

Back to Kant: Reinterpreting the Democratic Peace as a Macrohistorical Learning Process

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The contemporary international relations literature links the democratic peace hypothesis to Kant's famous peace plan. Yet, whether attempting to prove or disprove the hypothesis, most quantitative studies have lost sight of important dimensions of the Kantian vision. I reinterpret the democratic peace as a dynamic and dialectical learning process. In order to assess the dynamic dimension of this process (while controlling for exogenous dialectical reversals), I rely on quantitative evidence drawn from popular data sets. In conformance with the Kantian perspective, the conflict propensities among democracies exhibit a steadily falling trend since the nineteenth century. Yet, in partial opposition to Kant's expectations, other dyads also experience a significant, although weaker, pacifying trend. A series of tests shows that these findings are robust to epochal effects, various control variables, and "maturity effects" measuring the age of democratic dyads.

After more than a decade of intense scholarly debate, the claim that democratic states hardly ever fight each other remains contested. Although most analysts appear to support the democratic peace hypothesis, a small but determined minority of realist scholars does not accept it. Despite this fundamental disagreement, both camps agree that Immanuel Kant laid the intellectual foundation of the hypothesis in the late eighteenth century.¹ Whether aiming at corroboration or refutation, most contemporary scholars appear to believe that they are operationalizing and testing some version of the Kantian thesis. Yet, although some analysts have come closer to Kant's original conjecture by embracing more of its analytical dimensions, neither side of the debate succeeds in fully capturing the dynamic and dialectical logic of the process.

Does it really matter whether Kant has been misunderstood? I argue that it does. Rather than engage in exegesis for its own sake, I maintain that only partial representations are responsible for many of the empirical and theoretical disputes haunting the current debate. By squeezing Kant's fundamentally dynamic argument into a Procrustean bed of static regression equations, today's researchers typically expect the "Kantian effect" to be time-invariant.

It is worth revisiting Kant's original peace plan.

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¹ It has been suggested that other authorities deserve credit for the formulation. Gates, Knutsen, and Moses (1996) assert that Kant drew on Rousseau. Yet, among the classical authors, Kant's treatment remains the most influential (see Ray 1995).

Instead of viewing the democratic peace argument as merely a "second-image" claim about the pacific effect of a particular regime type on dyadic relations, I propose a Kantian reinterpretation of the democratic peace hypothesis as a dynamic and dialectical learning process. It is dynamic rather than stationary in that states alter their behavior as a consequence of taking past experience into account. Thus, the effect of democracy changes over time. The process is dialectical because catastrophic reversals, such as world wars, drive home the point that there is little choice but to eliminate violence in interstate relations.

Once recast in these terms, the democratic peace argument can be tested in a way that reflects at least some of the conjecture's subtlety. Indeed, Kant ([1784] 1970a, 50) anticipated that, one day, it would become feasible to evaluate the empirical validity of his postulates:

The real test is whether experience can discover anything to indicate a purposeful natural process of this kind. In my opinion, it can discover *a little*; for this cycle of events seems to take so long a time to complete, that the small part of it traversed by mankind up till now does not allow us to determine with certainty the shape of the whole cycle, and the relation of its parts to the whole.

Writing in the late eighteenth century, Kant was in a less privileged position than social scientists are today. Yet, most of his predictions have had an almost uncanny tendency to be borne out by history, despite the scarcity of information on which he based his theorizing.

In this article, I focus primarily on the dynamic dimension of the famous peace plan and merely correct for exogenously given dialectical disturbances. The empirical part draws on data from standard quantitative sources that have so far been analyzed in exclusively static terms. The evidence strongly supports the core of the Kantian learning hypothesis. Since the first half of the nineteenth century, democratic states appear to be much better learners in their mutual relations than when faced with other states, or than nondemocratic states in their own interactions. There is no support, however, for the (possibly Kantian) view

that learning can only take place among democracies. Indeed, some learning appears to spill over into other relations.

Additional tests indicate that these results hold whether we control for historical period or certain liberal or geopolitical variables, and whether we limit the scope to the post-1945 period. In the latter case, it is even possible to find evidence for a “maturity effect” that distinguishes old democratic dyads from newer ones. These results cast doubt on realist attempts to explain away the democratic peace as a merely geopolitical side-effect of the Cold War.

The article is organized as follows. In the following section I revisit Kant’s peace plan. I then criticize the modern democratic peace literature in the light of Kant’s writings. Next, some operational hypotheses are derived, and a basic statistical model is presented. The findings are then exposed to a series of robustness checks. In conclusion I sum up the results and discuss future empirical and theoretical elaborations.

KANT’S PEACE CONJECTURE

In his famous essay “Perpetual Peace,” Kant ([1795] 1970b) sets out the main argument in three “definitive articles.” These should be seen as joint conditions for truly lasting peace. The first condition requires states to be republics, which in today’s terminology could be translated as liberal democracy.² The second calls for a confederation of free states to form in order to preserve peace. The third definitive article contends that a limited sense of world citizenship is needed to secure the two first conditions.³

By arguing that only transcendence of power politics can deliver stable peace, Kant parts company with generations of realist thinkers who have placed their hope in the balance of power as the best way to prevent war. The three definitive articles, far from being a mere utopian shopping list, are bundled together as a hypothetical development. Together these arguments anticipate a complex diffusion process whereby the rule of law and norms of peaceful change can spread both up from the domestic realm and down from interstate relations. Keenly aware of the constraints imposed by power politics, Kant proposes a sophisticated and nondeterministic account of how and why world history is likely, although not certain, to converge slowly on the three conditions.

To grasp the logic of these arguments, it is necessary to go beyond “Perpetual Peace.” In particular, “Idea for a Universal History with Cosmopolitan Purpose” introduces crucial mechanisms without which it is

impossible to do justice to the Kantian argument (Kant [1784] 1970a). Kant’s reasoning depends on the idea of progress through learning. Ultimately, peace will emanate from individuals’ realization that war is both destructive and immoral. But before this lesson can be learned, conflict is needed to drive home the point. Moreover, this learning process can only develop in a very specific context. Liberal democracy allows individuals to realize their full “civilized” potential. At the interstate level, democratization requires a peaceful confederation of democracies (*Staatenbund*) to defend these state-level achievements. In other words, individual learning presupposes collective learning, both at the state level and within the entire international system.

Because of its highly interconnected nature, the argument appears unrealistic unless all conditions are satisfied simultaneously. At first blush, the peace plan indeed seems to suffer from a chicken-or-egg dilemma (Hurrell 1990; see also Waltz 1962), but this is a misunderstanding. As Huntley (1996, 50) remarks, “the problem only emerges when achievement of the rule of law is conceived as a chronologically discrete event, rather than, as for Kant, an unending process taking place at both [the domestic and international] ‘levels’ simultaneously.”

As a way to transcend the security dilemma, Kant proposed a set of mechanisms that, together, generate peace without resorting to teleological speculation. After ruling out revolution as a means of democratization, Kant hypothesized that, in the long run, warfare itself will force authoritarian rulers to liberalize their states, for “civic freedom cannot now be interfered with without . . . a decline of the power of the state in its foreign relations. Therefore this freedom is gradually extended. If one obstructs the citizen in seeking his welfare in any way he chooses, . . . one also hampers the vitality of all business and the strength of the whole [state]” (Kant [1784] 1970a, 50). This process implies a gradual percolation of democratic norms from the citizens up to the political leaders (p. 46). But democracy also spreads from the top down, which accelerates individual learning and, thus, creates a more solid foundation for freedom: “It is only through [a good political constitution] that the people can be expected to attain a good level of moral culture” (Kant [1795] 1970b, 113).

At the interstate level, the second definitive article outlines a diffusion process responsible for the emergence of the peaceful confederation:

For if by good fortune one powerful and enlightened nation can form a republic (which is by its nature inclined to seek perpetual peace), this will provide a focal point for federal association among other states. These will join up with the first one, thus securing the freedom of each state in accordance with the idea of international right, and the whole will gradually spread further and further by a series of alliances of this kind (Kant [1795] 1970b, 104).

To see why Kant thought that interdemocratic peace will materialize, it is helpful to examine the first definitive article. In an often-cited argument, Kant suggests that democratically elected leaders will have

² But see Brown 1992; Gates, Knutsen, and Moses 1996; and Owen 1997, 15–7. These authors make much of Kant’s rejection of democracy. In Kant’s lifetime, “republic” was associated with direct democracy in the classical Greek sense, but today’s liberal and representative democracies come very close to what Kant meant by republican politics. See Chan 1997, 64, and Huntley 1996, 48.

³ For general introductions to and translations of Kant’s political philosophy, see, e.g., Friedrich 1949; Hinsley 1963; and Reiss 1970. The original texts can be found in Kant 1968. In addition, there are several cogent discussions specific to international relations: see Doyle 1983a, 1983b; Huntley 1996; Hurrell 1990; and Waltz 1962.

to take their peoples' pacific preferences into consideration before going to war (Kant [1795] 1970b, 100). Yet, the effect of democracy is not limited to this simple cost-benefit mechanism. Kant sees no reason why the upward spread of norms has to stop at the democratic state's borders. Once the pathway of normative progress is opened, the rule of law will creep into interstate relations, and this will obviate, or at least reduce, the need to rely on threats and enforcement (Kant [1784] 1970a, 51).

