Examining a Most Likely Case for Strong Campaign Effects: Hitler's Speeches and the Rise of the Nazi Party, 1927–1933

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Abstract

Given the devastating historical consequences, Hitler's rise to power amidst an unprecedented propaganda campaign constitutes one of the most notorious cases for campaign effects research. Although contemporary witnesses and historians seem unanimous in recognizing the importance of Hitler's campaign for the electoral success of the Nazi party, empirical evidence is scant. We collected data about Hitler's speeches and gauge their impact on voter support at five national elections preceding the dictatorship. We use a semi-parametric difference-in-differences approach to estimate effects in the face of potential confounding due to the deliberate scheduling of events. Our findings suggest that, while Hitler's speeches appear rationally targeted, their impact on the Nazis' electoral fortunes were negligible. Only the 1932 presidential runoff, an election preceded by an extraordinarily short, intense and one-sided campaign, yields consistent effects. Our findings have repercussions for both modern research into campaign effects and the dominant epistemology of historical explanation.

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Figure 1: On November 21, 1922, The New York Times gave its readers their first glimpse of Adolf Hitler (Brown, 1922).

NEW POPULAR IDOL RISES IN BAVARIA

Hitler Credited With Extraordinary Powers of Swaying Crowds to His Will.

> "I cannot remember in my entire life such a change in the attitude of a crowd in a few minutes, almost a few seconds [. . .] Hitler had turned them inside out, as one turns a glove inside out, with a few sentences. It had almost something of hocus-pocus, or magic about it." —German historian and contemporary witness Karl-Alexander von Müller, on the verge of the *Beer Hall Putsch*, November 8, 1923, quoted in (Gordon, 2015, 288).

> "I am conscious that I have no equal in the art of swaying the masses." —Adolf Hitler in a reported conversation 1932-34 with early co-partisan Hermann Rauschning (1939, 212). The authenticity of these records have been challenged though, see Janssen (1985).

Prologue

On November 11, 1923, almost ten years before the Nazi seizure of power, Adolf Hitler was arrested and subsequently sentenced to five years in prison for his leading role in the Beer Hall Putsch (*Bürgerbräu-Putsch*), a failed coup d'état against the national government. During his detention, Hitler confined the then banned and disintegrating National Socialist German Workers' Party (*Nationalsozialistische Deutsche Arbeiterpartei, NSDAP*) to a drastic strategy change away from a subversive battle group to a vote- and office-seeking political party (Stachura, 1980). As Hitler put it in a personal conversation with Nazi fundraiser Kurt Lüdecke (quoted in Pridham, 1973, 27):

> "Instead of working to achieve power by an armed coup, we shall have to hold our noses and enter the Reichstag [the national parliament] against the Catholic and Marxist deputies. If out-voting them takes longer than out-shooting them, at least the results will be guaranteed by their own constitution."

Hitler was released on parole at the end of 1924 and, reassuring his party's new loyalty to the constitution, achieved that the ban on the NSDAP was lifted. His previous assertions notwithstanding, Hitler held a rabble-rousing public speech at the party's re-launch on February 27, 1925 in Munich's *Bürgerbräukeller*. The regional authorities' reaction came swiftly: another five public appearances were cancelled right away, and on March 9, the Bavarian cabinet issued a two-year gag order against Hitler (Rösch, 2002, 56–68). Many other regional governments, including those of Prussia, Saxony, Hesse, Oldenburg, Anhalt, Hamburg, and Lübeck, followed (Bruppacher, 2012, 159–172). And although the NSDAP was not banned once again, party organs and meetings were subject to increased surveillance. According to police reports, turnout at NSDAP meetings and rallies declined markedly in the subsequent period (Rösch, 2002, 208–210), and the NSDAP's poor results at the state elections in Saxony, Mecklenburg-Schwerin, and Thuringia reinforced the view that "the NSDAP with a Hitler free to speak in public would cause no future concern to the authorities" (Pridham, 1973, 77). On March 6, 1927, the Bavarian government revoked its gag order, and Adolf Hitler would take up his unprecedented campaign activities.

Introduction

In only four years, the NSDAP evolved from a radical fringe group garnering less than three percent of the vote at the 1928 *Reichstag* election into the most popular German party with more than 37 percent of the national vote in July 1932, effectively paving the way for the Nazi takeover in March 1933. Within the same period, later Minister for Popular Enlightenment and Propaganda Joseph Goebbels started to build up the NSDAP's propaganda machine, firmly based on the principles laid out in Hitler's notorious book *Mein Kampf* (1925), which put a heavy emphasis on oratory as a means of mass mobilization (Hitler, 1935, preface):

> "I know that one is able to win people far more by the spoken than by the written word, and that every great movement on this globe owes its rise to the great speakers and not to the great writers."

Hitler certainly was a relentless orator. Between the repeal of the speaking ban on March 6, 1927 and the eve of the *Reichstag* election of March 5, 1933, Hitler had 455 public appearances, with a gross estimated attendance from police reports of at least 4.5 million.[1]

[1]For data sources, estimation procedures and detailed descriptive statistics, see Appendix C. Note that this figure is wide of the 35 million Loebs (2010, 3) gives for 1932 alone.

But to what effect? Presumptive evidence for strong effects is indeed overwhelming: the numerous gag orders already speak volumes about the authorities' beliefs in Hitler's agitatorial potency, there were signs of electoral stagnation and organizational decay when the bans were in force, the unparalleled campaign activities that followed their repeal coincided with a steep electoral rise of the Nazi party, and plenty of reports from contemporary witnesses further corroborate the importance of Hitler's campaign for the Nazis' success (e.g. Abel, 1965). Yet, previous empirical research has largely concentrated on the organization of Nazi propaganda (Anheier, 2003; Flint, 2000; Rösch, 2002; Taylor, 2014), the manipulative techniques employed (Anheier, Neidhardt and Vortkamp, 1998; Herb, 2002; Kahlenberg, 2014; Loebs, 2010; Novak, 2014; Paul, 1990), and its reception in the media (Engelmann, 2004, 2007; Melischek and Seethaler, 2000; Wilke and Sprott, 2009), rather than its effectiveness in eliciting popular support. Only a handful of studies have attempted to systematically assess the effectiveness of early Nazi propaganda in general, and of Hitler's public speeches in particular.[2] Most recently, Adena and her colleagues (2015) measure local exposure to radio broadcasting, using a method for predicting the spatial attenuation of radio signals, and find that exposure was negatively related to NSDAP support *before* the Nazi seizure of power, but positively soon *afterwards* as the party assumed control over the mass media. In line with this finding, the authors also provide evidence that radio content before 1933 was largely pro government and against the Nazis. These results corroborate the portrayal of early Nazi propaganda by later broadcasting director and Goebbels' deputy Eugen Hadamovsky (1933, 44):

> "All the means of public opinion were denied to Hitler. His newspapers were banned, he was denied use of the radio, his brochures and leaflets were confiscated. He had no choice but to reach the masses directly through constantly growing mass rallies."

Ohr (1997*a*) collects data on local party events—not Hitler speeches—in Hessian communities and finds a positive relationship between Nazi campaign activity so measured and changes in municipal Nazi vote shares between the 1930 national and the 1931 regional parliamentary elections. In an earlier study, Ciolek-Kümper (1976) focuses on Hitler appearances, and—roughly—compares changes in ward-level Nazi vote shares at the regional election in Lippe on January 15, 1933 relative to the preceding *Reichstag* election in November 1932. She finds no evidence of the effectiveness of Hitler's intense campaign efforts. In a similar manner, Plöckinger (1999) looks at differences between local- and regional-level Nazi vote shares at the July and November 1932 *Reichstag* elections in Bavaria but does not find any deviations between municipalities visited by Hitler and those that were not. Though inventive, the latter studies are limited in their geographic and temporal scope, and potentially suffer from causality issues which received much less attention at the time these studies were conducted than they do today (see Keele, 2015).

[2] Voigtländer and Voth (2014, 2015) examine the effectiveness of Nazi propaganda *under the dictatorship* 1933-45, using novel data and empirical strategies.

In this study, we revisit the question of how effective early Nazi propaganda was in garnering electoral support in Weimar Germany. Our focus is on Hitler's public speeches as the Nazis' chief campaign tool at that time. We rely on original data that has superior geographic and temporal scope and resolution. We use a semi-parametric difference-in-differences estimation strategy, and we draw on the campaign resource allocation literature to account for often ignored endogeneity problems in the assessment of local campaign effects. Several robustness checks are provided. We conclude with a discussion of the implications of our findings for both the dominant epistemology of historical explanation and modern research into campaign and leader effects.

Estimating campaign effects: problems and strategies

Under the impression of Hitler's rise to power amidst an unprecedented campaign, refugee scholar Paul Lazarsfeld fielded a panel survey during the run-up to the 1940 U.S. presidential election in Erie County, Ohio, which marked the beginning of modern research into campaign effects.[3] The study's findings were surprising—they did not substantiate Lazarsfeld's motivating concern that campaigns could arbitrarily manipulate the public. Instead, the presidential campaign was found to "merely" activate the voters' pre-existing dispositions (Lazarsfeld, Berelson and Gaudet, 1968). Only since the late 1980s, this paradigmatic view of minimal campaign effects has been challenged by scholars using novel data and sophisticated methodologies—laboratory experiments (e.g., Iyengar and Kinder, 1987), rolling surveys (e.g., Johnston et al., 1992), field experiments (e.g., Gerber and Green, 2000), or natural experiments (e.g., Huber and Arceneaux, 2007)—to identify campaign effects in the face of a campaign realm that is characterized by selective exposure to (and perception of) countervailing campaign messages.

While the historical perspective of our research precludes attractive design options that employ randomization or survey data,[4] a number of recent studies try to gauge the impact of candidate appearances on voting behavior, using widely available information about the candidates' campaign itineraries and local-level election results (Campbell, 2008; Herr, 2002; Hill, Rodriquez and Wooden, 2010; Holbrook, 2002; Jones, 1998; King and Morehouse, 2004; Sellers and Denton, 2006; Vavreck, Spiliotes and Fowler, 2002). Such studies typically suffer from identification issues that challenge causal claims. Like any observational study, they are subject to potential confounding (see Goldstein and Holleque, 2010). Confounding would occur, for instance, if candidates and their staff deliberately selected locations for their appearances where they expected a vast pool of easy-to-mobilize supporters, or where they anticipated a close race. If a researcher failed

[3]For an overview of the development of empirical research into campaign effects on political attitudes and behavior, see Brady and Johnston (2006) and Hillygus (2010).

[4]See Collier (1944) for an early (non-randomized) experiment on the attitudinal effects of Nazi propaganda materials on a sample of U.S. college students 1941-42. Also see Reuband (2006), who uses a retrospective survey conducted in 1949 to assess mass support during the Nazi regime.

to properly take into account such confounders (latent support, marginality), she would probably overestimate the effect of appearances on the candidate vote and turnout.[5] We use a semi-parametric difference-in-differences estimation strategy to account for potential confounding due to observed and unobserved variables (see Abadie, 2005; Heckman, Ichimura and Todd, 1997).

Difference-in-differences is a statistical technique to estimate causal effects from repeated cross sections or panel data. In the generic case, we observe the outcomes of two groups at two points in time. Only one of the groups has been exposed to the presumed cause (i.e., the campaign appearance) at time two. Given that group composition is constant across time, the causal effect estimate is the difference in the overtime changes between the two groups. By comparing changes between groups, this estimate removes both biases in time-two comparisons that result from permanent differences between the groups and biases in overtime comparisons in the exposure group that result from common developments in both groups. The *semi-parametric approach* compares each exposure case with one (or a set of) similar controls, and a diff-in-diff estimate is calculated with reference to the matched controls only. Similarity here is understood in terms of a similar probability of exposure. In order to determine the probability of exposure conditional on observable features of the units, parametric models (usually logit or probit) are specified and fitted to the data. Matching then proceeds on the estimated treatment probability or *propensity score* (see Rosenbaum and Rubin, 1983). The main advantage of this semi-parametric approach is that it allows for heterogeneous effects, as long as this heterogeneity is related to the covariates used in the specification of the propensity score model. Another advantage is that it provides simple diagnostics to check whether observed features are balanced between the exposure and the control group (see Abadie, 2005).

Above and beyond potential confounding, such studies of candidate appearances may be considered what epidemiologists call *spatial ecological studies* (Wakefield, 2004). Spatial ecological studies use geographic proximity to a presumed cause (in our case: campaign appearances) as a surrogate for individual exposure to the cause (attendance to the campaign event) and measure the response (voting behavior) at the level of geographic units (communities or counties).[6] A number of additional biases may arise in such a setup. It is well known that, when aggregate data are used to make inferences about individuals, group-level observations can be highly misleading. Even under unconfoundedness (e.g.,

[5]In their original study, Shaw and Gimpel (2012) randomize a candidate's travel schedule during the 2006 Texas gubernatorial race in order to make campaign appearances statistically independent of other factors related to the outcome of interest. While such a randomized field experiment is a powerful design for valid causal inference, even the authors seem surprised that their candidate's staff actually agreed to let scholars interfere in their strategic planning (Shaw and Gimpel, 2012, 140). Moreover, this is an apparently infeasible approach for a retrospective study like ours.

[6]Shaw and Gimpel (2012) field a large-scale survey of registered voters that includes items on both exposure to the campaign events and candidate support. Such data would have allowed them to estimate causal effects of individual exposure by using an instrumental variable approach (see Angrist, Imbens and Rubin, 1996). However, Shaw and Gimpel (2012) limit their empirical analysis to before–after comparisons within and between geographic units.

by random assignment of campaign appearances), higher turnout or voter support in visited localities cannot unambiguously be attributed to increased propensities to turn out and vote for the candidate among those who attended the campaign events. Such aggregate effects may also come about, for instance, in the fashion of an indirect two-step flow of communication (Katz and Lazarsfeld, 1955), in which opinion leaders who would turn out and support their candidate anyway (i.e., for whom the individual effect of attendance is essentially zero) attend the event and are then motivated to mobilize and persuade further supporters within their personal networks (Rosenstone and Hansen, 1993). In our particular case, positive effects of Hitler's campaign visits on local Nazi vote shares might also have occurred indirectly through intimidation. As Childers and Weiss (1990) document, violence was an integral part of Nazi mobilization strategy at the end of the Weimar Republic. Now if Hitler's appearances were regularly accompanied by assaults on political opponents, increases in Nazi vote shares at the upcoming election would also possibly result from selective abstention by supporters of opponent parties. Either way, campaign effects on local-level election outcomes are, like other neighborhood effects, emergent properties of the social interaction of the residents (Oakes, 2004). Therefore, one has to be cautious not to interpret even internally valid aggregate estimates of the effect of campaign appearances on election results in terms of the impact of individual attendance on voting behavior (e.g., Ohr, 1997*a*,*b*).

Finally, spatial ecological studies potentially suffer from ambiguities in separating exposure from non-exposure units. Effects of campaign events need not be restricted to the areal units for which we observe the outcomes of interest. For instance, voters and opinion leaders from neighboring units may also attend the events, and carry individual and network effects back home. Likewise, the geographic range of news media that cover the events may well exceed the borders of the units of analysis. Such spatial spillovers would violate the non-interference assumption underlying most methods for causal inference. Non-interference is an essential aspect of the *stable unit-treatment value assumption (SUTVA)*. It implies that a treatment applied to one unit does not affect the outcome of other units, and allows researchers to employ multiple units for estimating causal effects (Rubin, 1980). To illustrate the implications, imagine that Hitler's appearances actually had their intended effect on Nazi support in the visited county, but that this effect carried over to neighboring counties through travel activity, personal networks or media coverage. If these neighboring counties were similar according to the above (propensity score) notion, and served as controls in assessing the effect of Hitler's appearance on the NSDAP vote in the exposure county, the diff-in-diff estimate would obviously be biased downward, since the average overtime difference in outcomes among control units would not properly reflect the expected developments in the absence of the appearance.

The targeting of candidate appearances

A corollary of potential confounding, the first step in assessing the impact of candidate appearances on election returns is to theorize how such visits are being targeted and in what way the factors governing targeting choices relate to the outcome of interest (Althaus, Nardulli and Shaw, 2002). In doing so, we adapt an instrumental view and assume that campaign activities serve the maximization of votes to increase the chances for office while accounting for mobilization costs (e.g., Bartels, 1985; Brams and Davis, 1974; Colantoni, Levesque and Ordeshook, 1975; Cox, 1999). Accordingly, candidates should focus their scarce resources on where they expect personal appearances to favorably translate into additional votes and additional votes to be decisive for winning mandates. The former suggests that rational campaigners primarily target locales with large numbers of eligibles and a high expected share of supportive voters. The latter expectation implies that candidates are more likely to visit competitive districts in which small vote shifts could change the allocation of mandates in their favor or to their detriment. All those factors—the number of eligibles, expected electoral support, a party's expected competitiveness—are potential confounders in that they may also influence election results as the outcome of interest. Applied to the present case, the size of the local electorate may be negatively linked to Nazi vote shares, since rural areas were less populous and, at the same time, more supportive, on average, of the NSDAP than urban areas for programmatic reasons (Heberle, 1978; Thurner, Klima and Küchenhoff, 2015). Likewise, the classical decision-theoretic model of voting suggests that a party's expected competitiveness may directly affect the relative strength of parties through selective participation and strategic voting (Cox, 1999).

Local infrastructure is relevant to mobilization costs. In the context of U.S. presidential campaigns, Holbrook's (2002) study of Truman's 1948 whistle-stop campaign and Althaus, Nardulli and Shaw's (2002) narratives of the boat trips down the Mississippi river by Al Gore in 2000 and by Georg H.W. Bush in 1988 provide good examples of campaigns in which transportation connection on the ground matters. A remarkable feature of Hitler's 1932 campaign, he had, for the first time in election history, chartered a plane to carry him to campaign events. Under the ambiguous label "Hitler over Germany", he made almost 150 appearances in April, July and October/November 1932. Therefore, distance to the nearest airfield should have mattered for targeting as of the 1932 elections. Another infrastructural aspect, the strength of local party organizations is often quoted as an important source of logistic support and secondary mobilization (Cox, 1999; Rosenstone and Hansen, 1993). Some authors even consider local organizational strength as yet another campaign tool subject to strategic allocation (Bartels, 1985), which reminds us that a leading candidate's campaign is not a unitary entity but rather a set of efforts undertaken by various agents. For instance, Kelley (1961) in his study of U.S. presidential campaigns found that contenders used their running mates' schedules in either complementary or duplicative ways. Geographically or temporarily complementary campaign schedules carry the risk of offsetting campaign effects (see Finkel, 1993, also see the section on robustness below), while duplicative itineraries bring about potential misattribution of campaign effects. One way or the other, we need to account for the activities of other Nazi speakers when assessing the effects of Hitler's public appearances. Measurements of all the potential confounders discussed in this section will be included in the propensity score model specifications below.

Data collection and measurement

Period of observation

Our empirical analysis covers the period between the repeal of the speaking ban on Hitler in Bavaria on March 6, 1927 and the last (halfway) competitive *Reichstag* election on March 5, 1933.[7] Five national parliamentary elections (on May 20, 1928, September 14, 1930, July 31, 1932, November 6, 1932, and March 5, 1933) and a two-round presidential election (on March 13, 1932 and April 10, 1932) were held within this period. Our diff-in-diff approach focuses on changes between the four consecutive parliamentary elections and both rounds of the presidential election, respectively.

