# Going Viral:

# Protests and Polarization in 1932 Hamburg

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JEEA Teaching Slides

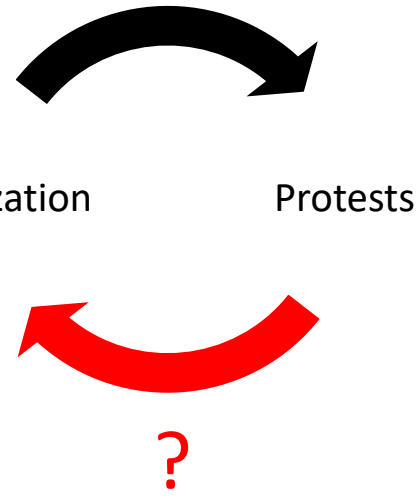
# Motivation

- Demonstrations, protest marches, mass rallies one of the oldest and most durable forms of public politics
  - Long lineage: from the Bastille to the storm on the Capitol
- Seemingly growing in popularity
  - Explosive growth in number of protests since 2011 (Cantoni et al., 2024)
  - Ubiquitous, weekly events globally
- Existing literature: they can persuade

  (Madestam et al. 2013)
- Can they both persuade and repel?

# Motivation


- Chicken-and-egg problem:
  - Do mass protests simply **reflect** polarization?
  - Or can protests increase cleavages in the society, **causing** greater polarization (perhaps by convincing people of extreme positions)?



# This paper

Examines the effect of Nazi marches and demonstrations in Hamburg in 1932

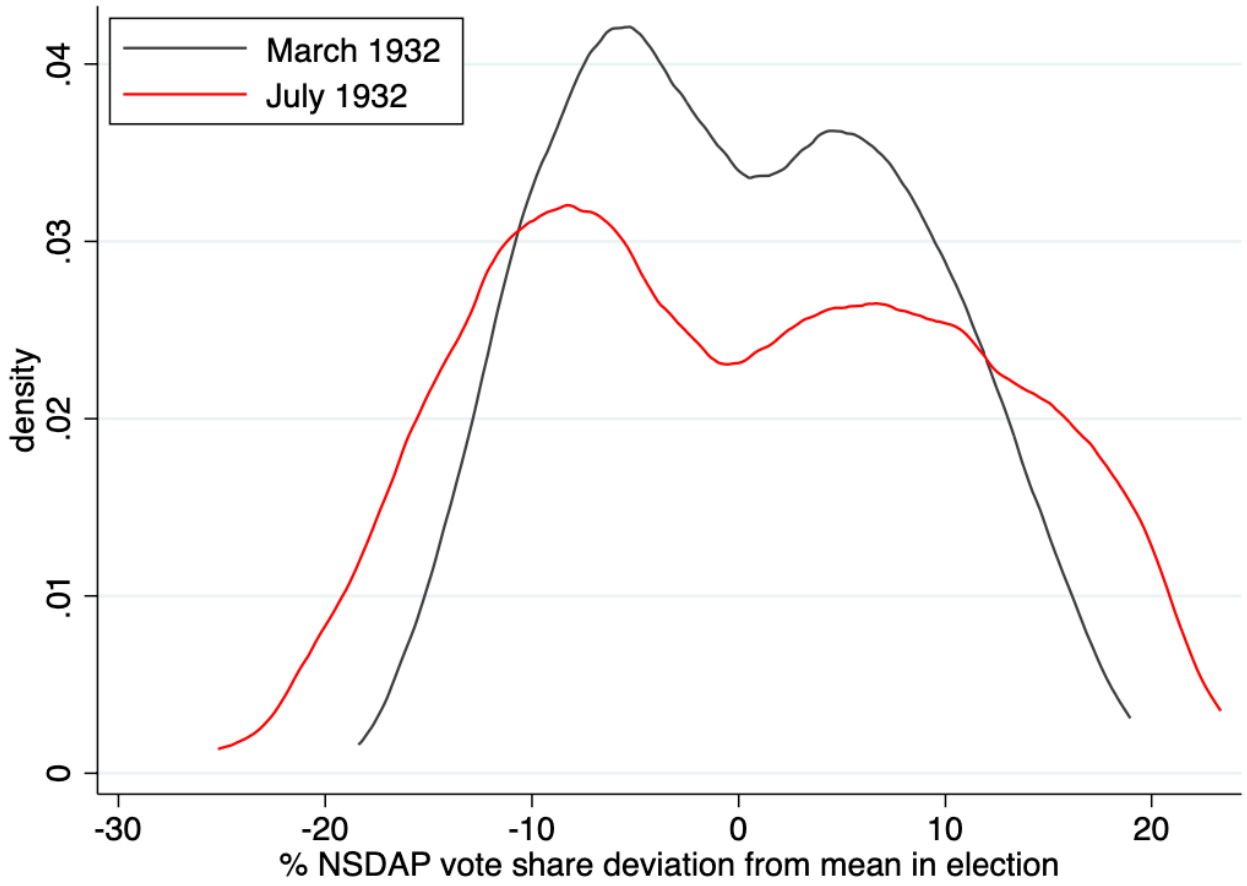
**Rich data:**

- High-frequency election data
- Granular spatial info on voting
- Granular HH-level characteristics

**Results on:**

- On average: marches were persuasive
  - Direct treatment effects
  - Indirect treatment ("multiplier")
- Somewhere: marches had a backlash

➔ Overall Effect: Polarization



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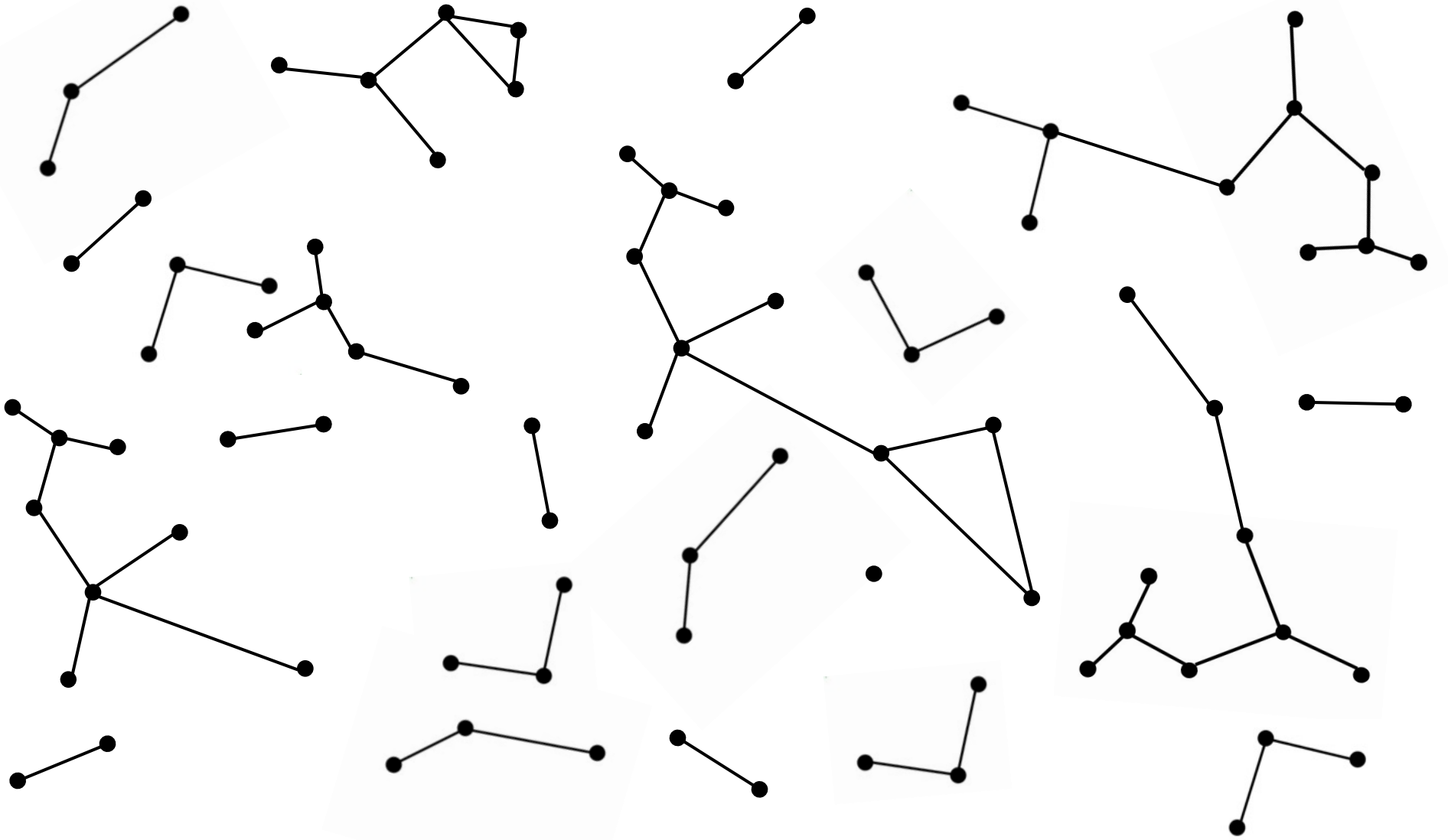

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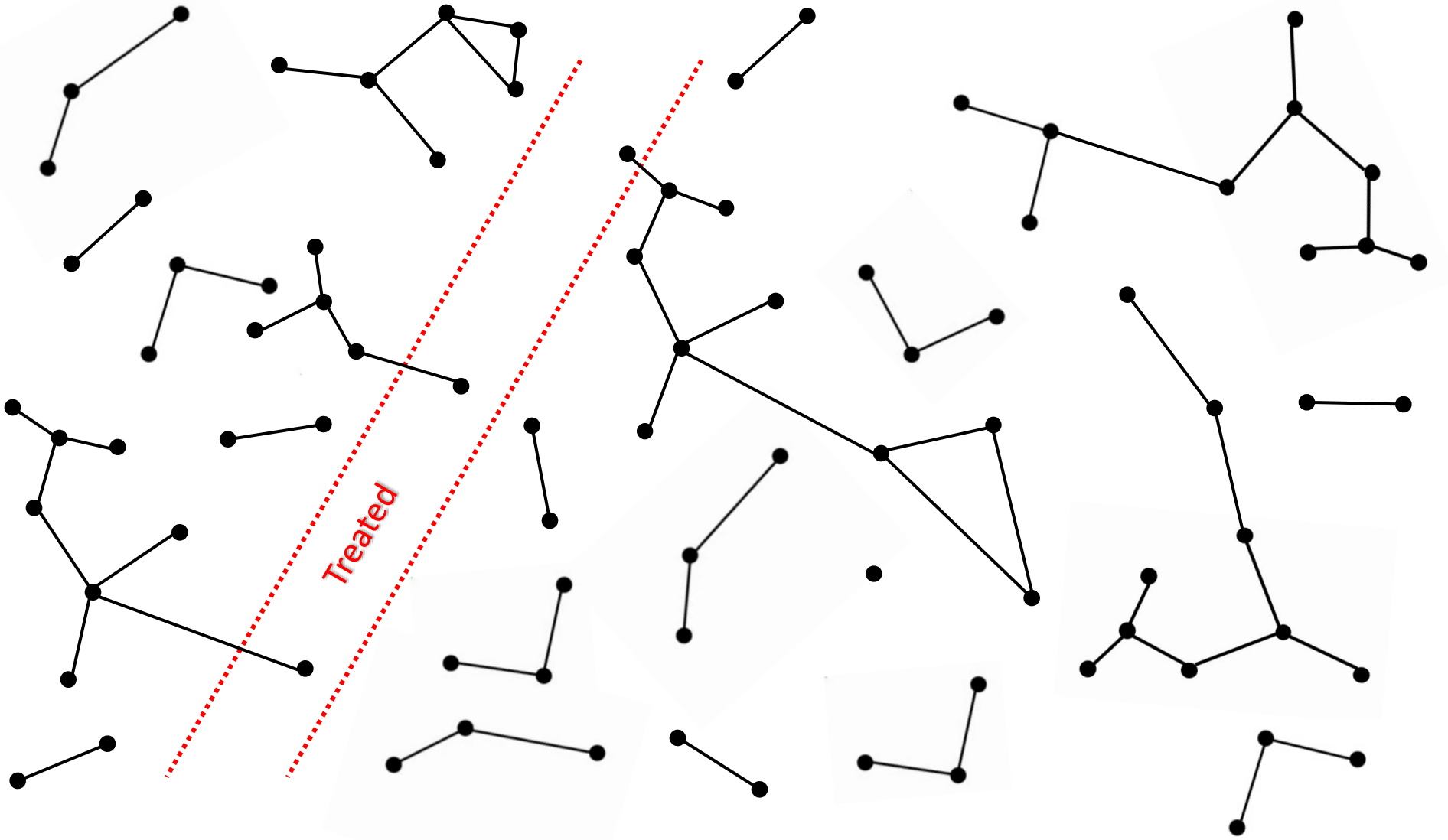

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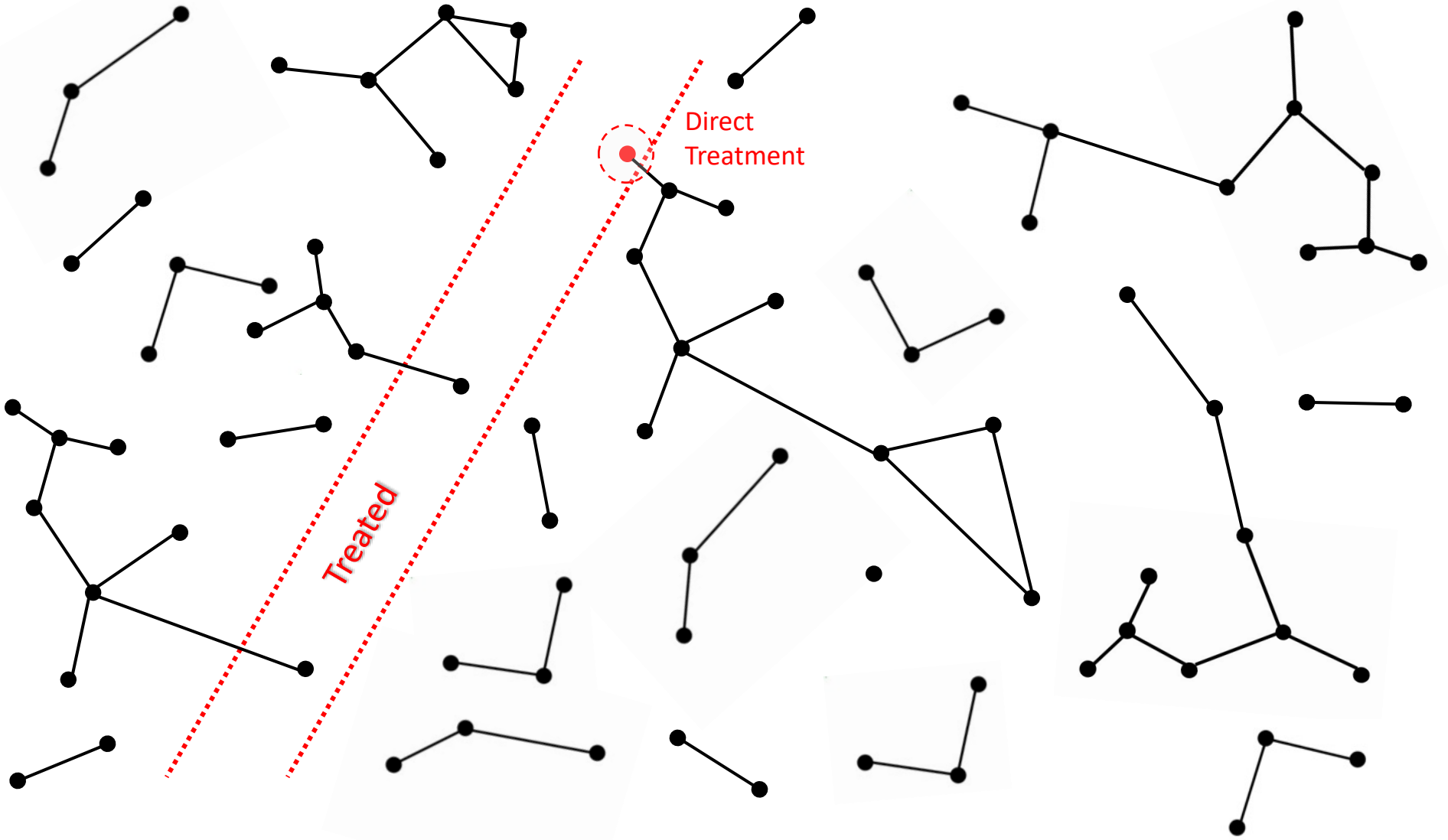

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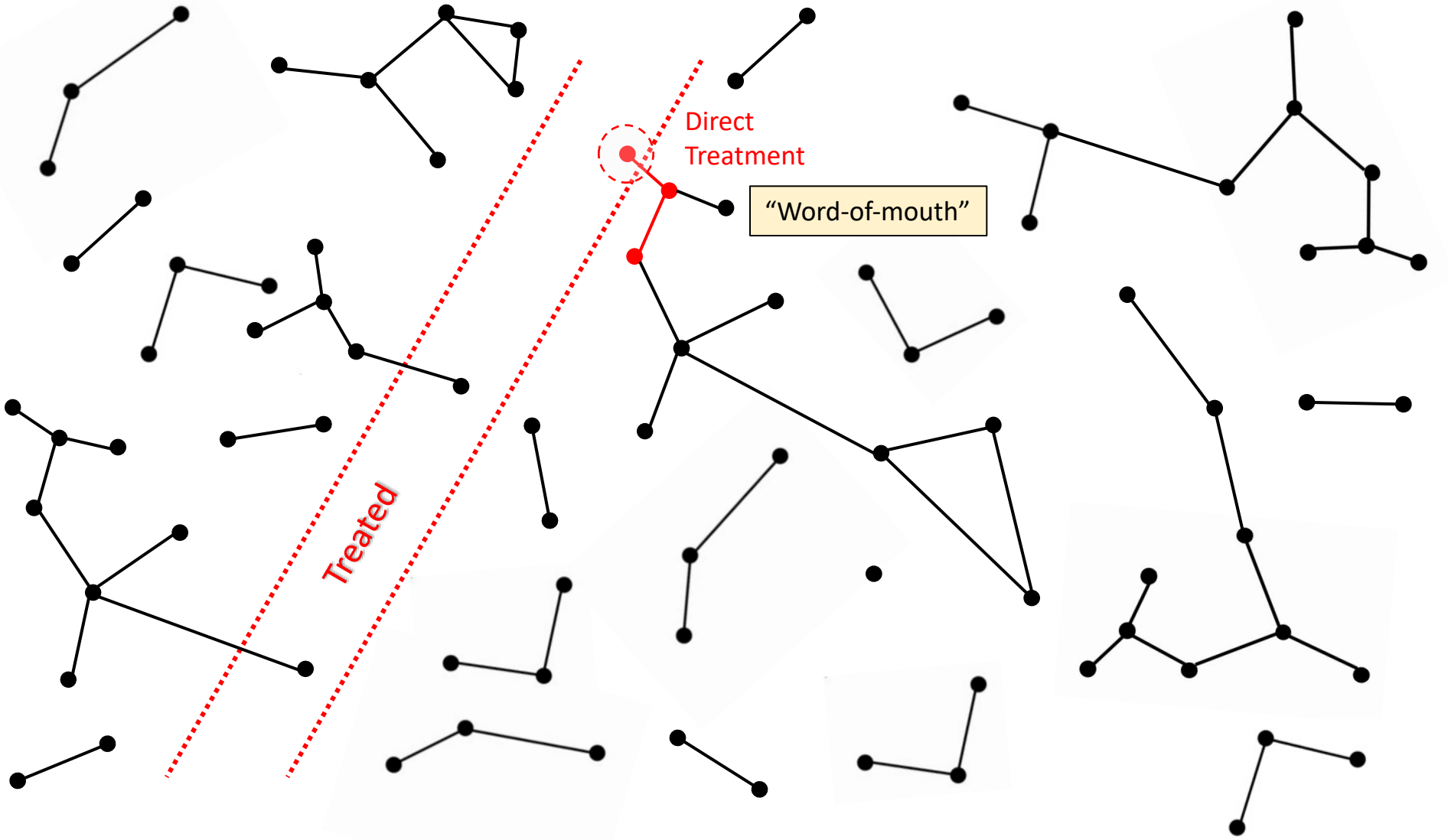

