Radio and the rise of the Nazis in pre-war Germany

Maja Adena,1 Ruben Enikolopov,2,3,4 Maria Petrova,2,3,4, Veronica Santarosa5, and Ekaterina Zhuravskaya6

1Social Science Research Center Berlin
2Barcelona Institute for Political Economy and Governance
3Universitat Pompeu Fabra
4New Economic School
5University of Michigan
6Paris School of Economics

May 31th, 2014
Motivation

- Dictators often come to power through a democratic process rather than military coups
  - Examples: Mugabe, Lukashenko, Chavez, Hitler
- How do future dictators persuade voters to support them?
  - Which institutional elements of a consolidated democracy are missing?
  - What are the safeguards against the rise of popularity of potential dictators?
- Does propaganda help dictators maintain popularity after consolidation of power?
  - When is propaganda more and less effective?
Motivation

- Dictators often come to power through a democratic process rather than military coups
  - Examples: Mugabe, Lukashenko, Chavez, Hitler
- How do future dictators persuade voters to support them?
  - Which institutional elements of a consolidated democracy are missing?
  - What are the safeguards against the rise of popularity of potential dictators?
- Does propaganda help dictators maintain popularity after consolidation of power?
  - When is propaganda more and less effective?
Motivation

- Dictators often come to power through a democratic process rather than military coups
  - Examples: Mugabe, Lukashenko, Chavez, Hitler

- How do future dictators persuade voters to support them?
  - Which institutional elements of a consolidated democracy are missing?
  - What are the safeguards against the rise of popularity of potential dictators?

- Does propaganda help dictators maintain popularity after consolidation of power?
  - When is propaganda more and less effective?
Main messages

- We focus on the role of radio in Germany during the decade preceding WWII and show that:
  1. Whether future dictators or pro-democratic forces have control over mass media and whether extremist speech is allowed plays a role in preservation or collapse of immature democracies
  2. Propaganda can be very effective in maintaining popular support for dictator’s policies, but it can also backfire and lead to lower support for the dictator
     - depending on listeners predisposition to the message
Why Nazi Germany?

- The rise of the Third Reich is the most prominent example of a collapse of democracy without a military coup.
  - The Nazis won the March 1933 election (Nazi party got 43.9% of popular vote +8% for DNVP, their coalition partner); 18 days later parliament passed the *Enabling Act*.

- Historians have not reached consensus on the role of media in this process.

- The Nazis themselves strongly believed in media power.
  - e.g. Joseph Goebbels, the Reich minister of propaganda, said:
    - Feb 1933, after Hitler’s appointment as chancellor: “Now it will be easy to carry on the fight... Radio and press are at our disposal. We shall stage a masterpiece of propaganda.”
    - Aug 1933: “It would not have been possible for us to take power or to use it in the ways we have without the radio.”
Why Nazi Germany?

- The rise of the Third Reich is the most prominent example of a collapse of democracy without a military coup.
  - The Nazis won the March 1933 election (Nazi party got 43.9% of popular vote +8% for DNVP, their coalition partner); 18 days later parliament passed the Enabling Act.

- Historians have not reached consensus on the role of media in this process.

- The Nazis themselves strongly believed in media power.
  - e.g. Joseph Goebbels, the Reich minister of propaganda, said:
    - Feb 1933, after Hitler’s appointment as chancellor: “Now it will be easy to carry on the fight... Radio and press are at our disposal. We shall stage a masterpiece of propaganda.”
    - Aug 1933: “It would not have been possible for us to take power or to use it in the ways we have without the radio.”
Why Nazi Germany?

- The rise of the Third Reich is the most prominent example of a collapse of democracy without a military coup.
  - The Nazis won the March 1933 election (Nazi party got 43.9% of popular vote +8% for DNVP, their coalition partner); 18 days later parliament passed the *Enabling Act*.

- Historians have not reached consensus on the role of media in this process.

