A Streetcar Named Sarajevo: Catalysts, Multiple Causation Chains, and Rivalry Structures

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"Streetcar" interpretations of world politics emphasize the significance of contingent catalysts vis-à-vis structural variables and multiple, nonlinear chains of causation, among other things. Ultimately, though, it is difficult to evaluate the significance of catalysts in the absence of systematic data on war precipitants that would allow one to compare the effects of catalysts and other factors. More concrete but under conceptualized is the explanatory payoff associated with examining nonlinear interactions among multiple rivalries in bringing about wars that spread more widely than anticipated. World War I is a good case in point. A very large number of interstate rivalries contributed in various ways and over a number of years to the outbreak of a world war that no one sought precisely in the way in which it emerged. Focusing on the structure of their interactions also facilitates the synthesis of a number of alternative interpretations of why World War I began. Examining the effects of interconnected and "ripe" rivalry fields in other major power war contexts should prove to be equally beneficial.

Richard Ned Lebow (2000–2001) has recently invoked what might be called a streetcar interpretation of systemic war and change. According to him, all our structural theories in world politics both overdetermine and underdetermine the explanation of the most important events—such as World War I, World War II, or the end of the Cold War. Not only do structural theories tend to fixate on one cause or stream of causation, they are inherently incomplete because the influence of structural causes cannot be known without also identifying the necessary role of catalysts. As long as we ignore the precipitants that actually encourage actors to act, we cannot make accurate generalizations about the relationships between more remote causation and the outcomes that we are trying to explain. Nor can we test the accuracy of such generalizations without accompanying data on the presence or absence of catalysts. In the absence of an appropriate catalyst (or a "streetcar" that failed to arrive), wars might never have happened. Concrete information on their presence ("streetcars" that did arrive) might alter our understanding of the explanatory significance of other variables. But since catalysts and contingencies are so difficult to handle theoretically and empirically, perhaps we should focus instead on probing the theoretical role of contingencies via the development of "what if" scenarios.

Lebow's challenge to the normal industry of explaining the Big Bang events of world politics contains a mixture of points, with some of which it is hard to disagree.

Yet there are other parts of the argument with which it is very hard to agree. More importantly, though, Lebow almost makes an argument about explaining World War I that seems more compelling than the possible role of catalysts and contingency. By arguing that World War I was a "nonlinear confluence of three largely interdependent chains of causation which produced independent but simultaneous gestalt shifts in St. Petersburg, Vienna, and Berlin," Lebow highlights an interpretation of World War I that contains considerable potential for synthesizing other interpretations, overcoming the tendency to promote one causal factor over others, and developing a general structural interpretation that may prove useful in helping to explain other systemic wars. Drawing out this alternative argument about systemic wars which is underdeveloped in Lebow's challenge is the main focus of the present essay. Along the way, some ancillary observations will need to be made about other aspects of the streetcar explanation. When all is said and done, and regardless of whether streetcars arrive on time, theoretical generalization and empirical testing about structural change remain viable enterprises.

The Streetcar Challenge

Lebow's many specific points about World War I include the contention that we do not give sufficient credit to the assassination of Archduke Ferdinand at Sarajevo as a major cause. Instead, the tendency is to focus on German blank checks and Austrian pretexts for war. But if Ferdinand had not been killed in 1914, Lebow believes, it is possible that war might have been avoided altogether and that the underlying conditions promoting war could have dissipated in the absence of a catalyst at just the right time to provoke Austrian, German, and Russian bellicosity. More generally, though, his assertions about war explanations can be summarized in the following condensed form:

1. Current theories of international relations almost invariably focus on one chain of causation; multiple paths of causation (including international and domestic structures, domestic politics, and leaders) and their possible interaction (in linear or nonlinear ways) need to be considered.
2. Theoretical explanations for war take catalysts for granted, assuming that as long as the right underlying conditions are present, some incident will sooner or later set armies on the march. But, just as streetcars do not always come, underlying causes do not make events inevitable; they only create the possibility of change. Fortuitous contingencies or catalysts that are independent of the causes may be necessary in the sense that the outbreak of war requires the conjunction of underlying pressures and appropriate catalysts. Without an appropriate catalyst, the underlying causes may evolve in such a way that the pressure for change is weakened or eliminated.
3. If a war could have been prevented by avoiding the catalytic event, the war outcome must be regarded as highly contingent. Contingencies and catalysts in the form of random acts or conjunctures of multiple chains of causation are difficult to deal with theoretically. Not only are they difficult to theorize about, they also render theory construction and empirical testing of theories problematic. If catalysts are necessary conditions, we cannot make generalizations about the relationships between underlying conditions and the probability of war outbreak unless we also assume the presence of any appropriate catalyst. Nor can one test general theories of war if it is impossible to control for the mediating role of catalysts between independent and dependent variables.

Lebow's first statement about monocausal propensities is virtually unassailable. Without a doubt, theories of international relations tend to privilege some factor or small set of factors over others. In some respects, that is precisely what theories are supposed to do. The problem is that it is usually easier to focus on one element and/ or level of analysis—polarity distribution, power transition, alliance bipolarization, democratic dyads, arms races, crisis behavior—than it is to develop a fully specified set of statements about how some of these elements combine to increase the probability of war. This monocausal penchant is an old problem of IR theory, one that has long been recognized, yet also one that has not received adequate attention for we continue to prefer monocausal "solutions" to our IR puzzles. We know better but the path of less resistance continues to be highly tempting.

The second group of statements on the role of catalysts is more debatable. Yes, precipitants do tend to be taken for granted. Structural theories are about piles of firewood that are viewed as becoming either exceptionally dry or impregnated with starter fuel. The general nature of such arguments is that given this highly combustible set of ingredients (whatever they may be), the probability of a conflagration is higher than if the firewood is wet or unsoaked in kerosene. No structural theorist says that a possibly ensuing conflagration is due to spontaneous combustion. Someone still has to light a match or spark a flint. Nor do most structural theorists say that the presence of the appropriate sort of underlying conditions makes some outcome inevitable—only that it is more probable.[1] If no one lights a match, then it is possible that the primed firewood will not catch on fire.

Yet the very ability to say empirically that there is a greater probability of fire if the wood is dry than if it is wet implies that dry firewood, historically, has ignited more often than wet firewood. The presence or absence of a lit match does not vitiate the ability to generalize about the circumstances that make lighting the match more successful. This is one place in which the Lebow argument goes astray. Specific wars may well be highly contingent on the specific event(s) that precipitate them. British entry into the 1739 War of Jenkins's Ear against Spain was precipitated in part by the alleged mistreatment of a British ship captain.[2] Yet can one really feel comfortable in saying that the British would never have entered the war if the damage to Jenkins's ear had not occurred? British decision-makers, or some of them at least, presumably were looking for an opportunity to improve their Caribbean position. It is not hard to imagine another streetcar coming along to serve the purpose of precipitating further gains in the penetration of the Spanish colonial empire.

More generally, though, the question is whether wars in general tend to break out given some set of underlying conditions? If they do, it suggests that the catalytic role may not be as critical to either a theory's construction or evaluation as Lebow thinks. Either some type of precipitant is present or it is not. If it is frequently absent and one still finds a strong relationship between the development of underlying conditions and the outbreaks of war, the catalyst can hardly be a major or necessary causal factor. If the catalyst is frequently present when the appropriate underlying set of conditions is also present, assuming again the strong relationship between the structural causes and war outcomes, the assumption that "some incident will sooner or later set armies on the march" may in fact be appropriate.

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[1] Some power transition language may verge on statements about the inevitable. But even in these cases the emphasis is usually on the apparent inevitability of the power transition, not on how decision-makers will respond to the transition. See, for example, the discussion about the possibility of a Chinese ascendancy in the twenty-first century in Tammen et al. (2000:153–81).

