

Lexicocalorimeter: Real-time health measurement

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Complex Networks | @networksvox
CSYS/MATH 303, Spring, 2018

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Vermont Advanced Computing Core | University of Vermont



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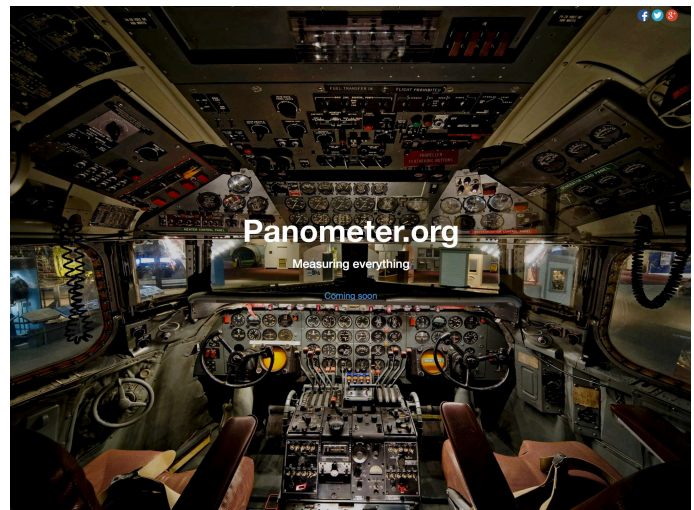


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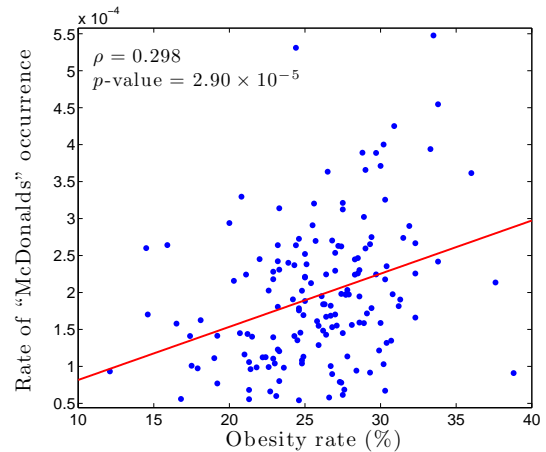
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Obesity and tweets—"McDonalds":



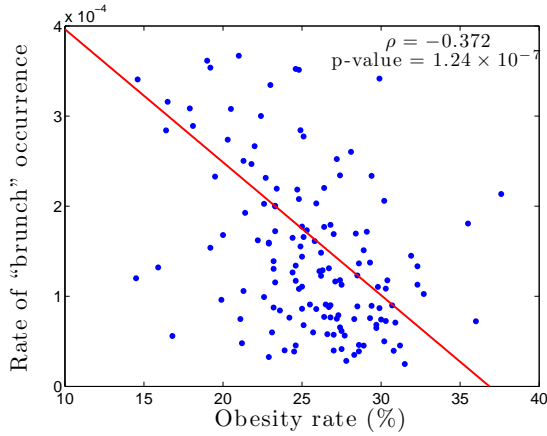
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Obesity and tweets—"Brunch":



Word	ρ	p -value
cafe	-0.509	6.07×10^{-14}
sushi	-0.487	9.93×10^{-13}
brewery	-0.469	8.67×10^{-12}
restaurant	-0.448	8.93×10^{-11}
bar	-0.435	3.59×10^{-10}
banana	-0.434	3.77×10^{-10}
apple	-0.408	5.22×10^{-9}
fondue	-0.403	8.34×10^{-9}
wine	-0.400	1.08×10^{-8}
delicious	-0.392	2.17×10^{-8}
dinner	-0.386	3.85×10^{-8}
coffee	-0.384	4.51×10^{-8}
bakery	-0.383	5.12×10^{-8}
bean	-0.378	7.88×10^{-8}
espresso	-0.377	8.47×10^{-8}
cuisine	-0.376	8.82×10^{-8}
foods	-0.374	1.07×10^{-7}
tofu	-0.372	1.27×10^{-7}
brunch	-0.368	1.79×10^{-7}
veggie	-0.364	2.46×10^{-7}
organic	-0.361	3.13×10^{-7}
booze	-0.360	3.34×10^{-7}
grill	-0.354	5.4×10^{-7}
chocolate	-0.351	6.77×10^{-7}
#vegan	-0.350	7.47×10^{-7}

mcDonalds	0.246	6.18×10^{-4}
eat	0.241	8.22×10^{-4}
wings	0.222	2.13×10^{-3}
hungry	0.210	3.65×10^{-3}
heartburn	0.194	7.37×10^{-3}
ham	0.177	1.45×10^{-2}