- The Nazis themselves strongly believed in media power.
  - e.g. Joseph Goebbels, the Reich minister of propaganda, said:
    - Feb 1933, after Hitler’s appointment as chancellor: “Now it will be easy to carry on the fight... Radio and press are at our disposal. We shall stage a masterpiece of propaganda.”
    - Aug 1933: “It would not have been possible for us to take power or to use it in the ways we have without the radio.”
Poster: All Germany hears the Fuhrer with the Volksempfaenger ("peoples radio"), 1935
Promotional photo: "The Ideal German Family", late 1930s
Literature

- Anecdotal evidence that propaganda matters Yet, virtually no systematic evidence of effects of propaganda in dictatorships and falling democracies
  - Our paper fills this gap
  - Closest: Putin (Enikolopov et al 2011), Berlusconi (Durante et al 2013)

- A vast literature on media effects in democracies
  - DellaVigna Kaplan (2007); Olken (2009); Gentzkow Shapiro (2011); Stromberg (2004), etc.
  - Our paper is first to show dissuasion rather than persuasion effect

- Mass media on ethnic hatred: DellaVigna et al. (2013); Yanagizawa-Drott (2014)
  - We focus on broader set of outcomes
Literature

- Anecdotal evidence that propaganda matters. Yet, virtually no systematic evidence of effects of propaganda in dictatorships and falling democracies
  - Our paper fills this gap
    - Closest: Putin (Enikolopov et al 2011), Berlusconi (Durante et al 2013)
- A vast literature on media effects in democracies
  - DellaVigna Kaplan (2007); Olken (2009); Gentzkow Shapiro (2011); Stromberg (2004), etc.
    - Our paper is first to show dissuasion rather than persuasion effect
- Mass media on ethnic hatred: DellaVigna et al. (2013); Yanagizawa-Drott (2014)
  - We focus on broader set of outcomes
Literature

- Anecdotal evidence that propaganda matters Yet, virtually no systematic evidence of effects of propaganda in dictatorships and falling democracies
  - Our paper fills this gap
    - Closest: Putin (Enikolopov et al 2011), Berlusconi (Durante et al 2013)
- A vast literature on media effects in democracies
  - DellaVigna Kaplan (2007); Olken (2009); Gentzkow Shapiro (2011); Stromberg (2004), etc.
    - Our paper is first to show dissuasion rather than persuasion effect
- Mass media on ethnic hatred: DellaVigna et al. (2013); Yanagizawa-Drott (2014)
  - We focus on broader set of outcomes
Radio in Germany

- Beginning of radio in Germany: 1923
- Monopoly by the state postal company *Reichpost*
- Radio content took 2 shape turns
  - before 1929: almost exclusively culture and entertainment
  - 1929 - Jan 1933: political news with pro-government slant and no access of the Nazis to the radio
    - Nazis initiated referendum against respecting reparations required by Versailles Treaty
    - In response, the government started campaign explaining potential negative effects of this
    - During the following 4 election campaigns, the government allowed political broadcast, denying the Nazis access to radio
  - Feb 1933-end of WWII: heavy pro-Nazi propaganda
    - Adolf Hitler was appointed Chancellor on January 30, 1933; his party won key elections 5 weeks later
Political Radio Broadcast

Political broadcast by year

(years in parentheses had no elections)
Radio: Unequal Access

Political broadcast by election campaign and affiliation

Nazi vote by parl.el.

- 1928: 2.6%
- 1930: 18.3%
- 1932 I: 37.3%
- 1932 II: 33.1%
- 1933: 43.9%

Number of appearances of political figures on the radio

1929

Referendum

Parl. el.

Pres. el.

Parl. el. I

Parl. el. II

Parl. el.

Weimar government

Third parties

Unknown

NSDAP

Von Papen

Non affiliated

Adena et al. Radio and the Rise of the Nazis 05/31/2014 10 / 31
Rapid Radio Expansion

Figure 2. Total number of radio listeners in Germany, 1924-1933.