The external dimension of the peaceful confederation is also provided for in Kant's argument. The pacific league aims at abolishing all wars, which makes it more than a temporary defensive alliance, but it will have to serve as a protective mechanism when the confederation is exposed to external challenges from nondemocratic states: "It is necessary to establish a federation of peoples in accordance with the idea of the original social contract, so that states will protect one another against external aggression while refraining from interference in one another's internal disagreements" (Kant [1797] 1970c, 165). Although Kant opposed violent means to establish democratic rule, he thought it entirely legitimate that the democratic confederation be defended through armed conflict if necessary.

As a complement to the first two definitive articles, the third one rests on self-interested mechanisms rather than on teleology. At least to begin with, the normative evolution of cosmopolitan law that secures transnational "hospitality" follows from economic interdependence: "For the spirit of commerce sooner or later takes hold of every people, and it cannot exist side by side with war . . . Thus states find themselves compelled to promote the noble cause of peace, though not exactly from motives of morality" (Kant [1795] 1970b, 114; see also Kant [1784] 1970a).

A KANTIAN CRITIQUE OF THE DEMOCRATIC PEACE LITERATURE

In recent years there has been a surge of interest in the relationship between war and democracy. Following Michael Doyle's (1983a, 1983b) pioneering theoretical efforts (see also Rummel 1979), countless quantitative studies (for a review, see Chan 1997), game-theoretic interpretations (e.g., Bueno de Mesquita et al. 1999), and case studies (e.g., Elman 1997) have appeared. Although considerable controversy continues to surround the operationalization of the key variables, analysts on both sides of the liberal-realist divide interpret the democratic peace hypothesis as a relational statement that implies the (almost total) absence of warfare between democracies. Nearly all studies frame the hypothesis in dyadic terms (Chan 1997, 62–5), although some contend that there is also a monadic effect (e.g., Rousseau et al. 1996) and a systemic component (e.g., Doyle 1997; Gleditsch and Hegre 1997; Huntley 1996).

The first quantitative studies homed in on regime type as the only component of the Kantian peace, but methodologically self-conscious scholars have recently

expanded the analytical scope well beyond this simple, monocausal hypothesis. For example, Bruce Russett and his colleagues have explicitly proposed and tested a multicausal interpretation of the democratic peace. Oneal and Russett (1997, 268) reevaluate Kant's message as saying that "peace can be built on a tripod of complementary influences: republican constitutions (i.e., representative democracy), international law and organization, and 'cosmopolitan law' (economic interdependence)" (see also Oneal, Oneal, and Russett 1996). This promising research program has been extended to include direct statistical analysis of the "third organizational leg" (Oneal and Russett 1998; Russett, Oneal, and Davis 1998).

Despite these theoretical advances, international relations scholars typically refer to Kantian variables rather than to Kantian theory. As they admit themselves, what is needed is a process theory that articulates the dynamics and dialectics of Kant's peace postulates. I shall compare the Kantian process to the modern literature with respect of each of these dimensions.

Dynamics

Both proponents and critics appear to agree about the law-like status of the democratic peace hypothesis. On the liberal side of the debate, Jack Levy (1988, 661–2) celebrates it as "the closest thing we have to an empirical law in the study of international relations" (see also Doyle 1996, 364). In practice, this boils down to testing the claim wherever democracy can be said to be present in the historical record. Some analysts have even gone so far as to apply it to the city-states of classical Greece and other premodern societies (e.g., Russett 1993; cf. Chan 1997, 69), but most studies are limited to the period, or parts of it, covered by the Correlates of War (COW) database (Small and Singer 1982), starting in 1816.

Not even Doyle (1983a, 1983b), whose careful analysis traces the systemic dimension of Kant's process, does full justice to its dynamic quality. One must agree with Huntley (1996, 64) that Doyle's "depiction insufficiently recognizes the *generative capacity* of anarchy that the liberal peace demonstrates." According to this critique, Doyle's argument implies that the democratic peace "has revealed no new, potentially transformational manifestations of anarchy's effects on international politics. Rather, liberal states have overcome a static structural condition" (p. 64).

Realist skeptics also tend to view the democratic peace as a static effect. Taking Levy's observation about empirical law as his starting point, Layne (1994) attempts to refute this putative law by investigating "near misses." Gowa (1999, 67) is even more explicit: "The democratic-peace hypothesis predicts that the war and lower-level dispute rates of democratic dyads should be uniformly lower than are those of their non-democratic counterparts. Thus, the finding that relative dyadic dispute rates vary across time is inconsistent with it."

In a rare exception to the dominant static perspec-

tive in the quantitative literature, Gaubatz (1996) compares Kant's predictions with the historical record and claims that they lack support. His somewhat mechanical measures could be criticized, but his study is refreshing because of its graphical presentation of statistical trends. Another attempt to rearticulate the diachronic logic of Kant's peace plan was made by Modelski (1990), who refers explicitly to both evolution and learning (see also Modelski 1991). Yet, his cyclic argument appears to have little to do with Kant's open-ended evolutionary theme.⁴

Since learning is a notoriously tricky concept to define (Levy 1994), it is necessary to make a brief conceptual detour. Learning can be seen as a special case of social evolution (which is not to be confused with its biological counterpart). Although Kant's work antedates Darwin's conceptual breakthrough, it anticipates modern evolutionary theory (Modelski 1990). In brief, evolutionary processes presuppose four ingredients: variation, selection, retention, and a population of units on which these mechanisms can act (Campbell 1969; Kahler 1999; Nelson 1995).

Learning, then, can be defined as a particular type of cultural-evolutionary process in which actors use inferences drawn from their own (or vicariously experienced) environmental variation in an attempt to select more effective cognitive constructs for future decision making (cf. Breslauder and Tetlock 1991; Levy 1994; Reiter 1996, 19–20). Depending on whether learning is primarily rational or extrarational, these constructs are either interest-based or rule-based. Whereas rational (interest-based) learning presupposes an adjustment of beliefs and/or preferences, extrarational (rule-based) learning pertains to normative processes that become internalized as a part of the choice set itself (Elster 1989; Ullmann-Margalit 1977).

Both individuals and organizations can learn. Unlike individual learning, the collective counterpart does not necessarily depend on, but may entail, thought processes in human brains. Organizations also benefit from learning mechanisms that function through turnover of subunits or structural transformations of the organization itself (Hedberg 1981; Levitt and March 1988).

Kant refers to both natural and cultural evolution, the latter of which implies not only individual but also organizational learning. His peace process relies on natural selection and simpler learning, especially in its initial phases, followed by more complex modes of learning. For example, Kant ([1784] 1970a) assumes democracies to be more effective at fighting wars, which facilitates their ecological survival in natural-selection terms. Moreover, the cost-benefit argument for the democratic peace represents the first step of a normative learning process.

Clearly, Kant's notion of learning cannot be reduced to purely instrumental rationality, since its later phases feature rule-based dynamics that modify the feasible

set of options. The Kantian logic goes well beyond the individual level, for his theory crucially singles out liberal democracy as the most fertile soil for the pacific seed: "Kant does not accept the naive liberal assumption that the 'people' are always peaceful or virtuous. Progress towards perpetual peace is ultimately dependent on the moral progress of individuals. Yet such progress in turn can only come about within a good political constitution" (Hurrell 1990, 196).

The state should be seen as more than a passive environment within which collective learning may take place. Indeed, Kant ([1784] 1970a, 49) suggests,

as long as states apply all their resources to their vain and violent schemes of expansion, thus incessantly obstructing the slow and laborious efforts of their citizens to cultivate their minds, and even deprive them of all support in these efforts, no [civilizing] progress can be expected. For a long internal process of careful work on the part of each commonwealth is necessary for the education of its citizens.

As we have seen, the peaceful transformation of human affairs crucially depends on the interstate context as well. The second definitive article outlines the democratic confederation as the environment within which states are socialized into curbing their aggressive tendencies (Kant [1797] 1970c). Since nondemocratic states are structurally handicapped to experience moral learning, either at the elite or popular level, swift pacific progress in interstate relations requires that all parties be democracies: "The socializing influence is produced by the compelling examples of states expanding the *rule of law* in their *mutual relations* with increasing success" (Huntley 1996, 58, emphasis in original). The last step, therefore, implies that democratic states learn not only internally, as individual organizations, but also externally in their relations with other democracies.

Dialectics

Since most liberals interpret the democratic peace hypothesis as a universally applicable causal law, they are vulnerable to realist challenges that highlight presumed anomalous cases at any point in history. Even a small number of conflictual democratic dyads threatens the liberal position, which explains why case-focused controversies have been so intense (Elman 1997, 44; Ray 1995).

