

# Health Psychology

## **Reading Between the Menu Lines: Are Restaurants' Descriptions of "Healthy" Foods Unappealing?**

Bradley P. Turnwald, Dan Jurafsky, Alana Conner, and Alia J. Crum

Online First Publication, May 25, 2017. <http://dx.doi.org/10.1037/hea0000501>

### CITATION

Turnwald, B. P., Jurafsky, D., Conner, A., & Crum, A. J. (2017, May 25). Reading Between the Menu Lines: Are Restaurants' Descriptions of "Healthy" Foods Unappealing?. *Health Psychology*. Advance online publication. <http://dx.doi.org/10.1037/hea0000501>

## BRIEF REPORT

## Reading Between the Menu Lines: Are Restaurants' Descriptions of "Healthy" Foods Unappealing?

Bradley P. Turnwald, Dan Jurafsky, Alana Conner, and Alia J. Crum  
Stanford University

**Objective:** As obesity rates continue to climb in America, much of the blame has fallen on the high-calorie meals at popular chain restaurants. Many restaurants have responded by offering "healthy" menu options. Yet menus' descriptions of healthy options may be less attractive than their descriptions of less healthy, standard options. This study examined the hypothesis that the words describing items in healthy menu sections are less appealing than the words describing items in standard menu sections. **Method:** Menus from the top-selling American casual-dining chain restaurants with dedicated healthy submenus ( $N = 26$ ) were examined, and the library of words from health-labeled items ( $N = 5,873$ ) was compared to that from standard menu items ( $N = 38,343$ ) across 22 qualitative themes (e.g., taste, texture). **Results:** Log-likelihood ratios revealed that restaurants described healthy items with significantly less appealing themes and significantly more health-related themes. Specifically, healthy items were described as less exciting, fun, traditional, American regional, textured, provocative, spicy hot, artisanal, tasty, and indulgent than standard menu items, but were described with significantly more foreign, fresh, simple, macronutrient, deprivation, thinness, and nutritious words. **Conclusion:** Describing the most nutritious menu options in less appealing terms may perpetuate beliefs that healthy foods are not flavorful or indulgent, and may undermine customers' choice of healthier dining options. From a public health perspective, incorporating more appealing descriptive language to boost the appeal of nutritious foods may be one avenue to improve dietary health.

**Keywords:** health communication, food labeling, food, mindset, public health

**Supplemental materials:** <http://dx.doi.org/10.1037/hea0000501.supp>

When it comes to dining out, many Americans regularly feel like they must choose between what is delicious and what is healthy. Americans generally consider nutritious foods to be less tasty and indulgent than many other high-calorie options (Colby, Elder, Peterson, Knisley, & Carleton, 1987; Raghunathan, Naylor, & Hoyer, 2006) and consistently choose taste and indulgence over healthiness (Albright, Flora, & Fortmann, 1990; Colby et al., 1987), particularly when dining out (NPD Group, Inc., 2013). Americans consume one third of daily calories at restaurants

(Lin & Guthrie, 2012) and order food from a restaurant six times per week (National Restaurant Association, 2008). On average, meals at full-service restaurants contain almost 200 more calories, 10 more grams of fat, 58 mg more cholesterol, and 412 mg more sodium compared to meals at home, and are even higher in cholesterol and sodium than meals at fast food restaurants (An, 2016). In a country where more than one third of adults are obese (National Center for Health Statistics, 2016), the question of why people choose high-calorie, low-nutrient restaurant foods is one of great importance to public health.

In response to public health initiatives to boost healthy eating, many chain restaurants now accentuate their healthiest options in a "healthy choices" section of the menu. In fact, the number of healthy menu items offered at restaurants has increased in recent years (Food Genius, 2014). Though it may seem like a good idea to highlight the healthiest options on the menu, a growing psychological literature suggests that emphasizing health could have counterintuitive effects. Health-focused food labeling can negatively influence people's expectations and sensory experiences (e.g., Kähkönen & Tuorila, 1998; Wansink, Park, Sonka, & Morganosky, 2000). For example, foods perceived as healthier taste worse (Raghunathan, Naylor, & Hoyer, 2006; Wansink, Park, Sonka, & Morganosky, 2000), are less enjoyable (Raghunathan, Naylor, & Hoyer, 2006; Wansink, Park, Sonka, & Morganosky,

---

Bradley P. Turnwald, Department of Psychology, Stanford University; Dan Jurafsky, Department of Linguistics and Department of Computer Science, Stanford University; Alana Conner and Alia J. Crum, Department of Psychology, Stanford University.