[2] Spanish coast guards in the Caribbean were confiscating ships believed to be engaged in illegal trade with Spanish colonies. While the British government had negotiated successfully a settlement of grievances with Spain in 1739, opposition to the arrangement pressed for a more coercive response in both the press and Parliament. Captain Jenkins brought his severed ear to Parliament in a pickle jar as evidence of Spanish atrocities and as part of a factional campaign to provoke a war in the face of governmental reluctance (Jones, 1980:199).

At the same time it is not inconceivable that a theory's explanatory power or pre(post)dictive utility might be enhanced by knowing something about certain types of precipitants. It could be that the interaction of some types of precipitants and underlying causes makes war outbreaks much more probable. For instance, if a precipitant or catalyst removes barriers to war participation that might otherwise have been difficult to overcome, the catalytic factor begins to take on more significance than simply a randomly lit match. The alleged attack on Captain Jenkins is one such example. It galvanized popular and legislative support for British entry into a war that might otherwise have been more difficult to justify. It also weakened the governmental inclination to avoid war in this instance. Lebow's interpretation of Sarajevo is similar in spirit. Whatever else it may have done, it removed an influential decision-maker who was reluctant to see Austria-Hungary go to war in 1914, thereby facilitating a 1914 Viennese hawkish decision in conjunction with other factors.[3]

Yet it is difficult to know how far to push the relative significance of such factors if we examine cases one by one. One is limited in what can be said about the significance of polarity distributions or democratic dyads when the case N is only one or two; so, too, for the role of catalysts and, for that matter, alternative historical scenarios in which we can probe the significance of various factors in a speculative vein.[4] We would need to look at an array of cases (and, preferably, a simultaneous array of noncases) if we wish to assess the importance of catalytic factors. In other words, Lebow may be right to suggest that we are missing out on an important clue by slighting the role of catalysts. It remains to be seen whether slighting catalysts precludes theorizing or testing theories. The odds are that it does not but that certainly does not mean that no one should bother to check whether understanding catalysts strengthens our overall explanatory capabilities.

But there is a second argument embedded in Lebow's challenge that is far more intriguing. Sarajevo is so important to Lebow because he argues that it helped change the way decision-makers in three countries regarded the prospective costs and benefits of war. Prior to 1914, German decision-makers were reluctant to encourage Austrian action in the Balkans, especially in view of the prospects for being forced to deal with Russian and French threats on two fronts. Yet they also were worried about future Russian military improvements. Austrian decision-makers disagreed about how best to cope with Southeast European threats to their interests and imperial integrity. Russian decision-makers had to deal with a string of foreign policy failures ranging from the Russo-Japanese War outcome to the 1908 Bosnian crisis and the threat of revolution. Another failure had to be avoided. Sarajevo helped stimulate decision-makers into action in all three capitals. The Germans encouraged the Austrians to do something fairly risky. The Austrians were encouraged to take the offensive against Serbia. The Russians felt they had to avoid another foreign policy embarrassment. The interaction of these shifts toward greater risk-taking perspectives, according to Lebow, made an Austro-German-Russian escalation of hostilities much more likely than had hitherto been the case.

So far we are still in the realm of the catalytic event's significance. Lebow makes the argument even more interesting by suggesting that each of these three shifts in perspective were strongly influenced by a variety of earlier developments. If Wilhelm I had not annexed Alsace-Lorraine after the Franco-Prussian War, there might have been no Franco-German rivalry. If the German statesmen who followed

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[3] Others have made this argument as well without turning the assassination into a major causal factor. See, e.g., Ferguson (1999:148).

[4] While there are a number of roles that counterfactual analysis can play in the analysis of interstate politics, including exploring, probing, or reinforcing more general analyses, it seems improbable that such analysis could ever supplant the complementary need for systematic analysis. For a review of the uses of counterfactual analysis in world politics see Tetlock and Belkin (1996).

Bismarck's ouster from control over German foreign policy had been able to handle Russia as well as Bismarck had, the Russians might have been less likely to ally with France. If Germany had not provoked an unproductive naval race with Britain, there might not have been an Anglo-French entente. If these three chains of causation had worked out differently, Europe might not have been bipolarized into two hostile camps.

Lebow further contends that it was the interaction among these chains of causation that was more important than any of the individual chains themselves. That is to say, no single chain could have produced a war. It took the interaction of all three to generate World War I. Moreover, while it is clear that Lebow is arguing for the coming together of multiple streams of causation, it is not clear that he is content to limit the argument to three chains (and their interaction effects). He also notes that Austria's annexation of Bosnia in 1908 precluded the possibility of cooperation between Austria and Serbia. By humiliating Russia shortly after Japan had done something similar, the Austrian annexation also meant that Russia would look for opportunities to return the favor. Three years later, the Italian movement into Libya encouraged Serbia, Bulgaria, and Greece to attack what remained of the Ottoman Empire in southeastern Europe. Serbia emerged from the Balkan Wars ending in 1913 even more inclined to encourage Slav unrest in the Austrian empire at a time when Germany was becoming more inclined to support an Austrian preemptive strike on one of the southern sources of threat to the maintenance of its empire. This interpretation sounds more like at least five chains of interactive causation.

We need to take a step back from these specific arguments to recognize what is being said more generally. Lebow can be viewed as arguing that Austria, Germany, and Russia became likely to go to war in 1914 thanks in part to a structural background of developments in the Franco-German, Russo-German, Anglo-German, Anglo-French, Austro-Serbian, Austro-Russian, Russo-Japanese, Serbian-Turkish, Greco-Turkish, and Bulgarian-Turkish rivalries. Implicit to these fairly explicit arguments are references that might have been made about still other rivalries. The Anglo-French entente emerged from the British decision to better confront the main threat of Germany by deescalating its rivalries with not only France, but also the United States and Russia. France, Russia, and the United States had all also elevated the threat perceived to be posed by Germany. Italy attacked Turkish territory in North Africa in part because Italy was unable to do much about pursuing directly its rivalries with Austria or France and was therefore safer seeking territorial expansion and Great Power glory on another continent altogether. A residual Franco-Austrian rivalry persisted as well.[5] Austro-German cooperation after the 1870s presumed the termination of their old rivalry. So, too, did Russo-French cooperation after 1890. The Balkan wars further weakened Russia's Bulgarian client to the profit of Bulgaria's Greek and Serbian rivals. The number of relevant causation chains multiplies rather quickly.

Discussion of rivalries have been with us at least since Thucydides. Perhaps because they seem so familiar in the conflict landscape, we have long taken them for granted. Only recently have we begun to focus on them explicitly as structured relationships that are not all that common in frequency but which are uncommonly related to conflict propensities. In other words, rivalries offer exceptional clues to who is more likely to fight whom because rivals have already pre-selected one another as their most likely enemies and sources of threat.[6] What is most remarkable about the above paragraphs is that 15 of the 38 existing rivalries in

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[5] See, e.g., Schroeder (1999).

[6] One way (Thompson, 2001b) to identify rivalries is to define them as the relationships that form when decision-makers identify competitive enemies that are posing strategic or military threats. The more common quantitative

TABLE 1. Strategic Rivalries Existing in 1913

Rivalries Involving European Actors	Rivalries Involving Only Non-European Actors
Albania-Greece	Afghanistan-Iran
Austria-France	Argentina-Brazil
Austria-Italy	Argentina-Chile
Austria-Turkey	Bolivia-Paraguay
Austria-Russia	Bolivia-Peru
Austria-Serbia	Chile-Peru
Britain-Germany	China-Japan
Britain-Russia	Colombia-Ecuador
Bulgaria-Greece	Colombia-Peru
Bulgaria-Rumania	Colombia-Venezuela
Bulgaria-Turkey	Ecuador-Peru
Bulgaria-Serbia	El Salvador-Guatemala
Ethiopia-Italy	El Salvador-Honduras
France-Germany	Guatemala-Honduras
France-Italy	Iran-Turkey
Germany-Russia	Japan-United States
Germany–United States	
Greece-Turkey	
Greece-Serbia	
Japan-Russia	
Russia-Turkey	
Turkey-Serbia	

Source: Extracted from information reported in Thompson (2001b).
Note: Rivalries identified in bold print in the left-hand column are discussed in the text.

