

System Structure and Violent Conflict: Evidence from Asian State Systems

Peter Brecke
The Sam Nunn School of International Affairs
Georgia Institute of Technology
Atlanta, GA 30332-0610

peter.brecke@inta.gatech.edu

Paper prepared for the 2001 Meeting of the Peace Science Society (International) on October 26-28 in Atlanta, Georgia.

ABSTRACT

This paper is an interim report of a long-term project to develop a Conflict Catalog and from that a taxonomy of violent conflicts. The paper examines the question of the impact of system structure operationalized as polarity on the prevalence of warfare in the system. It uses Wilkinson's system structure data for the Chinese (725 BC to 1850 AD) and Indic (500 AD to 1700 AD) state systems. The paper develops a new measure of power in the European state system from 1494 to 1945 and from that calculates the polarity or structure of the European state system for that time frame. The paper compares the relative frequency of warfare for each system type in the different state systems.

INTRODUCTION

One of the core tenets of the neorealist school of thought is that the structure of an international system has a profound effect on the stability of that system in terms of the crises, violence, and warfare that occurs. Unfortunately (and somewhat curiously), the questions of whether that tenet is true and, if so, in what manner the structure affects the level of conflict remain unanswered (Lebow, 1995). On the theoretical side, an exploration of different arguments regarding the warfare-dampening effects of alternative system structures reveals positions in favor of most of the different types. One can find advocates of hegemonic systems, bipolar systems, tripolar systems, and multipolar systems. There are even a variety of arguments about the peace-enhancing impact of multipolar systems of different sizes. Levy (1984) nicely summarizes these arguments.

Figure 1 depicts six different positions in a very schematic form. Each line portrays how an international system with differing numbers of major powers or different types of polarity is likely to fare in terms of avoiding violent conflict according to the advocates of a particular structure. The unipolar/hegemonic, bipolar, and tripolar lines are straightforward. The three variants of multipolarity presented need a little elaboration. The simple variant of multipolarity attempts to capture the argument that peace enhancement rises markedly as the system becomes multipolar. The gradual increase variant of multipolarity portrays the alternative position that peace enhancement increases with the number of major powers. The odd combinations variant attempts to depict the more complex argument that increasing multipolarity increases peace enhancement, but the effect is much stronger when there are an odd number of major powers.

One could say that, at least theoretically, the bases are covered. If there is evidence showing one type of system structure or another having experienced fewer conflicts than the others, there already exists a theoretical explanation.

Unfortunately, a subsequent search for evidence in favor of one or more of the alternatives unearthed a dismaying dearth of studies that truly address the questions posed above. Consequently, I found—quite to my surprise—that to answer the questions, I was going to have to do my own empirical study. With my Conflict Catalog project I possessed the information to quite thoroughly address the violent conflict side of the relationship. The other component, system structure information, was a different matter. Wilkinson has produced time series of system structure for the Far Eastern (Chinese) states system from 1025 BC to 1850 AD and for the Indic (Indian subcontinent) states system from 550 BC to 1800 AD (Wilkinson, 1999b and 1996, respectively). These series are invaluable because they (at least in principle) allow an empirical test that includes a comparison of three state systems: European, Chinese, and Indian.

The unexpected hurdle to such a three-way comparison is that with respect to the European state system, there is disagreement or at least confusion as to what was the nature of the system at any given time. For example, Waltz's (1979) characterization of the system being multipolar from 1700 up until 1945 when it became bipolar does not easily reconcile with Gilpin's (1981) assertion that Britain exercised hegemony from 1815 to 1914 and then the United States exercised hegemony after 1945. A number of scholars have attempted to develop characterizations that are more systematic and discerning, but each has significant limitations (Thompson, 1986; Levy, 1984; Wayman, 1984; Midlarsky, 1974; Singer, Bremer, and Stuckey, 1972; Schweller, 1993).

This paper describes my effort to create an index of military power for the major powers of the European state system from 1494 to 1945, the transformation of those countries' power scores into a determination of the polarity of the European state system over that time frame, and a comparison using the three state systems of the relative amount of warfare experienced by each system type. The paper concludes with an assessment of whether a system's structure is indeed an important determinant of the amount of violent conflict within a system, and if so, the nature of the system structure's influence.

