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ABSTRACT

Political Instability and Birth Outcomes: Evidence from the 1981 Military Coup in Spain[1]

We study the effect of exposure to political instability in-utero on health at birth. We exploit the coup d'état that took place in Spain on February 23, 1981. Although short-lived and unsuccessful, the event generated stress and fear among the population, especially in areas that had suffered more repression during the Civil War and the recent dictatorship. We follow a difference-in-differences strategy and compare birth outcomes before and after the coup, in areas that were differentially "affected". We find that children who were in utero during the coup in more affected areas were born with significantly lower birth-weight (around 9 grams lighter), especially if they were exposed to the coup in the first or second trimester of pregnancy. We contribute to the literature on the effects of maternal stress by focusing on an acute (and relatively common) source of distress that is unlikely to have affected newborn health via other channels.

JEL Classification: I12, J13

Keywords: birth outcomes, birth weight, political instability, military coup

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1. Introduction

We study the effect of exposure to political instability in-utero on health at birth. Political instability defined as "the propensity of a government to collapse" has been shown to have detrimental effects on economic growth through uncertainty (Alesina et al., 1996). Uncertainty has the potential to generate stress and affect mental and ultimately overall health (Aneshensel et al., 1991). Pregnant women are a particularly sensitive group, and their health is intimately linked to their children's birth outcomes, which have been shown to affect later life economic, educational, and health outcomes (see Strauss and Thomas 2007 for a survey).

We estimate the impact of the 1981 military coup in Spain on health at birth. We find that children who were in utero during the coup in more affected areas were born with significantly lower birth-weight, especially if they were exposed to the coup in the first or second trimester of pregnancy.

We contribute to the recent literature on the effects of fetal shocks on infant health (see Almond and Currie 2011and Almond, Currie and Duque 2018), which has examined a wide variety of intrauterine shocks (famines, wars, diseases, environmental toxins, etc). The current frontier of this literature is to focus on comparably more minor shocks that can shed light on the mechanisms driving the adverse effects on infant health. This paper contributes to that frontier as it exploits a shock to political instability, which can be reasonably interpreted as a pure shock to stress, and is arguably not confounded by other factors associated with larger-scale stressful events (e.g. wars, terrorist attacks, and disasters may also lead to changes in resources, incomes, employment opportunities, or institutions).

We exploit an extreme political instability shock, the military coup that took place in Spain on February 23, 1981 (from now on called "23F"). As the coup was ultimately

unsuccessful (and was over after 18 hours), it plausibly did not have substantial impacts on other factors, such as family income, labor markets, or institutions. Thus, it can largely be interpreted as a short-lived stressful event.

A number of recent papers have studied the impact on babies' health of different sources of political conflict, including landmine explosions in Colombia (Camacho, 2008), the September 11 terrorist attacks (Brown 2012, Currie and Schwandt 2016, Berkowitz et al. 2003, Lederman et al. 2004, Lauderdale 2006, Eskenazi et al. 2007), the Palestinian conflict (Mansour and Rees, 2012), and ETA terrorist attacks in Spain (Quintana-Domeque and Rodenas-Serrano, 2014). Our contribution lies in the focus on a different source of stress, which is not a foreign country or terrorist group, but the possibility of a change in the national political regime from democracy to a (violent) dictatorship, a frequent event across the globe. The transfer of power through the use of military force is a commonplace event in world affairs. According to the dataset by Powell and Thyne (2011), since 1950 there have been more than 8 military coups per country, on average, and about half of them resulted in a change in the government.

Why does it matter that we focus on a different source of stress? What new insights do we gain by studying the impacts of a short-lived unsuccessful political coup? An advantage of our setting is that the stress channel is arguably most salient. In other contexts, we might worry about separating out stress from other important mechanisms such as income, physical damages, or environmental toxins. In this sense, we are closer in spirit to Currie and Rossin-Slater (2013), who analyze the effect of hurricane warnings in areas that were not in the end affected by a hurricane.

Although most of the population thought it would succeed (CIS, 1981), the 23F was unsuccessful, which allows us to isolate the effect of the coup itself from the effect of exposure to particular political regimes. The coup had clear time limits: it started at

6:23pm on February 23 with the kidnapping of all members of Parliament, and was over by 12:15pm the following day with their release. This allows for a precise definition of exposure to the coup. The event was covered in real time by the media and it became known to virtually all Spanish citizens within a few hours. According to CIS (1981), 81% of Spaniards declared to have known about the coup before 9 pm of February 23, and 65% reported feeling "scared" or "restless". The perpetrators of the coup were identified and their intentions were clear: they wanted to abolish the recently established democracy and reinstate the previous dictatorial regime.

We use the presence of a mass grave in the locality of residence of the mother as a source of heterogeneity in exposure to the military coup. Mothers who live in municipalities where mass graves have been found are more likely to have family members or acquaintances who were executed by the dictatorial regime. We show that having had family members executed was associated with higher levels of stress during the coup. Moreover, mass graves represent a testimony of political repression which may keep the memories of suppression alive also on those who did not suffer family or social loses. The expectation of suffering reprisals if the coup succeeded clearly may have affected the intensity of the coup experience (the stress generated by the shock). We proxy the expectation (or fear) of suffering reprisals using the presence of mass graves in the municipality of residence.

Using Spanish birth register data, we follow a difference-in-differences specification where we compare the health at birth of children who were in utero at the time of the coup (i.e. born in March-October 1981) with that of children born on the same dates in the previous year (i.e. born before the coup, in March-October 1980), in municipalities with and without mass graves. We control for municipality, month, and year of birth fixed effects, as well as province time trends and parental characteristics.

We find that children who were in the womb in more affected areas at the time of the coup were born with significantly lower birth-weight, especially if they were exposed to the coup in the first or second trimester of pregnancy. Mothers who were pregnant at the time of the coup in municipalities with mass graves gave birth to babies who were 9 grams lighter on average, or almost 2 percent of a standard deviation, and were 0.2 percentage points more likely to have low birthweight babies. These results are robust to the use of the presence of military forces supporting the coup in the municipality of residence as an alternative source of heterogeneity in the intensity of the treatment.

The remainder of the paper is organized as follows. The next section provides some background on the political situation in Spain and the events surrounding the 1981 coup. Section 3 describes the empirical strategy, while section 4 discusses the data sources and presents some descriptive statistics. Section 5 describes the estimated effects on health at birth, and section 6 concludes.

2. The Spanish 1981 Coup

The general and dictator Francisco Franco ruled over Spain from 1939 until his death in 1975. He rose to power during the bloody Spanish Civil War when, with the help of Nazi Germany and Fascist Italy, his Nationalist forces overthrew the democratically elected government of the Second Republic.

Adopting the title of "El Caudillo" (*The Leader*), Franco persecuted political opponents, censored the media, and otherwise exerted absolute control over the country. Some of these restrictions gradually eased as Franco got older, and upon his death, the country transitioned to a constitutional democratic monarchy.

The first democratic elections took place in 1977. The subsequent national elections took place in 1979 under the rules of the recently signed constitution (approved by referendum in 1978). After the elected Prime Minister, Adolfo Suárez, resigned in 1981,

King Juan Carlos I designated Leopoldo Calvo Sotelo as a substitute. The designation of Calvo Sotelo as the country's new Prime Minister needed to be approved by the Spanish elected representatives, who started to vote one by one at 6pm on February 23, 1981. Only 23 minutes later, Lieutenant Colonel Antonio Tejero led a group of 200 armed officers of the Civil Guard that burst into the Spanish Parliament.

