Seeing is Believing: Identity, Inequality, and the Impact of Television on the Hispanic Achievement Gap

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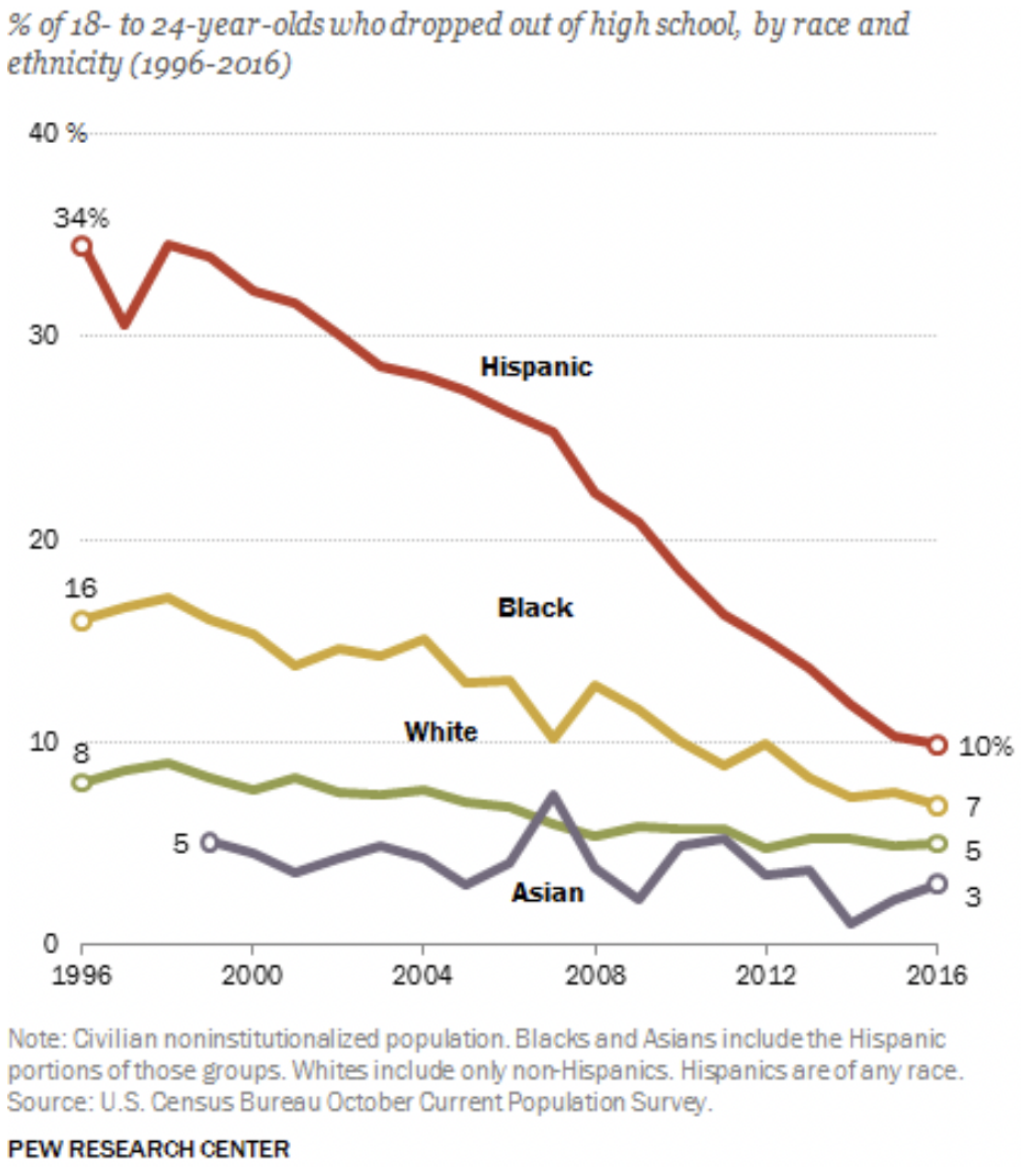
Motivation (I): the Hispanic achievement gap is large



Motivation (II): Americans *really* love TV

Outside of Sleeping, Americans Spend Most of Their Time Watching Television

Television is the most popular leisure activity in the U.S. These states tend to watch the most.

By Kaia Hubbard | July 22, 202

America's Addiction to Television Is Not Normal

Binge-watching is far from being a US-only phenomenon, but the US is way ahead of the rest of the world in its TV addiction.

