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Political Stressors and Birth Outcomes: Evidence from the 2016 U.S. Presidential Election

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Abstract

We study political shocks as potential birth outcomes stressors, specifically the unexpected result of the 2016 U.S. presidential election. We investigate this two-sided shock using an innovative data linkage: Colorado voter registrations and birth certificates, matched by sex, birth year, and name. Contrary to our hypotheses, we do not find an effect on birth outcomes. We do find some evidence that stress-related behaviors in pregnancy worsened for Democrats. This research adds new evidence on the effects of in-utero exposure to two-sided stressors, uses a novel data linkage, and expands the new economics area of politics as a determinant of health.

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1. Introduction

Stressful events experienced in-utero can affect both short-term infant health and longer-run economic outcomes. Potentially stressful in-utero events include physical (e.g., exposure to disease in-utero), economic (e.g., parental job loss), and psychological stressors (e.g., proximity to violence). In this paper we consider another potential source of stress: positive or negative political stress that emerges from unexpected changes in political power. We specifically focus on the 2016 U.S. presidential election of Donald Trump, which was unexpected from the perspective of most Americans.

Partisanship is an increasingly salient feature of American society. Elections might create meaningful stress for individuals that could be positive or negative in direction depending on one's own partisanship. One major contribution of our paper is to study such a two-sided shock, as much of the literature studies only one-sided shocks (e.g., exposure to pollutants).

In addition to considering a new source of potential in-utero stress and considering how positive and negative in-utero stress affect birth outcomes, we implement our analyses with a novel data linkage between individual-level voter registration data and birth certificate microdata from Colorado. To our knowledge we are among the first papers to successfully implement this kind of probabilistic, fuzzy individual-level data linkage between voter information and vital records data, and the first to link intergenerational information between parental voting information and birth certificates.

2. Background

A large literature in economics investigates the effects of in-utero shocks on birth outcomes, infant health, and longer-run outcomes (Almond et al., 2018; Almond and Currie, 2011; Almond and Mazumder, 2011; Currie et al., 2022; Currie and Schwandt, 2016). Prior research has

examined the potential effects of direct health shocks in-utero, for example, exposure to the 1918 flu pandemic (Almond, 2006; Beach et al., 2022; Fletcher, 2018). Other research has examined the potential effects of economic shocks experienced in-utero on birth outcomes, for example, exposure to job loss within the household (Lindo, 2011) and prenatal exposure to the Earned Income Tax Credit (Hoynes et al., 2015). More recently, economists have examined the potential role of in-utero psychological stress as an input to infant health. This body of research examines a variety of sources of psychological stress ranging from acute family-level stressors, such as, domestic violence (Currie et al., 2022), the death of a maternal relative (Persson and Rossin-Slater, 2018)), exposure to traumatic events such as hurricanes (Currie and Rossin-Slater, 2013), terrorism (Quintana-Domeque and Ródenas-Serrano, 2017), or random violence (Currie et al., 2024), and fears of potential violence and discrimination (Bakhtiari, 2020; Lauderdale, 2006) and of job loss (Carlson, 2015). Even in-utero exposure to sports-related stress has been linked to birth outcomes (Duncan et al., 2017), which is consistent with the idea that even relatively "mild" shocks can affect child outcomes when experienced at a sensitive developmental period (Almond et al., 2018).

We add to this literature by considering a different type of in-utero shock: political shocks. Political polarization in the U.S. has increased over the past several decades as Democrats and Republicans have diverged on policy preferences (Pew Research Center, 2014), and political scientists have documented the rise of affective polarization, wherein political partisans have animosity towards people from other parties (Iyengar et al., 2019). In this context, we propose that shocks to the political environment may be sources of stress that could affect birth outcomes. Specifically, we examine the 2016 presidential election of Donald Trump as a potential source of in-utero stress. The election result was likely surprising for most Americans, as pundits and the news media largely predicted that Hillary Clinton would win the election (Mercer et al., 2016).

Furthermore, the election result likely led to strong emotional responses. CNN exit polls showed that 92% of Clinton supporters would be scared by a Trump win, whereas 97% of Trump supporters would be excited (CNN Politics, 2016). Public opinion data shows a divergence in self-assessed mood between Democrats and Republicans after the 2016 election (Davis, 2017). One study using search engine data showed that Spanish speakers searched for more mental-health related terms after the election but Democrats overall did not (Krupenkin et al., 2019). Another study measured short-run changes in mood and cortisol levels among college students before and after the election and showed that individual cortisol and positive affect level changes were associated with political beliefs (Hoyt et al., 2018). The 2016 election even caused Thanksgiving dinners with attendees of different political positions to be 30 to 50 minutes shorter (Chen and Rohla, 2018).

We are aware of two other papers that considered the effects of the 2016 election on birth outcomes. A pre-post analysis shows that pre-term birth rates increased in New York City after the 2017 presidential inauguration, with largest increases for foreign-born Hispanic women from Mexico or Central America (Krieger et al., 2018). Our paper complements that analysis by using a difference-in-differences approach and adding granularity and directionality to the "shock" of the 2016 election result by explicitly characterizing the partisanship of parents using their voter registration. A second paper examined fertility rates and found that Republican-leaning counties had an increase in fertility rates relative to Democratic counties after the 2016 election, and relative fertility declined for Hispanics as well compared to non-Hispanics (Dahl et al., 2022). Also relevant to the relationship between political changes and birth outcomes is research using time series methods that finds an association between the party of the U.S. president and infant mortality

rates (Rodriguez et al., 2014). Beyond the economics literature, Torche et al. (2021) show that between 1971 and 2018 Democratic presidents improve infant health, especially for Black infants.

An interesting feature of the 2016 presidential election as a potential in-utero stressor is that it was a two-sided shock, in that the direction of the shock for a person would depend on their partisanship. Republicans and Donald Trump-voters would presumably experience a positive shock, while Democrats and Hillary Clinton-voters would experience a negative shock. We posit that this two-sided shock of the election result is distinct from the overall stress beforehand stemming from the uncertainty of the upcoming election, which was likely to be more consistent across party lines.[1] We are aware of only one other paper that considers effects of a two-sided in-utero shock on birth outcomes. That paper found that a local team playing in the Super Bowl leads to worse birth outcomes, and that result is driven by birth outcomes for mothers in proximity to the winning team (Duncan et al., 2017).

We investigate the effects of potential stress of the 2016 presidential election on birth outcomes with an innovative data linkage, combining individual-level voter registration data, including party affiliation, with the mother identified on birth certificate microdata from the state of Colorado. Other researchers have linked voter registration data to publicly available data on home sales (McCartney et al., 2024), and to mortality data from the social security death master file, newspapers, funeral homes, and other sources (Wallace et al., 2023). We are the first paper that links administrative birth data with voter registration data at the individual level, and furthermore to do so for a state where the voter registration file contains partisan affiliation. Our data allow us to test whether births to mothers who were registered as Democrats, Republicans,

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[1] There was also additional individual-level heterogeneity in the nature of the shock, stemming from differences in predicted election outcomes. However, we cannot observe that heterogeneity in our analyses.

and Unaffiliated changed after the largely surprising 2016 election which likely was a strong positive or negative stressor for mothers, depending on the mother's political affiliation. The analyses were pre-registered before we had access to the linked birth certificate data.[2]

3. Methods

3.1. Data

Our analyses focus on the state of Colorado, which was selected because of the data linkage availability and because it is a politically heterogeneous state offering substantial variability in individual and area-level partisanship. Figure 1 shows the Census block-level 2016 presidential vote shares, and while Hillary Clinton received 47.2% of the overall state's vote to Donald Trump's 44.4%, there is extensive geographic variation in vote shares in both urban and rural areas.

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[2] https://osf.io/ybtcd

Figure 1.