Tejero and fellow members of the *Guardia Civil* held deputies and cabinet members hostage. In the meantime (7pm), Lieutenant Colonel Milans del Bosch occupied by force the third biggest city in Spain, Valencia. Many other military divisions were waiting for instructions to surrender. Meanwhile, people ran to collect basic goods in supermarkets, and left-wing parties' affiliates ran to the parties' facilities to burn all documentation that would allow the coup perpetrators to identify them or their colleagues.[2] The coup supporters intended to prosecute leftists and regional nationalists ("independentists"), whose identities had just come to light with the recently instituted democracy. They made lists of "reds" (socialists and communists) and "independentists" they intended to "take for a walk", a euphemism for assassination used by dictatorial regimes in Spain and Latin America. [3]

The public television managed to broadcast the first 30 minutes of the Congress takeover. After the coup perpetrators destroyed the cameras, one radio station managed to continue broadcasting in real time. The fact that most Spaniards spent the night

[2] https://23defebrerode1981.wordpress.com/

[3] A list of 3,000 individuals that coup perpetrators intended to assassinate in the Real Madrid football stadium was made public by the press one year after the coup (Actual Magazin, August 20, 1982). There are also many local public lists available, as every group of dictator followers was expected to elaborate one. The lists were very extensive, including individuals even if they were not officially affiliated to political parties (for instance, those who had participated in cultural events organized in the parties' facilities, or simply believed to have a left-wing ideology).

listening to the radio explains why that night is popularly called "la Noche de Los Transistores" (the night of radio receivers).

At 1:24am the next day, the King gave a nationally televised address in which he denounced the coup and called for the rule of law to be upheld and for the democratically elected government to continue in place. The coup soon collapsed. At 5:45am the military troops abandoned Valencia, at 10am female representatives were allowed to exit Congress, and at 12:15pm male representatives were freed, putting an end to a very stressful 18 hours.[4]

The trial against the coup perpetrators took place in early 1982, and 30 members of the military and the Civil Guard were sentenced to prison. The head of the coup, Lieutenant Colonel Tejero, was sentenced to 30 years.

3. Empirical strategy

Our goal is to estimate the causal impact of in-utero exposure to the military coup on fetal health. Our "treated group" thus includes all newborns who were in utero on February 23, 1981. We define as our control group all newborns who were in utero on the same date of the previous year (February 23, 1980). The control children were all born before the coup. We do not use as controls children who were conceived after the coup, since the coup experience may have affected subsequent conceptions.

On top of the before-after comparison, we use a measure of "exposure", exploiting individual-level heterogeneity in the level of fear and stress generated by the coup. An analysis of survey data (see section 4) reveals that individuals who report their relatives having suffered repression or violence during the Spanish Civil War (1936-39) are also

[4] Soledad Álvarez-Coto, one of the directors of the most popular newspaper in Spanish language, El País, declared in 2016: "I believe the 23-F is the most important moment in the history of this newspaper."
(http://elpais.com/elpais/2016/02/18/eps/1455812618_874352.html)

more likely to report feeling intense fear during the military coup of 1981. As a measure of civilian casualties at the local level during the Spanish Civil War, we use the location of mass graves as reported by the Ministry of Justice (see Figure 1). The underlying assumption, backed up by survey data, is that individuals in municipalities with mass graves would have suffered more stress during the coup. Thus, we follow a difference-in-differences approach, where we compare children who were in utero during the coup to children born before the event, in municipalities with versus without mass graves. In a robustness check, we also use a continuous measure of exposure (the number of corpses in the mass graves in each municipality).

We estimate three equations, progressively more demanding on the data. The first specification is the following:

$$(1) \quad Y_{ilt} = \alpha + \beta_0 Post_t + \beta_1 Post_t MassGraves_l + \gamma X_{ilt} + \mu_l + \gamma_m + \varepsilon_{ilt}.$$

The dependent variable Y is a measure of newborn health such as birth-weight, for individual baby i born in municipality l in month t. *Post* is an indicator for children who were in utero during the coup, and were thus born after (in March-October of 1981). *MassGraves* is an indicator for the presence of mass graves in municipality l, our measure of the intensity of the treatment.

We control for municipality fixed effects (μ) as well as calendar month of birth fixed effects (γ). Thus, we are accounting for any time-invariant differences between municipalities with and without mass graves which may be correlated with fetal health, as well as for any seasonality in health at birth at the national level. We also include characteristics of the mother as well as birth order as controls (X_{ilt}).

The coefficient β_0 captures a potential discrete change in fetal health at the national level between 1980 and 1981 births. This coefficient will capture the overall effect of the

coup on fetal health across the country, but also other time-changing factors or any pre-existing national trends.

Our coefficient of interest is β_l, which captures the difference in mean fetal health between treated and control (1981 and 1980) births, in municipalities with versus without mass graves. If the coup generated stress in the population disproportionately in localities with mass graves, we expect β_l to be negative. Our identifying assumption is that there was no other unobserved factor that affected fetal health in 1981 (relative to 1980), disproportionately in municipalities with and without mass graves.

In our second specification, we control for time effects more flexibly, by controlling for month and year fixed effects (March 1980, April 1980, …, November 1981) instead of calendar month dummies and year indicators separately (see δ in equation 2). We are now unable to estimate the coefficient on *Post* separately, since it is collinear with the month fixed-effects.

(2) $Y_{ilt} = \alpha + \beta_1 Post_t MassGraves_l + \gamma X_{ilt} + \mu_l + \delta_t + \varepsilon_{ilt}$.

In a final set of specifications (equation 3), we also include province-specific linear trends, in order to allow for (smooth) regional variation in the evolution of newborn health over time.

(3) $Y_{ilt} = \alpha + \beta_1 Post_t MassGraves_l + \gamma X_{ilt} + \mu_l + \delta_t + \theta_p t + \varepsilon_{ilt}$

As an alternative identification strategy, we use a different measure of intensity of the treatment, and assume that stress would have been higher in the provinces of Madrid and Valencia. The coup took place in Madrid (the capital), and military troops took to the streets in Valencia. The physical proximity to the troops plausibly could have made the population more afraid.

In addition, we estimate specifications where we split the treatment indicator into three, depending on the trimester of pregnancy when the coup took place, thus trying to

estimate potential heterogeneous effects depending on the stage of the pregnancy when the stressful event hit.

4. Data and summary statistics

We use birth-certificate micro data provided by the Spanish National Statistical Institute in order to measure health at birth at the individual level. These data cover the universe of registered births in Spain annually, and include individual-level information on the month of birth and the municipality of residence of the mother, as well as several birth outcomes and a number of demographic characteristics of the parents. Our main sample includes children born in 1980 and 1981.

Our main measure of fetal health is birth-weight. We report results for weight in grams, as well as its natural log, and a dummy indicating birth-weight below 2,500 grams (low birth-weight). Additional measures of newborn health include normal birth, weeks of gestation, prematurity, and 24-hour mortality. We also observe stillbirths (late fetal deaths).

Since we do not observe the exact date of birth in our main data, we use month of birth to define the relevant sample. We define as "treated" all children whom we can be certain were in utero on February 23, 1981. All children born in March-September 1981, as well as the vast majority of October 1981 births, would have been conceived before February 23, thus they are considered "treated".[5] We exclude all November and December births since conception could have taken place after the coup. We apply the same restrictions to 1980 births, which are included as our control group.

[5] A fetus conceived on February 22, 1981 (i.e. one day before the coup) would turn 36 gestational weeks on October 18, and 39 weeks on November 8. 97% of all children in the relevant period (for whom information on weeks is available) were born with at least 36 weeks of gestation, and the most common gestational ages at birth are 39 and 40 weeks.

We were able to obtain the exact date of birth for most of the sample (except for mothers residing in very small municipalities). In additional specifications, we include February 24-28 births in the treated group (and drop very small municipalities from the sample).

We restrict the sample to singleton births with mothers aged 15 to 49, and we exclude observations with less than 26 weeks of gestation, and birth-weight below 500 or above 6,500 grams (we drop 1.87% of the sample for all these reasons combined). Our main sample includes 530,617 observations with information on birthweight.