DEFINITION OF SYSTEM STRUCTURE

When one studies those works that empirically test whether there is a relationship between system structure and warfare, one finds that researchers tackle the challenge of how to capture system structure through one of two routes. The first route, argued most forcefully for by Levy (1984), uses system size, the simple number of major states, to represent the system's polarity and compares that number against the frequency of wars. Using that path results in the European system being effectively treated as multipolar from 1495 to 1975 with the lowest level of "polarity" being quadrupolar. As such, the relative merits of unipolarity, bipolarity, and even tripolarity are not tested.

The second route, cogently argued for by Thompson (1986), starts from the assumption that it is not simply the number of major states that matters. Rather, the distribution of power or capabilities within the system, especially among the major states, serves as a better measure of the polarity of a system because it gets at differences that are likely to be behaviorally important. As Thompson puts it, "...is it plausible to entertain precisely the same behavioral expectations for a five-power system in which two of the five actors control 80% of the capabilities and for a five-power system in which each actor controls exactly 20% of the capabilities?" (p. 594)

Singer, Bremer, and Stuckey (1972) and Wayman (1984) correctly focus on the distribution of capabilities, but their power concentration indices, by reducing the distribution to one number, are not subtle enough measures of the nature of the state system from 1816 to 1965 to be fully satisfactory for testing the relative merits of the different possible structures. Thompson and Rasler (1994) use the power concentration index as well as a leadership index. While the leadership index measures something different than the power concentration index, it suffers from the same lack of subtlety problem.

In an attempt to precisely define system structure in terms of polarity, which is the concept used in the different theories depicted above, Thompson (1986) proposes the following definitions of different types of polarity:

- 1) In a unipolar system, one state controls 50% or more of the relative capabilities that matter
- 2) In a near-unipolar system, one state controls more than 45% but less than 50% of the relative capabilities and no other state possesses as much as 25%
- 3) In a bipolar system, two states control at least 50% of the relative capabilities and each of the two leading actors possess at least 25% with no other state controlling as much as 25%
- 4) In a multipolar system, three or more states each control at least 5% of the relative capabilities but no single state controls as much as 50% and no two states have as much as 25% apiece (pp. 598-600).

Thompson applies the four criteria to an index of global reach capabilities derived from shares of state-owned naval combat vessels. The data used to generate that index can be found in Modelski and Thompson (1988). Thompson uses this index because there is no dataset encompassing a number of capabilities that contribute to determining a country's power that spans a timeframe commensurate with testing long cycle theory. The global reach capabilities index at least provides a measure that goes from 1494 to 1983, and it is, arguably, a reasonable proxy for other capabilities measures. Unfortunately, applying Thompson's global reach capabilities index to the European state system is that it does not provide a measure of non-naval states such as Austria-Hungary or Prussia.

Thompson and Ressler (1994) provide the data that addresses that limitation. They provide time series of the size of field combat armies for the major European countries from 1494 to 1945. If one combines an index of naval power in the European state system that can be generated from Thompson and Modelski (1988) with an index of land power that can be generated from Thompson and Ressler (1994), one can create a military power index for the European state system that does not unfairly penalize the non-naval states. I created such an index for this project.

Wilkinson (1999a) classifies system structure according to the following schema:

- Universal empire
- Hegemony
- Unipolarity
- Bipolarity
- Tripolarity
- Multipolarity
- Nonpolarity

Wilkinson's classification is attractive because it encompasses a broad range of

system types, and perhaps most importantly, it includes tripolarity. In addition, Wilkinson's categories, as he defines them, correspond quite closely to those defined by Thompson. There are two notable differences in the names: Wilkinson's hegemony corresponds to Thompson's unipolar and Wilkinson's unipolarity corresponds to Thompson's near-unipolar. To have the ability to distinguish tripolar systems from other multipolar systems, there needs to be an addition and a change to Thompson's definitions. Accordingly, I propose and use the following definitions for different types of polarity:

- 1) In a unipolar system, one state controls 50% or more of the relative capabilities that matter
- 2) In a near-unipolar system, one state controls more than 45% but less than 50% of the relative capabilities and no other state possesses as much as 25%
- 3) In a bipolar system, two states control at least 50% of the relative capabilities and each of the two leading actors possess at least 25% with no other state controlling as much as 25%
- 4) In a tripolar system, three states each control at least 16.667 % of the relative capabilities but no single state controls as much as 50% and no two states have as much as 25% apiece
- 5) In a multipolar system, three or more states each control at least 5% of the relative capabilities but the criteria for the other types of systems are not met.