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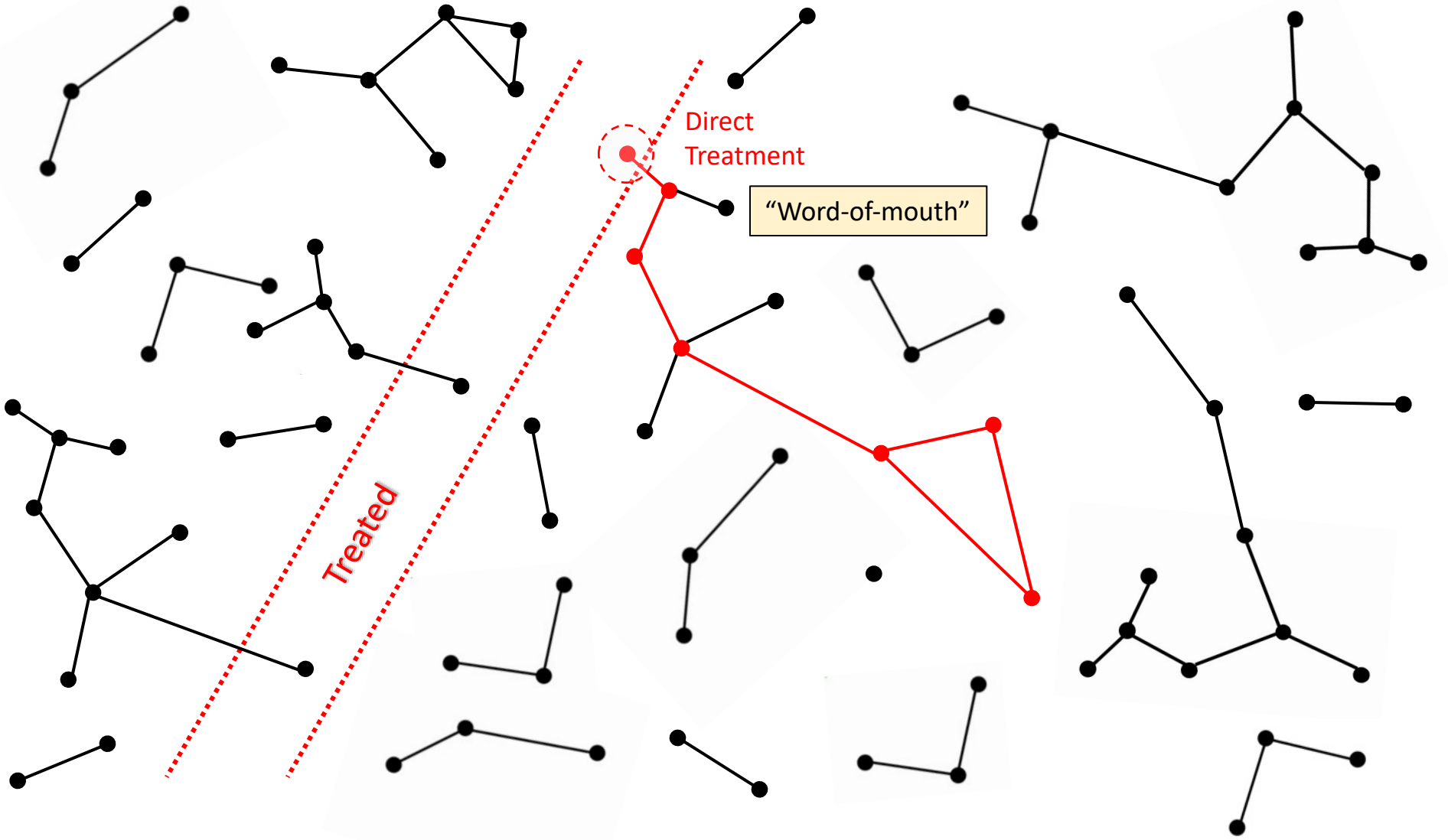

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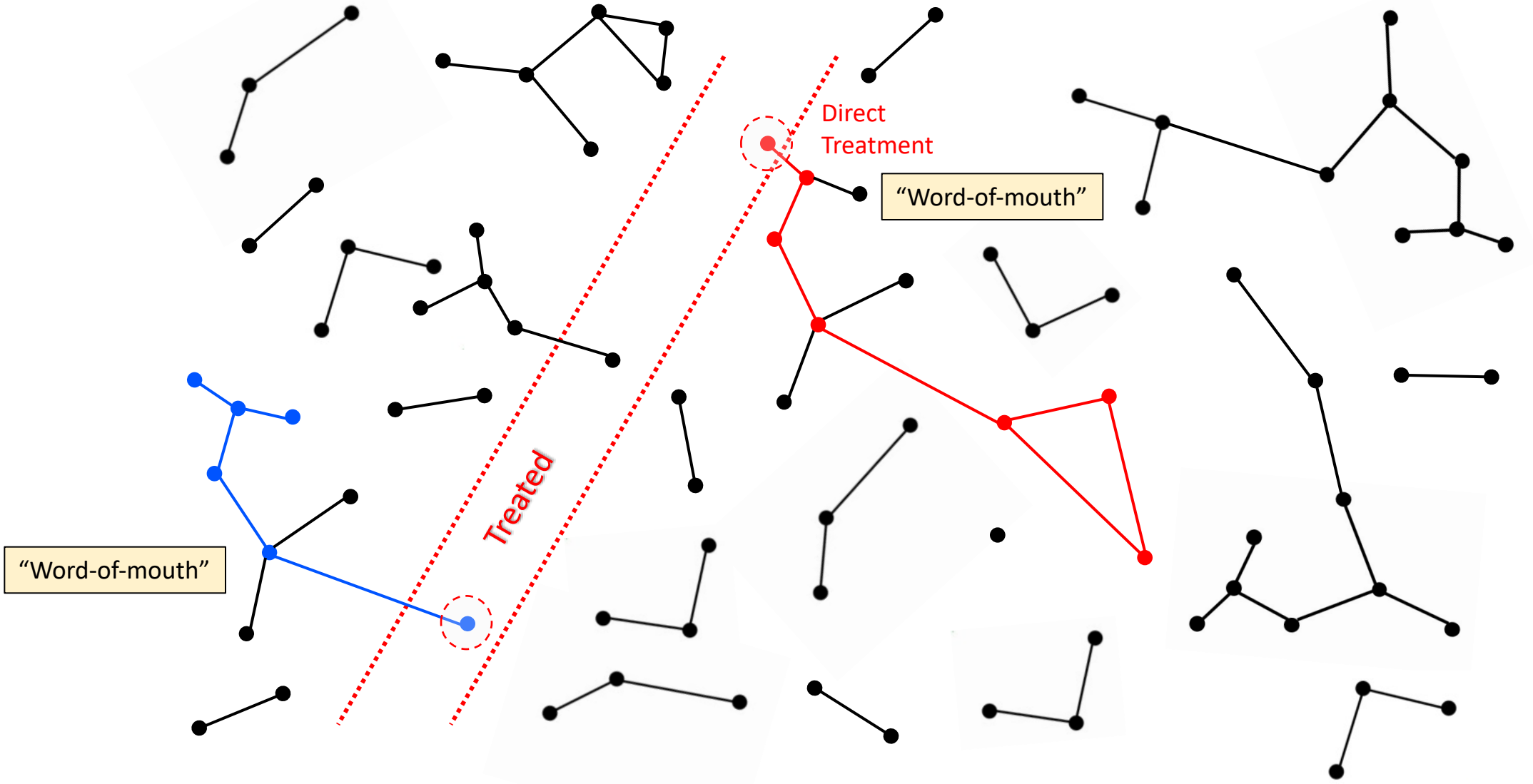

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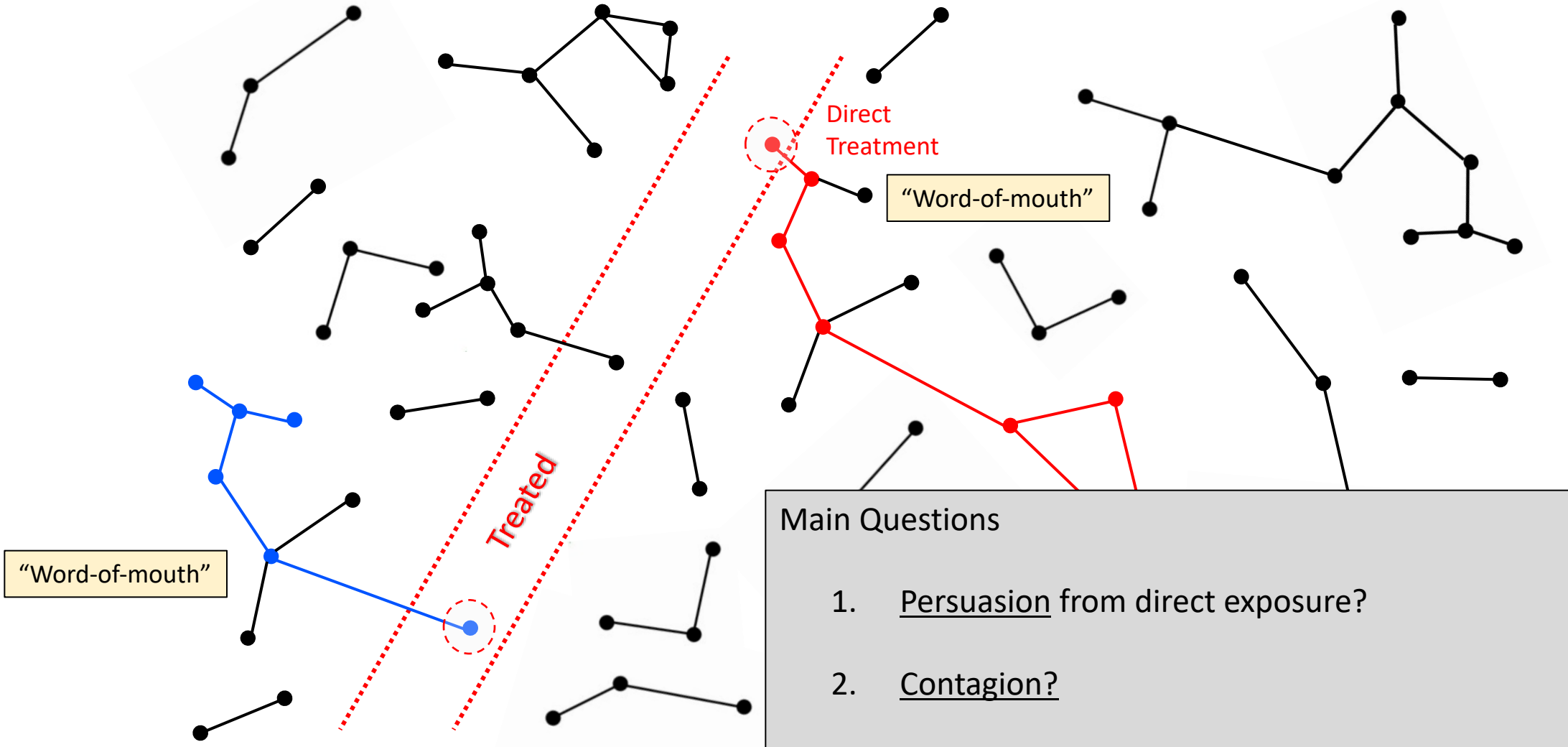


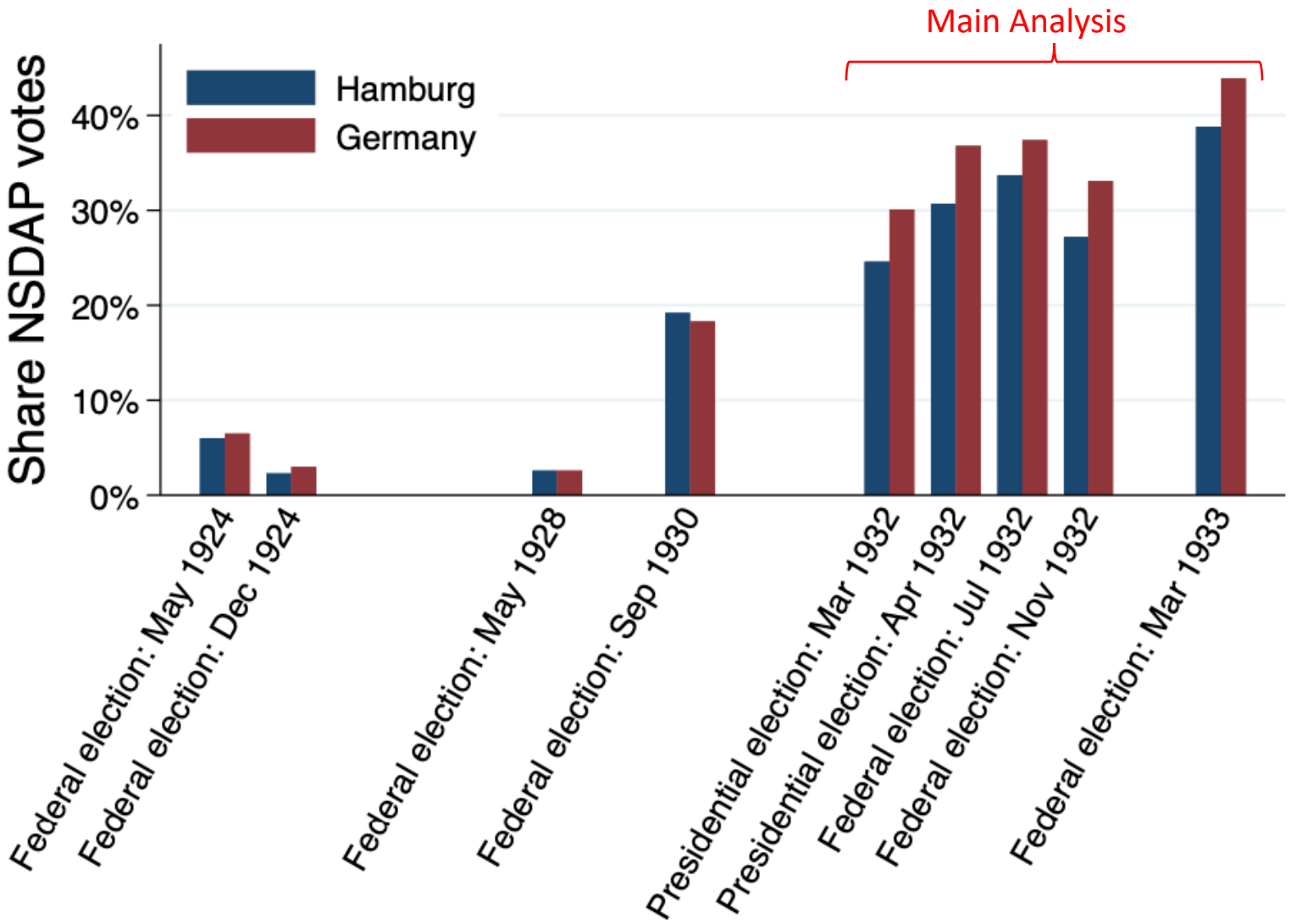

Main Questions

1. Persuasion from direct exposure?
2. Contagion?
3. Polarization?

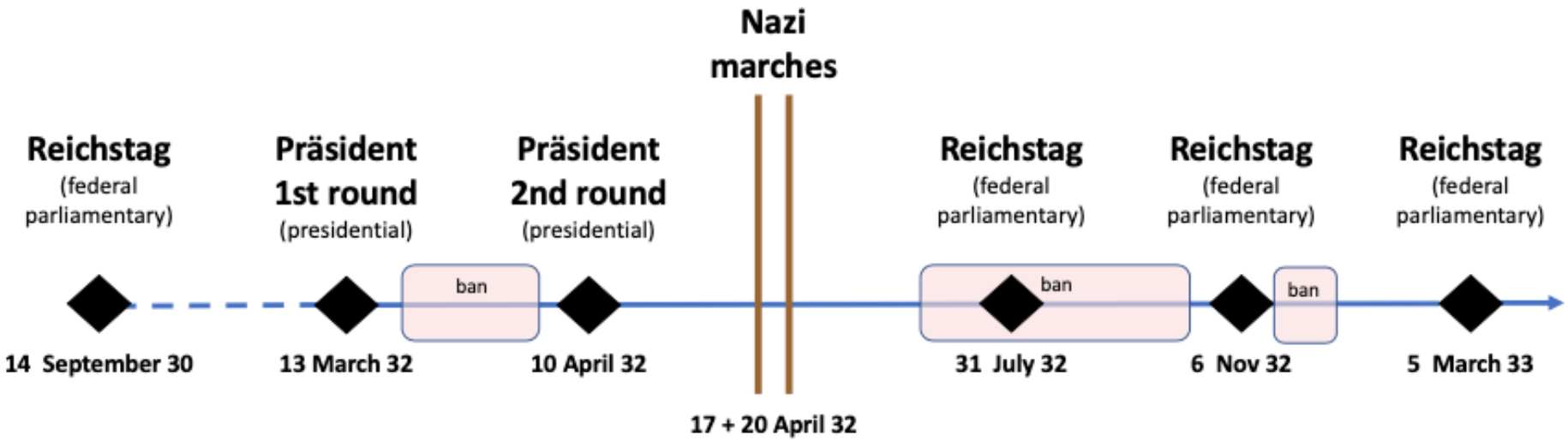
# Outline of the Talk

1. Background
   - Hamburg & the 1932 Marches
2. Empirical Strategy & Data
3. Main Results
   i. Direct Effects
   ii. Uniform Persuasion or Polarization?
   iii. Indirect Effects
4. Robustness
5. Discussion and Conclusion

# Background: Nazi Support in Hamburg



# Background: Timeline of Events



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# Data

## Geocoded Marching Paths

- From German police records

## Road Network in GIS

- We digitize a historical map of Hamburg for 1930-1940, provided by *LGVB* (2020)

## Address Book Data

- We digitize the 1932 book, ~400k heads of household (essentially universe)
- Includes address and occupation, location matched with polling stations

## Voting Outcomes

- Digitized from statistical bulletin
- Highly disaggregated, 622 polling stations (“neighborhoods”)
- Three pre-marches elections: September 30 + March 32 + early April 32
- Three post-marches election: July 32 + November 32 + March 33

## Connections to Treated HHs: 1918 Viral Contagion

- 1918 Spanish Flu: Individuals recorded dead, including address and date of death
- Aggregate to weekly panel, at the polling station level (622)

=> **Panel dataset: neighborhood-by-election level**

# Data: Marches

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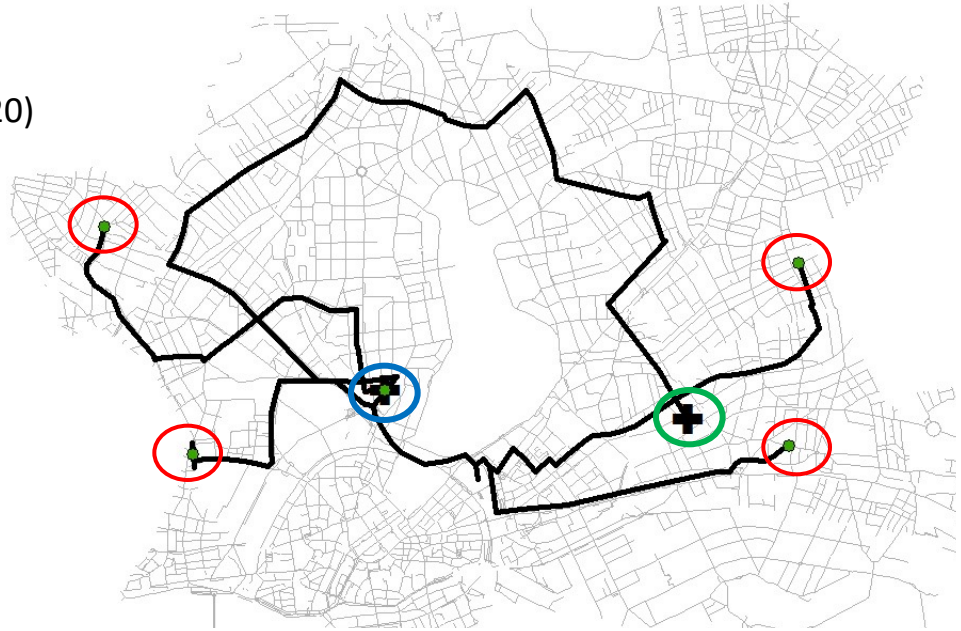
1. Starting Points
2. Rally Mid-Point
3. End Point



