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VANDERBILT UNIVERSITY
PMB 505 • 230 APPLETON PLACE • NASHVILLE, TENNESSEE 37203-5721 • TEL 615-322-3175 • FAX 615-343-6003 • VANDERBILT.EDU/CSDI

Blind Retrospection:
Why Shark Attacks Are Bad For Democracy

Christopher H. Achen
Larry M. Bartels

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Christopher H. Achen

Princeton University
achen@princeton.edu

Larry M. Bartels

Vanderbilt University
larry.bartels@vanderbilt.edu

Conventional accounts of retrospective voting assume that voters can use changes in their own welfare to discern whether incumbent leaders have governed well or badly. We challenge this assumption, arguing that the connection between incumbents' performance and voters' subjective well-being is likely to be highly random. As a result, retrospective voting is harder than it seems, and incumbents often get rewarded or punished for events beyond their control. We illustrate this point by tracing the electoral impact of a clearly random event—a dramatic series of shark attacks in New Jersey in 1916. We show that voters in the affected communities significantly punished the incumbent president, Woodrow Wilson, at the polls. We also develop a simple formal model demonstrating that the randomness of "blind retrospection" significantly impairs the effectiveness of elections as mechanisms for political accountability.

Blind Retrospection:

Why Shark Attacks Are Bad For Democracy[1]

The theory of retrospective voting provides the most compelling account we have of the relationship between leaders and citizens in democratic political systems. The theory is attractive, in no small part, because it seems to require less of citizens than alternative conceptions of democracy do. For example, Fiorina (1981, 5) argued that retrospective voters "need *not* know the precise economic or foreign policies of the incumbent administration in order to see or feel the *results* of those policies. … In order to ascertain whether the incumbents have performed poorly or well, citizens need only calculate the changes in their own welfare."

The influential works of Downs (1957, ch. 3), Key (1966), Kramer (1971), and Fiorina (1981) all portrayed retrospective voting as an optimistic alternative to the rather bleak portrait of habitual, socially determined political behavior provided by Berelson, Lazarsfeld, and McPhee (1954), Campbell et al. (1960), and other early

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[1] Earlier versions of this report were presented at the 2002 Annual Meeting of the American Political Science Association and in seminars at the Juan March Institute in Madrid and at the University of Michigan, Princeton, North Carolina—Chapel Hill, Stanford, Texas A&M, Emory, Wisconsin—Madison, DePauw, Wilfrid Laurier, William and Mary, and Vanderbilt. We are grateful to participants in those seminars, as well as to numerous colleagues and friends for helpful discussions and comments; to Jonathan Ladd for organizing data; to Helene Wood for graphical assistance; to John Geer, Bryan Jones, Karen Long Jusko, Sasha Killewald, Suping Lu, Arlene Saxonhouse, W. Phillips Shively, John Wilkerson, and Natasha Zharinova for pointing us to examples, references and data sources; to Jerry Woolley, the Point Pleasant Beach Borough historian, for his assistance with Ocean County history; and to John Blydenburgh and David Mayhew for help with New Jersey political history. Achen also expresses his thanks to the Center for the Study of Democratic Politics, Princeton University, and to the Department of Political Science, University of Michigan, for their financial support of a fellowship year.

analysts of electoral choice. Fiorina (1981, 4) discerned "rough justice" in the electoral punishments periodically meted out to incumbent politicians by American voters. Kramer (1971, 140) characterized his analysis as demonstrating that election outcomes "are not 'irrational,' or random, or solely the product of past loyalties and habits, or of campaign rhetoric and merchandising." And Key (1966, 7) famously put the "perverse and unorthodox argument" of his book in a nutshell: "voters are not fools."

By dispensing with the unrealistic notion that ordinary citizens vote on the basis of well-informed political preferences or ideological positions, the theory of retrospective voting seems to rescue voters from the charge that they are too uninformed or too disengaged to play a meaningful role in the democratic process. Depressing evidence about how little voters know becomes, if not quite irrelevant, at least not fatal to democratic theory.

While we consider this an important virtue, we believe that the theory as it stands fails to do justice to the very considerable logical and informational difficulties faced by retrospective voters evaluating the performance of incumbent politicians. Is it true that voters can "ascertain whether the incumbents have performed poorly or well" simply by assessing "changes in their own welfare"? Given the myriad sources of "welfare" and the complex problems of causal attribution involved in using changes in welfare to gauge incumbent performance, that is by no means clear. If not—if voters' electorally relevant subjective welfare is only tangentially related to incumbents' performance—then retrospective voting may provide only a tenuous form of political accountability.[2]

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[2] Fiorina (1981, 202) noted in passing that the normative appeal of the theory of retrospective voting hinges in significant part on the assumption "that the *electorate does a passable job of attributing responsibility to government decision makers*." However, his brief discussion of the

Our aim here is to examine how well voters are likely to fare using "changes in their own welfare" to evaluate the performance of their leaders. Our analysis proceeds in three stages. First, we explore the difficulty of discerning when and how voters' welfare is affected by political leaders. In light of that difficulty, we argue that voters engage in *blind retrospection*, punishing or rewarding political leaders for events that are clearly beyond their control. Second, we illustrate this point by examining in some detail a single colorful instance of blind retrospection: the unjustly neglected impact of shark attacks on American presidential elections. Finally, we develop a simple model formalizing the negative implications of blind retrospection for political accountability.

A Rational God of Vengeance and of Reward?

Rulers and their potential challengers through the centuries have been well aware of the potential political significance of dramatic changes for the better or (usually) worse in collective well-being. For example, in the theology of classical Egypt, pharaohs were divine beings responsible for making the Nile flood annually. When it failed to do so, some scholars believe that the pharaoh's reign was shortened, and perhaps his life as well (Bell 1971; Hassan 1994). Not surprisingly, there are records of Egyptian court officials wishing their pharaoh a good Nile flood.

When disasters take on truly catastrophic dimensions, not just the ruler but the entire regime can come under suspicion. Islamic missionaries in Java and Sumatra successfully blamed Dutch rule for the 1883 volcanic explosion on Krakatoa (Winchester, 2003, 317-338). An earlier catastrophic eruption in 11th-century Arizona apparently triggered social upheavals among the people living nearby; their Hopi

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problems raised by that assumption focused almost entirely on the issues of divided government and responsible parties, rather than on the more basic questions considered here.

descendants still preserve folk memories of the event, which they interpret as retribution for their ancestors' "morally imbalanced and corrupt" culture (Gidwitz 2004, 52). Similarly, the European famine of the early 14th century led to outbreaks of heresy and heretic burning in Silesia (Jordan 1996). Later in the 14th century, the Black Death, which may have killed a third or more of the European population, "discredited the leaders of society, its governors, priests, and intellectuals, and the laws and theories supported by them," generating numerous spontaneous religious and political movements to threaten both secular governments and the Catholic church (Herlihy 1997, 64).

