Timing the Changes in Political Structures:
A New Polity Database

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This article introduces the Polity IIId dataset ('d' is for dates). The Polity IIId project codes the precise dates of changes in political structure identified by Polity III, for all independent countries in the international system from 1800 to 1994. By moving from annual measurements of authority and polity characteristics, the Polity IIId data is more appropriate for event-based analysis. We discuss the implications of the new dataset for event count and event history models of democracy and war, democratization and war, regime type and civil war, and causes of change in political structure.

MEASURING DEMOCRACY

Democracy has long been an important concept in the social sciences. Scholars have incorporated a regime type variable in their analysis of the democratic peace (Gates 1983; Rummel 1983; Bremer 1992; Maoz and Russett 1993), the civil peace and ethnic conflict (Muller and Weede 1990; Auvinen 1997), environmental degradation (Gleditsch and Sverdrup 1995; Midlarsky 1997), military intervention and foreign policy (Bueno de Mesquita, et al. 1992; Siverson 1995; Gelpi 1997), and regime duration (Gurr 1974; Gurr et al. 1990; Bueno de Mesquita and Siverson 1995), among others. Measures of democracy have been developed and applied by contemporary scholars. Some of the more sophisticated measures of regime type have become popular datasets among scholars investigating aspects of societal governance and regulation. These include Bollen's multivariate measurement model-based indicator (1980, 1993), the Freedom House (annual) survey of political and civil rights around the world, Arat's human rights based indicators (1991), Vanhanen's election-based measures (1990, 1997), and Coppedge and Reinicke's multivariate approach (1990). The most widely employed measure derives from the Polity database (Gurr 1978 – Polity I; (Gurr et al. 1989 – Polity II; and Jaggers and Gurr 1995 – Polity III).

A limitation common to all of these datasets is that they provide only annual information about regime characteristics[1]. Precise dating of regime changes and transformations are not available. This annual format creates difficulties for any event analysis. This shortcoming is noted by Jaggers and Gurr, who comment that 'the annualization format of the Polity II (and Polity III) data has made it difficult to precisely match regime type with event-based social behavior, such as international conflict' (1995, 470).[2] The

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[1] The first version of the Polity database contained only information about major and minor changes within the life of polities. Lichbach (1984) was the first to extend these major and minor changes into interpolated, annual scores on regime characteristics, a tradition that has now become standard practice in the Polity project.

[2] Gasiorowski (1993, 1996) does provide more precise dating, but his dataset is limited spatially and temporally to regime transitions in 97 Third-world countries after independence.

dataset introduced in this paper, POLITY IIId, overcomes this limitation by explicitly measuring the month and day of changes in political structure.[3]

With the annual format, all transitions in Polity III were coded as though the transformation took place 1 January of the year of transition. In cases involving coups or elections, as well as other cases in which a precise date is identifiable, the advantage of more accurate coding is quite evident. Specifically, it is possible to gauge whether the regime change preceded or followed other events, such as the outbreak of war. But even in cases where political transformations are more incremental or evolutionary, there is an advantage in ascribing some degree of precision beyond the first day of the year and in distinguishing those political transformations that can be identified to have taken place on a particular date from those that took place over a period of weeks.

Social scientists study events. As political scientists, we tend to focus on political events such as elections, wars and other less violent international disputes, the implementation of particular policies, polity transformations, and other interesting 'political' events. All events, by definition, are temporally linked. In general, social scientists (and most others) have assumed that uncovering anything related to the causes of certain events requires a clear temporal precedent. The temporal arrow goes only in one direction and events that are subsequent do not influence those that are prior. There are many possible ways to analyze events, but we focus here on two types of analysis that are distinguished by the type of research question under investigation. *Event count models* (King 1989) have been widely employed in political science to analyze summed events of binary phenomena. For example, they can be used to study the number of terrorist incidents in a year or the number of coup d'etats in Africa since World War II. Event count models can be estimated with Poisson, negative binomial, and generalized event count distributions (King 1989; McCullagh and Nelder 1989). *Event history models*, on the other hand, focus on the duration of events and non-events, such as the duration of illness in an individual or of conflict in a country. Such models gauge the risk, or hazard rate, that a country will move from being in one state of affairs to another. Cox regression (hazard) models are useful for such

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[3] Previous versions of the Polity data (I, II, and III) include some information on the dates of political changes (especially the months in which changes occur), but the principal investigators chose not to include that information in the final datasets.

analysis (Raknerud and Hegre 1997). Critical to event analysis is the incorporation of time (and timing) into the analysis. Polity IIId facilitates this by identifying the dates of political changes.