*Green lines – dates of Parliamentary elections*

*Red lines – dates of Presidential elections*
Data: main explanatory variables

- Panel of radio signal strength in 1928-1938
- Subscription rates to the radio for 3 years: 1931-1933
- 2 shifts in radio content
  - Exploit geographical and over-time variation in radio signal, change in radio content
  - Control for the main determinants of transmitter location (explain 97% of variation in signal strength):
    - Flexible polynomial of population
    - City dummy
    - Altitude
    - Distance to the nearest big city (analogue of free space signal, controls for the other potential sources of information: newspapers, cinemas, rallies)
Maps of Signal Strength

May 1928:

September 1930:

July 1932:

November 1932:

March 1933:

Signal strength
Deciles 1928-1933

1: [-34.7, 2.4]
2: [2.4, 6.6]
3: [6.5, 9.5]
4: [9.5, 12.3]
5: [12.3, 15.1]
6: [15.1, 18.0]
7: [18.0, 21.1]
8: [21.1, 25.6]
9: [25.6, 32.7]
10: [32.7, 64.2]

Note: The legend provides threshold levels of signal strength for each decile.
Map of Changes in Signal Strength

September 1930 (change from May 1928), deciles:

July 1932 (change from September 1930), deciles:

November 1932 (change from July 1932), deciles:

March 1933 (change from November 1932), deciles:
Subscriptions and signal strength

Fitting subscriptions to generalized logistic function of radio signal strength

Radio subscription rate in 1931 (percentage)

Radio signal strength

Subscription share  Radio Signal Strength, generalized logistic fit
Empirical Results

Data: outcome variable (+timeline)

Radio slant:
- No Radio or Neutral Radio
- Pro-Nazi Bias

Timeline:
- 1922
- 1926
- 1930
- 1934
- 1938
- 1942

Outcomes:
- Parliamentary Elections:
- Presidential Elections:
- New Nazi party members:
- Referendum against the Treaty of Versailles:
- Expression of anti-Semitism, cross-section data:

1929
- Dec
- May
- Sep
- Jul
- Nov
- Mar
- Mar-Apr
- Jan
- Feb
- Mar
- Dec

1933–1942

Hitler appointed Chancellor (Jan 30, 1933)

Adena et al. Radio and the Rise of the Nazis 05/31/2014 16 / 31
Specifications

- x-section on first differences at time $t$ with province fixed effects:
  \[
  \Delta y_{it} = \beta_0 t + \beta_1 t \text{Radio\_exposure}_{it} + X'_{it} \beta_2 t + \varphi_p + \epsilon_{it}
  \]

- panel with district and year fixed effects:
  \[
  y_{it} = \beta_0 + \beta_1 \text{Radio\_exposure}_{it} + X'_{it} \beta_2 + \varphi_i + \tau_t + \epsilon_{it}
  \]

- $y_{it}$ - share of votes for the Nazis or other outcomes
- $\text{Radio\_exposure}_{it}$ - signal strength, its non-linear transformation, or listenership instrumented by SS
- $X_{it}$ is a vector of controls
  - *Determinants of transmitter location*
  - *Socio-economic controls*: census variables, including shares of Jews and Catholics, blue- and white-collar workers, WWI participation, property tax, welfare recipients
  - Voting preferences in 1924
  - Robust to controlling for newspapers, cinemas, and location of Hitler’s speeches
### Empirical Results

### Voting: Cross-section

#### Panel A. Reduced form estimation

<table>
<thead>
<tr>
<th>Election dates:</th>
<th>Sep 1930 (Change from May 1928)</th>
<th>Jul 1932 (Change from Sep 1930)</th>
<th>Nov 1932 (Change from Jul 1932)</th>
<th>Mar 1933 (Change from Nov 1932)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radio signal strength</td>
<td>-0.061*** [0.022]</td>
<td>0.035 [0.032]</td>
<td>-0.003 [0.013]</td>
<td>0.043** [0.020]</td>
</tr>
<tr>
<td>Radio Signal Strength, non-linear transformation</td>
<td>-0.212*** [0.069]</td>
<td>0.129 [0.107]</td>
<td>0.036 [0.050]</td>
<td>0.118* [0.068]</td>
</tr>
<tr>
<td>Province fixed effects</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Baseline controls</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>958</td>
<td>958</td>
<td>958</td>
<td>958</td>
</tr>
</tbody>
</table>

