historians have tended to focus on the political characteristics Rome (Harris 1979, e.g.). However, we can provide a more systematic analysis by incorporating other ancient empires. We measure hegemony here by calculating an Herfindahl-Hirschman Index (HHI) of the empires surface area. Since we have the size but not the exact location of the political surface, we calculate HHI in two ways: size as a share of (1) the Mediterranean region (as shown in Figure 2) and (2) the total size of other major empires. Appendix Figure A.1 overlays the sizes of major empires over time above a time series of battles.

Table 3 shows the relationship between violence and international hegemony. The Y variable is $\#Battles$ and relates to other covariates via a negative binomial functional form.[20] Columns 1 and 3 have X variable $HHI(1)$, which uses size as a share of the mediterranean region. Columns 2 and 4 have X variable $HHI(2)$, which uses size as a share of total empire size. Columns 3 and 4 include a time variable to account for common factors that could determine both state size and violence over time. The statistically insignificant result for HHI in Columns 1 and 2 show no raw correlation between hegemony and violence. However, columns

[20]This includes civil-wars. In the appendix we find the results are similiar when excluding civil conflicts.

3 and 4 control for a linear time trend for violence (*Decade*) and find a positive coefficient for HHI.[21]This suggests that after allowing for a time trend, international hegemony is associated with more violence. [22]

Table 3: Battles vs. HHI

	(1)	(2)	(3)	(4)
HHI_1	0.01		1.62^{***}	
	(0.45)		(0.60)	
HHI_2		-0.12		0.84^{**}
		(0.32)		(0.42)
Decade			0.04^{***}	0.03^{***}
			(0.01)	(0.01)
Constant	2.74^{***}	2.80^{***}	2.78^{***}	3.36^{***}
	(0.34)	(0.19)	(0.35)	(0.21)
Observations	58	58	58	58
Log Likelihood	-218.55	-218.51	-210.17	-212.32

Notes: Y variable is #*Battles*. HHI_1 denotes HHI as scaled by the surface area of Empires in an unknown extent. HHI_2 denotes HHI as scaled by surface area of the mediterranean region. Heteroskedastic Consistent (type3) standard errors reported with stars $(*, **, ***)$ denoting $p < (0.05, 0.01, 0.001)$. Including the variable $Decade^2$ does not qualitatively change the results.

Overall, the effect of hegemony is mixed. Within Greece, greater size asymmetry between states is correlated with more violence, but the standard errors are quite large. Within the Mediterranean, the qualitative results are different depending on whether we look at the Roman world over time or across empires controlling for a time trend. Furthermore, it is not clear that one exercise is more correct. For example, although there are reasons to account for a time trend, it ought not be accounted for if Roman hegemony over the Mediterranean both encourages trade and causes the time trend in productivity.

[21]Including the variable $Decade^2$ does not change this result qualitatively.

[22]This same positive coefficient, although statistically insignificant, is found when aggregating to 6 centuries rather than 58 decades.

V Conclusion

This paper revisits some of the most important debates in international relations. As we document, our conflict data fails to find anything intrinsic to democratic regimes that makes them more peaceful in the ancient world. This is consistent with recent arguments that factors other than popular representation *per se* are responsible for the peace we observe amongst modern democracies. We also find mixed evidence for the realist perspective which argues that violence declines with a more powerful state. We document that rise of Rome coincides with a decline in non-Roman violence, but find differing results in cross-sectional analysis. More work is needed, but overall the data from the ancient world suggest that neither the relationship between hegemony and violence nor the universality of the democratic peace are obvious empirical facts.

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A Supplementary Data Appendix (Not for Publication)