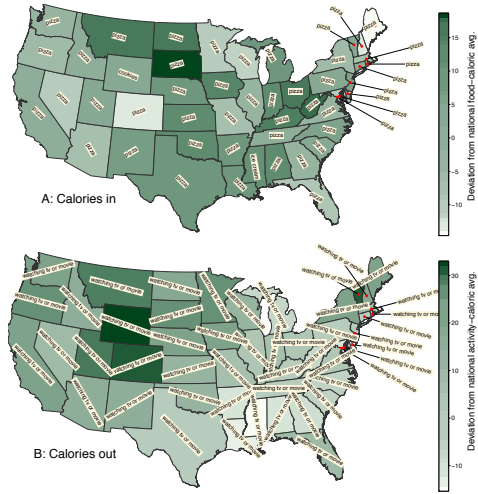
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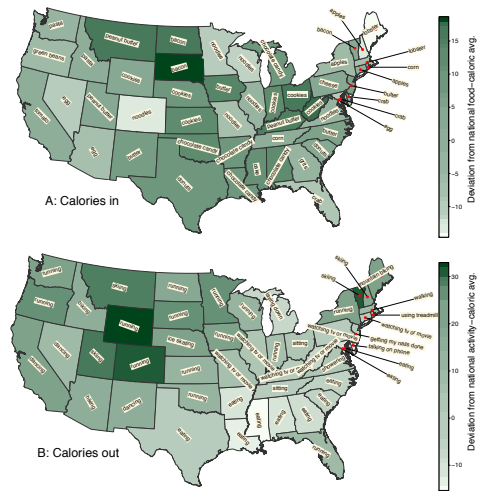
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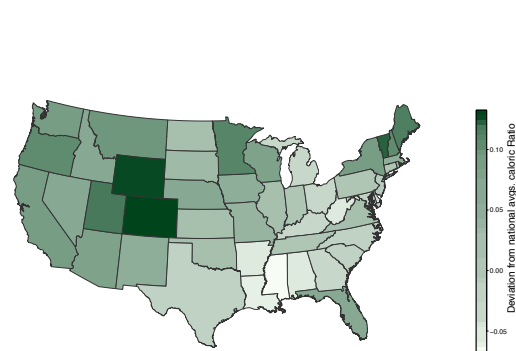
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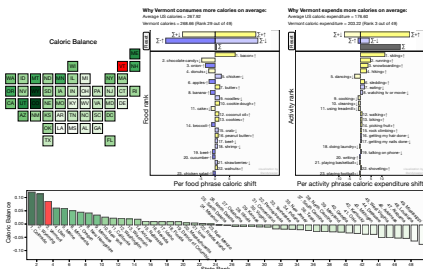
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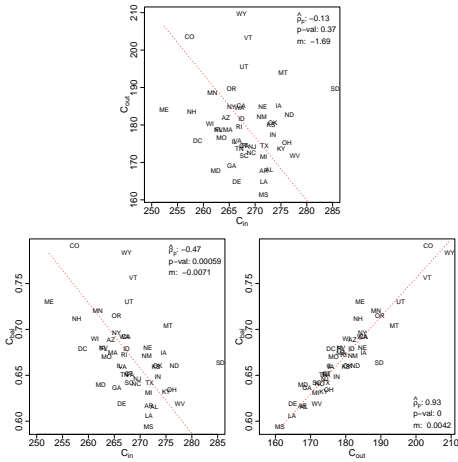
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"The Lexicocalorimeter: Gauging public health through caloric input and output on social media"
Alajajian, Williams, Reagan, Alajajian, Frank, Mitchell, Lahne, Danforth, and Dodds.
PLOS ONE, 12, e0168893, 2017. [1]



