Think 53: Food Talks
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How to Read a Menu

Tuesday, May 9, 2017
How to do “Linguistics of the everyday”

Do social science by studying aspects of everyday life

*Computational social science* if the datasets are big
Goal for today

Understand the methods that we used for studying menus

With the idea that some of you will want to study something like menus (or other texts) for your final projects
How do menus reflect socio-economic differences?

What linguistic differences are reflected in cheap versus expensive menus?

Menus as reflections of attitudes toward socio-economic class

Online menus from 6562 restaurants
  ◦ 650,000 menu items
  ◦ 5,000,000 words
  ◦ allmenus.com, yelp.com
Datasets

http://www.allmenus.com/

Yelp Challenge Dataset

The Challenge Dataset:
- 2.2M reviews and 591K tips by 552K users for 77K businesses
- 566K business attributes, e.g., hours, parking availability, ambience.
- Social network of 552K users for a total of 3.5M social edges.
- Aggregated check-ins over time for each of the 77K businesses
- 200,000 pictures from the included businesses

Cities:
- U.K.: Edinburgh
- Germany: Karlsruhe
- Canada: Montreal and Waterloo
- U.S.: Pittsburgh, Charlotte, Urbana-Champaign, Phoenix, Las Vegas, Madison

Get the Data
<table>
<thead>
<tr>
<th>Restaurant</th>
<th>Cuisine</th>
<th>Location</th>
<th>Price</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Johnny Rockets</td>
<td>Fast Food</td>
<td>Bos</td>
<td>$$</td>
<td>Bacon lettuce and tomato crisp thick bacon fresh lettuce tomato and mayonnaise on your choice of bread</td>
</tr>
<tr>
<td>Johnny Rockets</td>
<td>Fast Food</td>
<td>Bos</td>
<td>$$</td>
<td>Chicken club sandwich grilled marinated chicken breast with thick bacon fresh lettuce tomato and mayonnaise on triple decker sourdough</td>
</tr>
<tr>
<td>Johnny Rockets</td>
<td>Fast Food</td>
<td>Bos</td>
<td>$$</td>
<td>Egg salad sandwich made from scratch just like mom's served with fresh lettuce and mayonnaise on your choice of bread</td>
</tr>
<tr>
<td>Johnny Rockets</td>
<td>Fast Food</td>
<td>Bos</td>
<td>$$</td>
<td>Chili size served open faced with our exclusive all meat chilli and topped with fresh grated cheddar cheese and chopped onions</td>
</tr>
<tr>
<td>Thai Chef &amp; Sushi Bar</td>
<td>Sushi</td>
<td>Dc</td>
<td>$$</td>
<td>Sweet corn soup delicious creamy corn soup with minced chicken finished with egg</td>
</tr>
<tr>
<td>Thai Chef &amp; Sushi Bar</td>
<td>Sushi</td>
<td>Dc</td>
<td>$$</td>
<td>Chu chee shrimp grilled shrimps topped with chef's spicy chu chee sauce served with steamed vegetables</td>
</tr>
<tr>
<td>Quince</td>
<td>Italian</td>
<td>Sf</td>
<td>$$$$</td>
<td>Wild nettle tomato fondue of fontine val d'anoca</td>
</tr>
<tr>
<td>Quince</td>
<td>Italian</td>
<td>Sf</td>
<td>$$$$</td>
<td>Woodside farm jerusalem artichoke soup homemade pancakes and thyme</td>
</tr>
<tr>
<td>L'Impero</td>
<td>Italian</td>
<td>Nyc</td>
<td>$$$$</td>
<td>Composed cheese plates chef's selection of three served with warm cranberry nut bread and house made accompaniments supplement with prix fixe menu</td>
</tr>
<tr>
<td>Papa John's Pizza</td>
<td>Pizza</td>
<td>Nyc</td>
<td>$</td>
<td>The works x large sink your teeth into this pizza loaded with a mouthwatering combination of pepperoni ham spicy italian sausage fresh sliced onions green peppers gourmet baby portabella mushrooms and ripe black olives</td>
</tr>
<tr>
<td>Joe's Shanghai</td>
<td>Chinese</td>
<td>Nyc</td>
<td>$$</td>
<td>Prawns w exotic sea scallop sauce</td>
</tr>
</tbody>
</table>
How to test hypotheses

1. Form hypotheses about interesting classes of words – create word lists

2. Count to see which restaurants these words are associated with

3. Confirm the hypotheses by running statistics
   - Linear regression
   - Logistic regression
   - Ordinal logit regression
Choice


Cheap restaurants focus on diner choice

Expensive restaurants don’t
Expensive restaurant menu:

Cheap restaurant menu

Skinnylicious® is our account of fresh and delicious options with lower calorie, signature taste, so redefines low calorie. For more information visit our website or call our phone number.