#### Panel B. OLS and IV results

<table>
<thead>
<tr>
<th>Election dates:</th>
<th>Sep 1930 (Change from May 1928)</th>
<th>Jul 1932 (Change from Sep 1930)</th>
<th>Nov 1932 (Change from Jul 1932)</th>
<th>Mar 1933 (Change from Nov 1932)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specification:</td>
<td>OLS</td>
<td>IV</td>
<td>OLS</td>
<td>IV</td>
</tr>
<tr>
<td>Date for the subscription rate variable:</td>
<td>Apr 1931</td>
<td>Apr 1932</td>
<td>Apr 1932</td>
<td>Apr 1932</td>
</tr>
<tr>
<td>Radio subscription rate, %</td>
<td>-0.096** [0.043]</td>
<td>-0.362*** [0.101]</td>
<td>0.039 [0.027]</td>
<td>0.172 [0.145]</td>
</tr>
<tr>
<td>Province fixed effects</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Baseline controls</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>809</td>
<td>807</td>
<td>834</td>
<td>832</td>
</tr>
<tr>
<td>F-statistic for the exclusion of the instrument</td>
<td>44.86</td>
<td>45.66</td>
<td>29.53</td>
<td>16.57</td>
</tr>
</tbody>
</table>

---

Adena et al., Radio and the Rise of the Nazis, 05/31/2014
Counterfactuals based on IV estimates

- In the absence of the radio in 1930, Nazis could have gained 5.4 percentage points more (23.65 instead of 18.25%), or just 0.88 below their main competitor, the Social Democratic Party (SPD)
  - They could have had larger bargaining power over choosing chancellor

- If the radio were switched off in January 1933, the subsequent March elections would have produced a 3.8-percentage-point-lower vote share for the Nazi Party
  - This constitutes 35% of what Nazi gained between Nov 1932 (33.09%) and Mar 1933 elections (43.91%)
Empirical Results

Counterfactuals based on IV estimates

- In the absence of the radio in 1930, Nazis could have gained 5.4 percentage points more (23.65 instead of 18.25%), or just 0.88 below their main competitor, the Social Democratic Party (SPD)
  - They could have had larger bargaining power over choosing chancellor
- If the radio were switched off in January 1933, the subsequent March elections would have produced a 3.8-percentage-point-lower vote share for the Nazi Party
  - This constitutes 35% of what Nazi gained between Nov 1932 (33.09%) and Mar 1933 elections (43.91%)
Identification concerns

- Identifying assumption: conditional on observables, radio signal strength is uncorrelated with unobservable determinants of Nazi political support
  - in baseline results observables include all time-invariant district characteristics
- This assumption is not directly testable
- We perform a series of reality checks to show that it is unlikely that unobservables are driving these results under the assumption that observables are correlated with unobservables
  - test in the spirit of Altonji-Elder-Taber (2005)
- We also conduct placebo tests, looking at outcomes before radio expansion
- Run panel fixed effects regressions
Empirical Results

Identification concerns

- Identifying assumption: conditional on observables, radio signal strength is uncorrelated with unobservable determinants of Nazi political support
  - in baseline results observables include all time-invariant district characteristics
- This assumption is not directly testable
  - We perform a series of reality checks to show that it is unlikely that unobservables are driving these results under the assumption that observables are correlated with unobservables
    - test in the spirit of Altonji-Elder-Taber (2005)
  - We also conduct placebo tests, looking at outcomes before radio expansion
  - Run panel fixed effects regressions
Identification concerns

- Identifying assumption: conditional on observables, radio signal strength is uncorrelated with unobservable determinants of Nazi political support
  - in baseline results observables include all time-invariant district characteristics
- This assumption is not directly testable
- We perform a series of reality checks to show that it is unlikely that unobservables are driving these results under the assumption that observables are correlated with unobservables
  - test in the spirit of Altonji-Elder-Taber (2005)
- We also conduct placebo tests, looking at outcomes before radio expansion
- Run panel fixed effects regressions
Identification concerns