This article shows how the Polity IIId dataset was generated and illustrates how it may be used in event analysis. We begin with a brief description of the conceptual foundations of the Polity project. Next we introduce the Polity IIId data, focusing on the criteria we used to code the start and end dates of changes in political structure. Then we turn to analytical applications of the data, notably the study of the democratic peace.

THE CONCEPTUAL FOUNDATIONS OF THE POLITY PROJECT

The Polity project was conceptually developed by Gurr (1974) in his study of regime durability and change. A polity was defined as 'the basic political arrangements by which national political communities govern their affairs. … When a system changes abruptly and substantially on one or more of these dimensions [of authority patterns] the change is treated as the end of one polity and the beginning of the other' (Gurr, 1974, 1483). In order to analyze regime persistence, Gurr collected data on several authority characteristics for each polity in the international system between 1800 and 1971[4]. These characteristics were derived from Eckstein's theory of authority relations that applied to all social units, including polities. This early development of an analytic delineation of authority relations was detailed in Eckstein and Gurr (1975). The Polity I project focused on five dimensions of a political system's authority: 'the influence relations between superordinate and subordinate strata; the degree of inequality between the strata; the institutional relations among superordinates; the competitiveness of the recruitment to superordinate positions; and the basis of political legitimacy, whether personal, substantive or procedural' (Jaggers and Gurr 1995, 470). Using these measures, Gurr (1974) was able to compare the durability of regimes across time and space.

Polity II expanded the scope of the original dataset to include *annual* codings of nine institutionalized authority characteristics, and for over 150 countries from 1800-1986. Although Gurr eschewed the use of the Polity database to measure the degree of autoc-

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[4] Polity I collected data at only two points in time, at the beginning and end of each polity.

racy and democracy in historical polities, this later became the main use of the accumulated information. Scales of democracy, autocracy, and anocracy were created through the aggregation of authority characteristics reflecting the influence dimensions of authority, the recruitment of chief executives, and the centralization of government structure (Jaggers & Gurr 1995, 470). Polity III updated the data comprising the democracy and autocracy indicators for the post World War II period (1946-94). These data were merged with the information from Polity II for the period 1800-1945.

POLITY IIId

Polity IIId returns to the original structure of the Polity dataset with *the polity* as the unit. A polity is synonymous with a country in which there is no recorded change in the political structure. This definition of a polity is slightly different from Polity I, where polities start or end only when 'a system changes abruptly and substantially'. In Polity IIId, polities also start or end when minor changes occur in a country's political structure. Using this definition, there are 176 countries (current or historical) and 1,358 polities in the Polity IIId dataset. Organizing the dataset this way allows precise start and end dates. We will refer to an event causing a polity to end and a new one to start as a *change in political structure*, or *political change* for short.

As a point of departure, the Polity IIId project coded the month and day of all changes in political structure as recorded in the Polity III dataset. We took these changes for granted, without challenging the original coding of Polity III, with one exception that is described below. More precisely, we define a change in political structure as: 1) actual changes in the indicators that contribute to the democracy and autocracy indicators,[5] 2) entering or leaving a period of transition,[6] 3) acquiring or losing Polity status,[7] and 4) ac-

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[5] This includes the regulation of participation, the competitiveness of participation, the competitiveness of executive recruitment, the openness of executive recruitment, and executive constraints. For more detailed descriptions of these measures, see *Polity II Codebook*; Gurr, Jaggers, and Moore (1990); Jaggers and Gurr (1995).