We collect data on mass graves by municipality from the Spanish Ministry of Justice, and we merge them with the birth registers by place of residence of the mother.[6] Mass graves are burial sites where the remains of people who disappeared under violent circumstances during the Civil War and the subsequent political repression have been found. Most of the victims belong to the defeated Republican army and its supporters. According to Espinosa Maestre (2006), the number of victims among Republicans was 129,472.[7] Historians agree that a significant proportion of victims occurred after the Civil War. At the end of the war, the number of political prisoners incarcerated in Spanish prisons was above 270.000. Álvaro Dueñas (2009) estimates that at least 50,000 opponents of the Dictatorship were executed after the Civil war. Guzmán (1978) considers that the right figure is close to 200,000. In contrast, the number of war casualties among Dictator followers was estimated to be 38,563 (Espinosa Maestre, 2006).

[6] The data are publicly available at the following link: https://mapadefosas.mjusticia.es/exovi_externo/CargarInformacion.htm. The information on the number of individuals in each mass grave is available only for 1,510 graves.

[7] Many historians consider this figure a lower bound. Preston (2012) estimated that the number of victims among the defeated was approximately 180,000.

The number of mass graves in our data is 2,640.[8] The average number of buried individuals per grave is 38.6. Mass graves are geographically located by assigning them to the closest populated area. The location of mass graves across Spain is illustrated in Figure 1. There is significant heterogeneity in the geographical distribution of mass graves. The regions with the highest concentration of mass graves are Andalucía, Aragón, Asturias, and Murcia.

Table 1 reports descriptive statistics for our main sample. There are 742,155 births recorded during the relevant period (March-October of 1980 and 1981), and we observe birth-weight for 530,786 of them (72%), and weeks of gestation for 459,015 (62%). We test for birth-weight and gestation weeks missing at random in section 5.

Average birth-weight in our sample is 3,396 grams, and about 3% of newborns weighed less than 2,500. Average gestational age is 38 weeks, and 3% of births are premature (born with less than 36 weeks of gestation). About 1% of children die within the first 24 hours.

As individual-level controls, we include the age of the mother, her marital status, whether she reports working in a high-skilled occupation, and the parity of the child. Average maternal age is 27, almost 96% of the mothers are married, and only 6% of them hold a high skill occupation. The average baby represents the second live birth to the mother.

Regarding exposure to the coup, 61% of babies were born in municipalities with mass graves, and 18.5% were born in the provinces of Valencia and Madrid. Out of the 48% of

[8] One may be concerned that some mass graves exist but have not been discovered yet. Mass graves often become known because inhabitants of the nearest municipalities report them. Those mass graves that have not been registered yet are probably not known to inhabitants and thus, mothers residing in those municipalities are probably less aware of previous repression by the dictatorial regime. This makes them part of our control group.

babies who were exposed to the coup, 12%, 18%, and 19% were exposed in the first, second and third trimesters, respectively.

5. Results

Our main results for the causal effect of exposure to the military coup in utero on birth-weight are illustrated graphically in Figure 2. We simply plot average birth-weight by month of birth, for 1980 and 1981 births, splitting them by the presence of mass graves in the municipality. We observe no significant differences in birth-weight across the two groups of municipalities in 1980 (left panel). Birth-weight appears to be significantly lower among early 1981 births (right panel), which would be consistent with a national-level negative effect of the coup. We also observe that in 1981 (except for March), birth-weight is lower in provinces with mass graves, and this difference is significant for June and July births (who would have been in the second trimester of pregnancy on February 23).

Before presenting our main regression results, we next provide evidence supporting our assumption that individuals who lived in municipalities with mass graves felt more stress during the 23F military coup. We use survey data from CIS (National Sociological Research Center) collected in 2008. The data are described in Table A1 of the Appendix. Our main dependent variable is a dummy indicating whether the surveyed individual feared a civil war on 23F. Other available information includes individuals' age, gender, region of residence, and political ideology. Crucial for our analysis, the survey also collected information on whether a respondent's relatives or friends suffered repression during the Civil war and the dictatorship. The results of regressing fear during the coup on all the above-mentioned variables (see Table A2) show that having friends or relatives who suffered repression is associated with individuals experiencing more fear during the coup.

Table 2 presents our main regression results for the causal effect of exposure to the military coup in utero on birth-weight. We report coefficients β_0 and β_1 (see equation 1). Each column reports the results of a different regression, and each panel is for a different dependent variable (birthweight in levels and in logs, and a low-birthweight indicator). For each of the three outcome variables, we report the results from the three specifications (see section 4), for our main sample (March-October births), as well as alternative samples that exclude October (since some October births may have been conceived after February 23) or include November (since some November births were conceived before the coup).

Column 1 presents the results of estimating equation (1) in our main sample. We find that children born after the coup were significantly smaller than the control births (Panel A), by about 8 grams (or 0.22 log points). This was particularly pronounced in municipalities with mass graves, with an interaction coefficient of a similar size. We find no significant effects on the fraction with low birthweight (Panel C).

The results are robust when we exclude October-born children or include November-born children (columns 2 and 3, respectively). The magnitude of the main coefficient of interest becomes smaller when we include November births, as expected since some of those were not exposed to the coup in utero (they were conceived after).

Columns 4 to 6 report the results of estimating equation (2). Our estimates of β_1 are very similar. Affected children were born almost 8 grams smaller than control ones, but there is no significant difference at the bottom of the birthweight distribution (Panel C). Finally, columns 7 to 9 display the results from our most restrictive specification (equation 3), where we control for 50 province-specific linear trends. Our coefficient of interest remains around the same magnitude, and precision increases slightly.

Our results suggest that in-utero exposure to the coup led to children born about 9 grams smaller in the more affected municipalities relative to the rest, with a total effect about twice as large. The effect of 9 grams is equivalent to 0.3% of the average birthweight, or almost 2% of a standard deviation. The magnitude of the estimated effect is similar to the coefficient associated with having a high-skilled mother.

Compared to previous literature, our estimated effect is higher than the one in Mansour and Rees (2012)'s study of the impact of the Palestinian conflict. They found that an additional conflict-related fatality 0-2 months before birth is associated with a reduction of 2.1 grams in birth weight. Our estimates are also high with respect to Quintana-Domeque and Rodenas-Serrano (2014)'s study of the effect of terrorist attacks in Spain. They estimated that in-utero exposure to terrorism early in pregnancy (1st trimester) reduces birth weight by 0.3 grams. Our coefficient is more similar to Camacho (2008)'s study of landmine explosions in Colombia. She found a significant decrease of 8.7 grams in weight for a baby experiencing stress in utero due to landmine explosions in the municipality of residence. Finally, we are also aligned with Brown (2012)'s findings that infants in utero during the 9/11 attacks were 5-15 grams smaller. Overall, our results are comparable in magnitude to those in the previous literature.

Robustness checks

In an alternative specification, we use the number of victims in each municipality's mass graves (in 1,000's) as the exposure variable (instead of the binary indicator for presence of a mass grave). As shown in Table A3 in the Appendix, the sign of the estimates is consistent with the main specification, and the coefficients remain significant in most specifications (both for birthweight in levels and logs). Results indicate that one thousand more victims in the municipality of residence make babies exposed to the coup around 2.5 grams lighter.

Birthweight is considered a key measure of neonatal health. It has been shown to have long-lasting impacts on adult height, IQ, education, and labor market outcomes (Behrman and Rosenzweig, 2004; Black, Devereux, and Salvanes, 2007). For this reason, we focus our analysis on birthweight. However, we also explore other neonatal health outcomes that are available in our data. In particular, we exploit information on late fetal death, normality (absence of abnormal conditions in the fetus at birth), prematurity (born with 36 weeks of gestation or less), late gestation (born with 41 weeks of gestation or more), mortality, sex, and number of births. Table A4 in the Appendix shows that we do not detect an effect of the coup on any of those outcomes, perhaps due to the fact that most of them relate to mortality, which is a rare event. However, all coefficients associated with being born after the coup point in the direction that the average baby born after the coup had worse health at birth than those born before the coup.