2016 Presidential Election in Colorado by Census Block Group — Major Cities Highlighted
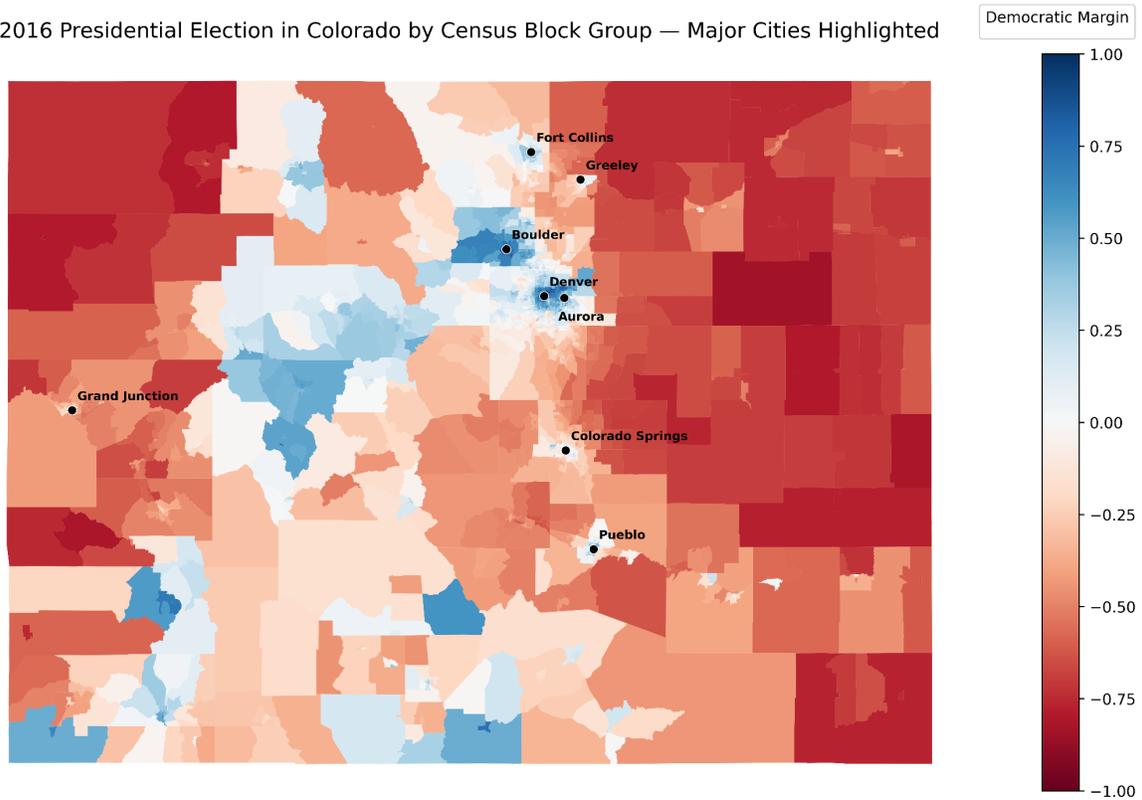
We use birth certificate microdata, which cover all live births in Colorado from 2008-2017, aggregated by the Colorado Department of Public Health and Environment Center for Health and Environmental Data (CEHD). The birth certificate data include detailed information on newborns and their parents.[3] This includes several measures that we use as outcomes: birthweight (measured in grams); estimated gestational age; Apgar score measured at 1 minute; and specific labor and delivery complications, congenital anomalies, and health care use in the delivery setting. The data include information on maternal behaviors that could be affected by election-related stress and may mediate any relationship with birth outcomes, including timing and number of prenatal visits, amount of smoking by trimester, and amount of alcohol consumption by trimester. The data also

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[3] We use the specific language used on the Colorado birth certificates of Mothers and Fathers to describe the birthing parent and non-birthing parent.

include detailed background information on the parents that is nearly complete for mothers and mostly complete for fathers. This includes sociodemographics (age, race, ethnicity, educational attainment, marital status, usual occupation), insurance status, and pre-pregnancy diagnoses and prior birth history for the mother. The data also include geographic identifiers to the level of the Census block group.[4]

One of our innovations is in linking the birth certificate data to individual-level voter registration data. We obtained the Master Voting History List from the Colorado Secretary of State Office via the Election Cycle Subscription Service.[5] These data are publicly-available for a small fee and include information on the party that each person registered with (e.g., Democrat, Republican, Unaffiliated), along with voter full names, address, birth year, gender, and ZIP codes. It also includes other, more specific voter information including the individual's precinct, and whether the individual voted in each primary or general election (but not whom the individual voted for).[6] The voter registration data that we use were extracted on July 31, 2017.

CEHD staff matched the voter registration data with the birth certificate data. To facilitate as many matches as possible despite potential name changes or typos, linkages began based on truncated names (first three letters), year of birth, and ZIP code. Matches were then scored based on the number of matching features and we required matched individuals to have the same gender, birth year, and exact matches on the first and last name (at the time of delivery or maiden name)

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[4] In an alternate version of our analysis, we use these covariates to predict whether an individual likely voted for the Republican or Democratic candidate (similar to Louguet-Marx 2025). These results are consistent with those shown below, despite the increased sample size from including independents' preferences in a two-party system.

[5] https://www.sos.state.co.us/pubs/elections/resultsData.html

[6] We had considered using a vote in the 2016 Democrat or Republican primary election as evidence of stronger partisanship, but less than 8% of our linked sample voted in the primary, and so for power reasons we did not analyze that variable.

to be included in the analytical matched sample. All names and other identifying information were removed from the analytical file shared with the authors. See Appendix 1 for additional details.

Starting with all 3,692,154 voters in the July 2017 extract of the Colorado Master Voting History List (2,821,618 of whom voted in the 2016 general election),[7] there were 978,656 matches and a total of 606,672 unique individuals were matched in some form to a birth record in Colorado. There were a total of 668,405 unique matched births (out of 942,543 overall birth records), which meant that some births were linked to two parents and some parents were linked to multiple births. As described above, we required matches to have the same age, sex, and truncated first/last names, which left us with 929,715 matches (584,584 unique individual parents and 638,840 unique births). We focus on the 909,812 (98%) unique individuals who were linked to birth certificates from 2008-2017 and were registered as a Democrat, Republican, or "unaffiliated," excluding the relatively small share of registered voters who were registered with smaller political parties (e.g., Libertarians). This represents the main analytical sample where we have individual-level information on voter registration. Our specific analytic samples only include a subset of those observations that are in the periods proximate to presidential elections, as described below.

We also examine partisanship at the level of Colorado's 3532 Census block groups.[8] To measure a Census block group's partisanship, we start with 2016 precinct-level Colorado Clinton or Trump vote counts for president.[9] We convert precinct-level vote shares to Census block group-

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[7] According to the Colorado Secretary of State's website there were only 2,780,247 votes for president in 2016. The difference is mostly due to approximately 40,000 individuals who left that part of the ballot blank. Other differences include individuals removed from voting rolls between November 2016 and July 2017.

[8] In our preregistration we planned to do this at the voting precinct level, and our results are the same at that level of aggregation. We decided to change to the Census block group to facilitate looking at changes over time (given that we learned that precincts are not consistent), to allow for linkage to census information at the block group level, and because it may be a better overall geographic unit to measure local political affiliation. Each census block group is uniquely identified by the combination of County, Census Tract Number, and Block Group Number.

[9] That precinct-level data can be found from the Colorado Secretary of State's website.

level vote shares by overlaying precinct and census shapefiles, calculating the intersection of each precinct with all of the Census block groups it is contained in, and then creating the Census block group votes as a weighted sum of all the precinct votes.[10] Figure 1 shows the map of Colorado by percentage Democratic margin at the Census block group level.

3.2. Analytic Approach

We first present graphical documentation of the relationship between voting patterns in the 2016 presidential election and birth outcomes aggregated at the Census block group level, using publicly-available precinct-level voting data and the complete birth certificate microdata. Specifically, we examine the correlation between changes in Census block group-level birth outcomes during in-utero exposure to the 2016 election (November 6, 2016–August 12, 2017) and the same interval 12 months earlier, and the difference in Clinton-Trump vote share in each Census block. This subsample has 34,847 matched newborn-mother voter records, though a small share of those observations has missing covariates and so are excluded from the regressions below.[11]

We next use our linked birth certificate data to estimate difference-in-differences (DID) models of birth outcomes. The first set of models uses the individual-level data on partisan affiliation from the Colorado voter file. The data for these models include births that occurred between August 2016–June 2017 to mothers who were registered voters. The model is described by the following equation:

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[10] We use Colorado precinct shapefiles for the 2016 election from Harvard Dataverse, and 2010 Census block group shapefiles from the Colorado Department of Public Health and Environment.

[11] For 21,283 (61%) of those observations the newborn's father also matches to a registered voter. While this is likely too few observations to have sufficient power to use this subsample for formal regressions, we can look at the relative frequencies of different pairs of parental voter registrations. 24% are both independents, 21% both Republicans, and 13% both Democrats. For 10% the fathers are independent and the mothers Democrats; for 6% the reserve. For 8% the fathers are independent and the mothers Republicans; for 9% the reverse. Republican-Democrat pairs are quite rare, with 3% Republican fathers and Democrat mothers and 1% the reserve.

$$Y_{iwyc} = \alpha MotherParty_i + \gamma PostElection_w + \beta MotherParty * PostElection_{iwy}$$

$$+MotherX_i + FatherX_i + BirthX_i + Month_m + County_c + \varepsilon_{iwyc}$$

Y_{iwyc} represents outcomes for birth i in week w and county c.[12] $MotherParty_i$ is a set of indicators for political party registration, with Democrat and Unaffiliated as coefficients and Republican as the reference category. $PostElection_w$ is an indicator for whether at least one trimester of a pregnancy occurred after the election day (i.e., the second week of February 2017). We also estimate alternative versions with separate interaction terms for each trimester.