<http://panometer.org/instruments/lexicocalorimeter/>

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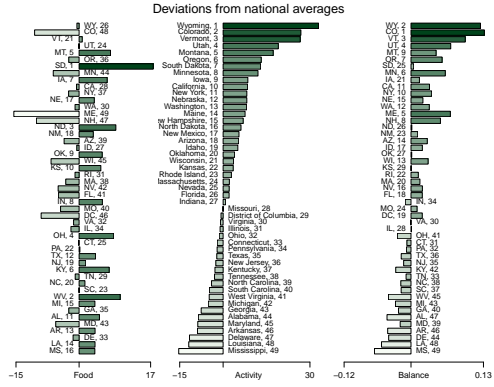
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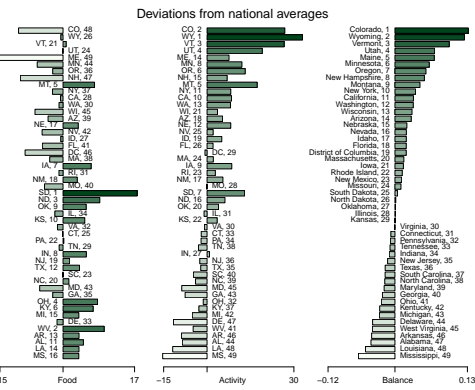
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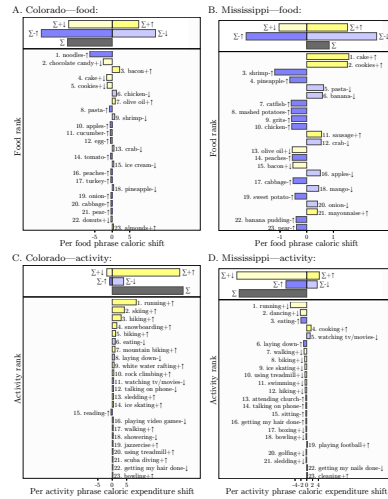
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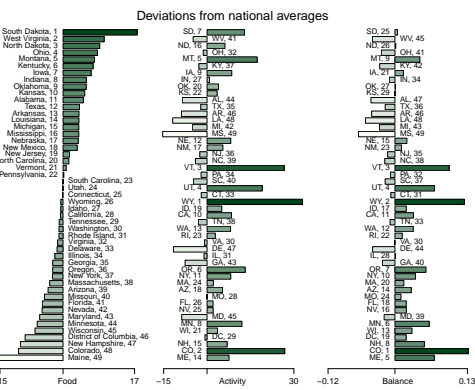
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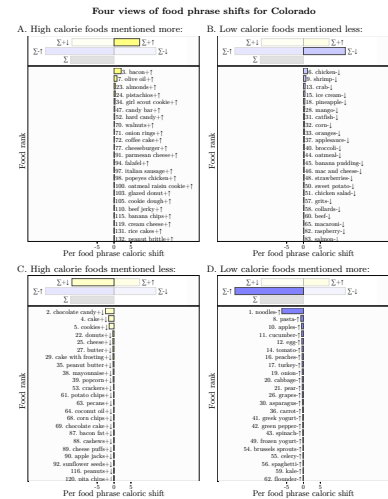
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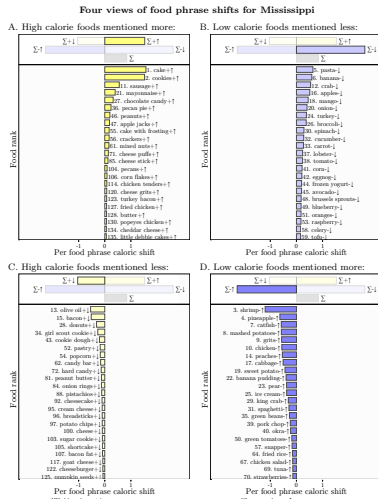
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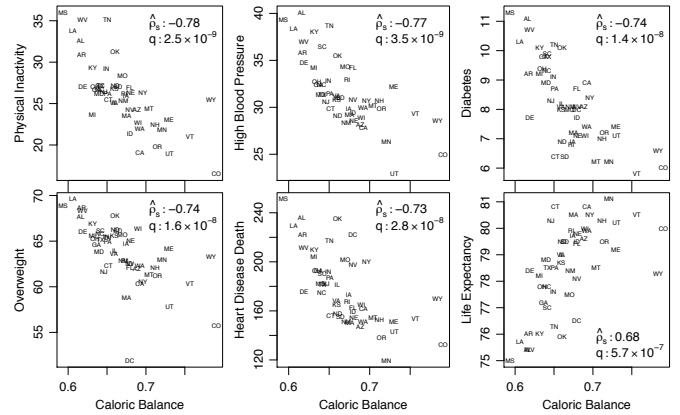
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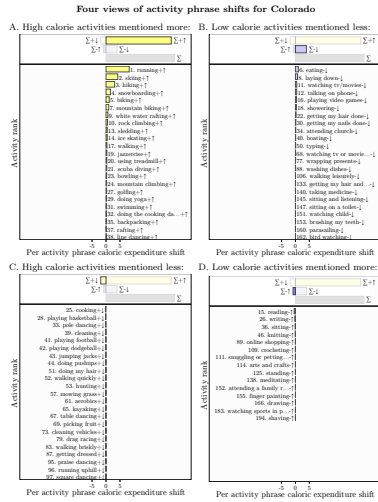


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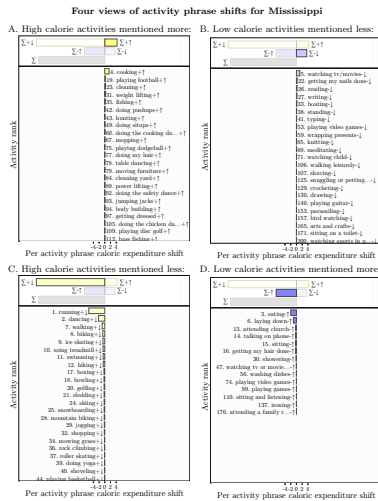
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The Lexicocalorimeter:

Health and/or well-being quantity	ρ_{LCM}	$\rho_{C_{20}}$	$\rho_{C_{10}}$	ρ_{C_0}	$\rho_{C_{-10}}$	$\rho_{C_{-20}}$
1. % no physical activity in past 30 days [24]	0.78	0.77	0.76	0.75	0.74	0.73
2. % have been physically active in past 30 days [24]	0.78	0.77	0.76	0.75	0.74	0.73
3. % high blood pressure [24]	0.77	0.76	0.75	0.74	0.73	0.72
4. Heart disease death rates [27]	0.76	0.75	0.74	0.73	0.72	0.71
5. Adult diabetes rate [25]	0.74	0.73	0.72	0.71	0.70	0.69
6. % adult overweight/obesity [27]	0.73	0.72	0.71	0.70	0.69	0.68
7. % adult overweight/obesity [27]	0.73	0.72	0.71	0.70	0.69	0.68
8. % adult obesity [25]	0.72	0.71	0.70	0.69	0.68	0.67
9. Gallup Wellbeing score [15]	0.72	0.71	0.70	0.69	0.68	0.67
10. America's Health Rankings, overall [24]	0.72	0.71	0.70	0.69	0.68	0.67
11. Life expectancy at birth [27]	0.68	0.67	0.66	0.65	0.64	0.63
12. % who eat fruit less than once a day [28]	0.67	0.66	0.65	0.64	0.63	0.62
13. % child overweight/obesity [27]	0.64	0.63	0.62	0.61	0.60	0.59
14. % who eat vegetables less than once a day [28]	0.61	0.60	0.59	0.58	0.57	0.56
15. Median daily intake of fruits [28]	0.59	0.58	0.57	0.56	0.55	0.54
16. Smoking rate [27]	0.59	0.58	0.57	0.56	0.55	0.54
17. Median household income [27]	0.51	0.50	0.49	0.48	0.47	0.46
18. Median daily intake of vegetables [28]	0.50	0.49	0.48	0.47	0.46	0.45
19. % high cholesterol [24]	0.49	0.48	0.47	0.46	0.45	0.44
20. Colorectal cancer rate [25]	0.48	0.47	0.46	0.45	0.44	0.43
21. Brain health ranking [27] (lower is better)	0.47	0.46	0.45	0.44	0.43	0.42
22. US Census Gini index score [30] (lower is better)	0.46	0.45	0.44	0.43	0.42	0.41
23. % with bachelor's degree or higher [3]	0.42	0.41	0.40	0.39	0.38	0.37
24. Avg # poor mental health days, past 30 days [24]	0.39	0.38	0.37	0.36	0.35	0.34
25. Nonretirement Hip Five personality trait [31]	0.37	0.36	0.35	0.34	0.33	0.32
26. Binge-drinking rate [24]	0.37	0.36	0.35	0.34	0.33	0.32
27. Farmers markets per 100,000 in pop. [28]	0.33	0.32	0.31	0.30	0.29	0.28
28. Extremism Hip Five personality trait [31]	0.33	0.32	0.31	0.30	0.29	0.28
29. Avg # poor physical health days, past 30 days [24]	0.32	0.31	0.30	0.29	0.28	0.27
30. Strolling of the Heales toas score (lower is better) [25]	0.31	0.30	0.29	0.28	0.27	0.26
31. % schools offering fruit/veg at celebrations [28]	0.25	0.24	0.23	0.22	0.21	0.20
32. Openness Hip Five personality trait [31]	0.23	0.22	0.21	0.20	0.19	0.18
33. % cropland harvested for fruits/veg [28]	0.19	0.18	0.17	0.16	0.15	0.14
34. Conscientiousness Hip Five personality trait [31]	0.11	0.10	0.09	0.08	0.07	0.06
35. % census tracts, healthy food retailers within 1/2 mile [28]	0.06	0.05	0.04	0.03	0.02	0.01
36. Organic Meats Overall FoodRanking [33] (lower is better)	0.02	0.01	0.00	0.00	0.00	0.00
37. Agreeableness Hip Five personality trait [31]	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 1. Spearman correlation coefficients, ρ_{LCM} , and Benjamini-Hochberg q -values for calorie input C_{in} , calorie output C_{out} , and calorie ratio C_{out}/C_{in} , and demographic data related to health and physical activity. Hip Five personality traits are health and well-being rankings by state, and socioeconomic status, correlated, ordered from strongest to weakest Spearman correlations with calorie ratio. The two trends in the table indicate significance levels of 0.01 and 0.05 for the Benjamini-Hochberg q -value corresponding to the first 21 health and/or well-being quantities and then the next four numbers (22-25). The bottom 9 quantities were not significantly correlated with C_{out} according to our tests. Table S1, S2, and S3 present the same analysis for calorie measures including phrase representing liquids, and for the difference $Calorie = C_{out} - (1 - C_{in})C_{in}$, both without and with liquids included.