- Identifying assumption: conditional on observables, radio signal strength is uncorrelated with unobservable determinants of Nazi political support
  - in baseline results observables include all time-invariant district characteristics

- This assumption is not directly testable

- We perform a series of reality checks to show that it is unlikely that unobservables are driving these results under the assumption that observables are correlated with unobservables
  - test in the spirit of Altonji-Elder-Taber (2005)

- We also conduct placebo tests, looking at outcomes before radio expansion

- Run panel fixed effects regressions
Identification concerns

- Identifying assumption: conditional on observables, radio signal strength is uncorrelated with unobservable determinants of Nazi political support
  - in baseline results observables include all time-invariant district characteristics

- This assumption is not directly testable

- We perform a series of reality checks to show that it is unlikely that unobservables are driving these results under the assumption that observables are correlated with unobservables
  - test in the spirit of Altonji-Elder-Taber (2005)

- We also conduct placebo tests, looking at outcomes before radio expansion

- Run panel fixed effects regressions
Lags and leads of radio signal: results are driven by the change in content of radio
### Altonji-Elder-Taber (2005) style test: prediction on observables

<table>
<thead>
<tr>
<th>Index of observables</th>
<th>Change in Nazi vote share</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>[0.153]</td>
<td>[0.250]</td>
<td>[0.088]</td>
</tr>
<tr>
<td>Population, fifth polynomial</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Province fixed effects</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>City (Stadtkreis)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>959</td>
<td>959</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.43</td>
<td>0.42</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Voted &quot;Yes&quot; on the Referendum</th>
<th>Vote share of von Hindenburg in April 1932</th>
<th>Vote share of Hitler in April 1932</th>
<th>Party members of NSDAP in 1933</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index of observables</td>
<td>-0.521</td>
<td>0.352</td>
<td>-0.737</td>
</tr>
<tr>
<td>(Prediction of signal strength)</td>
<td>[0.440]</td>
<td>[0.462]</td>
<td>[0.453]</td>
</tr>
<tr>
<td>Population, fifth polynomial</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Province fixed effects</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>City (Stadtkreis)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>950</td>
<td>953</td>
<td>953</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.49</td>
<td>0.45</td>
<td>0.43</td>
</tr>
</tbody>
</table>
## District Fixed Effects

<table>
<thead>
<tr>
<th>Nazi Vote Share</th>
<th></th>
<th>Change in the Nazi Vote Share</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Time span of the sample:</td>
<td>September 1930, July 1932, and November 1932</td>
<td>All parliamentary elections 1928 – 1933, combined</td>
<td>Between September 1930 and November 1932</td>
</tr>
<tr>
<td>Radio Signal Strength</td>
<td>-0.036*</td>
<td>-0.219***</td>
<td>0.026***</td>
</tr>
<tr>
<td>[0.018]</td>
<td>[0.076]</td>
<td>[0.007]</td>
<td>[0.007]</td>
</tr>
<tr>
<td>Radio Signal Strength, non-linear transformation</td>
<td></td>
<td>-0.219***</td>
<td></td>
</tr>
<tr>
<td>[0.076]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radio signal strength x pro-Nazi slant (0 for 1928, -1 for 1930 – 1932, +1 for 1933)</td>
<td></td>
<td></td>
<td>0.026***</td>
</tr>
<tr>
<td>[0.007]</td>
<td></td>
<td></td>
<td>[0.007]</td>
</tr>
<tr>
<td>Non-linear transformation of signal strength x pro-Nazi slant (0 for 1928, -1 for 1930 – 1932, +1 for 1933)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in subscription rate between April 1931 and April 1932</td>
<td></td>
<td></td>
<td>-0.027</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[0.123]</td>
</tr>
<tr>
<td>Baseline controls, interacted with time fixed effects</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Baseline controls</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>District fixed effects</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Time fixed effects</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>2,836</td>
<td>2,836</td>
<td>4,713</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.922</td>
<td>0.923</td>
<td>0.959</td>
</tr>
<tr>
<td>F-statistics for instrumental variable</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Empirical Results