Despite this long history, most of the detailed evidence for the political significance of changes in collective well-being comes from studies of the impact of economic conditions on election outcomes in contemporary democracies (Gosnell and Colman 1940; Kramer 1971; Markus 1988; Lewis-Beck 1988; and many others). While details of the causal path are still disputed, a virtual consensus has emerged that the effect of pocketbook voting is real and substantial. This pattern of electoral reward and punishment seems to bolster the conventional interpretation of retrospective voting as an effective mechanism for political accountability since, in the post-Keynesian era, competent governments are thought to have real influence on the course of the economy. Thus, the strong tendency of voters to reward incumbents for good economic times and punish them for bad times is often viewed as a mark of the rationality of democratic electorates, sometimes misappropriating Key's (1964, 568) ironic characterization of the electorate as "a rational god of vengeance and of reward."

This conventional interpretation overlooks significant reasons to doubt the rational basis of pocketbook voting in modern democracies. For one thing, the

relationship between economic conditions and election outcomes seems to have existed well before Keynes taught governments how to gain some control over a modern industrial economy.[3] Histories of American politics routinely ascribe shifts in the electoral fortunes of incumbent parties to economic booms and busts (e.g., Sundquist, 1983). Poor weather and bad harvests have been given substantial credit for the rise of the Populists in Kansas (Miller 1925) and Nebraska (Dixon 1898, 637; Barnhart 1925) in the 1890s. The Socialist Party in Saskatchewan (Lipset 1959, chs. 5-6) and the funny-money Social Credit Party in Alberta (Irving 1959, ch. 8) are said to have gained votes in the 1930s for similar reasons. And no less a politician than Benjamin Disraeli recognized the electoral significance of bad harvests in 19th-century Britain.[4]

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[3] In the first edition of his popular textbook on party politics, Key (1942, 628) noted that voters seem to have rewarded and punished incumbents for good or bad times "[e]ven before it could be said that the national Government could do much of anything to improve their condition." How, he wondered, are we to interpret this sort of behavior? "Is it to be considered as a rational seeking to better one's status by the ballot or is it merely blindly striking a blow at a scapegoat? To throw out the 'ins' probably had about the same effect on economic conditions as evangelical castigation of Satan has on the moral situation. Perhaps the swing against the 'ins' can best be described as a displacement of economic resentment on political objects. By this catharsis discontent was dissipated and the peace kept." This passage disappeared from subsequent editions of Key's text, replaced by more detailed analysis of New Deal voting patterns. It is unclear whether this alteration reflected a change in Key's view; however, it seems safe to assume that the author of *The Responsible Electorate* would not have described pocketbook voting in these terms.

[4] In 1879, Disraeli wrote to a colleague that "The only danger and difficulty which the present Ministry has to encounter are natural. … After four bad harvests in this country, we are apparently about to meet a fifth dearth" (Monypenny and Buckle 1929, 1347). Sure enough, in a disastrous election the following spring the Tory government fell. As Disraeli complained, "Never was so great a discomfiture with a cause so inadequate. I think, as far as I can collect, 'hard times' was the cry against us. The suffering want a change—no matter what, they are sick

Presumably the voters in Victorian Britain did not imagine that their government controlled the harvests with the divine power of Egyptian pharaohs, but they punished nonetheless.

Even in modern circumstances, when it is clearly sensible for voters to attribute *some* responsibility for economic conditions to incumbent politicians, there are daunting uncertainties involved in assessing *how much* responsibility incumbents ought to bear for *which* economic conditions. Studies of contemporary economic voting suggest that voters mostly respond to short-term income growth in the months immediately preceding an election; but since income growth is highly volatile, short-term income growth is unlikely to be a reliable benchmark for assessing incumbent performance or a reliable basis for predicting future performance (Achen and Bartels 2004). Thus, even in sophisticated modern democracies, economic voting may be a good deal less "rational" than it appears. Indeed, voters' tendency to focus on very recent economic conditions at election time may perversely tempt incumbents to pursue "myopic policies for myopic voters" (Tufte 1978, 143).

Wolfers (2002) studied economic voting in contemporary U.S. gubernatorial elections, attempting to distinguish aspects of economic performance that were plausibly affected by incumbents' policies from the effects of economic forces clearly outside incumbents' control, such as international oil price shocks. His analysis suggested that voters rewarded and punished incumbents for both sorts of economic conditions.

While further work along those lines would be quite valuable, our approach here is different. Rather than quibble about which economic conditions can sensibly be

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of waiting" (Monypenny and Buckle 1929, 1395). We are indebted to W. Phillips Shively for this reference.

attributed to incumbent politicians, we take as a test case the impact of an event that was clearly outside any incumbent's control—a string of shark attacks in New Jersey in 1916. From our perspective, the electoral response to this spectacular, very random event is a particularly illuminating instance of the broader phenomenon of retrospective voting. If, as we argue, retrospection is blind, then incumbents should be expected to pay at the polls when things go wrong, whether or not objective observers can find a rational basis for blame. And pay they did.

Shark Attacks: The Voters Bite Back

On the four-day Fourth of July weekend in 1916, the beaches of New Jersey were packed with crowds happy to escape the summer heat of nearby cities.[5] On Saturday, July 1, a young Ivy League graduate from Philadelphia, Charles Vansant, was swimming just beyond the breakers in four feet of water at Beach Haven. He was attacked by a shark. Skillful lifeguards managed to get him to shore, but he died soon after from blood loss.

Five days later, a young Swiss bellhop named Charles Bruder, a strong swimmer like Vansant, ventured out past the lifelines at Spring Lake beach, some forty five miles north of Beach Haven. He, too, was attacked by a shark. Though rescued by lifeguards in a small boat, he died of his wounds before reaching shore.

In the days after the two deaths, nearly all of the diminished numbers of Jersey Shore swimmers stuck close to shore. However, no one worried about boys swimming in a creek on July 12 in the town of Matawan, about two miles from open water. Yet one was attacked and killed by a shark, as was a young man from the town who dove

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[5] Unless otherwise noted, our historical rendition follows Fernicola (2001), the most complete account. See also Capuzzo (2001).

in to recover the boy's body. Downstream, another group of boys were swimming at the same time in ignorance of the attacks. Within half an hour, one of them had his leg mauled by a passing shark. However, he was quickly pulled from the water, reached the local hospital, and survived.

By this time, the mounting panic reached a crescendo. Even the distant *San Francisco Chronicle* had this front-page headline on July 14: EAST COAST BEGINS WAR ON RAVENOUS MAN-EATERS (Fernicola 2001, 87). Steel mesh was being installed at beaches. Bounties were offered, and sharks were killed in sizable numbers along the shore. Finally, one great white shark was hauled in near Matawan Creek with what appeared to be human bones in its stomach. Perhaps for that reason, the attacks stopped, ending the most serious string of shark-related fatalities in American history.