$MotherX_i$ and $FatherX_i$ are the set of covariates for mother's and father's sociodemographic characteristics (age, educational attainment, racial group, Hispanic/Latino ethnicity), respectively. $BirthX_i$ is the set of covariates describing details of the birth i (place of birth in a hospital; attended by a physician, midwife, or other; number of previous live births for the mother, whether the mother had a previous c-section, payer of the birth (private insurance, Medicaid, other government insurance, self-pay, military, other); whether the mother had pre-pregnancy diabetes, pre-pregnancy hypertension, and any previous poor pregnancy outcomes). $Month_m$ is a set of fixed effects for month-of-birth, and $County_c$ is a county of birth fixed effect. We also estimate models without any parent or birth-specific covariates to assess whether compositional change of births influences the coefficient estimates. β is our coefficient of interest.

The outcomes that we examine include birthweight measured in grams along with established cutpoints for low (<2500g) and very low birthweight (<1500g); gestational age measured in weeks along with cutpoints for moderate-late preterm (32–37 weeks), very preterm (28-32 weeks), extremely preterm (<28 weeks); and Apgar score measured at one minute. We also

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[12] We are unfortunately unable to attempt to replicate the fertility results of Dahl, Lu, and Mullins (2022) as a mother must have a child to be in our matched voter registration-birth certificate sample, and we only have one point of measurement of mother's partisan affiliation.

combine birthweight and gestational age information to create another measure of infant health, small for gestational age, defined as below the 10th percentile of birthweight for each week of gestational age (Aris et al., 2019).[13] We focus our attention on low-birthweight, preterm birth, small for gestational age, and Apgar score as they are relatively easy to interpret, but show results for other outcomes in the Appendix. We examine three outcomes that might represent responses to election-related stressors and thus mediate any relationship with birth outcomes: average number of cigarettes/day over the pregnancy, average number of alcoholic drinks/day over the pregnancy, and the number of prenatal visits over the pregnancy.

Finally, we also construct three indices of negative birth outcomes, following Currie, Mueller-Smith, and Rossin-Slater (2020). We use these indices to improve the statistical power relative to the individual constituent measures and to reduce the number of models to be estimated. First is a severe birth outcomes index, which includes indicators for severely adverse outcomes: very low birth weight, very preterm birth, low 1-minute Apgar score (<7), NICU admission, any abnormal conditions (e.g., use of assisted ventilation or surfactant) or congenital anomalies of the newborn, and death by the time of birth certificate filing. Second is a broad negative birth outcomes index, which includes all outcomes included in the severe birth outcomes index, as well as other less severe measures: continuous birth weight in grams, indicator for low birth weight, gestational age in weeks, and indicator for preterm birth. Third is a use-of-medical-services index, which includes: indicator for first trimester prenatal care initiation, number of prenatal care visits, indicator for induction of labor, indicator for delivery by c-section, and indicator for any complications during labor or delivery (e.g., premature rupture of membranes, unplanned

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[13] We did not pre-register the small for gestational age outcome because we were not aware of it when we pre-registered.

operating room procedure following delivery, unplanned hysterectomy, maternal transfusion). We create each of these indices by coding each of the component measures so that a higher value represents a worse outcome (for the severe-birth-outcomes and broad-negative-birth-outcomes indices) or more use of medical services (for the use-of-medical-services index). For each index, we standardize each component outcome by subtracting the mean for births from August 2014– June 2015 and dividing by the standard deviation of that group. Those standardized variables are then averaged to create the index.

In addition to the main DID model described by Equation (1), we estimate more-flexible models that will allow us to assess whether effects on birth outcomes vary by whether the election occurred by trimester, or post-pregnancy. We do not have a specific hypothesis about how the effects will vary by the timing of conception with respect to the election.

In addition to the two models described above, we estimate triple-difference versions of these models. The data for these models include births that occurred between July 2014-June 2015, and July 2016–June 2017 (as above), to people who were registered voters. The "third difference" in these models compares births that occurred in the 2016 election cycle to births in the 2014 midterm election cycle.

4. Results

Figures 2a–4a show the scatterplots of Census block group average birth outcomes for births in utero the year prior to the 2016 election and one year prior, and the Census block group 2016 Trump-Clinton vote share. Figures 2b–4b show the scatterplots of the changes in Census block group average birth outcomes between births exposed to the 2016 election and one year prior, and the Census block group 2016 Trump-Clinton vote share. Each Census block group observation is weighted by the number of births that it contains. The scatterplots for the low

birthweight, preterm birth, small-for-gestational age, and Apgar outcomes are shown here.

Figure 2a. Block Group-Level 2016 Vote Share and Average Prior Year Share Low Birthweight
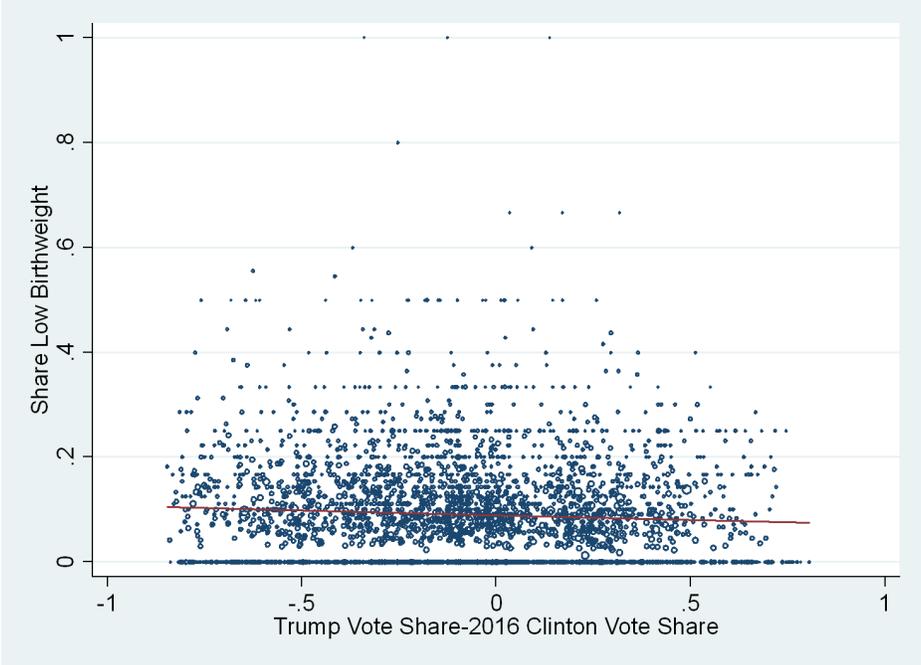
Figure 2b. Block Group-Level 2016 Vote Share and Changes in Share Low Birthweight