Additional results with electoral outcomes

- Referendum "against enslavement of German people" by means of the reparations of the Treaty of Versailles in 1929
  - Radio signal strength had a negative effect on voting YES at this referendum and on signatures collected in its support

- Presidential election of 1932
  - Radio had a negative effect on voting for Hitler, positive effect on voting for the incumbent Von Hindelburg, and no effect on Taelmann or voter turnout

- Party membership in 1932-1933
  - positive effect in 1933, no significant effect in 1932
Additional results with electoral outcomes

- Referendum "against enslavement of German people" by means of the reparations of the Treaty of Versailles in 1929
  - Radio signal strength had a negative effect on voting YES at this referendum and on signatures collected in its support

- Presidential election of 1932
  - Radio had a negative effect on voting for Hitler, positive effect on voting for the incumbent Von Hindelburg, and no effect on Taelmann or voter turnout

- Party membership in 1932-1933
  - Positive effect in 1933, no significant effect in 1932
Additional results with electoral outcomes

- Referendum "against enslavement of German people" by means of the reparations of the Treaty of Versailles in 1929
  - Radio signal strength had a negative effect on voting YES at this referendum and on signatures collected in its support

- Presidential election of 1932
  - Radio had a negative effect on voting for Hitler, positive effect on voting for the incumbent Von Hindelburg, and no effect on Taelmann or voter turnout

- Party membership in 1932-1933
  - positive effect in 1933, no significant effect in 1932
## Anti-Semitism

### Table 7. Radio Availability and Anti-Semitism

<table>
<thead>
<tr>
<th>Panel A. Full sample results.</th>
<th>Log(deportations before 1942)</th>
<th>Letters to <em>Der Stürmer</em></th>
<th>Attacks on synagogues</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model:</strong></td>
<td>OLS</td>
<td>ML</td>
<td>OLS</td>
</tr>
<tr>
<td><strong>Sample:</strong></td>
<td>All cities</td>
<td>All cities</td>
<td>All cities with synagogues in 1933</td>
</tr>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td></td>
</tr>
<tr>
<td>Radio signal strength in 1937</td>
<td>0.016**</td>
<td>0.019**</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>[0.006]</td>
<td>[0.009]</td>
<td>[0.001]</td>
</tr>
<tr>
<td>Log (population)</td>
<td>0.277***</td>
<td>0.636***</td>
<td>-0.005</td>
</tr>
<tr>
<td></td>
<td>[0.069]</td>
<td>[0.107]</td>
<td>[0.013]</td>
</tr>
<tr>
<td>Altitude</td>
<td>-0.001</td>
<td>-0.001**</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>[0.001]</td>
<td>[0.001]</td>
<td>[0.000]</td>
</tr>
<tr>
<td>City located at navigable river</td>
<td>0.363***</td>
<td>0.561***</td>
<td>0.043**</td>
</tr>
<tr>
<td></td>
<td>[0.067]</td>
<td>[0.119]</td>
<td>[0.019]</td>
</tr>
<tr>
<td>Jewish settlement in 1349</td>
<td>0.661***</td>
<td>0.716***</td>
<td>0.046*</td>
</tr>
<tr>
<td></td>
<td>[0.103]</td>
<td>[0.149]</td>
<td>[0.026]</td>
</tr>
<tr>
<td>Socioeconomic controls</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Voting controls, 1924</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Province fixed effects</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>1,295</td>
<td>1,361</td>
<td>1,115</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.407</td>
<td></td>
<td>0.105</td>
</tr>
</tbody>
</table>

Note: Results of ordinary least squares estimation in columns (1) and (3); Results of Poisson maximum likelihood estimation in column (2). Standard errors clustered by province (*Wahlkreis*). * p<0.1, ** p<0.05, *** p<0.01.
### Listeners’ predispositions