The Cheesecake Factory

To Place Your Take Out Order Please Call: (630) 473-9622
375 University Avenue
Palo Alto

Small plates & snacks

- STUFFED MUSHROOMS 4.95
  - Fried or Parmesan Cheese, Garlic and Herbs on a Won Ton Base
- WHITE BEAN HUMMUS 4.95
  - Served with Nine-Olive Crostini
- BEETS WITH GOAT CHEESE 4.95
  - Fresh Beets, Apples, Baby Arugula, Frans, and Goat Cheese
- LITTLE HOUSE SALAD 3.95
  - Served on Two Yogurts
- ENERGY SALAD 5.95
  - Baby Kale, Radicchio, Glazed Fennel, Grilled Chicken, Cherry Tomatoes, Cucumbers, Cherry Tomato Vinaigrette
- MACARONI 11.50
- ROASTED GARLIC A LA PLANCHE 16.95
- LUCIA'S CHEESECAKE 9.95

Macadams®

All served with Fresh Fruit or Green Salad
Sweet Potatoes 1.00 extra
We use premium Certified Angus Beef® or American Style Kobe for all of our Burgers

OLD FASHIONED BURGER® 9.50
- Charbroiled on a Fluted Bun with Cheese, Tomatoes, Onion, Pickles and Mayonnaise
- CHICKEN BURGER® 9.50
- A Chicken Filet on a Fluted Bun with Cheese, Lettuce and Tomato
- KOBE BURGER® 9.50
- American Style Kobe Filet with Roasted Balsamic Vinegar and Onion

WILD MUSHROOM BURGER® 11.50
- Smoked Bacon and Herb Grilled with Grilled Mushrooms, Onion and Miso
- GREEN CHILE CHEESEBURGER® 11.50
- Monterey Jack Cheese, Arugula and Red Onion with Honey-Mustard Mayo
- BLUE CHEESE E.L.T BURGER® 11.50
- Cabbage Bacon, Lettuce, Tomato, Cheese and Marinated Lettuce with Blue Cheese

MEMPHIS BURGER® 11.50
- Topped with Roasted BBQ Q. C. Pickles, Honey-Chipotle Cole Slaw, Pickles and Mayonnaise

Specialties

- S。E。A。F。O。O。D

- REMP PLATTER 14.95
- Served with French Fries and Cole Slaw
- EANS SHRIMP 14.95
- Served with Fresh Corn, Mushrooms, Garlic and Onion with a choice of Buns. Served with Fresh and Red Sauce

- FRANCHISE 14.95
- Served with Fresh Corn, Mushrooms and a choice of Buns. Served with Fresh and Red Sauce
- RAP Mong 14.95
- Served with Fresh Corn, Mushrooms and a choice of Buns. Served with Fresh and Red Sauce
- CHICKEN GUMBO 16.95
- Served with Fresh Corn, Mushrooms and a choice of Buns. Served with Fresh and Red Sauce
- CK PEPPER SHrimp 17.95
- Served with Fresh Corn, Mushrooms and a choice of Buns. Served with Fresh and Red Sauce

- ARBOUR SALMON 15.95
- Served with Fresh Corn, Mushrooms and a choice of Buns. Served with Fresh and Red Sauce
- LENTED FILET OF SALMON 19.95
- Served with Fresh Corn, Mushrooms and a choice of Buns. Served with Fresh and Red Sauce
- STONE CRUSTED SALMON 19.95
- Served with Fresh Corn, Mushrooms and a choice of Buns. Served with Fresh and Red Sauce
- CRUSTED ARTICHOKE 21.95
- Served with Fresh Corn, Mushrooms and a choice of Buns. Served with Fresh and Red Sauce