Figure 3a. Block Group-Level 2016 Vote Share and Average Prior Year Share Preterm
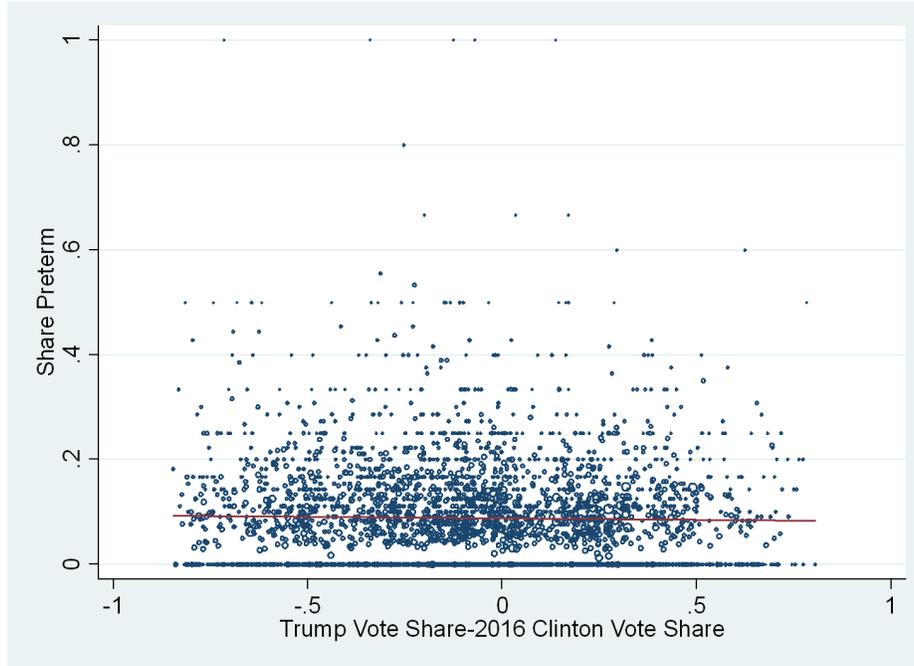
Figure 3b. Block Group-Level 2016 Vote Share and Changes in Share Preterm
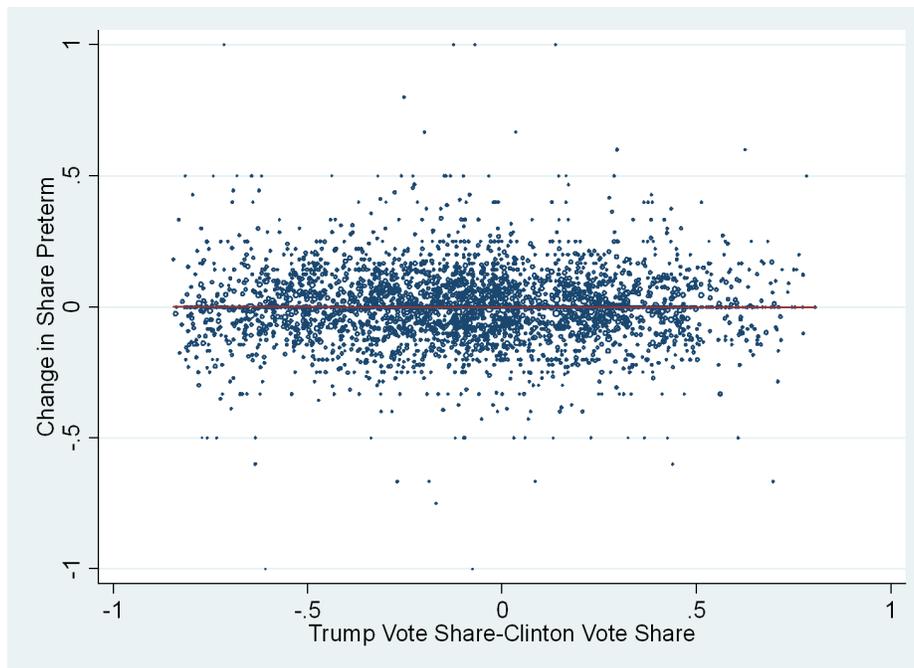
Figure 4a. Block Group-Level 2016 Vote Share and Average Prior Year Share
Small-for-Gestational
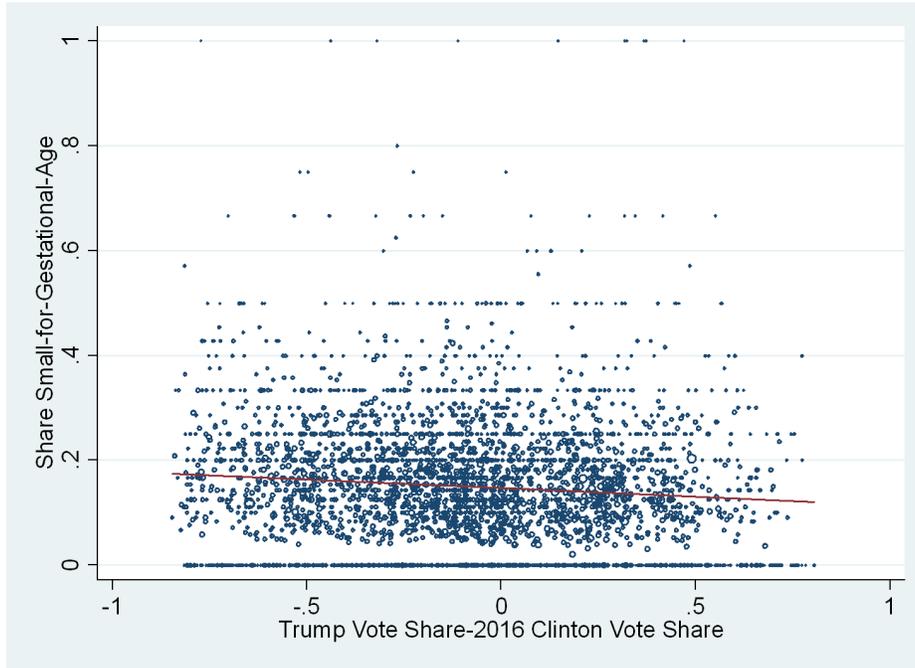
Figure 4b. Block Group-Level 2016 Vote Share and Changes in Share Small-for-Gestational Age
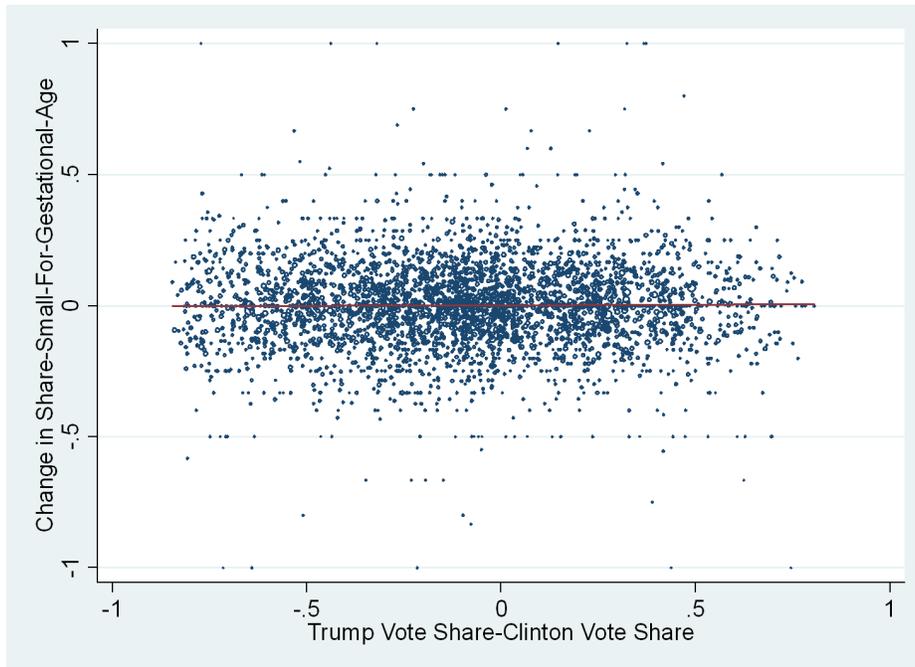
Figure 5a. Block Group-Level 2016 Vote Share and Average Prior Year Apgar Score
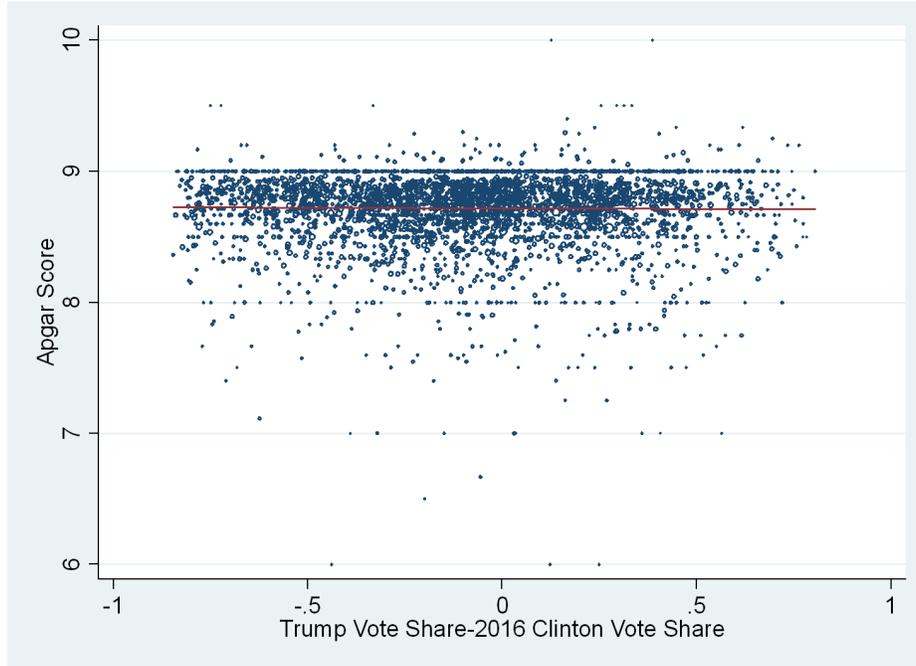
Figure 5b. Block Group-Level 2016 Vote Share and Changes in Apgar Score
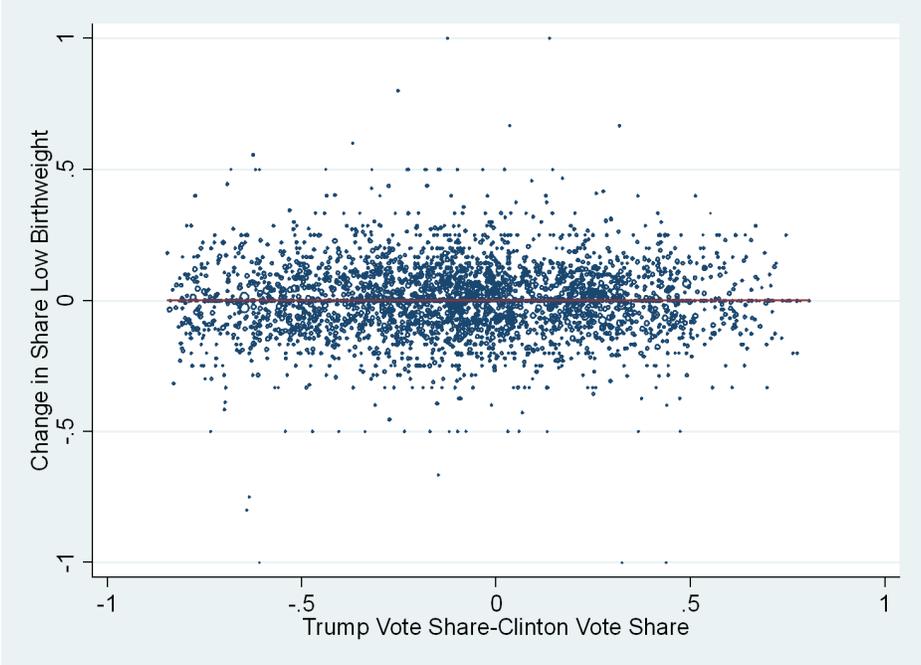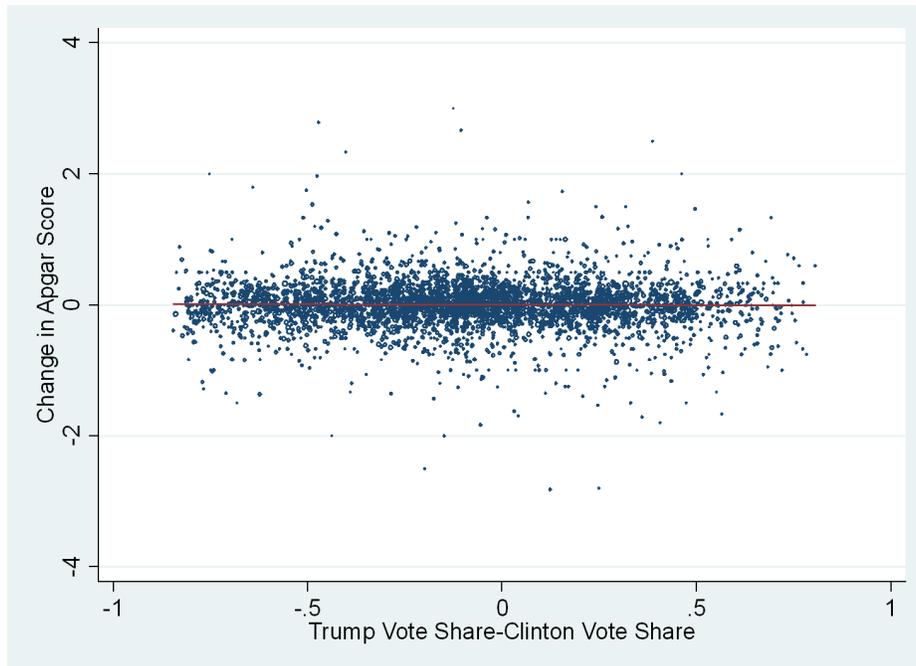