By John McDuling, Quartz and Quartz

Americans Spent More Time Watching TV Than Working After Pandemic Hit in 2020

By Terence P. Jeffrey | October 15, 2021 | 4:58pm EDT

How does Spanish Language TV affect Hispanic educational outcomes?

This project:

Show that SLTV reduces the Hispanic achievement gap in public schools:

- Identification: difference-in-discontinuities design
- Gap vs. whites and Asians in SAT/ACTs taken, calculus courses taken, AP exams passed, etc. **shrinks** with SLTV
- However, the gap vs. whites and Asians **rises** when looking at English proficiency

How to reconcile this?

How to reconcile this?

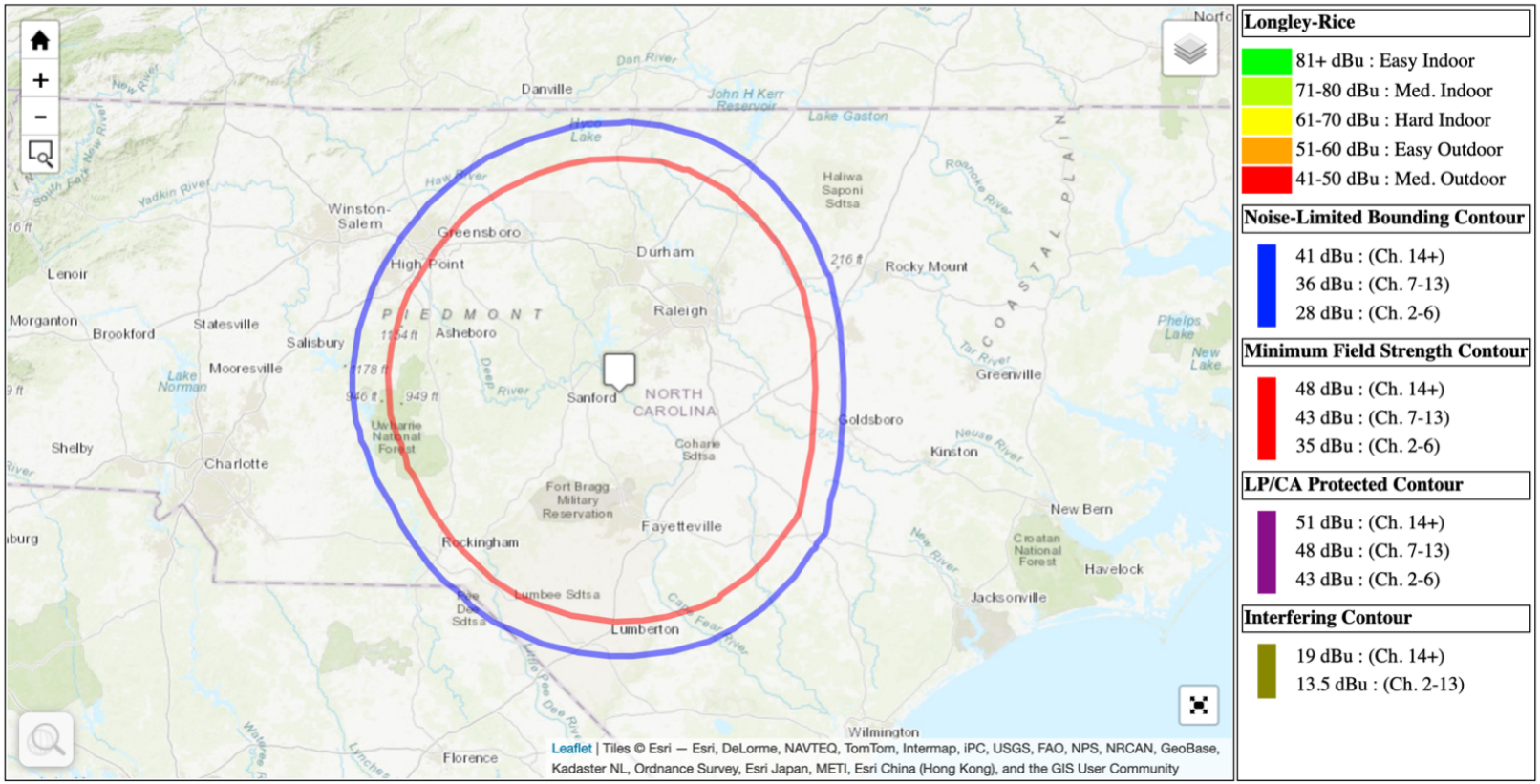
Propose an **identity** mechanism. Four strands of evidence:

1. More bullying on the basis of ethnicity (but not gender)
2. Hispanics perform better where SLTV focuses more on Hispanic identity (but not on education)
3. Hispanics with SLTV visit Hispanic branded establishments more (but not Brazilian branded ones)
4. Counties with SLTV are more socially connected to LatAm

Coverage Map for TV Station WUVC-DT

Coverage Maps

WUVC-DT (40-1) BLCDT-20060912ACZ



Longley-Rice

- 81+ dBu : Easy Indoor
- 71-80 dBu : Med. Indoor
- 61-70 dBu : Hard Indoor
- 51-60 dBu : Easy Outdoor
- 41-50 dBu : Med. Outdoor

Noise-Limited Bounding Contour

- 41 dBu : (Ch. 14+)
- 36 dBu : (Ch. 7-13)
- 28 dBu : (Ch. 2-6)

Minimum Field Strength Contour

- 48 dBu : (Ch. 14+)
- 43 dBu : (Ch. 7-13)
- 35 dBu : (Ch. 2-6)

LP/CA Protected Contour

- 51 dBu : (Ch. 14+)
- 48 dBu : (Ch. 7-13)
- 43 dBu : (Ch. 2-6)

Interfering Contour

- 19 dBu : (Ch. 14+)
- 13.5 dBu : (Ch. 2-13)

Empirical Strategy

- Construct spatial RD arising from FCC TV signal regulation *(OET Bulletin 69)*
  - TV stations protected from interference only within certain coverage contour areas. Keep observations within 100 KM of the contour boundary
  - Follow Velez & Newman (2019), expand from 2 counties to entire US
  - Spanish Language TV: Isolate causal effect on SLTV on Hispanic communities

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  - Spanish Language TV: Isolate causal effect on SLTV on Hispanic communities

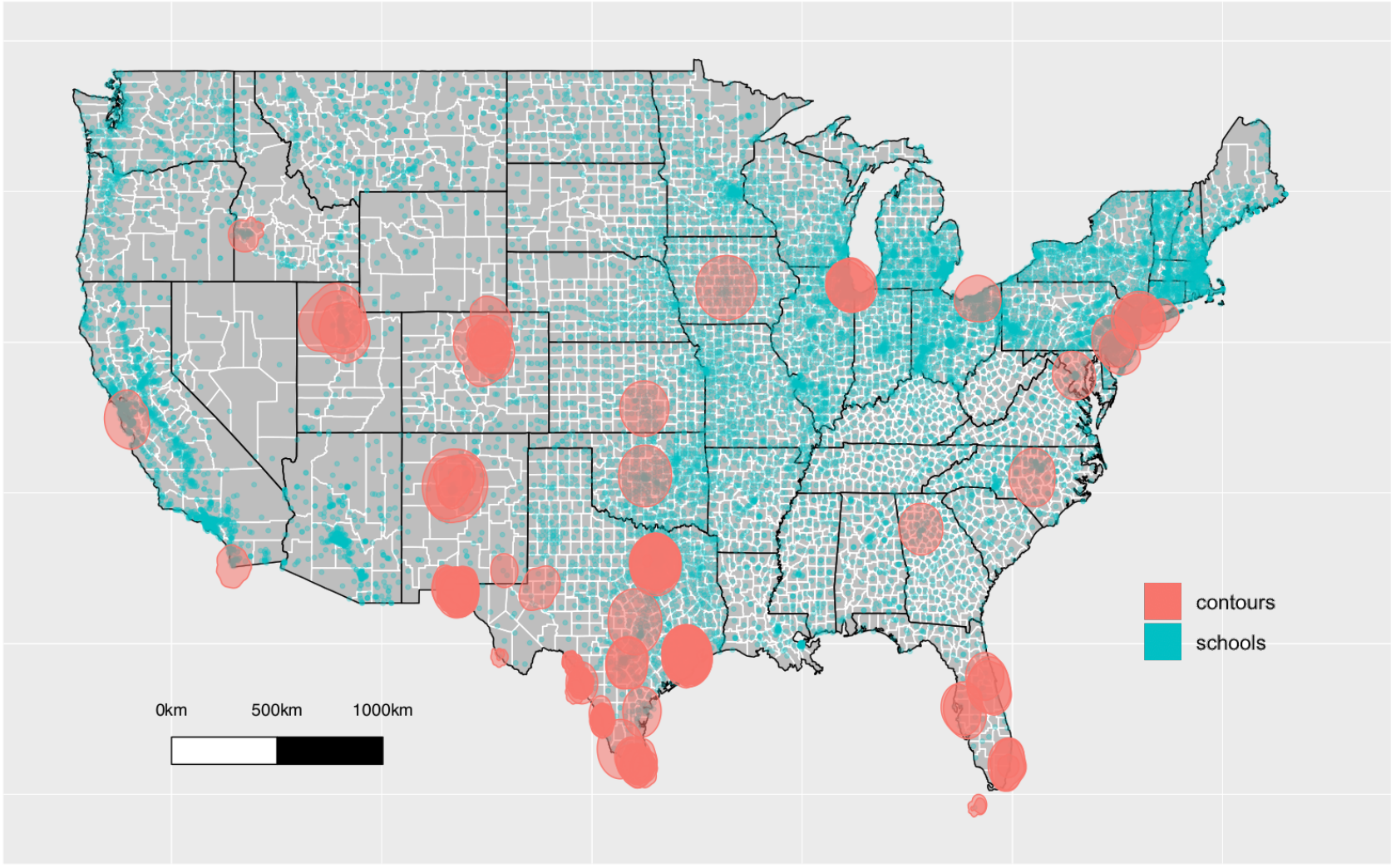
- Compare against outcomes among Asians
  - Less likely to identify as Hispanic (or watch SLTV)
  - Combine RD with Asian 'control' for difference in discontinuities

