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Who reports noticing and using calorie information posted on fast food restaurant menus?

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Abstract

Objectives—Identify consumer characteristics that predict seeing and using calorie information on fast food menu boards.

Methods—Two separate data collection methods were used in Philadelphia during June 2010, several weeks after calorie labeling legislation went into effect: 1) point-of-purchase survey and receipt collection conducted outside fast food restaurants (N=669) and 2) a random digit dial telephone survey (N=702). Logistic regressions were used to predict the odds of reporting seeing, and of reporting seeing and being influenced by posted calorie information.

Results—Of the 35.1% of point-of-purchase and 65.7% of telephone survey respondents who reported seeing posted calorie information, 11.8% and 41.7%, respectively, reported that the labels influenced their purchasing decisions; of those influenced, 8.4% and 17% reported they were influenced in a healthful direction. BMI, education, income, gender, consumer preferences, restaurant chain, and frequency of visiting fast food restaurants were associated with heterogeneity in the likelihood of reporting seeing and reporting seeing and using calorie labels.

Conclusions—Demographic characteristics and consumer preferences are important determinants in the use of posted calorie information. Future work should consider the types of consumers this information is intended for, and how to effectively reach them.

Background

In 2008, New York City became the first jurisdiction to implement a city-wide calorie labeling policy that required fast food restaurants with more than fifteen locations nationally to post the calorie content of items on their menus.¹ Two years later, in 2010, the federal government passed similar legislation as part of the Patient Protection and Affordable Care

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Act, requiring restaurant chains with more than twenty locations to post calorie information on menus.² A key objective of these policies is to assist consumers in making more informed decisions and to encourage consumers to reduce their consumption of foods that are associated with rising rates of obesity in adults and children.³

Though many consumers report seeing calorie information and a subset report using calorie information, most controlled studies do not indicate that calories purchased change much, if at all.^{4,5} The mechanisms by which fast food restaurant menus could affect consumer behavior are complex. Posted calorie information on menu boards assumes consumers have sufficient knowledge of the number of calories they should consume to maintain a healthy weight and requires that consumers read and subsequently use that information in deciding what to purchase.

Not all consumers notice the information on fast food menu boards. A 2009 study in New York City found that after the introduction of calorie information on menu boards, there was a significant increase in the number of consumers that noticed calorie information in the restaurant.⁵ Despite this, most studies indicate that only between 54 percent and approximately 60 percent of fast food patrons reported seeing the calorie information after it was posted⁵⁻⁷, though, in a more recent study this was 38 percent.⁸ It is unlikely at these findings are uniform across all consumers, so it is important to note who might be more likely or less likely to see and use this information.

Examining consumer responses to nutrition labels on packaged food provides important insights into which consumers notice and use calorie information at restaurants. Some have concluded that there is no relationship between existing nutrition knowledge and using food packaging nutrition labels⁹. A systematic review of who uses food packaging nutrition labels found that females, higher income individuals, health conscious individuals, and more educated individuals were more likely to report looking at food packaging nutrition labels.¹⁰ In addition, prior nutrition knowledge and a desire to eat healthy were associated with using food packaging nutrition labels.^{11,12}

In order for fast food consumers to respond to calorie information on menu boards it is necessary that they both notice and understand the posted calorie information. Individual characteristics can have an impact on nutritional knowledge and the likelihood of reporting responding to posted calorie information. According to one study low-income individuals and non-Whites had lower levels of nutrition knowledge compared to their non-whites.⁹ A second study found that younger individuals and higher socioeconomic status individuals had a better understanding of nutrition than their counterparts.¹² Women who reported seeing calorie information were also more likely to report the labels influenced their purchasing decision. In addition, there is some evidence that those who live in lower-income areas are less likely to use the information.¹³ Two studies conducted in cities that implemented labeling, New York and Philadelphia, concluded that those with knowledge about nutrition and those already interested in nutrition and healthy eating were more likely to report future calorie label use.^{8,14} Also relevant to the use of calorie labels were a failure to fully comprehend calories and/or a failure to eat healthy.¹⁴

This study contributes to the literature by directly examining characteristics that predict seeing and reporting utilizing calorie label use, two key steps necessary for the information to influence consumer choice. Using two unique datasets that are comparable yet have key and important differences, we present an analysis of the associations between the demographic characteristics and nutritional knowledge of fast food consumers with the rate at which they observed calorie information and the rate that this information influenced their choices.