These figures illustrate the substantial geographic variation in 2016 voting behavior along with substantial variation in the birth outcomes. We do not see evidence of a strong relationship

between 2016 vote share and the average levels of the birth outcomes for births prior to the 2016 election. Block groups with a higher 2016 Trump vote share had slightly lower likelihoods of low birthweight (Figure 2a), preterm birth (Figure 3a), and small-for-gestational age (Figure 4a), but these differences are small. There is little visual evidence of a relationship between changes in area-level birth outcomes and area-level 2016 vote share, as demonstrated by the bivariate regression line imposed on the scatterplots (Figures 2b-4b).

We next turn to the main novelty of our work, which is the direct linkage between voter registration data and the birth certificate microdata. Table 1 shows the summary statistics for births where the mother was a registered Republican, Independent, and Democrat. Birth outcomes are generally quite similar across the three partisan groups. However, there are strong differences in the racial and ethnic composition of mothers across parties, and modest differences in mother's educational attainment and payer for the birth.

Table 1. Summary Statistics by Mother's Political Registration

	Mother is Registered Republican		Mother is Registered Independent		Mother is Registered Democrat	
	Mean (SD)	N	Mean (SD)	N	Mean (SD)	N
Outcome Variables:						
Birthweight (g)	3,242 (547.4)	9,033	3,207 (554.9)	14,526	3,189 (569.5)	10,184
Low Birthweight	0.079	9,033	0.089	14,526	0.095	10,184
Very Low Birthweight	0.010	9,033	0.011	14,526	0.014	10,184
Gestational Age (weeks)	38.69 (1.91)	9,024	38.65 (2.00)	14,526	38.64	10,186
Preterm Birth	0.082	9,024	0.089	14,526	0.089	10,186
Small for Gestational Age	0.128	9,019	0.141	14,517	0.155	10,177
Apgar Score	8.729 (0.75)	8,987	8.710 (0.80)	14,489	8.724 (0.79)	10,159
Number of prenatal visits	10.67 (3.44)	8,867	10.61 (3.66)	14,234	10.59 (3.67)	9,968
Average Prenatal Cigarettes	0.305 (1.81)	9,018	0.473 (2.20)	14,485	0.341 (1.85)	10,150
Average Prenatal Drinks	0.0275 (0.31)	9,014	0.029 (0.31)	14,496	0.043 (0.43)	10,141
Severe Outcomes Index	-0.083 (3.02)	8,983	0.051 (3.15)	14,484	0.140 (3.32)	10,156
Broad Outcomes Index	-0.277 (5.56)	8,983	-0.007 (5.78)	14,484	0.126 (6.02)	10,156
Medical Outcomes Index	0.410 (2.20)	8,648	0.357 (2.25)	13,790	0.416 (2.24)	9,643
Predictor Variables:						
Mother's Age	30.12 (5.00)	9,032	29.66 (5.32)	14,529	30.90 (5.44)	10,187
Father's Age	32.27 (5.81)	8,764	31.93 (6.06)	13,797	33.08 (6.21)	9,640
Mother is non-Hispanic Black	0.008	9,033	0.036	14,529	0.085	10,187
Mother is non-Hispanic White	0.881	9,033	0.740	14,529	0.629	10,187
Mother is Hispanic/Latina	0.094	9,033	0.193	14,529	0.256	10,187
Mother's Educ: HS or Less	0.149	9,033	0.218	14,529	0.193	10,187
Mother's Educ: College grad	0.517	9,033	0.455	14,529	0.518	10,187
Born in Hospital	0.961	9,033	0.973	14,529	0.971	10,187
Birth covered by private ins	0.717	9,033	0.619	14,529	0.635	10,187
Birth covered by Medicaid	0.205	9,033	0.323	14,529	0.319	10,187

Table 2 shows the results for the main outcome variables of infant health: low-birthweight, preterm births, small for gestational age, and Apgar score.[14] Higher values of low-birthweight, preterm births, small for gestational age indicate worse infant health, while a higher Apgar score indicates better infant health. We find little evidence that in-utero exposure to the 2016 presidential election had any differential effect across political party registration on these four birth outcomes. We also find no evidence that the timing of in-utero exposure to the 2016 election mattered differentially for mothers with different party registration.

Table 3 shows the results for the other outcomes that are index measures related to infant health. We do not find evidence that prenatal exposure to the 2016 election differentially affected the broad or severe infant health index measures differentially by mother's party registration. We do find that registered Independents had a small (coefficient = 0.071) and marginally significant ($p = 0.095$) increase in the medical care index for births exposed to the election, but no evidence that timing of exposure mattered.[15]

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[14] Models estimated without the parent and birth covariates yielded largely similar results as shown here.

[15] We did not pre-register maternal gestational hypertension as an outcome, but we did look at it based on a discussant comment. We do not find any evidence of differential partisan responses to the 2016 election, with very small and imprecise estimates (available upon request).