This material is based upon work supported by the National Science Foundation Graduate Research Fellowship Program Grant DGE-114747 and by the Robert Wood Johnson Foundation. We thank Cayla Hatton and Danielle Boles for assistance in menu collection and data organization for this study.

Correspondence concerning this article should be addressed to Bradley P. Turnwald, Department of Psychology, Stanford University, Building 420, Jordan Hall, Room 384, Stanford, CA 94305-2130. E-mail: [turnwald@stanford.edu](mailto:turnwald@stanford.edu)

2000), and make people hungrier (Finkelstein & Fishbach, 2010) compared with the same foods not portrayed as healthy. Furthermore, perceived healthiness directly represses physiological satiety and metabolism, as indicated by less precipitous postmeal reductions in the hunger hormone, ghrelin (Crum, Corbin, Brownell, & Salovey, 2011). These findings suggest a pervasive mindset that healthy food is not delicious or satisfying—a mindset that can operate outside of conscious awareness (Raghunathan, Naylor, & Hoyer, 2006).

Although restaurants may have good intentions in making their healthier items more visible, highlighting the health components of these foods may undermine healthier eating by reinforcing the mindset that healthy is not tasty. This possibility is intriguing, yet no research to date has systematically explored the language restaurants use to describe healthy food. Previous linguistic studies of food packaging (Freedman & Jurafsky, 2011), menus (Jurafsky, Chahuneau, Routledge, & Smith, 2016; Zwicky & Zwicky, 1980), and consumer reviews (Jurafsky, Chahuneau, Routledge, & Smith, 2014) revealed stark differences in thematic descriptions of foods of different prices. The present study is the first to explore how chain restaurants describe healthy and standard menu items. The descriptions of menu items marked as “healthy” were compared to descriptions of standard menu items at chain restaurants. It was hypothesized that healthy foods would be described with less appealing themes than standard menu items, in line with a broader American mindset that healthy is not tasty.

## Method

To examine how restaurants portray their healthiest foods, as compared to their standard offerings, menus were collected from the 100 top-selling chain restaurants (“2015 top 100,” 2015) in the casual/family dining category that had a healthy menu section or items marked with healthy logos. Thirty-seven of the top 100 chain restaurants were categorized as casual/family dining, and of these, 26 restaurant menus contained a healthy section (online supplemental Table S1). These 26 menus contained 262 healthy menu items with 5,873 words and 2,286 standard menu items with 38,343 words.

To generate qualitative themes, the title and description of every menu item (drinks excluded) were entered into a library blind to menu type (i.e., healthy or standard). Drawing on established semantic practices, prior lexicons, and published linguistic themes, as well as our initial examination of the menus (Freedman & Jurafsky, 2011; Jurafsky et al., 2016; Larcker & Zakolyukina, 2012; Zwicky & Zwicky, 1980), descriptive words were organized into 22 themes (online supplemental Table S2; all words that did not fit into a theme are in online supplemental Table S3). Some themes (e.g., “size”) were drawn directly from related research (Jurafsky et al., 2016). Other themes of interest from a social health perspective (e.g., “excitement”) had no precedent in the literature and were constructed from the library of words in this menu sample, blind to menu type.

A normalized frequency for standard items and for health-labeled items was obtained for each theme. To ensure that each word or phrase was indeed used in the context embodied by a given theme (e.g., “*under* 600 calories” represents the deprivation theme, but “children 10 and *under*” does not), each word or phrase was examined case by case in its sentence context. This resulted in exclusion of 81 word occurrences across all themes in the data set

(less than 1% of these word occurrences in the data set). All exclusions are marked in supplemental Table S2 in the online materials, and the following themes are the only themes that had more than one occurrence excluded from the frequency based on this context analysis (frequency of occurrences excluded in parentheses): size (9), vague positive (3), choice (29), farm (21), simple (3), and deprivation (10). Removal of these incorrect context words had no effect on the significance level or the direction of the effect for any theme.

