YouTube's recommendation algorithm creates rabbit holes, not echo chambers

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Talk in a slide

- Why no echo chambers [on Youtube]?
- Because rabbit holes dominate.

Definitions

- **Echo chamber:** "a bounded, enclosed media space that has
  the potential to both magnify the messages delivered within it
  and insulate them from rebuttal" *(link)*

Definitions

- **Rabbit hole:** "interested in something to the point of distraction – usually by accident, and usually to a degree that the subject in question might not...merit." *(link)*

Definitions

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  - **Iterative:** one piece of content leads to the next
  - **Exhaustive:** subsequent pieces of content dig deeper into a topic
  - **Associative:** subsequent pieces of content can deviate

Puzzle

Puzzle

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- · **Model:** Information as a consumption good *(McFadden, 2019)*

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- **Assumption 2:** Diverse supply of information
- **Model:** Information as a consumption good *(McFadden, 2019)*
- **Expectation:** Echo chambers should prevail!
- **Puzzle:** Echo chambers are rare *(Guess et al., 2018; Barbera, 2015; Guess, 2021)*

↦ Intuition

Explanation

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  - ...on Youtube

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  - ...on Youtube
  - ...in 2020

Data and Methods

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- 600 also provided their YouTube watch histories for us

Measures

- For each video, we observe:
    - Ideology *(Lai et al., 2024)*
    - Video "category" from YouTube API

Measures

- · For each video, we observe:
    - · Ideology *(Lai et al., 2024)*
    - · Video "category" from YouTube API
- · **Echo Chamber:** homogeneity of ideology of videos
- · **Rabbit Hole:** rate at which subsequent videos / recommendations shift to match current video

Roadmap

· Descriptives: Watch Histories
  · **Echo chambers** don't (really) exist
  · **Rabbit holes** do exist

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- Descriptives: Recommendations
  - **Echo chambers** really don't exist
  - **Rabbit holes** are even deeper
- Inference
  - Predict recommendation video ideology as a function of current and average of watch history

Watch Histories: Echo chambers don't (really) exist
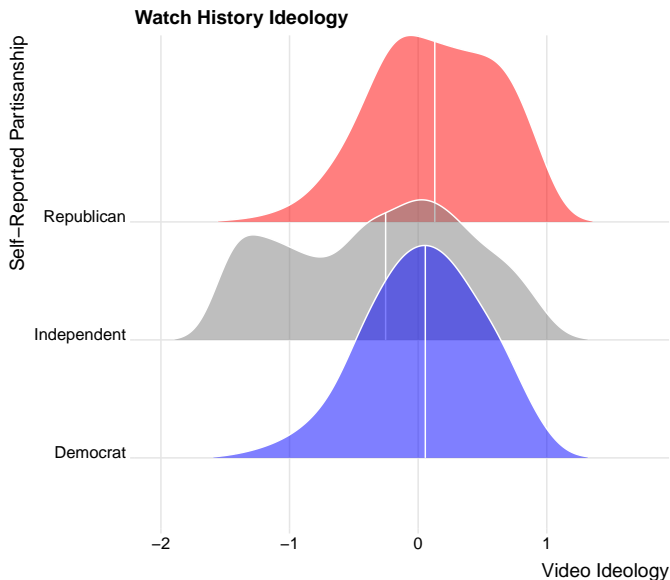
Watch History Ideology

Watch Histories: Echo chambers don't (really) exist

Watch History Ideology

Self–Reported Ideology (y-axis):
- 7 – Extreme Cons
- 6 – Conservative
- 5 – Lean Cons
- 4 – Moderate
- 3 – Lean Lib
- 2 – Liberal
- 1 – Extreme Lib

Video Ideology (x-axis): −2, −1, 0, 1

Watch Histories: But rabbit holes might

Share of subsequent video categories by current video
Watch Histories

Watch Histories: But rabbit holes might

Correlation of ideology
Watch histories

Subsequent video ideology (y-axis)
Current video ideology (News & Politics only) (x-axis)