This set of definitions possesses the virtues of being explicit (and thus reproducible), measurable, discerning among the different types of systems, and reasonably consistent with common-sense notions of what we might expect the distribution of capabilities to be for each type of system. Other definitions are, of course, possible and perhaps even desirable. Importantly, this set of definitions creates a schema for the European state system comparable to the categories used by Wilkinson for determining the structure over time of the Indic and Chinese state systems (1996 and 1999b, respectively).

DETERMINATION OF MILITARY POWER INDEX

As stated earlier, I created a military power index for the European state system for the period 1494-1945 in order to be able to determine the structure or polarity of the European system over an extended timeframe. The index is very simple. A spreadsheet was made that contained the number of major naval vessels possessed by each of the major European countries over that period of time. The sum of the number of ships was calculated for each year, and each country's share of the total

was determined. The data came from Modelski and Thompson (1988). The spreadsheet also contained the size of the army combat troops possessed by each country over the timespan of interest. The sum of the number of troops was calculated for each year, and each country's share of the total was determined. The data came from Rasler and Thompson (1994). The average of a country's two shares became the country's score for the military power index. The spreadsheet containing these data are available from the author.

I also possess population data for the European countries that goes back to 1400, but it was not included in the index because it is not clear that population was a significant component of power until the Napoleonic Wars. To address the issue of whether a broader measure of power is necessary, I also employed the Correlates of War National Material Capabilities dataset (Singer and Small, 1993) to create an analogous power index for the period 1816-1985 based on the six (five from 1816 to 1859) components of power in that datafile and an extended version of that index which included the naval ships data from Modelski and Thompson (1988). Correlations between the different indices for the different countries varied in value, but they were sufficiently high to continue the effort.

I have also made an extended version of that spreadsheet that includes the United States and Japan. The times series in that spreadsheet provide data and interesting graphs germane to Power Cycle Theory (Doran, 1991) and to Power Transition Theory (Organski and Kugler, 1980; Kugler and Lemke, 1996).

DETERMINATION OF EUROPEAN SYSTEM STRUCTURE

If we apply Thompson's coding criteria (with my modifications) to the military power index, we can then develop a time-series of the European system's structure.

To develop that time-series, I coded each country for each year into a particular power category depending upon the country's share value for the military power index. Each country was coded according to the following rules:

- A - index value less than or equal to 5%
- B - index value between 5% and 16.667%
- C - index value between 16.667% and 25%
- D - index value between 25% and 45%
- E - index value between 45% and 50%
- F - index value greater than 50%

Since the countries' index values were arranged in a grid (spreadsheet) format in which the countries were columns and the years were rows, it was easy to determine the system structure at each year simply by looking across a row in the spreadsheet

and ascertaining which of the five system structure possibilities presented above was appropriate. (Short, 1- or 2-year instances in which a country changed from one category to another and then back because of only a minor numerical change at a threshold were treated as no change in category when determining the system structure.)

SYSTEM STRUCTURE AND VIOLENT CONFLICT

With this empirically-based calculation of the European state system structure, we can return to the original question of does system structure impact the frequency of warfare, and if so, how. For this paper I will do the simplest comparison. I determine the number of years that each of the three state systems was in each of different system types and calculate the proportion of years that each system was in each system type. I then take the conflict datafile appropriate to each state system and allocate the conflicts to the type of system operative when they began. I calculate the share of the total set of conflicts of each state system allocated to each system type.

Finally, I derive the ratio of the share of conflicts in each system type divided by the share of years in each system type. If system structure has *no* impact, one would expect the frequency of conflict to not vary across system type. Thus, the ratio would be 1.0; the share of conflicts across any set of years determined by system type would be no different from any other set of years. If the ratio for a particular system type is higher than one, then that system type appears to be less effective at controlling the outbreak of violent conflict (or conversely, is more conducive to inciting the outbreak). If the ratio is less than one, the system type appears to be superior at controlling or inhibiting violent conflict.

