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The Politics of Hope and Despair: The Effect of Presidential Election Outcomes on Suicide Rates*

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Abstract

Objectives—This article examines the effect of election outcomes on suicide rates by combining the theory of social integration developed by Durkheim with the models of rational choice used in economics.

Methods—Theory predicts that states with a greater percentage of residents who supported the losing candidate would tend to exhibit a relative increase in suicide rates. However, being around others who also supported the losing candidate may indicate a greater degree of social integration at the local level, thereby lowering relative suicide rates. We therefore use fixed-effects regression of state suicide rates from 1981 to 2005 on state election outcomes during presidential elections to determine which effect is stronger.

Results—We find that the local effect of social integration is dominant. The suicide rate when a state supports the losing candidate will tend to be lower than if the state had supported the winning candidate—4.6 percent lower for males and 5.3 percent lower for females.

Conclusion—Social integration works at many levels; it not only affects suicide risk directly, but can mediate other shocks that influence suicide risk.

Well it's time for them to own their failure. It's time for us to change America.

Barack Obama (2008)

And let me offer an advance warning to the old, big spending, do nothing, me first, country second Washington crowd: change is coming.

John McCain (2008)

You have to see it to believe it. It looks like a bombed-out city—great, gaunt skeletons of buildings, windows smashed out, painted on one of them “Unkept promises,” on another, “Despair.” ... I talked to a man just briefly there who asked me one simple question: “Do I have reason to hope that I can someday take care of my family again? Nothing has been done.”

Ronald Reagan (1980)

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Let it also be symbolic that in so doing I broke traditions. Let it be from now on the task of our Party to break foolish traditions. We will break foolish traditions and leave it to the Republican leadership, far more skilled in that art, to break promises.

Franklin D. Roosevelt (1932)

Our revisions, reformations, and evolutions reflect a deliberate judgment and an orderly progress, and we mean to cure our ills, but never destroy or permit destruction by force.

Warren Harding (1920)

We reply to them that changing conditions make new issues; that the principles upon which rest Democracy are as everlasting as the hills; but that they must be applied to new conditions as they arise. Conditions have arisen and we are attempting to meet those conditions.

William Jennings Bryant (1896)

Change was a central theme of the 2008 presidential election in the United States. Candidates from both major parties campaigned on a platform of broad-based reform, offering new direction on policy and promises of a bipartisan approach to governing. However, it is difficult to connote *change* positively without *hope* that the future can and will be better. A meaningful call for the former only resonates if improvement is possible and achievable.

Although *change* and *hope* were especially prominent themes in the 2008 presidential election, they are hardly new. From at least William Jennings Bryant and the Bimetallism movement in 1896, through Warren Harding and Franklin Delano Roosevelt in the early 20th century, to Barack Obama and John McCain in 2008, presidential campaigns and candidates have invoked both to rally support. Although candidates have disagreed on precisely what policies need to be changed and what form this change will take, each has argued that their change is the right change for a hopeful future.

So long as candidates travel the country, energizing their bases and swaying independents with passionate campaign rhetoric, it is worth considering the other side of hope. Only one candidate wins. For those particularly thirsty for change, who desperately need hope, the disappointment of seeing *your* candidate lose can be a traumatic experience. Moreover, as pundits discuss culture wars and the red state-blue state divide, the partisan frenzy of politics can bear a striking resemblance to an athletic competition. To those who support the vanquished, the loss can seem alienating and the future may not appear hopeful at all.

This article examines the effect of defeat on one measure of electoral despair: suicide. Although presidential elections have been used to test the social integration theory of suicide developed by Durkheim in 1897, to our knowledge there is no published research on how suicide rates respond to election outcomes. Consistent with individuals responding to the unifying effects of elections, Phillips and Feldman (1973), Boor (1981), and Rahn (2006) have found that presidential elections tend to lower the overall suicide rate. However, it is also reasonable to suspect that both the sign and magnitude of the effect depend on the outcome of the election. That is, the suicide rate in states that supported the winner may respond differently than the suicide rate in states that supported the loser. For example, the suicide rate may decline in both sets of states through social integration at the national level, but the decline may be larger or smaller in the set of states that supported the eventual winner. Therefore, we consider the effect of election outcomes on *relative* suicide rates—the change in the suicide rate in states that supported the loser relative to the change in the rate in states that supported the winner.

We demonstrate that incorporating social integration into a rational choice model of suicide yields an ambiguous relationship between the proportion of voters in a state supporting the losing candidate and the relative suicide rate. States with a greater percentage of residents who supported the losing candidate would tend to exhibit relatively higher suicide rates from both being disappointed in the outcome and feeling isolated from the majority of citizens. However, being around others who also supported the losing candidate may provide solace or simply reflect a greater degree of local social integration, thereby lowering relative suicide rates. The relationship is thus an empirical question.