Table 3 presents the results of the most complete specification (equation 3), where the regressors capturing exposure to the coup are split in three depending on whether babies were exposed to the coup in the first, second, or third trimester of pregnancy. For each outcome, we present two sets of results: the first excludes October births under 34 gestational weeks, while the second excludes all October births.

Results are very similar across specifications and show that our results are driven by babies who were exposed to the coup in the second trimester of pregnancy. The most restrictive sample (column 2) suggests that the effect is also present for babies exposed to the coup in the first trimester.

To check the robustness of our results by trimester of pregnancy, we split the sample by trimester of exposure, and estimate three separate regressions. In practice, we replicate equation (3), but substitute exposure to the coup during pregnancy by dummies for exposure to the coup in a specific trimester. Results in Table A5 confirm that our effects

are driven by babies who were affected by the coup in the first and second trimesters of pregnancy.

As mentioned before, we also check the consistency of our results with those obtained using a different measure of intensity of exposure to the coup. Table 4 shows the result of interacting the coup indicator with a dummy for residents in Madrid and Valencia, the two cities that were occupied by military forces. Again, we show the results for two different samples for each health outcome. The results are highly consistent across specifications, and show that the coup reduced birth-weight in Madrid and Valencia compared to the rest of Spain, by a magnitude between 24 and 38 grams (1% decrease in birth weight and 0.7-0.8 percentage point increase in the incidence of low birth weight).

We also use the Madrid and Valencia measure of intensity of the coup experience to study differences in the effects of the coup across trimesters of pregnancy. Results in Table 5 support the conclusion that the strongest effects are experienced by mothers who were in the first and second trimester of pregnancy during the coup. However, we now also find significant negative effects of the coup on babies' health for mothers who were in the third trimester of pregnancy.

Our birth register data started to be systematically collected in 1975. The information on weeks of gestation was added to the forms in 1980, and it took some time until all local authorities collected it, hence it is not available for all babies in our sample. We check the consistency of our results with those obtained using the subsample of birth registers for which there is information on weeks of gestation. Although results shown in Table A6 in the Appendix are more imprecise, the estimates corroborate our conclusions that the military coup worsened neonatal health. These results need to be interpreted with caution because results in Table A7 show that, while birthweight information is arguably missing

at random, there is evidence that births affected by the coup are less likely to have information on gestational weeks.

One may be concerned about sorting of mothers with certain characteristics into areas with and without mass graves before and after the coup. As family characteristics influence neonatal health, such sorting could influence our estimates of the effect of the coup on birthweight. In Table A8 of the Appendix, we show that there is no significant association between a range of maternal characteristics and the interaction of "Post" and "Mass Graves".

The effect of the coup may differ across babies with different family characteristics. From a policy perspective, it is relevant to identify the most vulnerable children. We next explore the impact of the coup on babies' health for different subsets of babies, according to their family characteristics. For simplicity, we focus on the impact of the coup on birthweight as estimated in the specifications including month fixed effects and province time trends, and focus on babies born between March and October (inclusive). The average decrease in birth weight is 9.35 grams for the entire sample. When comparing this estimate with those from the different subsamples in Table 6, we conclude that the effect is stronger for first-born children (last column). This finding is consistent with previous evidence that birth order mediates the impact of in utero insults on birthweight (Aparicio, González and Vall-Castellò, 2020).

Finally, we also explore the effect of in-utero exposure to the coup on long-term outcomes. We use Labor Force Survey data, which includes information on month and province of birth (province is more aggregated than municipality). We now measure exposure to the coup using the proportion of mothers of babies born in each month exposed to mass graves in each province. Results in Table 7 show that children more exposed to the coup in utero were less likely to graduate from high-school, and were less

likely to be in the labor force 38 years later (in 2019). They were also less likely to be married, but this coefficient is not statistically significant. The coefficients on the coup have different signs, which may be explained because babies with a value of "post-coup" equal to one belong to a younger and hence more educated generation.

Our results for long-term outcomes are in line with Aizer et al. (2016)'s findings that in-utero exposure to elevated levels of stress negatively affects offspring cognition, health, and educational attainment. We also highlight that, according to the results in Persson and Rossin-Slater (2018), one potential channel for our long-term results is mental health. They find that in utero exposure to severe stress, as measured by the death of a maternal close relative, has lasting consequences on mental health in adulthood.

The effect of the 23F military coup on birth-weight is likely to explain the effect of the coup on long-term outcomes. According to estimates in Behrman and Rosenzweig (2004), an additional gram of birth weight implies an increase of 0.47 in years of schooling, 0.215 more BMI, 1.09 additional inches in adult height, and an increase of 0.14 in log-wages.

6. Conclusions

Previous literature shows that extreme events like wars, terrorist attacks, famines, and natural disasters have detrimental effects on neonatal health. Extreme events often imply increases in the levels of stress of the population, but they also carry the destruction of wealth, income, natural resources, labor market opportunities, and institutions. Hence, it is difficult to disentangle to which extent the detrimental effects of extreme events can be explained by maternal stress.

In this paper, we identify a political episode that due to its characteristics (short-lived and unsuccessful) represented a shock to the level of stress of the population, but did not affect other variables: the 1981 Military Coup in Spain. As the coup intended to reinstitute

the previous dictatorial regime, we find that individuals with previous experiences of dictatorial repression felt more scared during the coup. We then exploit this heterogeneity in exposure to the coup to identify its impact on neonatal health, and find that it affects birthweight negatively and significantly.

The negative effect of the military coup on babies' health is robust to the use of different measures of intensity of the coup experience and exposure to the coup. The estimated effect is particularly strong for babies who were affected by the coup in the first and second trimesters of gestation.

Our paper shows that pregnant women who experience extreme political instability shocks are particularly sensitive, and hence especially in need of health care. Our results suggest that part of the negative implications of extreme events on neonatal health can be explained by stress. Therefore, interventions to counteract these undesirable effects may include psychological support to pregnant women (e.g., post-traumatic stress disorder treatments).

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Tables and Figures

Table 1. Descriptive statistics

Variable	Mean	Std. Dev.	Min	Max	N
Birth weight	3,395.782	503,139	500	6000	530,786
Low birth weight (<2,500g.)	0.031	0.173	0	1	530,786
Normality	0.959	0.198	0	1	742,155
Gestational weeks	38.06	2,188	26	45	459,015
Premature (<36w.)	0.03	0.172	0	1	459,015
Premature (<37w.)	0.335	0.472	0	1	459,015
Mortality 24h.	0.01	0.101	0	1	742,155
Late fetal death	0.007	0.084	0	1	742,155
Male	0.521	0.5	0	1	742,155
Age of the mother	27.115	5,705	15	49	742,155
Married mother	0.958	0.2	0	1	742,155
High skilled mother	0.063	0.242	0	1	742,155
Birth order (only live)	1.95	1.119	0	5	742,155
Mass graves	0.609	0.488	0	1	742,155
Valencia or Madrid (prov.)	0.185	0.389	0	1	742,155
1981 birth	0.484	0.5	0	1	742,155
1981 birth, 1st trim.	0.118	0.322	0	1	742,155
1981 birth, 2nd trim.	0.181	0.385	0	1	742,155
1981 birth, 3rd trim.	0.186	0.389	0	1	742,155
Year of birth	1,980.50	0.5	1,980	1,981	742,155
Month of birth	6.5	2,278	3	10	742,155

Source: Birth-certificate data for 1980 and 1981, Spanish Statistical Institute. Mass graves information is from the Spanish Ministry of Justice.
Notes: The sample is restricted to singleton births in March-October of each year, with mothers aged 15 to 49. We exclude observations with less than 26 weeks of gestation, birth-weight below 500 or above 6,500 grams, and October births with less than 34 weeks of gestation.

