

26) The cost of racial animus on a black candidate: Evidence using Google search data

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Stephens-Davidowitz, S. (2014). The cost of racial animus on a black candidate: Evidence using Google search data.

Signal-to-noise ratio in Google search terms

$$\text{Underlying variable}_s = \beta \text{Term}_s + u_s$$

Term	Underlying variable	t-Stat	R^2
God	Percent believe in god	8.45	0.65
Gun	Percent own gun	8.94	0.62
African American(s)	Percent Black	13.15	0.78
Hispanic	Percent Hispanic	8.71	0.61
Jewish	Percent Jewish	17.08	0.86

American Community Survey

Data: state level

Normalized search volume: 2004 to 2007

$$\text{Racially Charged Search Rate}_j = \left[\frac{\text{Google searches including the word "[Word 1](s)"}}{\text{Total Google searches}} \right]_{j, 2004-2007}$$

Word	Code in text
nigger	Search Word 1
nigga	Search Word 2
fuck	Search Word 3

Racially charged search rate, state

Rank	State	Racially Charged Search Rate			
1.	West Virginia	100	26.	Wisconsin	63
2.	Louisiana	86	27.	Kansas	62
3.	Pennsylvania	85	28.	Texas	62
4.	Mississippi	83	29.	Virginia	59
5.	Kentucky	82	30.	Vermont	59
6.	Michigan	78	31.	California	57
7.	Ohio	78	32.	Maine	56
8.	South Carolina	76	33.	Nebraska	55
9.	Alabama	76	34.	New Hampshire	54
10.	New Jersey	74	35.	North Dakota	54
11.	Tennessee	73	36.	Iowa	53
12.	Florida	71	37.	Massachusetts	52
13.	New York	71	38.	Arizona	51
14.	Rhode Island	70	39.	Washington	50
15.	Arkansas	70	40.	South Dakota	50
16.	North Carolina	69	41.	Alaska	50
17.	Georgia	69	42.	Wyoming	48
18.	Connecticut	68	43.	Montana	48
19.	Missouri	68	44.	Oregon	47
20.	Nevada	67	45.	Minnesota	46
21.	Illinois	65	46.	District of Columbia	44
22.	Delaware	65	47.	Idaho	39
23.	Oklahoma	65	48.	New Mexico	39
24.	Maryland	64	49.	Colorado	39
25.	Indiana	63	50.	Hawaii	34
			51.	Utah	30

Search Volume at Media Market Level

Fraction of Google searches in area j in sample s :

$$X_{j,s} = x_{j,s} / x_{max,s}$$

N_j : reported for 30 media markets

W_j and C_j : reported for 200 media markets

$$C = N \cup W \text{ and } B = N \cap W$$

$$N_j = \frac{c_{max}}{n_{max}} C_j - \frac{w_{max}}{n_{max}} W_j + \frac{b_{max}}{n_{max}} B_j$$

Algorithm in Practice

Download 5000 samples for “weather”

Download 5000 samples for “nigger + niggers,”

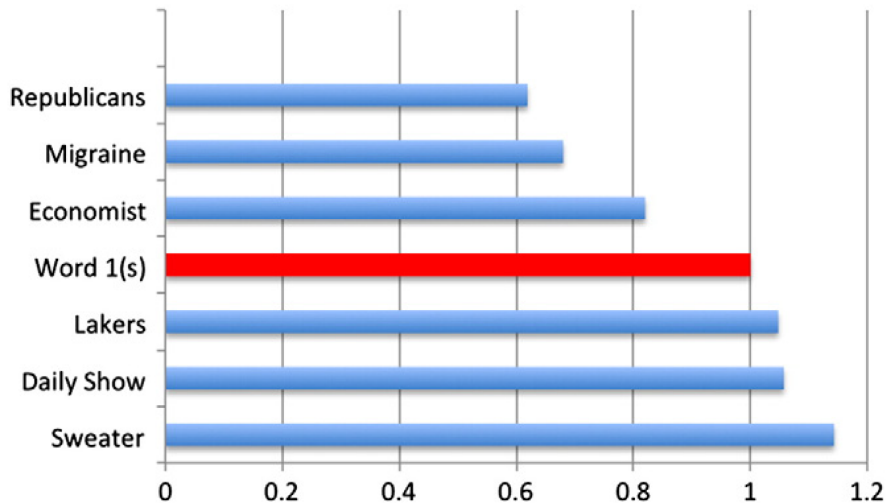
Download 5000 samples for “nigger + niggers + weather,”

Calculate a media market’s average score for “weather,”
“nigger + niggers,” and “nigger + niggers + weather.”