- Y。C。O。M。B。I。N。A。T。I。E。S

- Served with Fresh Corn, Mushrooms and a choice of Buns. Served with Fresh and Red Sauce
- SCALLOP AND STEAK DIANE 19.95
- Served with Fresh Corn, Mushrooms and a choice of Buns. Served with Fresh and Red Sauce
- AMBER AND STEAK DIANE 19.95
- Served with Fresh Corn, Mushrooms and a choice of Buns. Served with Fresh and Red Sauce
- 3 SALMON 19.95
- Served with Fresh Corn, Mushrooms and a choice of Buns. Served with Fresh and Red Sauce
- ANY COMBINATION OF THE ABOVE
Measuring more subtle aspects of choice

• Baby lamp chops grilled to your liking
• Marinated flak steak with eggs your way
• Quiche with your choice of either house salad or a cup of soup
• Biscuits and gravy with eggs anyway you like’em
Measuring more subtle aspects of choice

• choice, choose, any, add, or, specify, substitutions, specifications, options, pick, your way, your own, your liking, your style, your favorite, you like, you want, you request, way you, you may, select your, select from, you select, select one, select any, select or, select a, select up, select two

• chef's selection, chef's selections, chef's daily selection, chef's daily preparation, chef's choice, chef's selected, chef's assortment, tasting menu, omakase, kaiseki, courses, prix fixe
More subtle aspects of choice: who is the menu talking about?

Cheap restaurants:
“you”
“your way/style”
“you like/want”

Expensive:
“chefs choice”
“chef’s selection”
Even more subtle differences

Let’s look at adjectives
There were 1065 adjectives in the datasets

165 sensory adjectives
  ◦ Chunky, crispy, crunchy, doughy, fluffy, rich, smolky, tangy, zesty

176 participial adjectives
  ◦ Grilled, mixed, sliced, steamed, baked, smoked,

55 extreme positive sentiment words
  ◦ Amazing, awesome, exciting, extraordinary, incredible, legendary, perfect

15 delicious words
  ◦ Delicious, delectable, scrumptious, luscious, tasty, gourmet, savory
Finding adjectives

Aloo Paratha: Mashed potatoes flavored with tangy spices and herbs

Paneer do Pyaza Roll: Homemade cottage cheese and grilled onions

Masala Aloo Roll: Pan fried spiced potatoes and herbs
Finding adjectives automatically: Part-of-Speech tagging

https://nlp.stanford.edu/software/tagger.shtml

Aloo_NNP Paratha_NNP : _: Mashed_JJ potatoes_NNS flavored_VBN with_IN tangy_JJ spices_NNS and_CC herbs_NNS

Paneer_NN do_VBP Pyaza_NNP Roll_NNP : _: Homemade_JJ cottage_NN cheese_NN and_CC grilled_JJ onions_NNS

Masala_NNP Aloo_NNP Roll_NNP : _: Pan_NN fried_VBD spiced_JJ potatoes_NNS and_CC herbs_NNS

JJ = Adjective
NNP = Proper Noun
NN = Noun
VBD = Preterite
VBN = Past Participle
Cheap restaurants use vague "tasty" words

Delicious, gourmet, flavorful,

The delicious taste delicious outdoor grill flavor gourmet veggie special flavorful entrées flavorful ancho-chile

For every vague adjective the average price of a dish drops 2%
Cheap restaurants use vague "positive" words

Amazing, great, fantastic

our amazing signature subs

Amazing Spicy Chicken Casserole

our fantastic house made dressing

unbelievably great tasting
Middle priced restaurants use sensory adjectives

zesty, rich, golden brown, crispy, creamy

**Crispy** white-meat tenders served with a **creamy** Creole sauce
**rich, creamy** spinach artichoke dip
**Creamy**, homemade fettuccine alfredo
**zesty** chili pepper cream sauce
How do we know this is true?
Control variables

name category city restdollars numitems provenance traditional generous participle positive delicious choice adj sensory adj length wordlen

1 Tiffin Etc. indian philadelphia 2.0 24 0.0833 0.4167 0.0000 1.2500 0.0000 0.0000 0.0000 2.0417 0.5000 12.4583 6.5806

2 City Pie pizza nyc 1.0 47 0.0000 0.0000 0.0000 0.1915 0.0426 0.0000 0.2128 1.2766 0.2553 8.8085 6.2053

3 Wayo sushi bars sf 2.0 57 0.0000 0.0000 0.0000 0.0526 0.0000 0.0000 0.0000 0.3509 0.0877 3.5439 5.7928
Linear regression