To quantify differences in theme emphases between health-labeled items and standard menu items, log-likelihood ratios of normalized theme word frequencies in health-labeled items compared to that of standard menu items were calculated (Cressie & Read, 1984; Rayson & Garside, 2000). Since conventional Pearson’s chi-squared tests critically depend on assumptions of normality, log-likelihood ratios are a much more reliable alternative for text analysis, allowing for comparisons of both rare and common word occurrences with much smaller libraries than tests that assume normal distributions require (Dunning, 1993). To determine whether a given theme was represented significantly differently in the healthy corpus compared to the standard menu corpus, log-likelihood ratios were compared to the chi-squared test statistic critical value (1 degree of freedom). Word frequencies were calculated using NVivo qualitative data analysis software (QSR International Pty Ltd., Version 10, 2012).

## Results

Items in the healthy menu included seafood (20.61%), chicken (15.27%), appetizers/sides (14.89%), salads (14.12%), steak (7.25%), breakfast (6.87%), sandwiches (6.11%), soups (6.11%), and other (5.33%). Log-likelihood analyses revealed that descriptions of these healthy menu items used significantly fewer exciting, fun, traditional, American regional, texture, provocative, spicy hot, artisanal, tasty, and indulgent words than did standard menu items (all log-likelihood ratios and odds ratios are located in Table 1). In contrast, descriptions of healthy menu items used significantly more foreign, fresh, simple, macronutrient, thinness, depriving, and nutritious words. There were no significant differences in use of size, vague positive, choice, social, or farm themes. Also of interest, healthy menu items comprised only 7.7% (95% confidence interval [CI] [5.4%, 9.9%]) of menu item space, and menus contained fewer than two images ( $M = 1.7$ , 95% CI [0.8, 2.5]) of healthy items as compared to 22.8 images (95% CI [13.5, 32.1]) of standard items.

## Discussion

The data presented herein reveal a distasteful inequity in how restaurants currently portray healthy foods, as compared to standard foods. These top-selling restaurants, accounting for well over 10,000 dining locations in the United States, describe their healthiest choices as less appealing and with far more health-related themes than they describe standard items. At a time when obesity affects more than one in three Americans, presenting healthy menu options as far less appealing than standard options has important implications for dietary health because people prioritize taste and indulgence over health (Albright, Flora, & Fortmann, 1990; Colby et al., 1987), particularly when dining out (NPD Group, Inc., 2013). Numerous studies show that labeling food as healthy de-