Political Groupings

Table A.1: Beligerent Groups

Political Aggregate	Beligerents
Achaean League	Achaean League
Aetolian League	Aetolian League
Assyria	Assyria, Arabian allies, Neo-Assyrian Empire
Athens	Athens
Carthage	Carthage
Egypt	Egypt, Numidia, Ptolemaic Kingdom, Alexandrians
Epirus	Epirus
Gallic Tribes	Aedui, Allobroges, Arverni, Atrebates, Averni, Belgae, Bituriges, Boii, Carduci, Eburones, Galatian Tribes, Gallic Tribes, Gauls, Helvetii, Insubre, Massilia, Nervii, Rauraci, Seduni, Senones, Sequani, Sotium, Tectosagii, Tigurini, Tulingi, Veneti, Veragri, Viromandui, Volcae
German Tribes	Aduatuci, Ambrones, Basternae, Cimbri, German Tribes, Scirii, Suebi, Teutons
Greeks	Adria, Agrigentum, Akragas, Alabanda, Alalia, Ambracia, Amphilochia, Argos, Byzantium, Cephallonia, Chalcidice, Chalcis, Chios, Cora, Corcyra, Corinth, Cos, Crisa, Cumae, Cyzicus, Dion, Delphi, Elis, Epidaurus, Eretria, Gela, Himera, Issa, Karystos, Kirrha, Krinides, Kythera, Lindos, Locri, Mantinea, Medion, Megara, Melos, Messene, Methymna, Miletus, Mytilene, Mylasa, Naupactus, Naxos, Olynthus, Orchomenus, Panormos, Peparethus, Perinth, Pisa, Pharos, Pharsalus, Pherae, Phocis, Plataea, Pometia, Potidaea, Rhodes, Rhegion, Samos, Scione, Segesta, Selinus, Sicyon, Spartolos, Tanagra, Tarentum, Tegea, Tenedos, Thasos, Troezen, Zacynthus, Greek city states of Magna Graecia, Acarnania, Achaea, Aetolia, Arcadia, Boeotia, Bithynia, Caria, Crete, Ionia, Magna Graecia, Thessaly, Thrace, Peleponnesia, Amphictyonic League, Chalkidian League, Delian League, League of Corinth, Hellenic League, Peloponnesian League, Greek Tribes, Triballi, Getae
Italians	Adranum, Aequi, Aurunci, Agyrium, Allied Italian States, Apulia, Aricia, Bruttians, Campani, Capua, Catana, Etruscans, Fidenae, Italian Rebels, Italian Tribes, Italiotes, Italiote League, Labicum, Latin League, Latins, Latini, Leontini, Liguria, Lucania, Marsi, Pedum, Praenestini, Privernum, Sabines, Samnites, Sicilian Greeks, Sidicini, Slaves of Rome, Slaves of Sicily, Syracuse, Tarquinii, Tauromenium, Tyndaris, Umbrians, Veii, Volsci, Sicels
Macedon	Macedon, Macedonia, Macedonian Rebels, Antigonids, Antipatrids, Argeads, Lysimachids
Other	12 Kingdom Alliance, African Tribes, Ammonite, Ardiaei, Aspasians, Assacenians, Babylonia, Cilicia, Cyprus, Elea, Gaza, Guraeans, Illyria, Indian Allies, Israel, Jews, Judah, Lydia, Lydian Empire, Malli, Neo-Babylonian Empire, Noricum, Paurava, Rebel Libyans, Scythians, Tyrians, Pheonicia, Cilcians, Cythera, Mamertines, Amanienses, Dalmatia, Other,
Parthia	Greco-Bactrian Kingdom, Parthian Empire
Pergamon	Aegina, Attalid Dynasty, Kingdom of Pergamon, Pergamum, Pergamon
Persia	Achaemenid Empire, Median Empire, Persia, Persian Allies, Persian Empire, Persis, Sogdiana, Uxians
Pontus	Pontus, Armenia
Rome	Roman Republic, Roman Empire, Rome
Seleucids	Seleucid Empire
Spanish Tribes	Astapa, Budares, Baesadines, Carpetani, Celtiberians, Olcalde, Saguntines, Spanish Tribes, Spaniards, Toletum, Vaccaei, Vettones
Sparta	Sparta
Thebes	Thebes, Boeotian League

Democracy

Appendix Table A.2 uses a more exclusive definition of political regime. Democracy=1 if the polity was a democracy and not anything else during the time period. This specification gives qualitatively similar results.