#### Panel A. Interactions with pogroms

<table>
<thead>
<tr>
<th>Model:</th>
<th>Letters to <em>Der Stürmer</em></th>
<th>Log(deportations before 1942)</th>
<th>Attacks on synagogues</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OLS</td>
<td>ML</td>
<td>OLS</td>
</tr>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Sub-sample of cities with historical Jewish settlement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pogroms in 1349 * Radio signal strength, demeaned</td>
<td>0.049***</td>
</tr>
<tr>
<td></td>
<td>[0.016]</td>
</tr>
<tr>
<td>Radio signal strength, 1937</td>
<td>-0.035*</td>
</tr>
<tr>
<td></td>
<td>[0.018]</td>
</tr>
<tr>
<td>Pogroms in 1349</td>
<td>0.830***</td>
</tr>
<tr>
<td></td>
<td>[0.192]</td>
</tr>
<tr>
<td>All baseline controls</td>
<td>Yes</td>
</tr>
<tr>
<td>Province fixed effects</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>292</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.625</td>
</tr>
</tbody>
</table>

#### B. Interaction with NSFP vote in 1924

<table>
<thead>
<tr>
<th></th>
<th>Full sample of cities</th>
<th>Sample of cities with synagogues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vote for NSFP in 1924 * Radio signal strength, demeaned</td>
<td>0.156**</td>
<td>0.109***</td>
</tr>
<tr>
<td></td>
<td>[0.076]</td>
<td>[0.041]</td>
</tr>
<tr>
<td>Radio signal strength, 1937</td>
<td>0.005</td>
<td>0.010</td>
</tr>
<tr>
<td></td>
<td>[0.007]</td>
<td>[0.009]</td>
</tr>
<tr>
<td>Vote for NSFP in 1924</td>
<td>6.839**</td>
<td>8.830***</td>
</tr>
<tr>
<td></td>
<td>[2.860]</td>
<td>[3.084]</td>
</tr>
<tr>
<td>All baseline controls</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Province fixed effects</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>1,295</td>
<td>1,361</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.419</td>
<td>0.108</td>
</tr>
</tbody>
</table>
### Inequality and Radio Effect

#### Panel C. Interactions with historical inequality

<table>
<thead>
<tr>
<th></th>
<th>Full sample of cities</th>
<th>Sample of cities with synagogues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land inequality in 1895 *Radio signal strength, demeaned</td>
<td>0.125***</td>
<td>0.058</td>
</tr>
<tr>
<td></td>
<td>[0.039]</td>
<td>[0.048]</td>
</tr>
<tr>
<td>Radio signal strength, 1937</td>
<td>-0.070**</td>
<td>-0.025</td>
</tr>
<tr>
<td></td>
<td>[0.028]</td>
<td>[0.032]</td>
</tr>
<tr>
<td>Land inequality in 1895</td>
<td>1.698*</td>
<td>1.156</td>
</tr>
<tr>
<td></td>
<td>[0.938]</td>
<td>[1.056]</td>
</tr>
<tr>
<td>All baseline controls</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Province fixed effects</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Full radio effect for minimal level of inequality (Gini index 45)</td>
<td>-0.013</td>
<td>0.001</td>
</tr>
<tr>
<td>Observations</td>
<td>1277</td>
<td>1343</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.401</td>
<td></td>
</tr>
</tbody>
</table>
Empirical Results

Persuasion Rates

- Persuasion rate = the fraction of audience, convinced to change their behavior as a result of being exposed

- Assuming 4 listeners per subscription, persuasion rate of the “positive” message “vote for NSDAP in Mar 1933”: $f = 10.9\%$.
- Persuasion rate of the “negative” message “do not vote for NSDAP in 1930”: $f = 31.5\%$.