Table 1  
Results of Healthy Menu Item Versus Standard Item Descriptions

Theme	Odds ratio [95% CI]	Log likelihood	Frequency in healthy menu (% of words)	Frequency in standard menu (% of words)	Exemplar words
<i>Words more likely to occur in standard menu</i>					
Exciting	3.26 [1.73, 6.15]	19.26***	0.17	0.55	Crazy, spellbinding, action, adventure, blasts, kaleidoscope
Fun and engaging	2.04 [1.56, 2.66]	33.11***	1.00	2.03	Fun, dippable, bites, skewered, stacker, tanglers
Traditional	1.96 [1.56, 2.47]	38.85***	1.35	2.61	Countryside, housemade, classic, traditional, famous, recipe
American regional	1.96 [1.31, 2.92]	13.04***	0.44	0.86	Philly, California, Maine, New Orleans, Hawaiian, Nashville
Texture	1.95 [1.50, 2.54]	29.31***	1.02	1.98	Crispy, creamy, crunchy, flaky, gooey, velvety
Provocative	1.89 [1.96, 3.73]	4.04*	0.15	0.29	Dangerous, dirty, naked, temptation, sinful, envy
Spicy hot	1.64 [1.12, 2.40]	7.29**	0.49	0.81	Buffalo, mesquite, chipotle, fiery, firecracker, burnin'
Artisan	1.63 [1.07, 2.48]	5.96*	0.41	0.67	Artisan, handcrafted, hand-prepared, premium, finest, refined
Taste	1.52 [1.11, 2.08]	7.71**	0.75	1.13	Sweet, sour, salty, tangy, flavorful, delicious
Indulgent	1.37 [1.14, 1.65]	12.04***	2.21	3.01	Bliss, indulge, richest, succulent, mouth watering, decadent
<i>No difference in healthy menu vs. standard menu</i>					
Size	1.32 [.92, 1.88]	2.46	0.58	0.76	Monster, heaping, biggest, mammoth, huge, giant
Vague positive	1.27 [.77, 2.10]	.93	0.29	0.37	Great, perfect, amazing, best, tremendous, fabulous
Choice	1.13 [.81, 1.57]	.54	0.68	0.77	Choose, options, pick, choices, "you like", substitute
Farm	1.20 [.87, 1.66]	1.15	0.73	0.61	Farm, farmer, field, harvest, vine-ripened, raised
Social	2.72 [.96, 7.72]	3.01	0.09	0.03	Family, everyone, people, mama, daddy, granny
<i>Words more likely to occur in healthy menu</i>					
Foreign	1.27 [1.02, 1.58]	4.26*	1.62	1.28	Asian, Italian, French, Tuscan, Thai, Mexican
Fresh	1.38 [1.09, 1.75]	6.39*	1.41	1.03	Fresh, freshly
Simple	3.27 [1.68, 6.37]	10.25**	0.22	0.07	Simple, dry, mild, plain, mildly, simply
Macronutrients	8.76 [5.57, 13.77]	81.89***	0.75	0.09	Carb, fiber, fat, grain, protein, whole wheat
Thinness	10.72 [7.22, 15.91]	134.28***	1.11	0.10	Light, lighter, enlightened, skinnylicious, lighten, lites
Deprivation	17.70 [8.56, 36.59]	68.68***	0.46	0.03	Fat free, low-fat, sugar-free, no sugar added, low carb, reduced-fat
Nutritious	164.61 [40.04, 676.7]	185.49***	0.85	0.01	Wholesome, nutritional, fit, fit-fare, healthy

*Note.* Themes are organized by odds ratio from overrepresentation in descriptions of standard menu items (top section) to overrepresentation in descriptions of healthy menu items (bottom section). Themes in the center section showed no significant difference by menu type. For reference, the frequency of "with" (the most common word) was 4.0% in the entire data set. Odds ratios were calculated by dividing the corpus with higher normalized frequency by the corpus with lower normalized frequency such that all odds ratios are >1. CI = confidence interval.

\*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

creases preference (e.g., Raghunathan, Naylor, & Hoyer, 2006; Wansink, Park, Sonka, & Morganosky, 2000) and has detrimental effects for feelings of satiety (Finkelstein & Fishbach, 2010; Suher, Raghunathan, & Hoyer, 2016) and actual physiological satiety (Crum, Corbin, Brownell, & Salovey, 2011). Although the current study did not assess people's food choices, other studies show that, in general, foods that are described as less appealing are chosen less frequently (Wansink, Painter, & Van Ittersum, 2001) and perceived as less tasty (Wansink, Van Ittersum, & Painter, 2005). Furthermore, one study found that explicitly labeling snacks as a "healthy choice" decreased preference more than a subtle image that did not mention health (Wagner, Howland, & Mann, 2015). These findings suggest that the overwhelming emphasis on health in healthy menu sections could reduce people's selection of the most nutritious options at restaurants.

In the current study, the theme most lacking in the healthy item descriptions was "exciting." Yet in American culture, the most highly valued emotional state is high-arousal positivity (i.e., excitement; Tsai, Knutson, & Fung, 2006). Furthermore, healthy item descriptions used more foreign words and fewer traditional and American regional words, suggesting that healthy foods are not familiar. By failing to associate healthy foods with either valued emotions or familiarity, chain menus likely reduce the attractiveness of healthy menu items. Healthy menu item descrip-

tions also failed to leverage artisanal or farm words, even though these items are more likely to be artisanal or from farms than are standard items. Perhaps unexpected was that descriptions of standard items did not include more size or choice words, although they are perceived to be more filling (Suher, Raghunathan, & Hoyer, 2016) and more customizable than healthy foods. However, other themes for which there was no difference by menu type, such as vague positive and social words, do not rely on specific attributes of foods and could be used more frequently to boost the appeal of healthy items.