Areal units

The availability of election statistics dictates our choice of areal units. Thanks to an epic data collection effort by Jürgen Falter and collaborators (Falter and Hänisch, 1990), digitalized community-level election statistics are available for the 1928, 1930 and 1933 elections, but not for the elections in 1932. For the 1932 elections, the Reich Statistical Office (*Statistisches Reichsamt*) reported election returns only at the higher administrative level of counties (*Kreise*) and county boroughs (*kreisfreie Städte*) (see Hänisch, 1989, 45). This leaves us with a single election pair (1928-30) for a community-level diff-in-diff analysis. We will use the community-level data ($N = 3,864$), among other things, to check the sensitivity of our empirical results to potential violations of the non-interference assumption discussed above. Other than that, our analytical focus will be on the counties and county boroughs ($N = 1,000$). While election statistics are available at the county and, partly, the municipal level, neither level was relevant for the apportionment of parliamentary seats. Mandates were allocated at the level of the 35 primary districts (*Wahlkreise*) and 16 secondary districts (*Wahlkreisverbände*), which will serve as additional geographical layers to compute measures of the NSDAP's competitiveness (see below).

[7] Gag orders in other regions were remitted successively: Saxony on January 26, 1927, Hamburg on March 23, 1927, Baden on April 22, 1927, Lübeck on May 18, 1927, and Anhalt and Prussia on November 16, 1928 (Bruppacher, 2012, 181–198).

Areal units are key in generating and combining substantive variables. Unfortunately, the Falter data do not readily contain the geographic information necessary to do so.[8] In an independent data collection effort, we retrieved the center coordinates of all the municipalities and county boroughs included in Falter and Hänisch (1990) from the Google Maps API service (Google Inc., 2015).[9] Whole counties were geo-referenced in terms of the center coordinates of their main towns or cities in order to account for the uneven population distribution within counties.

Outcome variables

The primary outcome of interest is the number of NSDAP votes in a *Reichstag* election in an areal unit relative to the voting-eligible electorate. The reason for standardizing against the number of eligibles—not actual voters—is that the specific apportionment method used in *Reichstag* elections guaranteed each party one seat per 60,000 votes (see Appendix E), so that an increase in the number of votes from one election to the next would increase a party's chances of winning additional seats irrespective of the vote gains and losses for other parties. We also use the so-defined vote share for the communist party (*Kommunistische Partei Deutschlands, KPD*) as the Nazi's major adversary, and the turnout rate as alternative outcomes. For the 1932 presidential elections, we use vote shares for Adolf Hitler and Ernst Thälmann, the KPD's candidate, as outcomes of interest. The size of the areal units' voting-eligible population serves as weighting variable in the diff-in-diff analysis. Given its vast variability across units—county-level electoral populations range between 184 and 871,764, with a mean of 41,358 eligibles—appropriate weights seem imperative for our analysis (Ridgeway et al., 2015). All the election data are taken from Falter and Hänisch (1990).

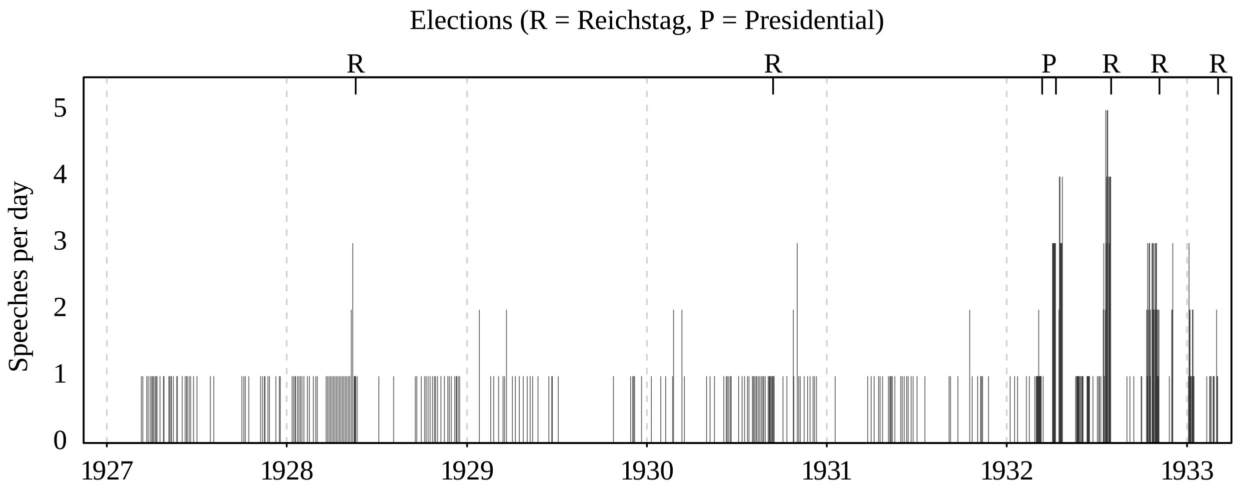
Exposure

Our main source of information about Hitler's public appearances is the multi-volume edition "Hitler. Reden, Schriften, Anordnungen" (Hitler. Speeches, Writings, Directives) by the Institute for Contemporary History Munich (Hitler, 1992, 1994*a*,*b*,*c*, 1995, 1996, 1997, 1998). For each appearance within the specified period, we hand-coded its date, location, type of event (public or private) and, if available, attendance figures by source (police reports, press coverage, Nazi press coverage). As the edition only covers the period

[8]O'Loughlin and colleagues (O'Loughlin, Flint and Anselin, 1994; O'Loughlin and Shin, 1995) digitalized county boundaries as of the 1930 *Reichstag* election based on U.S. military maps from World War II. However, this map does not contain geographic information about most county boroughs and none of the communities. The former problem would lead to the exclusion of a substantial share of the voting eligible population from the analysis. The latter problem would prevent us from disaggregating our study to the municipality level. Paul Thurner and his colleagues (2015) made a fresh geocoding effort including all the counties and county boroughs. For the last-mentioned reason, however, we do not use their materials either.

[9]See Appendix A for details and links to computer code.

Figure 2: Timeline of Hitler's public appearances and national elections, March 1927 to March 1933.

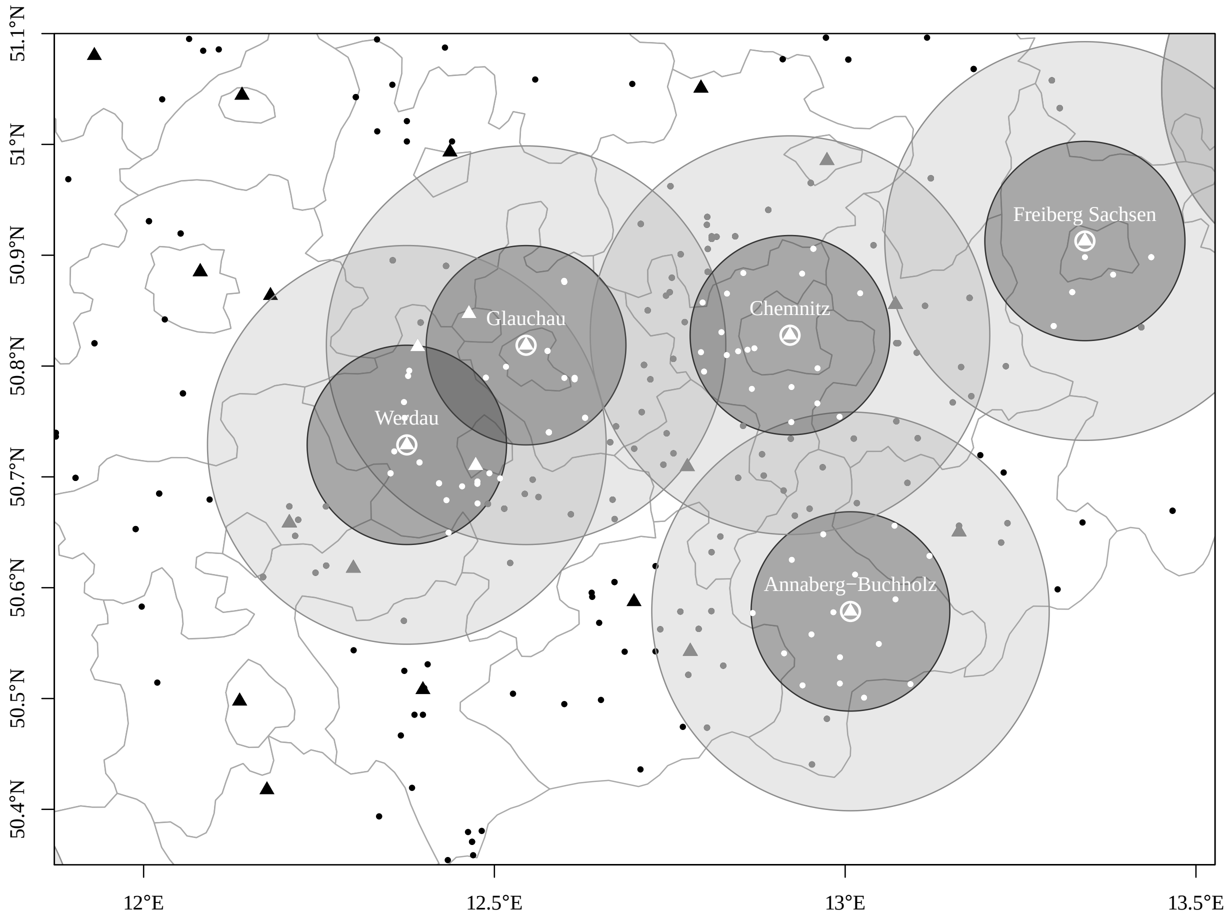


until Hitler's appointment as head of the national government on January 30 1933, we consulted Bruppacher (2012) to fill the gap until the *Reichstag* election on March 5 1933. For validation, we used Bruppacher (2012) and Domarus (1973) and retrieved information from hitlerpages.com, a website, maintained by a Dutch amateur historian that provides a daily account of Adolf Hitler's life from various sources. In sum, we were able to identify 566 Hitler appearances in the specified period, 455 of which in public.[10] Figure 2 provides a timeline of events for the whole observation period.[11] Apparently, Hitler's campaign activities had already been intense in the period between the 1928 and 1930 elections (84 appearances) and culminated in the run-up to the 1932 presidential and *Reichstag* elections (243 appearances). In early 1933, as Hitler had already been appointed head of government, the NSDAP's strategy quickly switched from winning votes to repression (Evans, 2005). Of the mere 36 events recorded between November 7, 1932 and March 5, 1933, as many as 16 related to the regional elections in Lippe on January 15, 1933 (see the clustering of events in Figure B1 in the Appendix).

In order to assess the effect of Hitler's appearances on local election returns, we would ideally know whether or not (or even: to what extent) the local population for which we observe the outcome had been exposed to the event. Unfortunately, this information is not available. Like other spatial ecological studies, we use spatial proximity to the events as a surrogate for exposure. In a first step, Hitler appearances were point-referenced according to their location (municipality or borough center, possibly even the specific venue), once again using the Google Maps API service. We then classified those counties and county boroughs (municipalities in the municipal-level analysis) as exposure units whose center

[10]Most of the events we classified non-public were speeches on the occasion of meetings of party officials.
[11]A detailed description of the coding procedure and additional figures can be found in Appendix B.

Figure 3: Illustration of radius definitions of exposure areas (dark grey; exposed units white), no-matching areas (light grey), and potential control areas (white; control units black). Triangles represent centers of county boroughs, dots represent municipal centers.



coordinates were situated within a radius of 10 kilometers from an event location. At the same time, we only matched control units which were sufficiently distant to any of the exposure units in order to safeguard our analysis against potential spillover effects. To this end, we drew no-matching areas of 10 kilometers around the exposure areas. The definitions of exposure, no-matching and potential control areas are illustrated in Figure 3 as well as in Appendix D. Alternative specifications of the exposure variable with varying geographical and temporal scope will be considered in the section on robustness below.

Covariates

Competitiveness

The rational actors' perspective suggests that Hitler and the NSDAP focused their scarce campaign resources on close races, that is, on electoral districts where the stakes of winning additional seats (and of losing seats won in previous elections) were high. To measure the NSDAP's local electoral stakes, we follow lines similar to Grofman and Selb (2009) and develop party-specific competition indices that are sensitive to the nature of the automatic apportionment method being used at that time (Schanbacher, 1982). The indices are specified at the level of the primary and secondary electoral districts (Competitiveness 1 and 2, respectively) using election statistics, and reflect the minimum vote distance of the NSDAP to winning an additional seat or to losing their final seat at the respective level at the previous election relative to the highest possible vote distance to a seat gain or loss. Details of the calculations and descriptive statistics are given in Appendix E.

Organizational strength

It has been argued that local infrastructure is relevant to mobilization costs, and the strength of local party organization is one important infrastructural factor. Apart from some regional studies (Anheier, 2003; Anheier, Neidhardt and Vortkamp, 1998), there is no systematic nationwide information about the local organizational strength of the NSDAP and its development over time. As a proxy for organizational strength, we used sample data from the NSDAP member files to estimate county-level membership totals (Brustein, 1998; Falter and Kater, 1993). The thorough description of the sampling procedures in Schneider-Haase (1991) provides the basis for our calculation of county- and period-specific numbers of NSDAP members (in 1,000), which is detailed in Appendix F.

Distance to nearest airfield

Particularly important for mobilization costs as of 1932 is the distance to the nearest airfield. We consulted several Wikipedia entries and a privately run website[12] to identify a total of 70 civilian airfields in operation at that time. We used Google Maps API services to geocode the airfields, which provides the basis for calculating minimum distances to an airfield (in 100 km) for each municipality, county borough and county. For details, see Appendix G.

[12] http://www.forgottenairfields.com/.

Number of eligibles and previous vote share

Our theoretical considerations suggest that rational campaigners primarily target locales with large numbers of eligibles and a high expected share of supportive voters. Therefore, we include the number of eligibles (in 100,000) and the vote share of the NSDAP (at the 1932 presidential election: Hitler) at the previous election (i.e., the first election in each election pair considered). Information on both variables is taken from Falter and Hänisch (1990).

Previous appearances

In addition to the matching variables listed, we include a binary variable that indicates whether Hitler previously (i.e., before the last election) visited a county in order to help control for unobserved confounders, assuming that those factors had already affected past targeting decisions.[13]

Goebbels' appearances

To account for the eventuality that Hitler's campaign schedule was complemented or duplicated by those of other high-profile Nazi speakers, we collected information about the public appearances of Joseph Goebbels, the second most important Nazi speaker after Hitler, from his diaries (Goebbels, 1992).[14]

Predicting Hitler's appearances

In a first stage of our empirical analysis, we model the election-specific probability of a Hitler visit in a community or county as a function of the above covariates.[15] Predictions from these models will then be used in the causal inference step to trim the sample in order to include only those counties and communities as controls which are similar to exposure units in terms of their propensity score (and geographically distant enough from exposure units). However, the results from the propensity score estimation are interesting in their own right, too, since they provide rare systematic insight into the early Nazi campaign strategy (also see Ohr, 1997*b*).

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[13]Election-specific summary statistics of all the variables and supplementary maps are given in Appendix H.

[14]For details, see Appendix B.

[15]The model specification for the 1932 presidential runoff election does not include the competitiveness measures. These measures are specific to the parliamentary electoral system, and there does not seem to be a meaningful equivalent of regional competitiveness for the majority-plurality runoff system used in Weimar presidential elections.

Table 1: Probit estimates of Hitler appearances by election. Standard errors in parentheses.

	Sep 1930	Sep 1930 (mun.)	Apr 1932 (P)	Jul 1932	Nov 1932	Mar 1933
Competitiveness 1	0.311	0.697***		−0.653*	−0.294	1.251*
	(0.291)	(0.155)		(0.386)	(0.424)	(0.748)
Competitiveness 2	0.668***	0.945***		0.333*	−0.256	0.094
	(0.226)	(0.130)		(0.179)	(0.209)	(0.310)
Organizational strength	−0.704	−0.689***	−0.166	−0.106	−0.257*	−0.240
	(0.513)	(0.242)	(0.260)	(0.190)	(0.155)	(0.173)
Distance to nearest airfield	−0.323	0.015	−1.943***	−0.334*	−0.367	−3.574***
	(0.282)	(0.165)	(0.612)	(0.190)	(0.235)	(0.780)
Number of eligibles	0.695***	0.676***	0.196	1.200***	0.593***	0.577**
	(0.164)	(0.101)	(0.216)	(0.270)	(0.214)	(0.240)
Previous NSDAP vote share	3.394	1.720*		0.579	0.989*	0.158
	(2.146)	(0.987)		(0.847)	(0.589)	(1.088)
Previous Hitler vote share			−5.544***			
			(1.823)			
Previous appearance	0.844***	1.246***	5.719	0.985***	0.967***	0.418**
	(0.185)	(0.108)	(240.510)	(0.129)	(0.129)	(0.199)
Goebbels appearance	1.077***	1.230***	7.513	0.708***	1.165***	1.618***
	(0.200)	(0.113)	(6,609.109)	(0.207)	(0.381)	(0.293)
(Intercept)	−2.269***	−2.711***	−4.750	−1.161***	−1.714***	−2.337***
	(0.249)	(0.144)	(240.510)	(0.328)	(0.425)	(0.750)
Mc-Fadden's Pseudo R2	0.31	0.29	0.51	0.24	0.23	0.44
Observations	1,000	3,864	685	1,000	953	953
Log Likelihood	−229.763	−696.435	−63.317	−398.459	−252.176	−118.828
Akaike Inf. Crit.	477.526	1,410.869	140.633	814.918	522.353	255.655

Note: *p<0.1; **p<0.05; ***p<0.01

Table 1 reports probit estimates and their standard errors (clustered by primary electoral district) for each election separately. As one would expect, the size of the eligible population in a county turns out to be a consistent predictor of Hitler's campaign appearances across elections. Also in line with our expectations, the distance to the nearest airfield is a significant predictor of Hitler visits as of the 1932 elections—Hitler's first plane ride did not start before April 3, 1932 (Bruppacher, 2012, 265). The exceptionally large coefficient on airfield distance referring to the 1933 election is due to the extraordinarily intense regional election in Lippe in January 1933 and its proximity to the airports of Bielefeld and Hannover-Vahrenwald (see Figure H2 in the Appendix). The campaign trail also tended to stop where the NSDAP did well in the previous election (although the coefficients are weakly significant at most), and where the last election was close from the party's viewpoint. The parameter estimates indicate a negative relationship between the strength of local party organizations and the probability of a visit. An ad hoc interpretation of this finding would be that Hitler appearances had been targeted at areas lagging behind in terms of organizational development in order to increase party membership.[16] The significantly positive coefficient on Goebbels' appearances suggests that Goebbels' campaign schedule tended to duplicate Hitler's. Thus, if we ignored Goebbels' activities, there would be a certain risk in the subsequent analyses of erroneously ascribing campaign effects to Hitler whereas they actually trace back to Goebbels. Finally, previous campaign appearances prove to be useful predictors of current events, indicating that there are factors relevant to (past and current) targeting choices that are not appropriately taken into account in our model specification.[17] Nevertheless, the models fit the data remarkably well. Pseudo R^2 values range between 0.23 in November 1932 and 0.51 in April 1932. That is, Hitler's campaign schedule appears to be pretty much in line with an instrumental account of campaign resource allocation, and there does not seem to be much variation in campaign strategy over time.