Given the assumption of time-invariance, it is hardly surprising that insufficient attention has been given to the historical distribution of the alleged exceptions. And if an historical asymmetry is noted, few if any analysts have followed up this observation in building and testing theories. Most of these recent debates concern nineteenth-century cases, such as the British-American wars, the Fashoda crisis, the Spanish-American War, and early-twentieth-century conflicts, such as the outbreak of World War I (e.g., Layne 1994; Oren 1995).

Liberals usually are more mindful about tracing the temporal sequence of cases than are realists. For example, Russett (1993, 20) notices that "almost all of

⁴ Recently, more flexible dynamic and spatial inference methods have been employed (see Gleditsch and Ward 2000; McLaughlin, Gates, and Hegre 1999).

the few near misses are in the nineteenth century” (see also Ray 1995, 125). Nevertheless, this realization does not seem to inform empirical works that typically treat the democratic peace as if it applies universally.⁵

In sum, the common adherence to induction and nomological causation often obscures the possibility that an “anomaly” may be an early instance of failed learning or perhaps even a dialectical reversal. Such an interpretation might seem to make the democratic peace unfalsifiable, but what matters here is the macrohistorical trend rather than short-term disturbances. The *longue durée* only becomes visible by considering the temporal pattern of data. By contrast, isolated cases and static regressions are particularly sensitive to historical myopia.

In fact, Kant warns against interpreting sudden reversals as a sign that peace will not materialize in the long run. In his account, it is paradoxically violent conflict that drives the collective learning process:

Wars, tense and unremitting preparations and the resultant distress which every state must eventually feel within itself, even in the midst of peace—these are the means by which nature drives nations to make initially imperfect attempts, but finally, after many devastations, upheavals and even complete inner exhaustion of their powers, to take the step which reason could have suggested to them even without so many sad experiences—that of abandoning their lawless state of savagery (Kant [1784] 1970a, 47).

The dialectical nature of this explanation expresses itself through linked mechanisms operating at two levels. At first, the suffering is borne by the populations, whose war-weariness tends to increase as warfare grows more destructive. Then, increasingly desperate to extract more resources from their societies for bellicose purposes, political leaders adapt to intensified warfare by reluctantly democratizing state structures. This democratization inadvertently liberates the learning process, thus reinforcing the dialectical feedback loop (Hurrell 1990, 197).

As opposed to Kant’s conjecture of an inherently dynamic process, contemporary international relations research has by and large lost track of the diachronic qualities. Although liberals and realists agree on the democratic and dyadic dimensions of the hypothesis, most empirical studies miss its dynamic and dialectical dimensions. To fill this gap, I will evaluate a simplified model that traces Kant’s learning effect.

A MODEL OF KANT’S COLLECTIVE LEARNING PROCESS

Despite his penchant for abstract reasoning, Kant firmly believed that his predictions could in principle be assessed empirically with the benefit of hindsight, and doing so would require an aggregational approach: “History is concerned with giving an account of [human actions], no matter how deeply concealed their causes may be, and it allows us to hope that, if it examines the free exercise of the human will *on a large scale*, it will be

able to discover a regular progression among freely willed actions” (Kant [1784] 1970a, 41). In justifying this statistical view, he explains that “although we are too short-sighted to perceive the hidden mechanism of nature’s scheme, this idea may yet serve as a guide to us in representing an otherwise planless *aggregate* of human actions as conforming, at least when considered as a whole, to a *system*” (p. 52).

What, then, are the observable consequences of the Kantian scenario? First, learning implies behavioral modification over time. Second, at least in the long run, there should be a differentiation between interdemocratic relations and all other exchanges. Furthermore, the dialectical nature of the process implies that reversals may interrupt the trend toward peace. If Kant’s speculation holds up, then conflict frequencies among democracies will decrease gradually, as opposed to the more slowly evolving conflict patterns associated with other types of relations.

To assess these empirical implications, I rely on systematic conflict data covering most of the period since Kant wrote his peace plan in the late eighteenth century. Although Kant’s theory encompasses a systemic dimension, I follow the vast majority of available quantitative studies by selecting dyad-years based on interstate relations as the unit of analysis (though see Gleditsch and Hegre 1997). Since the data do not contain any democratic dyads before 1837, the sample starts with that year and runs through 1992, which is the last year for which all measures are available.⁶ Interaction opportunities clearly influence states’ decisions, so this study is limited to “risky dyads,” featuring at least one great power or geographically contiguous states (see Maoz and Russett 1992).

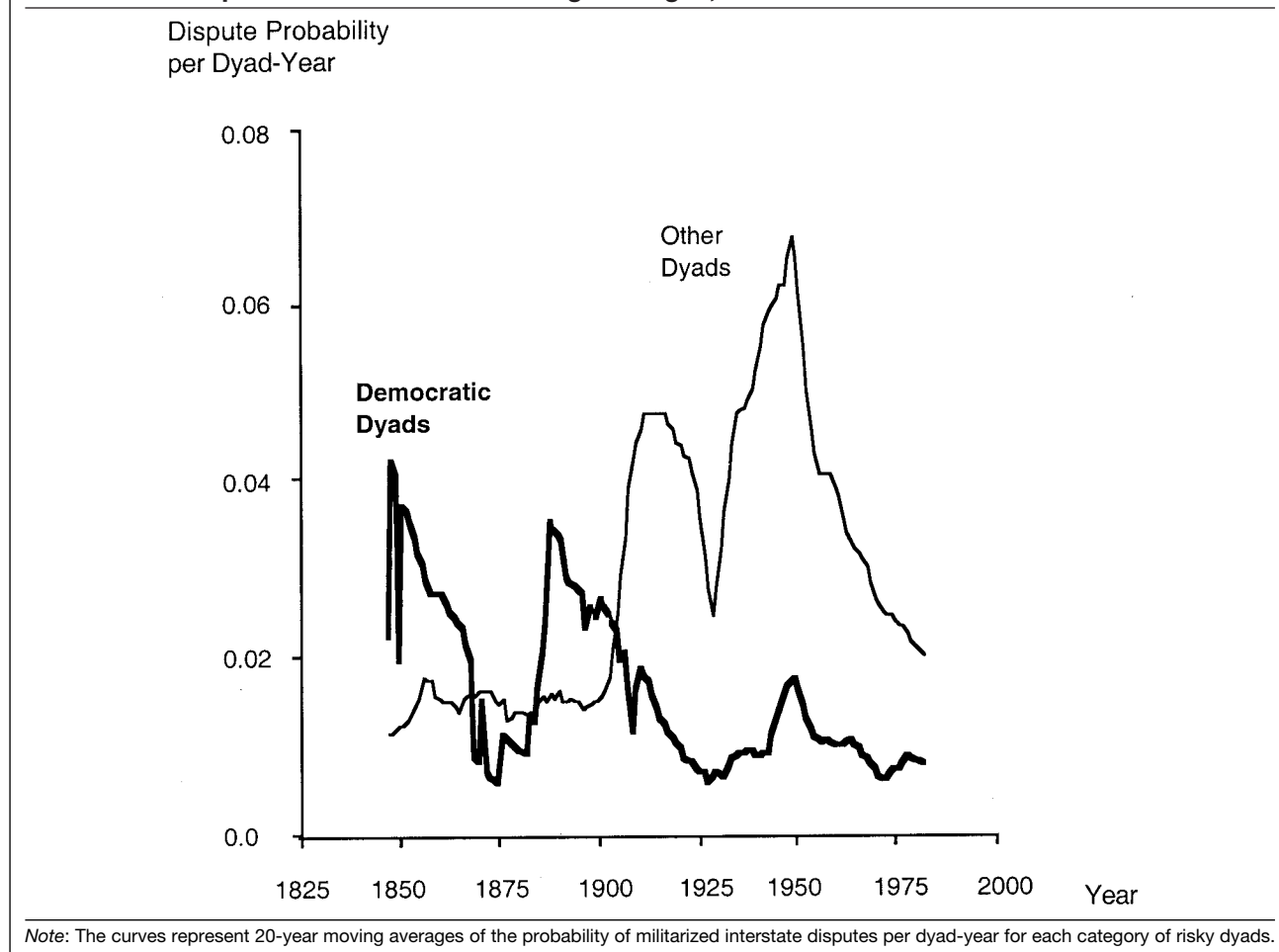
The dependent variable measures military conflict in general rather than war, since the latter occur too rarely to provide a basis for temporal trends (Farber and Gowa 1995; Gowa 1999, 48f). Fortunately, Kant’s normative arguments apply to lower-level conflict as well, since prohibitive norms are expected to form a security community that ultimately rules out violence of any sort.⁷ I follow the quantitative literature in employing militarized interstate disputes (MIDs) drawn from the Correlates of War (COW) Project. A MID involves display of weapons as well as threats or actual use of military force, even if no deaths result; 1,000 battle deaths are required to qualify as a war in the COW sense (see Gochman and Maoz 1984).