Subsequent N&P
— FALSE
— TRUE

▸ Heterogeneity

Recommendations: Echo chambers really don't exist

Reccomendation Ideology

Recommendations: Echo chambers really don't exist

Reccomendation Ideology
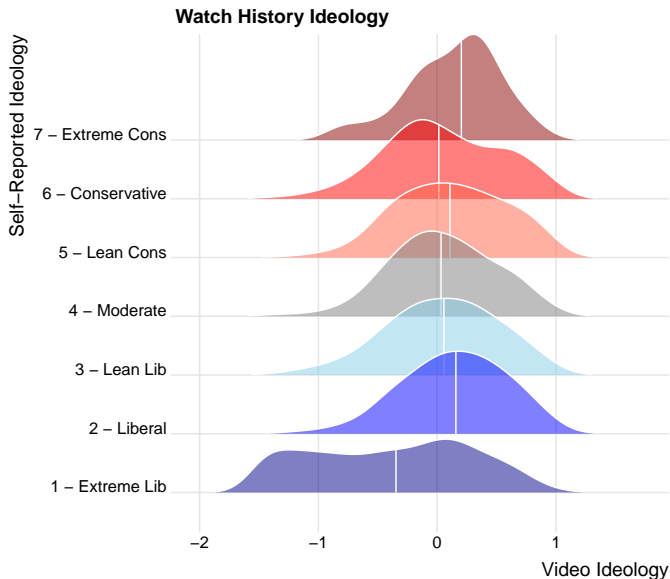