After controlling for the city, the total number of words, the average word length, the number of items on the menu..., do cheap restaurants have more "delicious" words than expensive restaurants?
Thinking about linear regression

Could I predict the number of dollar signs from the number of "delicious words"?
Linear Regression
Predicting Housing Prices

Example from Freakonomics (Levitt and Dubner 2005)

- Vague Adjectives: Fantastic, cute, or charming

<table>
<thead>
<tr>
<th># of Vague Adjectives</th>
<th>Amount House Sold Over Asking Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>$1000</td>
</tr>
<tr>
<td>2</td>
<td>$1500</td>
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<tr>
<td>2</td>
<td>$6000</td>
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<tr>
<td>1</td>
<td>$14000</td>
</tr>
<tr>
<td>0</td>
<td>$18000</td>
</tr>
</tbody>
</table>
Linear Regression

\[ y = -4900x + 16550 \]
Multiple Linear Regression

Predicting values:

\[ \text{price} = w_0 + w_1 \times \text{Num Adjectives} + w_2 \times \text{Mortgage Rate} + w_3 \times \text{Num Unsold Houses} \]

In general:

\[ \text{price} = w_0 + \sum_{i=1}^{N} w_i \times f_i \]

- Let’s pretend an extra "intercept feature" \( f_0 \) with value 1

Multiple Linear Regression

\[ y = \sum_{i=0}^{N} w_i \times f_i \]
Linear regression predicting $\$ from language, using "R"

```
lm(formula = restdollars ~ city + category + logwordlen + loglength + lognumitems + adjectives + largeportions + choice + provenance + traditional)
```
<p>|                  | Estimate  | StdError | z_value | Pr(&gt;|z|) |
|------------------|-----------|----------|---------|----------|
| (Intercept)      | -2.856242 | 0.329042 | -8.68   | &lt;2e-16   | ***    |
| citychicago      | -0.043169 | 0.033967 | -1.271  | 0.203809 |
| cityla           | 0.061897  | 0.042524 | 1.456   | 0.145562 |
| citynyc          | 0.166924  | 0.02487  | 6.712   | 2.08E-11 | ***    |
| cityphiladelphia | 0.018239  | 0.031218 | 0.584   | 0.559081 |
| citysf           | -0.047399 | 0.027739 | -1.709  | 0.087544 | .      |
| citywashington   | 0.102401  | 0.033002 | 3.103   | 0.001925 | **     |</p>
<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
<th>Std. Err.</th>
<th>z</th>
<th>p-value</th>
<th>Significance</th>
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<td>0.036237</td>
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<td>4.44E-10</td>
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<td>categorybakeries</td>
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<td>0.054413</td>
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<td>categoryfrench</td>
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<td>Category</td>
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<td>Coef 2</td>
<td>Coef 3</td>
<td>P-value</td>
<td>Significance</td>
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<tr>
<td>------------------------</td>
<td>---------</td>
<td>----------</td>
<td>--------</td>
<td>---------</td>
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<tr>
<td>adjectives</td>
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<td>0.052673</td>
<td>-4.344</td>
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<tr>
<td>plenty</td>
<td>-0.931954</td>
<td>0.305653</td>
<td>-3.049</td>
<td>0.002305</td>
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<tr>
<td>consumer choice</td>
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<td>-9.691</td>
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<td>14.478</td>
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<td>traditional authenticity</td>
<td>-0.45395</td>
<td>0.134103</td>
<td>-3.385</td>
<td>0.000716</td>
<td>***</td>
</tr>
</tbody>
</table>
Why Expensive Menus are short

Why say food is “fresh”?
   ◦ Because Grice

H. Paul Grice, Philosopher of Language
Known for his “Cooperative Principles”
4 Maxims of language
Grice’s “Cooperative Principle"

Make your conversational contribution such as is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchanged in which you are engaged."
Grice’s Maxims