1913, identified in Table 1, are mentioned explicitly. If we limit the geographical focus to rivalries involving at least one European actor, the proportion is 15 of 21, excluding three or four important rivalries that were terminated prior to the outbreak of World War I.[7]

Even so, one of the more interesting dimensions of the European rivalry structure is not merely that so many of the extant rivalries were active at the same time. Rivalries tend to blow hot and cold over time, although, admittedly, finding 15 proximate hot ones at the same time seems more than coincidental. More critically, a large number had also escalated to tension and hostility levels at which war was at least conceivable. As is well known, the main Great Powers were engaged heavily in various types of arms races in attempts to gain edges over their competitors, or at least not to fall too far behind.[8] They had also gravitated toward a bipolarized alignment. Neither the arms races nor the alliance structures necessarily meant that war was more likely, but these structural and behavioral processes certainly underscored the tensions and concerns about positional losses— whether it be located in Austria's unstable, southeastern European bailiwick, Anglo-German industrial/commercial/colonial/naval competition, or German fears that it was falling behind Russian military improvements. In their strategies to try and catch up or keep up with their rivals, an unusually large number of

approach, however, involves establishing minimal threshold criteria for the number of militarized inter-state disputes dyads participated in within specific periods of time. See, among others, Diehl and Goertz (2000).

[7] This group includes Austria-Prussia/Germany, Britain–United States, Britain-France, and France-Russia.

[8] Herrmann (1996:227–28) argues that arms races facilitated the perception of a closing window of opportunity for Germany to be able to deal with its rivals on the battlefield. Stevenson (1996:418) credits European arms races on land with bestowing the perception of a Franco-Russian ascending power curve while encouraging the Austrians and Germans, and their rivals, to see the Austro-German power curve as a descending one. In this respect, arms races encouraged both sides to contemplate war as a desirable option, albeit for different reasons.

adversaries had become "ripe" or riper for resorting to martial policy alternatives by 1914.[9]

Nonetheless, one of the more frustrating aspects of World War I analyses is that practically every explanation for conflict seems to find some resonance in the events leading to war in 1914. This is the flip side of Lebow's argument about tendencies to focus on only one chain of causation. Authors can construct plausible explanations of what happened without seeking to be fully comprehensive in circumstances in which a good number of the explanatory foci in international relations seemed to be at work. The question should not be whether we can add a ripe rivalry structure to the broad inventory of World War I explanations. Rather, can a ripe rivalry structure help to unify some of the partial explanations for the 1914 onset of war? And, if that should be the case, just what does a "ripe" rivalry structure mean?

The nature of the First World War also seems to facilitate allocating blame for the outbreak of war to almost every conceivable actor, and not without some claim to credibility. Can a ripe rivalry structure shed any light on this question which, after all, is not that far removed from more neutral inquiries into more abstract causes? If we know (or think we know) which explanations are most powerful, there are usually implicit or explicit links to which set of decision-makers were most at fault. For instance, if one emphasizes the German challenge of Britain's political-economic preeminence, accusatory fingers are apt to point in the German direction. If one emphasizes the Sarajevo precipitant, the primary but not exclusive finger of blame points to Austria-Hungary. If the British had been less ambiguous about their intentions, or if the Russians had been even slower to mobilize, or if the French had been willing to settle for second-place position on the Continent, the war might have been avoided. As will be demonstrated, there seems a considerable amount of blame to be allocated and a number of directions in which to point. Rather than play the blame game in the traditional sense, it should be more useful to look for a framework that is capable of spreading the blame around for the onset of a regional war that became a global war in a way that no one quite anticipated. Among other things, after all, World War I is supposed to have been the global war that no one really wanted.

At the same time, there may also be some profit in shifting the focus on catalysts or precipitants that may seem accidental in whether they occur or not to "system accidents." System accidents are situations in which machine failures compound their malfunctions in unanticipated fashions and nonlinear interactions to bring about catastrophic breakdowns. International politics do not work like machines but world wars certainly do resemble catastrophic breakdowns of normal processes of world politics. The question is whether the system accident analogy can be employed in a concrete way to illuminate the nature of interaction among multiple rivalries.

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[9] Other analysts have drawn attention to the idea of multiple rivalries influencing the severity and spread of war. John Vasquez's (1993) "steps-to-war" model suggests that war diffusion may be a function of territorial contiguity, rivalry, and alliances. The presence of any one of the trio should have a positive impact on the spread of war, but the combination of two or more could greatly increase the probability of war joining. Vasquez (1993:247) also notes that these variables tend to interact with each other. For example, a territorial dispute between two proximate actors can lead to a dyadic rivalry that, in turn, can lead to the search for allies in an attempt to gain an advantage on the adversary. The question then becomes one of whether allies can restrain their own and other states-rivalries or whether they become ensnared in other people's conflicts. Diehl and Goertz (2000:241–62) argue and find some empirical support for the idea that close ties between rivalries reinforce rivalry duration and increase the potential for rivalry escalation and conflict severity.

System Accidents

How is it possible for wars that no one really wants to become truly global affairs? One metaphor for such a phenomenon is offered by Charles Perrow's (1984) study of "systemic accidents." Focusing on disasters such as nuclear reactor breaches, Perrow first breaks down complicated machinery into four levels: each individual part, units that represent collections of parts, subsystemic arrays of units, and systems in which the various subsystemic arrays come together. Of least concern are the breakdowns or failures of parts and units, termed "incidents," that have no impact beyond the part or unit level. Machine failures that disrupt the subsystemic or systemic level ("accidents") are more serious, especially if they entail multiple and unanticipated failures at several levels (part, unit, subsystem, and system).

One of the prime ways in which a system accident can occur is attributed to the complex interactions of the various machine components. Linear interactions represent the programmed or designed functioning of the machinery. For instance, we are all familiar with freeway driving. A large number of automobiles, trucks, and motorcycles occupy a fairly small space yet move, some of the time anyway, at high speed without problems. Something unexpected happens—a tire goes flat, a driver falls asleep at the wheel, a deer attempts to cross the road. The unprogrammed event initiates a chain reaction in which one car hits another, and then several more are affected by the initial impact. The outcome can be quite messy with a large number of vehicles damaged and lives lost.

The disaster described above involves a single, initial failure and multiple, unexpected interactions among the components of the freeway system. When components begin interacting in ways not intended by a programmer, the interactions can be described as "nonlinear" and "complex." Table 2 elaborates the distinction by summarizing the situations in which interactions may stay linear or become more complex. The problem reduces in many respects to physical insulation. If all the components can be kept apart in ways that do not permit their interaction, linearity or an anticipated outcome is more probable. But machinery is not set up to work that way very often. The parts are often proximate and interconnected in order to make the machinery work the way it is programmed. When failures occur, feedback loops aggravate the level of complexity by creating unanticipated interactions that may not even be recognized at the time—let alone understood in time to do anything about the problem(s).

Perrow makes one more distinction of some utility in analyzing complex interactions. "Tightly coupled" systems allow for no buffer between different parts, units, and subsystems. "Loosely coupled" systems provide some amount of insulation, if only in the form of slack, between components. Consequently, the tightly coupled systems respond very quickly to disturbances and, therefore, are more vulnerable to disasters while loosely coupled systems can absorb some level of failure without the entire system being disrupted.