## 17-April-1932

- "Marching order" to 6300 NSDAP members
- 8000 people in total

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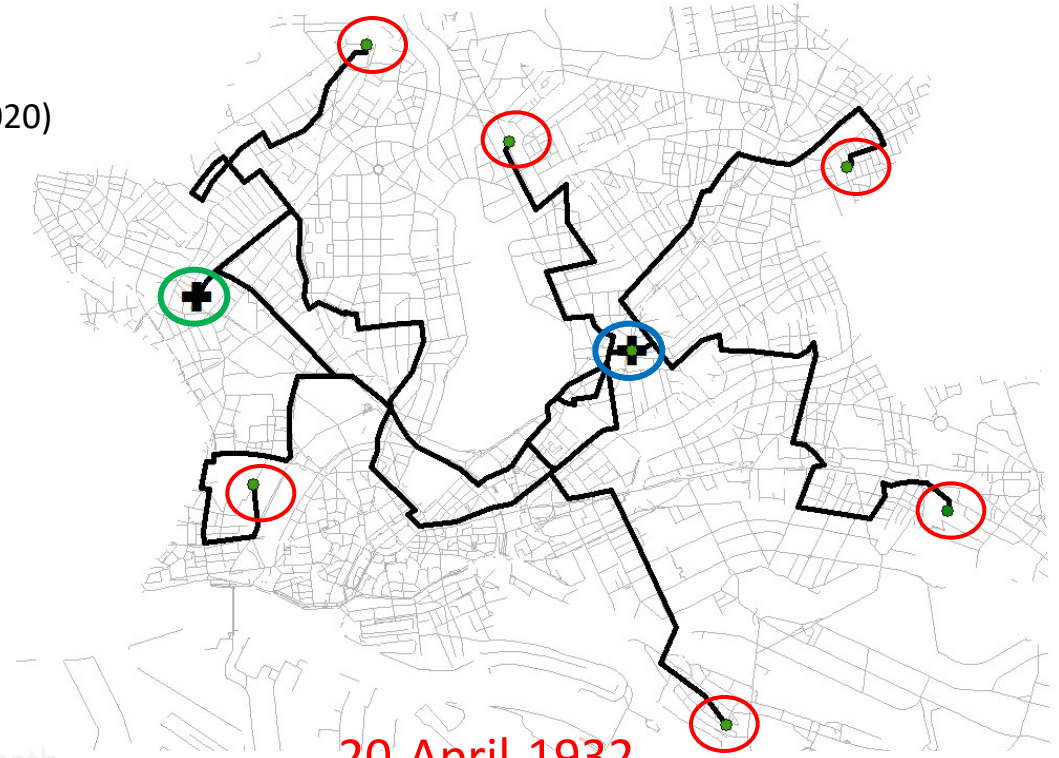

20-April-1932

- "Marching order" to 3000 NSDAP members
- 5000 people in total

# Data: Households

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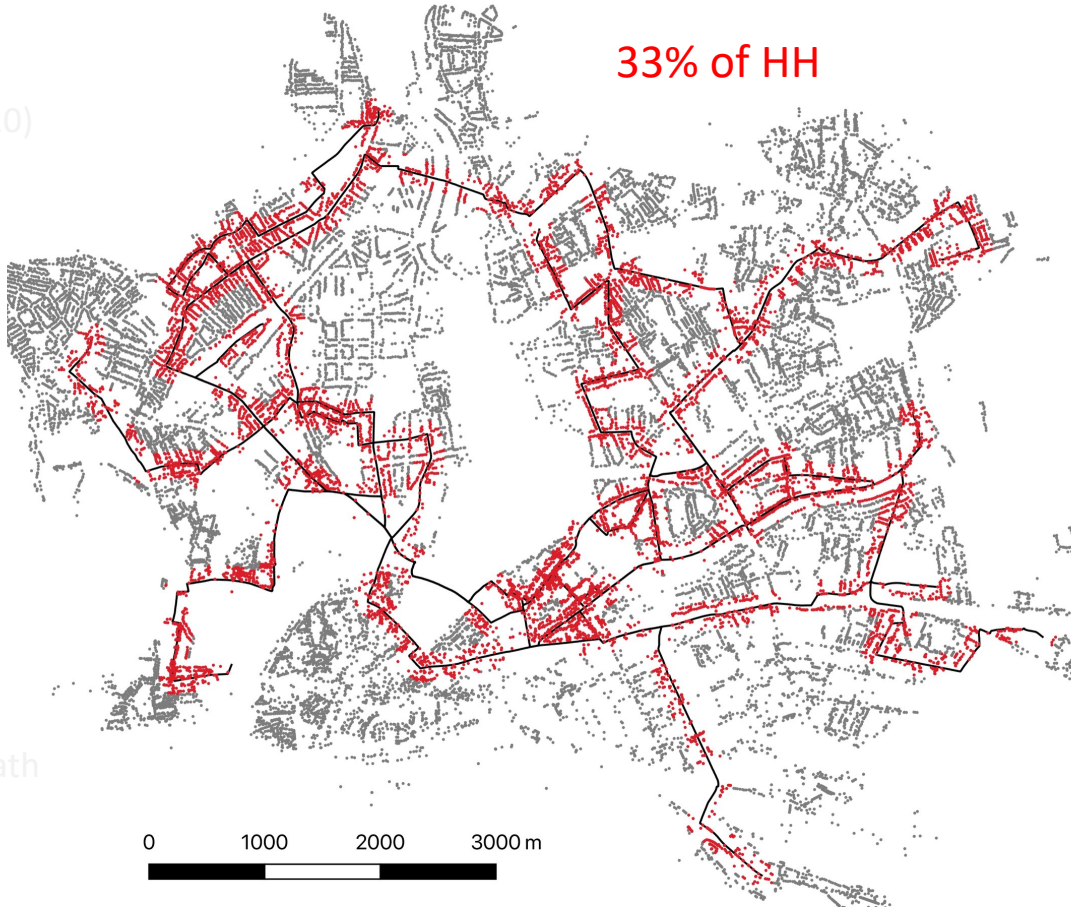

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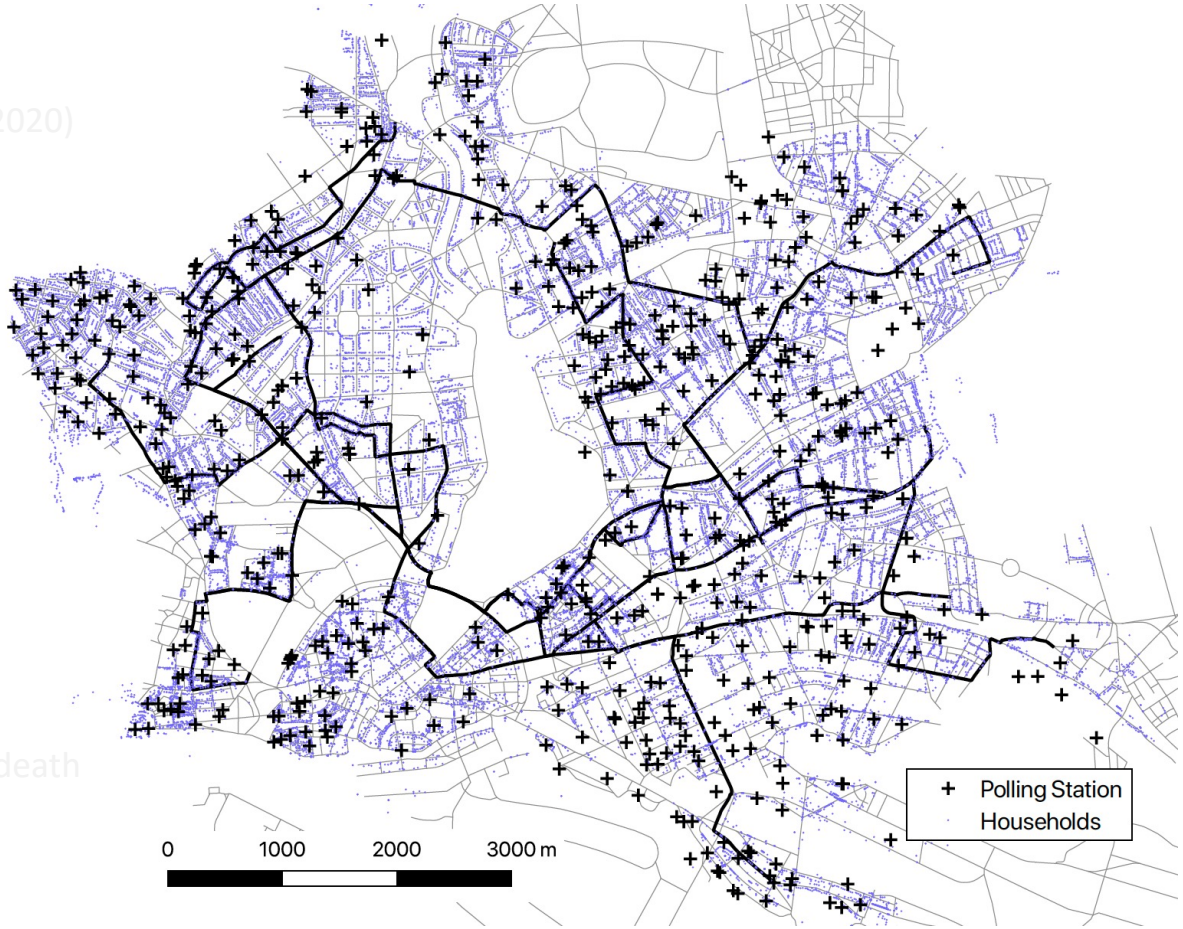
- HHs matched with polling stations (neighborhoods)



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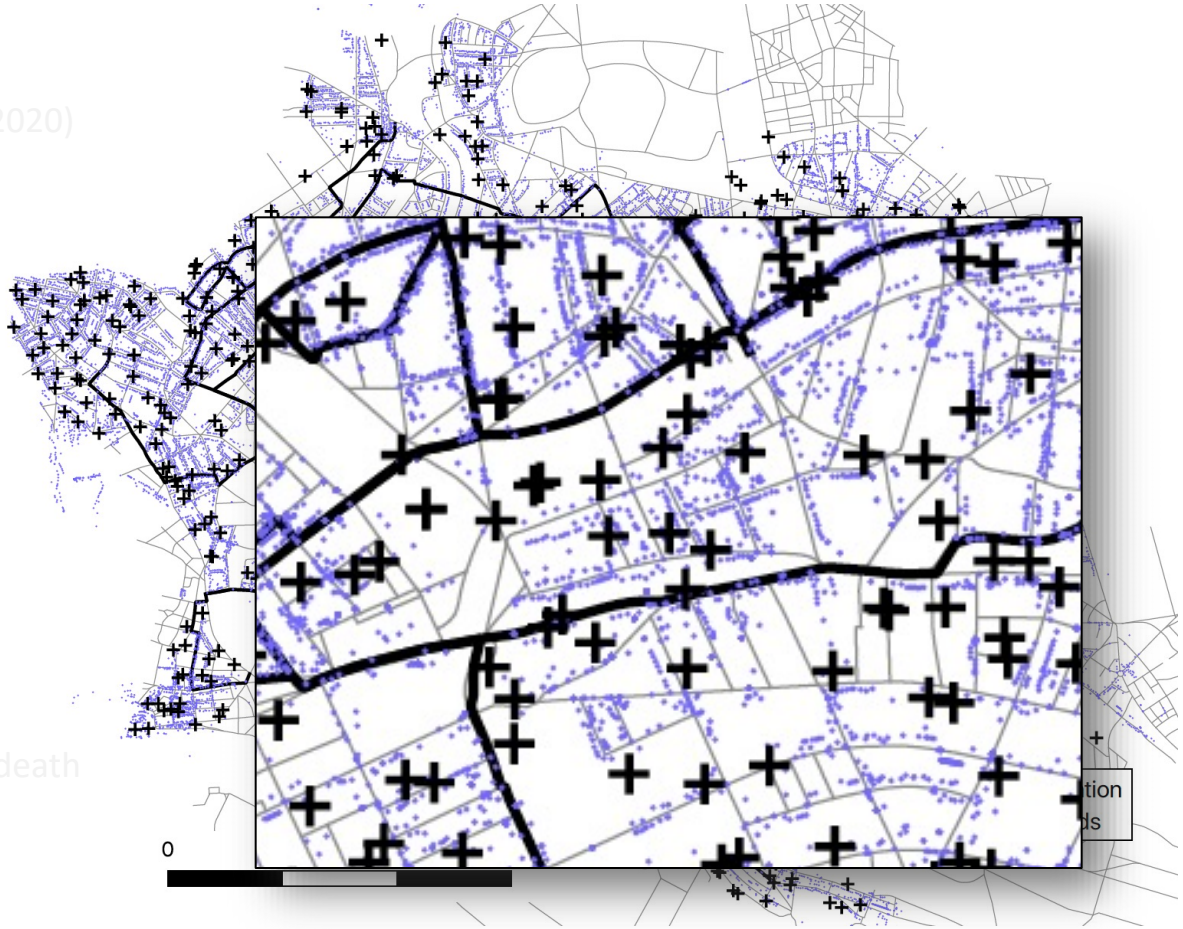

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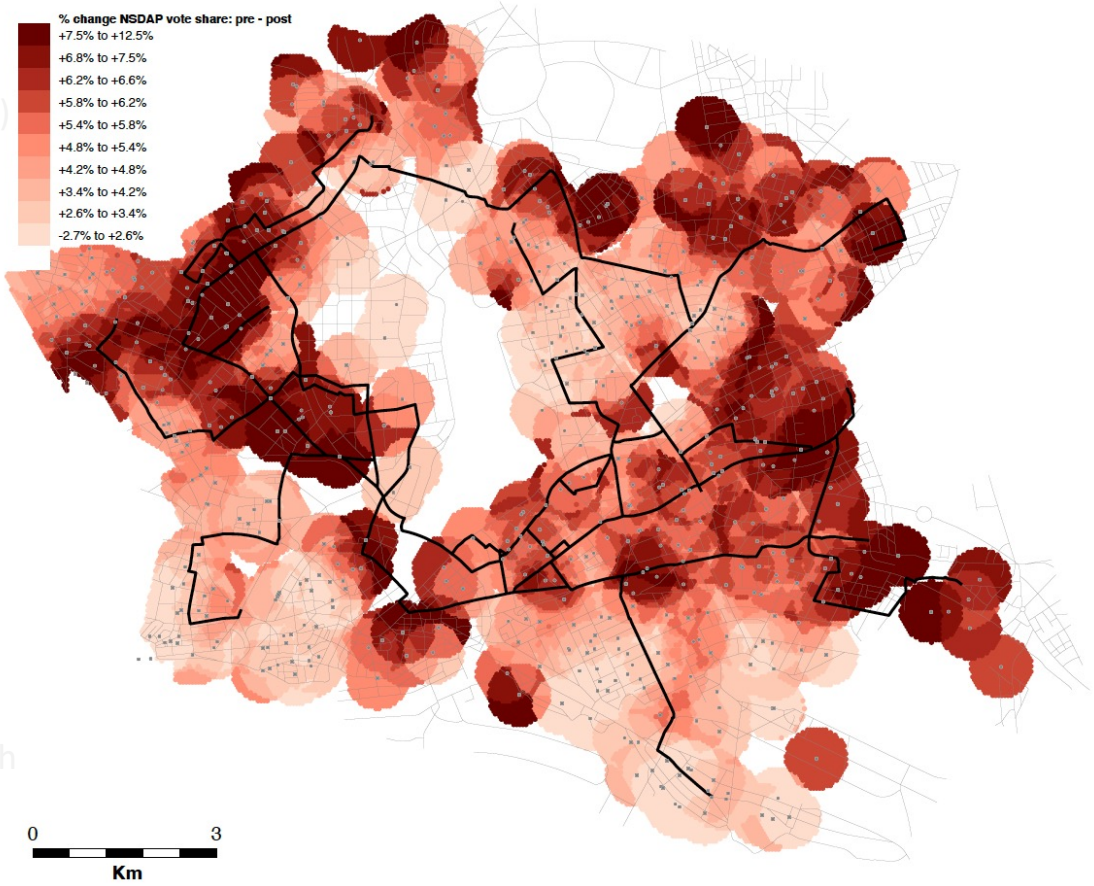
- Nazi party swing, before and after marches



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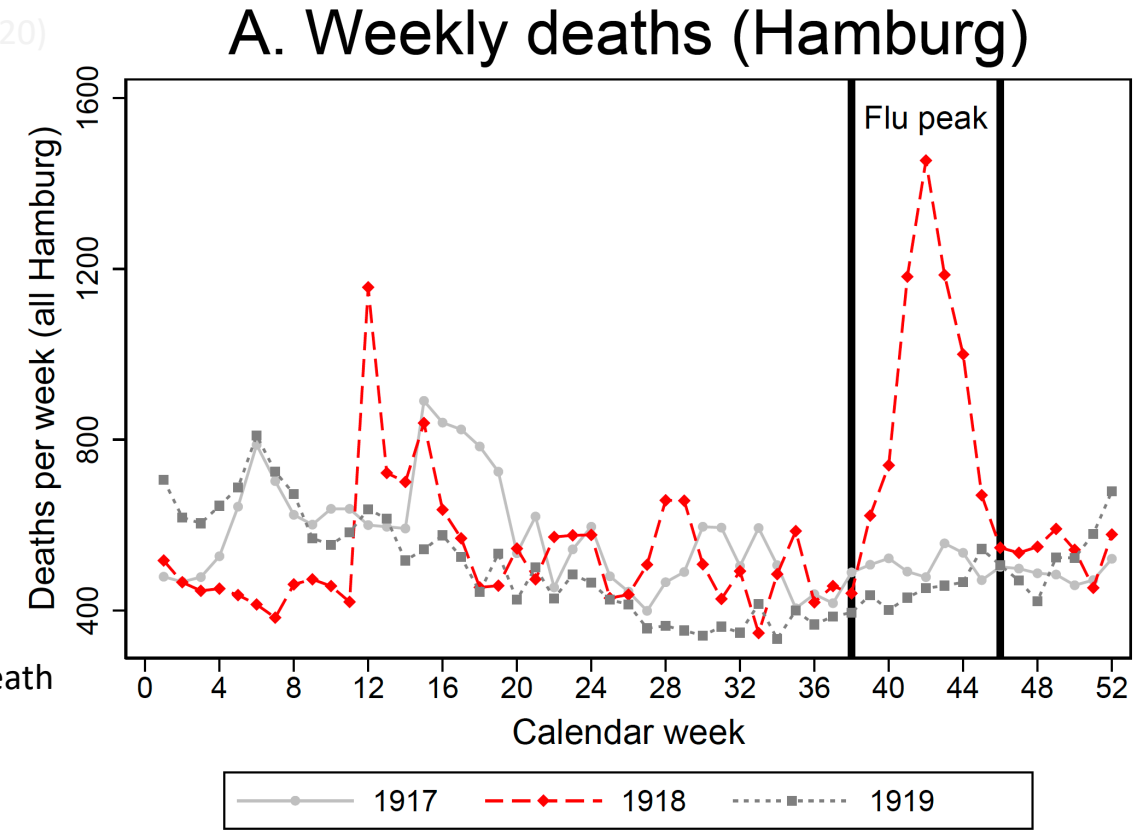

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### Flu exposure

1. For each neighborhood, we estimate the pairwise flu correlation in 1918 across weeks to all other neighborhoods (~180k pairs)

$$\rho_{ij} \equiv \frac{\text{Cov}(D_{it}, D_{jt})}{\sqrt{\text{Var}(D_{jt})\text{Var}(D_{jt})}}$$