I. Quantity
   A. Be informative
   B. Don’t give more information than is required

II. Quality
   A. Don’t lie or mislead
   B. Don’t make statements unless there is adequate evidence

III. Relation
   A. Be relevant

IV. Manner
   A. Avoid obscurity
   B. Avoid ambiguity
   C. Be succinct
   D. Be orderly

Grice “Logic and Conversation”
These Maxims sound obvious

But they are useful in two ways:

1) Sometimes what seems to violate a Maxim actually doesn’t, and the listener has to figure something out

2) Sometimes they are violated (“flouted”). When that happens, listeners search for an explanation for the violation

Both of these let us *imply* things without saying them

And these explain how speakers can mislead without technically lying
Maxim of Relevance

Make your contribution relevant

Relevance:
A: Where’s Bill?
B: There’s a yellow VW outside Sue’s house.

Flouting Relevance
A: How did you like my lecture?
B: Nice weather we’re having!
Relevance and ketchup

https://www.youtube.com/watch?v=1xbYD79_g98
Maxim of Quantity

Make your contribution neither more nor less than is required.

a. Make your contribution as informative as is required for the current purposes of the exchange.

b. Do not make your contribution more informative than required.

Flouting Quantity:

[Letter of Recommendation]:

“Dear Madam, Mr. X's handwriting is excellent, and his attendance at class has been regular.

Yours Sincerely”
Maxim of Quantity

Make your contribution neither more nor less than is required.

a. Make your contribution as informative as is required for the current purposes of the exchange.

b. Do not make your contribution more informative than required

Violating Quantity:

A: How did Harry fare in court the other day?
B: Oh he got a fine

If it turned out Harry also got a life sentence, then B is guilty of misleading A, even though what he says is technically true.
Maxim of Manner

Be perspicuous
a. Avoid obscurity of expression
b. Avoid ambiguity
c. Be brief (avoid unnecessary prolixity)
d. Be orderly

Flouting Manner:
a. "Miss X sang `Home on the Range'"
b. "Miss X produced a series of sounds that corresponded closely with the score of `Home on the Range'."
Maxim of Quality

Try to make your contribution one that is true

a. Do not say what you believe to be false

b. Do not say that for which you lack adequate evidence

Flouting Quality:

Bouncer: Are you 21?
Student: I’m 35.
Bouncer: Oh, right, and I’m 99.
Why Expensive Menus are short

Why say food is “fresh”?

Maxim of Quantity
  ◦ Don’t say more than you need

Maxim of Relation
  ◦ Be relevant

There must be a purpose to say “fresh”
Why Expensive Menus are short

Why say food is “fresh”?  
- Maxims of Quantity and Relevance:  
  - The hearer needs to know it’s fresh  
  - I am trying to communicate the freshness of my food

Why would you need to know?  
- Because you don’t already know if it’s fresh  
- i.e. you aren’t sure if it’s fresh

Expensive restaurants want you to assume food is fresh
Grice in action: *real* on menus

\$
\text{chocolate chip pancakes served with } real \text{ whipped cream}
\text{home made meatloaf served with } real \text{ mashed potatoes}
\text{lettuce, tomato, Russian dressing and } real \text{ bacon bits}
\$

\$
\text{California roll: } real \text{ crab and avocado}
\text{blueberry whole grain pancakes with } real \text{ maple syrup}
\$

"real" not on expensive menus!
Menus as a window onto history

- New York Public Library’s Buttolph collection
- 45,000 menus dating from the 1840s to the present,
- More than half collected by Miss Frank E. Buttolph (1850-1924)

http://menus.nypl.org/menus/decade/1850s
When does “real” first became common on menus?

From the New York Public Library’s Buttolph collection:

- **real butter** 1960s
- **real whipped cream** 1970s
- **real bacon** 1990s

Why then?