Nearest neighbor matching and covariate balance

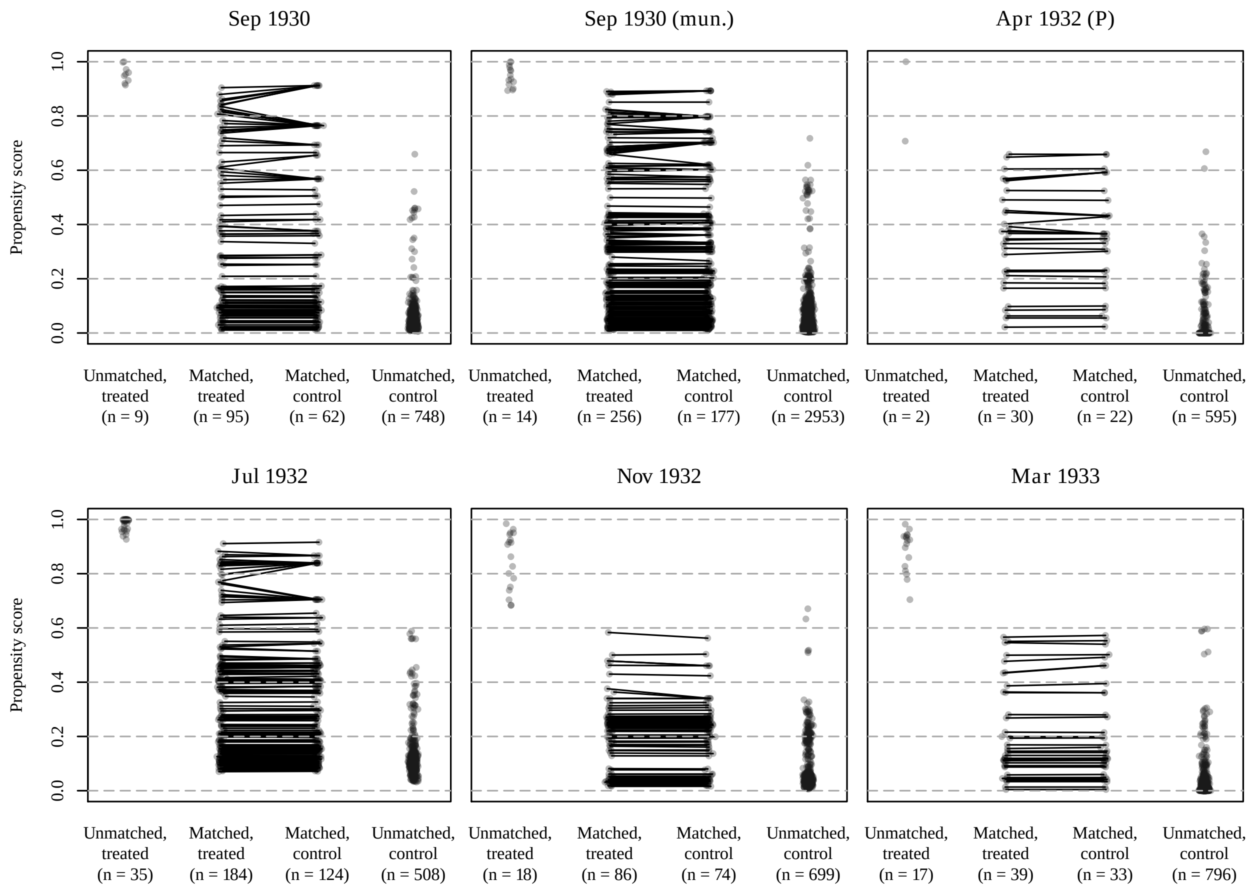
There is a whole variety of matching methods available, and choosing among them is far from obvious (Caliendo and Kopeinig, 2008; Stuart, 2010). Our preferred method is 1:1 nearest neighbor matching with replacement, subject to a caliper constraint. Accordingly, each exposure case is matched to the closest control unit on the predicted propensity score outside the no-matching zone (see Figure 3). Unmatched control units are dropped from the study population, as are those exposure units for which no controls are available within a range of 5 percentage points around their propensity score. The method is illustrated in Figure 4, which provides predicted propensity scores for four categories of units: unmatched exposure units, matched exposure units, unmatched control units, and unmatched control units. The lines depict matched pairs. Though intuitive, this method is less statistically efficient than other methods since it discards much information in situations in which there are way more control than exposure units. Moreover, the interpretability of estimates based on matched samples suffers if observations from both the exposure and non-exposure group are discarded. To the method's credit, however, it is relatively easy to include population weights, as it dispenses with additional matching weights.[18]

[16] Bytwerk (1981, 16) argues that Hitler appearances served to boost local NSDAP membership. Unfortunately, the available samples from the NSDAP member files are too small to detect local changes in membership in the immediate aftermath of Hitler appearances. What additional analyses show (see Table I36 in the Appendix), however, is that local organizational development in the whole legislative period following an election did not systematically differ between exposure and non-exposure units.

[17] The inflated SEs for Previous appearances and the intercept in the presidential election model are due to the fact that all the 21 appearances (32 units affected using a 10 km radius) took place in counties that had been exposed to earlier appearances. For this election, an earlier visit was—empirically speaking—a necessary but not sufficient condition for an appearance.

[18] We have also tried several alternative matching methods, but the results did not substantively differ.

Figure 4: Predicted propensity scores, by exposure and matching status. Lines indicate matched pairs.



In a next step, we compare the distribution of the covariates among exposure and control units to see whether conditioning on the estimated propensity score adequately balances potential confounders between the groups. Tables 2 and 3 report mean differences in variables between exposure and control units before and after matching, plus a statistic that indicates the relative improvement of covariate balance through matching. Obviously, matching markedly improved covariate balance to the extent that there are barely any mean differences left. The curious instances of covariate balance deteriorating after matching occur in situations in which the distribution of variables was well balanced even before matching so that slight distributional changes had massive consequences for the—relative—improvement statistic. In all, the balancing statistics suggest that we can approach the causal analysis step with some confidence.

Table 2: Propensity score and covariate balance before and after matching. Mean differences on variables reported.

	Sep 1930			Sep 1930 (mun.)			Apr 1932 (P)		
Variable names	Before	After	% Impr.	Before	After	% Impr.	Before	After	% Impr.
Propensity score	0.32	0.00	100	0.26	0.00	100	0.35	0.00	99
Competitiveness 1	0.05	-0.07	-40	0.10	0.03	75			
Competitiveness 2	0.16	0.13	15	0.16	-0.02	90			
Organizational strength	0.18	-0.08	55	0.09	0.01	94	0.40	0.02	96
Distance to nearest airfield	-0.22	-0.03	89	-0.14	-0.02	83	-0.28	-0.01	96
Number of eligibles	0.78	-0.09	89	0.33	0.02	93	0.85	0.30	64
Previous NSDAP vote share	0.01	0.00	89	0.01	0.00	79	-0.06	0.01	77
Previous appearance	0.27	-0.12	56	0.31	0.06	81	0.79	0.00	100
Goebbels appearance	0.41	0.02	95	0.34	-0.07	79	0.03	0.00	100

Table 3: Propensity score and covariate balance before and after matching, *continued*. Mean differences on variables reported.

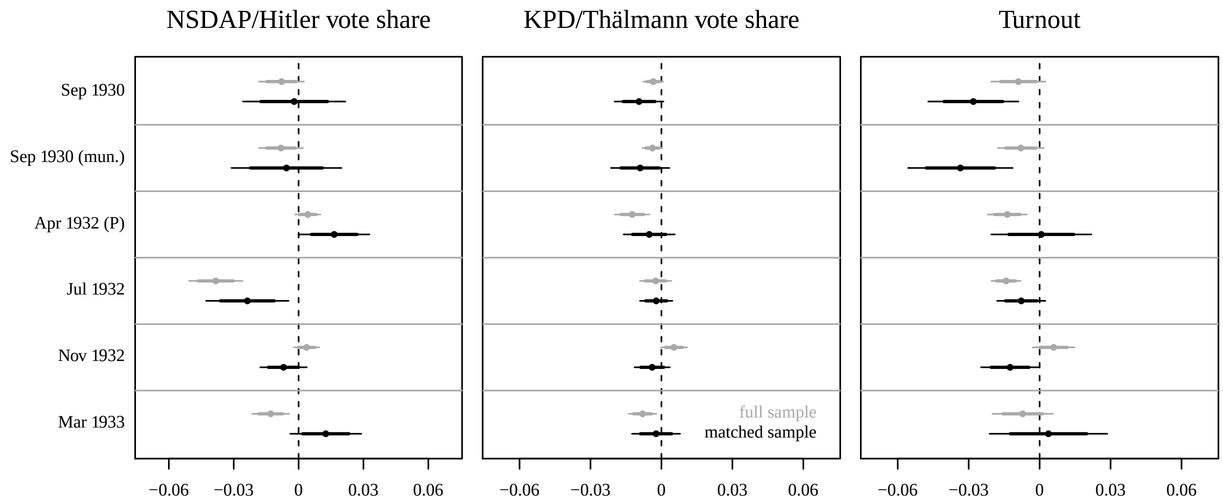
	July 1932			November 1932			Mar 1933		
Variable names	Before	After	% Impr.	Before	After	% Impr.	Before	After	% Impr.
Propensity score	0.28	0.00	100	0.23	0.00	99	0.37	0.00	99
Competitiveness 1	-0.02	0.00	70	0.00	0.01	-1030	-0.01	0.00	50
Competitiveness 2	0.03	-0.09	-255	0.00	0.00	52	0.02	-0.07	-296
Organizational strength	0.54	-0.03	94	0.60	0.08	87	0.93	-0.12	88
Distance to nearest airfield	-0.16	-0.02	91	-0.19	-0.02	90	-0.32	0.02	94
Number of eligibles	0.55	0.03	94	0.66	0.04	95	1.09	-0.12	89
Previous NSDAP vote share	0.00	-0.01	-66	0.00	-0.01	-16	-0.03	0.00	97
Previous appearance	0.36	-0.02	94	0.51	-0.01	98	0.49	-0.03	95
Goebbels appearance	0.20	0.01	97	0.13	0.01	91	0.36	0.08	79

Estimating campaign effects: empirical results

To estimate exposure effects, we fit diff-in-diff equations to the matched samples for each consecutive election pair. Units are weighted according to the size of their electoral population. Figure 5 reports diff-in-diff estimates for the five election pairs and their 80% and 95% confidence intervals, both for the matched and unmatched samples. The calculation of confidence intervals is based on robust standard errors to account for the clustering of temporal observations (pre- and post-exposure) within areal units. Results for three outcomes are reported: NSDAP (Hitler) vote shares, KPD (Thälmann) vote shares, and turnout. Most point estimates are in the range of ±1% of the voting-eligible population, and barely any coefficient is significantly different from 0 at conventional probability levels.[19] The strongest effect of −3% pertains to electoral turnout in the 1928-30 election pair, indicating that Hitler's early appearances had, on average, a demobilizing effect in exposure areas. A look at the other outcomes suggests that this demobilizing effect

[19]Note that lack of statistical significance may also be a consequence of the inefficiency of our estimation strategy. But even if we put significance considerations aside, the order of magnitude of estimated effects is unimpressive given the huge electoral swings to be observed at that time.

Figure 5: Diff-in-diff estimates of exposure effects on NSDAP (Hitler) vote shares, KPD (Thälmann) vote shares, and turnout in national parliamentary and presidential elections 1930-33. Lines represent 80% and 95% confidence bands. Estimates are reported for unmatched and matched samples. For full model statistics, see Tables I1 to I3 in the Appendix.



tended to to harm the KPD but left the Nazi vote share unaffected. This result supports Childer's (1990) observation that a concomitant feature of Nazi campaign events was concerted violence to intimidate political opponents and their supporters. This specific empirical pattern disappears in later elections, perhaps indicating that Goebbels' attempt to align the paramilitary branch of the NSDAP (*Sturmabteilung*, *SA*) to the quasi-legal course adopted earlier was, at least in part, successful (ibd.). While estimated exposure effects on NSDAP vote shares are mostly zero, a nominally negative effect occurs with the 1930-32 election pair, just when the Nazis took their greatest step forward electorally!

The 1932 presidential runoff election deserves special mention. Incumbent president Hindenburg had come out as the clear front-runner from the first election round on March 13, 1932, garnering 49.5% of the vote, followed by Hitler (30.1%) and communist leader Ernst Thälmann (13.5%). The other candidates won less than 7% altogether,[20] and did not stand again in the decisive second round. Hindenburg, who did not bother to enter the electoral fray himself (Pyta, 2007, 475), issued an emergency decree that limited the campaign period preceding the runoff on April 10 to just six days before the election—a decision that prompted Hitler to undertake his first of four plane rides. The novel mode of transportation afforded him 21 campaign appearances spread over the whole country during this short period, with a maximum of 5 appearances per day. While Hitler

[20]The Social Democrats and the catholic Center Party did not nominate separate candidates, and supported Hindenburg in order to prevent the election of Adolf Hitler.

eventually lost the election to Hindenburg, he nevertheless gained more than two million additional votes from the first to the second round. Our analysis suggests that some of the vote gains actually came from his campaign appearances. The finding that an unusually short and intense campaign had significant effects is in line with results from previous research which indicates that campaign effects run out quickly over time (e.g., Watt, Mazza and Snyder, 1993), for example, due to the interference of offsetting campaign messages.[21]

A final methodological remark, the matching approach obviously makes a difference. Diff-in-diff estimates of exposure effects on NSDAP vote shares are consistently more negative when applied to the unmatched samples. This indicates that Hitler's campaign trail usually stopped where smaller increases (or larger decreases) in NSDAP vote shares were to be expected. One interpretation of this result would be that, for infrastructural reasons, Hitler appearances were scheduled in more populous urban areas where the NSDAP fared worse electorally, due to the specific structure of political competition and for programmatic reasons (Heberle, 1978; Thurner, Klima and Küchenhoff, 2015).

Robustness

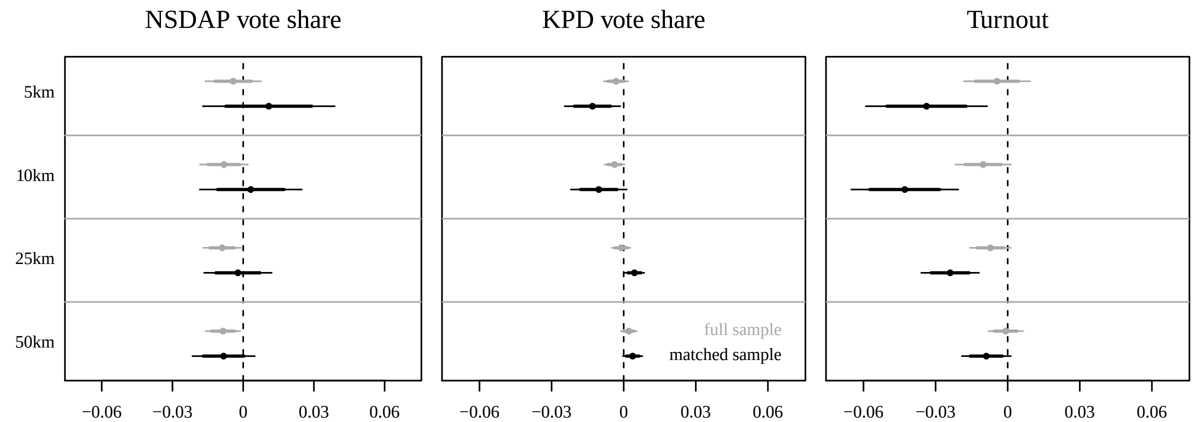
Absence of evidence is no evidence of absence. Therefore, meager empirical findings need to be scrutinized in pretty much the same way as strong results. In this section, we will play devil's advocate and ask if there are reasons to suspect that actual campaign effects went undetected with our data and research design. The discussion is organized around two potential problems: SUTVA violations due to spatial spillovers as well as multiple versions of exposure and offsetting effects due to rival campaigns and the complementary allocation of alternative campaign tools.

SUTVA violations

One serious drawback of our study is the unavailability of exposure data. Like other spatial ecological studies, we have to make do with spatial proximity to events as a surrogate of exposure. Thus far, the specification of the exposure variable has arbitrarily fixed the geographic reach of Hitler appearances to a radius of 10 kilometers around venues. If the actual reach of events had been wider than that, campaign effects might have had spilled over to neighboring areas which have served us as potential comparison units in estimating (in this case, underestimating) effects (see Rubin, 1980). In the previous analysis, we have drawn no-matching zones around exposure areas to avoid this problem (see Figure 3). As an alternative, we have varied the specifications of exposure areas from 5 to 50 kilometers around event locations using the 1928-30 municipal-level data which provide the highest

[21]In order to more systematically account for potential effect decay, we have replicated our analysis, this time only considering campaign appearances that took place within 2, 4, 8 and 12 weeks before an election. The results are, however, inconclusive. See Tables I7 to I21 in the Appendix for details.

Figure 6: Diff-in-diff estimates of exposure effects on alternative outcomes at the 1930 national parliamentary election (municipality-level data). Specifications of exposure areas vary from 5 and 50 km around venues. Lines represent 80% and 95% confidence bands. Estimates are reported for unmatched and matched samples. For full model statistics, see Tables I4 to I6 in the Appendix.



spatial resolution. The results plotted in Figure 6 indicate that initially positive effects of visits on NSDAP vote shares as well as initially negative effects on communist vote shares and turnout tended to fade out with increasing spatial distance. While these findings do not immediately suggest an optimal cutoff value for specifying exposure areas, our hunch is that a radius of 10 km plus an additional 10 km no-matching zone is a safe choice. Even broader diffusion effects, e.g., through national media, seem implausible given the mostly negative stance of the public media toward Hitler before 1933 (Adena et al., 2015), the low circulation figures of the Nazis' own national newspaper (*Völkischer Beobachter*) at that time (Layton, 1970), and the geographically fragmented press landscape (Führer, 2008).

Apart from non-interference between units, SUTVA also requires that there be only a single version of exposure (Rubin, 1980). This assumption is unlikely to hold in the present case for at least two reasons. First, the number of Hitler appearances between elections differed between exposure counties and elections. While most of the exposure cases (66%) actually reflect single campaign visits, there were other instances in which Hitler made multiple appearances in the run-up to an election. To name just the most extreme cases, Hitler held 17 public speeches between the July and November *Reichstag* elections of 1932 in Berlin-Mitte; for Munich, the home town of the Nazi movement, this figure was even 37. To account for varying numbers of campaign events, we have replicated our matched diff-in-diff analysis[22] for each of three exposure levels (see Imbens, 2000): one, two, and three or more campaign appearances. The results, which are detailed

[22]Due to the decreased number of events per category, we had to pool observations across elections. We included an additional set of fixed effects ("diff-in-diff-in-diff") to account for election-specific heterogeneity.

in Table I34 in the Appendix, do not point to any systematic differences between exposure levels. Second, as far as contemporary police reports and media coverage can tell, the size of events also varied widely. The figures range from 400 (November 30, 1928, in a gym in Hersbruck) to an estimated 100,000 (July 20, 1932, at the Victoria sports field in Hamburg), with an average of about 15,000 attendees. The problem of ignoring varying event size is again one of hidden variation of treatments. Larger events may have had stronger effects because they had reached a wider audience of voters and opinion leaders, or because they had attracted more media attention through which the campaign messages had been promulgated to the wider public. Larger events could also have had increased the intensity of spatial spillovers, both through travel activities and local press coverage. Once again, additional analyses do not indicate any systematic differences between events with less than 5,000, 5,000–20,000, more than 20,000 attendees, and of unknown event size respectively (see Table I35 in the Appendix).[23]

Offsetting campaign effects

Another plausible explanation for the weak results is that opposing campaigns did indeed have offsetting effects (Finkel, 1993; Gelman and King, 1993). For instance, Plöckinger (1999, 73–77) reports increased activity of local NSDAP organizations and their foes ahead of Hitler's visits, from leafleting on both sides, bill-posting and over-painting, to sabotage. Unfortunately, we do not have any systematic nationwide information about the campaign activities of other parties and candidates.[24] An admittedly indirect way to look at potentially offsetting campaign effects, we did not find any positive turnout effects that would presumably result from successful counter mobilization efforts—with the possible exception of the November 1932 elections. But even if there had been offsetting effects by opposing campaigns, we would still be able to validly conclude that the *n*et effects of Hitler appearances were essentially zero.