Empirical Specification

$$y_{i,j} = \beta \mathbb{I}[InsideContour_{i,j}] \times \mathbb{I}[Hispanic_{i,j}] + \gamma_k + \delta X_i + \epsilon_{i,j}$$

where $y_{i,j}$ is an outcome for observation i (which may be an individual, school, or establishment) under demographic category $j \in \{\text{Hispanic, not Hispanic}\}$, γ_k is fixed effect for school district k, and X is a vector of controls for the observation.

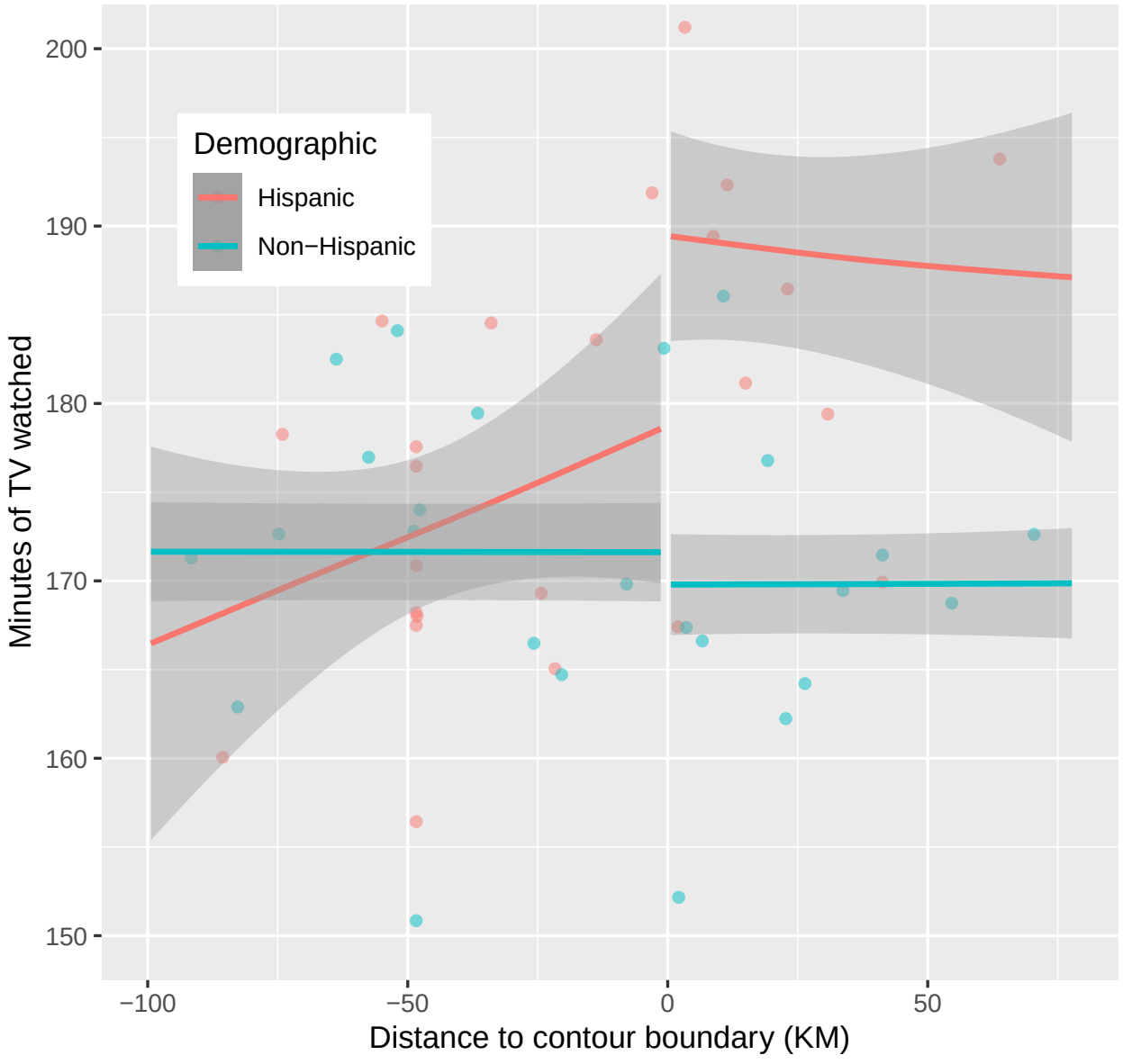
SLTV coverage and public schools

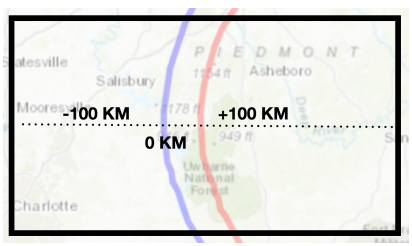


Data

- Instrument:
  - Identify 100 Spanish Language TV stations across the US from **TMS**
  - Station contours and other station data from the **FCC**
- **American Time Use Survey** over last 15 years:
  - 210,000 person-year observations
  - Average person watches 170 minutes of TV per day
- Department of Education's **Civil Rights Data Collection** in 2015:
  - 48,000 public schools in sample (unit of observation)
  - Data on academic outcomes (SAT/ACTs taken, AP exams passed, etc.) & other school data
- Other measures of identity:
  - TV transcript data from **archive.org**
  - Foot-traffic data from **Safegraph**
  - Social connectedness data from **Facebook**

TV Viewership across the SLTV Boundary





Negative distances are outside coverage contour (no SLTV). ▸ Time breakdown

Effect of SLTV on the Hispanic achievement gap

Effect of SLTV on Hispanic vs. Asian academic achievement

	(1)	(2)	(3)
Panel A: IHS(SAT/ACTs taken)			