Taken together, these results offer a potential solution for promoting healthier dining choices: Improve how menus present healthy dishes. First, menus could portray healthy items as being just as appealing as standard items. These descriptions need not be false; in many cases, healthy foods are provocative and exciting, with tantalizing sauces and seasonings. Second, if menus are going to highlight their healthiest items, they could allocate more space and images to these items, rather than giving less than 8% of menu space and fewer than two images on average. Third, if menus are going to present healthy items as less appealing and give them such a small space, perhaps they should not have a devoted submenu at all. These seemingly small changes could promote healthier choices by improving how appealing diners perceive healthy options to be, as opposed to conventional and largely

unsuccessful strategies that emphasize restriction and rely on individual willpower (Mann, Tomiyama, & Ward, 2015).

At a cultural level, changing how healthy foods are described might also help to change the pernicious mindset that healthy food is not tasty. Although a few of the menus were exemplary in using appealing descriptions for their health-labeled entrees, (e.g., “cherry chipotle glazed salmon,” or “housemade Argentinian-inspired chimichurri sauce”), these results suggest that the way most menus currently portray healthier items reinforces the mindset that healthy food is not delicious. As a result, despite intentions to increase healthy choices, healthy menus may be undermining the very behaviors they are designed to promote.

Much can be done to make healthy options more appealing, and future work is needed to understand how altering descriptions in restaurant settings could have cascading effects on food choice, metabolism, satisfaction, and broader mindsets about healthy eating. In the grand scheme of possible public health changes for combating obesity and diabetes, improving descriptions of healthy foods would be a relatively cost- and time-effective route to improve dietary health.