A related possibility for meager empirical findings in spite of substantial campaign effects is what might be labeled *s*ubstitution effects. While Hitler certainly was the Nazis' most prominent and relentless speaker, he was by far not the only one. As of spring 1929, the NSDAP entertained a special speaker's school (*Rednerschule*) which had reportedly trained about 6,000 speakers by 1933 (Bytwerk, 1981). According to the *Völkischer Beobachter*, the Nazis held a staggering number of 34,000 political meetings prior to the 1930 national parliamentary elections and even 50,000 in the run-up to the 1932 presidential

[23]Even after imputing missing values (see Appendix C), attendance figures are available for only 362 out of 455 Hitler appearances. In a related manner, we have also looked for differences across counties with eligible populations of less than 20,000, 20,000–50,000, 50,000–80,000, and more than 80,000—again without any notable results. See Tables I22 to I33 in the Appendix.

[24]Ohr (1997*a*) collected regional data from police reports for 224 Hessian communities 1930-32. Unfortunately, there had not been a single Hitler appearance in any of those communities during the period considered. An assessment of the coincidence of various parties' activities and Hitler appearances is therefore infeasible.

elections (Bytwerk, 1981, 16), but comprehensive independent information is once again missing.[25] In his study of Hessian communities, Ohr (1997*a*) actually found a positive relationship between the (frequency of) NSDAP political meetings and changes in municipal Nazi vote shares 1930-31. But even if we take this as evidence of the general effectiveness of the Nazis' propaganda meetings, this finding would only interfere with our conclusions about the ineffectiveness of Hitler's appearances if political meetings involving rank-and-file speakers on the one hand and Hitler appearances on the other were scheduled in a complementary fashion, so that their allegedly positive effects could in fact cancel each other out. Our propensity score analysis has already indicated that Hitler and Goebbels, the Nazis' top speakers, had duplicative rather than complementary campaign schedules. County-level correlations between Hitler and Goebbels appearances range from 0.27 in the period between the two rounds of the presidential elections in 1932 to 0.48 between the November 1932 and March 1933 parliamentary elections.[26] Moreover, the event calendars of the Lippe campaign in December and January 1933 reported in Ciolek-Kümper (1976, 313–317) also suggest that Hitler's appearances were normally scheduled *on top* of the list of district or regional speakers. These tentative results do not point to substitution effects. If anything, there would be a risk of erroneously attributing campaign effects to Hitler, whereas they actually traced back to Goebbels and other speakers.

Conclusion

Our empirical analysis suggests that Hitler's speeches as the Nazis' chief campaign tool at the end of the Weimar Republic were rationally targeted toward populous, competitive and accessible areas. Yet, their electoral effects were modest at most and of limited geographical and temporal scope. The most notable effect occurred with the 1932 presidential runoff—an election preceded by an extraordinarily short, intense, and one-sided campaign. This effect was way too feeble, however, to swing the election in Hitler's favor.

This is a surprising result, since several important ingredients that are commonly claimed to create communication environments conducive to substantive campaign effects were present at the time: Hitler heavily relied on personal appearances, even today considered by campaign practitioners as one of the most potent ways for candidates to directly shape public opinion while avoiding the often negative tone of the media (Faucheux, 2002); local party organizations to support the campaign developed rapidly (Anheier, 2003; Flint, 2000); Hitler is generally considered a charismatic leader and consummate campaigner (Willner, 1985); the manipulative techniques employed were novel

[25] Anheier, Neidhardt and Vortkamp (1998, 1266) use event announcements from the *Völkischer Beobachter* to measure the frequency of political meetings and point to massive overreporting problems due to the inclusion of non-partisan events, non-public events, and repeated announcements for the same events. For the greater Munich area, they initially count 8,670 events between 1925 and 1930, only 1,116 of which they classify as distinct events involving speakers.

[26] Also see Figure B2 in the Appendix.

and sophisticated (Paul, 1990); the use of modern technology such as aircraft and loudspeakers guaranteed Hitler an unparalleled geographic penetration and public attention (Plöckinger, 1999).

To be sure, campaign effects on voting behavior and election results are notoriously difficult to detect amidst a campaign realm that is characterized by the selective exposure of voters to a diffuse stream of conflicting messages (Bartels, 1993; Finkel, 1993; Zaller, 1992), and the unavailability of individual-level exposure and outcome data certainly exacerbate our effort. On the other hand, there are some distinctive circumstances which supposedly facilitate the assessment of campaign effects in our empirical case. Iyengar and Simon (2000, 151) conjecture that positive net effects should be limited to "campaigns in which one candidate has a significant resource or skills advantage", and by all accounts, Hitler's campaign far exceeded any of his rivals' efforts (Ohr, 1997*a*). Moreover, the hostility of the public media toward Hitler (Adena et al., 2015), the low circulation figures of the NSDAP's own national paper (Layton, 1970), and a territorially fragmented newspaper landscape (Führer, 2008) to some extent safeguards our analysis against potential spillover effects that often threaten the validity of spatial ecological studies of candidate appearances (Althaus, Nardulli and Shaw, 2002; Shaw, 1999). Therefore, we are pretty confident that our failure to find consistent evidence of campaign effects in what appears to be one of the most likely historical cases indeed provides evidence of their absence. This general result is in line with the now dominant, qualified view of the effectiveness of election campaigns to manipulate the public (e.g., Campbell, 2008; Gelman and King, 1993; Popkin, 1991).

Still, many historians tend to simply infer the effectiveness of Hitler's speeches and other tools of early Nazi propaganda after the fact from the NSDAP's surge at the polls.[27] As Kershaw (2014, 180) puts it, "studies of propaganda have generally been premised upon the implicit or explicit notion that Nazi propaganda [. . .] was a success story."[28] And here is an irony: there are numerous excellent studies of the Nazis' propaganda organization and manipulative techniques, that is, of the supposed *mechanisms* that produced propaganda effects whose existence and magnitude had not been well established yet. Only recently have scholars, mostly economists, begun to revisit the issue with novel data and inventive research strategies. However, while evidence of strong and long-lasting effects on collective perceptions, attitudes, and behaviors of Nazi propaganda under the dictatorship is now accumulating (Adena et al., 2015; Voigtländer and Voth, 2014, 2015), our examination of the crucial years leading up to the Nazi seizure of power casts doubt on the omnipotence of Nazi propaganda. Supposably, the NSDAP's propaganda machinery took its full effect only after the Nazis had begun to gain totalitarian control over the state apparatus, societal organizations, and the emerging mass media (also see Adena et al., 2015). For propaganda to be really effective, it seems that even a fragile democracy like the Weimar Republic did not provide enough breeding ground.

[27]For a critical discussion of the fallacies prevalent in traditional modes of historical explanation, see Fischer (1970).

[28]For notable exceptions, see Ciolek-Kümper (1976), Ohr (1997*a*) and Plöckinger (1999).

The notion that charismatic leaders are of particular importance for the electoral success of right-wing populist parties has recently regained attention (e.g. Eatwell, 2000; Kitschelt and McGann, 1997; Mény and Surel, 2002). Our empirical findings support a skeptical view (also see van der Brug and Mughan, 2007). Now and then, the mystification of the powers of demagogues seems inappropriate in that it overlooks the economic and political circumstances under which they succeed electorally.[29]

Supporting materials

All code and data necessary to reproduce the empirical analysis presented in this paper have been made available at: https://github.com/simonmunzert/hitler-speeches.

[29]For a thorough analysis of the devastating impact on the vote of national economic conditions in Weimar Germany, see King et al. (2008).

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Examining a Most Likely Case for Strong Campaign Effects: Hitler's Speeches and the Rise of the Nazi Party, 1927–1933

Appendix

Contents

A Geocoding areal units

Linking electoral outcomes to Hitler's public appearances requires geographical information on the administrative units for which electoral data are available. To measure election outcomes, we use data that were collected and digitalized in an epic data collection effort by Jürgen Falter and collaborators (Falter and Hänisch, 1990). The dataset provides information on electoral outcomes at all Reichstag elections since 1920 at both the county and municipal level, with the important exception of the July and November 1932 elections for which the Statistical Office did not publish any figures at the municipal level (see Hänisch, 1989, p.45). The dataset itself, however, does not contain any geographic identifiers. For that reason, John O'Loughlin and colleagues (O'Loughlin, Flint and Anselin, 1994) digitized county areal boundaries from a historical map of 1930.[30]

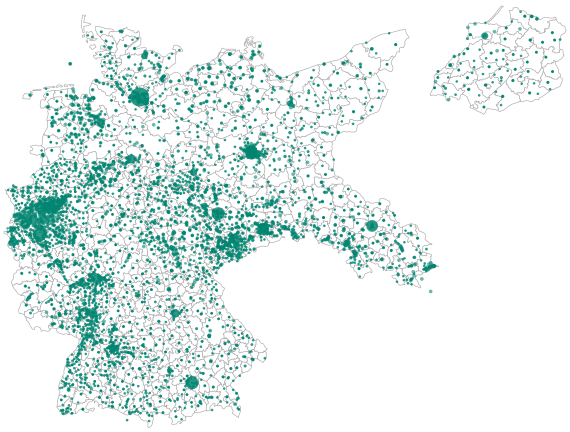
While this map in principle allows us to match public appearances—which are *de facto* spatial point data—with data on electoral outcomes, the geographic information is somewhat limited: First, it only covers 741 counties from 1930 and therefore does not take boundary changes or the creation of new and disbandment of old districts into account. Secondly, some counties (and county boroughs in particular) were completely missing from the shape file. This is not a minor problem. For instance, as documented in the Falter data, the voting eligible population at the May 1928 election sums up to about 62 million voters. However, after matching the O'Loughlin with the Falter data, we end up with valid information for only about 75% of the voting eligible population. That is, about a quarter of the voters would be missing in our analysis. Obviously, we cannot assume that the counties which get lost due to the matching process are completely missing at random on the variables of interest. Consequently, using these data would limit the generalizability of our findings. We tried to overcome these problems by manually enriching the original shape files with new boundaries of missing districts, but this resembled a drop in the bucket.[31] Thirdly, the counties vary substantively in areal size, which makes any effort of discrete matching of spatial points data with county polygon data rather fuzzy. Finally—and this is probably the most serious limitation of the existing geographical data for our purposes—the data are only available at the aggregation level of counties, not municipalities. Using data on the available 1,172 counties and county boroughs (not to speak of the fact that we have geographic information for less than 900 of these counties) in the Falter data set would ignore the information that is available at the municipal level, which sums up to 4,197 municipalities and 311 county boroughs. These data are more fine-grained both in terms of electoral outcomes and geographic dispersion. In sum, these reasons call for new geocoding efforts.[32]

[30]The data are freely accessible at http://www.colorado.edu/ibs/pec/johno/pub/nazi_data/nazi_data.zip.

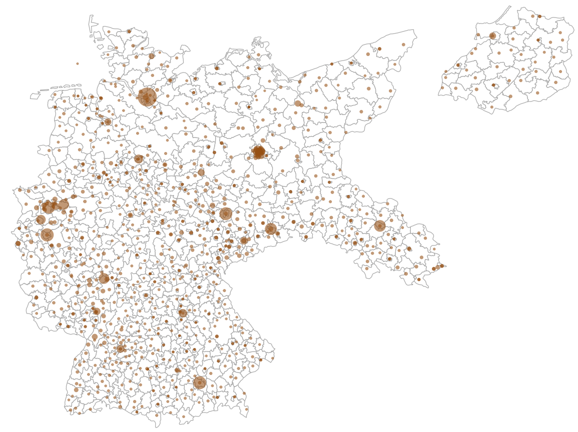
[31]In fact, the reported quarter of voters missing is based on our enhanced shape file, which already helped us gain a few million voters.

[32]However, we still use the enhanced O'Louhglin polygon data for map-based visual displays of our results.

Figure A1: Geo-referenced municipalities (n = 5,443, left panel) and counties/county boroughs (n = 1,246, right panel) from the Falter data set. Dot size is proportional to municipality-level population estimates in 1932.



(a) Municipalities



(b) Counties and county boroughs

To link electoral outcomes in the Falter data set with information on the exposure variables, we employ the following strategy: In an own data collection effort, we use the names of the municipalities and county boroughs in the Falter data set and geocode them using location services provided by the Google Maps API (Google Inc., 2015), i.e., the same strategy we employ to geocode Hitler's public appearances. For this purpose, we have to replace German names for locations in Silesia, Pomerania and East Prussia with their Polish and Russian equivalents in the first place. Wikipedia serves as a reliable source for these adaptations. Next, the municipality and county borough names are sent to the Google API service, which returns geographic coordinates, i.e. latitudes and longitudes. If the service failed to resolve our query, we corrected the input (a common reason were typos and deprecated municipality names). To ensure that the correct coordinates were returned, we validated our efforts by comparing the retrieved point coordinates within a common county unit. The rationale is that municipal coordinates should not deviate very much from a county-level median longitude and latitude. This validation strategy turned out to be very successful, as it helped us correct a substantive number of wrongly coded administrative units. Overall, we were able to get precise spatial location information for all 6,304 municipalities and county boroughs in the Falter data set. Figure A1 provides maps of all geo-coded observations, weighted by 1932 population size. Municipality-level election results are not available for the 1932 elections. Therefore, we use two samples; the first at the municipality level but restricted to the 1930 election, the second at the county level covering the elections between 1930 and 1933.

B Geocoding campaign events

We use the location information from the *Institut für Zeitgeschichte* editions to enrich the dataset with precise geographic information (latitudes and longitudes) for each of the appearances. To automate the process, we draw on the ggmap package (Kahle and Wickham, 2013) that helps tap the Google Maps API (Google Inc., 2015). The location name is sent to the service, which returns the geo-coordinates. To ensure that the API matches the locations with the correct locations, we conducted several validation checks and adapted the queries accordingly. In particular, we had to replace German names for locations in Silesia, Pomerania and East Prussia with their Polish and Russian equivalents. In addition, some places were misspelled in the original source or attributed to towns in Austria or Switzerland. We corrected for that, too. The results of our geocoding efforts are visualized in Figure B1.

In order to test for the possibility of substitution mechanisms in the assignment of locations for public appearances among Nazi elites, we also collected data on later Minister for Public Enlightenment and Propaganda, Joseph Goebbels, who played a leading role in establishing propaganda tools for the NSDAP by founding the newspaper *Der Angriff* (*The Attack*) and coordinating and controlling all party outlets across the country, but also by taking the role as a public speaker at various events and locations. No source for his public speeches exists comparable to the volumes documenting Hitler's appearances. However, Goebbels himself bore witness to his actions by cultivating a personal diary (Goebbels, 1992). We draw on this source to assemble a dataset on Goebbels's public appearances between April 1928 and March 1933.[33] To do so, we collected data on speeches in a semi-automatic manner by first looking for speech-related keywords ("sprech", "gesprochen", "rede", "kundgebung", "ansprache", "veranstaltung", "vortrag") in the entire document and then manually encoding information on who spoke and when, whether the speech was held in public or in front of a private audience, and finally geo-coding the appearances using the Google Maps API (Google Inc., 2015). In total, we were able to collect data on 200 public speeches, an overwhelming majority of which (110) held in Berlin. More importantly, the allocation of these appearances did not seem to be complementary to Hitler's appearances—he held most of his speeches in places where Hitler had an appearance, too (see also Figure B2).

[33] The manuscript lacks entries between October 30, 1926 and April 14, 1928.

Figure B1: Map of Hitler's public appearances between March 1927 to March 1933, by pre-election period.

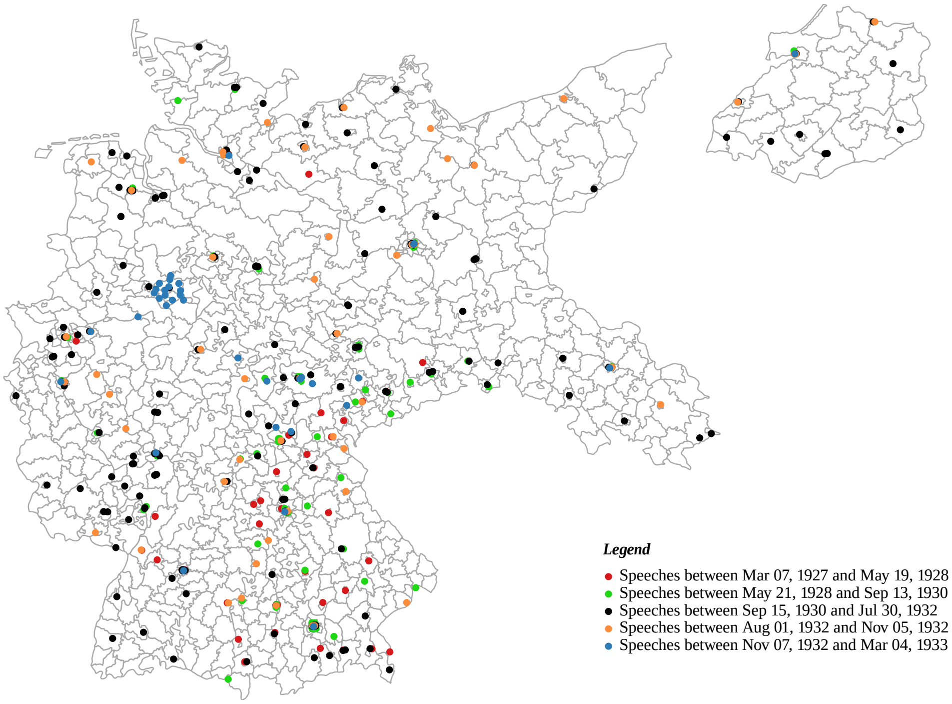
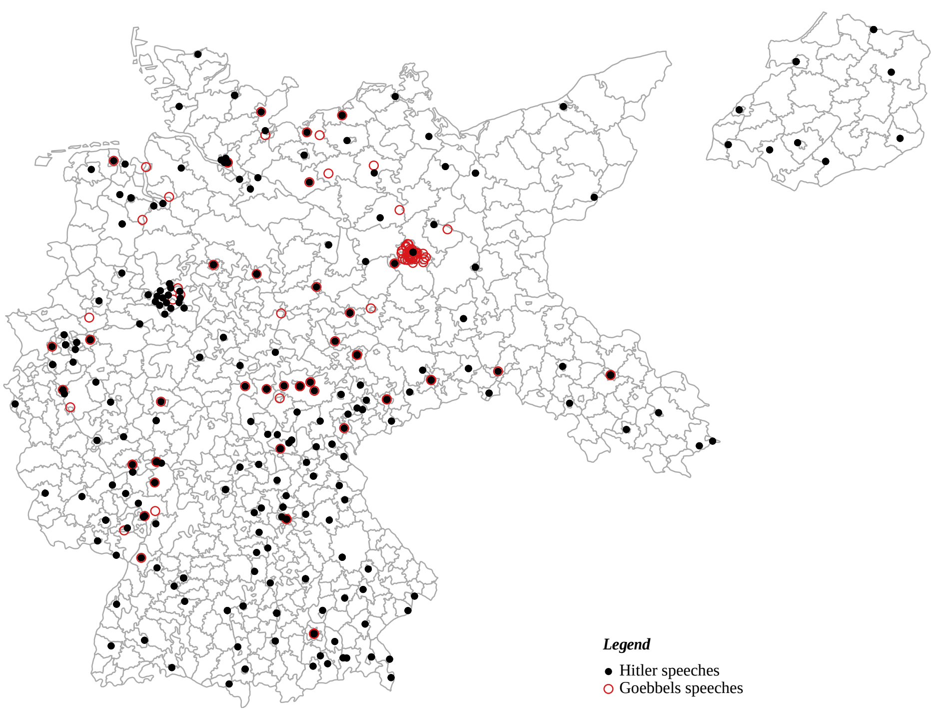


Figure B2: Map of Hitler's and Goebbels's public appearances between March 1927 to March 1933.