Data on regime type were obtained from the Polity III data set (Jagers and Gurr 1996). Jagers and Gurr (1995) provide a composite measure of democracy that reflects the constraints on political participation, leader

⁶ This censoring of the sample may seem to introduce selection bias, but my aim is not to estimate universal laws; rather, I want to investigate a specific macrohistorical process.

⁷ In a short-run perspective, however, there may be an important difference. Some rationalistic deterrence theories expect increased dispute activity to accompany decreased warfare (cf. Chan 1997, 66–8). Furthermore, Kant’s ([1784] 1970a) dialectical war-based argument requires warlike conflict rather than lower-level violence because regime change is unlikely to follow from mere disputes (cf. McLaughlin, Gates, and Hegre 1999).

⁵ But see Owen (1994, 1997), who contends that the very meaning of democracy has evolved over time.

FIGURE 1. Dispute Probabilities as Moving Averages, 1837–1992

selection, and other institutional constraints. To simplify the dynamic interpretation and to make my analysis comparable with recent studies (e.g., Faber and Gowa 1995; Gowa 1999), I code democracy as any dyad in which both states attain at least a six on Gurr's democracy scale.⁸

Before applying regression analysis to the statistical material, it is instructive to explore the descriptive statistics. Figure 1 presents a moving-average sweep of the dispute propensity per dyad-year over 20-year periods. The bold curve traces the probability for democratic dyads, and the thin curve indicates the trend for all other dyads. The residual category includes purely nondemocratic dyads and mixed ones comprising one democracy and one authoritarian state. With a few temporary exceptions, the picture reveals a descending pattern for the democracies' interactions. The conflict propensity among the other dyads, in contrast, appears to be rising, with peaks at the time of the world wars, although most of the Cold War period is characterized by a dramatic downward slope. From

the beginning of the twentieth century, the democratic curve is consistently lower than that of the other dyads.

At face value, these initial findings appear to confirm a Kantian interpretation of the democratic peace. The democracies seem to be better learners in their mutual relations than other types of dyads. The high starting point of the democratic curve is more puzzling from a Kantian perspective, however, and I will return to this issue. More important, the graph casts doubt on the realist thesis that nuclear weapons, or some other attribute of the Cold War, drive the process, because the democratic conflict rates began to descend after World War I (e.g., Gowa 1999). These findings are suggestive, but it would be a mistake to put too much weight on them at this point. After all, they stem from descriptive statistics, so no safe inference can be drawn from them, and they have not been exposed to statistical control. The rest of this section introduces a basic model that traces the dynamics of conflict, followed by a separate section that evaluates the causal robustness of the initial results.

How can one account for the temporal trends in Figure 1? Is it possible to formalize the temporal dependence along Kantian lines? If the dialectical theme is ignored for the moment, a simplified reading

⁸ Gurr's autocracy measure can be safely omitted because of its strong correlation (-0.83) with the democracy index (Gowa 1999, 50). I do not use multinomial indices since they complicate comparisons across learning curves (cf. Maoz and Russett 1993).

of the peace plan could take reinforcement learning as the starting point. That is, actors learn primarily from positive experiences.⁹ In our context, the argument assumes that pacific relations generate benefits in terms of wealth and security that gradually will be factored into the decision-making calculus of those states capable of learning. In the end, these changes will also trigger a normative process that reconfigures the choice set, such that violence becomes unthinkable (see Deutsch et al. 1959; Kaysen 1990). Because of my macro focus, it is impossible to tell one effect from the other, so this puzzle must be left to future research (see Levy 1994, 304–6). Of immediate importance, however, is whether the conflict propensity will fall over time conditional on the learning capacity of the actor-pair in question.

Because Kantian learning amounts to a fundamentally reciprocal experience in confidence-building, the process depends crucially on both sides' learning capacity. A breach of trust can easily destroy the gains of long cooperation. This type of organizational learning features "transactive memory" (Wegner 1986), since it relies on knowledge and norms embedded in the actors' supraindividual routines and habits (Argote 1999, 82–6; Hedberg 1981, 6). If institutions, customs, and standard operating procedures are the repositories of conflict-reducing techniques, then the process will proceed at the speed of the slowest learner. According to this logic, dyadic learning will operate rapidly only when both states are democracies, and it will occur much more slowly, if at all, in other cases.

This preliminary account says little about the functional form of the dyadic learning curves, but there is a rich literature to build upon, although most of it applies to very different phenomena, such as improvements in production methods (see Argote 1999) or rats finding their way through mazes (see Macy 1990). Whether individual or collective, reinforcement learning can be assumed to follow a straightforward pattern, at least as a theoretical starting point. In their classical stochastic model, Bush and Mosteller (1955) postulated that the probability of choosing the reinforced behavior p_t at time t follows the simple recursive rule:

$$p_{t+1} = p_t + c(1 - p_t), \tag{1}$$

where c is a positive constant less than one. Thus, the reinforcement effect decays asymptotically as the propensity approaches unity. Using this equation, Macy (1990, 816) interprets p_t as the probability that a set of social actors will contribute to a public good (i.e., refrain from free-riding). The solving of the security dilemma by democratic states can be seen as a special case of this general situation.

Adapting this simple formula yields an even simpler expression. Assuming that $\pi_t = 1 - p_t$ is the probability of two states engaging in conflict, reinforced behavior pertains to the opposite course of action, that is, refraining from conflict, with probability $p_t = 1 - \pi_t$.¹⁰

After some algebraic manipulations, substitution in equation 1 yields:

$$\pi_{t+1} = (1 - c)\pi_t.$$

Assuming that the initial conflict propensity is π_0 , the explicit relationship becomes $\pi_t = (1 - c)^t \pi_0$, which can be written as:

$$\pi_t = \pi_0 \exp(kt), \tag{2}$$

where $k = \ln(1 - c)$ is another negative constant. This formula expects learning to reduce the initial conflict propensity π_0 according to an exponential decay process with a negative coefficient k . As t goes to infinity, the conflict rate asymptotically approaches zero.

In addition to the suggestive shape of Figure 1, there is ample evidence from other areas that confirms the generality of this particular functional form. In economics, much research has centered on efficiency gains within single firms (e.g., Alchian 1963). Rather than being focused on an isolated organization's production of an easily quantifiable good, the Kantian process corresponds more closely to environmental learning that features interorganizational diffusion processes (Levitt and March 1988). Such learning includes knowledge transfer through personal contacts, observation, documentation, and embeddedness in social networks (Argote 1993, 41; 1999, chap. 1).

The crux is that theories of this kind are particularly hard to operationalize because of the fuzzy nature of "knowledge," as opposed to such easily measurable variables as cumulated output. Therefore, economists often rely on calendar time as a proxy for long-term knowledge acquisition (e.g., Rapping 1965; cf. Argote 1999, 15). Although other solutions are possible, my analysis starts with this simple form of temporal dependence. The next section also explores the influence of "dyadic" time.

Having justified the negative exponential form in equation 2 as my point of departure, I now turn to the problem of estimation. Assuming that t can be measured as calendar year Y and that the dummy variable D stands for democracy, it is straightforward to estimate the curve by using a standard logit model:

$$\Pr(X, \beta) \frac{1}{1 + e^{-X\beta}}, \tag{3}$$

where

$$X\beta = \beta_0 + \beta_1 D + \beta_2 D \times Y + \beta_3 (1 - D)Y. \tag{4}$$

For small probabilities $\Pr(X, \beta)$ we can assume that (refer to Figure 1)

$$\Pr(X, \beta) / \{1 - \Pr(X, \beta)\} \approx \Pr(X, \beta),$$

which implies that $\Pr(X, \beta) \approx \exp(X\beta)$.¹¹

dependencies of dyadic learning. An extended model could draw on Signorino's (1999) creative attempt to marry a strategic perspective with statistical validation.

¹¹ Similarly, Beck, Katz, and Tucker (1998, 1268) show that the logit and cloglog transforms are "almost identical" for event probabilities below 0.25 and "extremely similar" for probabilities below 0.5.

⁹ Note, however, that social psychologists claim people learn more effectively from failures than from successes (Levy 1994, 304).

¹⁰ This formalization does not attempt to disaggregate the interde-

TABLE 1. Logit Analysis of Dispute Propensity

Variable	Static Model (All Risky Dyads)			Dynamic Model (All Risky Dyads)		
	Coeff.	Std. Err.	Prob.	Coeff.	Std. Err.	Prob.
Constant (b_0)	-3.58	(0.02)	0.0001	-8.75	(1.08)	0.0001
Democratic (b_1)	-1.10	(0.11)	0.0001	22.92	(6.15)	0.0003
Year (Dem.) (b_2)				-0.0096	(0.0032)	0.0028
Year (Other) (b_3)				0.0027	(0.0006)	0.0001
Log-likelihood		-16,835.9			-16,805.1	
Sample size		73,320			73,320	

The democratic dummy variable allows estimation of two separate exponential learning curves. Setting $D = 1$ yields the curve for interdemocratic relations,

$$\Pr_{\text{dem}}(Y, \beta_0, \beta_1, \beta_2) \approx \exp(\beta_0 + \beta_1 + \beta_2 Y).$$

Setting $D = 0$ defines the function for all other dyads,

$$\Pr_{\text{other}}(Y, \beta_0, \beta_3) \approx \exp(\beta_0 + \beta_3 Y).$$

Whereas β_2 measures the decay constant k for democratic relations as defined in equation 2, β_3 estimates the corresponding quantity for all other dyads. Likewise, from $\beta_0 + \beta_1$ and β_0 we can obtain estimates for the respective curve's intercepts, π_0 .