Table A.2: Greek City-State Conflicts

	(1)	(2)	(3)	(4)
EitherDemocracy		1.16***	1.14***	0.85***
		(0.26)	(0.33)	(0.26)
BothDemocracy	1.42***	0.18	0.63**	0.63***
	(0.39)	(0.18)	(0.26)	(0.19)
MinSize		0.47	0.36	0.46
		(0.37)	(0.35)	(0.36)
SizeDifference	−0.03	0.39	0.36	0.34
	(0.12)	(0.27)	(0.27)	(0.24)
Distance	−0.001	−0.001	−0.001	−0.002
	(0.001)	(0.001)	(0.001)	(0.001)
AnyInfo				0.49
				(0.51)
Year FE	N	N	Y	Y
No.Battles	713	713	713	713
Observations	191,573	191,573	191,573	191,573

Notes: Y variable is # of battles for models (1)(2)(4) and Ever Battle for model (3). Standard errors are heteroskedastic and autocorrelated consistent corrected by double-clustering on Poleis ID's. Stars $(*, **, ***)$ denote $p < (0.05, 0.01, 0.001)$.

Eric Robinson wrote 2 books on Democracies outside of Athens (E. W. Robinson 1997, E. W. Robinson 2011). I convert these into a data-set that is smaller in time span, ranging from 480-323. This data-set covers a smaller number of poleis, 54 of which we could use 51, that were at least once Democratic. This data-set has more precise information about the democracies, notably the starting and ending dates. We exploit this data set by looking at the temporal variations in democracies and how it corresponds to violence. For example, did polis i battle more with his opponent when both were democratic? This differs from the approach we used in Table 2 which looks at 20-year periods and emphasizes cross-sectional variation with Time Fixed Effects in columns (3) and (4). Appendix Table A.3 shows the dyadic regressions from this alternative data source. We find qualitatively similar results, bringing more evidence against the democratic peace within Ancient Greece. While there are a set of problems with cross sectional data and a set of problems with time-series data, the intersection of those sets is considerably smaller.

Table A.3: Greek City-State Conflicts

	(1)	(2)	(3)	(4)
EitherDemocracy		0.64		0.17
		(0.67)		(0.32)
BothDemocracy	0.78***	0.59***	0.26	0.24
	(0.28)	(0.17)	(0.52)	(0.51)
Polis FE	N	N	Y	Y
No.Battles	48	48	48	48
Observations	231,708	231,708	231,708	231,708

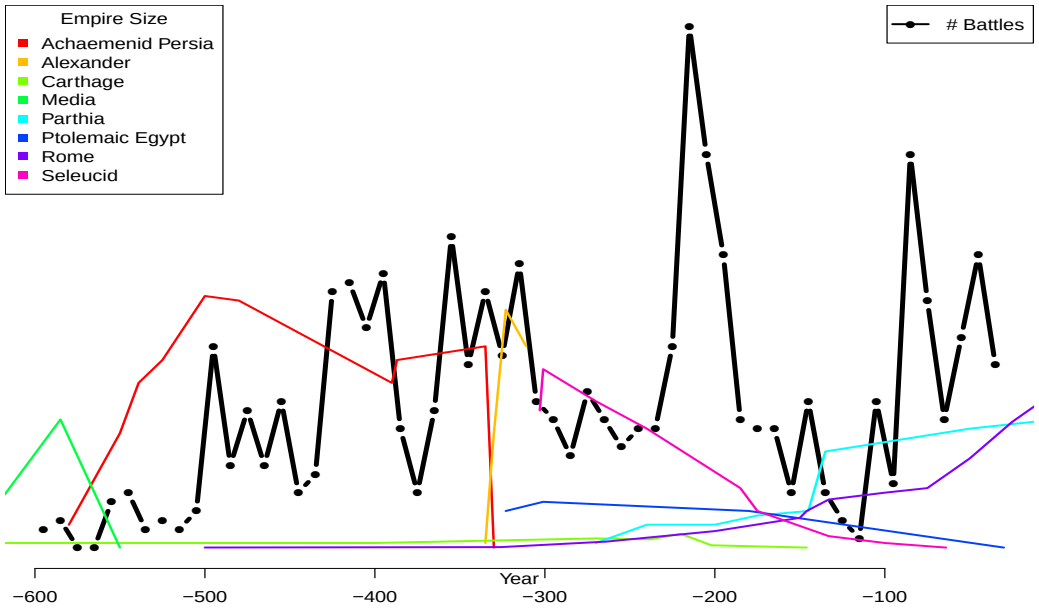
Notes: Y variable is # of battles for models (1)(2)(4) and Ever Battle for model (3). Standard errors are heteroskedastic and autocorrelated consistent corrected by double-clustering on Poleis ID's. Stars $(*, **, ***)$ denote $p < (0.05, 0.01, 0.001)$.