C Estimating the size of events

The documentation of speeches in the *Institut für Zeitgeschichte* editions frequently provides information on the reported audience sizes are of particular importance, which give us a rough indicator of the event size as well as the potential for a local impact. The sources of reported audience sizes can be classified into three categories: policy reports, common press, and Nazi press (most often, the *Völkischer Beobachter*). In rare cases, all of the sources are quoted with an estimated audience size, but most often just one or two sources are given. For $n = 93$ appearances, no estimates are reported at all. From the summary statistics for each of the sources (see Table C1) and a comparison of the density distributions (see Figure C1), we find the police reports to provide, on average, the most conservative estimates and the Nazi press to give the most optimistic ones. Reports by the press are, on average, somewhere in between.

In order to generate comparable estimates of audience size, we employ a simple model-based imputation approach. Our strategy starts with the observation that logs of the different reports are strongly correlated ($r >= .90$; see Figure C2). That is, while the reported figures vary substantively, the NS press reports are based on a very consistent and simple mechanism of overreporting of the true (or more neutrally reported) audience sizes. While none of the figures reported from the Nazi press are smaller than reported figures from both the police and the common press, the systematic relationships allow us to correct for the bias and generate valid and reliable estimates even in the absence of police or common press information. To do so, we take the police reports as ground truth (they also show the lowest incidence rate of missings; see again Table C1) and estimate three log-log models based on the following specifications:

$$\log\left(N_{\text{police}}\right) \sim \beta_0 + \beta_1 \log\left(N_{\text{press}}\right) + \beta_2 \log\left(N_{\text{NS press}}\right) \tag{1}$$

$$\log\left(N_{\text{police}}\right) \sim \beta_0 + \beta_1 \log\left(N_{\text{press}}\right) \tag{2}$$

$$\log\left(N_{\text{police}}\right) \sim \beta_0 + \beta_2 \log\left(N_{\text{NS press}}\right) \tag{3}$$

The imputation proceeds as follows: If only the police report estimate is missing, we use Equation 1 to predict them with both press figures. If only the press estimate is available, we use the results from Equation 2 to impute the missing police estimate, otherwise, we fall back to Equation 3. Note that all regression models show a very high fit (R squared > .90) and no suspicious outliers, which makes us confident that our imputation procedure produces generally plausible estimates. The last row of Table C1 reports summary statistics on the imputed variable. In comparison with the original variable, the imputed variable has a higher median and mean. According to the raw data, this is not due to the fact that we carry bias from the press variables into the imputed variable, but because missingness of police reports is systematically higher for larger events.

Figure C1: Distribution of reported audience sizes at public Hitler appearances, by source.

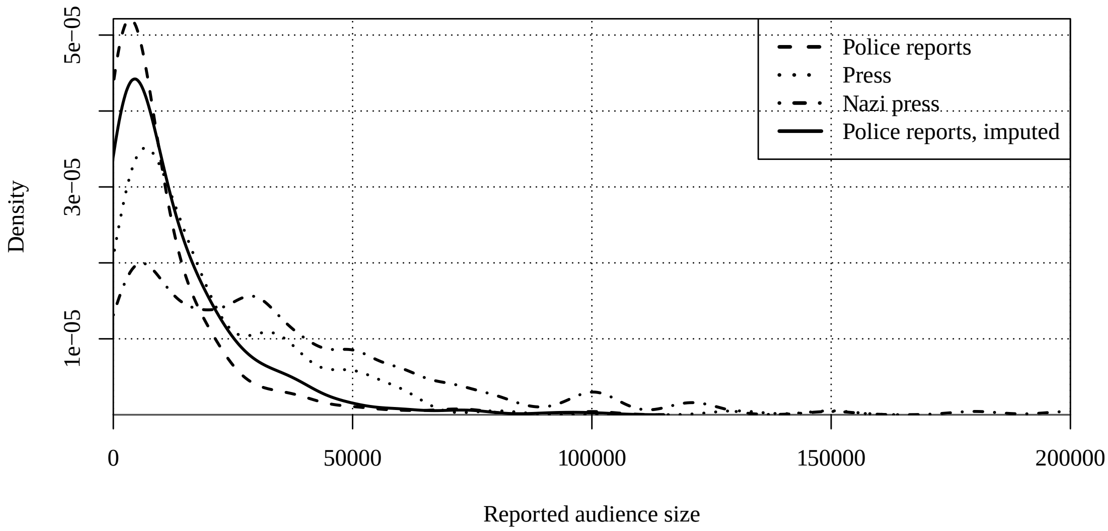


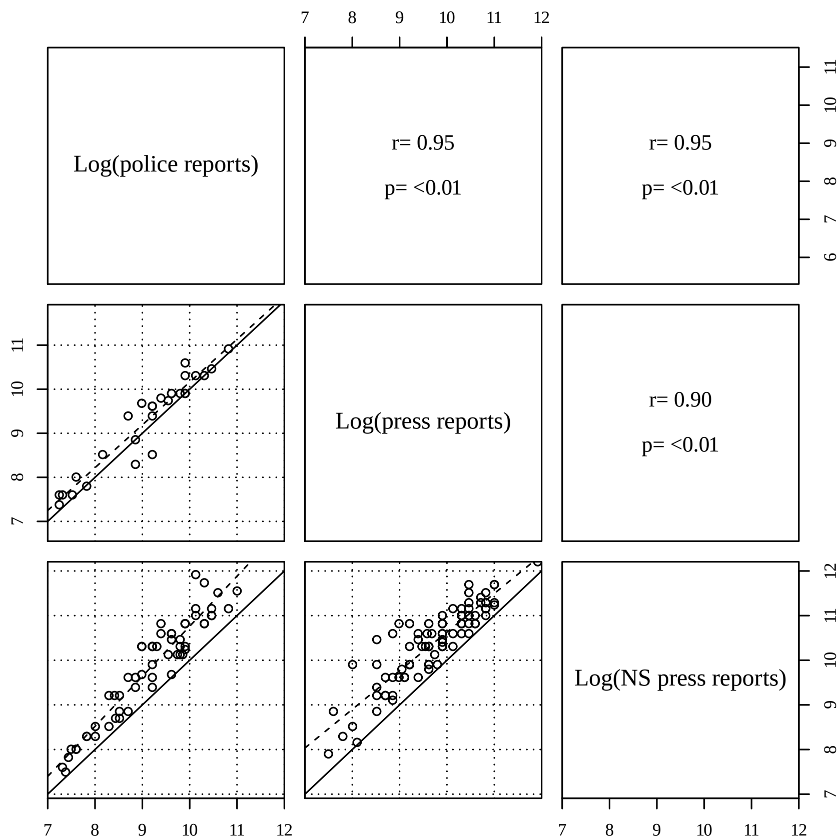
Table C1: Summary statistics of reported audience size, by source.

	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's	Total
Police reports	200	2,000	4,550	9,671	11,000	100,000	265	1,837,503
Press	700	5,125	12,500	20,190	30,000	150,000	301	3,109,540
Nazi press	1,000	10,000	30,000	35,870	50,000	200,000	272	6,564,100
Police reports, imputed	200	2,700	7,000	12,470	17,630	100,000	93	4,514,693

Table C2: Summary statistics for public speeches and audience counts, by election period. The column N^*_{speeches} summarizes speeches for which an estimate of the audience count is available.

	N_{speeches}	N^*_{speeches}	$\text{Sum}_{\text{audience}}$	$\text{Mean}_{\text{audience}}$
May 1928	84	57	107,366	1,884
Sep 1930	92	62	304,794	4,916
Jul 1932	189	172	3,184,345	18,514
Nov 1932	54	49	789,810	16,119
May 1933	36	22	128,378	5,835
Total	455	362	4,514,693	12,472

Figure C2: Comparison of various reports on audience size at Hitler's public appearances.



D Specifying exposure

In order to determine which county and municipality units were exposed to a public appearances and which not, the geo-point data on Hitler's appearances on the one hand and the municipality/county point data on the other have to be matched. Therefore, we draw radii of varying length around the places of appearance. Each administrative unit that falls within a radius is considered an exposed observation. We employ a set of four different radii—5km, 10km, 25km, and 50km—to be able to test for potential spillover effects and possible violations of the non-interference assumption.

While spillover effects certainly have a substantial component—we can plausibly hypothesize that speeches held at a particular place not only affected electoral outcomes, but also had an impact on neighboring units because voters in these neighboring units also were exposed to the appearance—they can also bear a methodological problem: We do not know anything about the existence and scope of spillover effects a priori. If we chose radii that are too narrow, units that contain exposed voters are wrongly used as control units and, if those units are compared to the exposed units, we would underestimate the true effect. Similarly, if we chose radii that are too large, we would assign exposure to factual control units, which would also lead to a downward bias. The crux of the matter is that, after all, the radius is an artificial criterion of exposure assignment and we cannot assume it to have strong implications for being exposed or not (compare this to recent advances in causal inference based on geographic natural experiments, e.g., Keele, Titiunik and Zubizarreta, 2015; Keele and Titiunik, 2016). Rather, we try to approximate the propensity of voters in an administrative unit to being or not being exposed to one of Hitler's speeches. We would not want to match municipalities or counties that are very close to each other, with one being just inside the radius and the other just outside of it, as both can be assumed to have roughly the same propensity of exposure. To guard against such interferences, we introduce an additional buffer zone between exposed and control units. Figure 3 in the paper illustrates our strategy. Red dots indicate places of appearance. Blue radii cover administrative units (blue dots) within a 10km radius of the event location. Green radii cover an area within 20km of the event. For other radius specifications, we add another 10km to determine the buffer zone. Observations that are outside of any exposure zone but inside the green radius (green dots) are neither considered exposed nor used as controls. Units outside of any no-matching buffer zone (black dots) are potential control units. We then perform exact matching on the no-matching buffer zone indicator to ensure that exposed units are only matched with control units that are outside of any no-matching buffer zone. For sure, this results in a reduction of available control units, but a potential increase in variance buys us a reduction in bias.

In addition to the spatial dimension, we also consider the timing of a public speech relative to an upcoming election. In the default specification, we employ the arguably naive assumption that timing plays a very limited role and every appearance between two elections has the same potential effect on electoral outcomes, regardless of whether it took place shortly after the previous election or just a few weeks before the election at which the outcome is measured. This assumption might seem overly simplistic, but given the intensified campaigning efforts shortly before elections (see again Figure 2 in the paper), the sample of speeches considered under this rule is sometimes not too different from more restrictive specifications that only consider speeches held during the election campaign (see Tables D1 and D2). Nevertheless, to be able to account for possible extenuating effects, we also employ specifications of the exposure variable where only public speeches held within 12, 8, 4, or 2 weeks before the election are considered.

All in all, we employ 4 x 5 = 20 (number of radius times number of time periods) different specifications of the exposure variable per election. Tables D1 and D2 provide an overview of the number of exposed, buffer and control units, separated by election and exposure variable specification.

Table D1: Exposure, buffer, and control units, by election and exposure variable specification.

		5km radius of exposure					10km radius of exposure				
Election	*Status*	*Full period*	*12 weeks*	*8 weeks*	*4 weeks*	*2 weeks*	*Full period*	*12 weeks*	*8 weeks*	*4 weeks*	*2 weeks*
Sep 1930	Exposed	76	36	34	28	19	104	55	53	43	32
	Buffer	59	38	36	26	21	86	46	42	27	18
	Control	865	926	930	946	960	810	899	905	930	950
Jul 1932	Exposed	173	100	85	79	68	219	131	115	111	99
	Buffer	109	73	69	63	60	149	104	94	84	79
	Control	718	827	846	858	872	632	765	791	805	822
Nov 1932	Exposed	78	78	78	77	40	104	104	104	103	61
	Buffer	54	54	54	53	35	76	76	76	76	34
	Control	821	821	821	823	878	773	773	773	774	858
Mar 1933	Exposed	39	31	29	23	18	56	46	46	36	31
	Buffer	45	37	35	29	22	68	47	40	34	22
	Control	869	885	889	901	913	829	860	867	883	900

Table D2: Exposure, buffer, and control units, by election and exposure variable specification, *continued*.

		25km radius of exposure					50km radius of exposure				
Election	*Status*	*Full period*	*12 weeks*	*8 weeks*	*4 weeks*	*2 weeks*	*Full period*	*12 weeks*	*8 weeks*	*4 weeks*	*2 weeks*
Sep 1930	Exposed	259	131	118	85	57	537	291	273	198	127
	Buffer	130	63	54	32	22	83	70	60	52	28
	Control	611	806	828	883	921	380	639	667	750	845
Jul 1932	Exposed	465	318	290	269	245	857	682	634	622	574
	Buffer	196	156	144	144	136	77	118	119	117	121
	Control	339	526	566	587	619	66	200	247	261	305
Nov 1932	Exposed	249	249	249	248	137	572	572	572	569	314
	Buffer	136	136	136	137	64	94	94	94	96	63
	Control	568	568	568	568	752	287	287	287	288	576
Mar 1933	Exposed	156	116	110	87	57	342	263	261	209	127
	Buffer	76	60	64	49	25	84	78	74	55	38
	Control	721	777	779	817	871	527	612	618	689	788

E Measuring competitiveness

In this section, we detail the calculation of our competitiveness measures. The electoral system governing the election of the Reichstag, in combination with a strong presidency, has often been considered one of the main culprits responsible for the breakdown of the Weimar Republic (e.g., Myerson, 2004; Shugart and Carey, 1992). It divided the country into 35 primary districts that were nested in 16 secondary districts. Seats were allocated at the primary and secondary district level as well as the national level, which constituted the highest electoral tier. An 'automatic' apportionment method was used according to which a party list received one seat per 60,000 voters at the level of the primary districts. This implied that the size of the parliament was not fixed, but varied according to the number of voters turning out at an election. Surplus votes were pooled for list apparentments at the secondary district level, and eventually, at the national level, and once again, one seat was given to the strongest list within an apparentment for 60,000 surplus votes, provided that one of the constituent lists received at least 30,000 surplus votes at the level of the primary districts. Despite its compensational mechanisms, the electoral system thus provided mobilization incentives at the levels of the primary and secondary districts which we quantify in terms of the actual party vote shares at the previous election. At the primary district level, we measure the NSDAP's competitiveness in terms of the closeness to gaining an additional seat and to losing the current seat at the district level, respectively. To illustrate, imagine a primary electoral district where the NSDAP won 250'000 votes at the previous election. The NSDAP would have been initially allotted 4 seats at the district level, since $\lfloor 250,000/60,000 \rfloor = 4$, and the number of surplus votes would be 10,000, since $250,000 - 4 * 60,000 = 10,000$. With 10,000 surplus votes, the NSDAP would have been closer to losing its final seat than to winning another primary district seat since this would require an additional $5 * 60,000 - 250,000 = 50,000$ votes. The value of our index of competitiveness at the level of this particular primary district would then be $\mathtt{max}(250,000 - 4 * 60,000, 5 * 60,000 - 250,000)/60,000 = 0.83$. More generally, the calculation can be written as

$$\text{comp\_1} = \max\left(\text{n.votes} - \text{n.seats} \times \text{q}, (\text{n.seat}s + 1) \times \text{q} - \text{n.votes}\right) \times \text{q}^{-1}, \tag{4}$$

where n.votes is the number of votes gained by the NSDAP in a primary district at the previous election, n.seats is the number of seats won in that district, and $q = 60,000$ is the electoral quota. Competitiveness in the secondary districts is calculated as

$$\text{comp\_2} = \left(\text{q} - \Sigma(\text{n.votes} - \text{n.seats} \times \text{q}) - \lfloor \Sigma(\text{n.votes} - \text{n.seats} \times \text{q}) \times \text{q}^{-1} \rfloor\right) \times \text{q}^{-1}, \tag{5}$$

where $\Sigma(\text{n.votes} - \text{n.seats} \times \text{q})$ is the number of surplus votes summed over all the primary districts that belong to a given secondary district, and $\lfloor \Sigma(\text{n.votes} - \text{n.seats} \times \text{q}) \times \text{q}^{-1} \rfloor$ is the number of seats won at the secondary district level. If $\Sigma(\text{n.votes} - \text{n.seats} \times \text{q}) < \text{q}/2$ for all the primary districts, then comp_2 = 0 according to the above rule.

F Estimating county-level NSDAP membership

We use two existing digitized samples from the original NSDAP membership indices archived at the Berlin Document Center to generate estimates of county-level NSDAP membership totals. The sampling procedure for each of these samples is described in more detail in Schneider-Haase (1991).

Both files are sorted alphabetically and stored in several thousand card boxes. In the early nineties, two research teams, one from Berlin, the other from Minneapolis, drew one sample each from both files, resulting in four different samples. Overall, about 40,000 observations were registered. The basic sampling design in all cases was based on a combination of cluster samples to (randomly) select a subset of card boxes. Next, about half of the cards were selected from each of these boxes. Depending on the year of interest, all members (for those who entered the party before 1930) or just the first five or six (depending on the research group; but in any case for observations between 1930 and 1933) cases entered the sample. This quota component was introduced to account for the fact that the total number of members was very small before 1930, and exploded in the years after.

To generate sampling weights that can be used to estimate NSDAP membership totals, we proceed as follows: First, we correct for the fact that the files contained cards not part of the population frame. Approximately 1.2 to 2.8% of the cards stemmed from a local (Franconian) register and about 6.5% referred to Austrian members (Botz, 1980; Schneider-Haase, 1991). We account for this by subtracting the corresponding fractions (we take the average of 2% to account for the Franconian register) from the assumed total of card boxes, which defines our population size. Next, we use information on the overall number of master file card boxes and the number of randomly selected boxes for each sample to compute selection probabilities, the inverse of which give us our population weights. For instance, to generate weights for observations sampled from the blue boxes, by the Berlin team, we calculate:

$$\text{weight}^{\text{blue}}_{\text{berlin}} = \left(\frac{n_{\text{blue\&berlin}}}{N_{\text{blue}}} * 0.5\right)^{-1} \tag{6}$$

The 0.5 factor accounts for the fact that two independent samples are considered. We proceed analogously for observations drawn from the green boxes and/or the Minneapolis team. For observations in the sample that entered NSDAP after 1929, we have to account for the quota component of the sample design. Recall that 5 to 6 cards for each of the years 1930 to 1933 were selected from each box, regardless of the overall number of cards. To still be able to generate sampling weights for these observations, we use information from a previous sample drawn by Kater (1980) to calculate year-specific drawing probabilities. The distribution of observations in the Kater sample by year is reported in Table F1. In these cases, we adapt the calculation of the weights accordingly:

$$\text{weight}^{\text{blue}}_{\text{berlin}} = \left(\frac{n_{\text{blue\&berlin}}}{N_{\text{blue}}} * 0.5\right)^{-1} * \text{rel.share}^{\text{kater}} * \frac{n^{*}_{\text{blue}}}{5}/2 \tag{7}$$

That is, we multiply the original weight with the year-specific empirical share of memberships from the Kater sample (rel.share$^{\text{kater}}$, e.g. 0.02 for 1930; see again Table F1). The last term accounts for the fact that just five (as illustrated) or six cards were selected from the box, which hold an average size of n^* cards.