Disaster in a freeway system is one thing; disasters in nuclear reactors or shuttle launches are entirely different matters. So, too, are disasters in international systems. Yet even though individual decision-makers (parts), decision-making groups (units), states (subsystems), and international systems (systems of

TABLE 2. Attributes of Complex and Linear Processes

Complex	Linear
Proximity	Spatial segregation
Feedback loops	Few feedback loops
Limited understanding	Extensive understanding

Source: Based on Perrow (1984:88).

subsystems) can be equated with Perrow's four level distinctions without much of a stretch, it could be argued that international systems are not the same entities as man-made machinery. Metaphors about machinery failures may be interesting but not transferable to international relations in which the components are not designed to run as if political interactions were linearly programmed to produce products of peace and stability. No doubt there are limits in applying machine failure metaphors to world politics. However, the utility of the metaphor lies not so much in the machinery imagery as it does in distinguishing between linear and complex interactions and applying them to rivalry structures.[10] The basic point is that dense and proximate rivalry fields are highly susceptible to producing complex and unanticipated interactions. What takes place in one rivalry can have implications for the course of several other rivalries. If they are also tightly coupled, "failures" in one or more rivalries to manage their levels of conflict can spread throughout the system.

For instance, a war breaking out between rival states A and B requires A's rival, state C, to come to the aid of B. State C's assistance to B motivates state D, also a rival to C, to support A. State D proceeds to attack state C and its main ally state E (also D's rival), which, in turn, encourages state F (still another D rival) to enter on the side of states C and E. States C, E, and F had once been rivals to each other but had deescalated their conflicts to better deal with the implications of D's ascendancy in the region and global systems. State F is allied to states A and D but believes it can profit more by switching to the CEF side, in part because states A and F are rivals over territory that A controls and F covets. States G and C are also rivals but G is allied to state F and also stands to gain more in its own region by joining the CEF side. After CEFG and AD become deadlocked on the battlefield, state H becomes motivated to intervene on the CEFG side. The point here is that states A and B (or D and E) were unlikely to foresee that their actions would lead to an eventual CEFGH versus AD showdown in which CEFGH would triumph over the AD combination.[11] A "system accident" can thus become a "system disaster," without anyone fully intending to bring about the actual outcome that eventually emerges. Decision-makers do not plan on global wars when they start smaller-scale wars that sometimes escalate via multiple hostilities, tight coupling, and complex interactions into much wider affairs than anyone initially foresaw.

Who should we blame then for these occasional system meltdowns? If no one can foresee the full scale of hostilities that emerges, is no one responsible? Did the "system" make them do it? Or, is it more accurate to spread the blame throughout the system? As hinted at earlier, assessing blame in complex interaction circumstances is not really all that profitable an endeavor. Variable levels of culpability can be identified, just as various interpretations that center on different actors in the system as the principal culprits can be acknowledged as at least partially accurate. That is to say, it can make sense to focus on German fears of falling behind, Austrian fears of losing imperial control, Russian fears of further humiliation, French desires for revenge, or British reluctance to make explicit their commitments simultaneously if it can be demonstrated that these attributes existed and contributed to priming various rivalries for conflict escalation. The same can be said of analyses that stress Anglo-German power transition or Austro-German-Russian competitions in the Balkans and elsewhere. Neither emphasis need be mutually exclusive forcing us to pick one over the other—unless it can be

[10] Although he does not apply his argument to rivalry structures, Jervis (1997:17) also displays no reluctance to endorse Perrow's perspective on densely interconnected systems in the analysis of international systems. Lebow (1987) is also quite comfortable with the implications of Perrow's perspective.

[11] The point here is not that decision-makers on both sides failed to foresee the possibility of defections from one side to the other, but that no one in early 1914 could be expected to predict very well the alignments and war participants of 1917.

demonstrated that one or the other genuinely deserves greater explanatory weight. We err by not confronting these alternatives in preference for more single-minded arguments about one factor being the key to explaining World War I.

To pursue this argument further, a sampling of recent arguments about World War I can be examined, albeit only very briefly. The point of such an exercise is not to confront or evaluate the fundamental disagreements about interpretation that they exemplify. We will continue to debate who did what to whom and why in the period leading up to 1914 because the evidence and the statements made by the decision-makers themselves can be interpreted in different ways. Rather, the sample reviewed here is meant to reinforce the argument that, in marked contrast to the views advanced in the sample, we would be better off constructing our explanations in the context of the interaction of multiple rivalries or antagonisms that led to what approximates a "system accident" in world politics. Calling the outcome a system accident does not rule out the possibility that some decision-makers actively sought a war—only that no one fully realized just what scale of warfare would actually ensue.

Nor does the occurrence of system accidents rule out the possible utility of giving greater emphasis to catalysts as Lebow argues. Yet an appreciation for ripe rivalry structures—multiple, proximate rivalries many of which are operating at heightened levels of tension and hostility and are also tightly coupled—does tilt us away from the expectation that precipitants will prove to be all that significant. The match that ignites a fire somewhere in a field that is only occasionally prone to either ignition or spreading widely (due to structural causes—e.g., power transitions, arms races, conflicts over spheres of influence, tightly coupled rivalries, and so forth) must take on a relatively diminished significance. Streetcars (precipitants) may not always arrive on schedule but their probability of appearance in some form, given the appropriate structural context, is likely to be greater than average.[12]

Multiple Rivalries

Recent arguments about the origins of World War I can be translated readily into rivalry interpretations. Dale Copeland (2000) argues that German decision-makers felt that they were militarily preponderant in the first decade of the twentieth century but expected to lose this status to a rapidly rebuilding Russia by 1916–17. Crisis diplomacy was attempted up to 1912 when the decision was finally made that a preventive war was the only viable option to stave off the anticipated relative decline. Moreover, there was only a limited window of opportunity to fight such a war before Russian military improvements made it too dangerous to contemplate. War might have broken out that year but was postponed to improve Germany's naval position vis-à-vis Britain.

Niall Ferguson (1999) blames Germany for forcing a continental war on a reluctant France and a more eager Russia and Britain for transforming a continental war into a world war unnecessarily. The British behavior was based in part on what is called a "Napoleonic Neurosis." The idea that Germany was the main threat for Britain was couched in language that portrayed Germans seeking full control of Europe via coercive tactics. Once this control was achieved, European resources would be placed at German disposal and would allow Germany to mount a formidable challenge against Britain in the world at large.

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[12] Another way of looking at this issue is to ask whether Franz Ferdinand's assassination would have or could have served as a catalyst to World War I in the absence of a structural context predisposed toward major power warfare? Lebow maintains that we cannot understand the significance of the structural arguments without translating them in terms of the catalyst. But we can turn the logic around just as easily and suggest that the catalyst may have little meaning in the absence of an appropriate structural context.

Ferguson's complaint is that there was little evidence to support the Napoleonic ambitions attributed to German decision-makers and that, furthermore, British decision-makers were aware that Germany was not in a position to mount such a campaign prior to 1914. He also contends that British decision-makers were not really alarmed by German colonial ambitions and that no one in London felt threatened by the possibility that the Germans might achieve parity with British naval superiority. This interpretation leads Ferguson to suggest that British decision-makers consciously chose to exaggerate the level of German threat in order to justify a commitment to France. Left unclear is why a desired commitment to France preceded an exaggeration of German threat unless, of course, the French connection was considered essential to meeting an emerging German threat.

Paul Schroeder (2001) contends that the primary cause of World War I was the breakdown of the relationships among the Austro-German-Russian triangle, linking the three major powers of the European core. For the most part, two of the triangle's dyads (Austria and Russia and Prussia/Germany and Russia) had managed to avoid fighting one another. Prussia/Germany and Austria had been intense rivals and had fought, but only rarely and not for extended periods of time. In general, the modal relationship within the triangle had been one of cautious cooperation and even alliance, creating a type of long peace at the European epicenter. The long peace prevailed as long as the three did not seek to exclude one of the three by force from the sub-regions in which they were engaged in positional competitions or, more seriously, to destroy any of the members of the triangle. The long peace broke down when Russia began seeking the elimination of Austria after 1908–1909. The European region then became involved in a general war that could only have begun in southeastern Europe.