Before the attacks, no arm of government had patrolled for sharks or set up barriers against them in New Jersey, since there had never been a recorded shark attack in the history of the state. Indeed, prominent American scientists doubted that unprovoked shark attacks on human beings ever occurred, certainly not as far north as New Jersey (Fernicola 2001, 22).[6] The general climate of skepticism led the *New York Times* to place its article about the first attack only on page 18, headlined "Dies After Attack by Fish"—no doubt a consolation to the New Jersey resort owners, who were anxious to avoid publicity.[7]

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[6] Indeed, two scientists who were later called in to investigate the attacks, Dr. John T. Nicols, an ichthyologist and director of the Fishes Wing of the American Museum of Natural History, and Dr. Frederick Lucas, director of the museum, had recently coauthored with a third scientist an article arguing that unprovoked sharks never attack human beings.

[7] Parallels to the film "Jaws" and its sequels are no accident. Peter Benchley, the author of the book on which the film was based, was a New Jersey resident, and the film version, though set on Long Island, New York, includes a reference to the 1916 New Jersey attacks.

In the aftermath of the attacks, the federal government was called on for help. The resorts were losing money rapidly, with $250,000 in reservations cancelled within a week. Some resorts had 75 percent vacancy rates in the midst of their high season (Capuzzo 2001, 274). Losses may have amounted to perhaps as much as $1 million for the season altogether, a sizable sum in 1918 (Fernicola 2001, 174). Letters poured into Congressional offices from the affected counties demanding federal action, though there was little any government agency could do. Fernicola (2001, 70) describes the atmosphere, as the shark attacks entered popular imagery and became a metaphor for other political crises as well:

> Newspaper cartoons now portrayed Wilson's chances for reelection in November, using the shark fin as the symbol for his potential loss. The black fin labeled "defeat" was shown slicing through shark-infested northeast regions. Other political cartoons of the day showed lawyers, represented by sharks heading toward a beleaguered sailboat, embossed with "Union Bank." At the stern of the bank boat, a chewed and legless victim dangled over the gunnel depicting "deposits."

As it happened, the Secretary of the Treasury, William McAdoo, had a summer home in Spring Lake and was in residence at the time of the second attack. Joseph Tumulty, Wilson's powerful aide for political affairs, had a summer home in Asbury Park, about five miles north of Spring Lake. President Wilson himself, a former president of Princeton University and former governor of New Jersey, had been looking for a summer White House in New Jersey as well, and chose a hotel in Asbury Park, moving there shortly after the attacks ended. Thus the attacks received immediate federal attention. Wilson held a Cabinet meeting to discuss the attacks (Fernicola 2001, 70), but the Bureau of Fisheries could suggest nothing beyond killing sharks at random and warning bathers. "No certainly effective preventive measure could be

recommended," they said (Capuzzo 2001, 277). The president could only direct the Coast Guard to inspect the beaches and patrol the water. However, the problem disappeared and autumn arrived before much could be done.

By election time in November, Wilson was back at his Asbury Park headquarters, but other election issues, notably potential U.S. entry into World War I, took over the headlines (Link 1954, 247-251). In the end, Wilson lost nearly all the northeastern and Great Lakes states, including New Jersey, but managed to squeak out his re-election by adding most of the Great Plains, Mountain States and West to the Democrats' customary Solid South.

Did the shark attacks influence the presidential election in the affected areas of New Jersey? Hitherto, sharks have not been suspects in any electoral analysis. Nonetheless, if our argument is correct, they should have reduced Wilson's vote. First, the attacks caused several deaths plus considerable emotional and financial distress to shore communities. Second, the election occurred just a few months after the summer's events, increasing the likelihood that they would be fresh in the minds of the voters as they went to the polls. Third, high federal officials were present at the scene from the beginning, reinforcing the notion that the federal government should do *something* to deal with the crisis. The fact that no government has any influence over sharks should have been irrelevant.

The evidence for a shark effect turns out to be rather strong. We now turn to the first piece of that evidence, using election returns at the New Jersey county level.[8] The Wilson vote in 1916 is the variable to be explained. Our key independent variable is an indicator for "beach counties," defined as Monmouth, Ocean, Atlantic, and Cape May

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[8] New Jersey electoral data are from the official reports published in the *Legislative Manual of the State of New Jersey*, various years.

counties. These were, and are, the classic "Jersey Shore" counties listed in the guidebooks, whose beach areas are heavily dependent upon summer tourism. They are the places in which the shark attacks would have had the most pronounced economic effects. The attacks themselves took place in Monmouth (three deaths) and Ocean (one).

We also include two control variables in our county-level analysis. The first is the Wilson vote in 1912, a measure of both partisanship and candidate appeal, including favorite son effects. Wilson's 1912 vote predicts his 1916 showing well, despite the fact that 1912 was a three-way race with former president Teddy Roosevelt running as a Progressive.[9] By contrast, the four presidential elections prior to 1912 (and their mean) were less correlated with the 1916 vote, and they added nothing to the linear regression fit once 1912 was included.[10]

One other control variable is needed to capture an important change in New Jersey politics between 1912 and 1916. Having supported Wilson for governor in 1910,

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[9] Throughout the northeast, the Roosevelt vote from 1912 returned almost entirely to Charles Evans Hughes, the Republican candidate, in 1916. (Socialist and other minor candidates, including Prohibition advocates, were also running in both years, but of course only Roosevelt was a serious third-party contender for the presidency.) Wilson gained less than a percentage point statewide in New Jersey in 1916 from his 1912 totals, and similar results held in other northeastern states. Wilson's 1912 vote is an excellent predictor of his 1916 vote across New Jersey counties, and even at the township level.

[10] Adding the Roosevelt proportion of the vote from 1912 generated a small positive, statistically insignificant coefficient. Wilson in 1916 undoubtedly picked up some small fraction of Roosevelt's 1912 New Jersey adherents, but visual inspection of the data indicates that the effect is too small and too erratic to detect reliably with county-level data. Keeping the Roosevelt variable made no difference in subsequent analyses, and so it was dropped.

the New Jersey bosses turned against him shortly after his election.[11] They initially opposed his nomination for president in 1912, but fell in line once it became inevitable (Link 1947, chs. 8-9 and pp. 427-28). After he became president, however, Wilson's control of the New Jersey Democratic Party, once nearly complete, slipped away (Blum 1951, 39, 76; Link 1947, 288). For example, the infamous Jersey City political boss Frank Hague supplanted a progressive Wilson ally during this period (McKean 1940, ch. 3; Connors 1971, ch. 3). To take account of Wilson's reduced power over the bosses in 1916, we include a control variable for "machine counties," defined as those counties with at least 30,000 voters in 1916 and 60 percent or more "foreign" citizens in the Census of 1910.[12] The counties so defined are Bergen, Hudson, Essex, and Union, adjacent to each other and just across the state line from New York City.