For the European state system I used two different sets of conflicts. The first is the comprehensive set in my Conflict Catalog (Brecke, 1998). The second set is derived by adding the international wars in the Correlates of War International and Civil War dataset (Singer and Small, 1994), the wars in the Major-Minor Power Wars dataset (Midlarsky and Park, 1994), and the wars in the Great Power Wars dataset (Levy, 1994).

Table 1 presents for the European state system the number of conflicts, the share of conflicts, the number of years, the share of years, and the conflict/years ratio for each system type based on the Conflict Catalog set of European conflicts.

Table 1

Pattern of Years and Conflicts per System Type: Conflict Catalog

	Number of <u>Conflicts</u>	Share of <u>Conflicts</u>	Number of <u>Years</u>	Share of <u>Years</u>	Conflict/ Years <u>Ratio</u>
Unipolar	20	.024	10	.022	1.062
Bipolar	309	.363	138	.305	1.189
Tripolar	223	.262	142	.314	.834
Multipolar	<u>299</u>	.351	<u>162</u>	.358	.98
	851		452		

As we can see from Table 1, periods of bipolarity experienced markedly higher levels of war than would be expected, periods of tripolarity experienced markedly lower levels than would be expected, and periods of unipolarity and multipolarity experienced about what would be expected.

Table 2 presents the same information as Table except that the set of violent conflicts comes from the three combined datasets.

Table 2

Pattern of Years and Conflicts per System Type: Combined Datasets

	Number of <u>Conflicts</u>	Share of <u>Conflicts</u>	Number of <u>Years</u>	Share of <u>Years</u>	Conflict/ Years <u>Ratio</u>
Unipolar	0	0	10	.022	0
Bipolar	34	.318	138	.305	1.043
Tripolar	36	.28	142	.314	.892
Multipolar	<u>299</u>	.402	<u>162</u>	.358	1.123
	107		452		

When we restrict ourselves to the set of wars involving the major European powers, we find that unipolarity does very well at controlling conflict, although the small set of years must temper such a conclusion. Bipolarity experiences a slightly higher level of war while tripolarity experiences a significantly lower amount of warfare. Multipolarity suffers a significantly higher amount of warfare than would be expected.

Fortunately, the impact of system structure on warfare can be tested, because of Wilkinson's Chinese and Indic system structure data, with two other state systems. Let us first compare Wilkinson's Chinese system structure data with Lee's (1931) time-series of the frequency of wars in China augmented for the period prior to 221 BC by Chinese-language data gathered as part of the Conflict Catalog project.

Wilkinson (1999b) allocates each 25-year interval in Chinese history from 1025 BC to 1850 AD to one of the seven system structures listed earlier. It is again worth noting that except for the addition of the two "extreme" possibilities, effective centralized governance and no major powers, Wilkinson's list closely resembles the distinctions based on Thompson (1986) used earlier for the European state system.

If we perform the same type of comparison with the Chinese system data as we did with the European system data, but limit ourselves to the timeframe 725 BC to 1850 AD because of limitations in the conflict data, we find the following in Table 3.

Table 3

Pattern of Years and Conflicts per System Type: China

	Number of <u>Conflicts</u>	Share of <u>Conflicts</u>	Number of <u>Years</u>	Share of <u>Years</u>	Conflict/ Years <u>Ratio</u>
Universal Empire	179	.076	300	.115	.657
Hegemony	108	.046	75	.029	1.585
Unipolar	594	.251	775	.298	.844
Bipolar	379	.16	350	.135	1.192
Tripolar	99	.042	275	.106	.396
Multipolar	941	.398	800	.308	1.295
Nonpolar	<u>62</u>	.026	<u>25</u>	.009	2.729
	2362		2600		

The results from Table 3 partially agree with the earlier findings. Perhaps most interestingly, bipolarity maintains or even extends the conflict-proneness found in the European state system whereas tripolarity enjoys even stronger evidence indicating the relative peacefulness of that type of system. Another result that is consistent with the European system is that multipolarity again appears to be relatively war-prone. Nonpolarity appears to correspond with anarchy. Also of interest is that hegemony (one power has more than 50% of the power in the system) appears to correspond with dramatically higher levels of warfare while universal empire appears very peaceable.