It is difficult to tell whether one or the other sample should be regarded as more representative of the unknown population. Therefore, we combine them by re-calibrating the weights according to the associated sample sizes. For instance, we would multiply the previously generated weight of an observation sampled from the blue box by the Berlin team with $\frac{n_{\text{blue\&berlin}}}{N_{\text{total}}}$.

To generate county estimates of NSDAP membership, we cumulate weighted county-level membership counts until election date (making the simplifying assumption that there are no resignations or deaths, as we do not have information about either of those).

Table F2 reports national-level estimates of NSDAP member totals prior to each election. We see a strong rise in memberships between the 1930 Reichstag and 1932 presidential elections. Note that these figures are substantively below those published by the NSDAP itself, which amount to over a million at the time of the Nazi seizure of power in 1933 (Volz, 1939).

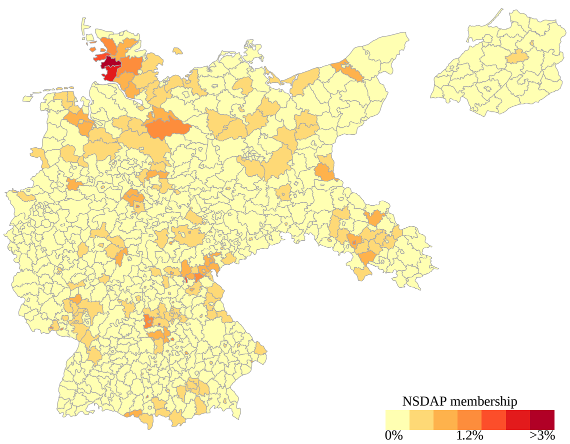
Table F1: NSDAP membership sample as reported in Kater (1980); quoted in Schneider-Haase (1991, 117).

	Absolute	Relative	Cumulated	Cumulated share
1925	34	0.002	34	0.002
1926	32	0.002	66	0.004
1927	23	0.001	89	0.005
1928	43	0.002	132	0.007
1929	112	0.006	244	0.013
1930	361	0.020	605	0.033
1931	829	0.045	1434	0.079
1932	905	0.050	2339	0.128
1933	3502	0.192	5841	0.320
1934	37	0.002	5878	0.322
1935	223	0.012	6101	0.334
1936	190	0.010	6291	0.345
1937	4330	0.237	10621	0.582
1938	314	0.017	10935	0.599
1939	1231	0.067	12166	0.666
1940	2217	0.121	14383	0.788
1941	1054	0.058	15437	0.846
1942	872	0.048	16309	0.893
1943	749	0.041	17058	0.934
1944	1196	0.066	18254	1.000
1945	1	0.000	18255	1.000

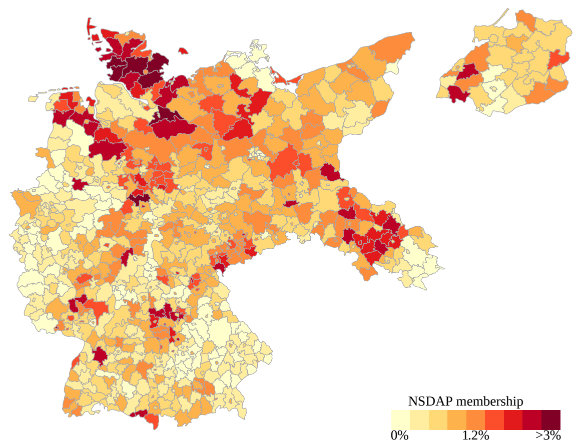
Table F2: Estimate of aggregate number of NSDAP members before Reichstag/Presidential elections, 1928-1933.

Election	Estimate
1928-05-20	30056
1930-09-14	125225
1932-03-13	478948
1932-04-10	500242
1932-07-31	556161
1932-11-06	638674
1933-03-05	655216

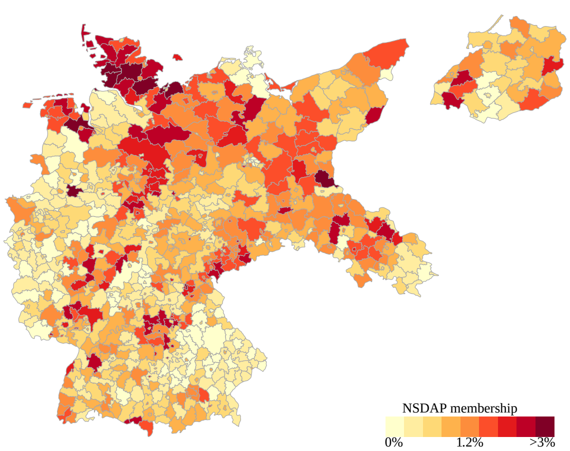
Figure F1: NSDAP membership estimates at the county level.



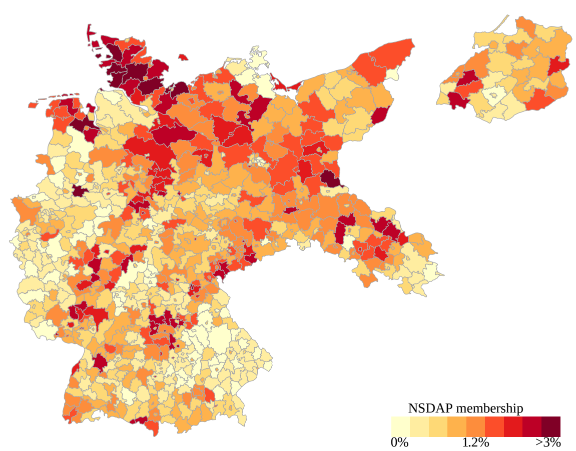
(a) Sep 1930 Reichstag election



(b) Jul 1932 Reichstag election



(c) Nov 1932 Reichstag election



(d) Mar 1933 Reichstag election

G Geocoding historical airfields

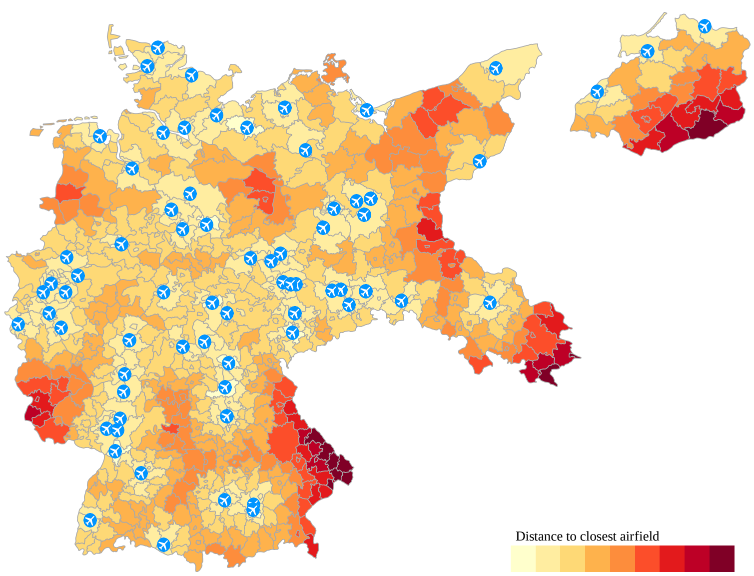
We consulted several online sources to identify civilian airfields that were operated in the German Empire at the time of Hitler's aircraft-supported campaign in 1932. In particular, we gathered information from the German Wikipedia, which provides several lists of still existing and former airfields under the following URLs:

- https://de.wikipedia.org/wiki/Liste_der_Verkehrslandepl%C3%A4tze_mit_IFR-Zulassung
- https://de.wikipedia.org/wiki/Liste_der_Verkehrs-_und_Sonderlandepl%C3%A4tze_in_Deutschland
- https://de.wikipedia.org/wiki/Liste_der_ehemaligen_Verkehrsflugh%C3%A4fen_in_Deutschland
- https://de.wikipedia.org/wiki/Kategorie:Ehemaliger_Flugplatz

Further, we crawled the website http://www.forgottenairfields.com/, which hosts a collection of former airfields in various countries.

We selected only those airfields and airports that were in operation in 1932 and located in the boarders of the German Empire. Further, we excluded airfields on small islands that were an unlikely target for campaign appearances (in fact, according to our data Hitler never spoke publicly on one of these islands) to prevent them from biasing our distance measure. Overall, we identified 70 airfields. See Figure G1 for a map of the respective locations.

Figure G1: Location of civilian airfields in the German Empire, 1932. Administrative counties are shaded according to their centroid's distance to the closest airfield.



H Descriptives

Table H1: Summary statistics, Sep 1930 election

Statistic	N	Mean	St. Dev.	Min	Max
Appearance within 5km radius	1,000	0.076	0.265	0	1
Appearance within 10km radius	1,000	0.104	0.305	0	1
Appearance within 25km radius	1,000	0.259	0.438	0	1
Appearance within 50km radius	1,000	0.537	0.499	0	1
Previous NSDAP vote share	1,000	0.154	0.072	0.009	0.416
Turnout	1,000	0.809	0.064	0.567	0.950
Competitiveness 1	1,000	0.544	0.254	0.142	0.980
Competitiveness 2	1,000	0.404	0.314	0.039	0.924
Number of eligibles	1,000	0.410	0.604	0.015	8.554
Organizational strength	1,000	0.117	0.182	0.000	2.544
Distance to nearest airfield	1,000	0.424	0.302	0.003	1.694
Goebbels appearance	1,000	0.079	0.270	0	1

Table H2: Summary statistics, 1930 election (municipality-level data)

Statistic	N	Mean	St. Dev.	Min	Max
Appearance within 5km radius	3,864	0.027	0.163	0	1
Appearance within 10km radius	3,864	0.070	0.255	0	1
Appearance within 25km radius	3,864	0.254	0.435	0	1
Appearance within 50km radius	3,864	0.538	0.499	0	1
Previous NSDAP vote share	3,864	0.150	0.087	0.003	0.678
Turnout	3,864	0.820	0.078	0.371	1.000
Competitiveness 1	3,864	0.545	0.259	0.142	0.980
Competitiveness 2	3,864	0.393	0.302	0.039	0.924
Number of eligibles	3,864	0.106	0.331	0.006	8.554
Organizational strength	3,864	0.131	0.159	0.000	2.544
Distance to nearest airfield	3,864	0.388	0.272	0.003	1.694
Goebbels appearance	3,864	0.060	0.237	0	1

Table H3: Summary statistics, 1932 Presidential election (2nd round)

Statistic	N	Mean	St. Dev.	Min	Max
Appearance within 5km radius	685	0.028	0.164	0	1
Appearance within 10km radius	685	0.047	0.211	0	1
Appearance within 25km radius	685	0.127	0.333	0	1
Appearance within 50km radius	685	0.369	0.483	0	1
Previous NSDAP vote share	685	0.000	0.000	0	0
Turnout	685	0.839	0.051	0.646	0.946
Number of eligibles	685	0.398	0.565	0.019	8.742
Organizational strength	685	0.435	0.533	0.000	5.387
Distance to nearest airfield	685	0.446	0.302	0.003	1.694
Goebbels appearance	685	0.001	0.038	0	1

Table H4: Summary statistics, Jul 1932 election

Statistic	N	Mean	St. Dev.	Min	Max
Appearance within 5km radius	1,000	0.173	0.378	0	1
Appearance within 10km radius	1,000	0.219	0.414	0	1
Appearance within 25km radius	1,000	0.465	0.499	0	1
Appearance within 50km radius	1,000	0.857	0.350	0	1
Previous NSDAP vote share	1,000	0.329	0.128	0.051	0.757
Turnout	1,000	0.836	0.061	0.542	0.951
Competitiveness 1	1,000	0.727	0.138	0.523	0.998
Competitiveness 2	1,000	0.532	0.304	0.077	0.970
Number of eligibles	1,000	0.435	0.612	0.019	8.447
Organizational strength	1,000	0.529	0.712	0.000	7.446
Distance to nearest airfield	1,000	0.423	0.303	0.003	1.694
Goebbels appearance	1,000	0.069	0.254	0	1

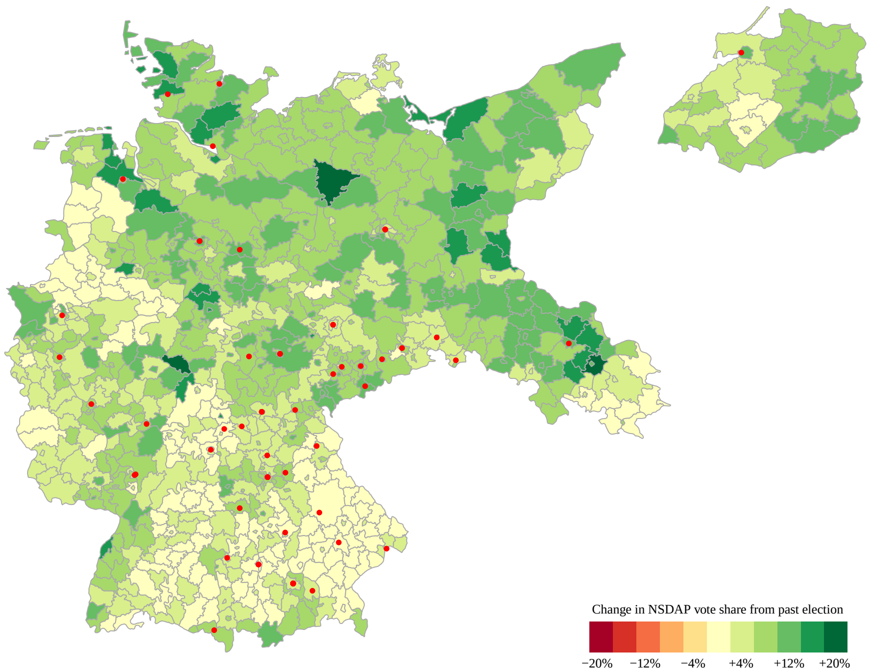
Table H5: Summary statistics, Nov 1932 election

Statistic	N	Mean	St. Dev.	Min	Max
Appearance within 5km radius	953	0.082	0.274	0	1
Appearance within 10km radius	953	0.109	0.312	0	1
Appearance within 25km radius	953	0.261	0.440	0	1
Appearance within 50km radius	953	0.600	0.490	0	1
Previous NSDAP vote share	953	0.279	0.115	0.043	0.686
Turnout	953	0.799	0.070	0.492	0.983
Competitiveness 1	953	0.759	0.148	0.518	0.993
Competitiveness 2	953	0.416	0.318	0.002	0.979
Number of eligibles	953	0.459	0.648	0.019	8.689
Organizational strength	953	0.622	0.844	0.003	9.067
Distance to nearest airfield	953	0.423	0.307	0.003	1.694
Goebbels appearance	953	0.021	0.143	0	1

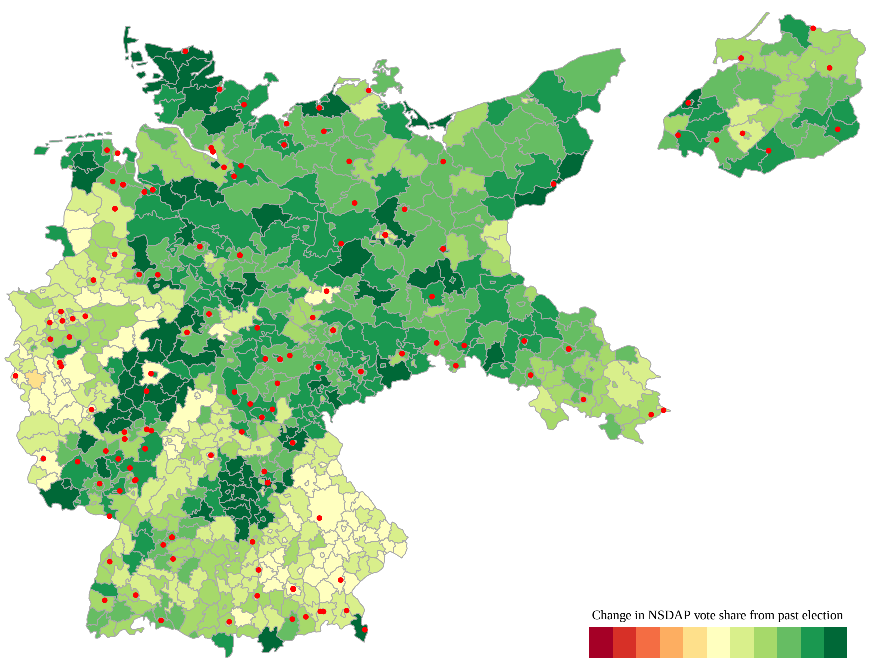
Table H6: Summary statistics, Mar 1933 election

Statistic	N	Mean	St. Dev.	Min	Max
Appearance within 5km radius	953	0.041	0.198	0	1
Appearance within 10km radius	953	0.059	0.235	0	1
Appearance within 25km radius	953	0.164	0.370	0	1
Appearance within 50km radius	953	0.359	0.480	0	1
Previous NSDAP vote share	953	0.412	0.109	0.117	0.791
Turnout	953	0.886	0.037	0.697	0.960
Competitiveness 1	953	0.767	0.133	0.508	0.972
Competitiveness 2	953	0.534	0.302	0.049	0.852
Number of eligibles	953	0.463	0.653	0.019	8.718
Organizational strength	953	0.637	0.865	0.003	9.199
Distance to nearest airfield	953	0.423	0.307	0.003	1.694
Goebbels appearance	953	0.033	0.177	0	1

Figure H1: Change in county-level NSDAP vote shares from election to election. Red dots indicate Hitler appearances between elections.