- **1950:** Margarine tax repealed and sales of margarine skyrocket
- **1960s:** First popular artificial whipped cream introduced
- **1970:** First popular artificial bacon introduced

The word ”real” on menus is a marker of the rise of “artificial” food!
Remember from last week
Words promising more food

hearty, enormous, plenty, loads, lots, hefty, gigantic, generous, generously, largest, heaping, refills, bottomless, unlimited, huge, big, bigger, biggest, ginormous, mega, largest, and more, with more, tons of, king sized, texas sized
Plenty

Baked Meat Lasagna with our hearty meat sauce
Tuna Supreme: A generous scoop of tuna
Plenty in steakhouses

**Big Shoulders:** and you thought our petite porterhouse was big! this is a **full forty ounces**! that's eight ounces short of three **pounds**! are you up to the challenge?
Factor that increases price of a dish:

Use rare words
- *tonnarelli, bastilla, persillade*

*Use long words:*
- *decaffeinated, accompaniments, complements, exquisitely*

*cheap restaurants:*
- *decaf* not *decaffeinated, sides* not *accompaniments.*

---

Factors predicting higher prices

Each additional average letter = 18 cents
Digression:
Rare words are also longer words

“Accompaniments” vs

“Sides”

https://books.google.com/ngrams/graph?content=accompaniments,sides&year_start=1800&year_end=2000&corpus=15&smoothing=3&share=&direct_url=t1%3B,accompaniments%3B,c0%3B.t1%3B,sides%3B,c0
Word length is inversely correlated with frequency

Short words are frequent
Frequent words are short
This fact was discovered in the 8th century

**Sibawayh:** Founder of Arabic grammar and Arabic linguistics
- Author of the Kitāb, “The Book”, a 900-page treatise on Arabic grammar (+morphology/phonology/phonetics)

~752 CE, born, probably Shiraz
- Ethnic Persian, non-native speaker of Arabic

~762 CE, arrives in Basra to study religious law
- Makes a serious grammatical error in public
- Is shamed in public
- Decides to study linguistics instead
Sibawayh and word frequency


“Frequency of usage” (*katra al-isti’mland*) is a major cause of language changing over time

- Some words get shorter over time
- Because they “occurs more frequently”

Rediscovered by European and American linguists
- 1100 years later in the late 19th century
100 words overrepresented on $$$ menus

28 of the 100 words were from high-status foreign cuisines:

**French** *(les, de, le, fois, gras, crème, mousse, tarte, pommes)*

**Italian** *(e, con, risotto, pancetta, burrata, polenta, parmigiano)*

**Japanese** *(tempura, uni, wagyu, sushi, yuzu, sashimi, miso, shabu, kobe, ponzu, wasabi, ninja, and sake)*
This has been true for over 100 years

New York Public Library’s Buttolph Collection
2858 menus from 1892-1921
One difference: trickle-down in status
(Veblen, Simmel)

1910:
  ◦ *gourmet*: only fancy restaurants
    “*braised lamb gourmet*” Waldorf Astoria
    "*tomato gourmet salad*" Hotel Manhattan

2010:
  ◦ *gourmet*: only cheap restaurants
    "*gourmet large pepperoni*" delivery pizza
There's more in menus: How healthy food is framed


As obesity rates continue to climb, blame has fallen on the high-calorie meals at chain restaurants

Many chain restaurants have responded by adding “healthy choices” sections

But how do they describe the food on these healthy menus?
The data

Menus from 26 casual-dining chain restaurants with healthy submenus
  ◦ e.g., Applebee's, Olive Garden, IHOP, Red Lobster

Every word on healthy and standard menu items coded for presence in 22 lexicons.

Which kinds of words occurred less often in the Healthy menus?
<table>
<thead>
<tr>
<th>Restaurant</th>
<th>2015 Sales Rank</th>
<th>Total Sales (billions $)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applebee's</td>
<td>10</td>
<td>4.6</td>
</tr>
<tr>
<td>Panera Bread</td>
<td>11</td>
<td>4.3</td>
</tr>
<tr>
<td>Olive Garden</td>
<td>16</td>
<td>3.8</td>
</tr>
<tr>
<td>Chili's</td>
<td>17</td>
<td>3.6</td>
</tr>
<tr>
<td>Buffalo Wild Wings</td>
<td>19</td>
<td>3.2</td>
</tr>
<tr>
<td>IHOP</td>
<td>23</td>
<td>2.9</td>
</tr>
<tr>
<td>Denny's</td>
<td>25</td>
<td>2.5</td>
</tr>
<tr>
<td>Outback Steakhouse</td>
<td>26</td>
<td>2.5</td>
</tr>
<tr>
<td>Red Lobster</td>
<td>28</td>
<td>2.4</td>
</tr>
<tr>
<td>Cracker Barrel</td>
<td>30</td>
<td>2.1</td>
</tr>
<tr>
<td>Texas Roadhouse</td>
<td>33</td>
<td>1.9</td>
</tr>
<tr>
<td>Cheesecake Factory</td>
<td>35</td>
<td>1.8</td>
</tr>
<tr>
<td>TGI Friday's</td>
<td>36</td>
<td>1.8</td>
</tr>
<tr>
<td>Longhorn Steakhouse</td>
<td>39</td>
<td>1.5</td>
</tr>
<tr>
<td>Red Robin</td>
<td>41</td>
<td>1.4</td>
</tr>
<tr>
<td>Ruby Tuesday's</td>
<td>45</td>
<td>1.2</td>
</tr>
<tr>
<td>Waffle House</td>
<td>46</td>
<td>1.1</td>
</tr>
</tbody>
</table>
What does "overused" mean?