Two of these machine counties, Hudson (Jersey City) and Essex (Newark), were particularly well known for boss control. In fact, alone among New Jersey's counties, Wilson never did get so much as partial control of the Essex Democratic machine, which was under the thumb of James Smith, Wilson's bitter political enemy, throughout this period (Blum 1951, 39-40; Link 1947, 288, 424). For that reason, Wilson's 1912 vote in Essex was so low relative to its electoral history that the county becomes a substantial outlier in predicting the 1916 vote, even beyond its status as a machine county. Simply put, Essex County in this electoral period does not act like the

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[11] For this reason, Wilson's vote for governor in 1910 is poorly correlated with his showing in both presidential elections and was not used as a statistical control in our analysis of his 1916 vote.

[12] "Foreign" here means that the citizen was foreign-born or had at least one parent foreign-born (the so-called "hyphens" in the vernacular of the time).

rest of New Jersey at the polls and does not belong in the same regression. We therefore excluded it from the analysis. The other 20 counties make up our sample.

The results of regressing Wilson's 1916 presidential vote in each county (except Essex) on a variable for beach county, a variable for machine county, and Wilson's 1912 vote are presented in Table 1. All of the variables are substantively significant and sensibly sized, and each of them is statistically significant beyond the .01 level. The overall multiple correlation R = .973, and the regression has a vote prediction error of just 1.7 percentage points.[13]

***** Table 1 *****

The estimated negative effect on Wilson's vote in the beach counties is a little more than 3 percentage points, with a 95% confidence interval confined between 1.2 and 5.2. The shark attacks indeed seem to have had an impact. The high statistical significance of the estimate is due to the very consistent effect across the beach counties, as may be seen from Figure 1. This figure shows the statistical relationship between Wilson's 1916 vote and his 1912 vote with the machine-county variable controlled. The ordinary least-squares regression lines are estimated separately for beach and non-beach counties, with Essex excluded. As the graph shows, the beach counties are each depressed nearly the same amount from their expected 1916 vote,

[13] None of the residuals falls more than two standard deviations from zero, and only one of them (Salem's) is near that level, about what would be expected by chance. By contrast, the excluded Essex County observation has a residual 4.6 standard deviations from zero in this regression, amply confirming its exclusion from the sample.

and the consistency of the effect both confirms the specification visually and tightens the standard errors statistically.[14]

***** Figure 1 *****

We ran many other regressions with alternate versions of the partisanship controls. None fit as well as the 1912 vote, and the estimated effect of the shark attacks remained at 2 to 4 percentage points so long as the 1912 vote was included as a control. We also tried controls for the proportion Irish, the proportion German, and the total proportion "foreign," since speculation was rampant at the time of the 1916 election that these communities would be unhappy with Wilson over the 1916 Easter Rising in Dublin (which the British suppressed) or with his potential entry into World War I on the British side. We found no effect, which is consistent with the conclusions of analysts of the national vote at the time.[15] Similarly, weighting the counties by the total 1916 vote, or using the change in the vote from 1912 to 1916 as the dependent variable, or both, never reduced the impact of the sharks by more than a tenth of a

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[14] If the machine counties were moved to the beach regression, they would fit nicely on the regression line even without a dummy variable for "machine county." They are themselves on the water or adjacent to the Hudson River. Capuzzo (2001, 270-273) notes that fear extended well beyond the Jersey Shore counties, up through the machine counties and onto New York State beaches, where the economy was also harmed. One shark was killed with a revolver near a yacht club in machine-controlled Hudson County (Fernicola 2001, 27). Thus it is possible that some of the negative "machine county" effect is due to the sharks. Similarly, Middlesex County, which is neither a machine nor a beach county, would fit almost exactly on the beach regression line: It is the county just north of the classic Jersey Shore counties. It has a modest shoreline and considerable river frontage on both banks of the Raritan, which empties at the shore.

[15] Two days after the election (November 9), the *New York Times* headlined "Both Candidates Got Hyphen Vote." For subsequent treatments reaching the same conclusion, see Leary (1967) and Cuddy (1969) on the Irish, and Link (1954, 232-251) on the Germans.

percentage point, and the standard errors never worsened. In fact, all the vote-weighted estimates were larger by a few tenths of a percentage point. Thus the shark effect stands up well under alternate specifications.[16]

We also undertook two additional investigations with different samples. First, we examined the vote in the first two shore townships where the attacks took place.[17] Both Beach Haven and Spring Lake were small, stable communities, making comparison sensible.[18] Figure 2 shows the vote change for Wilson between 1912 and 1916 in these two communities, and compares it with the change in their respective counties and in New Jersey as a whole. Both townships show remarkable drops in Wilson's support, 11 points in Beach Haven and 9 in Spring Lake—far more than the negligible changes in the Wilson vote in their counties and in the state. It is apparent that something drastically reduced enthusiasm for Woodrow Wilson in these two townships.

***** Figure 2 *****

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[16] Another possibility we considered was that Roosevelt might have run worse in the beach counties than in the rest of the state, leaving Wilson fewer voters there to pick up from Progressive Republicans in 1916. This would have created an artificial drop in Wilson's 1916 vote in the beach counties. To the contrary, however, Roosevelt ran *better* along the shore than in the rest of the state, so that the shark attack effect is, if anything, slightly underestimated in Table 1.

[17] Matawan Township and Matawan Borough, where the final two shark deaths occurred in a river, were excluded from this analysis since they are not beach resort communities and thus suffered no widespread economic loss from their shark attacks or anyone else's. In any case, the rapid growth in the number of voters in both places between 1912 and 1916 makes comparison impossible; more than a quarter of the 1916 voters in Matawan township had not been there in 1912.

[18] Beach Haven cast 112 votes for president in 1912 and 119 in 1916. The corresponding numbers for Spring Lake are 271 and 265.

We also investigated whether Beach Haven and Spring Lake were typical of beach areas. To answer this question, we examined the townships in Ocean County near the water. Ocean was chosen because it has many beach communities, nearly all on a bank of land (Long Beach Island) clearly separated from the mainland. Thus there is no difficulty in separating those eight communities right on the beach from the eleven near the beach but not on it.[19] New Jersey was growing rapidly in this era; to ensure over-time comparability, we dropped townships whose vote totals grew or shrank by more than 25% in this four-year period. This left us with 14 observations, four of them on the beach and ten nearby. The latter two sets of communities had very similar overall Democratic percentages for Wilson in 1912 (37.1% at the beach and 33.5% in the near-beach), making them plausibly comparable.