- Mild slant may be more effective than heavy propaganda

- Especially, given that radio sets were more widespread among the rich, while the poor were the main focus of Nazi propaganda in 1933
- But, it could also be the case that
  - the length of the 1933 campaign was (much) shorter than of the 1930 campaign
  - negative messages are generally more convincing
Persuasion Rates

- Persuasion rate = the fraction of audience, convinced to change their behavior as a result of being exposed
  - Assuming 4 listeners per subscription, persuasion rate of the “positive” message “vote for NSDAP in Mar 1933”: $f = 10.9\%$.
  - Persuasion rate of the “negative” message “do not vote for NSDAP in 1930”: $f = 31.5\%$.

- Mild slant may be more effective than heavy propaganda
  - Especially, given that radio sets were more widespread among the rich, while the poor were the main focus of Nazi propaganda in 1933
  - But, it could also be the case that
    - the length of the 1933 campaign was (much) shorter than of the 1930 campaign
    - negative messages are generally more convincing
Persuasion Rates

- **Persuasion rate** = the fraction of audience, convinced to change their behavior as a result of being exposed

  - Assuming 4 listeners per subscription, persuasion rate of the “positive” message “vote for NSDAP in Mar 1933”: \( f = 10.9\% \).
  
  - Persuasion rate of the “negative” message “do not vote for NSDAP in 1930”: \( f = 31.5\% \).

- Mild slant may be more effective than heavy propaganda

  - Especially, given that radio sets were more widespread among the rich, while the poor were the main focus of Nazi propaganda in 1933
  
  - But, it could also be the case that
    - the length of the 1933 campaign was (much) shorter than of the 1930 campaign
    - negative messages are generally more convincing
Persuasion Rates

- Persuasion rate = the fraction of audience, convinced to change their behavior as a result of being exposed
  - Assuming 4 listeners per subscription, persuasion rate of the “positive” message “vote for NSDAP in Mar 1933”: $f = 10.9\%$.
  - Persuasion rate of the “negative” message “do not vote for NSDAP in 1930”: $f = 31.5\%$.

- Mild slant may be more effective than heavy propaganda
  - Especially, given that radio sets were more widespread among the rich, while the poor were the main focus of Nazi propaganda in 1933
  - But, it could also be the case that
    - the length of the 1933 campaign was (much) shorter than of the 1930 campaign
    - negative messages are generally more convincing
Sensitivity of Persuasion Rate Estimates

Number of listeners/voters per subscription

Positive message

Negative message

21.8%
14.5%
10.9%
8.7%
7.3%
6.2%

63.0%
42.0%
31.5%
25.2%
21.0%
18.0%

21.8
14.5
10.9
8.7
7.3
6.2

2
3
4
5
6
7
Placebo tests

- German radio availability is not associated with outcomes that it was not supposed to affect.
  - Radio signal strength in 1928 (when it was apolitical) does not affect the change in the share of votes received by extremist parties between 1924 and 1928 or the shares of votes for the extremist parties in these years.
  - The signal strength in 1929-1933 is not associated with any voting outcomes in 1920, 1924, or 1925.
  - Signal strength in 1937 or its interaction does not affect crime rates from 1900 to 1920 and anti-Jewish pogroms in 1920s.
Conclusions

Radio was an important tool in the struggle for power in the late Weimar Republic and was used both by the Nazis (after 1933) and by their opponents (before 1933)

- Mass media can play an important role both in dismantling democratic institutions through a democratic process and in avoiding transitions to autocracies
- It can also help maintaining political support of the dictatorial regime after the full consolidation of power

Predisposition of the listeners matters a great deal for the effect of propaganda:

- Media propaganda works better in places with stronger predispositions to its messages
- Propaganda may backfire if the recipients of the message are negatively predisposed
Conclusions

- Radio was an important tool in the struggle for power in the late Weimar Republic and was used both by the Nazis (after 1933) and by their opponents (before 1933)
  - Mass media can play an important role both in dismantling democratic institutions through a democratic process and in avoiding transitions to autocracies
  - It can also help maintaining political support of the dictatorial regime after the full consolidation of power

- Predisposition of the listeners matters a great deal for the effect of propaganda:
  - Media propaganda works better in places with stronger predispositions to its messages
  - Propaganda may backfire if the recipients of the message are negatively predisposed