In terms of the current notation, Kant's liberal learning theory generates three propositions:

- P1: $\beta_2 < 0$,
- P2: $\beta_2 < \beta_3$, and
- P3: $\beta_3 \geq 0$.

The first proposition states that, over time, democracies learn to become more peaceful in their mutual relations. The second postulates that learning proceeds more quickly in democratic relations than in other dyads. The third requires that all other relations fail to exhibit any learning whatsoever. Taken together, these constitute a first, crude assessment of Kant's complex learning theory.¹²

Table 1 compares the results generated by the dynamic base model to those of the corresponding static framework. The latter confirm what most quantitative studies have already shown, namely, that joint democracy has a negative and highly significant effect on dispute behavior.¹³ More important, the dynamic

analysis vindicates all three Kantian propositions. There is strong evidence for P1 with a clearly negative coefficient at -0.0096 at a high level of significance. Moreover, given the positive estimate for the other dyads, P2 holds as well and a Wald test reveals that the difference between the two slope coefficients is significant ($p = 0.0002$). Finally, this estimation corroborates P3 because of the positive sign of b_3 .¹⁴

Since the two models are nested, it is also possible to conduct a likelihood-ratio test to establish whether the variables of the dynamic model are jointly significant. The test statistic is 30.8, so it is clear that the difference is highly significant ($p < 0.0001$).

Based on these estimation results, Figure 2 plots the two conflict curves for the entire sample period, using a thick line for democratic dyads and a thin line for others. As would be expected from Figure 1, the democratic probability function starts at a high level but decreases steadily and is well below the other conflict curve.

The visual impression confirms the numerical findings as well as the intuition drawn from the moving averages of Figure 1. It is indeed possible to fit a learning curve in the case of democratic relations. Based on equation 2, the democratic learning rate can be computed as $c = 1 - \exp(k) = 1 - \exp(b_2) = 0.0096$, that is just below one percentage point. In the long run, this makes an important difference; if the initial dispute frequency is about 0.03 (refer to Figure 1), the rate can be expected to shrink 150 years later to as little as $(1.0 - 0.0096)^{150} = 0.007$.

In contrast to the earlier graph, however, the democratic curve in Figure 2 no longer starts at a much higher level than the other learning curve. If we are to believe the estimated exponential curves, the discrepancy in Figure 1 is mainly an artifact of the small number of observations for the mid-nineteenth century.¹⁵ To the extent there is a substantive reason for

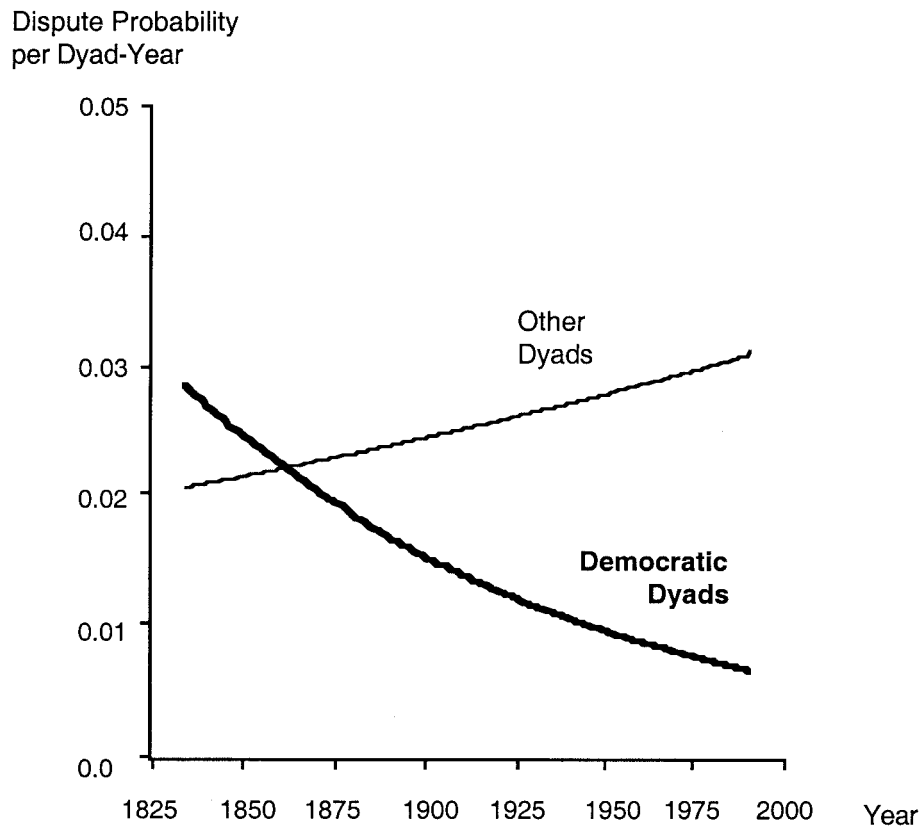
¹² Since Kant did not specify the original relationship between democratic and other relations, these propositions say little about the starting point of learning curves. If we assume that large states are more prone to conflict than small ones, Kant's ([1784] 1970a) suggestion that democratic security communities tend to develop around a great-power core can be used to explain why initial conflict frequencies are more elevated for democratic states.

¹³ Macrohistorical processes of this type violate the assumption of both temporal and spatial independence of the observations, which implies that the estimates of the standard errors might be inflated. To fix this problem, Beck, Katz, and Tucker (1998) introduce an ingenious "peace year" correction for duration dependence, but they point out (p. 1273) that their method is incompatible with models containing "variables that vary by time but not across units," which is what the current model does. Thus, I choose to disregard their fix. In a study based on time-varying parameters that escapes some of these

problems, Cederman and Penubarti (1999) confirm the qualitative results of Table 1.

¹⁴ Sensitivity analysis distinguishing between purely nondemocratic and mixed dyads yields similar findings. The purely nondemocratic curve becomes even steeper, however, and the corresponding curve for mixed dyad relations loses most of its slope.

¹⁵ The early sample period contains relatively few data points. In 1837, there are only 156 observations, and only the British-American dyad is democratic. Not until 1848 were these two democracies joined by France and Switzerland, creating five democratic dyads. In

FIGURE 2. Estimated Learning Curves for Democratic and Other Dyads

Note: The curves represent the probability of militarized interstate disputes per dyad-year for each category of risky dyads (including the two world wars), based on the parameter estimates reported for the dynamic model in Table 1.

initial “democratic belligerence,” however, it may derive from that fact that the first democracies—in particular the United States, Britain, and France—were involved in colonial and postcolonial competition, which produced many conflict opportunities and delayed the emergence of a democratic security community. Because the United States was a secessionist republic, Anglo-American relations only gradually developed from the original “vertical” mode into a “horizontal” one that permitted norms of equality to take root. Moreover, Owen (1994) shows that the very meaning of democracy has evolved historically. In the absence of a stable intersubjective understanding of the term, there could be no learning process. In earlier times, democracies tended to be remarkably jingoistic, as evidenced by the Spanish-American War, but more recent history reflects a steady trend toward pacifism.

ROBUSTNESS OF THE INITIAL RESULTS

Does Kant’s democratic learning effect disappear when we control for epochal effects? Do the results become spurious once exposed to competing explanations? Do

1900, the number increased to 18 out of 338 dyads. Only eleven disputes between democracies occurred before 1900, many of them pitting the United States against the United Kingdom. The findings in Table 1 depend crucially on these early years, which will be explored in the next section.

the propositions hold across the sample? The following analysis addresses each question in turn.

Epochal Effects

Kant’s dialectical argument refers to catastrophic reversals of the peace process, which justifies special treatment of the world wars. An explicit tracing of the causal effect of these disturbances lies beyond the scope of the study, but it is appropriate to exclude these comparatively short periods from the sample since they detract from the macro trend. My focus is on historical progress rather than temporary shocks. In any case, during these general wars, dyadic interactions became almost meaningless (Gowa 1999, 47).

In addition, I control for systemic effects for the remaining periods. There may be both geopolitical and liberal explanations for why these epochs differ, and the challenge is to establish that the learning effect persists despite such changes.¹⁶ Rather than partition the sample itself, I introduce two dummy variables, *INTER* (for the interwar period, 1921–38) and *COLD* (for the Cold War, 1948–92), to capture the indepen-

¹⁶ Highlighting systemic differences related to polarity and weapons technology, Gowa (1999) partitions her sample into pre-World War I and post-World War II eras and drops the interwar years. I see no compelling reason to exclude the interwar period.