In each area, we compared Wilson's vote percentages in 1912 and 1916. If our argument is correct, the beach voters should show the largest drop in support for Wilson, while the near-beach citizenry should be largely unaffected.[20] As shown in Figure 3, the actual vote change turns out to be a drop of 13.3 percentage points in the beach area, compared to a tiny loss of half a percentage point in the near beach, an easily statistically significant difference. [21] Again, we find that disaffection for Wilson

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[19] The western border of the near-beach area was set to the current Garden State Parkway, which runs within a few miles of the shore in Ocean County.

[20] One beach township, Sea Side Park, apparently split into two between 1912 and 1916 and jointly nearly doubled in size; we dropped it from the analysis for lack of over-time comparability.

[21] The simplest approach is a differences-in-differences regression model weighted by the 1916 total vote (to take account of the wide range of electorate sizes in these boroughs). Thus, with the change in the Democratic vote percentage from 1912 to 1916 as the dependent variable and

was widespread in the beach areas whose livelihood was most directly affected by the shark attacks, far different from the otherwise comparable areas next door, where Wilson's vote was nearly constant.

***** Figure 3 *****

In summary, then, every indication in the New Jersey vote returns is that the horrifying shark attacks during the summer of 1916 reduced Wilson's vote in the beach communities by about ten percentage points. An effect of that size may sound modest to those unfamiliar with American electoral experience, but by those standards it is a near-earthquake. A full earthquake, Franklin Roosevelt's landslide victory in the 1932 election during the Great Depression, reduced Hoover's vote in New Jersey by just twelve percentage points.[22]

In the case of the shark attacks, retrospection was surely blind. Shark attacks are random events in the purest sense of the term, and they have no governmental solution. If bathers insist on swimming in the ocean, governments then and now cannot save them, as the subsequent attacks in New Jersey in 1960 and the regular

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"beach borough" as the explanatory variable, we obtain a coefficient of −12.8 percentage points, with a standard error of 4.4 (t=2.9). Alternately, a weighted regression with the Democratic vote in 1916 as the dependent variable, and with "beach borough" and the 1912 Democratic vote as explanatory variables, yields a beach effect of −11.1 percentage points (with a standard error of 3.2; t=3.5). (Unweighted regressions are substantively inappropriate, but they yield even larger beach coefficients.) Finally, if we eliminate two townships with fewer than 50 voters in 1916, the differenced regression produces a beach coefficient of −8.4 percentage points, while the second regression version yields −8.8, both with t-ratios exceeding 2.7. In short, alternate versions of the beach versus non-beach comparison lead to precisely the same substantive conclusion, which we summarize as a loss of about 10 percentage points in the areas most directly affected by the shark attacks.

[22] Hoover's vote share in New Jersey fell from 59.8% in 1928 to 47.6% in 1932.

encounters in Florida, California, South Africa, and Australia demonstrate (Fernicola 2001, ch. 5). Nor could the aftermath of the 1916 attacks be repaired by governmental action. The truth could not be covered up. The vacationers could not be compelled to come to the beach, nor could the sharks be forced to stay away. The government was helpless.[23] Yet the voters punished anyway.[24]

Blind Retrospection Impairs Democratic Accountability

We have shown that voters sometimes punish incumbent political leaders for misfortunes that are clearly beyond the leaders' control. In related work (Achen and Bartels 2002), we have argued that they do so with considerable regularity—incumbent presidents throughout the 20th century were punished at the polls for droughts and floods, for example. That fact seems to us to rule out the possibility that voters were actually punishing incumbents for sub-par *responses* to misfortunes rather than for the misfortunes themselves. After all, it is hard to see why incumbents' responses to droughts and floods would have been substantially worse than average over the course

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[23] Of course, from the perspective of a century later, it is obvious that extending federal welfare benefits and unemployment compensation would have helped. But these social programs did not exist at the time, they could not have been put in place quickly, and no one would expect them to be enacted in response to a single local disaster in any case. The idea that "failed federal disaster assistance" explains the anti-Wilson vote seriously misreads the historical circumstances.

[24] On one occasion, sharks apparently had a more direct and unfortunate impact on an incumbent. On 17 December 1967, Australian prime minister Harold Holt disappeared while swimming in shark-infested waters at Cheviot Beach near Portsea, Victoria. His body was never found.

of an entire century.[25] Nor is there any reason to think that blind retrospection is limited to natural disasters. For example, Healy, Malhotra, and Mo (2010) have shown that incumbents' electoral support is affected by the success of local college football teams in the weeks before an election.

What, if anything, is wrong with such behavior? In a world of great uncertainty and costly attentiveness, perhaps this is exactly what voters should do to hold their leaders accountable—"only calculate the changes in their own welfare" (Fiorina 1981, 5) and vote accordingly. If a few pharaohs perish needlessly as a result, is that such a high price to pay for a system in which every incumbent has a strong incentive to do whatever she can to maximize her citizens' welfare? In short, aren't the voters behaving rationally?

In one sense, this view of our analysis is quite right. When voters are utterly ignorant about obvious connections (or disconnections) between leaders' actions and their own welfare, *blind retrospection* may be "rational" in the narrow, technical sense favored by economists. However, that does not imply that it will be "rational" in the everyday meaning of "sensible" or "prudent." Indeed, foolishly uninformed behavior of the sort we attribute to voters' in New Jersey in 1916—and, by implication, to voters in other times and places—is likely to be quite detrimental to their welfare. Ignorance hurts.

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[25] Voters may insist on low taxes and unintrusive government, thereby ensuring poor disaster preparedness. In that case, government performance in response to disasters will *nearly always* seem poor in some absolute sense, and incumbents will be punished accordingly. But this sort of retrospective punishment on the voters' part is self-defeating in exactly the way we have suggested, since the randomness of the trigger makes it pointless (in an electoral sense) for any incumbent to make adequate preparations for disasters (Healy and Malhotra 2009).

To show why that is the case, we formalize the implications of blind retrospection within a simple, mostly conventional model of democratic accountability in which voters and incumbent leaders are both assumed to be perfectly "rational" in the economists' sense. In models of this sort, the electorate has a principal-agent relationship to elected politicians (Ferejohn 1986; Laffont and Martimort 2002). Incumbents may be tempted to focus on other goals besides maximizing voters' subjective welfare,[26] and voters cannot monitor how hard or effectively the incumbent is working on their behalf. However, they can tell when they experience pain or pleasure, and they know that their pain and pleasure is attributable, in part, to the incumbent's efforts on their behalf.

The key implication of these models is that voters can increase the incumbent's incentive to pursue their welfare by simply punishing her at the polls when they experience pain and rewarding her when they experience pleasure. Thus, blind retrospection may be perfectly "rational." But will it be *effective* in ensuring political accountability? That is the focus of our formal analysis.