Using presidential election results from 1980 to 2004, we find that in the year of a presidential election, a state supporting the eventual loser will tend to exhibit a lower suicide rate than if it had instead supported the national winner. In subsequent years, the effect of the election outcome on the suicide rate within a state disappears. This finding is consistent with individuals finding some hope that they live in a state that leans with them even though the nation as a whole voted for the opposing candidate. That the suicide rate no longer depends on the election outcome as one moves farther from the election is strong evidence that the finding is substantive rather than a statistical anomaly. Other explanations based on unobserved state characteristics would require the omitted variables to follow a specific cyclical process that varied not only across states and time, but also across election outcomes.

These results should encourage social scientists to further study how individuals respond to political campaigns, both before and after the actual election, across a range of behaviors. In addition, the hyperbole surrounding elections often insinuates that if the opponent wins, it would be a “disaster for the nation.” Although this is used for rhetorical effect, it potentially offers an important parallel to other traumatic events, such as war or natural disasters. As communities confront a shared loss, our results suggest that social integration is a critical element in how some individuals respond. Thus, treating individuals atomistically at the expense of community-level avenues of support may not be the best allocation of resources. Although the current article cannot address this question directly, it should encourage future research on the effectiveness of direct methods of long-term disaster relief. These issues are discussed in the last section of this article.

Background

Durkheim's (1897) hypothesis that the degree of social integration affects the propensity to commit suicide has generated an active empirical research agenda for more than a century. He argues that individuals who are only loosely connected to other members of society are at increased risk for suicide. He contends that one way individuals display their attachment to society is by participating in ceremonies that reflect the common sentiments of the community. A community can be defined as broadly or narrowly as is useful for the purpose: families, clans, ethnic groups, towns, congregations, religions, and nations. Each possesses ceremonies that unite its members and express its shared ideals. Their occurrence fosters greater integration while providing an opportunity for members to reaffirm their attachment.

Phillips and Feldman (1973) investigate whether presidential elections serve as such an integrating event. In democratic nations, elections serve not only the functional role of assigning governance, but also celebrate a mutual belief in liberty, agency, and self-determination. Comparing monthly mortality in election years with that in adjacent nonelection years, the authors find that the percentage of all annual deaths that occur in September and October of presidential election years is smaller by a statistically significant amount.

Boor (1981) extends these findings specifically to suicide risk when he compares the percentage of all annual suicides that occur in September and October of election and adjacent nonelection years. He finds that both the percentage of suicide deaths and the percentage of all deaths are lower in election years. The proportion of annual suicide deaths that occur during November and December of election years is also smaller than the proportion that occur in adjacent nonelection years. In contrast, the proportion of deaths from all causes occurring in November and December is higher in election years. Boor concludes that presidential elections serve as an integrating force and that individuals who forego suicide immediately before elections are not simply postponing the act until after the election.

Wasserman (1983) offers several critiques of the empirical literature, most notably arguing that omission of economic controls like the monthly unemployment rate could lead to spurious results. He also points out that the proportion of annual deaths occurring in a particular month can fall even though the absolute level of deaths during the month increases. Using time-series regression analysis, he concludes that there is no significant difference in the suicide rate during September and October in election years.

Boor and Fleming (1984) correctly rejoin that looking at suicide rates alone does not adequately control for year effects. Though Wasserman (1984) contends that his regression analysis could be supplemented with year fixed effects, such results are never reported. Moreover, he does not report results that exclude unemployment controls, so it is impossible to judge whether the results of Boor (1981) are the result of a spurious correlation with economic fluctuations.

A more recent addition to the literature is a working paper by Rahn (2006), who uses monthly suicide and unemployment data from 1948 to 1993, and includes both month and year fixed effects as suggested by Wasserman (1984). She reports negative coefficients on the interaction terms between election year indicator variables and month fixed effects for September and October, though only the September election year interaction dummy is statistically significant. She also finds a negative and significant coefficient on the January postelection year interaction, which she interprets as the social integration effect of the presidential inauguration. As a so-called negative test, she includes a dummy variable for the Olympics taking place and it is not significant. This last result suggests coefficient estimates are not driven by a coincidental cyclic pattern to suicide rates.

These papers study elections as sources of social integration. The current article is most similar to the work of Schultz and Bazerman (1980), who ask whether there is a relationship between the characteristics of the election and mortality outcomes. Comparing election years with adjacent nonelection years, they determine that neither voter turnout nor the closeness of the election is related to changes in mortality rates.

Although elections have occasionally been used to examine the social integration theory of suicide, the effect of war on suicide rates has more commonly been used when considering the political aspects of the phenomenon. Several papers have found that suicide rates fall during wars, consistent with social integration around a common enemy (Durkheim, 1897; Dublin and Bunzel, 1933; Sainsbury, 1972). But others have pointed out that the suicide rate in neutral countries sometimes fell during the same periods (Sainsbury, 1972; Halbwachs, [1930] 1978). Additionally, war often increases economic activity and numerous papers have rejected a relationship between war and suicide once variables like the unemployment rate were included in the analysis (Marshall, 1981; Wasserman, 1989). Stack (1982, 2000) and Lester and Yang (1991) provide a more substantial literature review for the interested reader.