TABLE 2. Logit Analysis of Dispute Propensity with Period Effects

Variable	Static Model (Risky Dyads without World Wars)			Dynamic Model (Risky Dyads without World Wars)		
	Coeff.	Std. Err.	Prob.	Coeff.	Std. Err.	Prob.
Constant (b_0)	-4.16	(0.06)	0.0001	9.71	(3.56)	0.0063
Democratic (b_1)	-1.09	(0.12)	0.0001	24.60	(7.34)	0.0008
Year (Dem.) (b_2)				-0.0205	(0.0041)	0.0001
Year (Other) (b_3)				-0.0074	(0.0002)	0.0001
Interwar (b_4)	0.06	(0.11)	0.27	0.43	(0.15)	0.0040
Cold War (b_5)	0.51	(0.07)	0.0001	1.26	(0.20)	0.0001
Log-likelihood		-12,606.2			-12,579.1	
Sample size		67,395			67,395	

dent effects (β_4 and β_5) of the two last historical periods, respectively:¹⁷

$$X\beta = \beta_0 + \beta_1 D + \beta_2 D \times Y + \beta_3(1 - D)Y + \beta_4 INTER + \beta_5 COLD. \quad (5)$$

Thus, the intercept β_0 (together with β_1 , the coefficient for the democracy dummy) measures the starting point of the pre-World War I learning curve. For the interwar period, β_4 has to be added to the intercept, and in the case of the Cold War, the adjustment is β_5 .

Table 2 lists the findings from the static and dynamic versions of this modified framework. In the time-invariant model, the democracy effect changes little compared to the static model in Table 1. Contrary to realist expectations, and despite the presence of bipolarity and nuclear weapons, the Cold War period actually appears to be characterized by a *higher* level of conflict than both the pre-World War I and interwar eras. The coefficient associated with the latter period does not reach significance, however.¹⁸

In the dynamic model, the interdemocratic learning effect becomes twice as strong compared to the non-periodized results in Table 1. Interestingly, the other dyads now experience a negative downward slope, which disconfirms P3. Their learning is still clearly slower compared to democracies (Wald test with $p < 0.0005$). As in the static model, the results indicate that the Cold War period exhibited more conflict, and now the coefficient for the interwar years turns significant as well.¹⁹

Propositions 1 and 2 receive further support, but the period-dependent analysis suggests that the learning

process is stronger in, but not isolated to, democratic relations. This means that the strong version of Kant's theory that relies on P3 is quite fragile. The weakness of this proposition can be attributed partly to the sharply dichotomous democracy coding used in this study, but learning in the residual category is too strong to be a mere artifact of operationalization. It is thus necessary to reassess the most categorical version of Kant's theory in favor of a weaker reinterpretation. Kant viewed democracy as an initial condition triggering the peace process, followed by a gradual normative diffusion throughout the international system. Rather than being a necessary condition, pacific development proceeds at differential speed, although interdemocratic relations are still the fastest way to transcend conflict.²⁰ This, of course, comes as no surprise to liberal scholars, who have argued that growing war-weariness and conflict inhibition can trickle into all interstate interactions (e.g., Mueller 1989).

Alternative Explanations

Aside from factoring in historical influences, I have so far refrained from incorporating any explicit control variables. As we have seen, however, Kant's multi-causal version of liberalism is embedded in a geopolitical environment. Rather than necessarily compete with all realist and liberal accounts, his framework can coexist with power-related processes and liberal domestic-level factors other than regime type.

To investigate whether the learning hypotheses remain valid under such conditions, I will introduce three control variables; the first two capture geopolitical determinants, and the last is an additional liberal factor. First, using COW data (Small and Singer 1990), the dummy variable *ALL* flags whether the two states

¹⁷ I exclude the two years after each world war since the interstate system can be assumed to require time to adjust after such shocks. This modification improves the fit somewhat without changing the qualitative results.

¹⁸ This is one of the few cases in which the "shadow" of the world wars matters, since significance can be easily obtained if the sample includes 1919 and 1920 as well.

¹⁹ Despite bipolarity and nuclear weapons, this era appears to be more rather than less conflictual than other periods, possibly due to decolonization or increased deterrence-induced subwar conflict. Detailed analysis of this issue lies beyond the scope of this study.

²⁰ This interpretation is strengthened by an extended robustness test that disaggregates dyads into mixed and purely nondemocratic pairs. Indeed, such an elaboration reveals that the slopes vary gradually, from a strong -0.021 for democracies, through -0.012 for mixed dyads, to -0.005 for authoritarian states. A double Wald test significantly separates the democratic learning rate from the other two ($p = 0.001$ and 0.014), which generalizes P2.

TABLE 3. Logit Analysis of Dispute Propensity with Control Variables

Variable	Static Analysis (Risky Dyads without World Wars)			Dynamic Analysis (Risky Dyads without World Wars)		
	Coeff.	Std. Err.	Prob.	Coeff.	Std. Err.	Prob.
Constant (b_0)	-4.87	(0.11)	0.0001	20.08	(5.10)	0.0001
Democratic (b_1)	-1.07	(0.15)	0.0001	25.57	(8.93)	0.0042
Year (Dem.) (b_2)				-0.0269	(0.0052)	0.0001
Year (Other) (b_3)				-0.0013	(0.0027)	0.0001
Interwar (b_4)	0.29	(0.14)	0.037	0.90	(0.19)	0.0001
Cold War (b_5)	0.91	(0.11)	0.0001	2.09	(0.26)	0.0001
Alliance (b_6)	-0.52	(0.09)	0.0001	-0.50	(0.09)	0.0001
Capability (b_7)	2.25	(0.10)	0.0001	2.24	(0.10)	0.0001
Development (b_8)	-0.12	(0.03)	0.0001	-0.09	(0.03)	0.0025
Log-likelihood		-8,801.4			-8,768.1	
Sample size		43,783			43,783	

are members of at least one common military alliance. Second, the index *CAP* measures the capability balance between the stronger and the weaker party of a dyad, (1 = perfect symmetry, 0 = total asymmetry) (Bennett and Stam 1999; Singer, Bremer, and Stuckey 1972). This measure is based on six power components: military expenditure, military personnel, iron and steel production, energy consumption, total population, and share of urban population. Third, complementing the liberal theme of democracy, the variable *DEV* is a proxy for the lowest dyadic level of economic development. This measure is based on energy consumption per capita, which is available as a part of the COW capability data (Bennett and Stam 1999).²¹

In sum, the expanded explanatory scope, which also features the period dummies as in equation 5, yields a new regression equation:

$$X\beta = \beta_0 + \beta_1 D + \beta_2 D \times Y + \beta_3(1 - D)Y + \beta_4 INTER \\ + \beta_5 COLD + \beta_6 ALL + \beta_7 CAP + \beta_8 DEV. \quad (6)$$

According to recent quantitative studies, the alliance measure should be negative, which reflects the intuition that aligned states are less likely to engage in mutual conflict. This is so because they have to worry about an external enemy and often share other interests (e.g., Russett, Oneal, and Davis 1998). The effect of the capability symmetry is less intuitive, but the literature offers both theoretical and empirical hints. Whereas a balance-of-power interpretation suggests that conflict becomes rarer as bilateral power relations become more symmetrical, an alternative version of realism, sometimes referred to as power transition theory, anticipates precisely the opposite: The more

evenly balanced are resources, the less certain is the outcome of a military clash, and thus the more likely that aggressors will be tempted to take risks (Organski 1968). The latter interpretation has received empirical confirmation in the studies of Russett and his colleagues (Oneal and Russett 1997; Russett, Oneal, and Davis 1998), who found that resource symmetry fosters conflict. Finally, from a Kantian standpoint, economic development should reduce conflict. Kant's political strand of liberalism emphasizes the opportunity costs of broken trade interdependencies, although, on a more general interpretation, his "spirit of commerce" signifies wealth-generated pacification of market economies (cf. Doyle 1983a, 213; McMillan 1997, 36; for statistical evidence, see Bremer 1992; Oneal and Russett 1997). Obviously, the two can be expected to be closely correlated, since wealthy states usually trade the most, so in either case development should have a strong, conflict-reducing influence.

The static regression reported in Table 3 reinforces the baseline expectations. Democracy has almost the same effect as in Table 2. The coefficients of the other variables are also as anticipated: The influence of both alliances and development is negative, and symmetric capabilities increase conflict frequency. In the dynamic model, P1 and P2 continue to hold. A Wald test of the second of these yields strong significance ($p < 0.003$). Hence, even in the presence of statistical control, democratic states still experience a noticeably faster learning rate among themselves than do other dyadic combinations. In contradiction to P3, there is again evidence for a weak, but far from negligible, learning process in the residual dyad category ($b_3 = -0.0013$).