2. Take the correlation coefficient, conditional on having a significant positive relationship, and calculate the average:
   1. with exposed neighborhoods
   2. with non-exposed neighborhoods

3. The standardized difference is flu exposure

Intuition: We proxy for 1932 contagion paths from marches with the 1918 contagion path to the treated neighborhoods relative to non-treated neighborhoods

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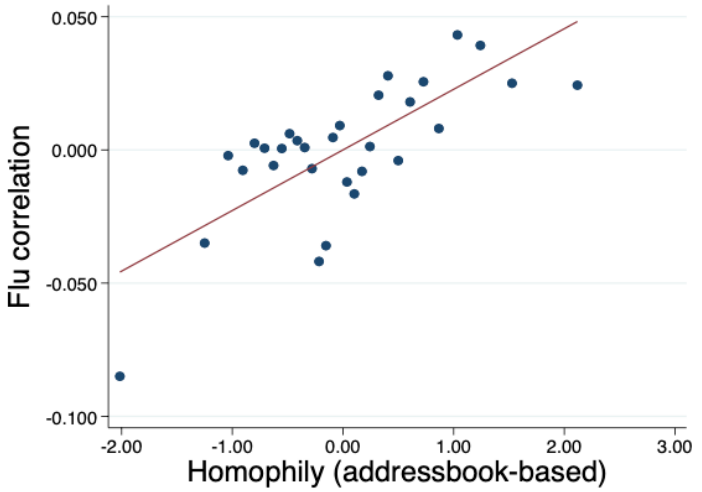
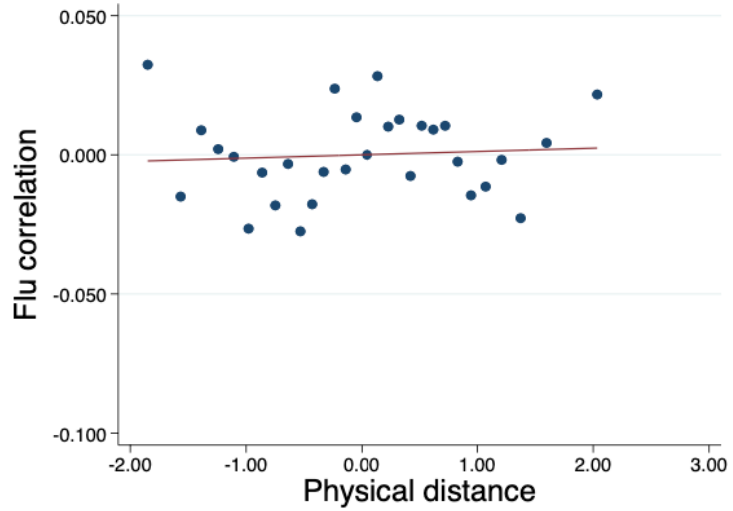
(a) Flu correlation and homophily




(b) Flu correlation and physical distance



# Data: Summary Statistics

Time-varying outcome Y

X-variables

| | Min | Mean | Max | St. dev. | Obs. |
|---|---|---|---|---|---|
| *Election results* | | | | | |
| NSDAP vote share 14 September 30 (pre) | 3.430 | 19.692 | 37.918 | 7.138 | 515 |
| Hitler vote share 13 March 32 (pre) | 5.864 | 24.260 | 43.231 | 8.282 | 622 |
| Hitler vote share 10 April 32 (pre) | 8.163 | 30.417 | 55.901 | 10.307 | 622 |
| NSDAP vote share 31 July 32 (post) | 8.253 | 33.443 | 56.788 | 11.291 | 622 |
| NSDAP vote share 6 November 32 (post) | 6.433 | 26.922 | 47.785 | 9.273 | 622 |
| NSDAP vote share 5 March 33 (post) | 10.624 | 38.465 | 59.760 | 10.917 | 622 |
| *Marches* | | | | | |
| Average distance to closest Nazi march (km) | 0.026 | 0.482 | 1.939 | 0.404 | 622 |
| Share households directly exposed to Nazi march | 0 | 32.514 | 100 | 36.340 | 622 |
| Share households directly exposed to KPD march | 0 | 30.632 | 100 | 38.556 | 622 |
| Share households directly exposed to SPD march | 0 | 21.093 | 100 | 32.009 | 622 |
| *Connection to march* | | | | | |
| Indirect exposure of households | -3.437 | -0 | 1.885 | 1 | 622 |
| *Demographic controls* | | | | | |
| Number of voters at polling station (10 April 32) | 501 | 1295.413 | 1940 | 171.677 | 622 |
| Share of blue collar workers | 0 | 35.519 | 63.793 | 14.533 | 622 |
| Share of civil servants | 0 | 6.068 | 53.922 | 4.525 | 622 |
| Share of shopkeepers | 0 | 11.442 | 27.993 | 4.172 | 622 |
| Share of households with telephone | 0 | 11.578 | 65.525 | 11.620 | 622 |
| Share of households with heating | 0 | 5.783 | 73.929 | 11.979 | 622 |
| *Street network controls* | | | | | |
| Distance to closest extreme point (km) | 0.008 | 1.382 | 3.794 | 0.703 | 622 |
| Distance to closest straight line between extreme points (km) | 0 | 0.792 | 2.956 | 0.568 | 622 |
| Number of streets within 200m of polling station | 1 | 4.584 | 15 | 1.973 | 622 |
| Share of streets in top tercile of width | 0 | 40.926 | 100 | 29.998 | 622 |
| Share of streets in bottom tercile of width | 0 | 20.125 | 100 | 24.194 | 622 |

# Specifications: Difference-in-Differences

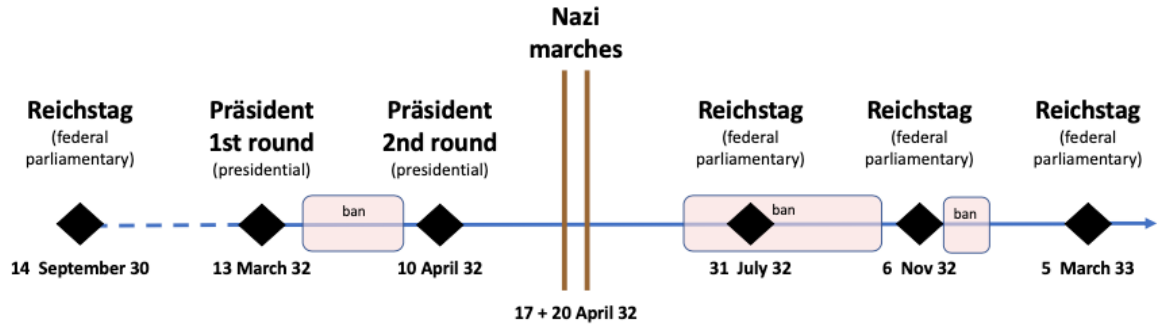
**Average Effect:**

$$N_{it} = \alpha_i + \alpha_t + \beta M_i \times Post_t + \sum_t \delta_t \mathbf{X}_i' + u_{it}$$

| | |
|---|---|
| **Persuasion, on average:** | $\beta > 0$ |
| **Backlash, on average:** | $\beta < 0$ |

# Threats to Identification: Pre-Trends?

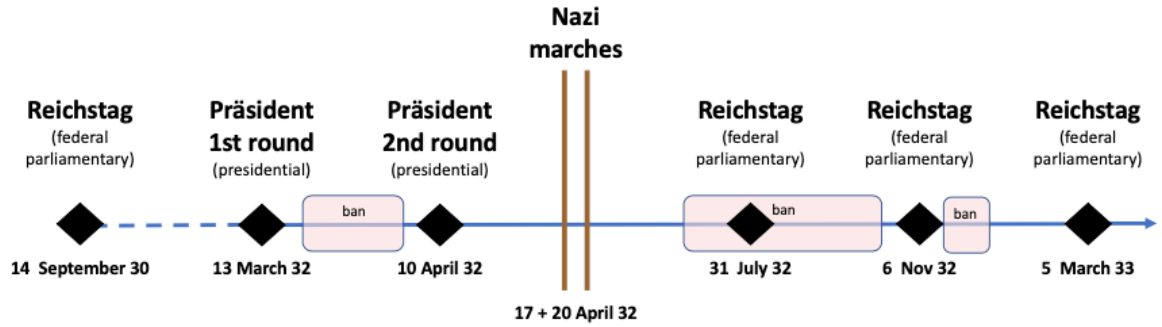
- What were they trying to target?
  - Neighborhoods swinging towards/away from NSDAP?




| | 13 March 1932 - 10 April 1932 | | |
|---|---|---|---|
| | (1) Δ NSDAP | (2) Δ KPD | (3) Δ turnout |
| log distance to march | 0.053 | -0.037 | -0.027 |
| | [0.087] | [0.057] | [0.063] |
| Demographic controls | Yes | Yes | Yes |
| Street controls | Yes | Yes | Yes |
| $R^2$ | 0.546 | 0.509 | 0.145 |
| Mean change in Y | 6.157 | -2.793 | -4.757 |
| Observations | 622 | 622 | 622 |

# Threats to Identification: Contemporaneous Shocks?

- Other correlated shocks?



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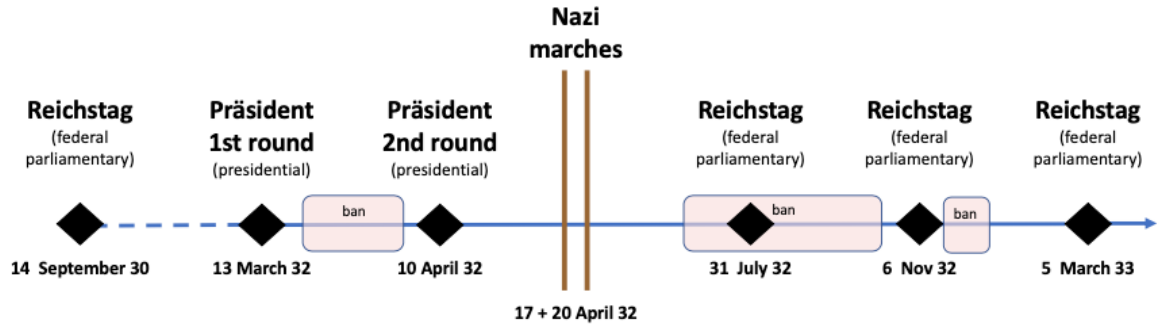


| | Within 500m from: | log distance to |
|---|---|---|
| | (1) | (2) |
| | EF rally | Speech (I) |
| Share households directly exposed (200m) | -0.000 | -0.049 |
| | [0.001] | [0.049] |
| Indirect exposure of households | -0.000 | 0.009 |
| | [0.000] | [0.018] |
| Constant | -0.139 | 9.113 |
| | [0.139] | [1.187] |
| Demographic controls | Yes | Yes |
| Street controls | Yes | Yes |
| $R^2$ | 0.013 | 0.316 |
| Mean dependent variable | 0.002 | 1.616 |
| Observations | 622 | 622 |

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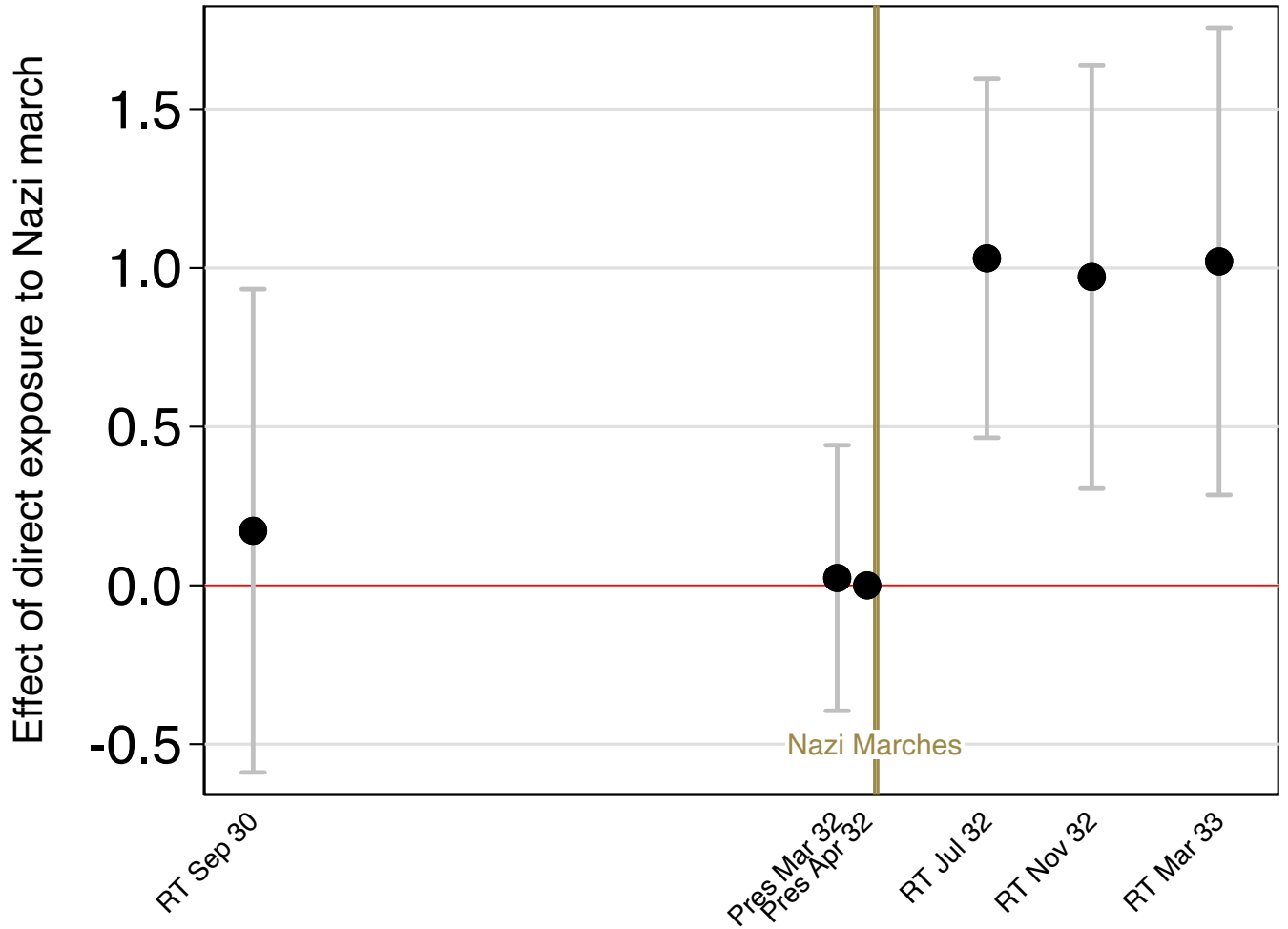
# Results: Average Direct Effects

| | % NSDAP votes | | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| log distance to march × post march | -0.443 | -0.410 | | | |
| | [0.111] | [0.104] | | | |
| Share households directly exposed (200m) × post march | | | 1.127 | 0.996 | |
| | | | [0.284] | [0.266] | |
| Share households directly exposed (200m) × t6 (post) | | | | | 1.021 |
| | | | | | [0.375] |
| Share households directly exposed (200m) × t5 (post) | | | | | 0.972 |
| | | | | | [0.340] |
| Share households directly exposed (200m) × t4 (post) | | | | | 1.030 |
| | | | | | [0.288] |
| Share households directly exposed (200m) × t2 (pre) | | | | | 0.023 |
| | | | | | [0.213] |
| Share households directly exposed (200m) × t1 (pre) | | | | | 0.172 |
| | | | | | [0.388] |
| Election & polling station FEs | Yes | Yes | Yes | Yes | Yes |
| Demographic controls × election FEs | No | Yes | No | Yes | Yes |
| Street controls × election FEs | No | Yes | No | Yes | Yes |
| $R^2$ | 0.864 | 0.914 | 0.864 | 0.914 | 0.933 |
| Mean NSDAP vote in 10 Apr '32 election | 30.417 | 30.417 | 30.417 | 30.417 | 30.417 |
| Direct effect t6 = t4: p-value | . | . | . | . | 0.969 |
| Direct effect t5 = t4: p-value | . | . | . | . | 0.803 |
| Direct effect t4 = t2: p-value | . | . | . | . | 0.000 |
| Observations | 3110 | 3110 | 3110 | 3110 | 3625 |

# Results: Average Direct Effects

| | % NSDAP votes | | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| log distance to march × post march | -0.443 | -0.410 | | | |
| | [0.111] | [0.104] | | | |
| Share households directly exposed (200m) × post march | | | 1.127 | 0.996 | |
| | | | [0.284] | [0.266] | |
| Share households directly exposed (200m) × t6 (post) | | | | | 1.021 |
| | | | | | [0.375] |
| Share households directly exposed (200m) × t5 (post) | | | | | 0.972 |
| | | | | | [0.340] |
| Share households directly exposed (200m) × t4 (post) | | | | | 1.030 |
| | | | | | [0.288] |
| Share households directly exposed (200m) × t2 (pre) | | | | | 0.023 |
| | | | | | [0.213] |
| Share households directly exposed (200m) × t1 (pre) | | | | | 0.172 |
| | | | | | [0.388] |
| Election & polling station FEs | Yes | Yes | Yes | Yes | Yes |
| Demographic controls × election FEs | No | Yes | No | Yes | Yes |
| Street controls × election FEs | No | Yes | No | Yes | Yes |
| $R^2$ | 0.864 | 0.914 | 0.864 | 0.914 | 0.933 |
| Mean NSDAP vote in 10 Apr '32 election | 30.417 | 30.417 | 30.417 | 30.417 | 30.417 |
| Direct effect t6 = t4: p-value | . | . | . | . | 0.969 |
| Direct effect t5 = t4: p-value | . | . | . | . | 0.803 |
| Direct effect t4 = t2: p-value | . | . | . | . | 0.000 |
| Observations | 3110 | 3110 | 3110 | 3110 | 3625 |