Table 2. The effect of the coup on birthweight

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A. Birthweight									
Post	-7.706***	-10.15***	-8.479***						
	(2.380)	(2.611)	(2.235)						
Post*MassGraves	-7.720**	-7.472*	-6.253*	-7.722**	-7.512*	-6.260*	-9.354***	-9.375**	-8.892***
	(3.807)	(3.866)	(3.608)	(3.791)	(3.860)	(3.588)	(3.448)	(3.745)	(3.218)
Panel B. Log(birthweight)									
Post	-0.00224***	-0.00302***	-0.00242***						
	(0.000751)	(0.000815)	(0.000707)						
Post*MassGraves	-0.00261**	-0.00247**	-0.00223**	-0.00261**	-0.00248**	-0.00223**	-0.00298***	-0.00298**	-0.00291***
	(0.00118)	(0.00120)	(0.00111)	(0.00117)	(0.00119)	(0.00111)	(0.00107)	(0.00116)	(0.001000)
Panel C. Low birthweight									
Post	0.000147	0.000277	0.00006						
	(0.000856)	(0.000862)	(0.000847)						
Post*MassGraves	0.00170	0.00164	0.00170	0.00171	0.00165	0.00171	0.00129	0.00156	0.00165*
	(0.00124)	(0.00128)	(0.00115)	(0.00124)	(0.00127)	(0.00115)	(0.00108)	(0.00112)	(0.000989)
N. observations	530,617	464,019	590,892	530,617	464,019	590,892	530,617	464,019	590,892
N. municipalities	6,970	6,806	7,066	6,970	6,806	7,066	6,970	6,806	7,066
Sample	Mar-Oct	Mar-Sept	Mar-Nov	Mar-Oct	Mar-Sept	Mar-Nov	Mar-Oct	Mar-Sept	Mar-Nov
Cal month FE	Y	Y	Y	N	N	N	N	N	N
Month FE	N	N	N	Y	Y	Y	Y	Y	Y
Prov. time trends	N	N	N	N	N	N	Y	Y	Y

Notes: Each column displays the results of a different regression, and each panel is for a different dependent variable. The base sample includes all singleton live births in March-October of 1980 and 1981 (mothers 15-49, birthweight 500-6,500g., gestational weeks above 25). All regressions control for age of the mother, a married dummy, a

single-mother dummy, three indicators for the education level of the mother, birth order indicators, and municipality fixed effects. Robust standard errors clustered at the municipality level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 3. The effect of the coup on birthweight by trimester of exposure

	Birthweight		Log(birthweight)		Low birthweight	
	(1)	(2)	(3)	(4)	(5)	(6)
Post (1981 births) 1st trim	-44.666***	-11.642	-0.017***	-0.004	0.025***	0.009**
	(10.034)	(12.187)	(0.003)	(0.004)	(0.003)	(0.004)
Post (1981 births) 2nd trim	-53.598***	-16.787	-0.02***	-0.006*	0.025***	0.009***
	(10.794)	(11.567)	(0.003)	(0.004)	(0.003)	(0.003)
Post (1981 births) 3rd trim	-61.81***	-25.509***	-0.022***	-0.008***	0.024***	0.008***
	(6.803)	(8.498)	(0.002)	(0.003)	(0.002)	(0.002)
Post*Mass graves 1st trim	-8.025	-12.666*	-0.002	-0.004*	0.0003	0.002
	(5.127)	(6.82)	(0.002)	(0.002)	(0.002)	(0.002)
Post*Mass graves 2nd trim	-11.649**	-11.829**	-0.004**	-0.004**	0.002	0.002*
	(4.709)	(4.906)	(0.001)	(0.002)	(0.001)	(0.001)
Post*Mass graves 3rd trim	-5.259	-4.847	-0.002	-0.002	0.0007	0.0009
	(4.387)	(4.642)	(0.001)	(0.001)	(0.001)	(0.001)
N	527,604	462,788	527,604	462,788	527,604	462,788

Notes: Each column displays the results of a different regression. The dependent variable is shown in the column header. The sample includes all singleton live births in March-October of 1980 and 1981 (mothers 15-49, birthweight 500-6,500g., gestational weeks above 25). For each dependent variable, the first specification excludes October births with under 34 gestational weeks, while the second excludes all October births. Control variables include province*month*year FE, year of birth FE, month of birth FE, three indicators for the age range of the mother, a married dummy, a single-mother dummy, three indicators for the skill level of the mother, birth order FE, and municipality FE. Robust standard errors clustered at the municipality level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 4. The effect of the coup on birthweight: Madrid and Valencia

	Birthweight		Log(birthweight)		Low birthweight	
	(1)	(2)	(3)	(4)	(5)	(6)
Post (1981 births)	-312.204***	-26.884***	-0.113***	-0.009***	0.123***	0.007***
	(35.875)	(8.662)	(0.011)	(0.003)	(0.012)	(0.002)
Post*(Madrid & Valencia)	-24.036***	-38.301***	-0.009***	-0.013***	0.008**	0.007**
	(9.213)	(10.452)	(0.003)	(0.003)	(0.003)	(0.003)
N	527,604	462,788	527,604	462,788	527,604	462,788

Notes: Each column displays the results of a different regression. The dependent variable is shown in the column header. The sample includes all singleton live births in March-October of 1980 and 1981 (mothers 15-49, birthweight 500-6,500g., gestational weeks above 25). For each dependent variable, the first specification excludes October births with under 34 gestational weeks, while the second excludes all October births. Control variables include province*month*year FE, year of birth FE, month of birth FE, three indicators for the age range of the mother, a married dummy, a single-mother dummy, three indicators for the skill level of the mother, birth order FE, and municipality FE. Robust standard errors clustered at the municipality level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 5. The effect of the coup on birthweight: Madrid and Valencia, by trimester

	Birthweight		Log(birthweight)		Low birthweight	
	(1)	(2)	(3)	(4)	(5)	(6)
Post (1981 births) 1st trim	-38.463***	-2.98	-0.015***	-0.002	0.023***	0.007*
	(9.542)	(12.062)	(0.003)	(0.004)	(0.003)	(0.004)
Post (1981 births) 2nd trim	-53.012***	-11.464	-0.02***	-0.004	0.025***	0.009***
	(9.571)	(10.67)	(0.003)	(0.003)	(0.003)	(0.003)
Post (1981 births) 3rd trim	-58.03***	-17.574*	-0.021***	-0.006**	0.023***	0.006**
	(6.562)	(9.075)	(0.002)	(0.003)	(0.002)	(0.003)
Post*(Madrid & Valencia) 1st trim	-57.553***	-83.123***	-0.019***	-0.026***	0.01*	0.015**
	(17.508)	(23.222)	(0.006)	(0.007)	(0.006)	(0.007)
Post*(Madrid & Valencia) 2nd trim	-40.716***	-63.489***	-0.013***	-0.02***	0.009*	0.011*
	(15.271)	(17.837)	(0.005)	(0.005)	(0.005)	(0.006)
Post*(Madrid & Valencia) 3rd trim	-36.472***	-54.703***	-0.012***	-0.018***	0.009**	0.01**
	(11.201)	(13.745)	(0.004)	(0.004)	(0.004)	(0.004)
N	527,604	462,788	527,604	462,788	527,604	462,788

Notes: Each column displays the results of a different regression. The dependent variable is shown in the column header. The sample includes all singleton live births in March-October of 1980 and 1981 (mothers 15-49, birthweight 500-6,500g., weeks above 25). For each dependent variable, the first specification excludes October births with under 34 gestational weeks, while the second excludes all October births. Control variables include province*month*year FE, year of birth FE, month of birth FE, three indicators for the age range of the mother, a married dummy, a single-mother dummy, three indicators for the skill level of the mother, birth order FE, and municipality FE. Robust standard errors clustered at the municipality level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 6. Heterogeneity of the effect of the coup on babies' health