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The Lexicocalorimeter:

Health and/or well-being quantity	ρ_{LCM}	$\rho_{C_{20}}$	$\rho_{C_{10}}$	ρ_{C_0}	$\rho_{C_{-10}}$	$\rho_{C_{-20}}$
1. % no physical activity in past 30 days [24]	0.78	0.77	0.76	0.75	0.74	0.73
2. % have been physically active in past 30 days [24]	0.78	0.77	0.76	0.75	0.74	0.73
3. % high blood pressure [24]	0.77	0.76	0.75	0.74	0.73	0.72
4. Heart disease death rates [27]	0.76	0.75	0.74	0.73	0.72	0.71
5. Adult diabetes rate [25]	0.74	0.73	0.72	0.71	0.70	0.69
6. % adult overweight/obesity [27]	0.73	0.72	0.71	0.70	0.69	0.68
7. % adult overweight/obesity [27]	0.73	0.72	0.71	0.70	0.69	0.68
8. % adult obesity [25]	0.72	0.71	0.70	0.69	0.68	0.67
9. Gallup Wellbeing score [15]	0.72	0.71	0.70	0.69	0.68	0.67
10. America's Health Rankings, overall [24]	0.72	0.71	0.70	0.69	0.68	0.67
11. Life expectancy at birth [27]	0.68	0.67	0.66	0.65	0.64	0.63
12. % who eat fruit less than once a day [28]	0.67	0.66	0.65	0.64	0.63	0.62
13. % child overweight/obesity [27]	0.64	0.63	0.62	0.61	0.60	0.59
14. % who eat vegetables less than once a day [28]	0.61	0.60	0.59	0.58	0.57	0.56
15. Median daily intake of fruits [28]	0.59	0.58	0.57	0.56	0.55	0.54
16. Smoking rate [27]	0.59	0.58	0.57	0.56	0.55	0.54
17. Median daily intake of vegetables [28]	0.50	0.49	0.48	0.47	0.46	0.45
18. Median household income [27]	0.48	0.47	0.46	0.45	0.44	0.43
19. % high cholesterol [24]	0.48	0.47	0.46	0.45	0.44	0.43
20. Colorectal cancer rate [25]	0.47	0.46	0.45	0.44	0.43	0.42
21. Brain health ranking [27] (lower is better)	0.46	0.45	0.44	0.43	0.42	0.41
22. US Census Gini index score [30] (lower is better)	0.46	0.45	0.44	0.43	0.42	0.41
23. % with bachelor's degree or higher [3]	0.42	0.41	0.40	0.39	0.38	0.37
24. Avg # poor mental health days, past 30 days [24]	0.39	0.38	0.37	0.36	0.35	0.34
25. Nonretirement Hip Five personality trait [31]	0.37	0.36	0.35	0.34	0.33	0.32
26. Binge-drinking rate [24]	0.37	0.36	0.35	0.34	0.33	0.32
27. Farmers markets per 100,000 in pop. [28]	0.33	0.32	0.31	0.30	0.29	0.28
28. Extremism Hip Five personality trait [31]	0.33	0.32	0.31	0.30	0.29	0.28
29. Avg # poor physical health days, past 30 days [24]	0.32	0.31	0.30	0.29	0.28	0.27
30. Strolling of the Heales toas score (lower is better) [25]	0.31	0.30	0.29	0.28	0.27	0.26
31. % schools offering fruit/veg at celebrations [28]	0.25	0.24	0.23	0.22	0.21	0.20
32. Openness Hip Five personality trait [31]	0.23	0.22	0.21	0.20	0.19	0.18
33. % cropland harvested for fruits/veg [28]	0.19	0.18	0.17	0.16	0.15	0.14
34. Conscientiousness Hip Five personality trait [31]	0.11	0.10	0.09	0.08	0.07	0.06
35. % census tracts, healthy food retailers within 1/2 mile [28]	0.06	0.05	0.04	0.03	0.02	0.01
36. Organic Meats Overall FoodRanking [33] (lower is better)	0.02	0.01	0.00	0.00	0.00	0.00
37. Agreeableness Hip Five personality trait [31]	0.00	0.00	0.00	0.00	0.00	0.00

TABLE S1. Identical to Tab. 1 but with liquids included. Spearman correlation coefficients, ρ_{LCM} , and Benjamini-Hochberg q -values for calorie input C_{in} , calorie output C_{out} , and calorie ratio C_{out}/C_{in} , and demographic data related to health and physical activity. Hip Five personality traits are health and well-being rankings by state, and socioeconomic status, correlated, ordered from strongest to weakest Spearman correlations with calorie ratio.