TV dummy × Hispanic	0.1598***	0.1598***	0.1598***
	(0.0264)	(0.0264)	(0.0264)
Panel B: IHS(calculus taken)			
TV dummy × Hispanic	0.2718***	0.2718***	0.2718***
	(0.0369)	(0.0369)	(0.0369)
Panel C: IHS(APs passed)			
TV dummy × Hispanic	0.0964***	0.0966***	0.0972***
	(0.0346)	(0.0353)	(0.0360)
# Hispanic, Asian students	Yes	Yes	Yes
School size controls	No	Yes	Yes
School type controls	No	No	Yes

Notes: School district fixed effects are always included. Standard errors are clustered at the school district level.

Effect sizes: how much is inequality reduced?

	Gap vs. Asian	Gap after SLTV
	(1)	(2)
SAT/ACTs taken	46.8%	38.3%
Calculus taken	53.6%	41.0%
APs passed	72.3%	69.6%
Gifted students	60.5%	51.0%
Advanced math taken	45.3%	31.7%
Biology taken	5.6%	-18.9%
Physics taken	43.7%	26.2%
Chemistry taken	27.7%	6.7%

So should we stick kids in front of a TV instead of sending them to school?

Exploring the identity mechanism

Effect of SLTV on Hispanic vs. Asian identity outcomes

	(1)	(2)	(3)
Panel A: IHS(limited English proficiency)			
TV dummy × Hispanic	0.3042***	0.3042***	0.3042***
	(0.0379)	(0.0379)	(0.0379)
Panel B: IHS(bullied based on ethnicity)			
TV dummy × Hispanic	0.0015*	0.0015*	0.0015*
	(0.0009)	(0.0009)	(0.0009)
# Hispanic, Asian students	Yes	Yes	Yes
School size controls	No	Yes	Yes
School type controls	No	No	Yes

Notes: School district fixed effects are always included. Standard errors are clustered at the school district level.