Table 2: Main Results

	(1) LBW	(2) LBW	(3) Preterm	(4) Preterm	(5) SGA	(6) SGA	(7) Apgar	(8) Apgar
Independent*Post-election	0.0053		0.0136		-0.00706		-0.0101	
	(0.0082)		(0.0105)		(0.00635)		(0.0171)	
Democrat*Post-election	0.0076		0.0009		0.00111		0.0038	
	(0.0086)		(0.0083)		(0.00726)		(0.0218)	
Independent*3rd Tri-Exposure		-0.0144		-0.0016		-0.0017		-0.0200
		(0.0134)		(0.0074)		(0.0148)		(0.0187)
Independent*2nd Tri-Exposure		-0.0013		0.0113		-0.0105		-0.0206
		(0.0104)		(0.0126)		(0.0125)		(0.0191)
Independent*1st Tri-Exposure		-0.0018		0.0164		-0.0019		-0.0167
		(0.0119)		(0.0129)		(0.0141)		(0.0299)
Democrat*3rd Tri-Exposure		-0.0113		-0.0097		-0.0051		0.0145
		(0.0124)		(0.0086)		(0.0133)		(0.0327)
Democrat*2nd Tri-Exposure		0.0090		0.0011		0.0028		0.0206
		(0.0108)		(0.0097)		(0.0119)		(0.0310)
Democrat*1st Tri-Exposure		-0.0128		-0.0147		-0.0104		-0.0127
		(0.0159)		(0.0143)		(0.0119)		(0.0249)
Observations	33,743	33,743	33,736	33,736	33,713	33,713	33,635	33,635
R-squared	0.024	0.024	0.030	0.030	0.022	0.022	0.032	0.032
Mean	0.0879	0.0879	0.0872	0.0872	0.142	0.142	8.719	8.719

PostElection is an indicator for whether at least one trimester of a pregnancy occurred after the election day (i.e., the second week of February 2017). Covariates include mother's and father's sociodemographic characteristics (age, educational attainment, racial group, Hispanic/Latino ethnicity), details of the birth i (place of birth in a hospital; attended by a physician, midwife, or other; number of previous live births for the mother, whether the mother had a previous c-section, payer of the birth (private insurance, Medicaid, other government insurance, self-pay, military, other); whether the mother had pre-pregnancy diabetes, pre-pregnancy hypertension, and any previous poor pregnancy outcomes). Fixed effects for month of birth and county of birth fixed effect.

Table 3: Results for Indices

	(1) Birth Outcomes Index	(2) Birth Outcomes Index	(3) Severe Outcomes Index	(4) Severe Outcomes Index	(5) Medical Care Index	(6) Medical Care Index
Independent*Post-election	0.190		0.083		0.071*	
	(0.177)		(0.082)		(0.042)	
Democrat*Post-election	0.105		0.010		-0.005	
	(0.197)		(0.091)		(0.062)	
Independent*3rd Tri-Exposure		-0.272*		-0.116		-0.011
		(0.147)		(0.102)		(0.076)
Independent*2nd Tri-Exposure		0.092		0.065		0.073
		(0.177)		(0.100)		(0.087)
Independent*1st Tri-Exposure		-0.005		-0.055		0.048
		(0.275)		(0.140)		(0.081)
Democrat*3rd Tri-Exposure		-0.321		-0.167		-0.016
		(0.207)		(0.147)		(0.076)
Democrat*2nd Tri-Exposure		0.083		-0.015		0.012
		(0.187)		(0.116)		(0.105)
Democrat*1st Tri-Exposure		-0.335		-0.187		-0.067
		(0.337)		(0.165)		(0.114)
Observations	33,623	33,623	33,623	33,623	32,081	32,081
R-squared	0.041	0.041	0.030	0.030	0.098	0.098
Mean	-0.0392	-0.0392	0.0422	0.0422	0.389	0.389

PostElection is an indicator for whether at least one trimester of a pregnancy occurred after the election day (i.e., the second week of February 2017). Covariates include mother's and father's sociodemographic characteristics (age, educational attainment, racial group, Hispanic/Latino ethnicity), details of the birth i (place of birth in a hospital; attended by a physician, midwife, or other; number of previous live births for the mother, whether the mother had a previous c-section, payer of the birth (private insurance, Medicaid, other government insurance, self-pay, military, other); whether the mother had pre-pregnancy diabetes, pre-pregnancy hypertension, and any previous poor pregnancy outcomes). Fixed effects for month of birth and county of birth fixed effect.

Next, we turn to outcomes that potentially mediate the relationship between prenatal exposure to stress and birth outcomes (Table 4). Average maternal cigarette consumption increased by 0.113 for registered Democrats who were exposed to the 2016 election during pregnancy, which is a large increase relative to the sample mean of 0.388. This increase seems to be driven by earlier-trimester exposure to the 2016 election. The point estimate for alcohol consumption for Democratic mothers after the 2016 election was also positive and large in magnitude relative to the sample mean, but was just outside of statistical significance (p=0.111). We also find that exposure to the 2016 election in the second and third trimesters led to higher alcohol use among registered Democrats. In contrast, we do not find any evidence that prenatal care visits changed differentially by mother's party registration after the 2016 election.

Table 4: Behavioral Results

	(1) Avg Cigs	(2) Avg Cigs	(3) Avg Drinks	(4) Avg Drinks	(5) Prenatal Visits	(6) Prenatal Visits
Independent*Post-election	0.058 (0.047)		0.007 (0.008)		-0.051 (0.068)	
Democrat*Post-election	0.112** (0.045)		0.013 (0.008)		-0.057 (0.095)	
Independent*3rd Tri-Exposure		0.030 (0.086)		0.0111 (0.015)		-0.013 (0.121)
Independent*2nd Tri-Exposure		0.038 (0.043)		0.015 (0.012)		-0.029 (0.135)
Independent*1st Tri-Exposure		0.148** (0.066)		0.007 (0.016)		-0.120 (0.160)
Democrat*3rd Tri-Exposure		-0.033 (0.060)		0.024* (0.013)		-0.057 (0.175)
Democrat*2nd Tri-Exposure		0.061 (0.054)		0.024** (0.010)		-0.073 (0.204)
Democrat*1st Tri-Exposure		0.177* (0.092)		0.026 (0.017)		-0.108 (0.206)
Observations	33,653	33,653	33,651	33,651	33,069	33,069
R-squared	0.090	0.090	0.014	0.014	0.076	0.076
Mean	0.388	0.388	0.0330	0.0330	10.62	10.62

PostElection is an indicator for whether at least one trimester of a pregnancy occurred after the election day (i.e., the second week of February 2017). Covariates include mother's and father's sociodemographic characteristics (age, educational attainment, racial group, Hispanic/Latino ethnicity), details of the birth i (place of birth in a hospital; attended by a physician, midwife, or other; number of previous live births for the mother, whether the mother had a previous c-section, payer of the birth (private insurance, Medicaid, other government insurance, self-pay, military, other); whether the mother had pre-pregnancy diabetes, pre-pregnancy hypertension, and any previous poor pregnancy outcomes). Fixed effects for month of birth and county of birth fixed effect.

Table 5 shows the results of the models that compare the main results with analogous models that examine the 2014 midterm election as a third difference. The results are broadly similar to the main results in that there is little evidence that the 2016 election differentially affected birth outcomes for mothers with different party registration.

Table 5. Triple-Difference Results

|	(1) LBW	(2) Preterm	(3) SGA	(4) Apgar
Independent*Post-election*2016	0.018*	0.013	-0.005	-0.012
	(0.011)	(0.012)	(0.011)	(0.026)
Democrat*Post-election* 2016	0.013	-0.007	0.0014	0.018
	(0.012)	(0.010)	(0.010)	(0.034)
Observations	68,349	68,331	68,284	68,156
R-squared	0.020	0.023	0.020	0.029
Mean	0.0884	0.0878	0.142	8.714

PostElection is an indicator for whether at least one trimester of a pregnancy occurred after the election day (i.e., the second week of February 2017). Covariates include mother's and father's sociodemographic characteristics (age, educational attainment, racial group, Hispanic/Latino ethnicity), details of the birth i (place of birth in a hospital; attended by a physician, midwife, or other; number of previous live births for the mother, whether the mother had a previous c-section, payer of the birth (private insurance, Medicaid, other government insurance, self-pay, military, other); whether the mother had pre-pregnancy diabetes, pre-pregnancy hypertension, and any previous poor pregnancy outcomes). Fixed effects for month of birth and county of birth fixed effect.

4.1. Heterogeneous Effects and Robustness Checks

First, we examine whether the main results are heterogeneous by the race or ethnicity of the mother, or by the immigration status of the mother. Because of the well-documented rhetoric and statements from then-Candidate Trump with respect to racial and ethnic minorities, along with prior evidence (Krieger et al., 2018), we hypothesize that Black, Indigenous, Hispanic/Latino, Asian, and other racial/ethnic minority groups had worse birth outcomes after the 2016 election.

We also hypothesize that births to immigrants (regardless of citizenship status, which we do not observe) will have worse outcomes after the election due to stress from the partisan rhetoric around immigration before and after the 2016 election, both overall and within political affiliation. We show the results of these models in Figure 6, expressing the coefficients relative to their subsample means for interpretability. We exclude the results for births to Asian and "other" racial/ethnic group mothers due to the very small sample sizes of those births. None of the reported effects are statistically significant. However, we do find some pattern of point estimates for in utero exposure to the 2016 election for Democratic-registered mothers being more harmful for birth outcomes for Hispanic/Latina mothers and foreign-born mothers compared to non-Hispanic White and US-born mothers, respectively. However, these estimates are all imprecise, owing in part to the smaller sample sizes of births to Hispanic/Latina mothers and foreign-born mothers.