Edward McCullough (1998) emphasizes French attacks on the post-1871 European status quo. Alliance with Russia in 1894 threatened German predominance which was further aided by the French enlistment of the British in its anti-German coalition. Its confidence boosted by its external support, France proceeded to challenge Germany over Morocco in the first decade of the twentieth century, even though its ultimate goal was to secure the return of Alsace-Lorraine. World War I thus reduces to a Germany on the defensive ultimately deciding on war to preserve the existence of its Austrian ally which was also acting in the Balkans on grounds of self-preservation.

These four arguments intersect in some places and diverge extremely in others. Copeland (2000) stresses the Russo-German rivalry as central. Ferguson (1999) emphasizes the Anglo-German rivalry. Schroeder (2001) argues that World War I stemmed from a breakdown in the Austro-German-Russian triangle, with particular emphasis on the Austro-Russian rivalry. McCullough (1998) accentuates the Franco-Germany rivalry. In his own argument, Lebow (2000–2001) notes the significance of the Franco-German, Russo-German, and Anglo-German rivalries, among several others. This is not the place to sort out the evidence for their various specific interpretations. One need not accept all of their claims as equally plausible in noting, however, that they are all engaged in implicit and explicit forms of rivalry analysis—even if they never even use the word "rivalry." Nor does it require much of a stretch of the imagination to suggest that all of the named rivalries probably had something to do with the initiation of World War I. Rather than privilege one or two of the rivalries as the main culprits, why not implicate all or almost all of them in a nonlinear interaction of multiple adversarial relationships?

This is not the same thing as saying that all of the rivalries were equally important to the war onset. Some played relatively minor or secondary roles. The rivalries among France, Italy, and Austria were probably not major factors. The course of the Serbian-Turkish rivalry (and those involving Greece, Bulgaria, and Turkey as well) seems to have indirectly escalated tensions in the Austro-Serbian rivalry. War in the Russo-Japanese rivalry definitely weakened

Russia; consequent attempts to rebuild the Russian military machine alarmed the Germans. Somewhat secondarily, the preliminary negotiations first between Germany and Austria and later between Britain and France, the United States, and Russia to either terminate or deescalate temporarily (in the Anglo-Russian case) their rivalries made the bipolarization of the Great Powers possible. One could also relegate the German-U.S. rivalry to the secondary category as far as the 1914 onset was concerned; the entry of the United States into the war in 1917 would be a different matter.

According secondary or minor status to eight rivalries still leaves five major ones. Austria-Russia, Austria-Serbia, Britain-Germany, France-Germany, Germany-Russia all seem significant to the initial outbreak of war, and its subsequent escalation to continental and world scale. All five rivalries experienced increases in hostility and tension in the decades leading up to 1914. In that sense, all five were primed toward exchanging greater conflict, not less. Of the five, only the Anglo-German one may have been moving away from an upward spiral of greater animosity just before 1914.

Two sets of rivalries were tightly coupled in Perrow's language. The rivalries linking Austria, Serbia, and Russia formed one triangular set. Anything Austria did to Serbia reverberated in the Austro-Russian rivalry. The rivalries linking Germany to France, Russia, and Britain formed a quadrilateral set. What Germany did to France reverberated in the Anglo-German and Russo-German rivalries even if Germany's attack on France was only a prelude to an attack on Russia. But the Franco-Russian alliance meant that the triangular and quadrilateral sets were also coupled fairly tightly. Thus, action beginning in the Austro-Russian-Serbian triangle was highly likely to affect the other cluster of rivalries no matter who lit the match. However, neither Serbia nor Russia, thanks to their relative weaknesses, were likely to attack Austria prior to 1914 even though their rivalries had escalated in animosity and tension levels. Austria, on the other hand, had the incentive and capability to attack Serbia. All it seemed to require was a reason and encouragement from its German ally. Once these prerequisites were satisfied and Austria was prepared to attack, Russia became the next link in the chain reaction. If it made no move to come to the aid of Serbia, the ensuing war could have been a brief dyadic affair between Austria and Serbia. If Russia mobilized against both Austria and Germany, Germany would probably have been in the fray, regardless of whether German decision-makers desired an opportunity for a preemptive strike against Russia. If Germany was in that meant France would probably be attacked according to the Schlieffen Plan. An attack on France increased the probability that Britain would enter the war. None of these outcomes was inevitable but the structure of multiple and interactive rivalries made the outcomes more probable once certain preconditions were met. For instance, the Serbian response to the Austrian ultimatum did not seem to matter much. But the extent of Russian mobilization did matter. The German continuing commitment to the Schlieffen Plan was also critical to stimulating the full interaction across the rivalry structure. Arguably, the German naval challenge and the related conflicts over colonies and markets were critical to maintaining the British connections to the Britain-France-Germany-Russia quadrilateral. Arms race on land, it has been argued, at least contributed to the perception of various states catching up and others falling behind. Moreover, war breaking out almost anywhere among the main five rivalries, again given the impressive potential for coupled, nonlinear interaction, might have led to the same or similar outcome.

Generalizing the Argument

Writing essays about events that occurred some 90 years ago, of course, is one thing. The social science problem is to develop some generalized appreciation of

how ripening rivalry fields may explode into a world war that was not fully intended by anyone. Can we develop some way of detecting a ripening rivalry field before it explodes? The main problem at this juncture is that we do not have a strong understanding of individual rivalry dynamics. Why do rivalries begin, escalate, deescalate, and terminate? If we fully understood what drives rivalries, we could probably aggregate this understanding to a field of rivalries. But we are just beginning to work on these questions after long ignoring the explanatory potential of rivalries. Excuses aside, we do have some strong analytical clues with which to work. These clues probably will not enable us to incorporate Schlieffen plans, German obsessions about Russian military reform, or Russian hostility toward Austria. That is to say, it is not likely that we can bring all of the 1914 details into a model at this time. Yet we can make a start in modeling why rivalry fields escalate nonlinearly.

Generalizing Nonlinear Rivalry Ripeness

The question is can a more general argument be developed that links multiple rivalries to nonlinear war expansion? We can start with some clues about conflict escalation in rivalry contexts. We know that serial conflict within rivalries increases the probability of war within the concerned dyads (Leng, 1983; Colaresi and Thompson, 2002). That is, the first clash in a rivalry has X probability of escalating into warfare. The second clash has X + n probability, and so on. Multiple clashes in a relatively short period of time do not make warfare inevitable but they do enhance the likelihood of warfare. Within a field of rivalries, a pattern of increasing serial clashes within multiple rivalries should be indicative of a "ripening" rivalry field. Such a field would be ripening because more and more rivalries within the field are experiencing a greater probability of escalating to warfare.

A second clue involves the oft-invoked argument about the bipolarization of the principal disputants. This structural feature speaks explicitly to Perrow's coupling distinction. More tightly coupled situations are more likely to lead to nonlinear breakdowns than less tightly coupled circumstances. Accordingly, the bipolarization of contending rivals, the ultimate form of a tightly coupled structure, should increase the probability of a nonlinear breakdown of relationships.