Regress “nigger + niggers” on “weather” and “weather +
nigger + niggers”

Use coefficients from regression to back out “nigger +
niggers” for remaining markets, using their average search
volume for “weather” and “nigger + niggers + weather.”

Common Word used in Google Search



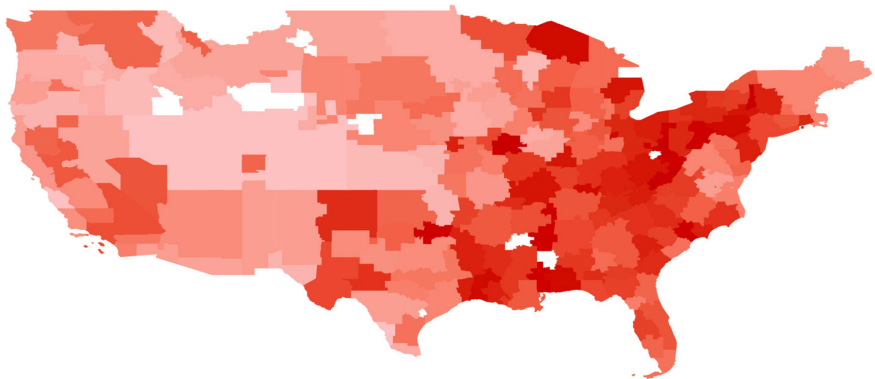
Top searches for “[Word 1](s)”.

Rank	'04-'07 search	'08-'11 search
	Data used	Data not used
1.	jokes	jokes
2.	[Word 1] jokes	[Word 1] jokes
3.	white [Word 1]	obama [Word 1]
4.	[Word 2]	[Word 2]
5.	hate [Word 1]	black [Word 1]
6.	i hate [Word 1](s)	funny [Word 1]
7.	black jokes	[Word 1] song
8.	the word [Word 1]	the word [Word 1]
9.	racist jokes	nas [Word 1]
10.	kkk	i hate [Word 1](s)

Music and terms, 2004–2007.

Rank	Top searches for '[Word 1] lyrics'	Top searches for '[Word 2](s)'
1.	[Word 1] song	[Word 2] lyrics
2.	[Word 1] song lyrics	my [Word 2]
3.	[Word 1] jokes	[Word 2] lyrics
4.	white [Word 1]	hood [Word 2]
5.	[Word 1] hatin me	my [Word 2]
6.	white [Word 1] lyrics	lyrics hood [Word 2]
7.	johnny rebel lyrics	[Word 2] stole
8.	johnny rebel	[Word 2] stole my
9.	david allen coe	my [Word 2] lyrics
10.	lyrics alabama [Word 1]	[Word 2] what

Racially charged search rate, media market

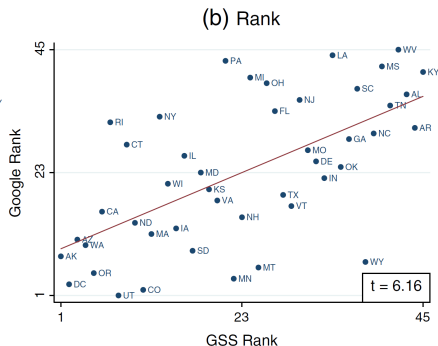
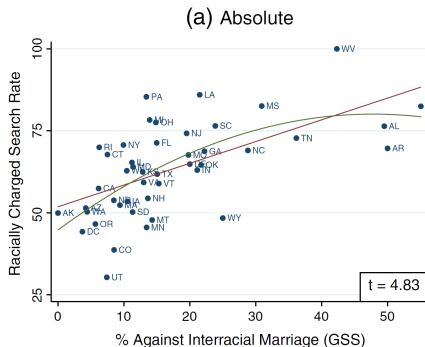


Predictors of an area's racially charged search rate

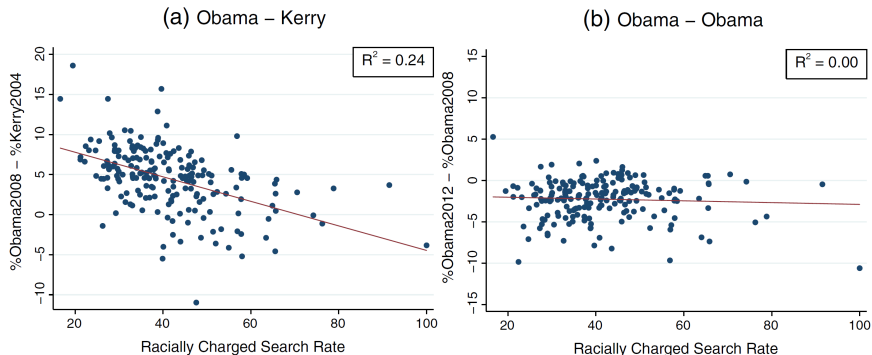
Dependent variable: Racially Charged Search Rate