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Health and/or well-being quantity	A_s for C_{in}	ρ -val	A_s for C_{out}	ρ -val	A_s for C_{net}	ρ -val
1. % no physical activity in past 30 days [24]	-0.78	3.07×10^{-99}	0.58	1.93×10^{-99}	-0.66	1.59×10^{-99}
2. % has been physically active in past 30 days [24]	0.78	3.07×10^{-99}	-0.58	1.93×10^{-99}	0.67	1.31×10^{-99}
3. US high blood pressure [24]	-0.77	3.07×10^{-99}	0.39	1.16×10^{-99}	-0.78	3.07×10^{-99}
4. Heart disease death rate [27]	-0.75	1.69×10^{-98}	0.38	1.24×10^{-99}	-0.73	2.07×10^{-99}
5. Adult diabetes rate [25]	-0.74	1.17×10^{-98}	0.34	2.77×10^{-99}	-0.77	3.07×10^{-99}
6. CNIHQ quality of life ranking [26]	-0.74	1.87×10^{-99}	0.33	3.22×10^{-99}	-0.77	3.40×10^{-99}
7. % adult overweight/obesity [27]	-0.71	1.35×10^{-98}	0.53	3.14×10^{-99}	-0.59	3.56×10^{-99}
8. Gallup Wellbeing score [3]	0.77	3.17×10^{-99}	-0.53	3.58×10^{-99}	0.73	4.85×10^{-99}
9. % adult obesity [25]	-0.69	8.10×10^{-99}	0.52	4.11×10^{-99}	-0.59	3.56×10^{-99}
10. America's Health Rankings, overall [24]	-0.69	1.31×10^{-98}	0.4	9.14×10^{-99}	-0.67	2.65×10^{-98}
11. Life expectancy at birth [27]	-0.67	7.56×10^{-99}	0.26	1.59×10^{-99}	-0.65	2.98×10^{-99}
12. % child overweight/obesity [27]	-0.65	2.58×10^{-98}	0.31	2.82×10^{-99}	-0.64	3.06×10^{-99}
13. % who eat fruit less than once a day [26]	-0.65	2.58×10^{-98}	0.27	7.45×10^{-99}	-0.51	3.89×10^{-99}
14. % who eat vegetables less than once a day [26]	-0.63	1.81×10^{-99}	0.23	3.14×10^{-99}	-0.64	3.72×10^{-99}
15. Median daily intake of fruits [26]	0.59	3.56×10^{-99}	-0.59	3.56×10^{-99}	0.41	3.73×10^{-99}
16. Smoking rate [27]	-0.59	3.83×10^{-99}	0.47	1.69×10^{-99}	-0.48	1.24×10^{-99}
17. Median daily intake of vegetables [26]	0.57	7.75×10^{-99}	-0.50	1.03×10^{-99}	0.31	3.69×10^{-99}
18. Median household income [27]	0.48	1.37×10^{-99}	-0.3	5.58×10^{-99}	0.4	6.07×10^{-99}
19. % high cholesterol [24]	-0.48	1.26×10^{-99}	0.24	1.16×10^{-99}	-0.48	1.05×10^{-99}
20. Colorectal cancer rate [25]	-0.47	3.72×10^{-99}	0.26	3.37×10^{-99}	-0.27	8.35×10^{-99}
21. Brain health ranking [25] (lower is better)	-0.46	1.95×10^{-99}	0.55	1.74×10^{-99}	-0.29	2.43×10^{-99}
22. US Census Gini index score [30] (lower is better)	-0.44	3.69×10^{-99}	0.11	5.12×10^{-99}	-0.5	6.22×10^{-99}
23. % with bachelor's degree or higher [6]	0.42	4.99×10^{-99}	-0.42	4.98×10^{-99}	0.41	3.23×10^{-99}
24. Avg # poor mental health days, past 30 days [24]	-0.39	9.87×10^{-99}	0.1	3.31×10^{-99}	-0.48	1.23×10^{-99}
25. Neurotension Big Five personality trait [31]	-0.37	1.31×10^{-99}	0.23	1.35×10^{-99}	-0.37	1.42×10^{-99}
26. Binge drinking rate [24]	0.34	2.92×10^{-99}	-0.12	4.88×10^{-99}	0.41	3.23×10^{-99}
27. Farmers markets per 100,000 in pop. [26]	0.33	2.96×10^{-99}	-0.03	3.59×10^{-99}	0.42	3.41×10^{-99}
28. Extraversion Big Five personality trait [31]	-0.33	2.83×10^{-99}	0.13	4.13×10^{-99}	-0.29	3.36×10^{-99}
29. Avg # poor physical health days, past 30 days [24]	-0.32	3.81×10^{-99}	0.16	3.32×10^{-99}	-0.38	1.16×10^{-99}
30. Striding of the Heifer becomes score (lower is better) [32]	-0.31	4.59×10^{-99}	0.16	3.32×10^{-99}	-0.43	3.65×10^{-99}
31. % schools offering fruit/veg at celebrations [26]	0.25	1.16×10^{-99}	-0.38	1.36×10^{-99}	0.05	7.75×10^{-99}
32. Openness Big Five personality trait [31]	0.23	1.31×10^{-99}	-0.42	5.43×10^{-99}	0.04	7.95×10^{-99}
33. % compliant households for fruit/veg [26]	0.18	3.24×10^{-99}	-0.03	3.58×10^{-99}	0.04	3.39×10^{-99}
34. Conscientiousness Big Five personality trait [31]	-0.1	5.31×10^{-99}	0.14	3.97×10^{-99}	-0.05	7.78×10^{-99}
35. % census tracts, healthy food retailer within 1/2 mile [26]	-0.06	7.47×10^{-99}	-0.39	3.09×10^{-99}	-0.24	1.28×10^{-99}
36. George Mason overall foodies ranking [33] (lower is better)	0.029	8.59×10^{-99}	-0.02	7.73×10^{-99}	-0.1	1.58×10^{-99}
37. Agreeableness Big Five personality trait [31]	0	9.95×10^{-99}	0.24	1.26×10^{-99}	0.08	6.41×10^{-99}