Figure 6. Heterogeneity by Race/Ethnicity and US/Foreign-Born
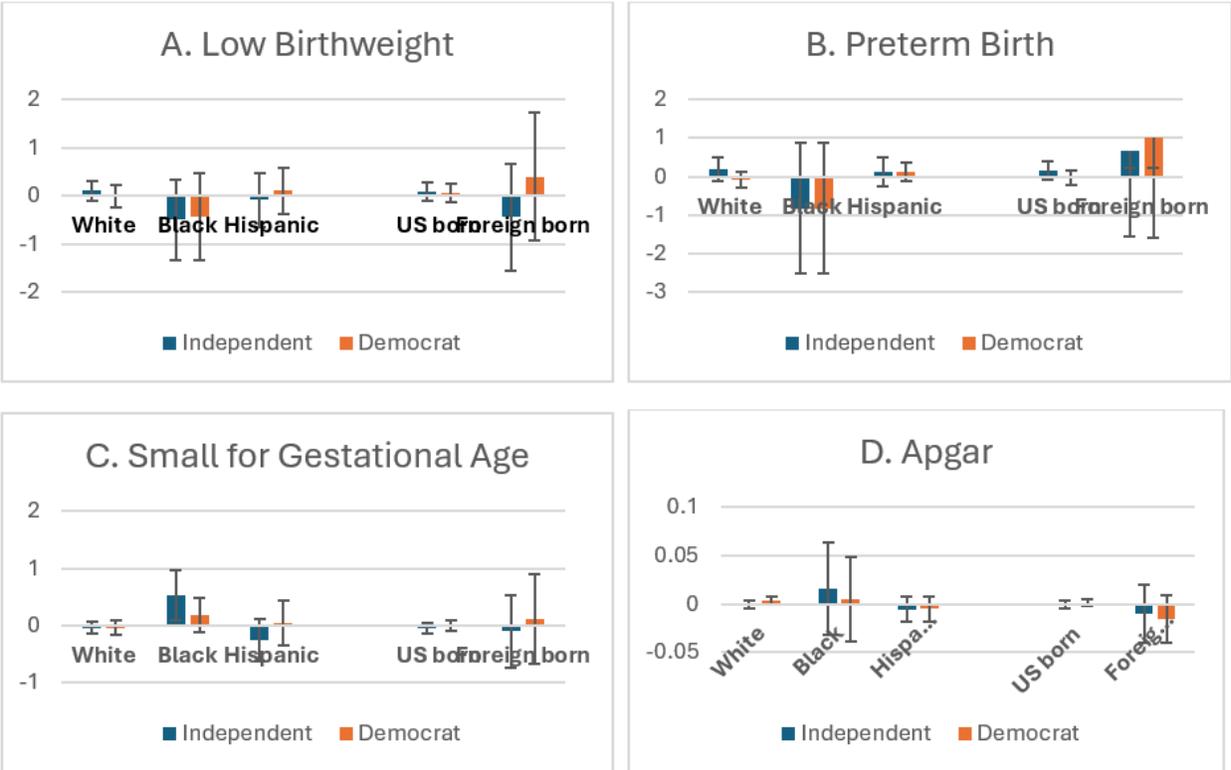
Second, we test for whether the effects of one's own partisan affiliation vary by the local political environment. For instance, it is possible that the Trump election might have created relatively more stress for a Democrat who lives in a predominantly Trump-voting area compared to a Democrat who lives in a heavily Democratic area. Overall, we find little evidence that individual-level partisan responses to the 2016 election varied by the voting pattern of mothers' local areas (Table 6). Where we do find significant differences, they are localized among registered Independents and do not show a consistent pattern with respect to positive or negative birth outcomes.

Third, we stratify the analysis by neighborhood socioeconomic status using 2017 five-year American Community Survey (ACS) estimates at the Census block group level. We calculated quartiles of median household income and percentage of adults 25 or older with a bachelor's

degree and assigned each voter the quartile associated with Census block group that they lived in. Appendix 2 reports the quartile-specific estimates for each of the four outcomes; across income and education strata, we find no consistent evidence of an effect. As with the local political environment analysis, the few statistically significant coefficients on Independent voters have inconsistent signs.

Table 6. Heterogeneity by Local Area 2016 Voteshare

	(1) LBW	(2) Preterm	(3) SGA	(4) Apgar
Trump-Voting Areas				
Independent*Post-election	.020	.005	.017	.055*
	(.013)	(.021)	(.021)	(.031)
Democrat*Post-election	.029	.011	.020	.030
	(.021)	(.021)	(.0148)	(.039)
Observations	10,630	10,631	10,624	10,606
Mean	.095	.092	.154	8.718
"Purple" Areas				
Independent*Post-election	.015	.011	-.0041	-.019
	(.016)	(.020)	(.012)	(.038)
Democrat*Post-election	.011	-.006	-.0001	.011
	(.019)	(.017)	(.013)	(.040)
Observations	10,857	10,855	10,850	10,826
Mean	.085	.084	.140	8.718
Clinton-Voting Areas				
Independent*Post-election	-.002	.026*	-.023**	-.039
	(.01418)	(.015)	(.010)	(.031)
Democrat*Post-election	.007	-.004	.003	.034
	(.022)	(.019)	(.015)	(.032)
Observations	11,556	11,550	11,539	11,506
Mean	.082	.085	.130	8.726

PostElection is an indicator for whether at least one trimester of a pregnancy occurred after the election day (i.e., the second week of February 2017). Covariates include mother's and father's sociodemographic characteristics (age, educational attainment, racial group, Hispanic/Latino ethnicity), details of the birth i (place of birth in a hospital; attended by a physician, midwife, or other; number of previous live births for the mother, whether the mother had a previous c-section, payer of the birth (private insurance, Medicaid, other government insurance, self-pay, military, other); whether the mother had pre-pregnancy diabetes, pre-pregnancy hypertension, and any previous poor pregnancy outcomes). Fixed effects for month of birth and county of birth fixed effect.

Fourth, we conduct a "falsification" check where we will estimate the same main models as described above, but use data from prior elections (2008 and 2012) where there was not the

same partisan shock as in 2016 (Table 7). Our a priori hypothesis was that we would not expect to see the same degree of partisan effect on birth outcomes in those other election years. We do not find substantial partisan effects of the 2008 and 2012 elections on most birth outcomes. We do find that the likelihood of births being small for gestational age dropped significantly among Democratic-registered mothers after the 2012 election of Democratic President Obama.

Table 7. Birth Outcome Regressions for the 2008 and 2012 Presidential Elections

	(1) LBW	(2) LBW	(3) Preterm	(4) Preterm	(5) SGA	(6) SGA	(7) Apgar	(8) Apgar
Independent*Post-election	0.003	-0.003	0.004	-0.002	-0.006	-0.012	0.015	0.018
	(0.008)	(0.009)	(0.007)	(0.008)	(0.011)	(0.009)	(0.026)	(0.028)
Democrat*Post-election	0.001	-0.001	0.009	-0.007	-0.004	-0.014**	0.017	0.023
	(0.006)	(0.008)	(0.007)	(0.007)	(0.010)	(0.007)	(0.034)	(0.017)
Election Year	2008	2012	2008	2012	2008	2012	2008	2012
Observations	30,453	32,156	30,435	32,141	30,402	32,106	30,408	32,067
R-squared	0.024	0.025	0.022	0.023	0.026	0.023	0.050	0.044
Mean	0.0866	0.0882	0.0930	0.0863	0.136	0.146	8.576	8.660

PostElection is an indicator for whether at least one trimester of a pregnancy occurred after the election day (i.e., the second week of February 2017). Covariates include mother's and father's sociodemographic characteristics (age, educational attainment, racial group, Hispanic/Latino ethnicity), details of the birth i (place of birth in a hospital; attended by a physician, midwife, or other; number of previous live births for the mother, whether the mother had a previous c-section, payer of the birth (private insurance, Medicaid, other government insurance, self-pay, military, other); whether the mother had pre-pregnancy diabetes, pre-pregnancy hypertension, and any previous poor pregnancy outcomes). Fixed effects for month of birth and county of birth fixed effect.

5. Conclusion

A rich economics literature demonstrates how exposure to a range of shocks and stressors during pregnancy can affect birth outcomes. To explore whether political events may be a stressor that affects birth outcomes, we matched individual-level voter registration data with birth certificate microdata from Colorado and studied the 2016 presidential election which was plausibly experienced as a positive or negative emotional shock depending on one's political affiliation. We find some evidence that health behaviors deteriorated for Democratic-registered mothers relative to Republican-registered mothers after the 2016 presidential election, but we do not find evidence that birth outcomes changed differentially.