# Results: Dynamics of Direct Effects



# Outline of the Talk

1. Background
   - Hamburg & the 1932 Marches
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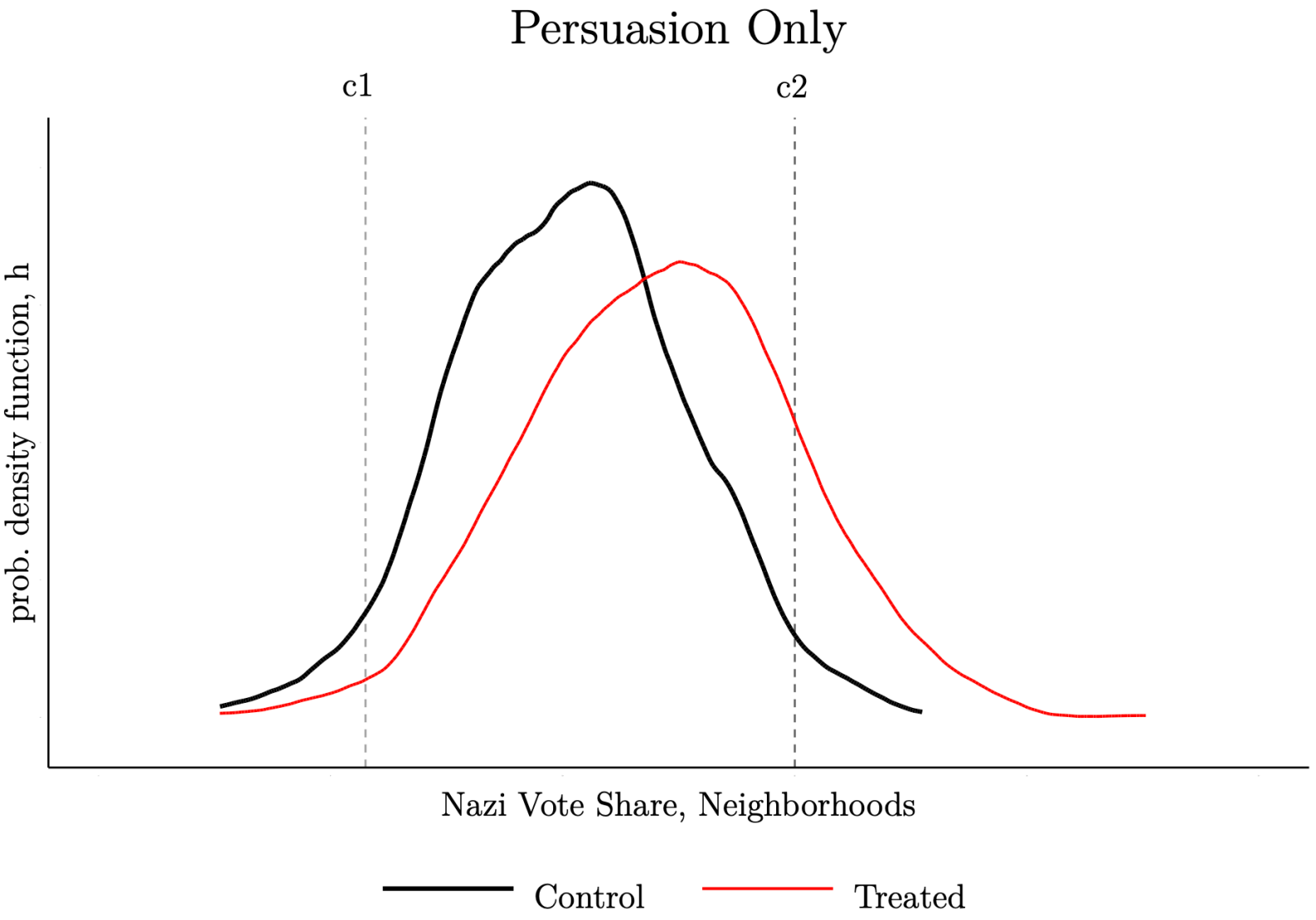
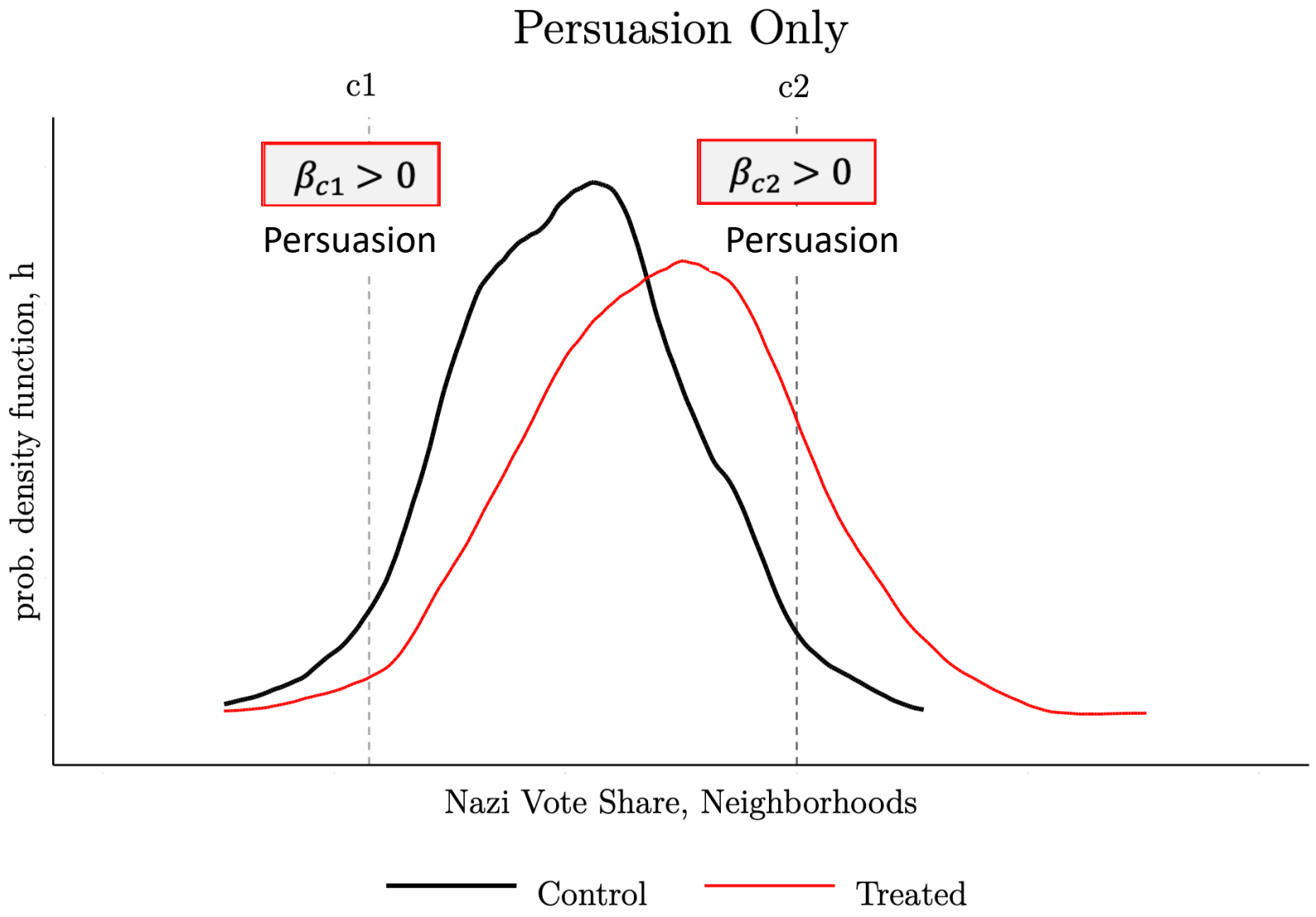
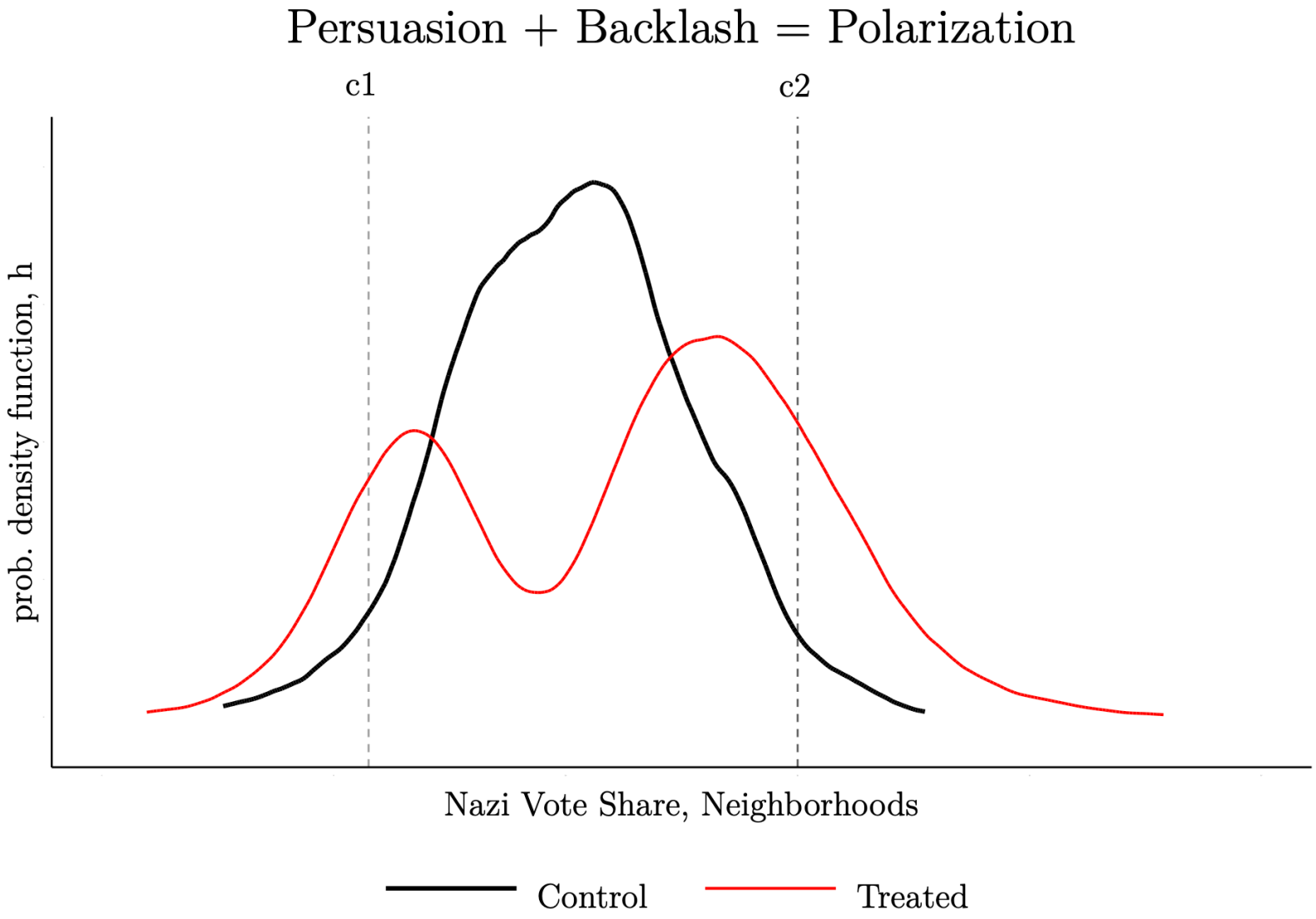
# Distribution Regression: Intuition



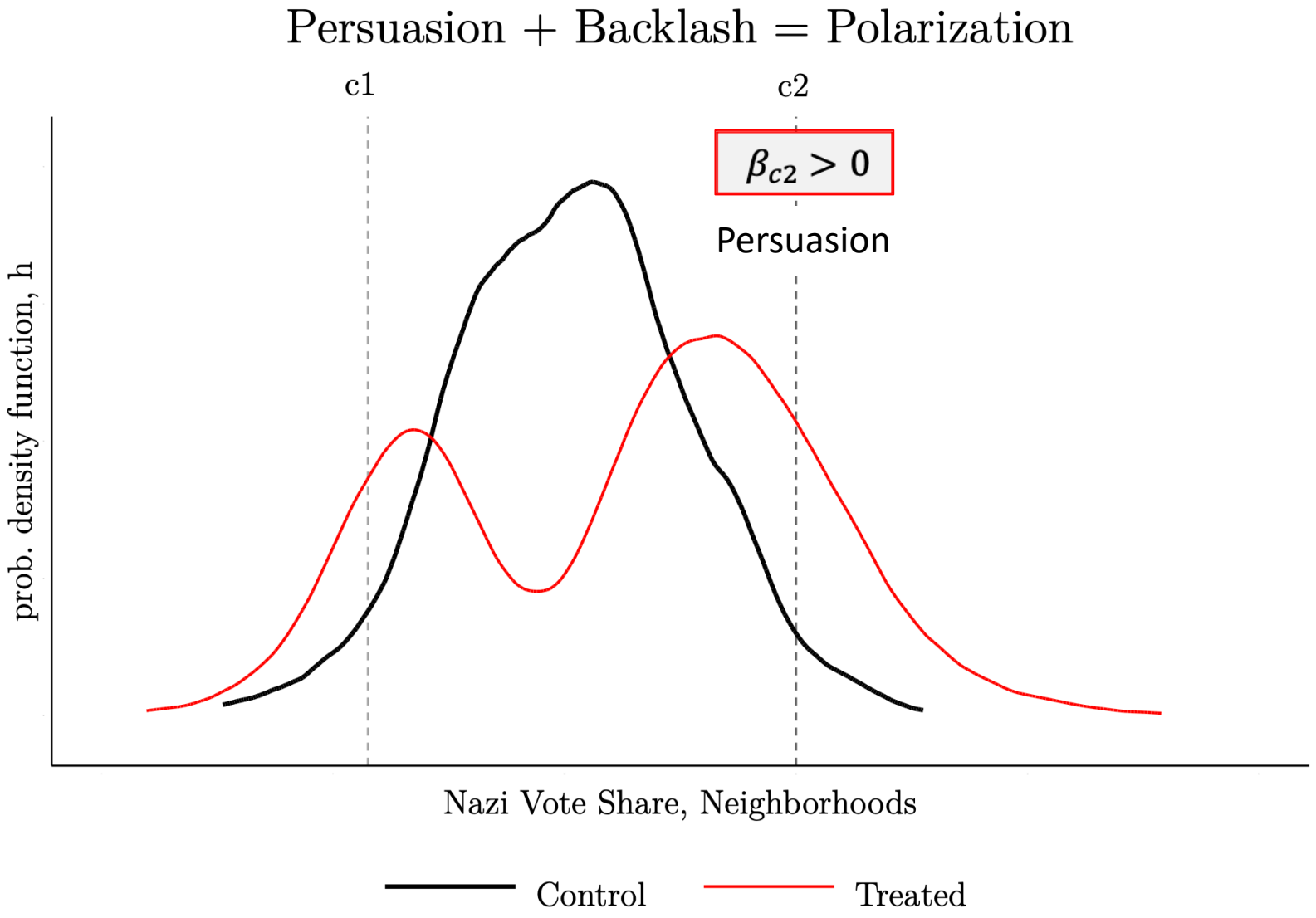
# Distribution Regression: Intuition



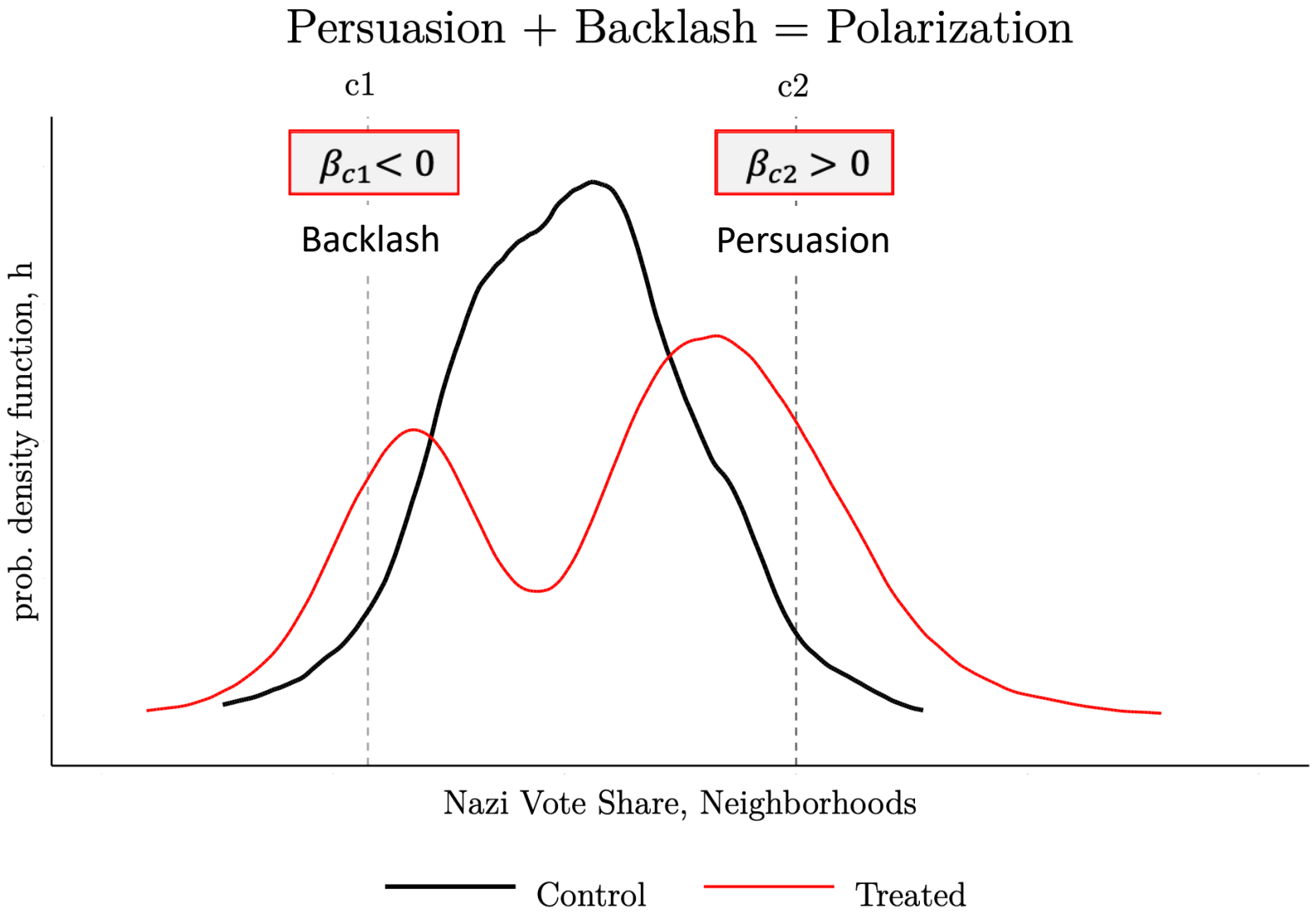
# Distribution Regression: Intuition



# Distribution Regression: Intuition



# Distribution Regression: Intuition



# Specifications: Difference-in-Differences

**Average Effect:**

$$N_{it} = \alpha_i + \alpha_t + \beta M_i \times Post_t + \sum_t \delta_t \mathbf{X}_i' + u_{it}$$

| | |
|---|---|
| **Persuasion, on average:** | $\beta > 0$ |
| **Backlash, on average:** | $\beta < 0$ |

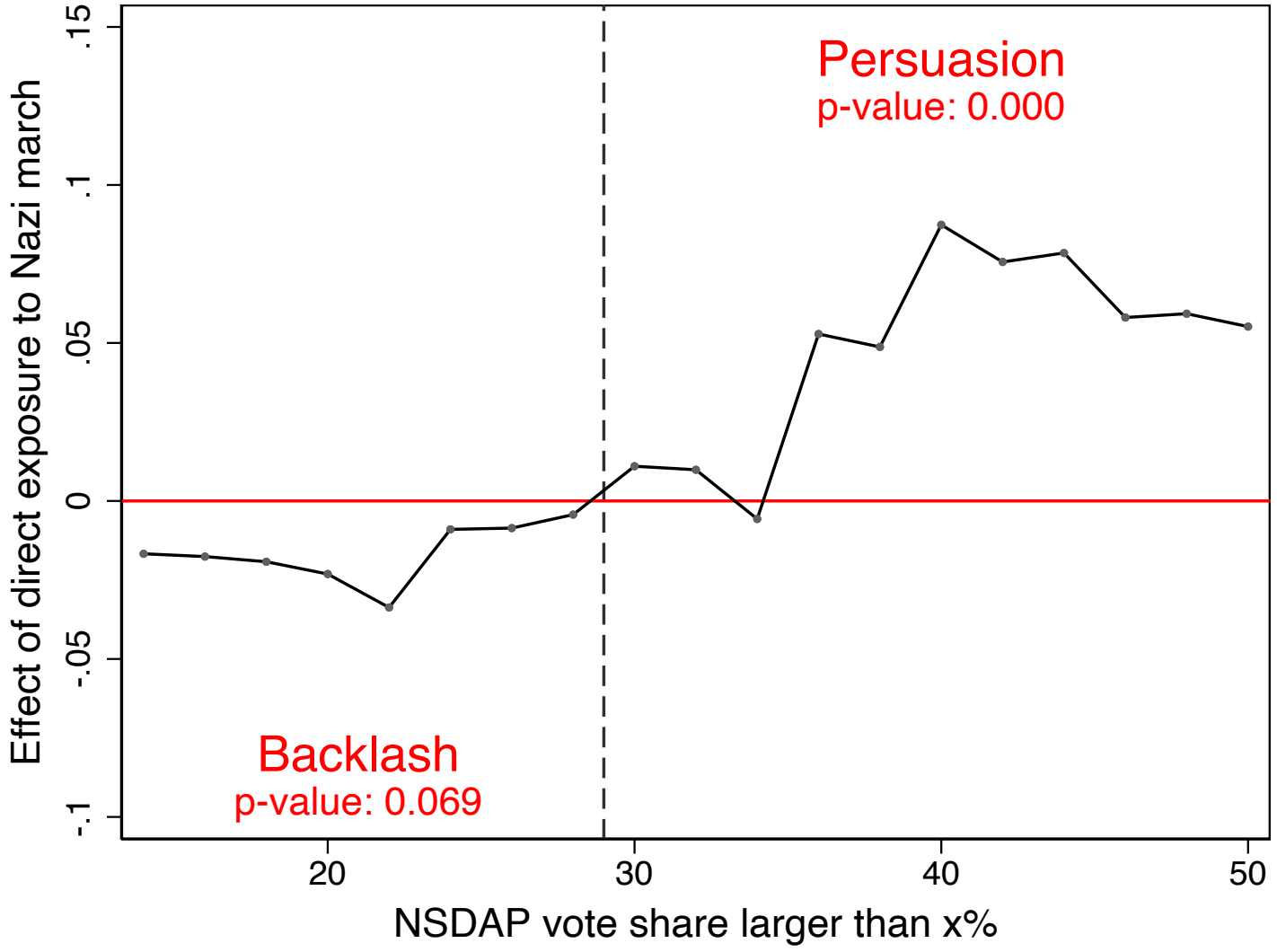
**Distribution Regression:**

$$N_{itx} = \alpha_i + \alpha_t + \beta_x M_i \times Post_t + \sum_t \delta_t \mathbf{X}_i' + u_{itx}$$ for many x