[6] Polity III designates transition periods in several ways. A 'transition polity' is a period of time in which 'new institutions are planned, legally constituted, and put into effect. Democratic and quasi-democratic polities are particularly likely to be so established, in a procedure involving constitutional conventions and referenda.' (*Polity II Codebook*, 7) A period of 'interruption' is also a transition period, which is usually the result of foreign military occupation and war. Finally, the project codes periods of 'interregnum',

quiring or losing Correlates of War system membership.[8] For each case that meets our criteria for a change in political structure, we coded information on the start and end dates of the polity, the sources of polity start and polity end, and the precision of the start and end dates. We also included a written description of the events surrounding the change.[9] All of the information coded for each political change refers to the factors leading to the end of one polity and the beginning of the next polity.[10]

For reasons which will become clear in the next section, we were puzzled why the military coup d'etat in Cyprus 16 July 1974 did not lead to a regime change in Polity III. The explanation is that the annual coding scheme of Polity II/III does not allow more than one change in political structure per year. Since we took the changes coded in Polity III as our starting-point, Polity IIId could still overlook short-lived polities. By and large, we have left this problem for future updates. As a systematic way of checking if other short-lived polities had been removed in the same way in the update, we tallied all the cases of coding change from 'in transition' in Polity II to 'not in transition' in Polity III [11]. Including Cyprus in 1974, there were 12 such cases and we anticipated coding changes for most of these. After a close investigation, we concluded that only the regime change in Cyprus warranted the insertion of a new polity. We inserted two consecutive 'transition' polities for Cyprus, following the coup d'état. The democratic regime in Cyprus is now coded as

where the authority of the political system disintegrates. This can include incidents of civil war, internal factionalism, and external military intervention.

[7] Polity status refers simply to the inclusion of a country in the Polity III dataset. We distinguish polity status from Correlates of War status, due to the differences in the time periods of the Polity and COW datasets.

[8] While many applications of the Polity data employ Correlates of War system membership status as a case selection mechanism, the Polity data includes cases before 1816, the first year of the COW system membership data. In some cases, nations are included in Polity at times when they are not recognized by COW as separate actors (e.g. Norway in the period 1814–1905). Conversely, some small countries which do not meet the Polity cut-off of 500,000 population, are included in COW (e.g. Bahamas 1973–94).

[9] The primary sources used to identify polity start and end dates included information contained in the Polity III files (*Annual Register*, Freedom House, *Statesman's Yearbook*), *Keesing's Record and World Events*, and Langer (1972).

[10] The end date of one polity is coded as the exact date of the event associated with the change in political structure, and the start date of the next polity is coded as the next day.

[11] These were Guatemala in 1957, Chile in 1973, Argentina in 1982, Mauritania in 1978, Upper Volta in 1969, Ghana in 1976 and 1977, Zaire in 1965 and 1966, Lesotho in 1986, and Nepal in 1980. Most of these were minor variations in autocratic rule. Following our ordinary coding procedures, the polity overthrown by the 1973 coup d'état in Chile was dated to end on 11 September 1973 – the day of the coup.

restored on 14 February 1975. In Polity III Cyprus was coded as having a democracy score of seven during the entire year.[12]

The identification of dates of changes in political structure was easier in the post-World War II period. This was a function both of improved news sources and the updating carried out in the Polity III project, which helped to eliminate errors in the previous versions. To give users of Polity IIId an indication about the precision of the polity start and end dates, we coded the dates as *exact*, *assigned*, *approximate*, or *missing*. Table 1 provides a frequency distribution of the precision of polity end dates in Polity IIId. For the entire period over 60% of the cases were coded with an exact polity end date (month and day). The percentage of polity end dates coded as exact was greater prior to WWII.

An example of a change coded with an exact polity end date is the military coup d'etat in Chile in 1973. In Polity III, General Pinochet's overthrow of President Allende was coded as occuring in the beginning of 1973. This was changed to 11 September 1973. At that point, Chile is coded as changing from democracy score six to zero. Another example is the so-called pan-Arab revolution in Iraq which overthrew King Faisal II on 14 July 1958, abolished the 1925 constitution, dissolved the legislature, and declared a republic. This is reflected as a decrease in Iraq's democracy score from one to zero and that change is now correctly dated. This example also shows that a major political event like the Iraqi revolution is not necessarily reflected in great changes in the institutional characteristics measured by the Polity project.