A third clue speaks to the structural background of rivalries such as the Anglo-German and Franco-German antagonisms. Both represented transitional processes in which one state was being overtaken by another. "Power transitions" represent a structural dynamic that are thought to be especially dangerous. They are also a more specific instance of rivalries that are ripe for conflict escalation. On the one hand, the overtaking actor is optimistic about its chances of defeating a declining leader. On the other, the actor being overtaken is anxious about its loss of a long held position and the political-economic implications for the future. As they approach some semblance of parity, they are thought to become increasingly likely to fight (Organski and Kugler, 1980; Tammen et al., 2000). The Anglo-German transitional case is well known. We may argue about the extent to which Germany had overtaken Britain and why Britain was more alarmed about German positional improvements than it was about U.S. positional gains, but there is little debate about whether global structural transition was at work.[13]

The Franco-German case is more ambiguous. Observers often focus on Alsace-Lorraine or Moroccan territorial disputes that certainly existed but overlook a more persistent problem. Since the mid-seventeenth century, France had been the

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[13] See, for instance, the arguments found in Tammen et al. (2000), Ingram (2001), and Thompson (1999, 2001a).

largest and most powerful actor in the West European region. The defeats suffered by Louis XIV and Napoleon had not entirely altered that fact. The defeat experienced in the 1870–71 Franco-Prussian War did seriously damage France's claim to being the leading regional power on the European Continent but it did not fully resolve the issue. Germany became the leading European military and economic power after 1871, but French decision-makers were not yet fully convinced of their loss of the regional lead. Hence, Alsace-Lorraine might be the more obtrusive index of regional discontent, but there was also an underlying and lingering structural question of regional hierarchy at stake. As long as the German lead over France was not too insurmountable, French decision-makers might hope to regain their regional lead, especially if allies could be mobilized to support the effort.

Power transitions can be strictly dyadic in character. But those power transitions that are most central to global and regional pecking orders are the ones that are least likely to remain dyadic.[14] Their outcomes are important to too many other actors and their own hierarchical positions. This is another example of coupling at work. A Russian-Japanese struggle in then-peripheral East Asia, particularly one that is waged less than conclusively, is less likely to entice third-party participation than is a similar positional struggle involving the world's main region and the constitution of global order. Even the United States ultimately could not stay aloof from the European combat that began in 1914.[15]

These more general arguments about serial conflict sequences, bipolarization, and structural transitions give us four different reasons to anticipate a stronger likelihood of nonlinear conflict expansion. It would be ideal if we could also incorporate Schroeder's insights on the course of Austro-Russian relations or Copeland's argument that Germany was most concerned about being unable to deal with Russia in the future. However, Schroeder's perspective does not lend itself readily to the sort of generalization that we might actually put to the test unless we could measure abrupt changes in Austrian perceptions about Russia over a period of time. Copeland's argument is operationable but, not unlike Schroeder's emphasis on the Austro-Russian-German triangle, it requires some acceptance of the assumption that the German-Russian rivalry was the principal concern of German decision-makers. The evidence for such an assumption remains debatable. The assumption also runs counter to the argument currently being explored on the interaction of multiple rivalries. None of these factors is a reason to ignore arguments about fluctuations in the "temperatures" of specific rivalries but they do go beyond our current ability to tap into and monitor rivalry temperatures. Until we can improve on this ability, it seems preferable to put such concerns aside in the interim.

Thus, we have at least three hypotheses about nonlinear conflict escalation in world politics:

> H1: *As an increasing number of adjacent rivalries experience serial clashes, the probability of nonlinear conflict expansion increases.*

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[14] Rasler and Thompson (1994) argue and find empirical support for the idea that, between 1494 and 1945, global wars represented situations in which declining global leaders were challenged by European regional leaders.

[15] We have historical myths that U.S. intervention in World War I was "to save democracy" or because of German interference with U.S. shipping and there is, as usual, some substance to these myths. But the most succinct explanation for U.S. involvement is that it could not afford to stay on the sidelines given the world order issues at stake, especially if its involvement could decide the outcome. A little more than a month before the U.S. entry into the war, President Wilson told a group of pacifists visiting the White House that war was inevitable and that as the leader of a war participant he could expect to be a part of the postwar negotiations. But if he were the leader of a neutral country, he could only "call through a crack in the door" (Knock, 1992:120). This anecdote hardly nails down the U.S. motivation(s) for war joining. It does suggest that this particular motivation was not alien to the incumbent president.

H2: *As the major actors in world politics become increasingly bipolarized, the probability of nonlinear conflict expansion increases.*
H3: *As central power transitions take place, the probability of nonlinear conflict expansion increases.*

To these three, we can add a fourth:

H4: *As more of these structural changes associated with conflict escalation occur simultaneously, the probability of nonlinear conflict expansion (and interaction among the main variables) increases even more so.*

Each of the independent variables can be operationalized for the period leading up to the outbreak of war in 1914. Assuming that the 1914–1918 combat can be equated with a nonlinear expansion of conflict, the empirical question becomes whether these processes take sharp upward turns immediately prior to 1914, and only prior to 1914. With only one instance of the dependent variable, there are rather major limitations on imputing causality.[16] Yet if we were to examine the nearly 100 years between the end of the Napoleonic Wars and the outbreak of World War I and find that the additive effects of rivalry disputatiousness, bipolarization, and central power transitions came together in a unique conjuncture in the years preceding 1914, we would have evidence that at least supports the notion that such factors are linked to "systemic accidents."

Measurement

Three types of indicators—for multiple, serial disputes within rivalry fields, bipolarization, and central power transitions—need to be fashioned. They also need to encompass a long, pre–World War I era so that we can assess the extent to which structural circumstances changed just prior to 1914. The end of the Napoleonic warfare in 1815 seems as good a place to start as any. We would not want to go before 1815 because the 1792–1815 fighting has nonlinear connotations of its own and, of course, there are major data availability problems. Any other starting point between 1816 and 1914 would be arbitrary and might miss something of interest.

Identifying serial disputes within rivalries is a fairly straightforward proposition although it does require some explicit rules. All rivalries involving two European actors or two major powers that were operative between 1816 and 1913 were first isolated. Next, the beginning dates of any militarized inter-state disputes (MIDs), the one standardized indicator of conflict (Jones, Bremer, and Singer, 1996) other than wars currently available for the nineteenth century, in which the pertinent dyads were involved were listed. Each successive dispute receives a successively higher number as long as the next dispute in the sequence took place within ten years of the one that preceded it. For instance, the Austrian-French dyad had MIDs in 1840, 1848, and 1888. The 1840 dispute received a score of one as the first dispute in the sequence. The 1848 dispute, occurring within ten years of 1840, received a score of two (as the second dispute). The third dispute in 1888 is not

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[16] World War I is not the only instance of nonlinear expansion conceivable. World War II and the Cold War also are worth examining in this context but space considerations preclude dealing with their complexities in a single examination. Earlier global wars, such as the 1792 outbreak, could also be examined but not necessarily with the same empirical rigor. With more variance in the dependent variable, it could be profitable to elaborate this theory with additional considerations that work toward and away from a global war outcome. Arms races, polarity, economic interdependence, democratic peace, and nuclear weapons come to mind as possible extensions. Another type of coupling worth examining more closely is the extent to which rivalries overlap. One could also test empirically for interaction effects among the variables.

considered part of the earlier sequence and thus reverts to a score of one as the "first" dispute in a later sequence that failed to evolve.