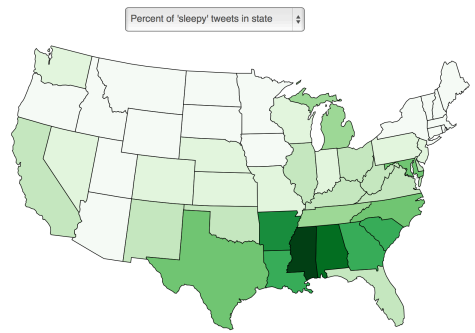
TABLE S1. Identical to Tab. 1 but with liquids included. Spearman correlation coefficients, A_s , and Benjamini-Hochberg ρ -values for caloric input C_{in} , caloric output C_{out} , and caloric ratio $C_{net} = C_{in}/C_{out}$, and demographic data related to food and physical activity. Big Five personality traits [31], health and well-being rankings by state, and socioeconomic status, correlated, ordered from strongest to weakest Spearman correlations with caloric ratio.

The Lexicalcalorimeter:

Health and/or well-being quantity	A_s for C_{in}	ρ -val	A_s for C_{out}	ρ -val	A_s for C_{net}	ρ -val
1. % no physical activity in past 30 days [24]	-0.78	3.42×10^{-99}	0.58	1.93×10^{-99}	-0.66	1.59×10^{-99}
2. % has been physically active in past 30 days [24]	0.78	3.42×10^{-99}	-0.58	1.93×10^{-99}	0.67	1.31×10^{-99}
3. US high blood pressure [24]	-0.77	3.69×10^{-99}	0.39	1.16×10^{-99}	-0.78	3.42×10^{-99}
4. Heart disease death rate [27]	-0.75	1.69×10^{-98}	0.38	1.24×10^{-99}	-0.73	2.07×10^{-99}
5. Adult diabetes rate [25]	-0.74	1.25×10^{-98}	0.34	2.77×10^{-99}	-0.77	3.07×10^{-99}
6. CNIHQ quality of life ranking [26]	-0.74	2.07×10^{-99}	0.33	3.22×10^{-99}	-0.77	3.40×10^{-99}
7. % adult overweight/obesity [27]	-0.71	1.48×10^{-98}	0.53	3.14×10^{-99}	-0.59	3.56×10^{-99}
8. Gallup Wellbeing score [3]	0.77	3.08×10^{-99}	-0.53	3.58×10^{-99}	0.73	4.85×10^{-99}
9. % adult obesity [25]	-0.69	8.40×10^{-99}	0.52	4.11×10^{-99}	-0.59	3.56×10^{-99}
10. America's Health Rankings, overall [24]	-0.69	1.39×10^{-98}	0.4	9.14×10^{-99}	-0.67	2.77×10^{-98}
11. Life expectancy at birth [27]	-0.67	7.61×10^{-99}	0.26	1.59×10^{-99}	-0.65	3.07×10^{-99}
12. % who eat fruit less than once a day [26]	-0.65	2.97×10^{-98}	0.57	7.45×10^{-99}	-0.51	3.89×10^{-99}
13. % child overweight/obesity [27]	-0.64	3.06×10^{-98}	0.34	2.78×10^{-99}	-0.64	3.06×10^{-99}
14. % who eat vegetables less than once a day [26]	-0.63	1.74×10^{-99}	0.23	3.14×10^{-99}	-0.64	3.69×10^{-99}
15. Median daily intake of fruits [26]	0.59	3.56×10^{-99}	-0.59	3.56×10^{-99}	0.41	3.73×10^{-99}
16. Smoking rate [27]	-0.59	3.77×10^{-99}	0.47	1.69×10^{-99}	-0.48	1.24×10^{-99}
17. Median daily intake of vegetables [26]	0.57	7.41×10^{-99}	-0.50	1.03×10^{-99}	0.31	3.69×10^{-99}
18. Median household income [27]	0.48	1.38×10^{-99}	-0.5	5.58×10^{-99}	0.4	6.07×10^{-99}
19. % high cholesterol [24]	-0.48	1.28×10^{-99}	0.24	1.15×10^{-99}	-0.48	1.05×10^{-99}
20. Colorectal cancer rate [25]	-0.47	3.68×10^{-99}	0.26	3.37×10^{-99}	-0.27	8.35×10^{-99}
21. Brain health ranking [25] (lower is better)	-0.46	1.91×10^{-99}	0.55	1.74×10^{-99}	-0.29	2.43×10^{-99}
22. US Census Gini index score [30] (lower is better)	-0.44	3.41×10^{-99}	0.11	5.12×10^{-99}	-0.5	6.22×10^{-99}
23. % with bachelor's degree or higher [6]	0.42	4.99×10^{-99}	-0.42	4.98×10^{-99}	0.41	3.23×10^{-99}
24. Avg # poor mental health days, past 30 days [24]	-0.39	1.05×10^{-99}	0.1	3.31×10^{-99}	-0.48	1.23×10^{-99}
25. Neurotension Big Five personality trait [31]	-0.37	1.30×10^{-99}	0.23	1.35×10^{-99}	-0.37	1.42×10^{-99}
26. Extraversion Big Five personality trait [31]	-0.34	2.78×10^{-99}	0.13	4.13×10^{-99}	-0.29	3.36×10^{-99}
27. Farmers markets per 100,000 in pop. [26]	0.33	2.88×10^{-99}	-0.03	3.59×10^{-99}	0.42	3.41×10^{-99}
28. Binge drinking rate [24]	0.33	2.88×10^{-99}	-0.12	4.88×10^{-99}	0.41	3.23×10^{-99}
29. Avg # poor physical health days, past 30 days [24]	-0.32	4.83×10^{-99}	0.16	3.32×10^{-99}	-0.38	1.16×10^{-99}
30. Striding of the Heifer becomes score (lower is better) [32]	-0.31	4.52×10^{-99}	0.16	3.32×10^{-99}	-0.43	3.65×10^{-99}
31. % schools offering fruit/veg at celebrations [26]	0.25	1.13×10^{-99}	-0.38	1.36×10^{-99}	0.05	7.75×10^{-99}
32. Openness Big Five personality trait [31]	0.23	1.30×10^{-99}	-0.42	5.43×10^{-99}	0.04	7.95×10^{-99}
33. % compliant households for fruit/veg [26]	0.18	3.28×10^{-99}	-0.03	3.58×10^{-99}	0.04	3.39×10^{-99}
34. Conscientiousness Big Five personality trait [31]	-0.1	5.31×10^{-99}	0.14	3.97×10^{-99}	-0.05	7.78×10^{-99}
35. % census tracts, healthy food retailer within 1/2 mile [26]	-0.06	7.41×10^{-99}	-0.39	3.09×10^{-99}	-0.24	1.28×10^{-99}
36. George Mason overall foodies ranking [33] (lower is better)	0	7.41×10^{-99}	-0.02	7.73×10^{-99}	-0.1	1.58×10^{-99}
37. Agreeableness Big Five personality trait [31]	0	9.85×10^{-99}	0.24	1.26×10^{-99}	0.08	6.41×10^{-99}