Not all cases of change in political structure could be dated exactly. The precision of the polity end dates was coded as 'assigned' in those cases where: 1) more than one event could be attributed to the change in political structure (in such cases we selected one of the events); 2) the particular event persisted for more than one day (such as a series of elections); or 3) the coders were uncertain whether or not the particular event identified was indeed the source of the change in political structure identified by earlier versions of the data. As Table 1 shows, 16% of the cases were assigned a polity end date. While 10%

But we found no reason to insert any transition polity preceding or following the coup, as the change from Polity II to Polity III would imply.

of the end dates were coded as 'assigned' from 1816-1994, the figure rose to 20% from 1946-94. It is not clear to us why the accuracy of the dating is lower for the most recent period. Conceivably, the greater availability of current news sources has made us more aware of the ambiguity of historical events. For the older period, we have relied more on the summary accounts with a 'settled' historical interpretation.

The political events that occurred in India in 1975 provide a good example of an 'assigned' polity end date. On 12 June 1975, the high court ruled Indira Gandhi's election to the *Lok Sabha* in 1971 null and void. Turmoil surrounding elections in June 1975 led to a declaration of a state of emergency on 26 June, approved by Parliament on 22 July. Numerous opposition leaders were arrested and press coverage of the events was heavily censored. In this case, more than one date could be selected as the transition from one polity to a less democratic polity (the democracy score declining from nine to seven). Polity IIId assigns the polity end date to 26 June, the day the state of emergency was declared which, although not completely exact, is considerably more precise than the 1 January 1975 coding in Polity III.

The Polity IIId project coded the precision of a polity end date as 'approximate' when a month could be identified, but not a specific day. Some of the sources provided some indication about when the events transpired, but not always in sufficient detail. Nearly 3% of all polity end dates from 1816-1994 are classified as approximate. The percentage of approximate end dates is slightly higher in the pre-WWII period. An example is Portugal's decrease in democracy from three to zero in 1907, when King Carlos I abolished the Cortes (the legislative body), suspended the constitution, and established a royalist dictatorship. Polity IIId coders were able to determine that the King became a dictator in May 1907, but unable to identify the precise day. In this case, the day is coded as missing but the timing is still more precise than the Polity III coding of 1 January 1907. More detailed historical research might reduce the indeterminacy even further.

Some changes in political structure could not be dated at all. The project coded the precision of polity end dates as 'missing' if the coders could not find any information

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[12] The institutionalized democracy scale in Polity III is an ordinal scale that ranges from zero (least democratic) to ten (most democratic). A common cut-off point on this scale has been to consider countries that score six or greater on this scale as democratic.

about the events surrounding the political change and were unable to code even the month when the change occured.[13] For the entire period (1800-1994) 8.5% of the polity end dates are coded as missing and this share is also higher in the pre-WWII period. An example of a missing polity end date is the decrease in Zimbabwe's democracy score from six in 1982 to three in 1983. Crackdowns by the government in 1983 lead to a decrease in political participation and executive constraints on Prime Minister Mugabe, but no precise date could be associated with the change from one polity to another in 1983.

Finally, 157 polities are still in existence and therefore have no end dates. They make up 12% of all polity endings over the entire period.[14]

THE DEMOCRATIC PEACE

The central finding of the democratic peace literature is that democracies rarely if ever fight wars with one another and that double-democratic dyads are much less likely than other dyads to become entangled in militarized disputes.

The most obvious problem with annual coding of regime and change in political structure when examining event-based social phenomena is the potential for a temporal mismatch. Such a mismatch may occur when an event such as a war or a militarized interstate dispute (MID) is dated precisely, as in the Correlates of War project and any regime change is coded annually. For example, Norway is implicitly coded as an occupied country from 1 January 1940 by Polity III with its annual coding format. This leads to a misleading classification of the German invasion on 9 April 1940 as a war between an autocracy and an occupied country. A better-known anomaly is the apparent outbreak of war on 20 July 1974 between Turkey and Cyprus, both classified as democracies[15]. The war was preceded

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[13] Some of the dates assigned in earlier versions of the Polity project were arbitrary, especially in cases where institutional changes occurred gradually over a long time period. The higher proportion of missing cases in the pre-WWII period can be attributed partly to this arbitrary assignment of dates in long-term changes. Even after consulting multiple data sources, we were still unable to document some of the changes.