	Young Mother	Middle Age Mother	Married Mother	Registered Dad	Mother No High-Skill	Father No High-Skill	None High-Skill	No Siblings
Post*Mass graves	-9.954*	-9.602**	-8.719**	-8.670**	-8.899**	-8.420**	-8.928**	-13.31***
	(5.296)	(4.305)	(3.533)	(3.469)	(3.552)	(3.736)	(3.497)	(4.976)
Observations	191,113	293,109	513,239	520,713	493,389	462,826	509,569	231,014
N. municipalities	5,550	6,269	6,941	6,955	6,911	6,859	6,933	6,003

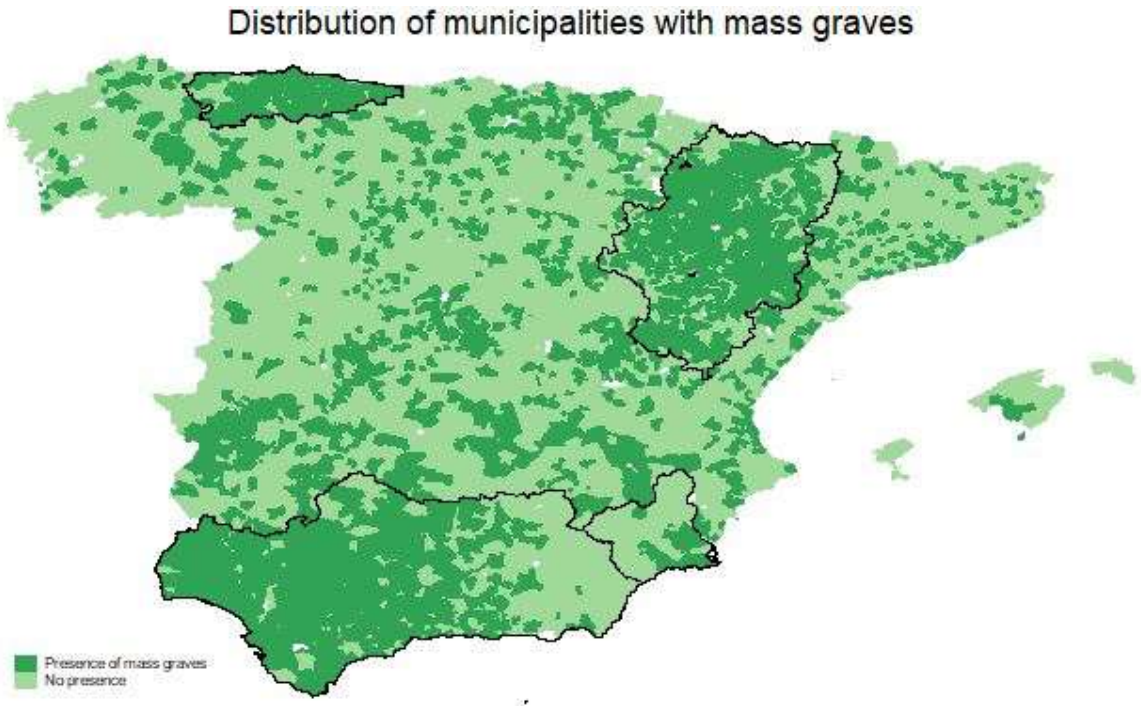
Notes: Each column displays the results of a different regression. The dependent variable is birth weight. The sample includes all singleton live births in March-October of 1980 and 1981 (mothers 15-49, birthweight 500-6,500g., gestational weeks above 25) with the characteristic displayed in the column header. Control variables include province*month*year FE, year of birth FE, month of birth FE, and municipality FE. Robust standard errors clustered at the municipality level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 7: The effect of the coup on long-term outcomes

	Married	High-school	University	Employed	In labor force
Post*Mass graves	-0.0864	-0.0935*	-0.0100	-0.0552	-0.0612***
	(0.0637)	(0.0509)	(0.0521)	(0.0517)	(0.0218)
Post	0.0244	0.0793*	0.0202	0.0251	0.0320**
	(0.0368)	(0.0400)	(0.0360)	(0.0316)	(0.0148)
Constant	0.466***	0.756***	0.575***	0.929***	0.937***
	(0.0355)	(0.0289)	(0.0276)	(0.0192)	(0.0133)
Observations	9,598	9,598	9,598	9,598	9,598
R-squared	0.035	0.037	0.032	0.034	0.021

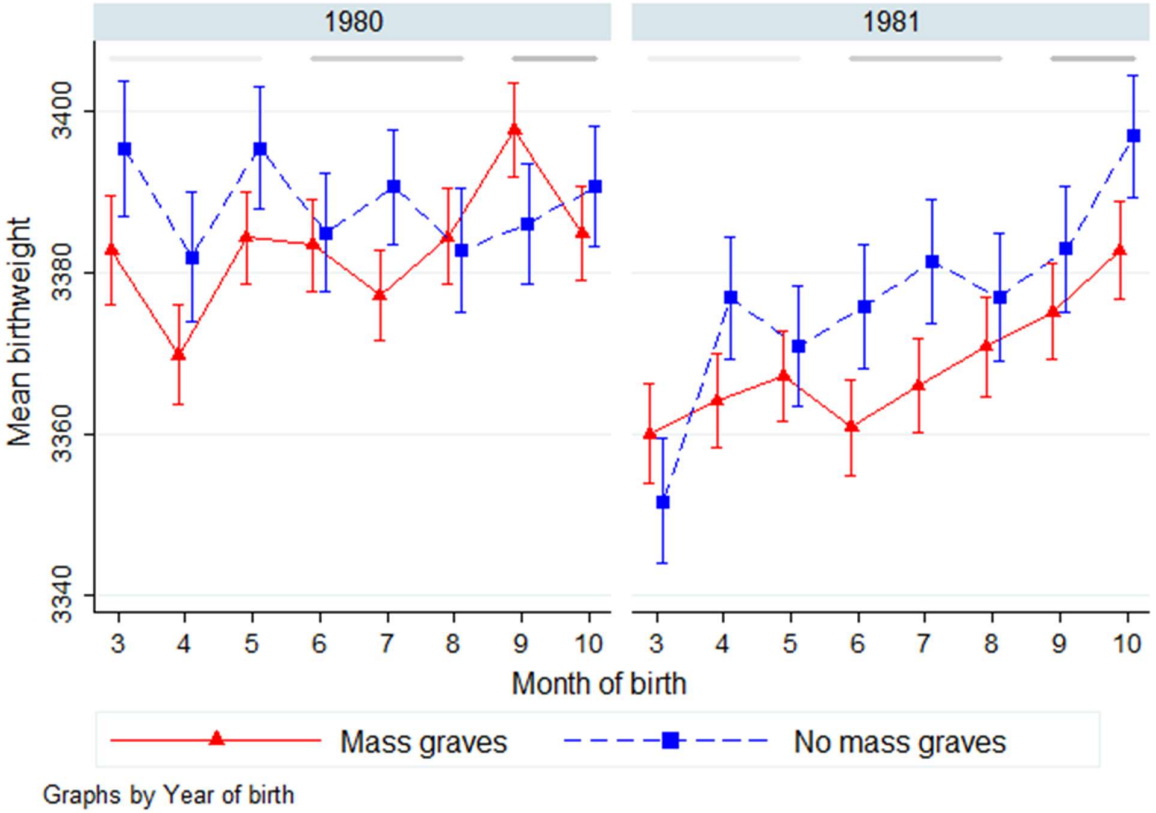
Notes: Data are from the 2019 Spanish Labor Force Survey. The sample includes individuals born in March-October of 1980 and 1981. All regressions control for province dummies. Observations are weighted using population weights. Robust standard errors clustered at the province level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Figure 1. Location on mass graves in Spain



Source: Spanish Ministry of Justice. Notes: the Canary Islands, Ceuta and Melilla are not depicted in the map

Figure 2. Mean birth-weight by month of birth and mass graves in municipality



Source: Spanish birth register data and mass graves data from the Ministry of Justice.