The preceding papers focus on the effect of war on suicide, but little attention has been paid to the effect of winning a war versus losing a war on suicide rates.¹ A notable exception is a recent paper by van Tubergen and Ultee (2006) that considers the suicide rate in the Netherlands during World War II. They argue that the spike in suicide rates in 1940 and 1945 reflects the behavior of Jews at the beginning of Nazi occupation and of collaborators during liberation. In effect, the losers respond very differently from the winners.

Theoretical Model

In this article, the question of interest is whether election outcomes affect the decision of individuals to commit suicide. The utility maximizing models developed by Hamermesh and Soss (1974) and Becker and Posner (2004) offer a useful framework to address the problem, in that rational choice can be interpreted as broadly as necessary to incorporate both individual and social factors that influence suicidal behavior. Because rational choice provides such a flexible accounting method for the myriad forces at work, we adopt it here to concisely illustrate the central argument. An individual decides to commit suicide in period t when the perceived value of future years of life is smaller than the cost of suicide:

$$\sum_{y=t}^Y \beta^{y-t} E[u(y)] \leq -S \forall Y=1, \dots, T \quad (1)$$

where $u(y)$ is the utility of the individual in period y ; S is the cost of committing suicide; T is the length of length of life without suicide; and the utility associated with death is normalized to zero. Although simple, it is possible to define utility and costs broadly enough to accommodate the most important economic and social aspects of suicide.

Some part of utility is internal to the individual, representing satisfaction with various aspects of life. Individuals who find great happiness in their careers, families, friends, and communities will be less likely to commit suicide than individuals who have become recently unemployed or suffered divorce. Yet to the extent that individuals derive happiness from having a large or close-knit social network, individual utility also captures aspects of social integration.

The costs associated with suicide are borne at both the individual and community levels, as well. Individuals may internalize the pain that their suicide will cause in other individuals, making them less likely to commit suicide. Again, this reflects on the amount of social integration. As Durkheim (1897) notes, however, high degrees of social integration can actually lead to increased suicide risk. For example, in families facing great financial difficulty, one individual may view suicide as increasing resources through a life insurance payout.

In societies that attach stigma to suicide and actively try to prevent it through mental health outreach programs, the ability to “slip through the cracks” could also be considered a cost. Individuals who live in communities with sufficient resources or desire to prevent suicide will have a larger value of S than those in communities with fewer resources or less emphasis on mental health. Of course, the decision to allocate resources to social programs also reflects on social integration.

¹Earlier work by Archer and Gartner (1976) studies homicide rates among countries that participated in World Wars I and II and finds that combatant countries experienced significantly larger increases in homicide rates following wars.

Finally, the model captures the important idea that an individual with a low level of happiness today will not commit suicide if he or she expects to be sufficiently happy in future periods. This insight establishes the key forces that influence suicide behavior in response to election outcomes.

Supporting the loser is viewed as a negative utility shock in the current period that lowers both individual satisfaction and the degree to which the individual feels integrated with society: a lower value of u and a lower value of S . Individuals may also expect the negative shock to last until the next election in four years. These feelings would tend to *increase* the number of suicides and the increase would tend to be greatest where many voters supported the eventual loser. We term this the *magnitude effect* of losing.

On the other hand, the old adage that “all politics is local” suggests an important opposing influence. Although supporters of the loser may feel less integrated with the nation as a whole, this may be tempered if the majority of residents in their state also supported the loser. Individuals may be encouraged that those in closest proximity to them think similarly. In addition, they may believe that positive outcomes are still possible at the state level in the coming years: a larger value of u and a larger value of S . Each of these forces would tend to *decrease* the suicide rate and the decrease would tend to be greatest where many voters supported the eventual loser. We term this the *local effect* of losing.

It is straightforward to make the preceding discussion more mathematically rigorous. The probability that individual i in state j commits suicide can be expressed as:

$$P_{ij} = s_{ij} - \mu Z_{ij} - \lambda [Z_{ij} z_j + (1 - Z_{ij})(1 - z_j) - 1] \tag{2}$$

where s_{ij} is a term specific to the individual that captures individual and social influences (mental health, support network, cultural taboos, etc.); Z_{ij} is an indicator variable for the election outcome at the national level that equals unity if the individual supported the winner; and z_j is the percentage of individuals that supported the national winner in state j . The parameter μ mediates the *magnitude effect* of losing and λ mediates the *local effect*.