$N_{itx}$ = 1 if $NaziVoteShare_{it} > x$

| | |
|---|---|
| **Persuasion effect:** | $\beta_c > 0$ |
| **Backlash effect:** | $\beta_c < 0$ |
| **Polarization:** | $Both\ \beta_c > 0\ \&\ \beta_c < 0, for\ some\ c$ |

# Results: Polarization



# Outline of the Talk

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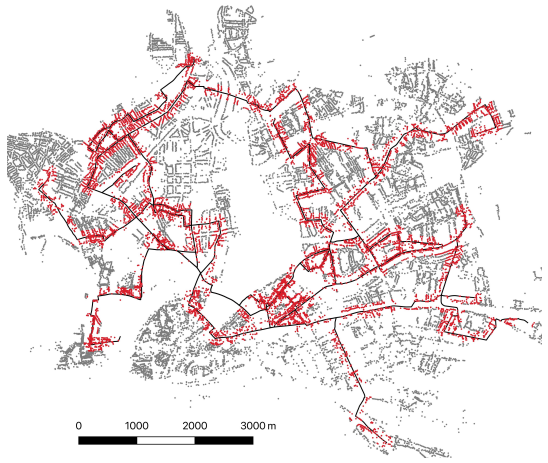
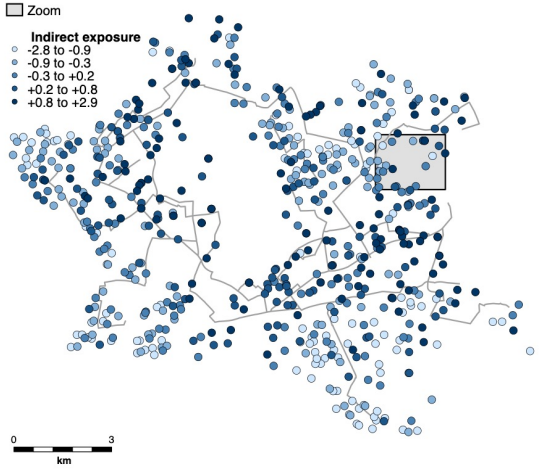
# Direct vs. Indirect Effects

**Diff-in-Diff:**

$$N_{it} = \alpha_i + \alpha_t + \beta M_i \times Post_t + \gamma Flu_i^M \times Post_t + \sum_t \delta_t \mathbf{X}_i' + u_{it}$$

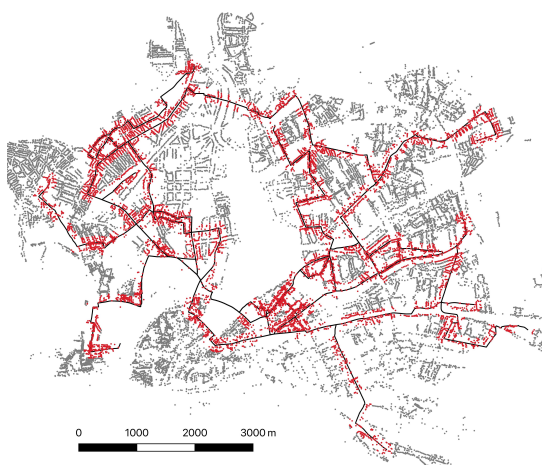


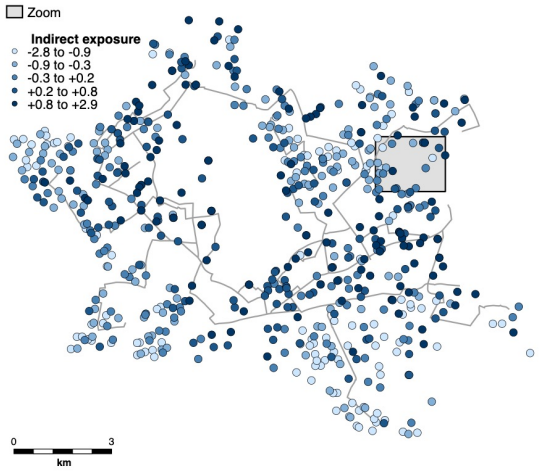



# Direct vs. Indirect Effects

**Diff-in-Diff:**

$$N_{it} = \alpha_i + \alpha_t + \beta M_i \times Post_t + \gamma Flu_i^M \times Post_t + \sum_t \delta_t \mathbf{X}_i' + u_{it}$$




| | |
|---|---|
| **Direct effect:** | $\beta > 0$ |
| **Indirect effect:** | $\gamma > 0$ |

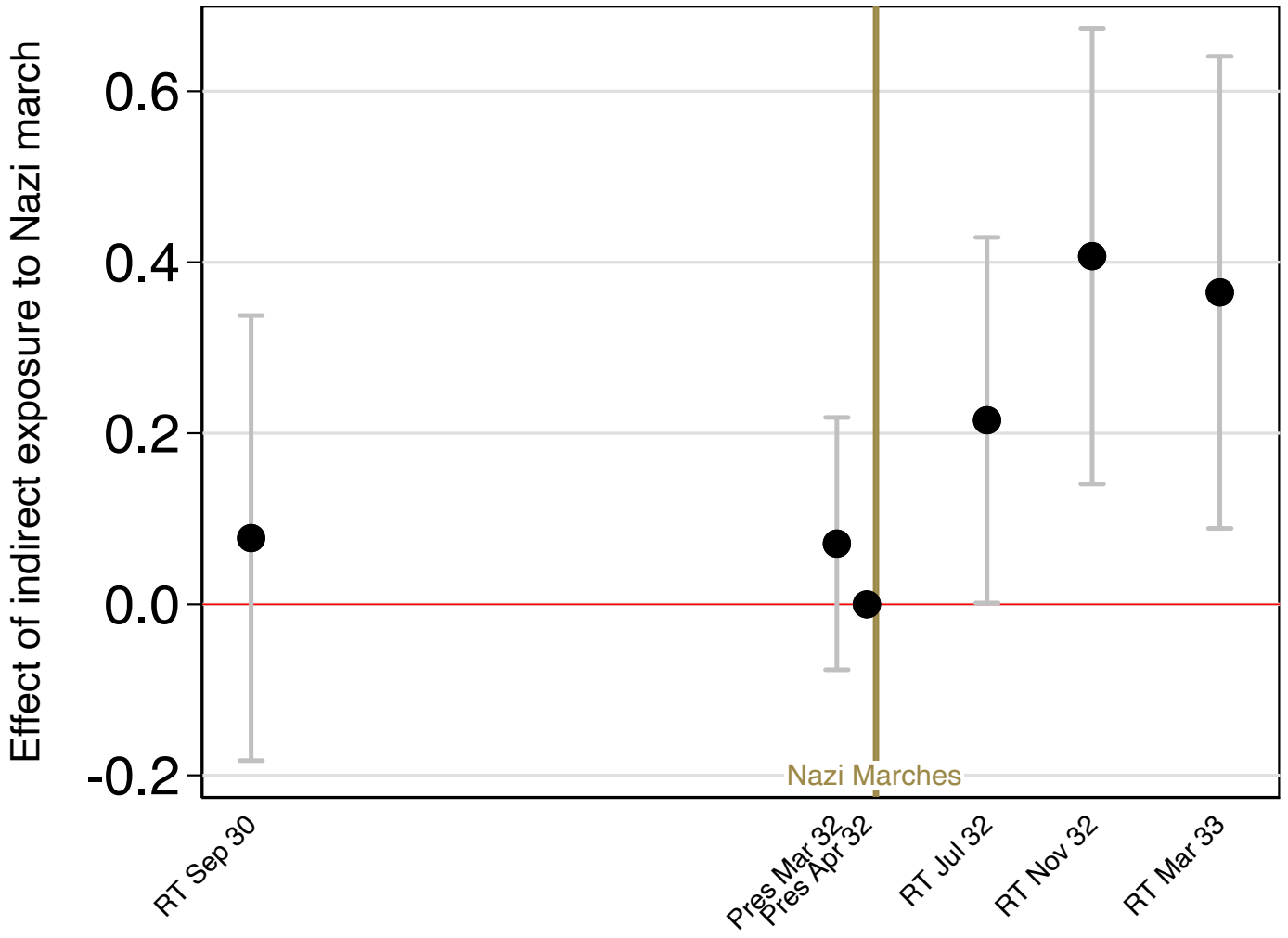
# Direct vs. Indirect Effects

| | % NSDAP votes | | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| Indirect exposure of households × post march | 0.515 | 0.314 | 0.294 | | |
| | [0.113] | [0.100] | [0.100] | | |
| Indirect exposure of households × t6 (post) | | | | 0.385 | 0.365 |
| | | | | [0.141] | [0.141] |
| Indirect exposure of households × t5 (post) | | | | 0.427 | 0.407 |
| | | | | [0.136] | [0.136] |
| Indirect exposure of households × t4 (post) | | | | 0.237 | 0.215 |
| | | | | [0.109] | [0.109] |
| Indirect exposure of households × t2 (pre) | | | | 0.071 | 0.071 |
| | | | | [0.075] | [0.075] |
| Indirect exposure of households × t1 (pre) | | | | 0.079 | 0.077 |
| | | | | [0.133] | [0.133] |
| Share households directly exposed (200m) × post march | | | 0.948 | | |
| | | | [0.264] | | |
| Share households directly exposed (200m) × t6 (post) | | | | | 0.962 |
| | | | | | [0.374] |
| Share households directly exposed (200m) × t5 (post) | | | | | 0.906 |
| | | | | | [0.337] |
| Share households directly exposed (200m) × t4 (post) | | | | | 0.996 |
| | | | | | [0.287] |
| Share households directly exposed (200m) × t2 (pre) | | | | | 0.012 |
| | | | | | [0.214] |
| Share households directly exposed (200m) × t1 (pre) | | | | | 0.161 |
| | | | | | [0.388] |
| Election & polling station FEs | Yes | Yes | Yes | Yes | Yes |
| Demographic controls × election FEs | No | Yes | Yes | Yes | Yes |
| Street controls × election FEs | No | Yes | Yes | Yes | Yes |
| $R^2$ | 0.864 | 0.914 | 0.915 | 0.933 | 0.933 |
| Mean NSDAP vote in 10 Apr '32 election | 30.417 | 30.417 | 30.417 | 30.417 | 30.417 |
| Indirect effect t6 > t4: p-value | | | | 0.051 | 0.051 |
| Indirect effect t5 > t4: p-value | | | | 0.015 | 0.014 |
| Indirect effect t4 = t2: p-value | . | . | . | 0.073 | 0.120 |
| Direct effect t6 = t4: p-value | . | . | . | . | 0.892 |
| Direct effect t5 = t4: p-value | . | . | . | . | 0.700 |
| Direct effect t4 = t2: p-value | . | . | . | . | 0.000 |
| Observations | 3110 | 3110 | 3110 | 3625 | 3625 |

Indirect Effects

Direct Effects

# Results: Dynamics of Indirect Effects



# Direct vs Indirect Effects: Effect sizes

| | $\beta$ (D1) | 1 sd $H^T/H$ (D2) | 1 sd % NSDAP$_t$ - % NSDAP$_3$ (D3) | Effect of 1 sd (D4: D1×D2/D3) |
|---|---|---|---|---|
| t=4 | 1.00 | 0.36 | 2.8 | 12.81% |
| t=5 | 0.91 | 0.36 | 3.7 | 8.91% |
| t=6 | 0.96 | 0.36 | 3.6 | 9.58% |

| | $\gamma$ (I1) | 1 sd $\rho^T - \rho^C$ (I2) | 1 sd % NSDAP$_t$ - % NSDAP$_3$ (I3) | Effect of 1 sd (I4: I1×I2/I3) |
|---|---|---|---|---|
| t=4 | 0.22 | 1.00 | 2.8 | 7.63% |
| t=5 | 0.41 | 1.00 | 3.7 | 11.01% |
| t=6 | 0.36 | 1.00 | 3.6 | 10.00% |

| | Total (D4+I4) | Direct (D4/Total) | Indirect (I4/Total) |
|---|---|---|---|
| t=4 | 20.44% | 63% | 37% |
| t=5 | 19.92% | 45% | 55% |
| t=6 | 19.58% | 49% | 51% |

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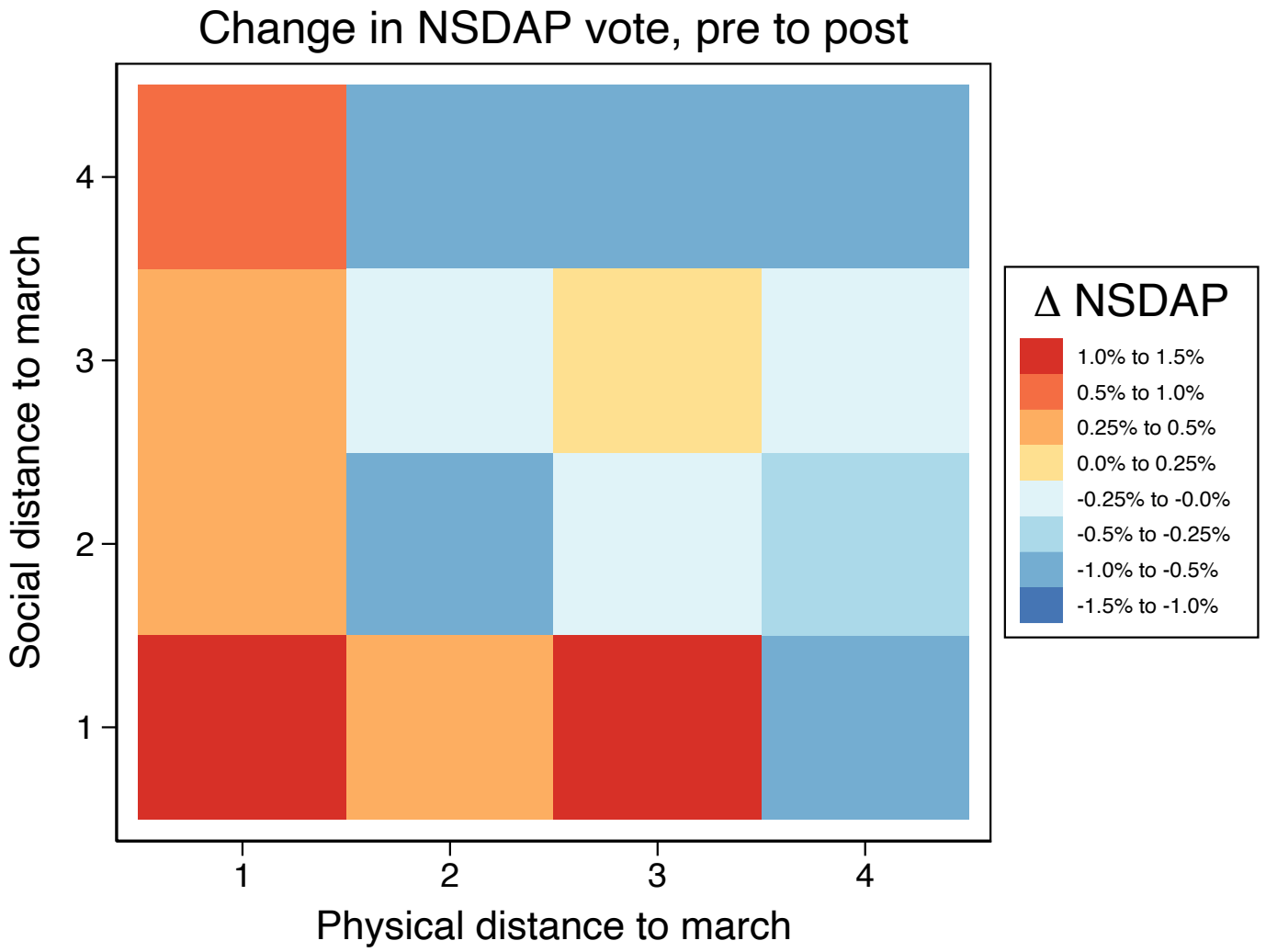
# Robustness

- Contamination of control group
- Non-random exposure to treatment
- Randomization Inference
- Spatial autocorrelation
- Nearest-neighbor matching
- Entropy balancing
- Coarsened exact matching
- Cutoff sensitivity
- Other propaganda
- Turnout

# Robustness: Contamination of control group



# Robustness: Non-random exposure to treatment

(a) Random march examples

# Robustness: Non-random exposure to treatment

| | % NSDAP votes | |
|---|---|---|
| | (1) | (2) |
| Share households directly exposed (200m) × post march | 0.895 | |
| | [0.149,1.714] | |
| Share households directly exposed (200m) × t6 (post) | | 0.857 |
| | | [-0.223,1.965] |
| Share households directly exposed (200m) × t5 (post) | | 0.925 |
| | | [0.095,1.840] |
| Share households directly exposed (200m) × t4 (post) | | 0.978 |
| | | [0.383,1.613] |
| Share households directly exposed (200m) × t2 (pre) | | 0.050 |
| | | [-0.824,0.865] |
| Share households directly exposed (200m) × t1 (pre) | | 0.246 |
| | | [-0.770,1.151] |
| Indirect exposure of households × post march | 0.303 | |
| | [0.254,0.345] | |
| Indirect exposure of households × t6 (post) | | 0.390 |
| | | [0.314,0.450] |
| Indirect exposure of households × t5 (post) | | 0.449 |
| | | [0.389,0.506] |
| Indirect exposure of households × t4 (post) | | 0.289 |
| | | [0.234,0.337] |
| Indirect exposure of households × t2 (pre) | | 0.146 |
| | | [0.101,0.210] |
| Indirect exposure of households × t1 (pre) | | 0.043 |
| | | [-0.010,0.116] |
| Expected direct exposure × post march | Yes | No |
| Expected indirect exposure × post march | Yes | No |
| Expected direct exposure × election FEs | No | Yes |
| Expected indirect exposure × election FEs | No | Yes |
| Election & polling station FEs | Yes | Yes |
| Demographic controls × election FEs | Yes | Yes |
| Street controls × election FEs | Yes | Yes |
| $R^2$ | 0.915 | 0.934 |
| Mean NSDAP vote in 10 Apr '32 election | 30.417 | 30.417 |
| Observations | 3110 | 3625 |

# Outline of the Talk

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   ii. Direct vs Indirect effects
4. Robustness
5. Conclusion