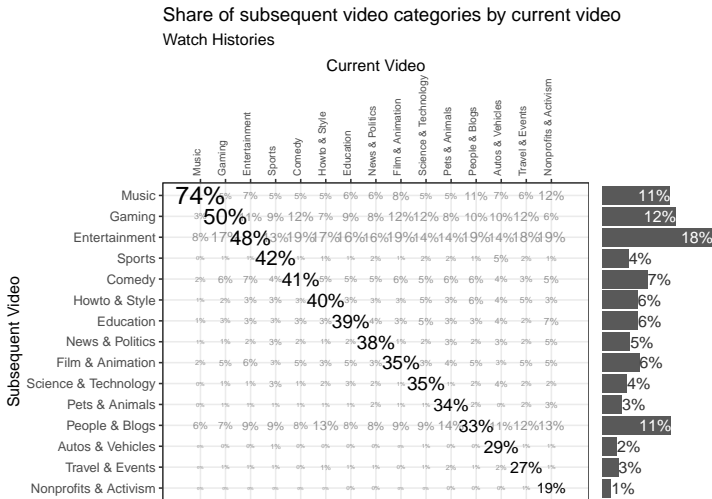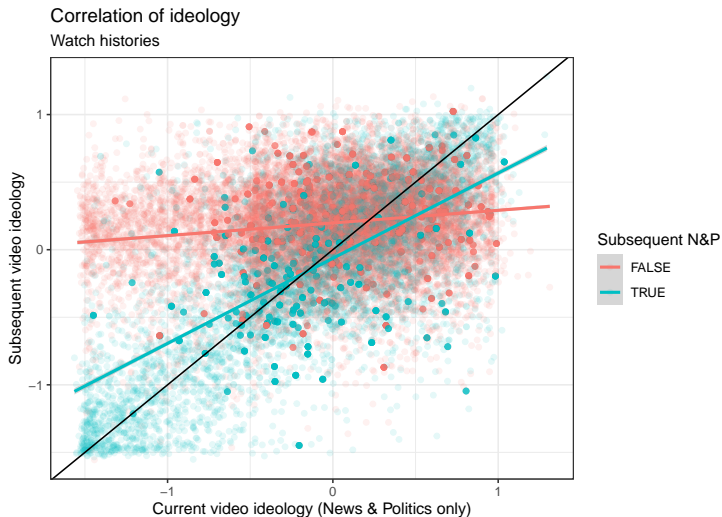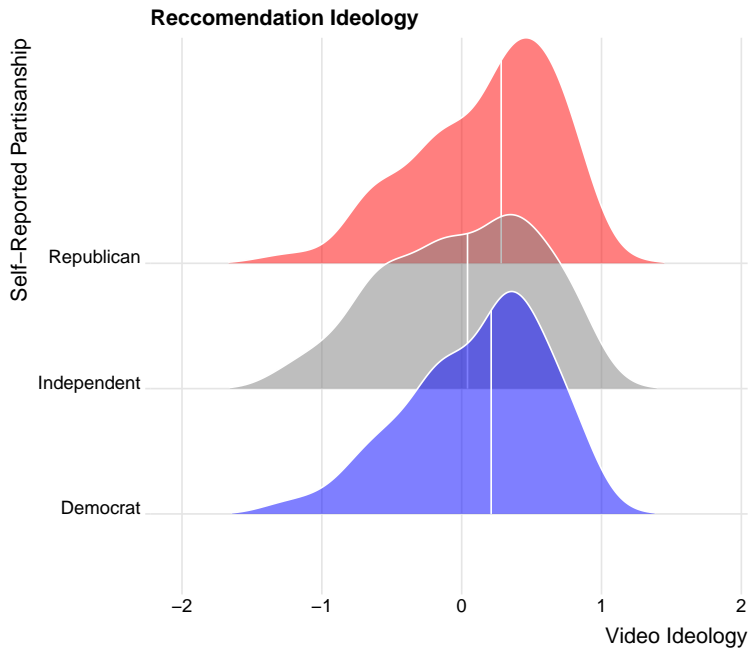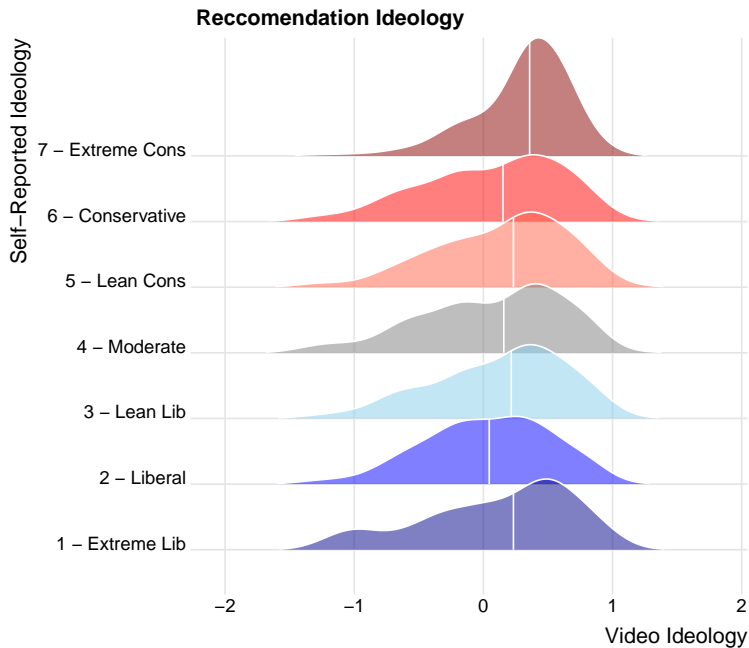
Recommendations: But rabbit holes do
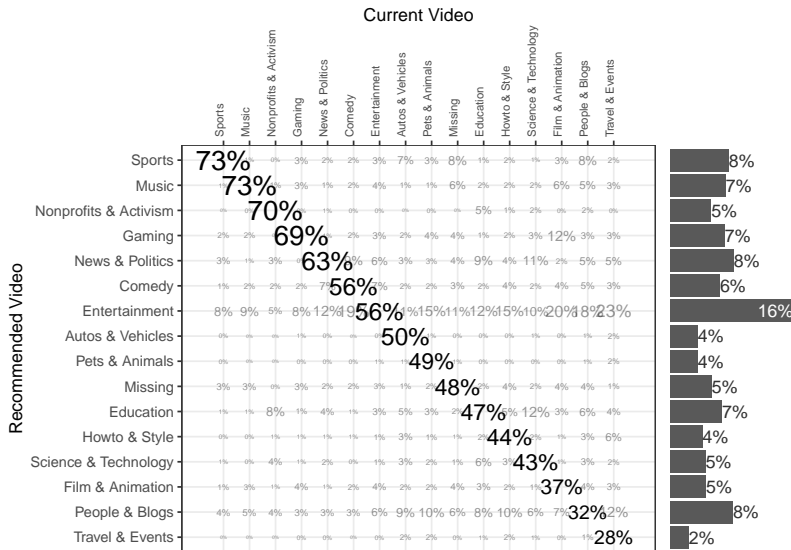
Recommendations: Stronger rabbit holes