▸ Disability and gender-based bullying placebo

The content of SLTV programs

- Data from archive.org's TV transcript database (2005 - 2015)
  - Use keyword matching to code content of television programs
  - Variation at the television network level

- Test three different mechanisms:
  - **Identity:** 10.8% of programs relate to Latin America (vs. sports/weather/local news translated into Spanish etc.)
  - **Education:** 15% of programs that mention schools
  - **Role models:** 5.0% of programs with good role models for children/adolescents (mostly telenovelas)

Differential effect of SLTV by program content

	(1)	(2)	(3)
Panel A: IHS(SAT/ACTs taken)			
TV × Hispanic × % programs on identity	2.313**		
	(0.943)		
TV × Hispanic × % programs on education		−0.516	
		(0.626)	
TV × Hispanic × % programs with role models			−2.085
			(2.151)
# Hispanic, Asian students	Yes	Yes	Yes
School size controls	No	Yes	Yes
School type controls	No	No	Yes

Notes: School district fixed effects are always included. Standard errors are clustered at the school district level. See effect for: ▸ Calculus ▸ AP exams

More on identity

- Hispanics **visit more Hispanic-branded establishments** (restaurants, recreation businesses) when they have access to SLTV ▸ Data and table
  - However, they are no more likely to visit Brazilian establishments (or Japanese, or Cajun/Creole etc.)

- Counties with SLTV are more **socially connected with Latin America** ▸ Data and table
  - However, they are not more connected to Brazil (or the rest of the world)

Contribution

- Gentzkow & Shapiro 2008 shows how English language TV benefits students: English acquisition/cognitive channel

→ Provide evidence on non-cognitive, *identity* based channel

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- Gentzkow & Shapiro 2008 shows how English language TV benefits students: English acquisition/cognitive channel

→ Provide evidence on non-cognitive, *identity* based channel

- Existing research that shows identity is a powerful mechanism driving meaningful outcomes (Benjamin & al. 2007; Bursztyn & al. 2015). New research on how identity is constructed and strengthened (Atkin & al. 2019; Bazzi & al. 2019)
- In much of the education lit. a salient minority identity is bad because of reasons like stereotype threat (Spencer, Logel, & Davies 2016)

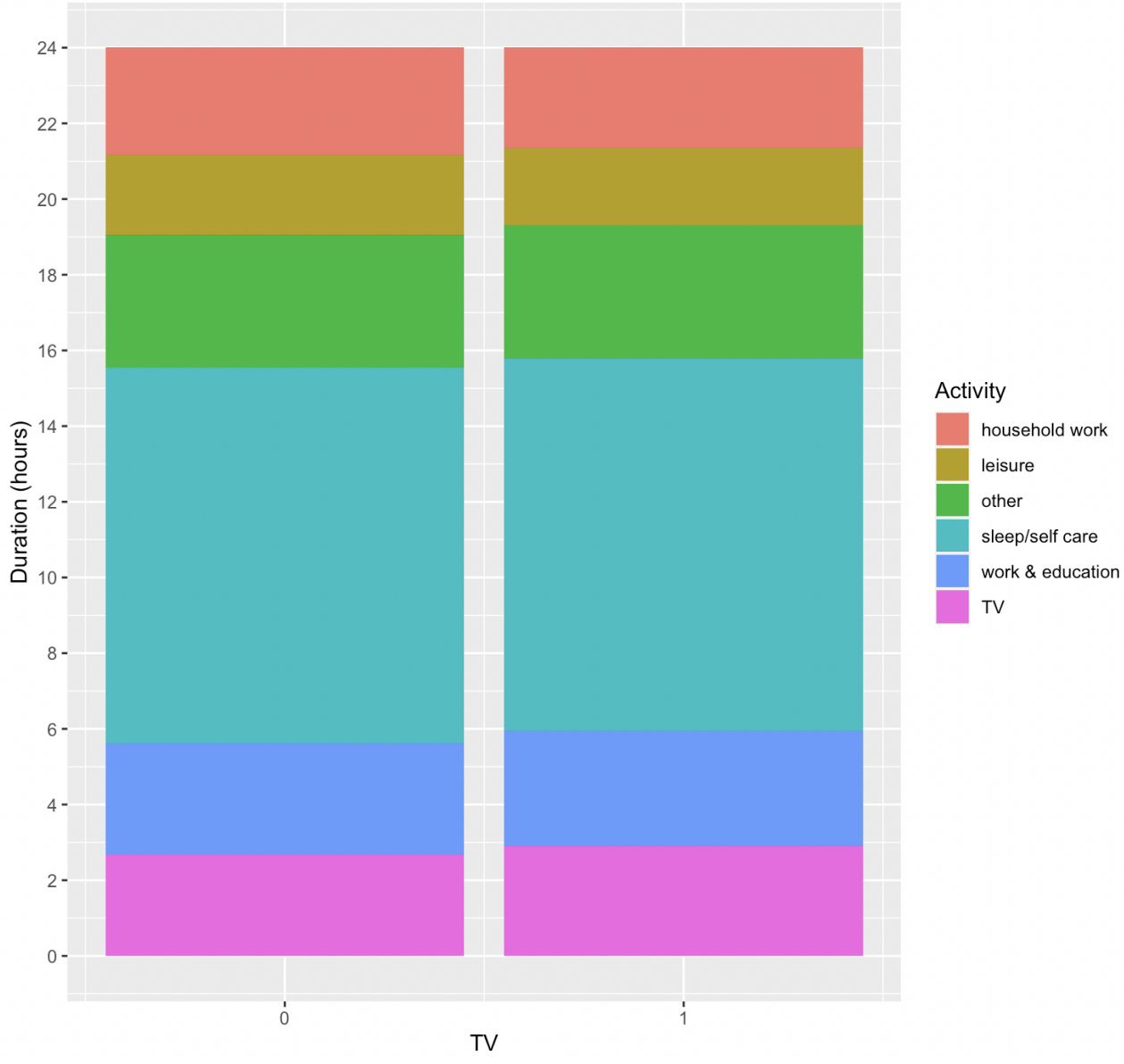
→ Show how identity can be bolstered by the media and how it can help reduce inequality