[14] The Polity IIId dataset also codes the sources of political change. The categories include creating (or dissolving) larger unit, starting (or ending) military occupation, beginning (or end) of colonial relationship, coup d'etat, revolution, and 'other'. The general category of 'other' was by far the most common source of polity start/end. Coup d'etats were also frequently associated with the change from one polity to another.

[15] We define a democracy as a regime scoring greater than a six on the democracy scale. We also ran analyses defining a democracy as a regime which scores above three when taking the difference between

by a military coup d'etat which temporarily ended democracy in Cyprus (Gleditsch and Hegre 1997, 286). This should obviously not be classified as a war between democracies. Polity IIId corrects these and other temporal anomalies.

Table 2 identifies how the more precise dating of regime transformation affects the accounting of wars and international conflict between different regime types. Polity IIId reduces the number of wars between democracies by two by eliminating the two outbreaks of war between Turkey and Cyprus in 1974[16]. Of the remaining eight war dyads between democracies, six refer to the well-known case of Finland vs. Western democracies during World War II, where there was no war action at all (Gleditsch 1995, 315). The two other cases are the Spanish-American war in 1898, and the Lithuanian-Polish war in 1919. The number of wars between democracies and autocracies increases as does the number of wars between autocracies.[17]

Table 2 also shows similar results for militarized interstate disputes: the number of democracies entangled in disputes with one another falls by eight cases, and there is also a reduction in the number of MIDs in politically mixed dyads, an increase in the number of disputes between autocracies, a major reduction in the number of dyads involving at least one regime in transition, and a very slight increase in the number of dyads involving missing cases.

Most dyadic analyses of the democratic peace statistically account for only three types of dyads (democratic, mixed, and autocratic). By reducing the number of dyads with one or two countries in transition or missing regime data Polity IIId expands the sample size of relevant cases for analysis.

Students of the democratic peace have known for some time about the anomalous cases of war between democracies, but the number of anomalous wars between other regime types have not been known. Nor have we known the extent to which the lack of precise dating of regime change has affected our analysis of interstate disputes. We could not

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the regimes score on the autocracy scale and its score on the democracy scale (i.e. democracy score minus autocracy score is greater than or equal to three). The results were very similar.

[16] There was a second outbreak of violence on 14 August, so this is classified as two outbreaks of war in the Correlates of War dataset.

know in advance whether the greater precision of Polity IIId would strengthen or weaken the democratic peace thesis. In fact, we find that the relationship between democracy and peace at the dyadic level is strengthened somewhat. What might be called `the autocratic peace' (the tendency for autocratic dyads to have a lower propensity for violent conflict than the mixed dyads, although not as low as the democratic dyads) is weakened both for wars and for MIDs. However, calculations not reproduced here show that at both levels of violence, the politically mixed dyads are still the most conflict-prone, even with the revised regime data (Raknerud & Hegre, 1997).

More importantly, Polity IIId may help us to address some problems inherent in a dyad-year framework of analysis, a framework that has nearly become a fixture of quantitative analyses of the democratic peace. Most such analyses assume that all dyad-years are statistically independent from one another. However, this is not true. Three types of dependence between cases can affect our analysis of the dyadic democratic peace: conflict that continues beyond a single year; conflict that alters the probability of conflict between other dyads in a given year; and 'enduring rivalries' (recurrent conflicts) involving cases in which one conflict is causally related to a subsequent conflict. When the independence assumption is violated, the statistical significance of the results is likely to be overestimated.