The second term on the right-hand side of Equation (2) captures the relationship between national election outcomes and individual desires. The third term on the right-hand side captures how individual choices interact with the choices of other voters in the state. To build the intuition behind Equation (2), begin with the baseline of an individual who supported the national loser ($Z_{ij} = 0$) in a state where everyone supported the national loser ($z_j = 0$) so that the second and third terms both equal zero. If instead an individual supported the national winner ($Z_{ij} = 1$) in a state where everyone supported the national winner ($z_j = 1$), then the probability of committing suicide would fall by μ . In this instance, national and local results reinforce each other, leading to a lower suicide probability. However, if an individual supported the national winner ($Z_{ij} = 1$) in a state where no one else supported the national winner ($z_j \approx 0$), then the probability of committing suicide would fall by μ , but increase by (approximately) λ . Here, the national and local results act in opposing directions and thus the overall effect depends on the relative size of the structural parameters.

Formally, the local effect is recovered by considering marginal changes in z_j :

$$\left. \frac{\partial P_{ij}}{\partial z_j} \right|_{z_j=1} = -\lambda \text{ and } \left. \frac{\partial P_{ij}}{\partial z_j} \right|_{z_j=0} = +\lambda.$$

The local effect will therefore decrease the probability of suicide for an individual who lives in a state with a higher proportion of like-minded voters relative to an identical individual residing in a state with a lower proportion of like-minded voters. This occurs when z_j is large and $Z_{ij} = 1$ or when z_j is small and $Z_{ij} = 0$. The magnitude effect can be measured by $[P_{ij}/Z_{ij} = 0] - [P_{ij}/Z_{ij} = 1] = \mu + \lambda(2z_{ij} - 1)$. This is plainly positive in states where the national winner garnered a majority of votes ($z_j > 1/2$).

It is straightforward to aggregate individual suicide probabilities to state-level suicide rates since the suicide rate in state j is just the average of P_{ij} over all residents in the state. Thus:

$$P_j = s_j - \mu z_j - 2\lambda[z_j^2 - z_j] \tag{3}$$

where we take advantage of the fact that the average value of Z_{ij} is z_j . Purely for expositional simplicity, assume that for states j and k , s_j equals s_k .² We then have the following result: $z_j < z_k$ and $P_j < P_k$ only if:

$$\frac{\lambda}{\mu} > \frac{1}{2(1 - z_k - z_j)}$$

In other words, state j that supported the national loser can have a lower suicide rate than an otherwise identical state k that supported the national winner if the local effect is sufficiently strong enough relative to the magnitude effect. As an example, suppose 51 percent of voters in state k supported the national winner, but only 24 percent of voters in state j supported the winning candidate. All else equal, state j would have a lower suicide rate so long as the local effect λ was at least twice as large as the magnitude parameter μ . Obviously, in actual empirical applications, no two states are identical. However, if we allow that s_j is time invariant, then by redefining j and k as time subscripts rather than geographic subscripts, the argument follows for changes in the suicide rate within a state over different election cycles. This insight motivates the use of fixed-effects regression described in the subsequent section.

It is clear that economic and sociological theory alone do not yield clean predictions of the relationship between election outcomes and suicide, since the magnitude and local effects of losing may work in opposite directions in states that supported the losing candidate. The remainder of the article attempts to empirically determine the relative importance of these competing factors by looking at recent presidential elections in the United States.

Data and Methods

Suicide data from 1981 through 2005 come from the National Center for Health Statistics Mortality Files, which report the annual number of suicides in each state by gender, age, and method. It is widely known that both the suicide rate and the method of suicide differ greatly by gender, leading most researchers to analyze males and females separately and this convention is followed here. The use of annual data in lieu of monthly data is a departure from the literature cited previously and results from issues of data availability. Annual data at the state level and monthly data at the national level are regularly published and readily accessible, but monthly suicide data at the state level are not.³ Although monthly national data can be used to document the effect of elections on suicide rates in October and

²This assumption is quickly discarded in the subsequent empirical work by estimating difference-in-difference and fixed-effects models.

November to test the social integration theory of suicide, they are not sufficient to study the relative importance of the magnitude and local effects described above. We have obtained from the Centers for Disease Control the number of suicides by age and gender at the state level for all months between 1996 and 2005, but this series suffers the serious drawback that it only covers three election cycles. As expected, the coefficient estimates using this smaller data set were too imprecise to be useful.⁴

State-level results from presidential elections are calculated in two ways. First, we define a dichotomous variable that takes on a value of 1 if the candidate receiving a plurality of votes in a state was not the winner of the Electoral College. The proportion of votes received by the national winner in each state is also calculated as a continuous outcome measure.

When using annual data, there are two possible definitions of the reference year. Presidential elections take place on the first Tuesday of November in years divisible by four. One could assign these years as the first to be affected since suicidal behavior in November and December might respond to the results of the nearest election. Alternatively, one could assign the subsequent year as the first to be affected by the results of the nearest election. As the presidential inauguration takes place on January 20 of the subsequent year and the effects of the election outcome are given longer to accumulate, there is a reasonable argument for such a definition. Empirical results were robust to definition and thus the former is used through the remainder of the article, for example, we study how the election outcome in 1984 affects suicide rates in each year from 1984 to 1987. With seven presidential elections between 1980 and 2004 and 51 states (including the District of Columbia), there are 357 election events in the data tied to 1,275 annual suicide rate outcomes.