**likelihood ratio**: does “fun” occur more (by %) in menu A or B?

\[
\frac{\% \text{ of words in menu A that are } "\text{fun}"}{\% \text{ of words in menu B that are } "\text{fun}"}
\]
<table>
<thead>
<tr>
<th>Theme</th>
<th>Example words</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exciting</td>
<td>crazy, spellbinding, action, adventure, blasts,</td>
</tr>
<tr>
<td>Fun</td>
<td>fun, dippable, bites, skewered, stacker, tanglers</td>
</tr>
<tr>
<td>Traditional</td>
<td>countryside, housemade, classic, traditional, famous,</td>
</tr>
<tr>
<td>Regional</td>
<td>Philly, California, Maine, New Orleans, Hawaiian</td>
</tr>
<tr>
<td>Texture</td>
<td>crispy, creamy, crunchy, flaky, gooey, velvety</td>
</tr>
<tr>
<td>Provocative</td>
<td>dangerous, dirty, naked, temptation, sinful, envy</td>
</tr>
<tr>
<td>Spicy hot</td>
<td>buffalo, mesquite, chipotle, fiery, firecracker, burnin’</td>
</tr>
<tr>
<td>Artisan</td>
<td>artisan, handcrafted, hand-prepared, premium,</td>
</tr>
<tr>
<td>Taste</td>
<td>sweet, sour, salty, tangy, flavorful, delicious</td>
</tr>
<tr>
<td>Indulgent</td>
<td>bliss, indulge, richest, succulent, decadent</td>
</tr>
</tbody>
</table>
### Words over-used on "Healthy" menu

<table>
<thead>
<tr>
<th>Theme</th>
<th>Example words</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreign</td>
<td>Asian, Italian, French, Tuscan, Thai, Mexican</td>
</tr>
<tr>
<td>Fresh</td>
<td>fresh, freshly</td>
</tr>
<tr>
<td>Simple</td>
<td>simple, dry, mild, plain, mildly, simply</td>
</tr>
<tr>
<td>Macronutrients</td>
<td>carb, fiber, fat, grain, protein, whole wheat</td>
</tr>
<tr>
<td>Thinness</td>
<td>light, lighter, enlightened, skinnylicious, lighten, lites</td>
</tr>
<tr>
<td>Deprivation</td>
<td>fat free, low-fat, sugar-free, no sugar added, low carb, reduced-fat</td>
</tr>
<tr>
<td>Nutritious</td>
<td>wholesome, nutritional, fit, healthy</td>
</tr>
</tbody>
</table>
Conclusion

• Major chain restaurants describe their healthiest choices as less appealing

• But we know people prioritize taste and indulgence over health

• Important for society: We need to improve how menus present healthy dishes to make them as appealing as standard items
How to read a menu: Look for the words that aren't there

Luxury advertising is “modest”, no mention of “real” or “fresh” or “delicious” or "generous portions"

Menus boasting of “real” foods are a tool to find the rise of “fake” food
    (even though advertisers never use the word “fake”)

Healthy menus avoid words indicating "fun", "spicy", "exciting", "tasty", "indulgent"
How to read a menu:
What's on expensive menus

Long words
Fancy words
High-status foreign words
Summary: The linguistics of everyday life

Everyday objects like menus are a window onto culture.
Many such artifacts are covered in words!
Even very simple linguistic and statistical techniques can be useful!
Menus make excellent final projects!!