Scholars have attempted to deal with this problem in a variety of ways. Bremer (1992: 320) argues that 'the question of how wars begin is fundamentally different from the questions of why wars grow in size, duration, or severity.' His solution to the problem of case dependence is to analyze only the characteristics of each conflicting dyad member at the beginning of the conflict. In this way, Bremer excludes from his analysis all subsequent dyad-years involving conflict between the two states. He also excludes all other dyads that join a multilateral conflict. There are two problems with this approach. First, this method effectively treats all conflicting dyads that fight longer than a year as peaceful dyads after the initial year of conflict. Second, his approach fails to include most participants in a multilateral conflict; indeed, World War II is treated as a war between Germany and Poland and all other war participants are treated as if they were peaceful – hardly an accu-

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[17] We define an autocracy here as the absence of democracy, meaning that an autocracy is a regime scoring lower than six on the democracy scale. This number is not directly affected by the country's score on the autocracy scale.

rate depiction of the actual events. Clearly this is very problematic, but the alternative, to ignore case dependence, is hardly better.

Raknerud and Hegre (1997) and Beck and Tucker (1996) provide two different answers to the problem of case dependence. Raknerud and Hegre use a Cox regression model that treats the interactions between each member of an interstate dyad as a continuous process. The essential idea behind Cox regression techniques is to estimate the probability of war in a dyad given that there was a war outbreak somewhere else in the system. This allows for the use of continuous time in which the time between war outbreaks is treated separately with a non-parametric function. Raknerud and Hegre use this event history modelling technique to assess the hazard of war. The more precise dating of regime change in Polity IIId allowed Raknerud and Hegre to avoid temporal mismatches.

Beck and Tucker (1996) account for case dependence by using a generalized additive model (GAM) utilizing a dyad-year approach (see also Beck, Katz, and Tucker 1997). They account for case dependence with a cubic smoothing spline of elapsed time since a dyad last experienced a militarized dispute. This smoothing incorporates time into the analysis, but unlike Cox regression event history analysis as used by Raknerud and Hegre, time is evaluated discretely in Beck and Tucker's GAM analysis. Beck and Tucker also used Polity III data, but annual measures of polities' regime scores constitute a crude measure by which to smooth temporal effects. Polity IIId will enable them to correct future GAM analyses and to use smaller discrete units of time, say dyad-months, and to correct temporal anomalies.

Polity IIId could be also used in many other research applications such as the study of the consequences of democratization and international conflict or civil conflict (Hegre et al. 1997; Mansfield and Snyder 1995ab; Ward and Gleditsch 1997; Thompson and Tucker 1997). Temporal mismatches and missing political changes (where several occur in a single year) are bound to have a distorting impact on such analyses. Analysis of the consequences of democratization, however, need not be limited to the study of conflict. With more precise dating of regime change, the economic consequences of democratization (or any other type of regime change) could also be studied. Since most economic data are aggregated quarterly, Polity IIId offers a nice alternative to annual aggregation.

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TABLE 1

Frequency Distribution of the Precision of Polity End Dates

	1816-1945		1946-1994		Entire period	
	(n)	%	(n)	%	(n)	%
1. Exact date	393	71.2	437	54.2	829	61.0
2. Assigned date	56	10.1	161	20.0	217	16.0
3. Approximate date	23	4.2	16	2.0	39	2.9
4. Missing	80	14.5	35	4.3	115	8.5
5. Polity still in existence	0	0.0	157	19.5	157	11.6
TOTAL	552	100.0	806	100.0	1,358	100.0

TABLE 2

Regime Codings for War Dyads and Militarized Interstate Dispute Dyads, 1816-1994

Polity III vs. Polity IIId (Absolute Numbers)

	War Dyads		MID Dyads	
Regime Combination	Polity III	Polity IIId	Polity III	Polity IIId
Two democracies	10	8	162	150
Mixed Dyad	116	129	1,313	1,273
Two Autocracies	94	111	1,102	1,148
One or Two in Transition	69	49	267	211
One or Two Missing Regime Data	56	48	151	153
TOTAL	345	345	2,935	2,935

NOTE: Democracies are defined as those regimes scoring 6 or higher on the democracy dimension of Polity III or Polity IIId. Cases with one in transition and one missing regime data are classified as missing regime data.