APPENDIX

Table A1. Descriptive statistics Historic Memory survey

Variable	Mean	Std. Dev.	Min	Max	N
Feared civil war on 23F	0.105	0.306	0	1	2,936
Age	47.176	18.159	18	99	2,936
Female	0.511	0.5	0	1	2,936
Identifies with right wing parties	4.39	1.745	1	10	2,435
Ring wing (missing values)	0.171	0.376	0	1	2,936
Ring wing (missing values incl.)	3.641	2.292	0	10	2,936
# relatives/friends suffered repression	1.546	1.104	0	4	2,936
Degree of nationalism	2.359	3.275	0	10	2,790
Identifies as Spanish (inv. Scale)	1.963	1.075	1	5	2,783
Andalucia, Aragon, Asturias, Murcia	0.168	0.374	0	1	2,936

Source: CIS (National Sociological Research Center) survey, 2008

Table A2. Regressions for fear at the time of the coup

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Age	0.0145***	0.0139***	0.0143***	0.0138***	0.0144***	0.0140***	0.0139***
	(0.0017)	(0.0017)	(0.0017)	(0.0017)	(0.0018)	(0.0018)	(0.0017)
Age^2	-0.0001***	-0.0001***	-0.0001***	-0.0001***	-0.0001***	-0.0001***	-0.0001***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Female	-0.0262*	-0.0230*	-0.0250*	-0.0224*	-0.0267*	-0.0259*	-0.0222*
	(0.0110)	(0.0111)	(0.0110)	(0.0110)	(0.0114)	(0.0115)	(0.0110)
Right wing (missing value)		-0.0921***		-0.0812***	-0.0747**	-0.0864***	-0.0838***
		(0.0215)		(0.0217)	(0.0237)	(0.0233)	(0.0217)
Right wing		-0.0121***		-0.0108**	-0.0120**	-0.0129***	-0.0112**
		(0.0035)		(0.0035)	(0.0036)	(0.0037)	(0.0035)
Repression Civil War and Dictatorship			0.0189**	0.0159**	0.0176**	0.0161*	0.0154**
			(0.0050)	(0.0051)	(0.0053)	(0.0053)	(0.0051)
Nationalism					-0.0031+		
					(0.0018)		
Spanish identity						-0.0113*	
						(0.0056)	
Regions with mass graves							0.0327*
							(0.0147)
Constant	-0.2804***	-0.2138***	-0.3020***	-0.2393***	-0.2417***	-0.2079***	-0.2444***
	(0.0402)	(0.0433)	(0.0405)	(0.0440)	(0.0459)	(0.0486)	(0.0441)
N	2,936	2,936	2,936	2,936	2,790	2,783	2,936

Notes: Regions with mass graves are Andalucía, Aragon, Asturias, and Murcia. Standard errors in parentheses. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table A3: Intensity of the coup experience measured by number of victims in mass graves

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A. Birthweight									
Post	-13.19***	-15.15***	-12.62***						
	(2.742)	(2.561)	(2.662)						
Post*N.Victims	-2.453***	-2.696***	-2.314***	-2.427***	-2.691***	-2.281***	-0.296	-1.362	0.689
(divided by 1000)	(0.823)	(0.713)	(0.776)	(0.807)	(0. 700)	(0.758)	(1.392)	(1.568)	(1.166)
Panel B. Log (birthweight)									
Post	-0.0042***	-0.0048***	-0.0040***						
	(0.0008)	(0.0008)	(0.0008)						
Post* N.Victims	-0.0007**	-0.0008***	-0.0007***	-0.0007**	-0.0008***	-0.0007***	-0.0001	-0.0004	0.0002
(divided by 1000)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0005)	(0.0005)	(0.0004)
Panel C. Low birthweight									
Post	0.0014*	0.0014	0.0014*						
	(0.0008)	(0.0009)	(0. 0007)						
Post* N.Victims	0.0004	0.0006	0.0004	0.0004	0.0006	-0.0004	0.0001	0.0002	0.0001
(divided by 1000)	(0.0005)	(0.0005)	(0.0004)	(0.0005)	(0.0005)	(0.0004)	(0.0006)	(0.0005)	(0.0005)
N. observations	337,820	295,578	376,128	337,820	295,578	376,128	337,820	295,578	376,128
N. municipalities	1,396	1,376	1,408	1,396	1,376	1,408	1,396	1,376	1,408
Sample	Mar-Oct	Mar-Sept	Mar-Nov	Mar-Oct	Mar-Sept	Mar-Nov	Mar-Oct	Mar-Sept	Mar-Nov
Cal month FE	Y	Y	Y	N	N	N	N	N	N
Month FE	N	N	N	Y	Y	Y	Y	Y	Y
Prov. time trends	N	N	N	N	N	N	Y	Y	Y

Notes: Each column displays the results of a different regression, and each panel is for a different dependent variable. The base sample includes all singleton live births in March-October of 1980 and 1981 (mothers 15-49, birthweight 500-6,500g., gestational weeks above 25). All regressions control for age of the mother, a married dummy, a single-mother dummy, three indicators for the education level of the mother, birth order indicators, and municipality fixed effects. Robust standard errors clustered at the municipality level in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table A4. Effect of the coup on additional birth outcomes

	Late fetal death	**Normality**	**Prematurity**	**Late gest.**	**Mortality**	**Male**
	(1)	(2)	(3)	(4)	(5)	(6)
Post (1981 births)	0.014***	-0.009	0.265***	-0.33***	0.018***	0.005
	(0.003)	(0.012)	(0.022)	(0.067)	(0.003)	(0.028)
Post*Mass graves	-0.0005	-0.0002	0.0003	-0.00008	-0.0001	-1.00E-05
	(0.0003)	(0.002)	(0.001)	(0.016)	(0.0004)	(0.003)
N	742,155	736,939	455,543	455,543	736,939	736,939

Notes: Each column displays the results of a different regression, and each panel is for a different dependent variable. The base sample includes all singleton live births in March-October of 1980 and 1981 (mothers 15-49, birthweight 500-6,500g., gestational weeks above 25). All regressions control for age of the mother, a married dummy, a single-mother dummy, three indicators for the education level of the mother, birth order indicators, and municipality fixed effects. Robust standard errors clustered at the municipality level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A5. The effect of the coup on birthweight by trimester, alternative specification

	Birthweight (1st trim)	**Birthweight (2nd trim)**	**Birthweight (3rd trim)**
	(1)	(2)	(3)
Post (1981 births) 1st trim	-302.847***		
	(38.036)		
Post*Mass graves 1st trim	-13.795**		
	(6.456)		
Post (1981 births) 2nd trim		-27.132	
		(34.795)	
Post*Mass graves 2nd trim		-11.481*	
		(6.111)	
Post (1981 births) 3rd trim			-63.15**
			(24.921)
Post*Mass graves 3rd trim			3.277
			(5.457)
N	130,701	203,693	193,210

Notes: Each column displays the results of a different regression. The dependent variable is shown in the column header. The sample includes September-October born babies in column 1, June-August born babies in column 2 and March-May born babies in column 3 (mothers 15-49, birthweight 500-6,500g., gestational weeks above 25). For each dependent variable, the first specification excludes October births with under 34 gestational weeks, while the second excludes all October births. Control variables include: province*month*year FE, year of birth FE, month of birth FE, three indicators for the age range of the mother, a married dummy, a single-mother dummy, three indicators for the skill level of the mother, birth order FE, and municipality FE. Robust standard errors clustered at the municipality level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A6. Effect of the coup on birthweight, subsample with info on weeks of gestation