TABLE S3. Identical to Tab. 1 but including liquids and using a caloric difference rather than caloric ratio. Spearman correlation coefficients, A_s , and Benjamini-Hochberg ρ -values for caloric input C_{in} , caloric output C_{out} , and caloric difference $C_{net} = C_{in} - C_{out}$ ($C_{net} = 1 - C_{net}/C_{out}$), and demographic data related to food and physical activity. Big Five personality traits [31], health and well-being rankings by state, and socioeconomic status, correlated, ordered from strongest to weakest Spearman correlations with caloric ratio. We chose ρ so that the average of C_{net} matched the average of C_{net} .

The Insomniometer:



Correlation with CDC's Sleep Insufficiency measure $\rho_s = .48, p = 5.3 \times 10^{-4}$.

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Lexicalcalorimeter

The LCM
Other lexical
meters
References



$\rho_s = .72, p = 5.8 \times 10^{-9}$
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Other lexical
meters
References



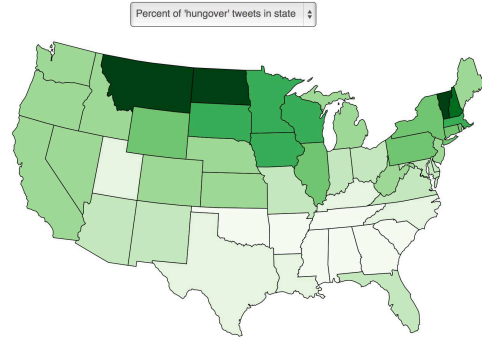
$\rho_s = .26$
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meters
References

$\rho_s = .27$
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The Hangoverometer:



Correlation with Binge drinking estimates $\rho_s = .72, p = 5.8 \times 10^{-9}$.

References 1

[1] S. E. Alajajian, J. R. Williams, A. J. Reagan, S. C. Alajajian, M. R. Frank, L. Mitchell, J. Lahne, C. M. Danforth, and P. S. Dodds. The Lexicalcalorimeter: Gauging public health through caloric input and output on social media. *PLoS ONE*, 12:e0168893, 2017. arXiv version available at <http://arxiv.org/abs/1507.05098>. pdf

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$\rho_s = .29$
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