Conclusion

- Hopefully persuaded you that an identity mechanism matters for Hispanic educational achievement
  - But there could also be other important ones!
  - TV appears to be one way to operationalise the identity mechanism in schools, what are others?
- Many ways that identity mechanism itself could operate (meta-mechanisms):
  - Stronger ties abroad
  - Self-confidence from representation on screen
  - Stronger in-group ties within school community
  - Greater connection with parents and support network
  - Recognise relative privilege vs. countries of origin & raise perceived value of education
  - More engagement and intellectual stimulation

Thank You!

TV viewership across the SLTV boundary



Hispanics with and without SLTV Back

Differential effect of SLTV by program content

	(1)	(2)	(3)
Panel B: IHS(calculus taken)			
TV × Hispanic × % programs on identity	2.788***		
	(1.034)		
TV × Hispanic × % programs on education		0.829	
		(0.666)	
TV × Hispanic × % programs with role models			1.616
			(2.463)
# Hispanic, Asian students	Yes	Yes	Yes
School size controls	No	Yes	Yes
School type controls	No	No	Yes

Notes: School district fixed effects are always included. Standard errors are clustered at the school district level. Back

Differential effect of SLTV by program content

	(1)	(2)	(3)
Panel C: IHS(APs passed)			
TV × Hispanic × % programs on identity	1.721		
	(1.280)		
TV × Hispanic × % programs on education		0.903	
		(0.922)	
TV × Hispanic × % programs with role models			−1.184
			(2.989)
# Hispanic, Asian students	Yes	Yes	Yes
School size controls	No	Yes	Yes
School type controls	No	No	Yes

Notes: School district fixed effects are always included. Standard errors are clustered at the school district level. ▸ Back

Effect of SLTV on foot traffic

	(1)	(2)	(3)
Panel A: IHS(IDEA (disability) students)			
TV dummy × Hispanic	0.0318	0.0325	0.0318
	(0.0338)	(0.0339)	(0.0338)
Panel B: IHS(bullied based on sex)			
TV dummy × Hispanic	0.0090	0.0088	0.0088
	(0.0056)	(0.0055)	(0.0055)
# Hispanic, Asian students	Yes	Yes	Yes
School size controls	No	Yes	Yes
School type controls	No	No	Yes

Notes: School district fixed effects are always included. Standard errors are clustered at the school district level. Back

Data: foot traffic

- Safegraph foot traffic data in 2019 to 136,000 establishments across the US
  - Restaurants are coded by Safegraph into different types of cuisine (11.6% are Hispanic)
  - Other recreational establishments are manually classified using keyword matching (10.7% are Hispanic)
  - Use census data to impute identity of visitors
- Run regressions at the establishment-visitor demographic level to see what kind of places Hispanics are more likely to visit
  - Main focus is on Hispanic-branded establishments
  - Three placebos: Brazilian, Japanese, and Creole/Cajun