We begin by supposing that a representative voter's *electorally relevant subjective well-being* depends on two factors: the amount of effort devoted by the incumbent leader to increasing the voter's well-being and the net effect of random factors beyond the incumbent's control, including shark attacks, floods, football scores, and other exogenous economic and social forces. More specifically, we assume that

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[26] In the theoretical literature, this is often labeled "shirking." We think the image of politicians sitting around with their feet up on their desks is inapt; however, models of this sort can be used to explore the implications of a much broader class of competing goals that might tempt incumbent leaders to deviate from doing whatever will maximize their prospects for reelection, which might include graft or, at the other extreme, providing for their constituents' long-term welfare in ways that the constituents themselves fail to recognize or appreciate.

{1} $\omega = \gamma + \varepsilon$,

where γ (≥ 0) represents the incumbent's level of diligence in furthering the pivotal voter's subjective well-being and ε is a random variable representing the impact on the voter's well-being of factors unrelated to the incumbent's effort. For the sake of concreteness, we assume that ε is normally distributed with mean zero and variance σ^2: $\varepsilon \sim N(0, \sigma^2)$, and that this *distribution* is known both to the voter and to the incumbent. However, the actual value of ε in any given period is unknown by the incumbent when she chooses her level of effort, and unobserved by the voter even after the fact.

This simple model captures the idea that the incumbent's effort and luck both contribute to the voter's subjective well-being. However, since we assume that the voter cannot tell them apart, his decision whether or not to return the incumbent leader to office for the second period is governed by the sum of both factors. Following the usual rule in principal-agent models, he reelects the incumbent leader if and only if the *subjective well-being* he experiences in the period before the election exceeds some threshold value τ:

{2} $\pi = \text{prob}(\omega \geq \tau)$.

Substituting {1} into {2} and rearranging,

{3} $\pi = \text{prob}(-\varepsilon < (\gamma - \tau))$

$= \Phi((\gamma - \tau)/\sigma)$,

where $\Phi(\cdot)$ represents the cumulative normal distribution function.

The part of equation {3} that is under the incumbent's control is her effort level, γ. Other things being equal, higher values of γ produce higher probabilities of reelection. However, effort devoted to increasing the voter's subjective well-being can be costly,

since it may require foregoing graft, ideological goals, or the esteem of future historians. To capture this trade-off, we assume that the incumbent maximizes[27]

$$\{4\} \qquad \upsilon = \pi - \gamma^2/2$$

$$= \Phi((\gamma - \tau)/\sigma) - \gamma^2/2.$$

The equilibrium relationship implied by this objective function is

$$\{5\} \qquad \gamma^* = \varphi((\gamma^* - \tau^*)/\sigma)/\sigma,$$

where γ^* and τ^* are the equilibrium choices of effort and the reelection threshold, respectively, and $\varphi(\cdot)$ represents the normal density function. This equilibrium relationship implies that the incumbent's choice of effort level, γ^*, depends in part on the voter's choice of reelection threshold, τ^*.

How will our voter choose τ^*? If his aim is to maximize his electorally relevant subjective well-being, he will choose a reelection threshold that maximizes equation {1}. His choice can have no effect on the second term in equation {1}; luck is random. Only the first term in equation {1}, the incumbent's effort level, γ, is subject to influence. Thus, the voter will want to choose a reelection threshold that elicits as much effort as possible from the incumbent, and his expected well-being will vary directly with that effort level.

It is clear from the equilibrium relationship in equation {5} that the incumbent's effort level is maximized when the voter chooses $\tau^* = \gamma^*$, because in that case the

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[27] Since the scale of γ is arbitrary, there is no loss of generality in choosing the coefficient 1/2 for the cost of effort in equation {4}, simplifying the subsequent exposition. However, the assumption that cost varies with γ^2 rather than γ (so that the marginal cost of effort is greater at higher levels of effort) has a substantively important impact on equilibrium behavior in our model.

expression on the right-hand side of equation {5} is maximized.[28] In light of that fact, equation {5} simplifies to

{6} $\gamma^* = \varphi(0)/\sigma$,

which expresses the incumbent's optimal effort level as a simple function of the parameter σ.

There is one additional constraint to bear in mind in this analysis. Since we have seen that the voter will always choose $\tau^*=\gamma^*$, the incumbent's probability of reelection in equilibrium will be .5. Given that fact, and the incumbent's utility function in equation {4}, it will never be worthwhile for the incumbent to choose an effort level greater than 1, since if she did her expected utility would be negative.[29] Thus, the equilibrium level of effort (and the equilibrium reelection threshold) will be *either* 1 (for sufficiently small values of σ) *or* the value implied by equation {6}. Figure 4 shows how this equilibrium level of effort—and thus the voter's expected subjective well-being—varies with σ.

***** Figure 4 *****

The implication of Figure 4 is that even relatively small amounts of randomness can significantly degrade the efficacy of elections as mechanisms for inducing incumbent leaders to pursue their citizens' subjective well-being. In any system where "moral hazard" is a concern—that is, in any system in which incumbents find it worth their while to seek reelection—increases in voters' sensitivity to random factors will reduce incumbents' diligence. Indeed, as the magnitude of random forces in the

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[28] Recall that the normal density function $\varphi(x)$ takes its maximum value at $x = 0$.

[29] The incumbent can always assure herself of non-negative utility by exerting no effort.

election increases, the incumbent's equilibrium level of exertion goes to zero (since no feasible exertion of effort can increase her chances of reelection by enough to be worthwhile).

We have assumed here that voters' only aim is to discipline incumbents to focus on the voters' subjective well-being. Since all potential leaders have identical objective functions, they will all respond similarly to this incentive, and the actual *outcome* of the election makes no difference to the voters. While this assumption is common in principal-agent models and in the theoretical literature on electoral accountability (e.g., Ferejohn 1986), it overlooks another, even more basic aim of elections—to *select* "good" leaders (Fearon 1999). It is easy to construct a model in which voters' payoffs depend solely on the intrinsic quality or competence of incumbent leaders, plus random factors. In such a model, larger doses of good or bad luck make it harder for voters who cannot tell the difference between competence and luck to identify high-quality incumbents. Thus, in much the same way that shark attacks and floods impair electoral accountability in our model by making it harder for voters to punish "shirking," they also make it harder for voters to select good leaders.[30]

Conclusion

Our stylized depiction of the principal-agent relationship between voters and elected officials is compatible with the empirical evidence we have presented regarding the blindness of retrospection. It implies that voters will punish incumbents whenever

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[30] Extending our models to deal simultaneously with incentive effects and differences in intrinsic competence makes the analysis more complicated, and the precise implications vary with arbitrary choices of assumptions regarding how the various moving parts fit together; hence we omit such an analysis here.

their welfare falls below some "normal" standard, regardless of whether their pain is traceable to the incumbents' policies. Shark attacks are random events, but since they produce negative shocks to votes' well-being, they should—and, in our account, do—lead to punishment at the polls.