## References

- Albright, C. L., Flora, J. A., & Fortmann, S. P. (1990). Restaurant menu labeling: Impact of nutrition information on entree sales and patron attitudes. *Health Education Quarterly*, *17*, 157–167. <http://dx.doi.org/10.1177/10901981900170020317>
- An, R. (2016). Fast-food and full-service restaurant consumption and daily energy and nutrient intakes in US adults. *European Journal of Clinical Nutrition*, *70*, 97–103. <http://dx.doi.org/10.1038/ejcn.2015.104>
- Colby, J. J., Elder, J. P., Peterson, G., Knisley, P. M., & Carleton, R. A. (1987). Promoting the selection of healthy food through menu item description in a family-style restaurant. *American Journal of Preventive Medicine*, *3*, 171–177.
- Cressie, N., & Read, T. R. (1984). Multinomial goodness-of-fit tests. *Journal of the Royal Statistical Society, Series B: Methodological*, *46*, 440–464.
- Crum, A. J., Corbin, W. R., Brownell, K. D., & Salovey, P. (2011). Mind over milkshakes: Mindsets, not just nutrients, determine ghrelin response. *Health Psychology*, *30*, 424–429. <http://dx.doi.org/10.1037/a0023467>
- Dunning, T. (1993). Accurate methods for the statistics of surprise and coincidence. *Computational Linguistics*, *19*, 61–74.
- Finkelstein, S. R., & Fishbach, A. (2010). When healthy food makes you hungry. *Journal of Consumer Research*, *37*, 357–367. <http://dx.doi.org/10.1086/652248>
- Food Genius. (2014, December 15). *Healthy and the “health halo”*. Available from <http://blog.getfoodgenius.com/healthy-and-the-health-halo-food-genius-publishes-new-industry-research-report/>
- Freedman, J., & Jurafsky, D. (2011). Authenticity in America: Class distinctions in potato chip advertising. *Gastronomica: Journal of Critical Food Studies*, *11*, 46–54.
- Jurafsky, D., Chahuneau, V., Routledge, B. R., & Smith, N. A. (2014). Narrative framing of consumer sentiment in online restaurant reviews. *First Monday*. Advance online publication. <http://dx.doi.org/10.5210/fm.19i4.4944>
- Jurafsky, D., Chahuneau, V., Routledge, B. R., & Smith, N. A. (2016, October 18). Linguistic markers of status in food culture: Bordieu’s distinction in a menu corpus. *Journal of Cultural Analytics*. Advance online publication. <http://dx.doi.org/10.22148/16.007>
- Kähkönen, P., & Tuorila, H. (1998). Effect of reduced-fat information on expected and actual hedonic and sensory ratings of sausage. *Appetite*, *30*, 13–23. <http://dx.doi.org/10.1006/appe.1997.0104>
- Larcker, D. F., & Zakolyukina, A. A. (2012). Detecting deceptive discussions in conference calls. *Journal of Accounting Research*, *50*, 495–540. <http://dx.doi.org/10.1111/j.1475-679X.2012.00450.x>
- Lin, B.-H., & Guthrie, J. F. (2012, December). Nutritional quality of food prepared at home and away from home, 1977–2008. Retrieved from Ideas Website: <https://ideas.repec.org/p/ags/uersib/142361.html#cite>
- Mann, T., Tomiyama, A. J., & Ward, A. (2015). Promoting public health in the context of the “obesity epidemic”: False starts and promising new directions. *Perspectives on Psychological Science*, *10*, 706–710. <http://dx.doi.org/10.1177/1745691615586401>
- National Center for Health Statistics. (2016). *Health, United States, 2015: With special feature on racial and ethnic health disparities*. Hyattsville, MD: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. Retrieved from <https://www.cdc.gov/nchs/data/abus/abus15.pdf>
- National Restaurant Association. (2008, December 18). *Industry forecast predicts trends in healthier options and “greener” restaurants in 2009* [Press release]. Retrieved from <http://www.restaurant.org/Pressroom/Press-Releases/Industry-Forecast-Predicts-Trends-in-Healthier-Opt>
- NPD Group, Inc. (2013, June 11). *Healthy at foodservice—Consumer expectations put in perspective*. Available from <https://www.npd.com/wps/portal/npd/us/news/press-releases/consumers-make-healthy-choices-at-restaurants-by-cutting-out-or-down-reports-npd/>
- Raghunathan, R., Naylor, R. W., & Hoyer, W. D. (2006). The unhealthy = tasty intuition and its effects on taste inferences, enjoyment, and choice of food products. *Journal of Marketing*, *70*, 170–184. <http://dx.doi.org/10.1509/jmkg.70.4.170>
- Rayson, P., & Garside, R. (2000, October 1–8). Comparing corpora using frequency profiling. In proceedings of the *workshop on Comparing Corpora, held in conjunction with the 38th annual meeting of the Association for Computational Linguistics (ACL 2000)*; pp. 1–6. Hong Kong, China.
- Suher, J., Raghunathan, R., & Hoyer, W. D. (2016). Eating healthy or feeling empty? How the “healthy = less filling” intuition influences satiety. *Journal of the Association for Consumer Research*, *1*, 26–40. <http://dx.doi.org/10.1086/684393>
- 2015 top 100: Growth in chain U.S. systemwide sales. (2015, June 19). *Nation’s Restaurant News*. Retrieved from <http://www.nrn.com/us-top-100/2015-top-100-growth-chain-us-systemwide-sales>
- Tsai, J. L., Knutson, B., & Fung, H. H. (2006). Cultural variation in affect valuation. *Journal of Personality and Social Psychology*, *90*, 288–307. <http://dx.doi.org/10.1037/0022-3514.90.2.288>
- Wagner, H. S., Howland, M., & Mann, T. (2015). Effects of subtle and explicit health messages on food choice. *Health Psychology*, *34*, 79–82. <http://dx.doi.org/10.1037/hea0000045>
- Wansink, B., Painter, J. E., & Van Ittersum, K. (2001). Descriptive menu labels’ effect on sales. *Cornell Hotel and Restaurant Administration Quarterly*, *42*, 68–72.
- Wansink, B., Park, S. B., Sonka, S. T., & Morganosky, M. (2000). How soy labeling influences preference and taste. *International Food and Agribusiness Management Review*, *3*, 85–94. [http://dx.doi.org/10.1016/S1096-7508\(00\)00031-8](http://dx.doi.org/10.1016/S1096-7508(00)00031-8)
- Wansink, B., Van Ittersum, K., & Painter, J. E. (2005). How descriptive food names bias sensory perceptions in restaurants. *Food Quality and Preference*, *16*, 393–400. <http://dx.doi.org/10.1016/j.foodqual.2004.06.005>
- Zwicky, A. D., & Zwicky, A. M. (1980). America’s national dish: The style of restaurant menus. *American Speech*, *55*, 83–92. <http://dx.doi.org/10.2307/3050498>

Received November 4, 2016

Revision received February 2, 2017

Accepted February 9, 2017 ■