Methods

Our study used survey datasets collected simultaneously using two distinct survey sampling methods: a point-of-purchase (POP) survey and a telephone survey. Data were gathered in Philadelphia in December 2009, several weeks prior to when calorie posting requirements in fast food restaurants went into effect, and in June 2010, several months after the Philadelphia legislation went into effect. Given that the data were collected as part of a larger study of the impact of labeling, data collection was also done in a comparison city, Baltimore. Here our focus is on the use of calorie labeling on a menu board and we only examine data from Philadelphia approximately four months after the introduction of labeling.

Data Collection: POP Survey

POP surveys were administered and fast food receipts were collected from customers at three fast food restaurants: McDonald's (eight locations), Burger King (four locations) and KFC (three locations). These restaurant chains were chosen because they had the largest presence in Philadelphia, had locations in Baltimore, and did not have calorie labels on their boards before the law went into effect. The restaurant locations were chosen because the zip code characteristics of the selected restaurants matched most similarly with the zip code characteristics of restaurants of the same chain in Baltimore. Receipt and survey collection was done during lunch time (11:30 am-2:30 pm) or dinner time (5 pm-8 pm). Research assistants initiated survey and receipt collection by approaching fast food restaurant customers and asking for their receipt and a short survey in exchange for \$2.

Data Collection: telephone survey

While the POP data collection was underway, a random-digit dial telephone survey was also done. Telephone numbers from low income ZIP codes were oversampled for both cities. A screening question was used to limit survey respondents to individuals who went to a fast food restaurant in the past three months. Details on the larger study are published elsewhere.⁸

Measures

Using self-reported responses to survey prompts we constructed our three binary outcome measures: 1) respondent saw calorie information on the menu board, 2) respondent was influenced by the calorie information on the menu board (conditional on having reported seeing the information), and 3) respondent made more healthful food choices as a result of having reported seeing the information. The first outcome was informed by very similar

survey prompts in each of the surveys: in the POP survey, "Did you see any calorie information in the restaurant?" and in the telephone survey, "Did you see any calorie or nutrition information in a restaurant?". Respondents who had seen calorie labels were then asked questions to determine if their behavior was influenced as a result of seeing the labels: POP survey respondents were asked "Did the information influence what you bought?"; we coded telephone survey respondents as having been influenced by labels if they responded "yes" to either question "Did seeing that calorie or nutrition information in a restaurant change your eating habits, other than fast food?" or "Did seeing that calorie or nutrition information change your eating habits?".

The third outcomes measure, an indicator reporting that the healthful change was instituted because of calorie labels, was conditional on having reported being influenced by the labels. The respondents' food choice in response to the labels was classified as healthful in the POP survey if they reported ordering fewer calories. The telephone survey classified responses to the question "How did the calorie or nutrition information change your eating habits?". Possible responses that were coded as indicating a healthful change included: "eat lower calorie food", "avoid high calorie food", "eat healthier foods", "eat smaller portions", "cook at home more", "eat fast food less often", or "stop eating fast food." We feel these two classifications, while different from one another, are qualitatively similar enough to allow us to compare our results from both samples.

Both the POP and telephone surveys included information on demographics (gender, age, race/ethnicity, education, income, height, weight) and nutrition knowledge ("I can eat as many calories as I want and not gain weight? Agree or disagree."). Fast food meal frequency is measured as the number of meals in the prior week in the telephone survey and as the average number of fast food meals per week in the POP survey. The telephone survey regression models include a measure for household income that was not available in the POP survey. The POP survey regression models also include measures for the most important factor in deciding what to purchase at the fast food restaurant (nutrition, taste, or both taste and nutrition), what type of order was purchased (to go versus eat-in), and the restaurant chain where the data were collected (e.g., KFC, McDonald's, or Burger King).