These data are then used to estimate two types of empirical specifications. The first approach is the standard difference-in-difference estimator. The control group for states that supported the winning candidate is the same group of states in the year preceding the most recent election and similarly for states that supported the losing candidate. Comparing the suicide rate during election years in states that supported the winner with the suicide rate in states that supported the loser could be misleading if states with higher suicide rates tended to support the winner more or less often than the loser. Comparing the suicide rate in states that supported the loser before and after the election could be misleading if suicide rates tended to fall during election years. The difference-in-difference estimator instead compares the change in the suicide rate in states that supported the loser with the change in the suicide rate in states that supported the winner. Doing so accounts for both common shocks and persistent differences across location.

To yield a consistent estimate of the effect of election outcomes on suicide rates, it must not be the case that what leads a plurality of citizens to vote for the eventual loser would also affect the suicide rate. For example, states that saw relatively large decreases in unemployment going into an election year could tend to support either the winning or losing candidate while simultaneously witnessing a decrease in suicide rates. Failing to include the unemployment rate in the analysis would wrongly attribute the change in suicide rates to the election outcome.

Unemployment is the most commonly mentioned socioeconomic variable of concern in the election literature, and thus the state-level unemployment rate is collected from the Bureau

³A referee noted that monthly data on suicide rates could be compiled from the multiple cause of death data available from the National Bureau of Economic Research. Such a task would be a potentially useful contribution for further research on this topic that allows for identification of the short-term effects of election outcomes on suicide rates.

⁴These results are available from the authors upon request.

of Labor Statistics for the years 1981–2005. Other socioeconomic variables could also be included in the analysis, but it is difficult to argue a priori that changes in the levels of variables such as the divorce rate or in alcohol consumption meaningfully affect election outcomes. It may be possible that election outcomes influence divorce or drinking behavior, which then affect suicide rates, but this is precisely one of the mechanisms we want to capture. A related concern is that other triggers of suicide vary across time and state in a pattern that follows state election outcomes, thereby generating a spurious correlation between outcomes and suicide. There is no reason to believe this would be the case and when the divorce rate, fertility rate, drinking behavior, uninsured rate, proportion of Hispanics, and proportion of blacks were added as explanatory variables, the coefficients of interest did not meaningfully change. Therefore, only the results that include the state unemployment rate are reported in the next section.

The difference-in-difference estimator is implemented through the following regression:

$$s_{j,t} = \alpha + \rho_1 \cdot 1(t \in Y) + \rho_2 R_{j,t} + \rho_3 R_{j,t} \cdot 1(t \in Y) + \delta U_{j,t} + \varepsilon_{j,t} \quad (\text{DD})$$

where $s_{j,t}$ is the suicide rate in state j in year t ; $R_{j,t}$ is an indicator for the result of most recent presidential election relative to year t in state j , where, $R_{j,t} = 1$ if the state supported the national loser; $1(t \in Y)$ is an indicator variable that equals 1 when year t is contained in the set of election years, Y ; and $U_{j,t}$ is the average monthly unemployment rate in state j in year t . The coefficient of interest in (DD) is ρ_3 , which is the difference-in-difference estimator of the effect of the most recent election outcome on the suicide rate.

The second approach we employ takes greater advantage of the panel structure of the data by using each state as a control for itself. By including state fixed effects, one can compare the suicide rate in one year with its average over the period of study. Adding year fixed effects eliminates annual variation that is common to all states regardless of the most recent election outcome. The problem is then phrased as whether a state that supports the losing candidate increases its suicide rate above its average or lowers its rate below the average. As with the difference-in-difference estimator, the fixed-effects estimator is only consistent if any omitted variables are not correlated with the election outcome; therefore, the unemployment rate is included.

With this approach, the empirical specification is:

$$s_{j,t} = \alpha + \beta_j + \gamma_t + \eta_1 R_{j,t} + \sum_{i=2}^4 \eta_i (R_{j,t} \cdot P_{i,t}) + \delta U_{j,t} + \varepsilon_{j,t}, \quad (\text{FE})$$

where $s_{j,t}$ is the suicide rate in state j in year t ; $R_{j,t}$ is the most recent election result in state j in time t ; $P_{i,t}$ is an indicator variable that takes on the value 1 if year t is the i th year in the nearest presidential election cycle; and $U_{j,t}$ is the average monthly unemployment rate in state j in year t . The parameters β and γ represent state and year fixed effects, respectively, while ε is a random error term.

The coefficients of interest are $\{\eta_1, \eta_2, \eta_3, \eta_4\}$. Since the election result is defined as the dichotomous variable that equals 1 when a state supports the losing candidate, then η_1 represents the average increase or decrease in the suicide rate in the year of the most recent presidential election relative to the average suicide rate in states that supported the victorious candidate. In this example, if the *magnitude effect* is stronger than the *local effect*, then η_1 will be positive. If instead the *local effect* dominates, then η_1 will be negative.