Major Political Entities and War

Table A.4: Main Dyadic Conflicts per Century

Century Start	Beligerents	Conflicts
-600	Other vs. Persia	8
-500	Athens vs. Greeks	38
-400	Italians vs. Rome	38
-300	Carthage vs. Rome	89
-200	Rome vs. Spanish Tribes	17
-100	Rome vs. Rome	69

Figure A.1: Empire Size



Civil Conflicts

Cunningham and Lemke (2013) argues against automatically separating the types of conflict because conflict types are not independant. For example, [A] civil war weakens the country to attackers [B] external conflict can unite a body politic [C] external actors can finance internal conflict. We check the robustness of our findings along this dimension.

As robustness to the democratic peace result, we include civil wars from the data set and re-run the regressions. Table A.6 shows the Size vs. Battles relationship when including any conflicts where both parties are from the same political entity. The results are qualitatively similiar to Table A.9

As robustnes to the hegemonic peace, we exclude any conflicts where both parties are from the same political entity. Table A.5 shows the HHI vs. Battles relationship. The results are qualitatively similiar to Table 3.

Table A.5: Battles vs. HHI

	(1)	(2)	(3)	(4)
HHI_1	0.54		1.87^{***}	
	(0.64)		(0.53)	
HHI_2		0.32		1.24^{***}
		(0.42)		(0.47)
Decade			0.04^{***}	0.03^{***}
			(0.01)	(0.01)
Constant	2.07^{***}	2.30^{***}	2.37^{***}	3.03^{***}
	(0.49)	(0.26)	(0.36)	(0.26)
Observations	58	58	58	58

Notes: Y variable is log(# Battles+1). HHI_1 denotes HHI as scaled by the surface area of Empires in an unknown extent. HHI_2 denotes HHI as scaled by surface area of the mediterranean region. Heteroskedastic Consistent (type3) standard errors reported with stars $(*, **, ***)$ denoting $p < (0.05, 0.01, 0.001)$. Including the variable $Decade^2$ does not qualitatively change the results.

Table A.6: Battles and Territory

	Battles	CumSize	Battles/CumSize
Egypt	29	96	0.300
Carthage	136	7	20.100
Persia	73	100	0.700
Rome	455	206	2.200
Macedon	111	12	9.100
Seleucid	38	38	1

Notes: Column Battles is the total count of battles over time (note a graeco-roman recording bias). Column CumSize is the sum of the empire size (interpolated) over time and is rounded to nearest integer. Column Battles/CumSize shows the fighting propensity scaled by the size of the empire and was rounded to 1st decimal.

Table A.7 excludes conflicts which had contestants from the same entity. The results are qualitatively similiar to Table 2.

Table A.7: Greek City-State Conflicts

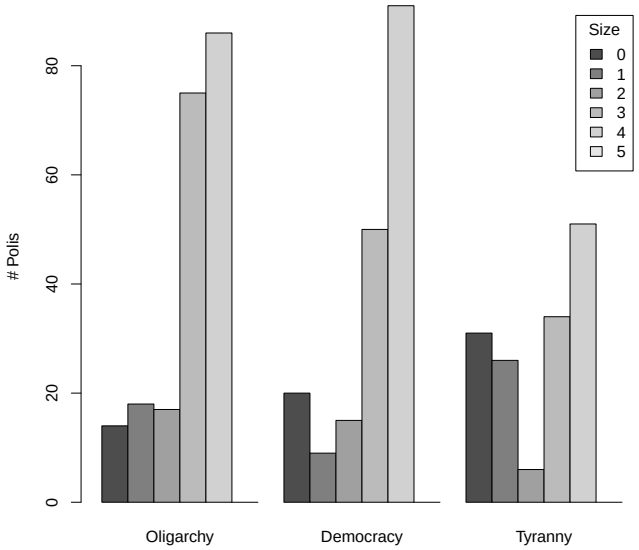
	(1)	(2)
EitherDemocracy		1.71^{***}
		(0.43)
BothDemocracy	2.16^{***}	0.86^{**}
	(0.41)	(0.35)
MinSize		0.40
		(0.35)
SizeDifference	-0.02	0.35
	(0.13)	(0.25)
Distance	-0.001	-0.001
	(0.001)	(0.001)
AnyInfo		-0.34
		(0.61)
Constant	-5.15^{***}	-7.08^{***}
	(0.47)	(1.60)
Year FE	N	N
No.Battles	767	767
Observations	191,590	191,590