Each of these differentially weighted dispute events are then assigned to the year in which they began. Each year's scores are aggregated and then multiplied by the number of rivalries engaged in a dispute in that year. The assumption here is that some mechanism needs to be in place to distinguish between circumstances in which one rivalry is very disputatious in a short period of time and those in which several rivalries are actively conflictual.[17]

This approach is quite conservative in most respects. Ten years may be too restrictive for decision-makers and populations with longer memories. A second or third dispute may deserve a higher score than one or two more points than the first dispute. Yet some coding rules are obviously needed. Disputes that are separated by too many years should not be regarded as belonging to the same sequence. Or, put another way, as more and more years intervene between disputes, it becomes less clear whether participants are likely to view themselves as sliding into a dispute sequence. Where exactly we should draw the lines between the start and ending of one sequence and a following one is not self-evident. Nor is the precise weighting formula for disputes within a sequence obvious either. As we start to think of disputes and crises more as serial phenomena, better mousetraps for capturing their sequential quality, no doubt, will be forthcoming.[18]

Bipolarization is not as easy to measure as one might think because the analyst is much better off if he or she knows who the poles are around which the mutual exclusive clusterings take place.[19] Yet knowing who the poles are after the war has been fought is one thing. Knowing who to tap as the structured interaction begins to take place is quite another. An additional problem is that the poles around which bipolarization may or may not take place are not necessarily the same poles that might be identified by polarity standards. For instance, in retrospect, the poles of attraction in the pre–World War I setting were Germany and France. One could not have foreseen this development in 1816 or 1848. Nor were Germany and France so powerful that they could be said to have constituted the two poles in a bipolar power structure outside of Western Europe.

To avoid using information about the bipolarization that emerged most obviously between 1915 and 1917, Wayman's (1985) alliance polarization index is employed as a bipolarization indicator. Wayman counts the number of major powers that form blocs by possessing defense pacts with each other.[20] He then counts the number of "poles" (the number of blocs plus the number of nonbloc major powers) and calculates the ratio of actual poles to potential poles (or the total number of major powers). An index score that approaches 1.0 indicates multipolarization while a score that approaches 0.0 is most likely to signify bipolarization. For present purposes, the Wayman score is subtracted from 1.0 so that bipolarized settings have high scores as opposed to low ones.

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[17] A year in which one rivalry engaged in its fifth dispute in a sequence would generate the same score as a year in which five different rivalries participated in their first dispute in a sequence. The problem here is to avoid giving too much weight to the fifth dispute in a sequence and too much to multiple rivalries just beginning sequences.

[18] A case in point is the Correlates of War research program on dispute density, sometimes referred to as "enduring rivalry" analysis. Over the past twenty years a number of different criteria have been put forward to measure how "dense" dispute activity is. At one point it was hoped that Diehl and Goertz's (2000) conventions about three classes (isolated, proto, and enduring rivalries) of density, which seem to be the most widely accepted stipulations, could be utilized for the construction of this index. It turned out, however, that their categorizations depended too much on disputes assigned to the 1914–1918 interval to be of much use for the 1816–1913 era.

[19] A distinction is being made here between polarity which addresses the distribution of power and polarization which taps into the extent to which behavior clusters around the poles. See, among others, Rapkin, Thompson, with Christopherson (1979).

[20] Looking only at defense pacts underestimates the degree of bipolarization in general but especially in the pre-1914 setting in which ententes figured prominently. Thus, the Wayman score is also conservative.

TABLE 3. Indicators for Nonlinear Conflict Expansion

Years	Rivalry Density	Alliance Bipolarization	Global Leader Decline	Regional Leader Ascent	Average Score
1815-19	.011	.6	.451	.050	.278
1820-24	.011	.8	.451	.230	.373
1825-29	.114	.2	.451	.188	.238
1830-34	.125	.2	.357	.192	.219
1835-39	.015	.4	.357	.213	.246
1840-44	.162	.6	.417	.150	.332
1845-49	.140	.4	.417	.191	.287
1850-54	.324	.2	.454	.204	.296
1855-59	.430	.2	.454	.245	.332
1860-64	.051	.17	.500	.187	.227
1865-69	.143	.17	.500	.159	.243
1870-74	.162	0.0	.481	.156	.200
1875-79	.254	.17	.481	.176	.270
1880-84	.081	.17	.570	.178	.250
1885-89	.283	.33	.570	.192	.344
1890-94	.007	.33	.667	.182	.297
1895-99	.577	.44	.667	.167	.463
1900-04	.463	.38	.755	.159	.439
1905-09	.452	.50	.755	.172	.470
1910-13	1.000	.50	.854	.304	.665

Power transitions are often measured in terms of a diminishing gap between a once dominant state and an overtaking challenger (see, for instance, Organski and Kugler, 1980). However, to do so in this context would again require knowing who fought whom in World War I. Rather than measure the diminishing gaps between Britain and Germany and France and Germany, indexes tapping into the relative positions of the global and regional leaders are used instead. The global leader in the 1816–1913 period was Britain. Its relative position is measured in terms of its share of major power leading sector production (Thompson, 1988:140). To index increasing structural dangers, the share is subtracted from 1.0, with a higher score indicating a stronger probability of global structural transition. France is viewed as the European regional leader between 1816 and 1871 with Germany replacing it after 1871. Regional leadership is measured in terms of share of European major power armies (Rasler and Thompson, 1994:197–98). Since these scores tend to be low after a defeat in global war (as in the Napoleonic Wars), rising scores are viewed as more troublesome. In this case, then, there is no need to reverse the scale.

Table 3 summarizes the data measurement outcomes in five columns. Conceivably, the measurement could have been carried out on an annual basis but Wayman's alliance polarization and Rasler and Thompson's army data are available in five-year intervals while Thompson's (1988) leading sector position information was published in ten-year intervals. Accordingly, the first column provides a normalized measure of sequential disputatiousness within the European/ major power rivalry field.[21] The propensity for sequential conflicts was low in the first half of the nineteenth century, increased briefly in the middle of the century, and then remained relatively low until the turn of the century. Sequential disputatiousness did not ramp linearly upward in the early part of the twentieth century. Instead, there was something of a lull between 1895 and 1905 before the explosion after 1910.

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[21] The sequential disputatiousness numbers are recast setting the highest score to 1.00 and then recalculating every other interval's score as a proportion of the highest original score.

TABLE 4. Rivalries and the Number and Timing of Militarized Disputes, 1816–1913

Rivalry	1816–1833	1834–1853	1854–1873	1874–1893	1894–1913
Austria-France		2		1	
Austria-Italy		3	2	1	2
Austria-Prussia		1	3		
Austria-Russia			4		1
Austria-Serbia					4
Austria-Turkey		1		2	2
Britain-France	1	1		3	4
Britain-Germany					3
Britain-Russia	1	3	4	4	
Britain-U.S.A.					5
Bulgaria-Turkey					4
France-Germany	4	2	6	3	1
France-Italy				1	1
France-Russia	2	3	3		
Germany-U.S.A.				1	2
Greece-Serbia					1
Greece-Turkey				6	6
Italy-Turkey				2	6
Japan-Russia			3		7
Russia-Turkey	8	1		5	4
Serbia-Turkey					3
Number of disputes	16	17	25	29	56
Number of rivalries	11	12	13	22	25
Disputes/Rivalries	1.455	1.417	1.923	1.318	2.24

Note: Disputes that occurred either when a dyad was not in a rivalry relationship or when a non-European major power was not a major power are omitted in this table.

Part of the problem was an increase in the sheer number of rivalries. Table 4 indicates that the number of pertinent rivalries doubled after 1873. Many of these new rivalries were concentrated in Southeastern Europe and increased their disputatiousness in the two decades leading up to the outbreak of global war, as demonstrated most dramatically in the two Balkan wars. But other rivalries also exhibited tendencies toward escalation of various kinds. As many as ten rivalries had three or more MIDs in the two decades immediately prior to World War I. Half involved Turkey as one of the rivals but the other half included Britain-Germany, Austria-Serbia, Japan-Russia, Britain-France, and Britain–the United States. Of this group, the last three were deescalated intentionally, along with others, in order to concentrate, in part, on the first two.