The parameter η_2 represents the change in this difference between the first and second years of the election cycle. Hence, $\eta_1 + \eta_2$ represents the average increase (if positive) or decrease (if negative) in the suicide rate in the second year of the cycle relative to the average suicide rate in states that supported the victorious candidate. An analogous argument holds for η_3 and η_4 . As the effects of the election fade, one would reasonably expect $\eta_1 + \eta_i$ to reach zero as i increases. Alternatively, η_3 and η_4 should approach the magnitude of η_1 , but have the opposite sign.

When the election year is defined as the first in the election cycle, the identification assumption is that η_1 includes the effect of the election outcome on November and December suicide rates. In fact, η_1 would also capture any anticipatory actions—if individuals expected the election outcome and responded to that expectation. The concern is that states that support the winner and states that support the loser differ systematically before the election in ways unrelated to the outcome. Monthly suicide data by state would offer a direct method of investigating this possibility, but the inclusion of interaction terms provides an indirect test of the plausibility of the identification assumption. To the extent that the effect of the election outcome is felt over a period of three to four months, the change in suicide rates in November and December should roughly match the change in suicide rates in the subsequent January and February. If η_1 picked up purely preelection behavior, which could be entirely unrelated to the election itself, then η_2 should be the opposite sign, but same magnitude, of η_1 . If the effect of the election outcome is felt over a three to four month window, then η_2 should be close to zero.

Finally, the aggregate suicide rate defined by Equation (3) actually allows for estimation of the structural parameters λ and μ up to a scaling parameter:

$$s_{j,t} = \alpha + \beta_j + \gamma_t + \theta_1 z_{j,t} + \theta_2 z_{j,t}^2 + \delta U_{j,t} + \varepsilon_{j,t} \tag{ST}$$

where

$$\begin{aligned} \theta_1 &= -\mu + 2\lambda \\ \theta_2 &= -2\lambda \end{aligned}$$

It is worth noting that while both the difference-in-difference and fixed-effects specifications assume a linear structure to the suicide rate, neither the time path of the log suicide rate within a state nor the time path aggregated over states needs to be linear. For example, if adjacent year fixed effects in (FE) were negatively correlated, that is, positive in even years and negative in odd years, then the suicide rate would be negatively autocorrelated even if the error term was independently and identically distributed. Alternatively, the changing composition of states that support the winning candidate in any election cycle would introduce a great deal of nonlinearity into the aggregate suicide rate for such states over time.

Results

Figure 1 presents weighted (by population) average state suicide rates (per 100,000 individuals) by year for males and females aged 20 to 59 years old between 1981 and 2005. Presidential election years are marked by vertical lines. The average rate of 23.5 suicide deaths per 100,000 for males aged 20 to 59 masks a steady decline over much of the time period: from 24.7 in 1981 to 21.3 in 1999. Since 1999, however, rates rebounded slightly to

22.3 in 2005. A similar pattern is evident for females, though they tend to have lower suicide rates overall. In 1981, the average suicide rate for females 20 to 59 years old was 8.3, falling to 5.5 in 1999 before climbing to 6.1 in 2005. The average rate over the entire period was 6.3 suicides per 100,000 females.

In Figure 2, states are grouped according to the election outcome of whether the plurality of voters in the state supported the winner of the Electoral College in the most recent presidential election. States that supported the winner have a higher average suicide rate when the Republican candidate is victorious (1981–1991 and 2000–2005) and a lower average suicide rate when Bill Clinton, a Democrat, was victorious (1992–1999). This pattern reflects the fact that so-called red states in the mountain and southern regions of the country tend to have higher suicide rates than more reliably “blue states” in New England, the upper Midwest, and Pacific Coast. Therefore, using either difference-in-difference or fixed effects is an appropriate method to control for the changing composition of states that supported the national winner and loser in each election.⁵

Although it is impossible to draw conclusions about suicidal behavior in election years because the composition of winning and losing states changes, it is useful to compare rates in the subsequent years during the same election cycle when the composition of states is constant. For males, there is a distinct pattern of the suicide rate in states that opposed the national winner converging toward the suicide rate in states that supported the national winner. In four of five election cycles, the difference in the average suicide rate between states that supported the winner and states that supported the loser declines in absolute value over the three years following an election. For example, the suicide rate for states that supported the national winner in the 1984 election is 4.77 points higher than the rate for states that supported the loser. By 1987, the difference falls to 1.89. In 1996, the suicide rate for states that supported the national winner is 3.33 points lower than the rate for states that supported the loser. By 1999, the difference falls to 2.55 points, almost 24 percent smaller in magnitude. A similar pattern holds for females over that span, though it is weaker: the absolute value of the difference declines in three of five election cycles. This pattern will be more rigorously investigated using the interaction terms in the fixed-effects regressions.