Echo Chamber Proportions by Context
Watch histories versus recommendation algorithm
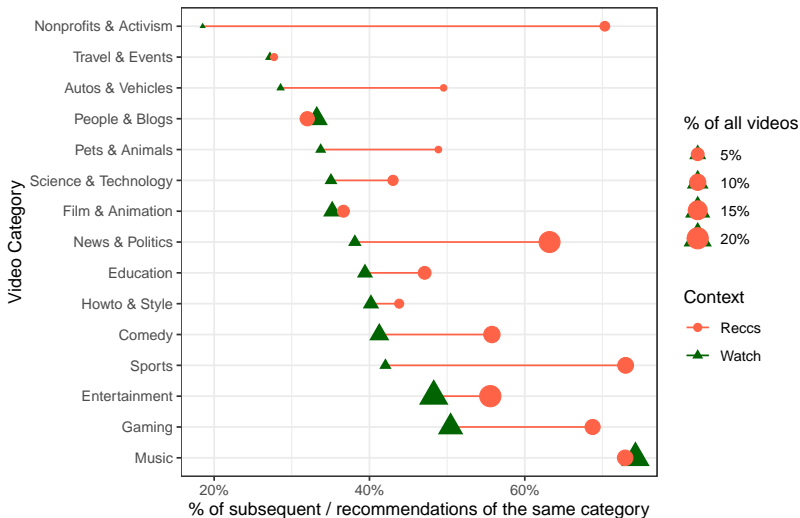
Recommendations: Stronger rabbit holes
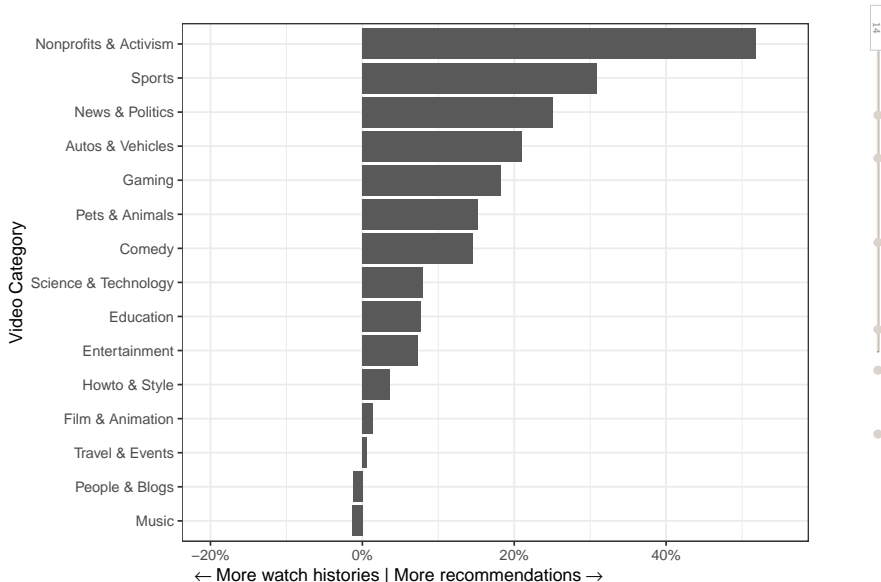
← More watch histories | More recommendations →

Regressions

· What is the relative weight of a user's watch history versus the current / recently watched videos on their recommendations?