Notes: Y variable is # of battles. Heteroskedastic Consistent (type3) standard errors reported with stars $(*, **, ***)$ denoting $p < (0.05, 0.01, 0.001)$.

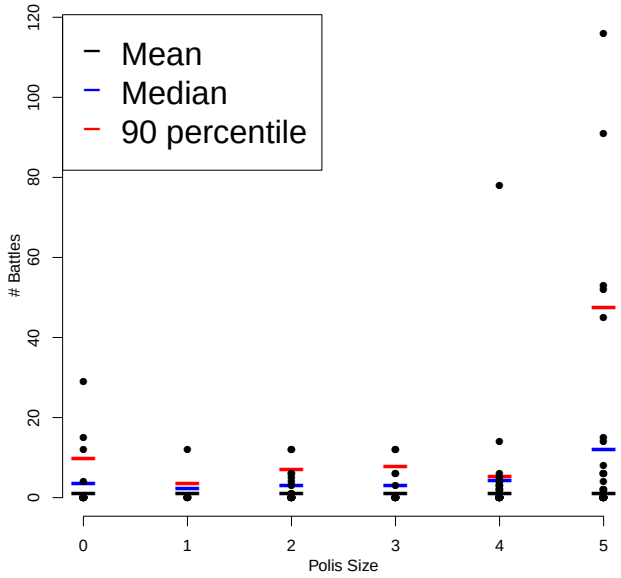
Figure A.2a shows the size distribution of greek poleis as grouped by political regimes (ever tyranny, ever democracy, every oligarchy) for each 20 year time period. On the right is a scatter plot of the average number of dyad battles from 600BC-300BC for each poleis vs. the size of that poleis. The black line is the mean line and the red line is 90% quantile line - i.e. for each poleis size a fraction 9/10 of poleis have a mean number of battles below the red line.

Figure A.2: Polis Size

(a) Histogram of Size by Political Regime



(b) Polis Size vs Violence



Poleis Size-assymetry and Violence

There is some evidence that greater assymetry is associated with more violence. For columns column sizes 1-4, as we move from row to row, we can see that there are higher rates of battle with larger city states.

Table A.8: # Battles / # Dyads , by Polis Sizes

	0	1	2	3	4	5
0	0.0027					
1	0.0017	0				
2	0.0028	0	0			
3	0.0024	0	0	0		
4	0.0026	0.0011	0.0018	0.0015	0.0024	
5	0.0042	0.0031	0.0054	0.0044	0.0049	0.0133

Comparing Empires to Rome

To compare empires, we scale the amount of violence by the surface area of the empire.[23] This is because one important factor in determining the number of conflicts is the size of the political entity. Rome was involved in the largest share of military activity in our sample but was also very large for a very long time. If Rome was uniquely violent then this should be reflected in it's battles/area. Since empire area is measured with error for each empire, the survivorship bias should lead to us observing many more Roman battles and also battles/size. Table A.9 that Rome in fact sits somewhere in the middle of the pack. This should not be the case if Rome was innately more violent than other empires.

Table A.9: Battles and Territory

	Battles	CumSize	Battles/CumSize
Egypt	29	96	0.300
Carthage	136	7	20.100
Persia	75	100	0.700
Rome	456	206	2.200
Macedon	118	12	9.700
Seleucid	41	38	1.100

Notes: Column Battles is the total count of battles over time (note a graeco-roman recording bias). Column CumSize is the sum of the empire size (interpolated) over time and is rounded to nearest integer. Column Battles/CumSize shows the fighting propensity scaled by the size of the empire and was rounded to 1st decimal.

[23]Note that the size of the empire is also likely determined by violence amongst other things, so there is an endogeneity issue that we are setting aside for now.