# Conclusion

1. Mass protests by extremists do **not** simply only **reflect** polarization

# Conclusion

1. Mass protests by extremists do **not** simply only **reflect** polarization

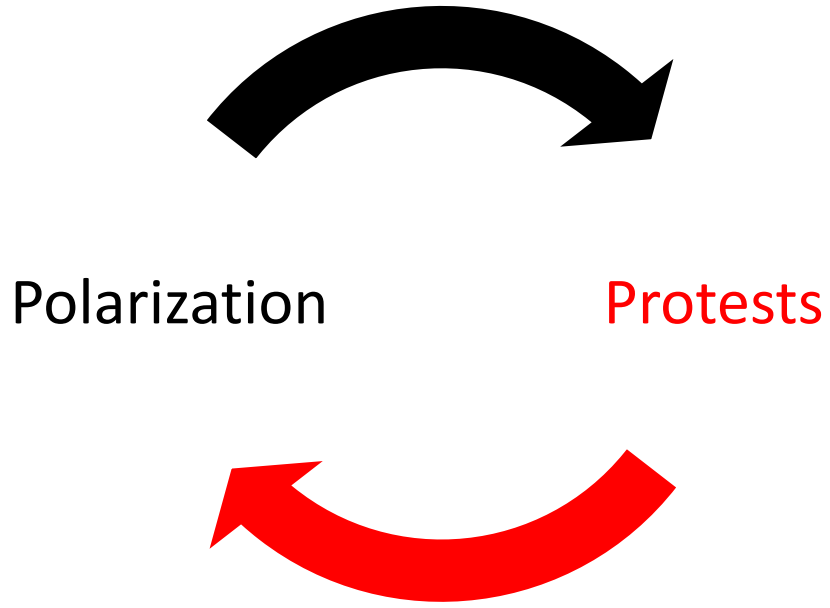
2. This display can not only **persuade**, but also **polarize** a population

# Conclusion

1. Mass protests by extremists do **not** simply only **reflect** polarization

2. This display can not only **persuade**, but also **polarize** a population

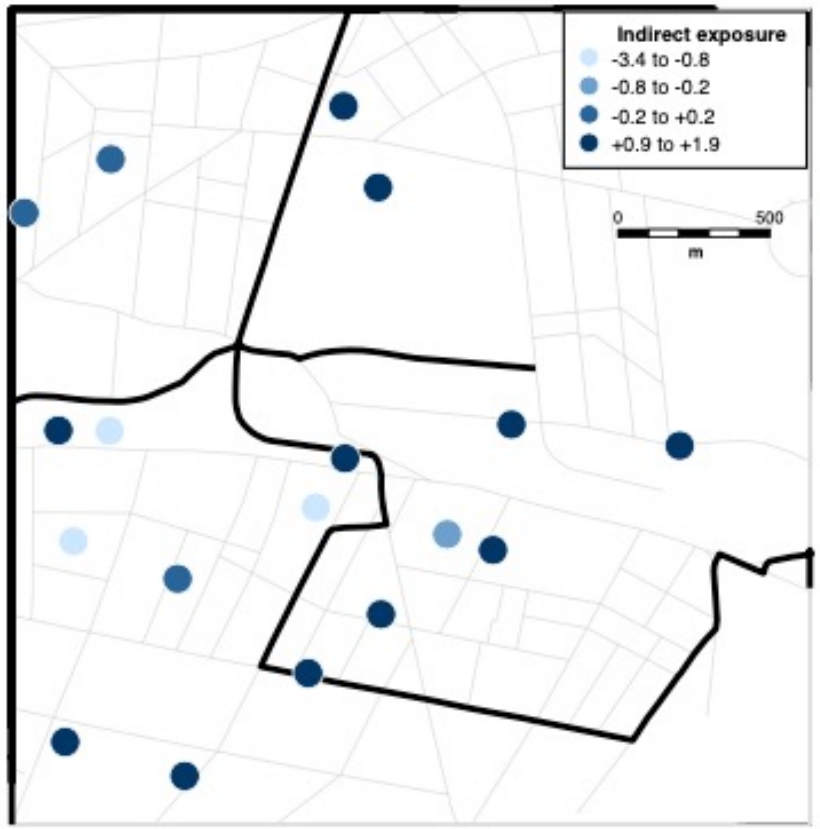
3. Potentially a vicious circle:

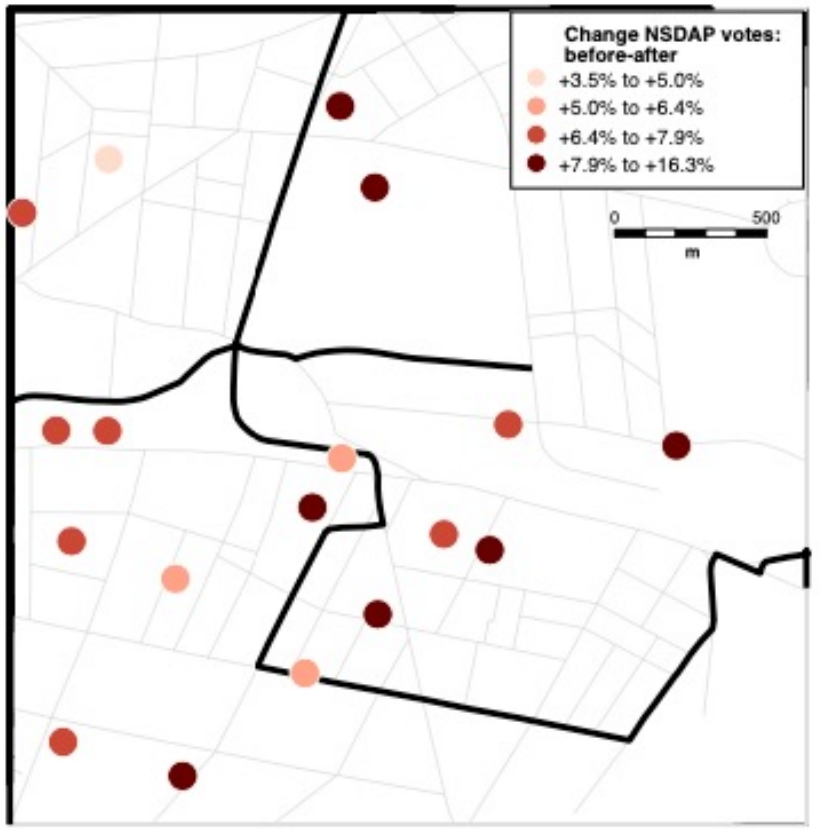


# Thanks!

# Appendix

# Data: Indirect exposure

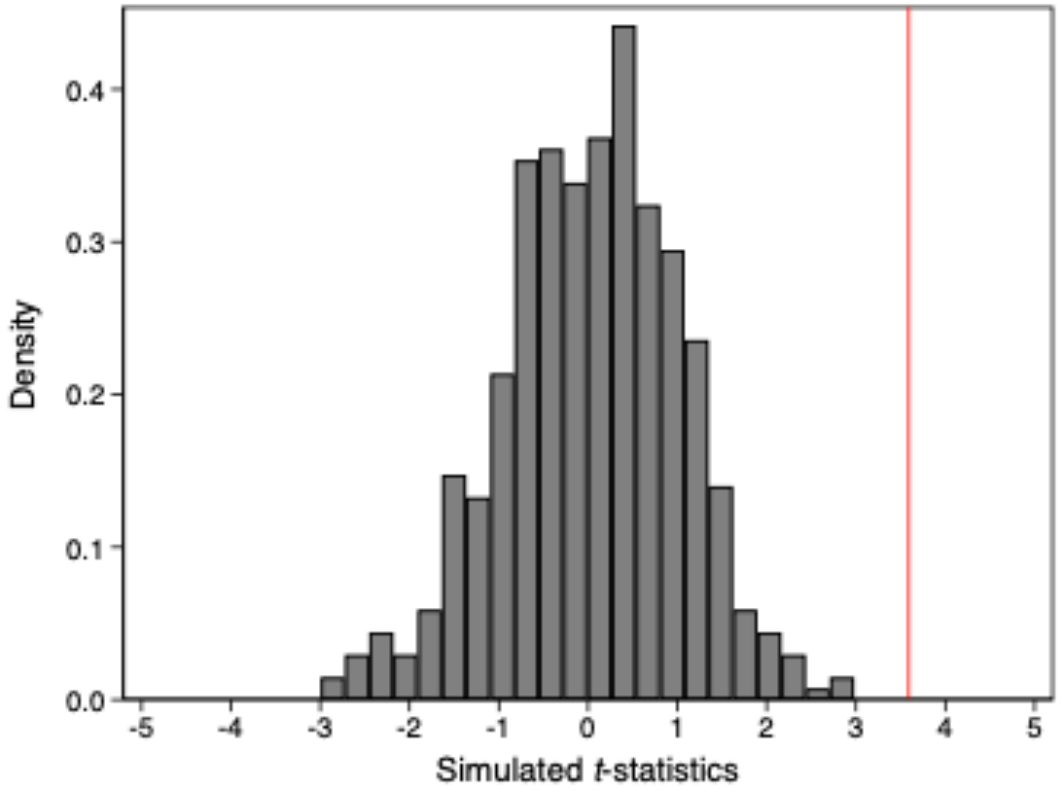



# Robustness: Type of indirect exposure

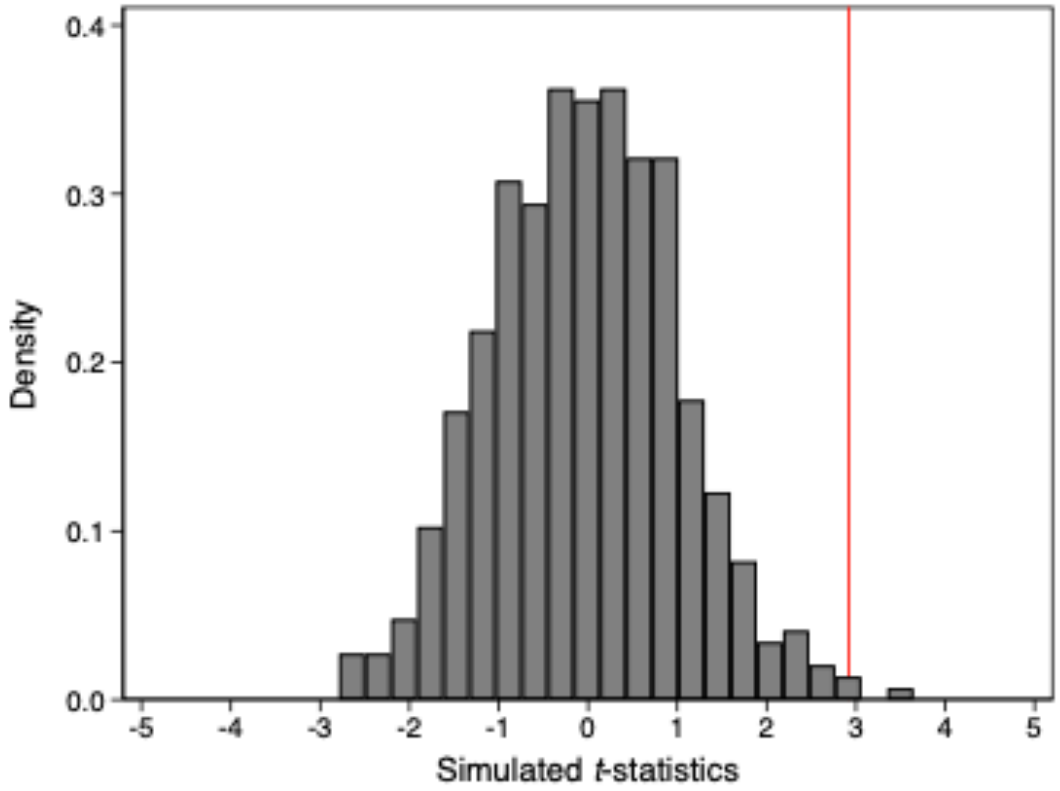
| | % NSDAP votes | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Indirect exposure of households to persuasion area × post march | 0.491 | 0.283 | 0.267 |
| | [0.135] | [0.118] | [0.118] |
| Indirect exposure of households to backlash area × post march | -0.074 | -0.036 | -0.030 |
| | [0.145] | [0.132] | [0.130] |
| Share households directly exposed (200m) × post march | | | 0.969 |
| | | | [0.265] |
| Election & polling station FEs | Yes | Yes | Yes |
| Demographic controls × election FEs | No | Yes | Yes |
| Street controls × election FEs | No | Yes | Yes |
| $R^2$ | 0.864 | 0.914 | 0.915 |
| Mean NSDAP vote in 10 Apr '32 election | 30.417 | 30.417 | 30.417 |
| Observations | 3110 | 3110 | 3110 |

# Robustness: Randomization Inference

(a) *t*-stats direct exposure




(b) *t*-stats indirect exposure



# Robustness: Spatial autocorrelation

| | % NSDAP vote | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Share households directly exposed × post march | 0.996 | | 0.948 |
| Baseline: s.e. clustered at polling station level | [0.266] | | [0.264] |
| Conley (1999) s.e.: cutoff at 200m | [0.268] | | [0.267] |
| Conley (1999) s.e.: cutoff at 500m | [0.280] | | [0.279] |
| Conley (1999) s.e.: cutoff at 1km | [0.305] | | [0.306] |
| Conley (1999) s.e.: cutoff at 1.5km | [0.318] | | [0.321] |
| Conley (1999) s.e.: cutoff at 2km | [0.333] | | [0.337] |
| Conley (1999) s.e.: cutoff at 2.5km | [0.347] | | [0.350] |
| Conley (1999) s.e.: cutoff at 3km | [0.353] | | [0.357] |
| | | | |
| Indirect exposure of households × post march | | 0.314 | 0.294 |
| Baseline: s.e. clustered at polling station level | | [0.100] | [0.100] |
| Conley (1999) s.e.: cutoff at 200m | | [0.099] | [0.099] |
| Conley (1999) s.e.: cutoff at 500m | | [0.100] | [0.100] |
| Conley (1999) s.e.: cutoff at 1km | | [0.100] | [0.100] |
| Conley (1999) s.e.: cutoff at 1.5km | | [0.101] | [0.100] |
| Conley (1999) s.e.: cutoff at 2km | | [0.100] | [0.100] |
| Conley (1999) s.e.: cutoff at 2.5km | | [0.100] | [0.100] |
| Conley (1999) s.e.: cutoff at 3km | | [0.101] | [0.100] |
| Election & polling station FEs | Yes | Yes | Yes |
| Demographic controls × election FEs | Yes | Yes | Yes |
| Street controls × election FEs | Yes | Yes | Yes |
| Observations | 3110 | 3110 | 3110 |

# Robustness: Nearest Neighbor matching

Table A.8: Panel A. Nearest neighbor match: first difference results for direct exposure.

| | Δ % NSDAP vote (before-after) | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| SATT | 0.791 | 0.265 | 0.541 | 0.524 | 0.633 | 0.636 |
| | [0.302] | [0.283] | [0.245] | [0.239] | [0.235] | [0.235] |
| Number of matched pairs | 109 | 109 | 327 | 327 | 545 | 545 |
| Number of matches per treated unit | 1 | 1 | 3 | 3 | 5 | 5 |
| Matching on coordinates | Yes | Yes | Yes | Yes | Yes | Yes |
| Matching on demographic controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Matching within district (17) | No | Yes | No | Yes | No | Yes |

Table A.8: Panel B. Nearest neighbor match: first difference results for indirect exposure.

| | Δ % NSDAP vote (before-after) | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| SATT | 0.780 | 0.519 | 0.639 | 0.551 | 0.644 | 0.622 |
| | [0.207] | [0.207] | [0.183] | [0.179] | [0.181] | [0.177] |
| Number of matched pairs | 311 | 311 | 933 | 933 | 1555 | 1555 |
| Number of matches per treated unit | 1 | 1 | 3 | 3 | 5 | 5 |
| Matching on coordinates | Yes | Yes | Yes | Yes | Yes | Yes |
| Matching on demographic controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Matching within district (17) | No | Yes | No | Yes | No | Yes |

# Robustness: Matching Exercises

| | % NSDAP vote | | |
|---|---|---|---|
| | (1) Base | (2) Entropy | (3) CEM |
| =1, if more than 80% households directly exposed × post march | 0.994 | 0.957 | 1.016 |
| | [0.249] | [0.238] | [0.264] |
| Election & polling station FEs | Yes | Yes | Yes |
| Demographic controls × election FEs | Yes | Yes | Yes |
| Street controls × election FEs | Yes | Yes | Yes |
| $R^2$ | 0.915 | 0.922 | 0.917 |
| Mean dep. var.: | 30.417 | 30.417 | 31.096 |
| Observations | 3110 | 3110 | 2295 |

# Robustness: Cutoff sensitivity

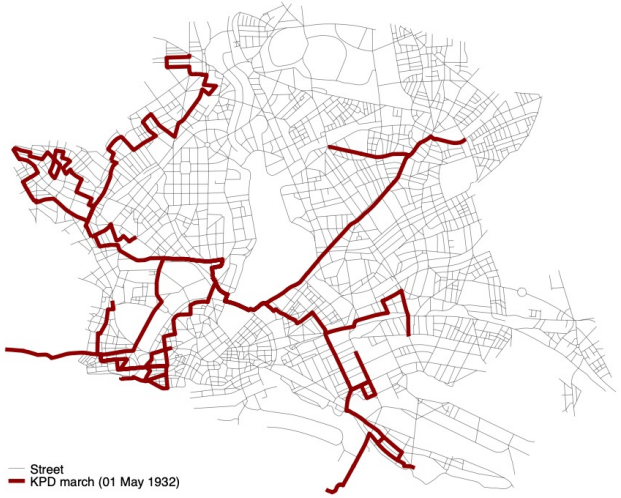
| | Dep var: % NSDAP votes | | | | | | |
|---|---|---|---|---|---|---|---|
| | Direct exposure | Indirect exposure | | | | | |
| | | >90% cutoff | | >80% cutoff | | >70% cutoff | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| | Panel A. 150m cutoff | | | | | | |
| Share households directly exposed × post march | 1.219 | | 1.184 | | 1.188 | | 1.179 |
| | [0.297] | | [0.294] | | [0.294] | | [0.294] |
| Indirect exposure of households × post march | | 0.352 | 0.339 | 0.343 | 0.331 | 0.349 | 0.334 |
| | | [0.107] | [0.105] | [0.104] | [0.103] | [0.104] | [0.103] |
| | Panel B. 200m cutoff | | | | | | |
| Share households directly exposed × post march | 0.996 | | 0.940 | | 0.948 | | 0.957 |
| | [0.266] | | [0.263] | | [0.264] | | [0.267] |
| Indirect exposure of households × post march | | 0.373 | 0.354 | 0.314 | 0.294 | 0.202 | 0.174 |
| | | [0.103] | [0.102] | [0.100] | [0.100] | [0.096] | [0.096] |
| | Panel C. 250m cutoff | | | | | | |
| Share households directly exposed × post march | 0.827 | | 0.789 | | 0.788 | | 0.799 |
| | [0.247] | | [0.245] | | [0.247] | | [0.248] |
| Indirect exposure of households × post march | | 0.309 | 0.293 | 0.218 | 0.194 | 0.150 | 0.123 |
| | | [0.100] | [0.100] | [0.095] | [0.096] | [0.089] | [0.089] |
| Election & polling station FEs | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Demographic controls × election FEs | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Street controls × election FEs | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Mean NSDAP vote in 10 Apr '32 election | 30.417 | 30.417 | 30.417 | 30.417 | 30.417 | 30.417 | 30.417 |
| Observations | 3110 | 3110 | 3110 | 3110 | 3110 | 3110 | 3110 |

# Robustness: Other propaganda

(a) NSDAP 17 and 20 Apr 1932


(b) NSDAP 28 Feb 33


(c) KPD 01 May 32




(d) SPD 01 May 32

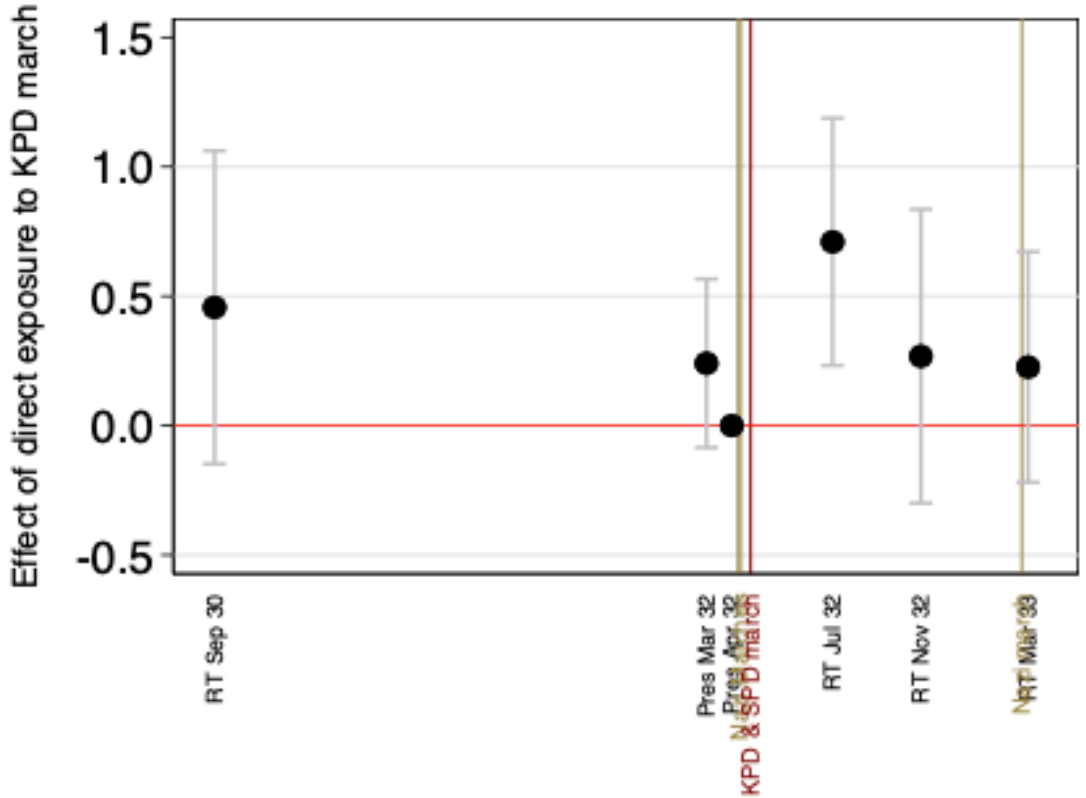
# Robustness: Other propaganda

Table A.11: Panel B. Robustness. Other marches: NSDAP vote share.