Our analysis has several limitations. First, our sample size may not have been large enough to detect small changes in birth outcomes. Our pre-registered a priori power analysis assumed 50,000 observations whereas our realized sample was approximately 34,000 observations, and the point estimates in our analyses were somewhat smaller than what had been assumed in our power analyses. Using our a priori assumed sample size of 50,000 births, we would have been quite underpowered to detect a relative effect size of 4% (corresponding to the relative effect on low birthweight of being exposed to a local team winning the Super Bowl in Duncan, et al. (2017)). But, we would have been adequately powered to detect a relative effect size of 12% (corresponding to the effects of exposure to the D.C. sniper attacks on low birthweight in Currie, et al. (2024)). Other studies of prenatal stressors and birth outcomes use samples with far more observations than we had (e.g., Duncan, Mansour, Rees 2016), and data from multiple states or larger states may be needed to detect partisan effects on birth outcomes. As such, some of our results are imprecise. For example, with 95% confidence we cannot rule out relative effects of being registered as a Democrat after the 2016 election that range from a 10% decrease to a 28% increase in low

birthweight, and from an 18% decrease to a 20% increase in preterm birth. We also do not have a way of directly characterizing the degree of unexpectedness and the positive or negative "shock" of the 2016 presidential election for parents. It is likely that even within party affiliation, parents varied in the emotional valence of the 2016 election result and in the prediction of the election outcome. Finally, our analyses only consider short-run birth outcomes and prenatal behaviors. In-utero stressors may have latent effects that show up in later-life (Almond and Currie 2011), which we are unable to observe in our data, and may plausibly occur given that we see some evidence of the 2016 election affecting mothers' health behaviors.

This research uses a novel data linkage to add new evidence on the effects of in-utero exposure to both positive and negative stressors. This work is part of a new area of economic inquiry into politics as a determinant of health outcomes (Wallace et al., 2023). Examining how political events function as positive or negative stressors affecting birth outcomes and other health behavioral responses is a promising avenue for future research across a variety of cases and contexts. Furthermore, as political polarization continues to be a defining characteristic of society, understanding how partisanship is related to health behaviors, health care, and health outcomes will be increasingly valuable.

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Appendix 1. Data Matching and Linking Procedures

Data staging

In both voter registration data (n=3,692,154 records) and birth registration data (n=957,421 records), the procedure was as follows:

-Ensure deduplication across unique ID's: voter ID (unique voter ID) and birth certificate number (unique live birth, but may represent multiple events occurring to a single voter, male or female)
-Create a version of last name, first name, and middle name, removing all special characters
-Create a truncated version of each of these: First 3 letters for first and last names; First letter for middle names
-Create standardized year of birth for voter and for mother
-Create standardized field for sex for voter and for mother
-Create standardized field for zip code and county of residence (as county name)
-Create standardized field for phone numbers available

Data linkage-blocking step

This represents a sequence of broad linkage steps, intending to cast a broad net to capture all possible matches, and include linkages applying the following sets of criteria:
1. Voter truncated first and last name (3 characters) match mother's first and last name at time of delivery, or mother's maiden first and last name, if changed; and voter year of birth matches mother's year of birth
2. Voter phone number matches either mother or father's phone number in birth registry
3. Voter truncated first and last name match mother's first and last name at time of delivery, or mother's maiden first and last name, if changed; and voter zip matches mother's zip at time of delivery
5. Voter truncated first and last name match mother's first and last name at time of delivery, or mother's maiden first and last name, if changed; and voter county matches mother's county at time of delivery

Data linkage-match scoring/selection step

Results from each pass of the blocking step are appended, and deduplicated by voter ID-birth certificate number pairs. Each possible match is assigned a 'score', based on the number and nature of the comparison of key identifying variables. 'Scores' were created separately for female voters/mother and male voters/fathers. This 'score' is a 5-digit code, where each code is a 1 (equal) or 0 (not equal), according to the following:

1st digit: 1=voter sex='F' and matched a maternal record; 0=voter sex='F' and matched a paternal record
2nd digit: 1=voter year of birth matched mother year of birth
3rd digit: 1=voter complete last name=mother's complete last name (at delivery or maiden)

4th digit: 1=voter complete first name=mother's complete first name (at delivery or maiden)
5th digit: 1=voter middle initial=mother's middle initial (at delivery or maiden), including if both are null

We only kept matches if the scoring was 11111 or 11110.

Appendix 2. Regressions Stratified on Census Block Group Education and Income Quartiles.

Appendix Table 1: Low Birthweight, stratified by education quartile

	(1) LBW	(2) LBW	(3) LBW	(4) LBW
Independent*Post-election	-0.015	0.004	0.027	-0.001
	(0.015)	(0.015)	(0.020)	(0.017)
Democrat*Post-election	-0.028*	0.018	0.029	0.003
	(0.016)	(0.013)	(0.021)	(0.011)
Observations	7,332	8,429	9,246	8,036
R-squared	0.049	0.039	0.049	0.046
Quartile	1	2	3	4
Mean	0.095	0.088	0.087	0.081

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix Table 2: Preterm Births, stratified by education quartile

	(1) Preterm	(2) Preterm	(3) Preterm	(4) Preterm
Independent*Post-election	0.006	0.024	0.019	0.009
	(0.024)	(0.018)	(0.017)	(0.010)
Democrat*Post-election	-0.033	0.018	0.019	0.006
	(0.021)	(0.021)	(0.021)	(0.008)
Observations	7,329	8,426	9,245	8,036
R-squared	0.052	0.054	0.051	0.049
Quartile	1	2	3	4
Mean	0.096	0.089	0.084	0.080

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix Table 3: Small for Gestational Age, stratified by education quartile

	(1) SGA	(2) SGA	(3) SGA	(4) SGA
Independent*Post-election	-0.032	-0.033**	0.017	-0.002
	(0.020)	(0.016)	(0.016)	(0.019)
Democrat*Post-election	-0.040	0.022	0.025	-0.014
	(0.024)	(0.020)	(0.017)	(0.015)
Observations	7,324	8,420	9,238	8,031
R-squared	0.043	0.041	0.036	0.041
Quartile	1	2	3	4
Mean	0.153	0.144	0.138	0.131

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix Table 4: Apgar score, stratified by education quartile

	(1) Apgar	(2) Apgar	(3) Apgar	(4) Apgar
Independent*Post-election	-0.021	-0.053	0.007	0.017
	(0.043)	(0.039)	(0.046)	(0.030)
Democrat*Post-election	0.034	-0.018	-0.049	0.039
	(0.037)	(0.061)	(0.040)	(0.031)
Observations	7,310	8,382	9,227	8,019
R-squared	0.056	0.067	0.037	0.046
Quartile	1	2	3	4
Mean	8.702	8.707	8.721	8.753

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix Table 5: Low Birthweight, stratified by income quartile

	(1) LBW	(2) LBW	(3) LBW	(4) LBW
Independent*Post-election	-0.008	0.014	0.0002	0.010
	(0.018)	(0.017)	(0.014)	(0.017)
Democrat*Post-election	0.001	0.018	0.009	-0.003
	(0.017)	(0.022)	(0.014)	(0.016)
Observations	6,384	7,235	9,001	10,165
R-squared	0.048	0.047	0.041	0.036
Quartile	1	2	3	4
Mean	0.102	0.092	0.082	0.080

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix Table 6: Preterm Births, stratified by income quartile

	(1) Preterm	(2) Preterm	(3) Preterm	(4) Preterm
Independent*Post-election	-0.008	0.036**	-0.005	0.027*
	(0.022)	(0.017)	(0.018)	(0.014)
Democrat*Post-election	-0.028*	0.032	-0.012	0.008
	(0.016)	(0.019)	(0.017)	(0.013)
Observations	6,382	7,232	8,999	10,164
R-squared	0.063	0.054	0.044	0.038
Quartile	1	2	3	4
Mean	0.102	0.086	0.083	0.081

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix Table 7: Small for Gestational Age, stratified by income quartile

	(1) SGA	(2) SGA	(3) SGA	(4) SGA
Independent*Post-election	-0.024	-0.034*	0.026**	-0.018
	(0.019)	(0.019)	(0.011)	(0.014)
Democrat*Post-election	-0.010	-0.010	0.019	-0.013
	(0.021)	(0.027)	(0.015)	(0.017)
Observations	6,376	7,227	8,995	10,156
R-squared	0.046	0.043	0.033	0.030
Quartile	1	2	3	4
Mean	0.164	0.150	0.137	0.123

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix Table 8: Apgar score, stratified by income quartile

	(1) Apgar	(2) Apgar	(3) Apgar	(4) Apgar
Independent*Post-election	-0.118***	-0.027	0.065*	-0.018
	(0.042)	(0.050)	(0.036)	(0.031)
Democrat*Post-election	-0.101	0.009	0.016	0.019
	(0.062)	(0.049)	(0.040)	(0.037)
Observations	6,361	7,212	8,967	10,140
R-squared	0.077	0.059	0.036	0.034
Quartile	1	2	3	4
Mean	8.704	8.706	8.720	8.743

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1