Effect of SLTV on foot traffic

	IHS(visitors to location)			
	(1)	(2)	(3)	(4)
Panel A.1: Restaurants — Hispanic establishment indicator				
TV × Hispanic × Hispanic food	0.872***	0.872***	0.872***	0.872***
	(0.062)	(0.062)	(0.062)	(0.062)
Panel B.1: Recreation — Hispanic establishment indicator				
TV × Hispanic × Hispanic brand	0.569***	0.569***	0.569***	0.569***
	(0.137)	(0.137)	(0.137)	(0.137)
County log(income)	Yes	Yes	Yes	Yes
County % Hispanic	No	Yes	Yes	Yes
County log(pop.)	No	No	Yes	Yes
County FE	No	No	No	Yes
NAICS code FE	No	No	No	Yes

Notes: Standard errors are clustered at the county level. See placebos for: ▸ Brazilian ▸ Japanese ▸ Creole/Cajun establishments. ▸ Back

Data: Social Connectedness

- Facebook Social Connectedness Data from 2020
  - County-country pairs coded by $\frac{FBConnections_{ij}}{FBUsers_i \times FBUsers_j}$
  - Captures relative strength of connection between US county and foreign country
  - Connectedness with other countries ranges from 0.02 to 381, mean value 9.388

Effect of SLTV on connection to Latin America

	SCI index		
	(1)	(2)	(3)
Panel A: Latin America vs. rest of world			
TV dummy × Latin America	22.023***	22.023***	22.023***
	(6.837)	(6.838)	(6.839)
Panel B: Latin America vs. Brazil			
TV dummy × Latin America	19.703***	19.703***	19.703***
	(6.219)	(6.220)	(6.221)
County log(income)	Yes	Yes	Yes
County % Hispanic	No	Yes	Yes
County log(pop.)	No	No	Yes

Notes: Standard errors are clustered at the state level. Back

Effect of SLTV on foot traffic to Brazilian establishments

	IHS(visitors to location)			
	(1)	(2)	(3)	(4)
Panel A.2: Restaurants — Brazilian establishment indicator				
Hispanic × TV × Brazilian food	0.058	0.058	0.058	0.058
	(0.241)	(0.241)	(0.241)	(0.241)
Panel B.2: Recreation — Brazilian establishment indicator				
Hispanic × TV × Brazilian brand	0.328	0.328	0.328	0.328
	(0.598)	(0.598)	(0.599)	(0.610)
County log(income)	Yes	Yes	Yes	Yes
County % Hispanic	No	Yes	Yes	Yes
County log(pop.)	No	No	Yes	Yes
County FE	No	No	No	Yes
NAICS code FE	No	No	No	Yes

Notes: Standard errors are clustered at the county level. Back

Effect of SLTV on foot traffic to Japanese establishments

	IHS(visitors to location)			
	(1)	(2)	(3)	(4)
Panel A.3: Restaurants — Japanese establishment indicator				
TV × Hispanic × Japanese food	0.010	0.010	0.010	0.010
	(0.067)	(0.067)	(0.067)	(0.067)
Panel B.3: Recreation — Japanese establishment indicator				
TV × Hispanic × Japanese brand	0.702	0.702	0.702	0.702
	(0.528)	(0.528)	(0.528)	(0.528)
County log(income)	Yes	Yes	Yes	Yes
County % Hispanic	No	Yes	Yes	Yes
County log(pop.)	No	No	Yes	Yes
County FE	No	No	No	Yes
NAICS code FE	No	No	No	Yes

Notes: Standard errors are clustered at the county level. Back

Effect of SLTV on foot traffic to Cajun/Creole establishments

	IHS(visitors to location)			
	(1)	(2)	(3)	(4)
Panel A.4: Restaurants — Cajun and Creole establishment indicator				
TV × Hispanic × Cajun and Creole food	0.174	0.174	0.174	0.174
	(0.196)	(0.196)	(0.196)	(0.196)
Panel B.4: Recreation — Cajun and Creole establishment indicator				
TV × Hispanic × Cajun and Creole brand	-0.187	-0.187	-0.187	-0.187
	(1.630)	(1.630)	(1.630)	(1.631)
County log(income)	Yes	Yes	Yes	Yes
County % Hispanic	No	Yes	Yes	Yes
County log(pop.)	No	No	Yes	Yes
County FE	No	No	No	Yes
NAICS code FE	No	No	No	Yes

Notes: Standard errors are clustered at the county level. Back