The second column in Table 3 lists Wayman's alliance polarization scores. Aside from a few early anomalies due primarily to the initial but gradually eroding nature of the consensus on French containment, the polarization scores begin to creep upward after the early 1880s. The third column, global leadership decline, also indicates an acceleration of British decline from at least the 1880s on. Only the fourth column, regional leadership, contributes little to the general suggestion of incipient structural problems. There is little genuine fluctuation prior to the very end of the 1816–1913 period suggesting that neither France nor Germany, in contrast to Philip II, Louis XIV, or Napoleon, created armies that were meant to dominate the region prior to 1914 based largely on their numerical size.[22]

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[22] Different measurement emphases on regional leadership would lead to different conclusions. For example, the regional share measurements are suppressed somewhat by the inclusion of Russian army sizes which grew increasingly large but not necessarily as powerful as the numbers suggest. Alternatively, an emphasis on the
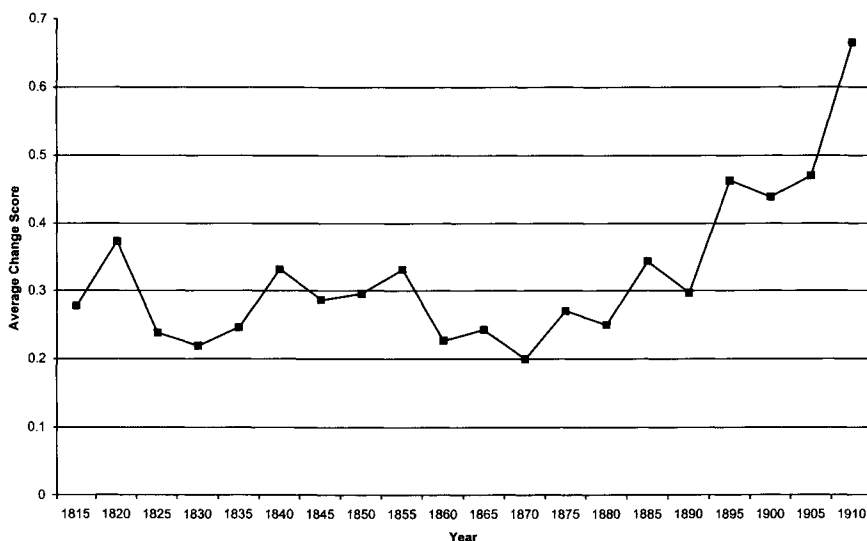
FIG. 1. Structural Change and Nonlinear Potential

The fifth column in Table 3 lists the average of the first four columns. As illustrated in Figure 1, combining the different sources of structural change leads to an outcome that fluctuated roughly around the 0.25 to 0.30 level from 1816 through the early 1890s. After 1895, the average scores nearly doubled and in the few years just before 1914, the mean structural change index more than doubled what had been the norm throughout most of the nineteenth century after 1815. The conjunction of these structural changes did not mean that a world war had to break out in 1914. But their conjunction apparently made a violent reaction of some kind more likely because we know that historically some of these types of structural change have been associated with intense conflict. France and Spain fought repeatedly over European regional leadership between the end of the fifteenth and the middle of the seventeenth century. No global leadership transition has yet managed to avoid a prolonged period of intensive combat.[23] We also know that serial clashes within rivalries tend to lead to escalation and war. It stands to reason that the more rivalries that are in this situation, the greater are the chances for the expansion of the wars that do break out. We also know that bipolarization need not lead to war but that it does tend to align and couple potential combatants in a head-to-head confrontational array. Alliance commitments can be ignored when it comes time to fight but the commitments also tell us something about whose interests are deemed most and least compatible. When all or most major powers have aligned themselves on one side or the other, there is less room for compromise and negotiation. There is also more room for suspicion and misperception concerning the other side's motivations and intentions.

Any one of the four types of structural change could be anticipated to increase the probability of conflict. When all four, or some combination of the four, come together at one time, we should be able to anticipate a compounded additive effect and an increased probability of conflict. In the 1914 case, the probability of conflict appears to have been increased tremendously. This is why

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distribution of economic innovation would show Germany in a much stronger position than its continental rivals and one that came to approximate the British position. A stress on the quality of military force would also improve Germany's relative position.

[23] Consider, for example, the fighting in 1494–1516, 1580–1608, 1688–1713, 1792–1815, and 1914–1945.

structural arguments invoke the metaphor of a dry stack of firewood ready for combustion and awaiting a precipitant of some sort. Sarajevo provided that spark in 1914. If Sarajevo had not occurred, something else might have (not would have) led to the same outcome because structural conditions were acutely ready for some type of combustion. Both the confluence of multiple processes of structural stress and the outbreak of war in the Austro-Serbian rivalry combined to make a nonlinear expansion of the conflict more likely—or so the data would suggest.

Conclusion

In 1923, George P. Gooch published his Creighton Lecture in which he (Gooch, 1923:3) argued that World War 1 was the outcome of "three separate but simultaneous antagonisms": the Franco-German conflict over Alsace-Lorraine, the Austro-Russian conflict over southeastern Europe, and the Anglo-German conflict over sea power. [24] He was on the right track back then, even if he did not follow up on his own lead. Somehow, we have collectively been diverted down countless analytical tangents since then. It is high time that we return to the theme of separate but simultaneous and overlapping antagonisms as a general, synthesizing explanation of major power warfare. Lebow's argument about catalysts almost returned attention to this theme but his presentation was essentially sidetracked by an emphasis on catalysts and contingency. Contingencies surely happen but if we become too seduced by their presence, it becomes all too easy to be diverted from more comprehensive theory construction and empirical analysis efforts. Catalysts may prove to be more important than we realize but the burden of evidence is still out on that question. Even if catalysts should be promoted from minor to major cause status, the elevation in their status need not alter the way we go about crafting explanations.

Yet it is not just a field of multiple proximate rivalries that should receive more attention. It is the potential for unanticipated, nonlinear interactions between the ones that are most strongly coupled, and the systemic contexts in which they emerge, that should be of most interest. We may not yet know why some rivalries escalate to war while others do not, but we do have some strong clues about how sets of rivalries can make war escalation even more probable than the circumstances driving any of the individual rivalries. At the risk of relying on still another metaphor, one could say that the whole is more dangerous than the sum of its parts. These nonlinear interactions across multiple rivalries can probably be found in other major power war onsets. They certainly need not be restricted to major power wars.[25] Minor powers are capable of creating complicated rivalry structures, although it seems likely that the potential for minor power rivalry fields to explode in nonlinear ways is more limited than situations involving major powers. Nonetheless, the empirical verdict on the dangers of nonlinear interactions remains open-ended. An examination of the 1816–1913 era is only a suggestive beginning—not the conclusive solution.

Yet the nonlinear potential for making dangerous situations even more dangerous should also alert us to the possibilities inherent in any future major power war onset—assuming that some potential for that kind of problem still exists. We have something new to look for—a field of interconnected rivalries (or

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[24] As the title of his book indicates, Gooch chose to concentrate exclusively on only one of the three rivalries in his book. Interestingly, he argued that Franco-German relations were relatively pacific as long as France pursued imperial expansion outside of Europe and clashed with Britain, at least until Morocco. Nevertheless, France would always have been receptive to Russia as long as France had some possibility of resolving its old German quarrel to its own satisfaction. In other words, this structural proclivity did not require an intense interest in the fate of Alsace-Lorraine. It only required that the issue remain open-ended.

[25] Lebow (2000–2001) counts the end of the Cold War, a case of rivalry termination among other things, as an instance of nonlinear effects.

their absence)—and perhaps an even more subtle problem—nonlinear interactions among rivalries—instead of malign expansionists, decision-makers frightened for their declining state's future, territorial irredentism, or statesmen reluctant to make explicit commitments. What we may have to worry most about, as Lebow suggests, are their interaction effects. Given our tendencies to focus on monocausal arguments, it should not be surprising that we do not have much practice either looking for them or dealing with them analytically. Until we gain more experience of this sort, it is difficult to estimate just how significant nonlinear interaction effects may prove to be in explaining the spread of war beyond what was anticipated by decision-makers. But, even if it is a very rare phenomenon, it seems worthy of our further attention.

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