	(1)	(2)	(3)	(4)
Percent age 65 or older	6.884 [*] (3.650)	3.341 (3.447)	6.492 [*] (3.668)	3.757 (3.495)
Percent w/ bachelor's degree	-9.309 ^{***} (2.105)	-8.532 ^{***} (2.147)	-10.104 ^{***} (2.004)	-9.459 ^{***} (2.129)
Percent Hispanic	-2.620 ^{***} (0.462)	-2.298 ^{***} (0.554)	-2.659 ^{***} (0.454)	-2.297 ^{***} (0.486)
Percent Black	2.556 ^{***} (0.826)	0.283 (1.268)	11.245 ^{***} (2.158)	6.734 ^{**} (3.172)
(Percent Black)-squared			-24.731 ^{***} (5.613)	-16.517 ^{***} (6.070)
Observations	196	196	196	196
R-squared	0.36	0.49	0.41	0.50
Census div. FE		X		X

Google racially charged search compared to GSS opposition to interracial marriage



Racially charged search rate and black candidate support



Summary Statistics

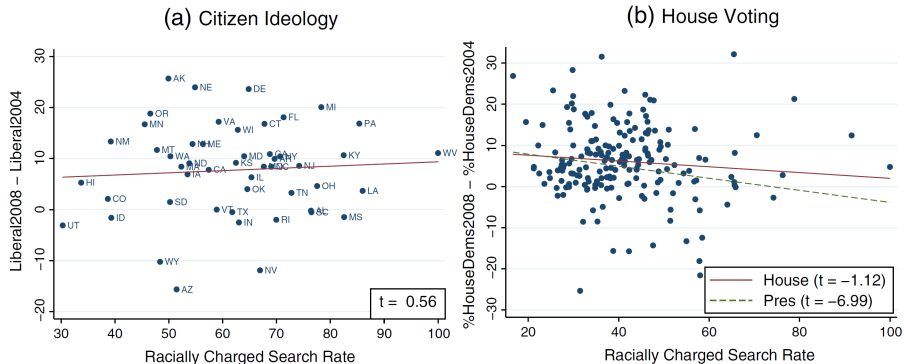
	Mean	SD	Min	Max
Racially Charged Search Rate	39.78	9.21	16.62	100.00
%Kerry2004	48.83	9.57	19.89	70.06
%Obama2008	53.76	10.18	22.16	75.05
%Obama2012	52.04	11.03	19.66	76.87
%Obama2008 — %Kerry2004	4.93	3.18	— 10.98	18.60
%Obama2012 — %Obama2008	— 1.72	2.03	— 10.61	5.27
%HouseDems2008 — %HouseDems2004	7.26	8.74	— 39.16	72.59
ln(Turnout2008) — ln(Turnout2004)	0.07	0.06	— 0.10	0.25

The effect of racial animus on black candidate vote share

$$(\%Obama2008 - \%Kerry2004)_j = \beta_0 + \beta_1 \cdot \text{Racially Charged Search Rate}_j + X_j \phi^1 + \mu_j$$

	Dependent variable: %Obama2008 — %Kerry2004					
	(1)	(2)	(3)	(4)	(5)	(6)
Racially Charged Search Rate	-1.490*** (0.305)	-1.486*** (0.258)	-1.341*** (0.260)	-2.124*** (0.435)	-2.002*** (0.259)	-1.776*** (0.304)
Home state	2.616*** (0.804)	4.234*** (1.118)	3.556*** (1.107)	2.481*** (0.854)	4.070*** (1.141)	3.636*** (0.996)
Observations	196	196	196	196	196	196
R-squared	0.26	0.51	0.62	0.30	0.52	0.62
Standard controls	X	X	X	X	X	X
Census div. FE		X	X		X	X
Demographic controls			X			X
Google controls				X	X	X

Change in liberalism (2004–2008) and racially charged search rate



The effect of racial animus: 2008 compared to 2012.