An important difference between the two surveys is that respondents in the telephone survey were asked about the previous three months, while respondents in the POP survey were asked about the visit they just made. The sampling methods of the telephone survey data allows for identifying the rate in which fast food eating Philadelphia residents are noticing and using the posted calorie information. In contrast, the POP survey is limited to individuals interviewed after having made a fast food purchase. The two surveys, while with their respective differences and similarities represent distinct samples, describe which types of individuals see calorie information, use calorie information, and whether and how they use the information.

Statistical Analyses

We used a chi-squared test to measure demographic differences among our key outcome variables. Each of our binary outcomes – having reported 1) seeing calorie labels, 2) being influenced by the calorie information, and 3) having healthier food options because of

seeing posted calorie information - were regressed using logistic models on demographics, nutrition knowledge, and the frequency of weekly fast food meal consumption. All standard errors in the POP survey models will be clustered at the type of restaurant level (i.e., one of the three chains). POP survey models were also run where the standard errors were clustered at the individual restaurant level. Results not shown but are available upon request. All analyses were performed using Stata version 12.0 (StataCorp, College Station, Texas, USA).

Results

Table 1 contains summary statistics for the POP survey sample and the telephone survey sample. The telephone survey (n=702) had a response cooperation rate of 11 percent, and a contact rate of 35 percent. Over half of respondents (53.4 percent) reported going to a fast food restaurant in the past three months. The majority of respondents were female, non-white, above the age of 50, either overweight or obese, had more education than a high school degree, and had consumed fast food in the prior week. Data were not collected on consumer-survey contact or response rates, but studies with very similar methodology have reported 60% participation.¹⁵ For the POP survey (N=669), the majority of respondents were male, under the age of fifty, had a high school education or less, and were overweight or obese.

Nearly two thirds of telephone survey respondents (65.7 percent) reported seeing calorie information on menu boards in the last three months and one third of POP survey respondents (35.1 percent) reported seeing calorie information on the menu board at the restaurant they just visited. Females, respondents with some college education or more, respondents with higher income, and respondents who do not believe they can eat as much as they want and not gain weight all were more likely to have noticed the menu board calorie information in the telephone survey sample. We find similar results in the POP survey for females and respondents with more than a high school education. Further we find that the more often an individual consumed fast food in a given week, the more likely they were to see the calorie labels. Consumers who care about nutrition when making their purchase, or who eat their meal in the restaurant were more likely to notice the menu board calorie labels. Finally, customers at KFC and Burger King restaurants were more likely to see calorie information on menu boards than customers at McDonald's.

Of the telephone survey respondents, 41.7 percent reported that the information influenced their purchasing decision. Only 11.8 percent of POP survey respondents reported that the information had ever influenced their purchasing decision. Of the POP survey respondents who indicated that they saw the posted calorie information, 33.6 percent reported changing their behavior during that visit to a fast food restaurant. Similar sub-groups in both samples were more likely to have noticed and be influenced by the calorie information on fast food restaurant menu boards. Females, respondents with some college education or more, respondents with higher income, and respondents who do not believe they can eat as much as they want and not gain weight all were more likely to report being influenced by the posted information. The overweight or obese, and frequent fast food visitors in the telephone survey were statistically more likely to report being influenced by posted calorie information. In the POP survey we found that females, whites, and having more than a high

school education are predictors for an increased likelihood of reporting using posted calorie information. POP survey respondents who ate inside of the restaurant or purchased from Burger King were more likely to have used the posted calorie information. Finally, individuals who based their purchase off of nutrition or both nutrition and taste were more likely to see the posted calorie information than individuals who based their purchase off of taste only.