To account for the changing composition of “winning” and “losing” states, Table 1 reports coefficient estimates from the difference-in-difference specification (DD) by gender when the dependent variable is the natural log of the suicide rate. Coefficients can then be interpreted as the percent change in the suicide rate when the independent variable increases by one unit. The coefficient on the interaction between the presidential election year dummy variable and the election outcome (ρ_3) is the difference-in-difference estimate of the effect of a plurality of residents supporting the losing candidate on the suicide rate in election years since $R_{jt} = 1$ when the state supports the loser. The suicide rate for males 20–59 years old (Column 1) falls by 11.3 percent in states that went for the losing candidate relative to states that went for the victor, while the suicide rate for females 20–59 years old (Column 2) falls by 13.6 percent. Each is statistically different from zero at the 1 percent level, but the 95 percent confidence intervals of the estimate are quite wide: $[-2.9, -19.7]$ for males and $[-3.4, -23.8]$ for females. Overall, the difference-in-difference estimates suggest that the local effect of losing is more important than the magnitude effect.

Turning to the fixed-effects estimator, Table 2 reports coefficients from regressions of (FE) by gender when the dependent variable is the natural log of the suicide rate. The average suicide rate of males 20–59 years old was 4.6 percent lower in the first year of the election cycle when the state supported the loser of the Electoral College instead of the winner. The

⁵Explaining why “red states” exhibit higher average suicide rates than “blue states” is beyond the scope of this article.

effect was even larger for females 20 to 59 years: 5.3 percent lower when the state supported the national loser. Both coefficients are statistically significant at the 1 percent level.

The fixed-effects and difference-in-difference results are quantitatively similar, but the fixed-effects coefficients are much more precisely estimated. Each of the fixed-effects estimates of η_1 fall within the 95 percent confidence intervals of the difference-in-difference estimates of ρ_3 , but the standard errors are roughly a third as large. For these reasons, we have greater confidence in the fixed-effects estimates, particularly in regard to the strength of the effect of supporting the losing candidate.

Notice also in Table 2 that the coefficient estimates on the interaction terms in both sets of regressions are generally positive, increasing as the duration since the last election increases, converging in magnitude to the coefficient on the election outcome and generally significant at standard levels. Equally important, the coefficient on η_2 is not significantly different from zero. The result is consistent with the effect of the election outcome being felt over a reasonable period of three to four months and suggests that η_1 is picking up the effect of the election outcome rather than systematic preelection behavior that is unrelated to the eventual election outcome. Figure 3 plots these results graphically. At period t , a value of zero would indicate that the suicide rate did not respond to the previous election outcome. In years with presidential elections ($t = 1$), the suicide rate in states supporting the losing candidate falls relative to the rate in states that supported the winning candidate. This difference is short-lived, as the difference in rates disappears by the second year after the election.

Finally, Table 3 reports fixed-effects coefficient estimates from the regression equation (ST) as well as estimates of the (scaled) structural parameters μ and λ . Notice first that the estimated structural parameter values are positive, as theory would require. Additionally, the local effect parameter λ is three to four times as large as the magnitude effect parameter μ . For both males and females, the suicide rate is initially increasing in the proportion voting for the winning candidate. The suicide rate reaches its maximum at $z_{ij} = 0.43$ for males and $z_{ij} = 0.45$ for females. That both are so close to the 50 percent mark reflects the strength of the local effect relative to the magnitude effect. Using the coefficient estimates, one can demonstrate that a state supporting the national winner with 55 percent of the vote ($z_{ij} = 0.55$) would exhibit a higher suicide rate for females than an otherwise identical state supporting the national loser with 66 percent of the vote ($z_{ij} = 0.34$).

Discussion

Existing work on the relationship of presidential elections to suicides has focused on the time period prior to the election. In contrast, the current article considers the effect of election outcomes on suicide rates. By combining the social integration theory that Durkheim posited over a century ago with the rational choice models of modern economics, it is possible to describe the varying individual and societal influences at play following an election. First, supporting the defeated candidate results in a negative utility shock, which would tend to increase the suicide rate in states that supported the losing candidate relative to states that supported the winning candidate. Second, individuals who supported the defeated candidate will feel less socially integrated with the nation as a whole, which would also tend to increase the suicide rate in states that supported the losing candidate relative to states that supported the winning candidate. Third, individuals that supported the losing candidate will feel more socially integrated at the local level in states where a plurality also supported the losing candidate compared to individuals in states that supported the winning candidate. This would act as a countervailing influence, tending to decrease the suicide rate in states that supported the losing candidate relative to states that supported the winning candidate.

The empirical results clearly demonstrate that this latter phenomenon is dominant. The suicide rate in states that supported the losing candidate in a presidential election actually declines sharply relative to states that supported the winning candidate. The decline is short-lived, as the rates converge by the second year after the election, evidence that the results are not driven by spurious correlation with omitted state attributes.

Although the article focuses on the narrow question of how suicide rates respond to election outcomes, we believe the results have broader implications for future research. We find evidence that when groups of individuals experience a negative utility shock, the degree of local social integration matters for an important health outcome. Although there is an extensive body of literature on events that foster social integration, there is relatively little work on how social integration mediates other events. Reexamining the relationship between war and suicide rates by comparing the effects on winners, losers, and nonparticipants as in van Tubergen and Ultee (2006) is a natural place to start.