	(1)	(2)	(3)	(4)	(5)	(6)
(a) Dependent variable: %Obama2008 – %Kerry2004						
Racially Charged Search Rate	– 1.490*** (0.305)	– 1.486*** (0.258)	– 1.341*** (0.260)	– 2.124*** (0.435)	– 2.002*** (0.259)	– 1.776*** (0.304)
(b) Dependent variable: %Obama2012 – %Obama2008						
Racially Charged Search Rate	0.096 (0.276)	– 0.146 (0.287)	– 0.027 (0.284)	– 0.401 (0.285)	– 0.283 (0.311)	0.048 (0.333)
(c) Dependent variable: %Obama2012 – %Kerry2004						
Racially Charged Search Rate	– 1.423*** (0.467)	– 1.896*** (0.425)	– 1.377*** (0.284)	– 2.551*** (0.577)	– 2.427*** (0.469)	– 1.706*** (0.457)
Observations	196	196	196	196	196	196
Standard Controls	X	X	X	X	X	X
Census div. FE		X	X		X	X
Demographic controls			X			X
Google controls				X	X	X

Robustness Checks

Specification	2008 coefficient	2012 coefficient
Baseline (all controls; Table 7, column (6))	− 1.776 (0.304)	− 1.706 (0.304)
Exclude Hawaii	− 1.553 (0.230)	− 1.463 (0.411)
Add control for change in house voting	− 1.699 (0.284)	− 1.610 (0.452)
Add control for swing state	− 1.779 (0.317)	− 1.647 (0.442)
Use %Obama as dependent variable and include control for %Kerry2004	− 1.682 (0.285)	− 1.661 (0.460)
Use %Obama as dependent variable and include 4th-order polynomial %Kerry2004	− 1.648 (0.293)	− 1.628 (0.478)
Add control for %Kerry2004 − %Gore2000	− 1.775 (0.312)	− 1.694 (0.439)
Add controls for %Kerry2004 − %Gore2000 and %Gore2000 − %Clinton1996	− 1.731 (0.329)	− 1.642 (0.453)
Use %Obama as dependent variable and include %Kerry2004, %Gore2000, %Clinton1996	− 1.577 (0.326)	− 1.547 (0.459)

Change in turnout (2004–2008) and racially charged search rate

$$\begin{aligned}
 (\ln(\text{Turnout2008}) - \ln(\text{Turnout2004}))_j = & \alpha_0 + \alpha_1 \cdot \%Kerry2004_j \\
 & + \alpha_2 \cdot \text{Racially Charged Search Rate}_j + \alpha_3 \cdot \text{Racially Charged Search Rate}_j \\
 & \times \%Kerry2004_j + Z_j \phi^3 + \epsilon_j
 \end{aligned}$$

	Dependent variable: $\ln(\text{Turnout2008}) - \ln(\text{Turnout2004})$					
	(1)	(2)	(3)	(4)	(5)	(6)
Racially Charged Search Rate	-0.001 (0.005)	-0.001 (0.005)	0.004 (0.005)	0.025** (0.013)	0.032* (0.017)	0.033* (0.017)
Racially Charged Search Rate · %Kerry2004				-0.056** (0.028)	-0.071* (0.039)	-0.064* (0.039)
Observations	196	196	196	196	196	196
R-squared	0.67	0.73	0.80	0.67	0.74	0.80
Census div. FE		X	X		X	X
Demographic controls			X			X

Country-wide effect: Google compared to other measures

Source	Obs	Measure	Controls	2008 cost	2012 cost
Google	196 media markets	Racially Charged Search Rate, '04-'07	Standard	3.5 (0.7)	3.3 (1.1)
			Standard + Census	3.5 (0.6)	4.4 (1.0)
			Standard + Census + Demogs	3.1 (0.6)	3.2 (0.9)
			Standard + Google	5.0 (1.0)	6.0 (1.3)
			Standard + Google + Census	4.7 (0.6)	5.7 (1.1)
			Standard + Google + Census + Demogs	4.2 (0.7)	4.0 (1.1)
GSS	45 states	% against interracial marriage, '90-'04	Standard	2.0 (0.6)	2.3 (0.6)
			Standard + Census	0.6 (1.3)	2.1 (1.3)
		Average prejudice, '72-'04	Standard	2.8 (1.1)	3.0 (1.0)
			Standard + Census	0.5 (1.6)	2.0 (1.9)
ANES	Individual	Explicit prejudice	Piston (2010)	2.3 (1.0)	
APYN		Explicit + implicit prejudice	Pasek et al. (2010)	2.7	
CCES		Racial salience	Schaffner (2011)	2.0	