Despite the presence of the dynamic terms, the control variables and the dummy variables remain unchanged and point in the expected direction. In consequence, these results still contradict the attempts to extricate the democratic peace from its geopolitical

²¹ A measure of GDP per capita is preferable, but its availability is very limited for the earlier part of the sample. I initially used urbanization data drawn from COW, with qualitatively similar results, but closer scrutiny revealed that this measure is of such poor quality that it cannot be relied upon.

context in order to reject it. Gowa (1999), for example, seeks to show that the democratic peace can be explained as an artifact of power-based interests (cf. Weede 1984). Yet, the fact that the initial findings refuse to disappear despite the explicit inclusion of realist control variables, such as common alliance ties and the capability balance, together with systemic dummy variables, increases our confidence that Kant was right. Regime-type dependent learning appears to unfold in tandem with realist and other liberal processes.

Dyadic Time

So far, I have made the simplifying but unrealistic assumption that learning proceeds at a constant rate throughout the entire sample period. Even though the most effective way to relax this assumption is to select a more flexible functional form, I opt for a simpler way to test the temporal robustness of results.²² This is an important task, because careful sensitivity analysis indicates that the results obtained thus far, and especially the dynamic ones shown in Table 1, depend quite heavily on a rather small number of observations in the nineteenth century.²³

It is desirable to develop a more robust model that holds evenly across the sample. This is why considering other temporal measures becomes crucial. It goes without saying that a severely left-truncated sample will make it very hard to separate the slope of the two learning curves, especially since the democracy exponential is bound to flatten out once learning is saturated. This means that P2 will be undermined without any substantive reason to reject Kantian theorizing. At the same time, as the unfolding of world history introduces more and more democracies, there are sharply differing experiences with this regime type. Some areas of the world are dominated by young democracies, and in other regions democratic rule has had the time to “mature.” In particular, since the early years after World War II coincide with decolonization, the difference between “old” and “young” democratic dyads becomes important.

To solve this problem, I extend Kant’s learning perspective by including dyadic (as opposed to calendar) time. This not only makes it possible to differentiate between democracies with a long history of cooperation and those that have only recently started to interact but also promises to improve the model’s cross-temporal applicability. Technically, the elaboration requires a democratic maturity variable, *M*, which is incremented for each year that both states remain democratic. It is set to zero for completely new dem-

ocratic dyads and when the relation ceases to be mutually democratic.²⁴

Because I have added this reformulated learning effect, there is no longer any need to separate the slope variables. In any case, tables 2 and 3 show that world-historical learning applies to both relational types. Thus, I include an undifferentiated variable to indicate the calendar year, *Y*. The modified equation can be written as:

$$X\beta = \beta_0 + \beta_1 D + \beta_2 Y + \beta_3 M + \beta_4 INTER + \beta_5 COLD.$$

This implies that the Kantian refinement depends on the following propositions:

- P4: $\beta_2 < 0$,
P5: $\beta_3 < 0$.

The first of these requires that all dyads exhibit learning, whether democratic or not. The second postulates that each year of common democratic history makes democracies more peaceful in their mutual relations. These propositions should hold at any point in the historical record.²⁵

Table 4 presents the results of this refined analysis. The first three columns illustrate what happens when the model is applied to the entire sample (except for the world wars and their two-year “shadows”). As can be seen, both P4 and P5 stand, although the maturity effect acts much more swiftly than the corresponding world-historical trend.²⁶ In order to gauge the recent validity of the refined learning model, the middle three columns focus on the Cold War era (which obviates the need for period dummies). Again, the two key coefficients are negative and significant, as postulated by P4 and P5, which further strengthens the maturity argument. The regression results in the last three columns add the same three control variables used in Table 3. Again, the main results are unchanged, although the development variable becomes insignificant. Nevertheless, given the latter’s preliminary operationalization, it is premature to dispose of economic liberalism as a factor for the post-World War II period.²⁷

A graphical representation can be used to interpret these findings. Figure 3 plots the estimated learning curves resulting from the middle three columns of Table 4, that is, the dynamic model without control variables. Despite the steady decrease in the Cold War

²⁴ The counter is activated for the first democratic dyad in 1837 and incremented for all periods except during the world wars. Thus, authoritarian invasions of such countries as Denmark and France are not allowed to bias the results during the World War II period.

²⁵ For the early sample period, a Kantian interpretation is agnostic about the democracy intercept. For the later stages, however, we must require that $\beta_1 < 0$.

²⁶ Further checks reinforce confidence in the cross-temporal validity of the model. It hardly makes any difference whether the sample starts at 1880 or 1921 (which means that the interwar dummy has to be omitted). In both cases, P4 and P5 hold, and again the latter has the strongest influence, although the slope varies slightly from case to case.

²⁷ It would be particularly interesting to use explicit GDP measures and trade data, but that goes beyond the scope of this article. Another possibility is that development has a strong but time-varying influence on conflict patterns. See Cederman and Penubarti (1999) for a model that relaxes the functional form of the control variables.

²² I have pursued this project elsewhere: Cederman and Penubarti (1999) employ a more elaborate technique based on time-varying parameter estimation.

²³ Running the dynamic base model from Table 1 on a truncated sample from 1880 seriously weakens all the propositions. For example, the slope difference between democratic and other dyads becomes insignificant ($p = 0.065$).

TABLE 4. Dynamic Analysis of Dispute Propensity with Democratic Maturity Effect

Variable	Risky Dyads except World Wars			Risky Post-World War II Dyads					
	Coeff.	Std. Err.	Prob.	Without Controls			With Controls		
Constant (b_0)	10.1	(3.6)	0.0045	43.9	(5.44)	0.0001	46.11	(6.59)	0.0001
Democratic (b_1)	-0.62	(0.17)	0.0002	-0.67	(0.19)	0.0005	-0.78	(0.23)	0.0007
Year (b_2)	-0.0076	(0.0019)	0.0001	-0.024	(0.003)	0.0001	-0.025	(0.003)	0.0001
Dem. Maturity (b_3)	-0.0251	(0.0075)	0.0008	-0.029	(0.009)	0.0013	-0.028	(0.011)	0.0097
Interwar (b_4)	0.45	(0.15)	0.003						
Cold War (b_5)	1.25	(0.20)	0.0001						
Alliance (b_6)							-0.57	(0.09)	0.0001
Capab. (exp.) (b_7)							2.20	(0.12)	0.0001
Development (b_8)							-0.044	(0.030)	0.14
Log-likelihood		12,574.3			8,163.1			6,642.2	
Sample size		67,395			38,970			30,322	

era, the nondemocratic and mixed categories were considerably more conflict-prone than all-democratic dyads. The addition of dyadic time allows us to distinguish different types of interdemocratic relations. Whereas the dotted line represents the steadily falling conflict probability for newly democratic dyads (i.e., those of zero relational age), the two lower bold curves trace the history of two imaginary but typical dyads. The lowest curve, for democratic couples already 50 years old in 1948, reflects a democratic security community with almost no conflict. The curve just above it, for dyads that turned mutually democratic in 1948, reveals a more dramatic decrease in dispute propensity, although the starting point is much higher.²⁸ This picture is consistent with the difference in “fresh” relations between newly independent states, or between such states and old democracies, on the one hand, and stable interdemocratic relations in the developed world, on the other hand.