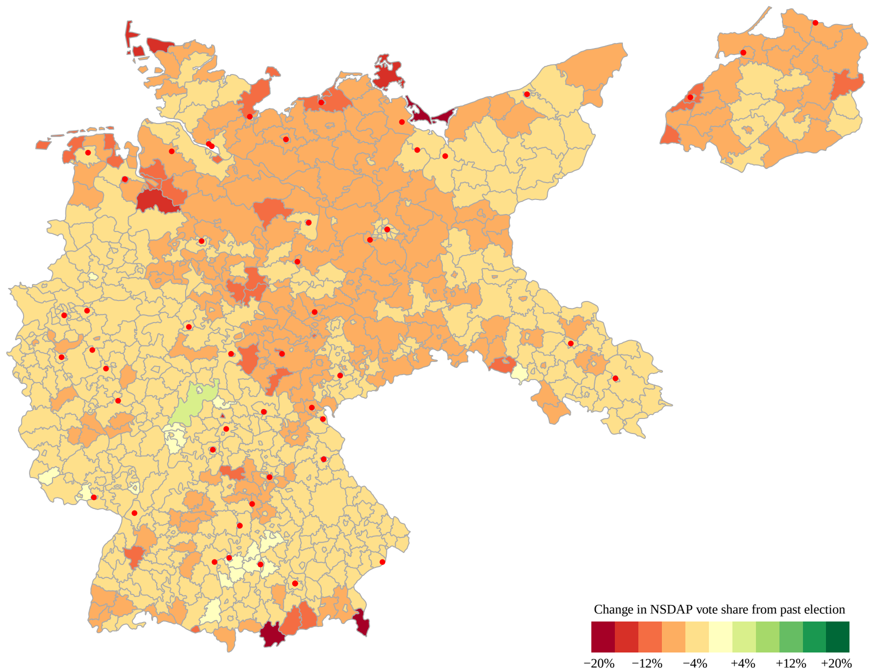


(a) May 1928 to Sep 1930 Reichstag election

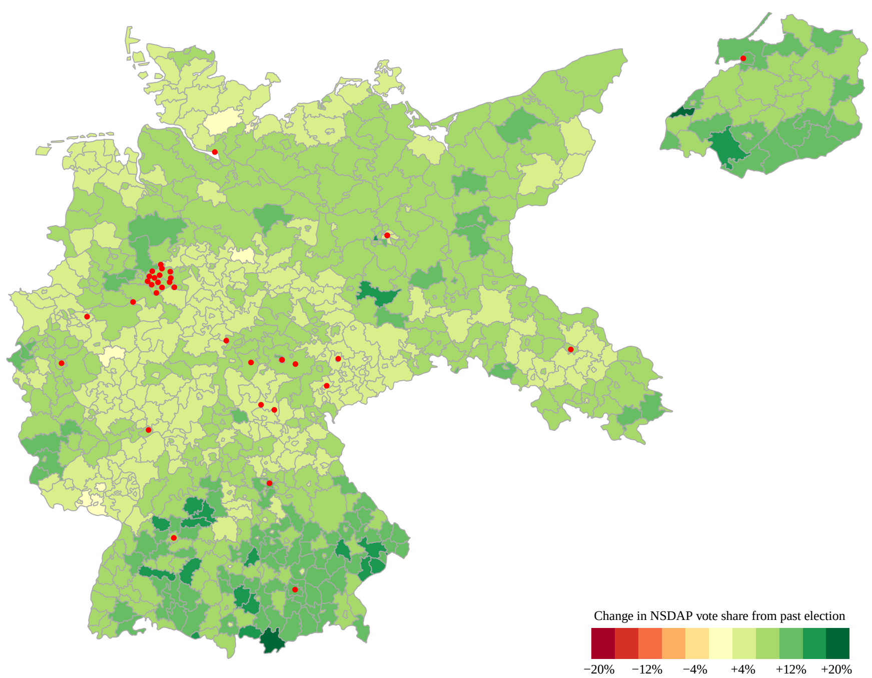


(b) Sep 1930 to Jul 1932 Reichstag election

Figure H2: Change in NSDAP vote shares from election to election, at county level. Red dots indicate Hitler's public speeches held between two elections.



(a) Jul 1932 to Nov 1932 Reichstag election



(b) Nov 1932 to Mar 1933 Reichstag election

I Supporting tables

Table I1: Effects of exposure to Hitler appearance on NSDAP/Hitler vote share.

	Sep 1930		Sep 1930 (mun.)		Apr 1932 (P)		Jul 1932		Nov 1932		Mar 1933	
Exposure, 10km	−0.008	−0.002	−0.008	−0.006	0.004	0.016**	−0.038***	−0.024**	0.004	−0.007	−0.013***	0.013
	(0.005)	(0.012)	(0.005)	(0.013)	(0.003)	(0.008)	(0.006)	(0.010)	(0.003)	(0.005)	(0.004)	(0.008)
(Intercept)	0.018***	0.022***	0.018***	0.027***	0.273***	0.193***	0.153***	0.165***	0.322***	0.328***	0.277***	0.239***
	(0.001)	(0.004)	(0.001)	(0.005)	(0.005)	(0.016)	(0.003)	(0.006)	(0.004)	(0.014)	(0.004)	(0.016)
Sample	full	matched	full	matched	full	matched	full	matched	full	matched	full	matched
Observations	1000	157	3864	433	685	52	991	305	948	159	952	72
Adjusted R^2	0.656	0.648	0.608	0.641	0.099	0.118	0.468	0.505	0.072	0.058	0.308	0.434

Note: Diff-in-diff models with number of actual voters as population weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I2: Effects of exposure to Hitler appearance on KPD/Thälmann vote share.

	Sep 1930		Sep 1930 (mun.)		Apr 1932 (P)		Jul 1932		Nov 1932		Mar 1933	
Exposure, 10km	−0.003	−0.009*	−0.004*	−0.009	−0.012***	−0.005	−0.002	−0.002	0.005*	−0.004	−0.008***	−0.002
	(0.002)	(0.005)	(0.002)	(0.006)	(0.004)	(0.005)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)	(0.005)
(Intercept)	0.061***	0.077***	0.061***	0.077***	0.097***	0.120***	0.082***	0.092***	0.110***	0.114***	0.123***	0.166***
	(0.003)	(0.009)	(0.002)	(0.010)	(0.004)	(0.012)	(0.003)	(0.008)	(0.003)	(0.009)	(0.003)	(0.012)
Sample	full	matched	full	matched	full	matched	full	matched	full	matched	full	matched
Observations	1000	157	3864	433	685	52	991	305	948	159	952	72
Adjusted R^2	0.177	0.116	0.151	0.108	0.232	0.215	0.145	0.015	0.106	0.009	0.178	0.119

Note: Diff-in-diff models with number of actual voters as population weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I3: Effects of exposure to Hitler appearance on turnout.

	Sep 1930		Sep 1930 (mun.)		Apr 1932 (P)		Jul 1932		Nov 1932		Mar 1933	
Exposure, 10km	−0.009	−0.028***	−0.008	−0.034***	−0.014***	0.001	−0.014***	−0.008	0.006	−0.012**	−0.007	0.004
	(0.006)	(0.010)	(0.005)	(0.011)	(0.004)	(0.011)	(0.003)	(0.005)	(0.005)	(0.006)	(0.007)	(0.013)
(Intercept)	0.750***	0.747***	0.761***	0.734***	0.860***	0.831***	0.813***	0.820***	0.842***	0.848***	0.806***	0.802***
	(0.003)	(0.012)	(0.002)	(0.009)	(0.003)	(0.012)	(0.003)	(0.006)	(0.002)	(0.007)	(0.003)	(0.010)
Sample	full	matched	full	matched	full	matched	full	matched	full	matched	full	matched
Observations	1000	157	3864	433	685	52	991	305	948	159	952	72
Adjusted R^2	0.204	0.254	0.159	0.223	0.073	0.280	0.043	0.036	0.086	0.091	0.423	0.553

Note: Diff-in-diff models with number of actual voters as population weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I4: Diff-in-diff estimates of exposure effects on NSDAP vote share at the 1930 national parliamentary election using community-level data with varying radius of exposure specifications.

	... 5km		... 10km		... 25km		... 50km	
Exposure, radius of...	−0.004	0.011	−0.008	0.003	−0.009**	−0.002	−0.009**	−0.008
	(0.006)	(0.014)	(0.005)	(0.011)	(0.004)	(0.007)	(0.004)	(0.007)
(Intercept)	0.018***	0.025***	0.018***	0.023***	0.017***	0.023***	0.014***	0.018***
	(0.001)	(0.005)	(0.001)	(0.005)	(0.001)	(0.002)	(0.001)	(0.001)
Sample	full	matched	full	matched	full	matched	full	matched
Observations	3864	181	3864	433	3864	1436	3864	2491
Adjusted R^2	0.608	0.597	0.608	0.624	0.608	0.596	0.609	0.613

Note: DID models with number of actual voters as pop weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I5: Diff-in-diff estimates of exposure effects on KPD vote share at the 1930 national parliamentary election using community-level data with varying radius of exposure specifications.

	... 5km		... 10km		... 25km		... 50km	
Exposure, radius of...	−0.003	−0.013**	−0.004*	−0.010*	−0.001	0.004**	0.002	0.004*
	(0.003)	(0.006)	(0.002)	(0.006)	(0.002)	(0.002)	(0.002)	(0.002)
(Intercept)	0.070***	0.091***	0.061***	0.080***	0.056***	0.050***	0.048***	0.053***
	(0.004)	(0.010)	(0.002)	(0.011)	(0.003)	(0.005)	(0.002)	(0.005)
Sample	full	matched	full	matched	full	matched	full	matched
Observations	3864	181	3864	433	3864	1436	3864	2491
Adjusted R^2	0.078	0.075	0.151	0.097	0.149	0.129	0.124	0.062

Note: DID models with number of actual voters as pop weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I6: Diff-in-diff estimates of exposure effects on turnout at the 1930 national parliamentary election using community-level data with varying radius of exposure specifications.

	... 5km		... 10km		... 25km		... 50km	
Exposure, radius of...	−0.004	−0.034***	−0.010*	−0.043***	−0.007*	−0.024***	−0.001	−0.009*
	(0.007)	(0.013)	(0.006)	(0.011)	(0.004)	(0.006)	(0.004)	(0.005)
(Intercept)	0.754***	0.744***	0.750***	0.725***	0.747***	0.722***	0.744***	0.732***
	(0.002)	(0.015)	(0.002)	(0.012)	(0.003)	(0.008)	(0.004)	(0.008)
Sample	full	matched	full	matched	full	matched	full	matched
Observations	3864	181	3864	433	3864	1436	3864	2491
Adjusted R^2	0.159	0.255	0.165	0.308	0.171	0.220	0.170	0.175

Note: DID models with number of actual voters as pop weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I7: Diff-in-diff estimates of exposure effects on NSDAP vote share at the 1930 national parliamentary election with varying time span specifications.

	... 12 weeks		... 8 weeks		... 4 weeks		... 2 weeks	
Exposure, time span of...	−0.013**	0.019	−0.013**	0.007	−0.012*	−0.032***	−0.010	0.003
	(0.006)	(0.012)	(0.006)	(0.017)	(0.007)	(0.011)	(0.008)	(0.025)
(Intercept)	0.019***	0.023***	0.019***	0.022***	0.019***	0.033***	0.019***	0.022***
	(0.001)	(0.005)	(0.001)	(0.005)	(0.001)	(0.009)	(0.001)	(0.008)
Sample	full	matched	full	matched	full	matched	full	matched
Observations	1000	80	1000	74	1000	60	1000	25
Adjusted R^2	0.657	0.717	0.657	0.712	0.656	0.764	0.656	0.795

Note: DID models with number of actual voters as pop weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I8: Diff-in-diff estimates of exposure effects on KPD vote share at the 1930 national parliamentary election with varying time span specifications.

	... 12 weeks		... 8 weeks		... 4 weeks		... 2 weeks	
Exposure, time span of...	−0.001	−0.003	−0.001	0.0004	−0.004*	0.003	−0.006**	−0.008
	(0.002)	(0.004)	(0.002)	(0.004)	(0.002)	(0.005)	(0.002)	(0.005)
(Intercept)	0.064***	0.069***	0.064***	0.068***	0.066***	0.044***	0.067***	0.039***
	(0.003)	(0.013)	(0.003)	(0.011)	(0.003)	(0.009)	(0.003)	(0.005)
Sample	full	matched	full	matched	full	matched	full	matched
Observations	1000	80	1000	74	1000	60	1000	25
Adjusted R^2	0.182	0.075	0.183	0.089	0.167	0.098	0.176	0.108

Note: DID models with number of actual voters as pop weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I9: Diff-in-diff estimates of exposure effects on turnout at the 1930 national parliamentary election with varying time span specifications.

	... 12 weeks		... 8 weeks		... 4 weeks		... 2 weeks	
Exposure, time span of...	−0.012*	−0.047***	−0.012*	−0.036**	−0.016**	−0.008	−0.026***	−0.046
	(0.007)	(0.012)	(0.007)	(0.018)	(0.007)	(0.012)	(0.006)	(0.028)
(Intercept)	0.762***	0.718***	0.762***	0.738***	0.762***	0.784***	0.759***	0.705***
	(0.003)	(0.016)	(0.003)	(0.022)	(0.003)	(0.023)	(0.004)	(0.041)
Sample	full	matched	full	matched	full	matched	full	matched
Observations	1000	80	1000	74	1000	60	1000	25
Adjusted R^2	0.189	0.260	0.189	0.248	0.190	0.162	0.197	0.408

Note: DID models with number of actual voters as pop weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I10: Diff-in-diff estimates of exposure effects on NSDAP vote share at the 1930 national parliamentary election, using municipal-level data, with varying time span specifications.

	... 12 weeks		... 8 weeks		... 4 weeks		... 2 weeks	
Exposure, time span of...	−0.013**	0.007	−0.013**	0.025**	−0.012*	0.012	−0.010	0.036
	(0.006)	(0.014)	(0.006)	(0.011)	(0.007)	(0.013)	(0.008)	(0.022)
(Intercept)	0.019***	0.017***	0.019***	0.014***	0.019***	0.027***	0.019***	0.017***
	(0.001)	(0.003)	(0.001)	(0.003)	(0.001)	(0.006)	(0.001)	(0.004)
Sample	full	matched	full	matched	full	matched	full	matched
Observations	3864	190	3864	183	3864	146	3864	65
Adjusted R^2	0.608	0.702	0.608	0.719	0.608	0.672	0.608	0.779

Note: DID models with number of actual voters as pop weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I11: Diff-in-diff estimates of exposure effects on KPD vote share at the 1930 national parliamentary election, using municipal-level data, with varying time span specifications.

	... 12 weeks		... 8 weeks		... 4 weeks		... 2 weeks	
Exposure, radius of...	−0.001	−0.008	−0.001	−0.012*	−0.004*	−0.011***	−0.005**	−0.009*
	(0.002)	(0.006)	(0.002)	(0.007)	(0.002)	(0.004)	(0.002)	(0.006)
(Intercept)	0.064***	0.086***	0.064***	0.094***	0.066***	0.107***	0.067***	0.098***
	(0.003)	(0.012)	(0.003)	(0.014)	(0.003)	(0.018)	(0.003)	(0.023)
Sample	full	matched	full	matched	full	matched	full	matched
Observations	3864	190	3864	183	3864	146	3864	65
Adjusted R^2	0.161	0.078	0.162	0.056	0.149	0.029	0.156	0.089

Note: DID models with number of actual voters as pop weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I12: Diff-in-diff estimates of exposure effects on turnout at the 1930 national parliamentary election, using municipal-level data, with varying time span specifications.

	... 12 weeks		... 8 weeks		... 4 weeks		... 2 weeks	
Exposure, radius of...	−0.012*	−0.026*	−0.012*	−0.026*	−0.016**	−0.043***	−0.025***	−0.057***
	(0.006)	(0.013)	(0.007)	(0.015)	(0.007)	(0.013)	(0.006)	(0.010)
(Intercept)	0.764***	0.758***	0.764***	0.754***	0.764***	0.746***	0.761***	0.724***
	(0.002)	(0.017)	(0.002)	(0.014)	(0.002)	(0.014)	(0.003)	(0.018)
Sample	full	matched	full	matched	full	matched	full	matched
Observations	3864	190	3864	183	3864	146	3864	65
Adjusted R^2	0.155	0.231	0.155	0.243	0.156	0.222	0.160	0.386

Note: DID models with number of actual voters as pop weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I13: Diff-in-diff estimates of exposure effects on NSDAP vote share at the Jul 1932 national parliamentary election with varying time span specifications.

	... 12 weeks		... 8 weeks		... 4 weeks		... 2 weeks	
Exposure, time span of...	−0.035***	−0.038***	−0.037***	−0.028**	−0.041***	−0.031***	−0.043***	−0.047***
	(0.008)	(0.011)	(0.008)	(0.013)	(0.008)	(0.012)	(0.008)	(0.014)
(Intercept)	0.151***	0.167***	0.151***	0.160***	0.152***	0.168***	0.152***	0.163***
	(0.003)	(0.006)	(0.003)	(0.008)	(0.003)	(0.009)	(0.003)	(0.008)
Sample	full	matched	full	matched	full	matched	full	matched
Observations	991	202	991	174	991	162	991	138
Adjusted R^2	0.461	0.517	0.463	0.487	0.466	0.529	0.468	0.540

Note: DID models with number of actual voters as pop weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I14: Diff-in-diff estimates of exposure effects on KPD vote share at the Jul 1932 national parliamentary election with varying time span specifications.

	... 12 weeks		... 8 weeks		... 4 weeks		... 2 weeks	
Exposure, time span of...	−0.001	0.004	−0.001	−0.001	−0.0005	0.013**	0.0003	0.011
	(0.004)	(0.005)	(0.004)	(0.005)	(0.004)	(0.006)	(0.004)	(0.007)
(Intercept)	0.090***	0.102***	0.089***	0.082***	0.089***	0.095***	0.089***	0.083***
	(0.004)	(0.010)	(0.004)	(0.008)	(0.004)	(0.010)	(0.004)	(0.009)
Sample	full	matched	full	matched	full	matched	full	matched
Observations	991	202	991	174	991	162	991	138
Adjusted R^2	0.123	0.062	0.137	0.121	0.146	0.076	0.149	0.108

Note: DID models with number of actual voters as pop weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I15: Diff-in-diff estimates of exposure effects on turnout at the Jul 1932 national parliamentary election with varying time span specifications.

	... 12 weeks		... 8 weeks		... 4 weeks		... 2 weeks	
Exposure, time span of...	−0.013***	−0.008	−0.013***	−0.009	−0.015***	−0.008	−0.015***	−0.011
	(0.003)	(0.006)	(0.003)	(0.007)	(0.003)	(0.006)	(0.003)	(0.007)
(Intercept)	0.819***	0.832***	0.819***	0.828***	0.819***	0.833***	0.818***	0.825***
	(0.002)	(0.009)	(0.002)	(0.010)	(0.002)	(0.009)	(0.002)	(0.012)
Sample	full	matched	full	matched	full	matched	full	matched
Observations	991	202	991	174	991	162	991	138
Adjusted R^2	0.043	0.018	0.043	0.021	0.044	0.018	0.048	0.039

Note: DID models with number of actual voters as pop weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I16: Diff-in-diff estimates of exposure effects on NSDAP vote share at the Nov 1932 national parliamentary election with varying time span specifications.

	... 12 weeks		... 8 weeks		... 4 weeks		... 2 weeks	
Exposure, time span of...	0.004	−0.007	0.004	−0.006	0.004	−0.003	0.008**	0.007
	(0.003)	(0.005)	(0.003)	(0.006)	(0.003)	(0.006)	(0.003)	(0.005)
(Intercept)	0.322***	0.328***	0.322***	0.311***	0.322***	0.319***	0.323***	0.324***
	(0.004)	(0.014)	(0.004)	(0.014)	(0.004)	(0.014)	(0.004)	(0.014)
Sample	full	matched	full	matched	full	matched	full	matched
Observations	948	159	948	156	948	152	948	83
Adjusted R^2	0.072	0.058	0.072	0.050	0.072	0.051	0.097	0.080

Note: DID models with number of actual voters as pop weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I17: Diff-in-diff estimates of exposure effects on KPD vote share at the Nov 1932 national parliamentary election with varying time span specifications.

	... 12 weeks		... 8 weeks		... 4 weeks		... 2 weeks	
Exposure, time span of...	0.005*	−0.004	0.005*	−0.001	0.005*	−0.0004	0.008**	−0.007
	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)	(0.005)
(Intercept)	0.110***	0.114***	0.110***	0.121***	0.110***	0.123***	0.110***	0.136***
	(0.003)	(0.009)	(0.003)	(0.011)	(0.003)	(0.012)	(0.003)	(0.013)
Sample	full	matched	full	matched	full	matched	full	matched
Observations	948	159	948	156	948	152	948	83
Adjusted R^2	0.106	0.009	0.106	0.002	0.108	0.002	0.149	−0.004

Note: DID models with number of actual voters as pop weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I18: Diff-in-diff estimates of exposure effects on turnout at the Nov 1932 national parliamentary election with varying time span specifications.