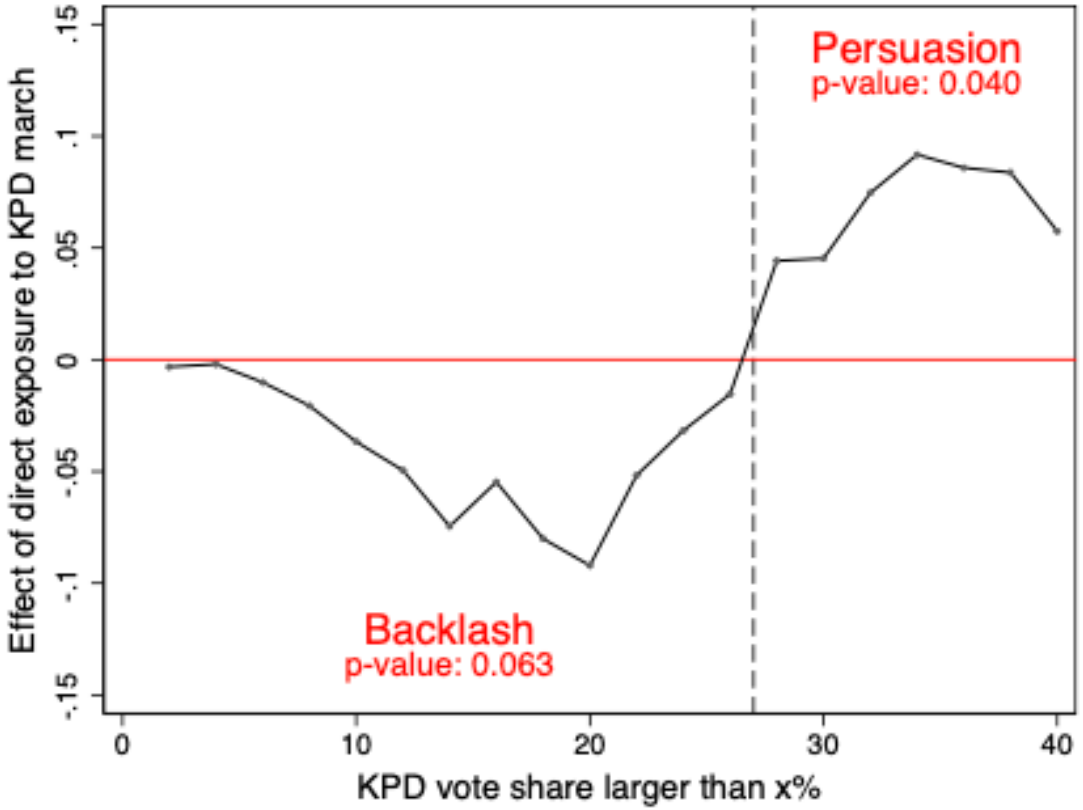
| | % NSDAP votes | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Share households directly exposed (200m) × post march | 1.100 | 1.119 | 1.188 | 0.959 | 1.244 | 1.191 |
| | [0.276] | [0.270] | [0.284] | [0.263] | [0.279] | [0.284] |
| Indirect exposure of households × post march | 0.270 | 0.291 | 0.271 | 0.293 | 0.271 | 0.271 |
| | [0.101] | [0.101] | [0.101] | [0.101] | [0.102] | [0.101] |
| Share households directly exposed to KPD march (200m) × post march | -0.555 | | | | -0.488 | |
| | [0.250] | | | | [0.250] | |
| Share households directly exposed to SPD march (200m) × post march | | -0.791 | | | -0.732 | |
| | | [0.292] | | | [0.292] | |
| Share households directly exposed to KPD or SPD march (200m) × post march | | | -0.629 | | | -0.627 |
| | | | [0.246] | | | [0.246] |
| Share households directly exposed to Feb33 Nazi march (200m) × post march | | | | -0.155 | -0.050 | -0.056 |
| | | | | [0.367] | [0.362] | [0.364] |
| Election & polling station FEs | Yes | Yes | Yes | Yes | Yes | Yes |
| Demographic controls × election FEs | Yes | Yes | Yes | Yes | Yes | Yes |
| Street controls × election FEs | Yes | Yes | Yes | Yes | Yes | Yes |
| $R^2$ | 0.915 | 0.916 | 0.915 | 0.915 | 0.916 | 0.915 |
| Mean NSDAP vote in 10 Apr '32 election | 30.417 | 30.417 | 30.417 | 30.417 | 30.417 | 30.417 |
| Observations | 3110 | 3110 | 3110 | 3110 | 3110 | 3110 |

# Robustness: Other propaganda

(a) Direct exposure




(b) Distribution regression

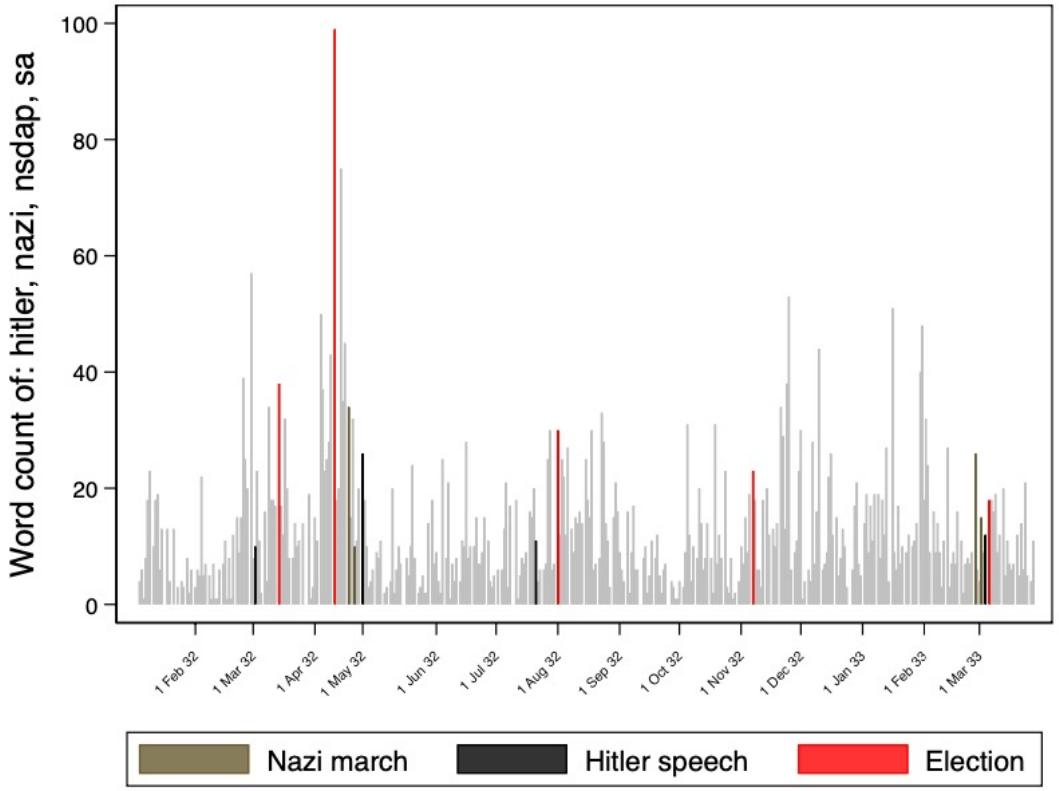


# Robustness: Other propaganda

| | % NSDAP votes | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Share households directly exposed (200m) × post march | 0.931 | 0.888 | 0.958 | 1.031 |
| | [0.260] | [0.263] | [0.263] | [0.268] |
| Indirect exposure of households × post march | 0.316 | 0.310 | 0.293 | 0.313 |
| | [0.101] | [0.101] | [0.100] | [0.100] |
| Log average distance to Hitler speech (II) × post speech | -0.709 | | | -1.545 |
| | [0.205] | | | [0.488] |
| Log average distance to Hitler speech (III) × post speech | | -0.384 | | 0.655 |
| | | [0.186] | | [0.426] |
| Log average distance to Hitler speech (IV) × post speech | | | 0.189 | 0.368 |
| | | | [0.264] | [0.258] |
| Election & polling station FEs | Yes | Yes | Yes | Yes |
| Demographic controls × election FEs | Yes | Yes | Yes | Yes |
| Street controls × election FEs | Yes | Yes | Yes | Yes |
| $R^2$ | 0.916 | 0.915 | 0.915 | 0.916 |
| Mean NSDAP vote in 10 Apr '32 election | 30.417 | 30.417 | 30.417 | 30.417 |
| Observations | 3110 | 3110 | 3110 | 3110 |

# Robustness: Other propaganda

Figure A.15: Media coverage.




*Note*: Robustness: Bars show frequency of NSDAP mentions (measured as wordcount of 'Hitler', 'Nazi', 'NSDAP' OR 'SA') in digitized fulltext version of the *Hamburger Anzeiger* over time (from 1 January 1932 to 31 March 1933). Brown bars mark day of first newspaper after a march. Black bars mark day of first newspaper after a Hitler speech. Red bars mark day of first newspaper after a national election.

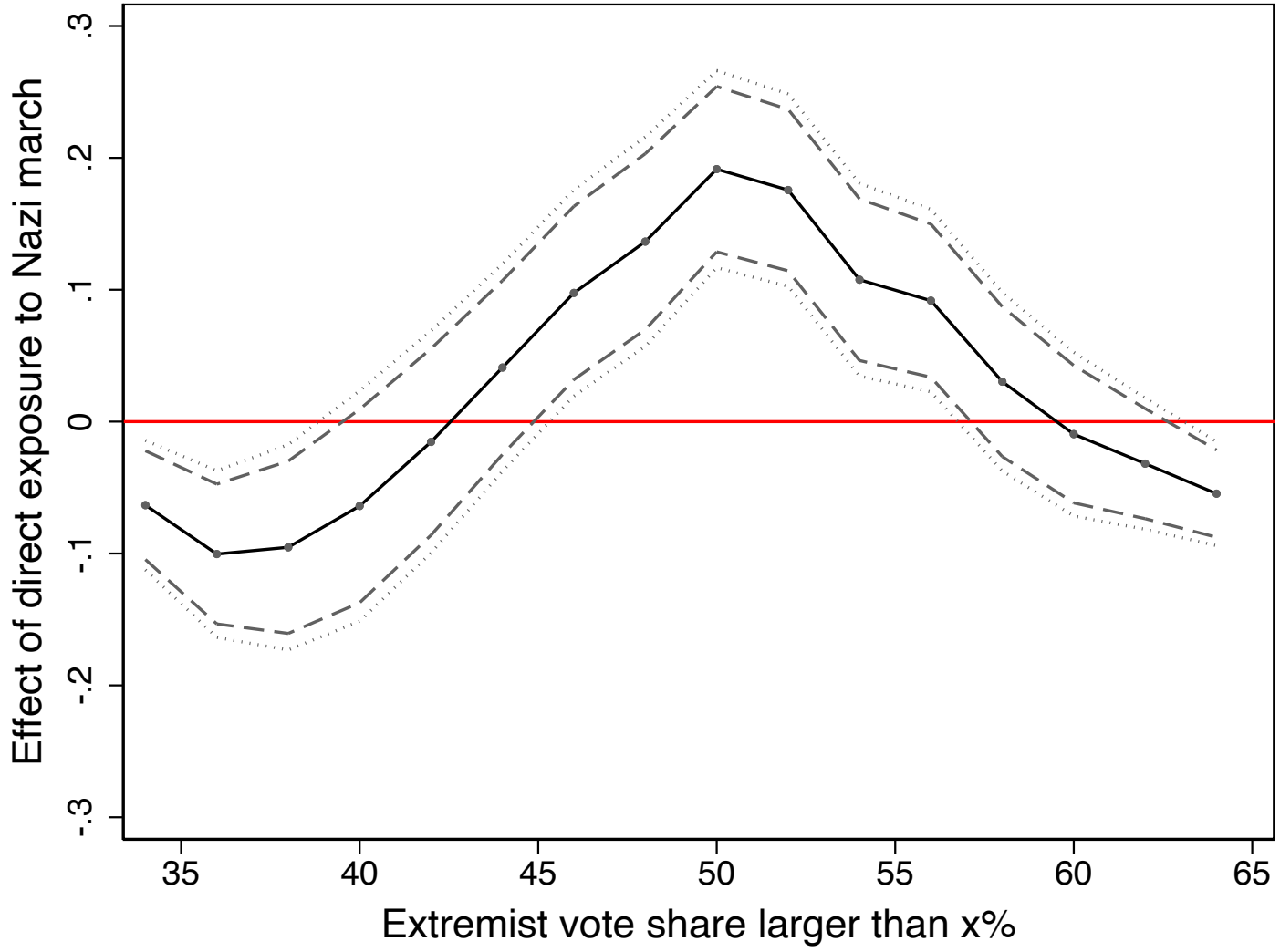
# Robustness: Turnout

| | Turnout | | | log voters | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Share households directly exposed (200m) × t6 (post) | -0.068 | | -0.076 | 0.007 | | 0.006 |
| | [0.220] | | [0.221] | [0.005] | | [0.005] |
| Share households directly exposed (200m) × t5 (post) | -0.775 | | -0.774 | 0.007 | | 0.007 |
| | [0.235] | | [0.237] | [0.004] | | [0.004] |
| Share households directly exposed (200m) × t4 (post) | -0.204 | | -0.215 | 0.002 | | 0.002 |
| | [0.290] | | [0.290] | [0.004] | | [0.004] |
| Share households directly exposed (200m) × t2 (pre) | 0.016 | | 0.015 | -0.002 | | -0.002 |
| | [0.159] | | [0.159] | [0.002] | | [0.002] |
| Share households directly exposed (200m) × t1 (pre) | -0.555 | | -0.542 | -0.006 | | -0.006 |
| | [0.272] | | [0.272] | [0.010] | | [0.010] |
| Indirect exposure of households × t6 (post) | | 0.045 | 0.047 | | 0.005 | 0.005 |
| | | [0.078] | [0.078] | | [0.002] | [0.002] |
| Indirect exposure of households × t5 (post) | | -0.019 | -0.002 | | 0.003 | 0.003 |
| | | [0.090] | [0.089] | | [0.002] | [0.002] |
| Indirect exposure of households × t4 (post) | | 0.063 | 0.068 | | 0.002 | 0.002 |
| | | [0.111] | [0.111] | | [0.002] | [0.002] |
| Indirect exposure of households × t2 (pre) | | 0.007 | 0.006 | | 0.000 | 0.001 |
| | | [0.053] | [0.053] | | [0.001] | [0.001] |
| Indirect exposure of households × t1 (pre) | | -0.091 | -0.078 | | 0.000 | 0.000 |
| | | [0.107] | [0.107] | | [0.005] | [0.005] |
| Election & polling station FEs | Yes | Yes | Yes | Yes | Yes | Yes |
| Log of number of voters (t3) × election FEs | Yes | Yes | Yes | No | No | No |
| Other demographic controls × election FEs | Yes | Yes | Yes | Yes | Yes | Yes |
| Street controls × election FEs | Yes | Yes | Yes | Yes | Yes | Yes |
| $R^2$ | 0.860 | 0.859 | 0.860 | 0.154 | 0.155 | 0.156 |
| Mean dep. var. in Apr. 32 election | 83.670 | 83.670 | 83.670 | 7.157 | 7.157 | 7.157 |
| Observations | 3624 | 3624 | 3624 | 3624 | 3624 | 3624 |

# Other results: Effect on extremism

| | % extremist parties votes | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Share households directly exposed (200m) × post march | 0.454 | | 0.423 |
| | [0.260] | | [0.260] |
| Indirect exposure of households × post march | | 0.204 | 0.195 |
| | | [0.099] | [0.099] |
| Election & polling station FEs | Yes | Yes | Yes |
| Demographic controls × election FEs | Yes | Yes | Yes |
| Street controls × election FEs | Yes | Yes | Yes |
| $R^2$ | 0.935 | 0.935 | 0.935 |
| Mean extremist parties vote in 10 Apr '32 election | 43.601 | 43.601 | 43.601 |
| Observations | 3110 | 3110 | 3110 |

# Other results: Effect on extremism



# Other results: Distribution regression descriptives

| | 20% threshold | 40% threshold | |
|---|---|---|---|
| | Mean | Mean | Difference |
| **Voting** | | | |
| Delta NSDAP pre to post | 1.907 | 4.013 | 2.106 |
| NSDAP vote share 31 July 32 (post) | 19.633 | 41.595 | 21.962 |
| Hitler (NSDAP) vote share 10 April 32 (pre) | 17.726 | 37.582 | 19.856 |
| Delta KPD pre to post | 7.953 | 4.081 | -3.872 |
| KPD vote share 31 July 32 (post) | 29.881 | 11.883 | -17.998 |
| Thälmann (KPD) vote share 10 April 32 (pre) | 21.928 | 7.802 | -14.126 |
| **Sociodemographic characteristics** | | | |
| Number of voters at polling station (10 April 32) | 1259.318 | 1320.742 | 61.424 |
| Share of day laborers/unemployed | 7.695 | 9.006 | 1.311 |
| Share of blue collar workers | 49.635 | 26.178 | -23.457 |
| Share of skilled workers | 5.261 | 7.593 | 2.332 |
| Share of white collar workers | 4.217 | 6.308 | 2.091 |
| Share of managers | 1.198 | 2.129 | 0.931 |
| Share of low grade civil servants | 6.010 | 6.106 | 0.096 |
| Share of high grade civil servants | 0.289 | 0.885 | 0.596 |
| Share of shopkeepers | 8.173 | 13.530 | 5.357 |
| Share of retired | 1.389 | 1.401 | 0.012 |
| Share of households with telephone | 3.921 | 17.237 | 13.316 |
| Share of households with heating | 0.986 | 9.307 | 8.321 |
| **Street network characteristics** | | | |
| Distance to closest extreme point (km) | 1.571 | 1.353 | -0.218 |
| Distance to closest straight line between extreme points (km) | 0.899 | 0.701 | -0.198 |
| Number of streets within 200m of polling station | 4.837 | 4.839 | 0.002 |
| Share of streets in top tercile of width | 41.403 | 39.964 | -1.439 |
| Share of streets in bottom tercile of width | 22.324 | 25.395 | 3.071 |
| Observations | 86 | 93 | |