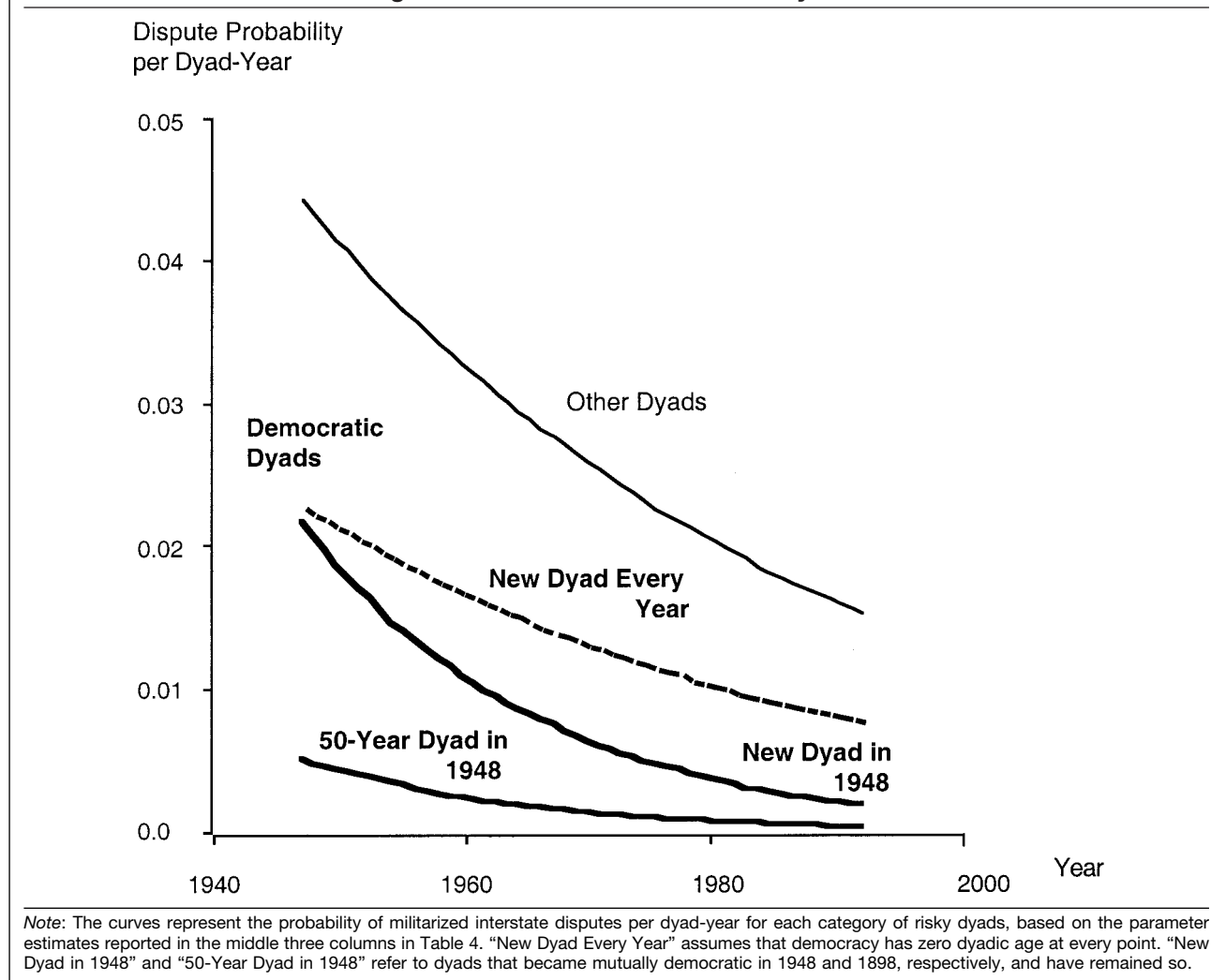
To render the three bold democracy curves a bit more concrete, consider the example of Britain and France, which by 1948 had together accumulated 60 years of democratic maturity. Their conflict record is blank since 1898. Approximating the curve labeled “new dyad in 1948” are British-Indian relations, which after India’s independence in 1947 display increasing maturity. From 1950, India is coded a democracy and continues to be so until 1992, which yields a maturity of 43 years in the last data year. As would be expected, there are no conflicts between the two countries. Finally, the troubled dyad of Greece and Turkey is close to the “new dyad every year” curve. Because

²⁸ In formal terms, the three curves were constructed as follows. The “just-turned-democratic” function defined for $t = 1948-92$ can be constructed by setting $D = 1$ and $M = 0$: $\Pr(t) = \exp(b_0 + b_1 + b_2t)$. The corresponding curve for a new democratic dyad in 1948 is $\Pr(t) = \exp\{b_0 + b_1 + b_2t + b_3(t - 1948)\}$, and that of the dyad that in 1948 is 50 years old is $\Pr(t) = \exp\{b_0 + b_1 + b_2t + b_3(t - 1948 + 50)\}$.

democracy is unstable in both states, the maturity effect has never stabilized. In 1948 both were democracies, but in 1960 that bond was broken. The relationship bounced back to nondemocratic status during long periods (1967–74 and 1980–83), and democratic maturity never lasted more than nine years. Symptomatically, disputes occurred especially, but not exclusively, in the nondemocratic years.

Several conclusions can be drawn from this picture. First, democratic security communities take time to mature. This result resonates with Maoz and Russett’s (1993, 629) statement that “the more democratic both members of [any dyad], the less likely they will become embroiled in a military dispute.” The advantage of my maturity-based operationalization is that it provides a more explicitly dynamic way to gauge the deepening of democratic relations.²⁹ Second, newly democratized relations improve quite quickly after both countries become democratic. My model does not operationalize democratization explicitly, and thus cannot speak to Mansfield and Snyder’s (1995) assertion that democratizing states are more conflict-prone than stable democracies, but it does support their claim about democracy’s need to settle before pacification can take root. Third, the nonjointly democratic dyads exhibit a trend toward lower dispute propensities. Further analysis is needed to establish whether this is an effect of a general civilizing diffusion of peaceful norms in the international system (Mueller 1989) or is due to geopolitical factors, such as nuclear deterrence and bipolarity (e.g., Gowa 1999; Mearsheimer 1990). The fact that these trends appear to develop smoothly and transgress period boundaries, however, makes it less

²⁹ Gowa (1993, 412) claims that there is no strong evidence of a “deep democracy hypothesis.” Although she creates a more demanding criterion for democracy (a score of at least ten), however, her test is static.

FIGURE 3. Estimated Learning Curves with Democratic Maturity Effect

likely that the answer can be found in conventional neorealist analysis.

CONCLUSION

It is premature to conclude that I have corroborated Kant's theory in its entirety, but my empirical investigations show that his conjecture stands up surprisingly well to evidentiary scrutiny. Democracies are indeed faster learners when interacting among themselves, and their relations become more peaceful with common experience of long duration. At the same time, I find no evidence for the strongly Kantian interpretation that pacific progress is restricted exclusively to democratic relations. In fact, the normative evolution appears to spill over into mixed, and to some extent even purely authoritarian, dyads.

In order to reach firmer conclusions, much theoretical, empirical, and methodological work remains to be done. What particular type of collective learning mechanisms operate at different stages of history and in different areas of the globe? Why do the nondemocratic and mixed relations also exhibit a pacifying

trend? What is the relative causal influence of negative and positive learning in various contexts?

Despite some inconclusiveness, this study has important consequences for future exploration of the democratic peace. On the meta-theoretical level, it warns against the dangers of method-driven thinking. Without doubt, regression analysis has improved our knowledge about the influence of regime type on conflict behavior, but this often has happened at the expense of theoretical imagination. By implicitly or explicitly (e.g., Ray 1995) treating the democratic peace hypothesis and its competitors as universal "covering laws," most scholars collect more observations to avoid selection bias rather than theorize about the population's temporal and spatial boundaries (Dessler 1991).

In terms of theory, I argue that international relations researchers still have much to learn from Kant's original statement. This does not mean that theorizing should be limited to merely rearticulating the Kantian thesis. Indeed, the results of this study cast doubt on a simplistic interpretation that treats mutual democracy as a necessary condition for pacific learning. Rather, it is more fruitful to consider Kant's position as a source

of conceptual inspiration. There is no denying that the intervening two centuries have produced promising theoretical insights and improved methods that will be useful in efforts to elaborate theories of dynamic and dialectical processes in the Kantian spirit.

For instance, the explanatory puzzle of democratic learning may find its resolution in recent scholarship. The notion of a security community may be particularly useful for theory-building. Although Karl Deutsch and his colleagues (1957) did not express their definition of security communities in terms of liberal democracy, they and others implicitly approximate the Kantian idea through reference to common values that support peaceful change (cf. Adler and Barnett 1998; Eberwein 1995; Risse-Kappen 1996; Russett 1998). Advances in applied learning theory also are promising in that they link the effectiveness of learning processes to domestic political structures (e.g., Reiter 1995; 1996; cf. Eder 1985). Moreover, methodological advances in evolutionary game theory and computational analysis pave the way for more flexible and context-sensitive modes of modeling (e.g., Axelrod 1984, chap. 8; Bendor and Swistak 1997; Cederman 1999).

One of the most urgent theoretical tasks is to widen the analytical focus as a way to introduce more elaborate causal control. To keep things simple, I chose a minimal set of control variables. In addition to introducing new indicators, it would be desirable to endogenize the functional form, which has been assumed to be constant. A more open-ended assessment of conflict trends stretching farther into the post-Cold War era may yield important findings about the future prospects of a Kantian peace taking root in ever larger areas of the globe.

Indeed, future empirical studies of earlier stages of the world-historical process also could benefit from an explicitly Kantian perspective. Without such refocusing, the debate will continue to treat many nineteenth-century cases as mere refutations of the democratic peace “law,” when they actually may corroborate a dynamic reinterpretation. Policy considerations should prompt a shift from the earlier cases to more recent interactions, but the former still deserve scholarly attention.

Seen in this light, the interdemocratic conflicts and crises of the previous century illuminate the dramatic contrasts with today’s highly institutionalized relations among democracies. Intertemporal comparisons of this type illustrate how military means have lost virtually all importance within a stable core of today’s democratic security community. Mearsheimer’s (1990) back-to-the-future scenarios notwithstanding, current power struggles within the democratic zone of peace concern monetary policy rather than clashes of imperial armies. In other words, Frankfurt has replaced Fashoda as the focus of political action.

This does not mean that “backsliding” will cease: To argue otherwise would completely miss Kant’s dialectical point. But it would be foolish to treat today’s Frankfurt in the same terms as yesterday’s Fashoda. Helmut Kohl’s statements that European integration is a matter of peace and war illustrate how much this

distinction between the bad old days and the good new days has been internalized by the world’s democratic leaders. I have attempted to show that enough evidence now exists for social scientists to take the Kantian peace conjecture seriously. Indeed, if one accepts Kant’s ethical reasoning as well, future research into the topic is not just an intellectual challenge; it is our duty.

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