Let us next do an analogous comparison with the Indic system. Unfortunately, accomplishing this task was significantly more time intensive than what was needed for the other two systems. While Wilkinson (1996) allocates each 10-year interval in Indian history from 550 BC to 1800 AD to one of the seven system structures, I have not been able to locate any compilation of Indian subcontinent conflicts analogous to Lee's (1931) compilation for China. I thus have been assembling such a compilation using primarily Schwarzberg (1992) and Schmidt (1995). I currently have the list from 550 BC to 1700 AD completed, but because of limitations in the data, the findings

below in Table 4 will be from the timeframe 500 AD to 1700 AD.

If we perform the same type of comparison with the Indic system data, we get the results found in Table 4.

Table 4

Pattern of Years and Conflicts per System Type: Indian subcontinent

	<u>Number of Conflicts</u>	<u>Share of Conflicts</u>	<u>Number of Years</u>	<u>Share of Years</u>	<u>Conflict/ Years Ratio</u>
Hegemony	43	.064	50	.042	1.641
Unipolar	261	.415	450	.375	1.107
Bipolar	236	.375	480	.40	.938
Tripolar	45	.072	120	.10	.715
Multipolar	23	.037	50	.042	.878
Nonpolar	<u>21</u>	.033	<u>50</u>	.042	.8
	629		1200		

The pattern for the Indic system in part agrees and in part differs from the previous systems. Perhaps most notably, tripolarity maintains a perfect record in terms of being significantly more peaceful than what would be expected. Hegemony, like in the Chinese state system, appears to experience warfare at a level much higher than what would be expected. Bipolarity, on the other hand, appears to be relatively peaceful system type in the Indic state system, which is a notable change. Similarly, multipolarity comes out as relatively peaceful, which is in contrast with previous findings. Nonpolarity differs dramatically from the one possible comparison, the Chinese state system, being very peaceful as opposed to being very war-prone.

Table 5 summarizes the findings by presenting the conflict/years ratio for all of the alternatives tested.

Table 5

Comparison of System Types Across Different State Systems:
Conflict/Years Ratio

	Europe: Conflict <u>Catalog</u>	Europe: Combined <u>Datasets</u>	<u>China</u>	Indian <u>Subcontinent</u>
Hegemony			1.585	1.641
Unipolar	1.062	0	.844	1.107
Bipolar	1.189	1.043	1.192	.938
Tripolar	.834	.892	.396	.715
Multipolar	.98	1.123	1.295	.878
Nonpolar			2.729	.8

CONCLUSION

What can we conclude? Evidence from three distinct state systems indicate that system structure does make a difference, but the findings are not what most probably expect. In terms of how system structure affects the level of conflict, most of the system types varied across state systems in terms of the amount of violent conflict experienced compared to what would be expected. Perhaps the most noteworthy findings are that tripolarity seems to have a significant pacifying effect whereas hegemony has a significant proneness for warfare. Bipolarity does not have a strong pacifying effect. If anything, bipolar systems are somewhat prone to war.

More generally, this paper will hopefully contribute to better theorizing about the causes of warfare. It goes beyond previous efforts in its attempt to use empirical evidence to answer the questions posed at the beginning of this paper. I hope that future scholars will use these findings to shape and constrain their theoretical formulations. In addition, this paper demonstrates that data about regions and times up to now almost ignored by European and North American scholars of war can be fruitfully applied to those questions.

BIBLIOGRAPHY

Brecke, Peter. 1998. Reinterpreting the Characteristics of Violent Conflict. Paper prepared for the 1998 Meeting of the Peace Science Society (International) on October 16-18, 1998 in East Rutherford, NJ.

Doran, Charles F. 1991. *Systems in Crisis: New Imperatives of High Politics at Century's End*. Cambridge, UK: Cambridge University Press.

Gilpin, Robert. 1981. *War and Change in World Politics*. Cambridge: Cambridge University Press.

Kugler, Jacek, and Douglas Lemke, (eds.) 1996. *Parity and War: Evaluations and Extensions of the War Ledger*. Ann Arbor, MI: University of Michigan Press.