	Late fetal death	Birthweight	Log(birthweight)	Low birthweight	Normality	Prematurity	Late gest	Mortality	Male	log(# births)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Post (1981 births)	-0.003	-126.902***	-0.041***	0.027***	0.037***	0.039***	-0.569***	0.001	-0.007	1.935***
	(0.002)	(16.956)	(0.005)	(0.003)	(0.008)	(0.003)	(0.042)	(0.001)	(0.014)	(0.073)
Post*Mass graves	-0.001**	-5.697	-0.002	-0.0003	0.002	0.0008	-0.0006	-0.001*	0.007**	-0.027
	(0.0005)	(4.095)	(0.001)	(0.001)	(0.002)	(0.001)	(0.016)	(0.0005)	(0.003)	(0.019)
N	494,174	410,254	410,254	410,254	490,504	490,504	490,504	490,504	490,504	50,099

Notes: Each column displays the results of a different regression. The dependent variable is shown in the column header. For column 1, the sample includes all singleton births in March-October of 1980 and 1981 (mothers 15-49, birthweight 500-6,500g., gestational weeks above 25). For columns 2-10, the sample includes all singleton live births in March-October of 1980 and 1981 (mothers 15-49, birthweight 500-6,500g., gestational weeks above 25). Control variables include: province*month*year FE, year of birth FE, month of birth FE, three indicators for the age range of the mother, a married dummy, a single-mother dummy, three indicators for the skill level of the mother, birth order FE, and municipality FE. Robust standard errors clustered at the municipality level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Tables A7. Test for birthweight and weeks of gestation missing at random

	Birthweight		Gestational weeks	
	(1)	(2)	(3)	(4)
Post (1981 births)	0.096***	0.095***	0.093**	0.131***
	(0.014)	(0.02)	(0.046)	(0.051)
Post*Mass graves	-0.003	-0.004	-0.031*	-0.04**
	(0.011)	(0.012)	(0.016)	(0.016)
Mother under 25	-0.016***	-0.017***	-0.0008	0.00003
	(0.002)	(0.002)	(0.002)	(0.002)
Mother between 25 and 35	-0.014***	-0.014***	-0.00009	0.0006
	(0.002)	(0.002)	(0.002)	(0.002)
Married mother	-0.107***	-0.107***	-0.056***	-0.055***
	(0.02)	(0.02)	(0.018)	(0.018)
No info on father	0.006	0.004	-0.036**	-0.035**
	(0.02)	(0.021)	(0.018)	(0.018)
Mother in high skill ocupation	-0.06***	-0.061***	-0.015***	-0.013***
	(0.011)	(0.011)	(0.005)	(0.005)
Father in high skill ocupation	-0.06***	-0.059***	-0.002	0.0003
	(0.011)	(0.01)	(0.003)	(0.003)
Both parents high skill	0.019***	0.019***	-0.005	-0.008
	(0.006)	(0.006)	(0.004)	(0.005)
N	742,155	652,858	742,155	652,858

Notes: Each column displays the results of a different regression. The dependent variable is shown in the column header. The sample includes all singleton births in March-October of 1980 and 1981 (mothers 15-49, birthweight 500-6,500g., gestational weeks above 25). For each dependent variable, the first specification excludes October births with under 34 gestational weeks, while the second excludes all October births. Control variables include: province*month*year FE, year of birth FE, month of birth FE, three indicators for the age range of the mother, a married dummy, a single-mother dummy, three indicators for the skill level of the mother, birth order FE, and municipality FE. Robust standard errors clustered at the municipality level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A8. The coup, mass graves, and family characteristics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A. Young									
Post	-0.00321	-0.00255	-0.00363*						
	(0.00209)	(0.00234)	(0.00195)						
Post*MassGraves	-0.00152	-0.00161	-0.00121	-0.00153	-0.00161	-6.042*	-7.92e-05	0.000834	-9.75e-05
	(0.00263)	(0.00286)	(0.00252)	(0.00264)	(0.00286)	(3.578)	(0.00294)	(0.00326)	(0.00270)
Panel B. Middle Aged									
Post	0.00481**	0.00427*	0.00545***						
	(0.00200)	(0.00218)	(0.00194)						
Post*MassGraves	0.000367	0.000629	-0.000475	0.000375	0.000631	-6.042*	-2.15e-05	-0.000888	-0.00102
	(0.00257)	(0.00278)	(0.00250)	(0.00257)	(0.00278)	(3.578)	(0.00267)	(0.00298)	(0.00253)
Panel C. Married									
Post	-0.00286***	-0.00243***	-0.00321***						
	(0.000851)	(0.000873)	(0.000797)						
Post*MassGraves	-0.00163	-0.00198	-0.00151	-0.00168	-0.00203*	-6.042*	-0.000821	-0.00120	-0.000655
	(0.00125)	(0.00121)	(0.00119)	(0.00125)	(0.00121)	(3.578)	(0.00122)	(0.00135)	(0.00114)
Panel D. No Dad									
Post	-0.00237***	-0.00225***	-0.00266***						
	(0.000601)	(0.000646)	(0.000592)						
Post*MassGraves	0.000411	0.000747	0.000499	0.000399	0.000741	-6.042*	-0.000132	0.000550	-0.000223
	(0.00101)	(0.00102)	(0.00100)	(0.00101)	(0.00102)	(3.578)	(0.000999)	(0.00104)	(0.000914)
Panel E. Mother High Skilled									
Post	0.000147	0.000277	0.00006						
	(0.000856)	(0.000862)	(0.000847)						
Post*MassGraves	0.00170	0.00164	0.00170	0.00171	0.00165	0.00171	0.00129	0.00156	0.00165*
	(0.00124)	(0.00128)	(0.00115)	(0.00124)	(0.00127)	(0.00115)	(0.00108)	(0.00112)	(0.000989)
Panel F. Father High Skilled									
Post	-0.00224***	-0.00302***	-0.00242***						
	(0.000751)	(0.000815)	(0.000707)						

Post*MassGraves	-0.00261**	-0.00247**	-0.00223**	-0.00261**	-0.00248**	-0.00223**	-0.00298***	-0.00298**	-0.00291***
	(0.00118)	(0.00120)	(0.00111)	(0.00117)	(0.00119)	(0.00111)	(0.00107)	(0.00116)	(0.001000)
Panel G. Both High Skilled									
Post	0.000147	0.000277	0.00006						
	(0.000856)	(0.000862)	(0.000847)						
Post*MassGraves	0.00170	0.00164	0.00170	0.00171	0.00165	0.00171	0.00129	0.00156	0.00165*
	(0.00124)	(0.00128)	(0.00115)	(0.00124)	(0.00127)	(0.00115)	(0.00108)	(0.00112)	(0.000989)
Panel H. Number of Children									
Post	0.000147	0.000277	0.00006						
	(0.000856)	(0.000862)	(0.000847)						
Post*MassGraves	0.00170	0.00164	0.00170	0.00171	0.00165	0.00171	0.00129	0.00156	0.00165*
	(0.00124)	(0.00128)	(0.00115)	(0.00124)	(0.00127)	(0.00115)	(0.00108)	(0.00112)	(0.000989)
N. observations	530,617	464,019	590,892	530,617	464,019	590,892	530,617	464,019	590,892
N. municipalities	6,970	6,806	7,066	6,970	6,806	7,066	6,970	6,806	7,066
Sample	Mar-Oct	Mar-Sept	Mar-Nov	Mar-Oct	Mar-Sept	Mar-Nov	Mar-Oct	Mar-Sept	Mar-Nov
Cal month FE	Y	Y	Y	N	N	N	N	N	N
Month FE	N	N	N	Y	Y	Y	Y	Y	Y
Prov. time trends	N	N	N	N	N	N	Y	Y	Y

Notes: Each column displays the results of a different regression, and each panel is for a different dependent variable. The base sample includes all singleton live births in March-October of 1980 and 1981 (mothers 15-49, birthweight 500-6,500g., gestational weeks above 25). All regressions control for month of birth indicators and municipality fixed effects. Robust standard errors clustered at the municipality level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.