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$$ideo_{irc} = \alpha_i + \rho_c + \beta_1 ideo_{itc} + \beta_2 ideo_{ic} + \varepsilon_{ic}$$

· where i indexes individuals, t indicates time (sequence), c indicates category, and r indicates recommendations

· α_i and ρ_c are individual and category fixed effects, respectively

Results

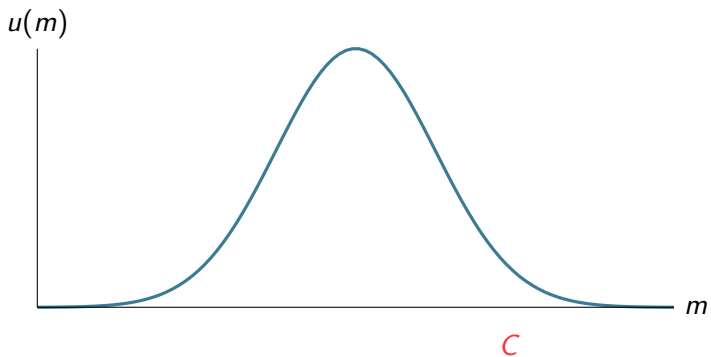## Predicting Recommendation Ideology
Watch history + Current
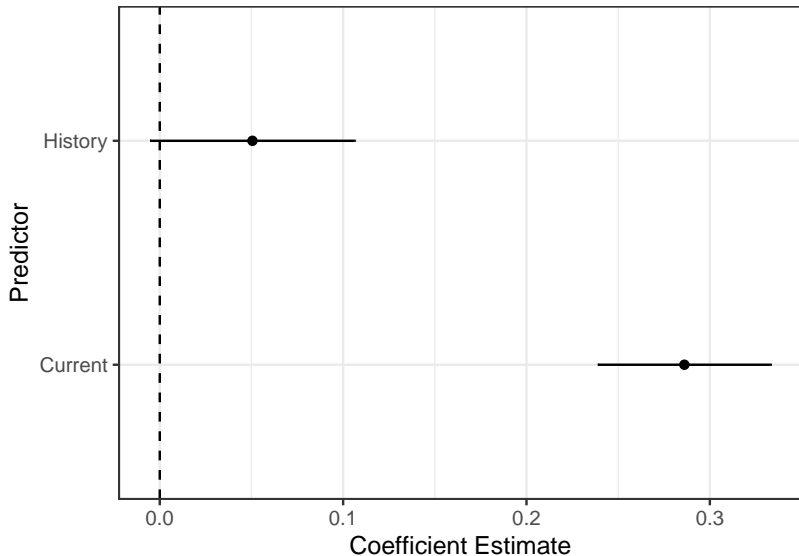
Discussion

- Youtube circa 2020 suggests that users experience **rabbit holes**, not **echo chambers**
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- Suggestive evidence that this is (partially) the product of the recommendation algorithm
- Interpretation relies on how dogmatically we think the **homophily assumption** describes info consumption
    - **Dogmatist**: Youtube's algo sux
    - **Skeptic**: Can we learn about demand for info from it?
    - **Depressingly**: are we studying an algorithm instead of the humans that we actually care about?

Thank you

All faults are my own, Vaibhav is a star
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Puzzle