	... 12 weeks		... 8 weeks		... 4 weeks		... 2 weeks	
Exposure, time span of...	0.006	−0.012**	0.006	−0.007	0.006	−0.007	0.008	−0.016**
	(0.004)	(0.006)	(0.004)	(0.007)	(0.004)	(0.007)	(0.005)	(0.008)
(Intercept)	0.846***	0.850***	0.846***	0.845***	0.846***	0.851***	0.845***	0.854***
	(0.002)	(0.007)	(0.002)	(0.007)	(0.002)	(0.008)	(0.002)	(0.010)
Sample	full	matched	full	matched	full	matched	full	matched
Observations	948	159	948	156	948	152	948	83
Adjusted R^2	0.088	0.090	0.088	0.093	0.088	0.105	0.088	0.138

Note: DID models with number of actual voters as pop weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I19: Diff-in-diff estimates of exposure effects on NSDAP vote share at the 1933 national parliamentary election with varying time span specifications.

	... 12 weeks		... 8 weeks		... 4 weeks		... 2 weeks	
Exposure, time span of...	−0.012***	0.018***	−0.012***	0.018***	−0.014***	0.004	−0.014***	0.010
	(0.005)	(0.007)	(0.005)	(0.007)	(0.005)	(0.011)	(0.005)	(0.008)
(Intercept)	0.278***	0.239***	0.278***	0.239***	0.278***	0.242***	0.274***	0.255***
	(0.004)	(0.015)	(0.004)	(0.015)	(0.004)	(0.030)	(0.005)	(0.018)
Sample	full	matched	full	matched	full	matched	full	matched
Observations	952	56	952	56	952	34	952	32
Adjusted R^2	0.313	0.423	0.313	0.423	0.317	0.365	0.291	0.536

Note: DID models with number of actual voters as pop weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I20: Diff-in-diff estimates of exposure effects on KPD vote share at the 1933 national parliamentary election with varying time span specifications.

	... 12 weeks		... 8 weeks		... 4 weeks		... 2 weeks	
Exposure, time span of...	−0.009***	−0.001	−0.009***	−0.001	−0.009***	−0.007	−0.008**	−0.005
	(0.003)	(0.005)	(0.003)	(0.005)	(0.003)	(0.008)	(0.004)	(0.005)
(Intercept)	0.123***	0.173***	0.123***	0.173***	0.123***	0.165***	0.126***	0.166***
	(0.003)	(0.012)	(0.003)	(0.012)	(0.003)	(0.021)	(0.003)	(0.014)
Sample	full	matched	full	matched	full	matched	full	matched
Observations	952	56	952	56	952	34	952	32
Adjusted R^2	0.174	0.173	0.174	0.173	0.185	0.065	0.157	0.074

Note: DID models with number of actual voters as pop weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I21: Diff-in-diff estimates of exposure effects on turnout at the 1933 national parliamentary election with varying time span specifications.

	... 12 weeks		... 8 weeks		... 4 weeks		... 2 weeks	
Exposure, time span of...	−0.004	0.025**	−0.004	0.025**	−0.005	−0.013	−0.008	−0.002
	(0.006)	(0.011)	(0.006)	(0.011)	(0.007)	(0.012)	(0.007)	(0.011)
(Intercept)	0.812***	0.829***	0.812***	0.829***	0.812***	0.804***	0.810***	0.833***
	(0.003)	(0.013)	(0.003)	(0.013)	(0.003)	(0.020)	(0.003)	(0.017)
Sample	full	matched	full	matched	full	matched	full	matched
Observations	952	56	952	56	952	34	952	32
Adjusted R^2	0.428	0.513	0.428	0.513	0.428	0.551	0.425	0.525

Note: DID models with number of actual voters as pop weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I22: Diff-in-diff estimates of exposure effects on NSDAP vote share at the 1930 national parliamentary election with varying county size specifications.

	... less than 20k		... between 20k and 50k		... between 50k and 80k		... more than 80k	
Exposure, county size of...	0.002	−0.012	−0.017*	−0.002	−0.011	−0.035**	0.002	0.029
	(0.014)	(0.023)	(0.009)	(0.015)	(0.010)	(0.017)	(0.010)	(0.024)
(Intercept)	0.027***	0.051***	0.017***	0.027***	0.017***	0.013***	0.015***	0.017***
	(0.002)	(0.011)	(0.001)	(0.009)	(0.002)	(0.003)	(0.002)	(0.006)
Sample	full	matched	full	matched	full	matched	full	matched
Observations	326	38	479	49	102	24	68	20
Adjusted R^2	0.477	0.361	0.621	0.515	0.701	0.802	0.768	0.711

Note: DID models with number of actual voters as pop weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I23: Diff-in-diff estimates of exposure effects on KPD vote share at the 1930 national parliamentary election with varying county size specifications.

	... less than 20k		... between 20k and 50k		... between 50k and 80k		... more than 80k	
Exposure, county size of...	0.001	0.002	−0.006	−0.002	−0.0005	0.002	−0.017***	−0.021**
	(0.003)	(0.005)	(0.004)	(0.006)	(0.004)	(0.010)	(0.007)	(0.009)
(Intercept)	0.027***	0.019***	0.044***	0.027***	0.087***	0.053***	0.106***	0.078***
	(0.002)	(0.004)	(0.002)	(0.005)	(0.008)	(0.013)	(0.008)	(0.010)
Sample	full	matched	full	matched	full	matched	full	matched
Observations	326	38	479	49	102	24	68	20
Adjusted R^2	0.038	0.085	0.085	0.164	0.036	0.138	0.045	0.171

Note: DID models with number of actual voters as pop weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I24: Diff-in-diff estimates of exposure effects on turnout at the 1930 national parliamentary election with varying county size specifications.

	... less than 20k		... between 20k and 50k		... between 50k and 80k		... more than 80k	
Exposure, county size of...	−0.008	−0.012	0.0003	0.003	0.001	−0.018	−0.025**	−0.046*
	(0.010)	(0.019)	(0.009)	(0.013)	(0.008)	(0.020)	(0.011)	(0.025)
(Intercept)	0.746***	0.717***	0.757***	0.758***	0.779***	0.723***	0.753***	0.714***
	(0.005)	(0.017)	(0.004)	(0.017)	(0.007)	(0.029)	(0.011)	(0.024)
Sample	full	matched	full	matched	full	matched	full	matched
Observations	326	38	479	49	102	24	68	20
Adjusted R^2	0.108	0.124	0.141	0.137	0.265	0.428	0.286	0.457

Note: DID models with number of actual voters as pop weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I25: Diff-in-diff estimates of exposure effects on NSDAP vote share at the Jul 1932 national parliamentary election with varying county size specifications.

	... less than 20k		... between 20k and 50k		... between 50k and 80k		... more than 80k	
Exposure, county size of...	−0.009	0.007	−0.006	−0.025*	−0.010	−0.007	−0.022*	−0.043*
	(0.016)	(0.026)	(0.009)	(0.015)	(0.015)	(0.021)	(0.013)	(0.024)
(Intercept)	0.144***	0.171***	0.157***	0.156***	0.153***	0.180***	0.151***	0.170***
	(0.005)	(0.022)	(0.004)	(0.008)	(0.007)	(0.013)	(0.010)	(0.011)
Sample	full	matched	full	matched	full	matched	full	matched
Observations	291	47	486	142	109	50	78	30
Adjusted R^2	0.368	0.361	0.444	0.468	0.523	0.587	0.555	0.547

Note: DID models with number of actual voters as pop weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I26: Diff-in-diff estimates of exposure effects on KPD vote share at the Jul 1932 national parliamentary election with varying county size specifications.

	... less than 20k		... between 20k and 50k		... between 50k and 80k		... more than 80k	
Exposure, county size of...	−0.007**	−0.010	−0.006**	−0.004	0.008	0.013	0.002	0.001
	(0.003)	(0.006)	(0.003)	(0.004)	(0.007)	(0.011)	(0.008)	(0.008)
(Intercept)	0.044***	0.051***	0.067***	0.065***	0.120***	0.127***	0.149***	0.125***
	(0.003)	(0.012)	(0.003)	(0.007)	(0.009)	(0.015)	(0.016)	(0.018)
Sample	full	matched	full	matched	full	matched	full	matched
Observations	291	47	486	142	109	50	78	30
Adjusted R^2	0.019	−0.014	0.031	0.027	−0.008	−0.022	−0.005	−0.035

Note: DID models with number of actual voters as pop weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I27: Diff-in-diff estimates of exposure effects on turnout at the Jul 1932 national parliamentary election with varying county size specifications.

	... less than 20k		... between 20k and 50k		... between 50k and 80k		... more than 80k	
Exposure, county size of...	−0.001	0.008	−0.006	−0.010	−0.001	−0.001	−0.006	−0.011
	(0.009)	(0.018)	(0.005)	(0.007)	(0.006)	(0.010)	(0.008)	(0.015)
(Intercept)	0.798***	0.813***	0.812***	0.810***	0.846***	0.836***	0.832***	0.834***
	(0.005)	(0.016)	(0.003)	(0.007)	(0.005)	(0.011)	(0.012)	(0.021)
Sample	full	matched	full	matched	full	matched	full	matched
Observations	291	47	486	142	109	50	78	30
Adjusted R^2	0.038	0.025	0.059	0.063	0.029	0.013	0.010	−0.0002

Note: DID models with number of actual voters as pop weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I28: Diff-in-diff estimates of exposure effects on NSDAP vote share at the Nov 1932 national parliamentary election with varying county size specifications.

	... less than 20k		... between 20k and 50k		... between 50k and 80k		... more than 80k	
Exposure, county size of...	−0.009	0.012	0.006	0.015	−0.001	−0.001	0.003	0.002
	(0.009)	(0.012)	(0.008)	(0.010)	(0.011)	(0.013)	(0.005)	(0.007)
(Intercept)	0.305***	0.426***	0.343***	0.371***	0.322***	0.349***	0.290***	0.288***
	(0.010)	(0.042)	(0.006)	(0.024)	(0.010)	(0.019)	(0.010)	(0.016)
Sample	full	matched	full	matched	full	matched	full	matched
Observations	257	31	459	66	120	24	87	28
Adjusted R^2	0.040	0.005	0.027	0.027	0.044	0.123	0.106	0.123

Note: DID models with number of actual voters as pop weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I29: Diff-in-diff estimates of exposure effects on KPD vote share at the Nov 1932 national parliamentary election with varying county size specifications.

	... less than 20k		... between 20k and 50k		... between 50k and 80k		... more than 80k	
Exposure, county size of...	0.003	−0.0004	−0.009**	−0.011**	0.003	−0.006	0.009**	0.002
	(0.003)	(0.004)	(0.004)	(0.005)	(0.005)	(0.006)	(0.004)	(0.006)
(Intercept)	0.059***	0.049***	0.083***	0.081***	0.130***	0.127***	0.163***	0.143***
	(0.003)	(0.012)	(0.002)	(0.007)	(0.007)	(0.014)	(0.008)	(0.014)
Sample	full	matched	full	matched	full	matched	full	matched
Observations	257	31	459	66	120	24	87	28
Adjusted R^2	0.013	−0.007	0.023	0.020	−0.010	0.007	0.014	−0.021

Note: DID models with number of actual voters as pop weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I30: Diff-in-diff estimates of exposure effects on turnout at the Nov 1932 national parliamentary election with varying county size specifications.

	... less than 20k		... between 20k and 50k		... between 50k and 80k		... more than 80k	
Exposure, county size of...	0.006	0.003	−0.0003	−0.002	0.017**	0.023**	0.003	−0.012
	(0.006)	(0.007)	(0.003)	(0.005)	(0.007)	(0.010)	(0.006)	(0.009)
(Intercept)	0.823***	0.856***	0.840***	0.845***	0.858***	0.856***	0.855***	0.864***
	(0.005)	(0.020)	(0.003)	(0.008)	(0.004)	(0.012)	(0.006)	(0.011)
Sample	full	matched	full	matched	full	matched	full	matched
Observations	257	31	459	66	120	24	87	28
Adjusted R^2	0.050	0.011	0.080	0.093	0.128	0.072	0.157	0.172

Note: DID models with number of actual voters as pop weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I31: Diff-in-diff estimates of exposure effects on NSDAP vote share at the 1933 national parliamentary election with varying county size specifications.

	... less than 20k		... between 20k and 50k		... between 50k and 80k		... more than 80k	
Exposure, county size of...	−0.021**	−0.010	−0.014**	−0.023*	0.003	0.019	0.002	0.026**
	(0.009)	(0.020)	(0.007)	(0.014)	(0.012)	(0.015)	(0.006)	(0.012)
(Intercept)	0.268***	0.334***	0.300***	0.230***	0.276***	0.250***	0.249***	0.226***
	(0.008)	(0.071)	(0.006)	(0.020)	(0.008)	(0.015)	(0.009)	(0.034)
Sample	full	matched	full	matched	full	matched	full	matched
Observations	260	6	469	28	130	15	90	12
Adjusted R^2	0.274	0.038	0.238	0.397	0.311	0.364	0.442	0.464

Note: DID models with number of actual voters as pop weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I32: Diff-in-diff estimates of exposure effects on KPD vote share at the 1933 national parliamentary election with varying county size specifications.

	... less than 20k		... between 20k and 50k		... between 50k and 80k		... more than 80k	
Exposure, county size of...	−0.008*	−0.020**	−0.003	0.004	0.001	−0.004	−0.009**	0.003
	(0.004)	(0.008)	(0.005)	(0.007)	(0.003)	(0.004)	(0.004)	(0.009)
(Intercept)	0.072***	0.053***	0.095***	0.147***	0.133***	0.208***	0.172***	0.164***
	(0.003)	(0.016)	(0.003)	(0.019)	(0.006)	(0.036)	(0.007)	(0.022)
Sample	full	matched	full	matched	full	matched	full	matched
Observations	260	6	469	28	130	15	90	12
Adjusted R^2	0.047	0.044	0.095	0.015	0.050	0.105	0.084	0.074

Note: DID models with number of actual voters as pop weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I33: Diff-in-diff estimates of exposure effects on turnout at the 1933 national parliamentary election with varying county size specifications.

	... less than 20k		... between 20k and 50k		... between 50k and 80k		... more than 80k	
Exposure, county size of...	−0.025***	−0.022	−0.011	−0.022**	0.005	0.005	0.0003	0.027
	(0.009)	(0.023)	(0.007)	(0.011)	(0.012)	(0.016)	(0.008)	(0.020)
(Intercept)	0.789***	0.828***	0.805***	0.783***	0.818***	0.815***	0.822***	0.812***
	(0.005)	(0.017)	(0.003)	(0.014)	(0.005)	(0.013)	(0.007)	(0.023)
Sample	full	matched	full	matched	full	matched	full	matched
Observations	260	6	469	28	130	15	90	12
Adjusted R^2	0.340	0.746	0.400	0.470	0.489	0.499	0.501	0.571

Note: DID models with number of actual voters as pop weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I34: Diff-in-diff-in-diff estimates of exposure effects on NSDAP vote share with varying number of visits specifications (election-pair fixed effects included).

	One visit		Two visits		Three or more visits	
Number of visits:	−0.002	−0.004	−0.006*	−0.003	−0.039***	−0.025
	(0.004)	(0.005)	(0.003)	(0.013)	(0.005)	(0.020)
(Intercept)	0.022***	0.034***	0.022***	0.008	0.021***	0.022**
	(0.002)	(0.008)	(0.001)	(0.008)	(0.001)	(0.011)
Sample	full	matched	full	matched	full	matched
Observations	3892	566	3892	100	3892	134
Adjusted R^2	0.594	0.557	0.599	0.734	0.596	0.697

Note: Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I35: Diff-in-diff-in-diff estimates of exposure effects on NSDAP vote share with varying number of visitors specifications (election-pair fixed effects included).

	Unknown		Less than 5,000		Between 5,000 and 20,000		20,000 or more	
Number of visitors:	−0.014***	0.008	0.013*	−0.023**	−0.005	−0.011	−0.021***	−0.018*
	(0.005)	(0.010)	(0.007)	(0.010)	(0.004)	(0.007)	(0.004)	(0.011)
(Intercept)	0.021***	0.045***	0.019***	0.050***	0.021***	0.023***	0.021***	0.025**
	(0.001)	(0.014)	(0.001)	(0.010)	(0.002)	(0.008)	(0.001)	(0.012)
Sample	full	matched	full	matched	full	matched	full	matched
Observations	3892	88	3892	144	3892	308	3892	268
Adjusted R^2	0.602	0.631	0.593	0.638	0.594	0.631	0.597	0.567

Note: DIDID models with number of actual voters as pop weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

Table I36: Effects of exposure to Hitler appearance on NSDAP membership rates.

	Sep 1930		Jul 1932		Nov 1932		Mar 1933	
Exposure, 10km	−0.001***	−0.001*	−0.002***	−0.001	−0.0004**	−0.0001	0.0003***	0.001**
	(0.0002)	(0.0003)	(0.0005)	(0.001)	(0.0002)	(0.0004)	(0.0001)	(0.0002)
(Intercept)	0.001***	0.001***	0.003***	0.003***	0.013***	0.013***	0.015***	0.014***
	(0.00004)	(0.0002)	(0.0001)	(0.0003)	(0.0003)	(0.001)	(0.0003)	(0.001)
Sample	full	matched	full	matched	full	matched	full	matched
Observations	1000	157	991	305	948	159	952	72
Adjusted R^2	0.215	0.207	0.401	0.441	0.040	0.005	0.049	−0.019

Note: DID models with number of actual voters as pop weights. Clustered SEs shown. *p<0.1; **p<0.05; ***p<0.01

J Software statement

The entire analysis was run under OS X 10.11.5 using R version 3.3.0 (R Core Team, 2016). In our empirical analysis, we made use of the following `R` software packages:

`AER` (Kleiber and Zeileis, 2008),
`broom` (Robinson, 2015),
`car` (Fox and Weisberg, 2011),
`clusterSEs` (Esarey, 2015),
`coefplot` (Lander, 2013),
`dplyr` (Wickham, 2015*a*),
`fields` (Nychka et al., 2015),
`FNN` (Beygelzimer et al., 2013),
`gdata` (Warnes et al., 2015),
`ggmap` (Kahle and Wickham, 2013),
`gpclib` (Peng et al., 2013),
`grImport` (Murrell, 2009),
`haven` (Wickham and Miller, 2016),
`ivpack` (Jiang and Small, 2014),
`lubridate` (Grolemund and Wickham, 2011),
`magrittr` (Bache and Wickham, 2014),
`maptools` (Bivand and Rundel, 2015),
`MatchIt` (Ho et al., 2011),
`mi` (Gelman and Hill, 2011),
`pdftools` (Ooms, 2016),
`plyr` (Wickham, 2011),
`png` (Urbanek, 2013),
`qlcMatrix` (Cysouw, 2015),
`RColorBrewer` (Neuwirth, 2014),
`rgdal` (Bivand and Piras, 2015),
`rgeos` (Bivand and Lewin-Koh, 2015),
`rowr` (Varrichio, 2015),
`rvest` (Wickham and Francois, 2015),
`sp` (Pebesma and Bivand, 2005),
`spatstat` (Baddeley and Turner, 2005),
`spdep` (Bivand, Keitt and Rowlingson, 2015),
`stargazer` (Hlavac, 2015),
`stringr` (Wickham, 2015*b*),
`XLConnect` (Mirai Solutions GmbH, 2015),
`XML` (Temple Lang, 2015),
`xtable` (Dahl, 2015), and
`zoo` (Zeileis and Grothendieck, 2005).

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