Lebow, Richard Ned. 1995. "The Long Peace , the End of the Cold War, and the Failure of Realism." in Richard Ned Lebow and Thomas Risse-Kappen (eds.) *International Relations Theory and the End of the Cold War*. New York: Columbia University Press. pp. 23-56.

Lee, J. S. 1931. "The Periodic Recurrence of Internecine Wars in China." *China Journal of Science and Arts*. (March, April). pp. 111-115, 159-163.

Levy, Jack S. 1984. "Size and Stability in the Modern Great Power System." *International Interactions*. Vol. 10, Nos. 3-4. pp. 341-358.

Levy, Jack S. 1994. GREAT POWER WARS, 1495-1815 \Computer file\. New Brunswick, NJ and Houston, TX: Jack S. Levy and T. Clifton Morgan \producers\, 1989. Ann Arbor, MI: Inter-university Consortium for Political and Social Research \distributor\.

Midlarsky, Manus I. 1974. "Power, Uncertainty, and the Onset of International Violence." *Journal of Conflict Resolution*. Vol. 18. pp. 422-429.

Midlarsky, Manus I., and Kun Y. Park. 1994. MAJOR-MINOR POWER WARS, 1495-1815 \Computer file\. Champaign-Urbana, IL: Data Development in International Research \producer\, 1991. Ann Arbor, MI: Inter-university Consortium for Political and Social Research \distributor\.

Modelski, George, and William R. Thompson. 1988. *Seapower in Global Politics, 1494-1983*. Hampshire, UK : Macmillan Press.

Organski, A. F. K., and Jacek Kugler. 1980. *The War Ledger*. Chicago: University of Chicago Press.

Rasler, Karen A., and William R. Thompson. 1994. *The Great Powers and Global Struggle 1490-1990*. Lexington, Kentucky: University Press of Kentucky.

Schmidt, Karl J. 1995. *An Atlas and Survey of South Asian History*. Armonk, NY: M.E. Sharpe.

Schwarzberg, Joseph E. ed. 1992. *A Historical Atlas of South Asia*. 2nd impression, with additional material. New York: Oxford University Press.

Schweller, Randall L. 1993. "Tripolarity and the Second World War." *International Studies Quarterly*. Vol. 37, No. 1 (March). pp. 73-103.

Singer, J. David, Stuart A. Bremer, and John Stuckey. 1972. "Capability Distribution, Uncertainty, and Major Power War, 1820-1965." in Bruce M. Russett, ed. *War, Peace, and Numbers*. Beverly Hills, CA: Sage. pp. 19-48.

Singer, J. David, and Melvin Small. 1993. NATIONAL MATERIAL CAPABILITIES DATA, 1816-1985 \Computer file\. Ann Arbor, MI: J. David Singer, University of Michigan, and Detroit, MI: Melvin Small, Wayne State University \producers\, 1990. Ann Arbor, MI: Inter-university Consortium for Political and Social Research \distributor\.

Singer, J. David, and Melvin Small. 1994. CORRELATES OF WAR PROJECT: INTERNATIONAL AND CIVIL WAR DATA, 1816-1992 \Computer file\. Ann Arbor, MI: J. David Singer and Melvin Small \producers\, 1993. Ann Arbor, MI: Inter-university Consortium for Political and Social Research \distributor\.

Thompson, William R. 1986. "Polarity, the Long Cycle, and Global Power Warfare." *Journal of Conflict Resolution*. Vol. 30, No. 4 (December). pp. 587-615.

Waltz, Kenneth N. 1979. *Theory of International Politics*. Reading, MA: Addison-Wesley.

Wayman, Frank Whelon. 1984. "Bipolarity and War: The Role of Capability Concentration and Alliance Patterns among Major Powers, 1816-1965." *Journal of Peace Research*. Vol. 21, No. 1. pp. 61-78.

Wilkinson, David. 1996. "Configurations of the Indic States System." *Comparative Civilizations Review*. Vol. 34 (Spring). pp. 63-119.

Wilkinson, David. 1999a. "Unipolarity Without Hegemony." *International Studies Review*. Vol 1, No. 2 (Spring). pp. 141-172.

Wilkinson, David. 1999b. "Power Polarity in the Far Eastern World System 1025 BC—AD 1850: Narrative and 25-Year Interval Data." *Journal of World-Systems Research* Vol. 5, No. 3. pp. 501-617.