↠ Back
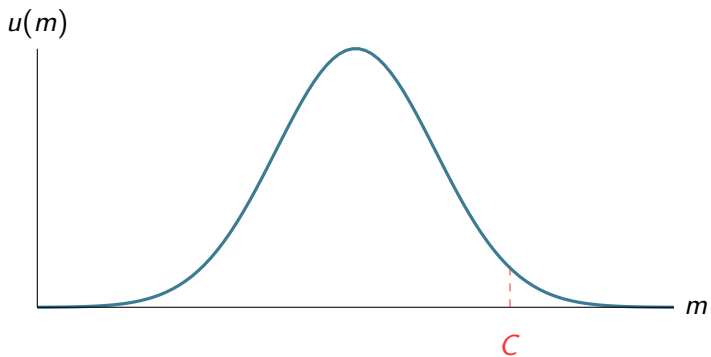
Puzzle

$u(m)$

m

C
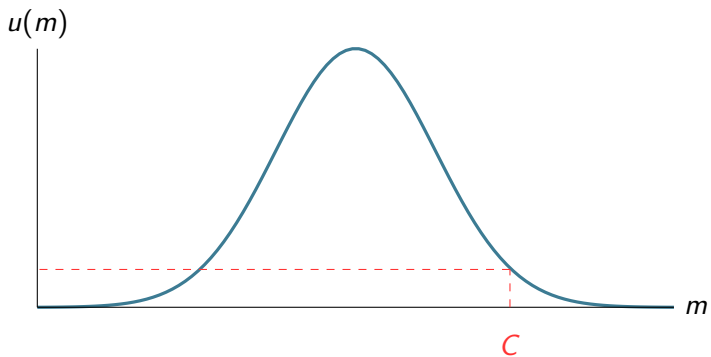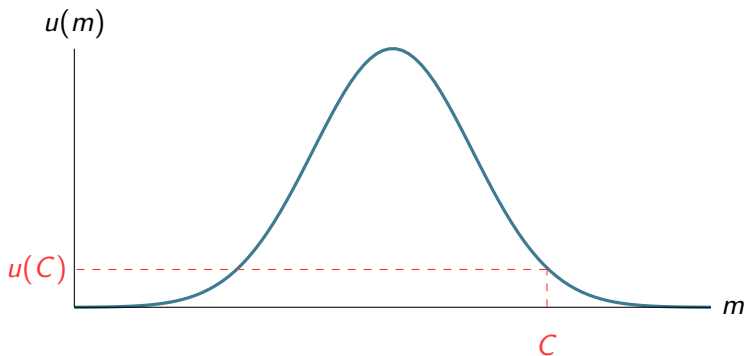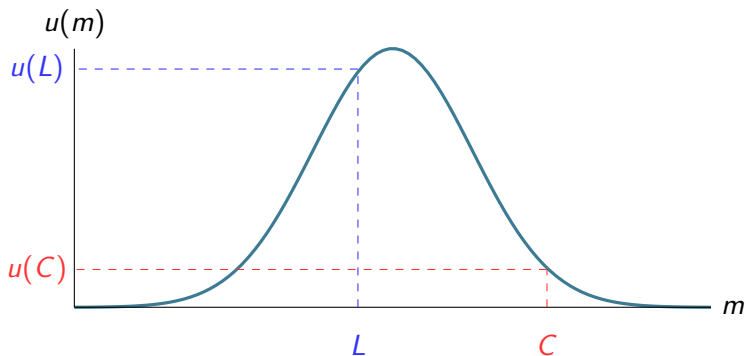
Puzzle

Puzzle

Puzzle

⇢ Back

Watch Histories: Echo chambers don't (really) exist

Watch History Ideology: n = 149
News & Politics Only

Respondent ID (10+ vids in history)

Video Ideology

Videos
- 500
- 1000
- 1500
- 2000
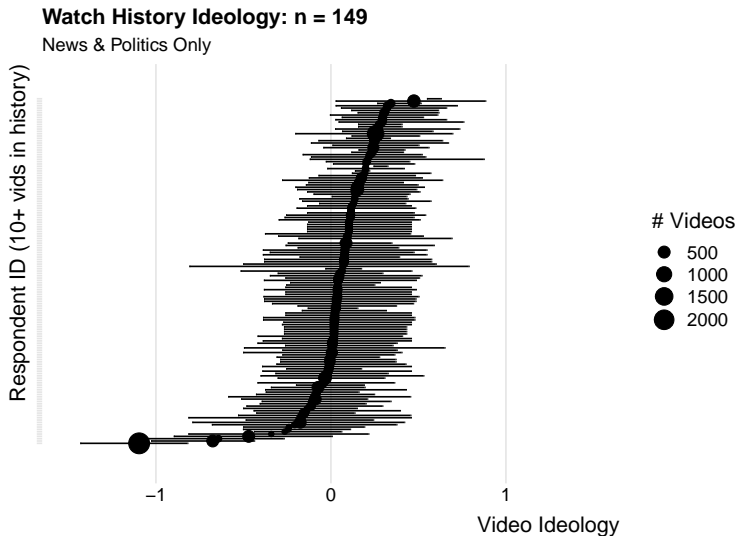
Recommendations: Echo chambers really don't exist

Recommendation Ideology: n = 298
News & Politics Only

Respondent ID (10+ vids in recommendations)

Video Ideology

Videos
200
400
600

▸ Back

3-way interaction

Watch Histories: But rabbit holes might

Ideology Correlation by Video Category

Watch Histories