Behavior of this sort may be "rational" in the economic sense.[31] However, it is hard to square with popular notions of democracy in which ordinary citizens assess their public life critically, weigh the qualifications of competing candidates for public office, and then choose between the candidates in accordance with their own values. Citizens in our portrayal often cannot distinguish shark attacks and droughts from poor tax policies and disastrous foreign wars. They are frequently ignorant about evidence and causation, and they vote simply on the basis of current pain and pleasure.

The "rough justice" (Fiorina 1981, 4) embodied in the electoral verdicts rendered by such voters are likely to be rough indeed. They may be so rough that incumbents see little point in exerting themselves on the voters' behalf. As a result, citizens who cannot distinguish the effects of shark attacks and droughts from the effects of tax policies and foreign wars are likely to experience a great many misguided tax policies and disastrous foreign wars.

Retrospective voting is harder than it seems. The conventional account, minimalist as it is, greatly underestimates both the real limitations of democratic

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[31] Our formal model is based on the assumption that voters *do* behave rationally. However, our empirical evidence is equally consistent with a political psychology in which retrospective voting has more in common with kicking the dog—or with the superstitious tendency of earlier peoples to punish their own leaders for droughts, plagues, or volcanic eruptions—than with the rational assessments of blame or credit envisioned by such pioneering scholars of retrospective voting as Gosnell, Key, Kramer, and Fiorina.

citizens and the real limitations of democratic accountability. A satisfactory defense of democracy will have to be built upon more realistic grounds.

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Table 1: The Effect of Shark Attacks on the 1916 New Jersey Presidential Vote

Parameter estimates from ordinary least squares regression analysis (with standard errors in parentheses). Dependent variable: 1916 Woodrow Wilson vote share (two-party %) in New Jersey counties.

	Coefficient	*t*-ratio
Beach County	–3.23 (.99)	3.3
Machine County	–5.66 (1.09)	5.2
Wilson 1912 Vote (3-way fraction)	.947 (.061)	15.4
Intercept	4.54 (2.78)	1.6
standard error of regression	1.70	
adjusted R^2	.94	
N	20	

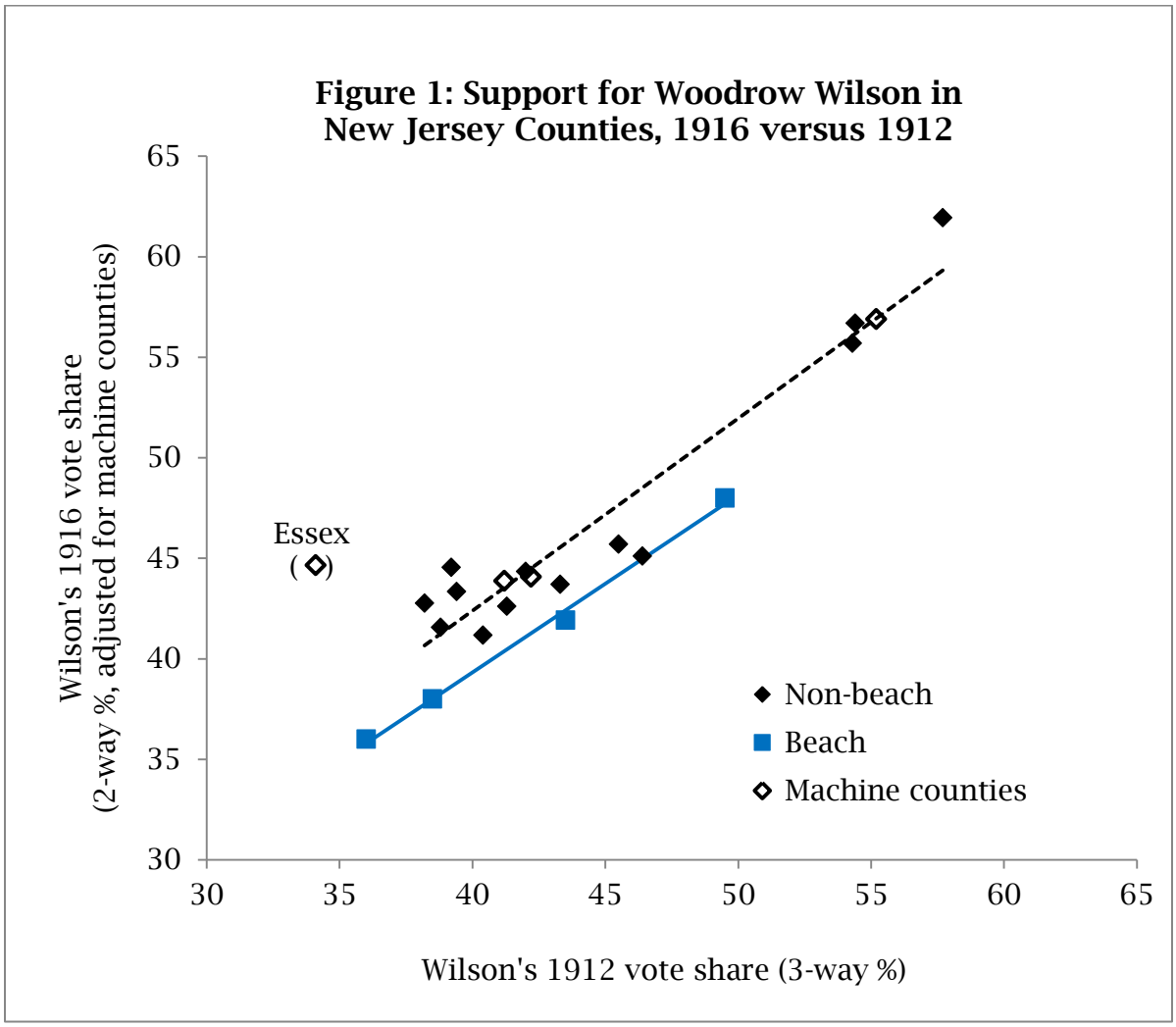
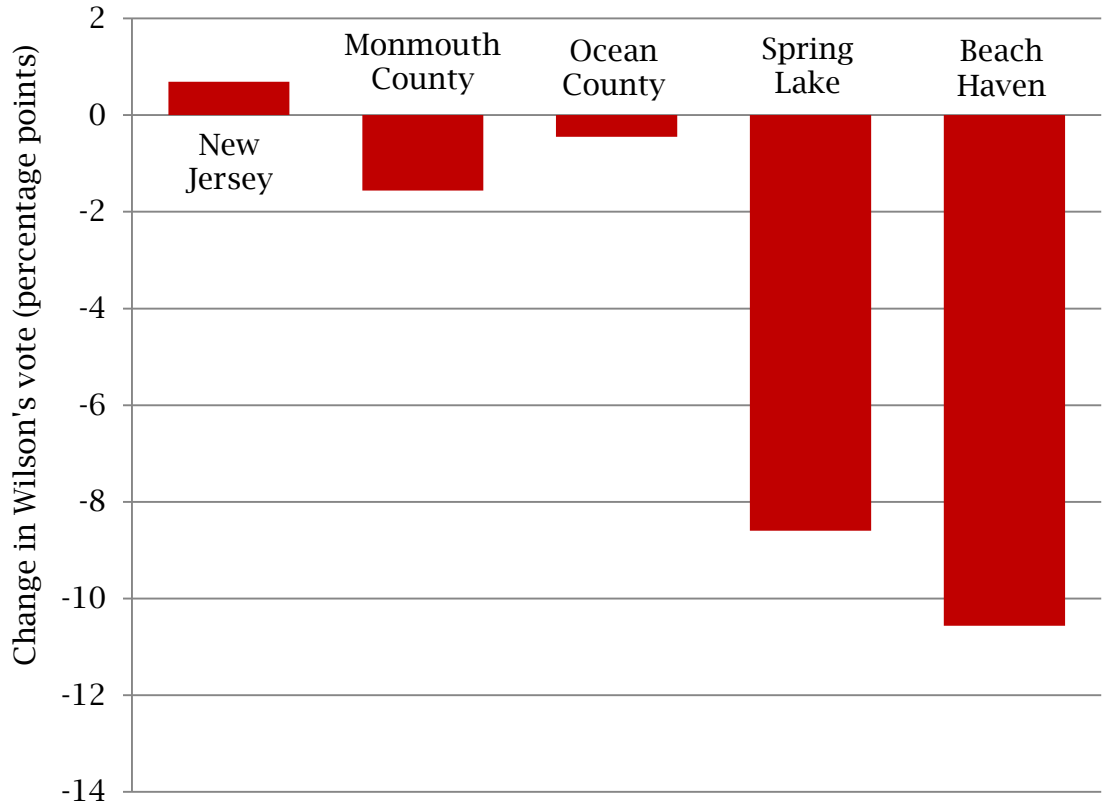