In addition, communities routinely face events such as natural disasters or plant closings. Simply treating individuals from these communities atomistically by providing lump-sum transfers—generally regarded as economically efficient—*may* be less beneficial than interventions that call on and even enhance the local social networks that exist. For example, the government could provide housing subsidies to flood victims, encouraging some families to move, weakening the existing social network. Alternatively, the government could provide financial assistance to support a local rebuilding taskforce that empowered the flood victims. The current article cannot provide the answer to whether one is more cost effective, but we believe it further establishes it as a question worth asking in the social integration literature.

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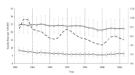


FIGURE 1.

Weighted Average Suicide Rates by Gender and Unemployment Rate, 1981–2005

Notes: Observations are weighted by state population. Standard deviations for suicide rates are depicted as error bars. Presidential election years are denoted by dashed vertical lines.

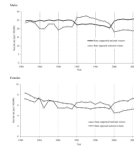


FIGURE 2.

State Suicide Rates for Males and Females by Election Outcome, 1981–2005

Notes: Observations are weighted by state population. Standard deviations for suicide rates are depicted as error bars. Presidential election years are denoted by dashed vertical lines.

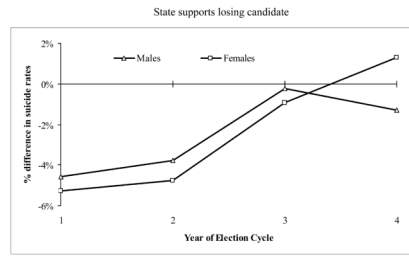


FIGURE 3.
Difference in Suicide Rates by Number of Years After Election

TABLE 1

Difference-in-Difference Estimates of Election Outcomes on State Suicide Rates

Independent Variables	Males 20–60		Females 20–60	
	Unemployment rate	0.009	<i>c</i>	0.031
	(0.005)		(0.006)	
Presidential election year (ρ_1)	0.032		0.046	<i>c</i>
	(0.023)		(0.027)	
State supported losing candidate (ρ_2)	-0.029		-0.016	
	(0.031)		(0.037)	
Interaction (ρ_3)	-0.113	<i>a</i>	-0.136	<i>a</i>
	(0.042)		(0.051)	
Observations	612		612	
R^2	0.049		0.083	

a denotes significant at 1 percent level;

b denotes significant at 5 percent level;

c denotes significant at 10 percent level.

Note: The interaction term between the presidential election year and the election outcome is the difference-in-difference estimator of the effect of losing the election on suicide rates. Presidential elections in 1984, 1988, 1992, 1996, 2000, and 2004. Observations are weighted by state population.

TABLE 2

Fixed-Effects Estimates of Election Outcomes on State Suicide Rates

Independent Variables	Males 20–60		Females 20–60	
Unemployment rate	–0.005	<i>c</i>	0.011	<i>a</i>
	(0.003)		(0.004)	
State supported losing candidate (η_1)	–0.046	<i>a</i>	–0.053	<i>a</i>
	(0.013)		(0.020)	
Interactions				
Second year of election cycle (η_2)	0.008		0.005	
	(0.017)		(0.027)	
Third year of election cycle (η_3)	0.043	<i>b</i>	0.043	
	(0.018)		(0.029)	
Fourth year of election cycle (η_4)	0.033	<i>c</i>	0.066	<i>b</i>
	(0.018)		(0.029)	
Observations	1,275		1,275	
Groups	51		51	
R^2	0.272		0.392	

a denotes significant at 1 percent level;

b denotes significant at 5 percent level;

c denotes significant at 10 percent level.

Note: All regressions include year and state fixed effects. Observations are weighted by state population.

TABLE 3

Fixed-Effects Estimates of Election Outcomes on State Suicide Rates

Independent Variables	Males 20–60		Females 20–60	
Unemployment rate	-0.005	<i>c</i>	0.0129	<i>a</i>
	(0.003)		(0.004)	
Percent supporting national winner (θ_1)	2.365	<i>a</i>	5.250	<i>a</i>
	(0.684)		(1.048)	
Percent supporting national winner ² (θ_2)	-2.747	<i>a</i>	-5.892	<i>a</i>
	(0.717)		(1.098)	
Parameters				
Magnitude (μ)	0.382	<i>a</i>	0.642	<i>a</i>
	(0.090)		(0.139)	
Local (λ)	1.3735	<i>a</i>	2.946	<i>a</i>
	(0.359)		(0.549)	
Observations	1,275		1,275	
Groups	51		51	
R^2	0.281		0.410	

a denotes significant at 1 percent level;

b denotes significant at 5 percent level;

c denotes significant at 10 percent level.

Note: All regressions include year and state fixed effects as well as year * outcome interaction terms. Observations are weighted by state population.