Figure 1: Support for Woodrow Wilson in New Jersey Counties, 1916 versus 1912
Wilson's 1916 vote share (2-way %, adjusted for machine counties)
Wilson's 1912 vote share (3-way %)
65
60
55
50
45
40
35
30
30
35
40
45
50
55
60
65
Essex
( )
Non-beach
Beach
Machine counties

Figure 2: Change in Woodrow Wilson's Vote (1912-1916) in Counties and Townships with Shark Attacks



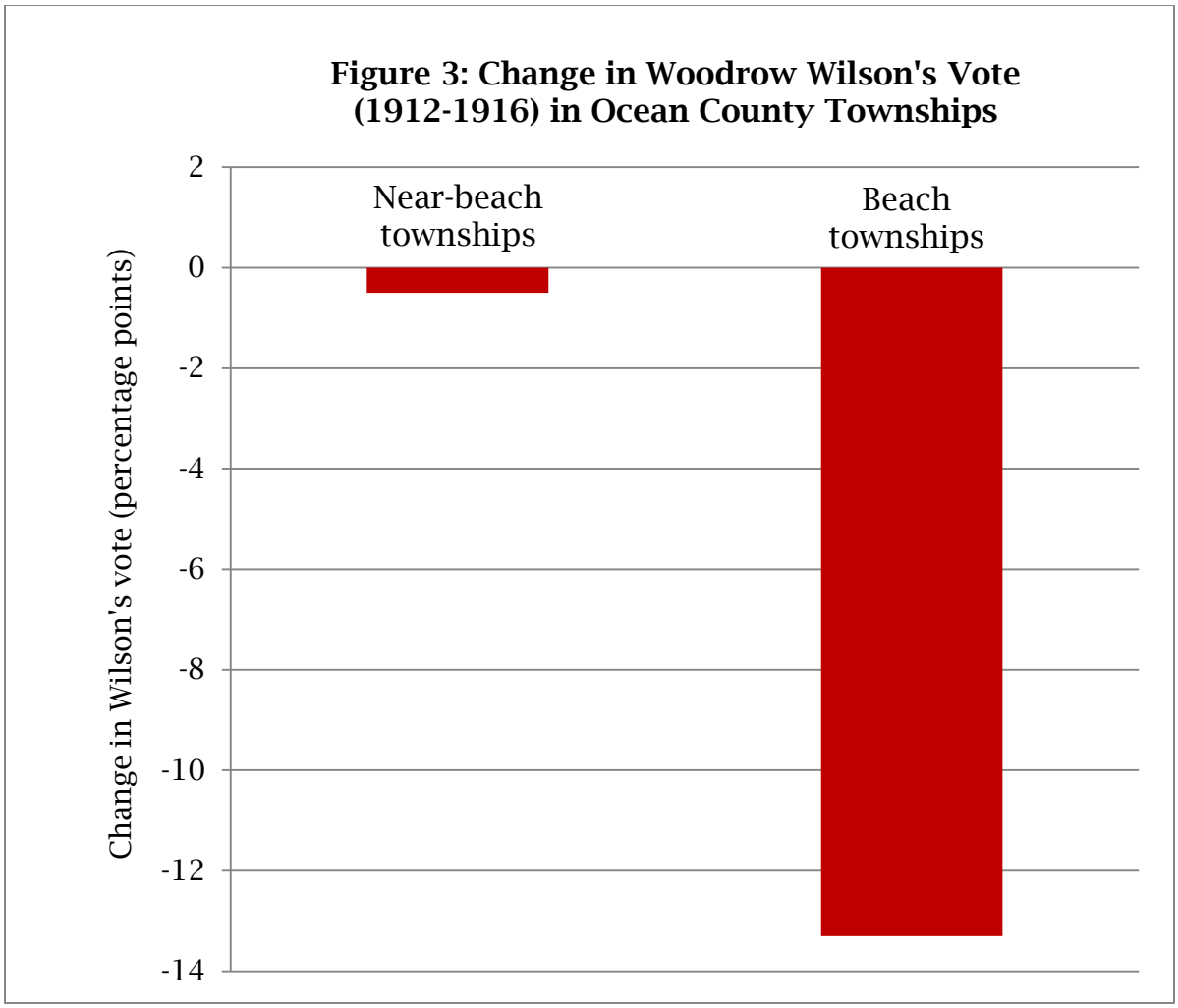


Figure 3: Change in Woodrow Wilson's Vote (1912-1916) in Ocean County Townships
Change in Wilson's vote (percentage points)
2
0
-2
-4
-6
-8
-10
-12
-14
Near-beach townships
Beach townships

Figure 4: Blind Retrospection Erodes Incumbents' Diligence