Approximately 8.4 percent of POP survey respondents reported that the posted calorie information influenced them in a more healthful direction, 23.8 percent of the sample of individuals who reported seeing the calories posted on restaurant menus. We found that 17 percent of telephone survey respondents reported that they changed their behavior in healthier direction. Conditional on having seen the posted calorie information, 25.8 percent of telephone survey respondents reported making a more healthful purchase at fast food restaurants. The telephone survey respondents that were most likely to be influenced in a more healthful direction include females, whites, Hispanics, those over the age of 30, respondents with some college education or more, respondents with higher income, the overweight or obese, respondents who frequent fast food establishments often and respondents who do not believe they can eat as many calories as they want. In contrast, there are no statistically significant differences in the proportions of being influenced in a healthful manner after seeing the posted calorie information amongst the POP survey respondents.

Not all respondents who were influenced by the labels were influenced in a healthful direction. Thirteen respondents, or .44 percent, of the telephone survey respondent sample reported an unhealthful response ("Eat higher calorie food" / "look for higher calorie food" / "eat less healthy food") to seeing calorie labels at a fast food restaurant. Similarly, 19 respondents, or 2.84 percent of all POP survey respondents, (8.08 percent of respondents who reported being influenced by the calorie information) reported they "bought food that was higher in calories" after seeing the calorie labels.

Table 2 includes the results from logistic regression models predicting the odds of reporting seeing calorie labels. In both the telephone survey and the POP survey, females have 1.89 (CI=1.29–2.78, $p=0.001$) and 1.59 (CI=1.22–2.08, $p=0.001$) times greater odds of reporting seeing calorie labels relative to males. Higher levels of education (i.e. greater than a high school degree) are associated with an increased likelihood of reporting seeing calorie labels. Those who earn over \$20,000 are more likely to see calorie information relative to those who earn less than \$20,000. In the POP survey overweight and obese individuals are statistically less likely to see the labels. Similarly individuals that go to fast food restaurants with greater frequency are more likely to see calorie labels, but there does not appear to be a monotonic dose effect. Instead the effect appears to plateau with three to four visits a week. Consumers who ate at the restaurant had a 2.06 (CI=1.03–4.12, $p=0.042$) times greater odds of reporting seeing the labels than customers who took their meals to go. Similarly individuals that chose their food primarily due to its nutritional value (OR = 2.03, CI=1.36–3.02, $p=0.001$), or its nutritional value and the taste of the item (OR = 1.69, CI=1.20–2.40, $p=0.003$) are more likely to use the calorie labels than those that base their decision solely on taste.

Table 3 presents the results of the logistic models where the outcome variable is a dichotomous variable for whether the respondent was influenced in using the calorie labels, as well as whether the change was in a healthful direction. Respondents aged between 31 and 50 years in the POP survey are more likely to be influenced in a healthful direction (OR=2.70, CI=1.25–5.84, $p=0.012$), while similar respondents in the telephone survey are not. Females are more likely to report being influenced by the labels and in a healthful direction in both samples. Higher educated respondents in both samples have increased odds to report using the labels in a healthful direction, but the results are not statistically significant. Overweight and obese individuals in the telephone survey have increased odds of reporting using the calorie labels in a healthful direction, but only obese individuals are at statistically significant increased odds (OR= 2.03, CI=1.04–3.94, $p=0.037$) This is in contrast to the POP survey where overweight individuals are statistically less likely to use calorie labels in a healthful direction (OR=0.47, CI=0.22–0.98, $p=0.044$). In both the telephone sample and the POP sample, respondents who say they can eat as many calories as they want to without losing weight are less likely to use the calorie labels in a healthful direction. Only in the telephone survey does the number of visits made to a fast food restaurant impact the likelihood of reporting being influenced by calorie labels in a healthful direction.

Several of the variables that were only included in the POP sample were statistically significant predictors of the use of calorie labels in a healthful way. Individuals who valued nutrition over taste were at 4.83 (CI=2.10–11.12, $p=0.000$) increased odds to using the calorie labels in a healthful direction. Respondents who based their purchase off both taste and nutrition were at 3.92 (CI=3.60–4.27, $p=0.000$) increased odds for being influenced in a healthful direction relative to purchases based off of taste alone. In addition, eating inside of the restaurant led to 2.31 (CI=1.46–3.65, $p=0.000$) greater odds of reporting being influenced in a healthful direction by the calorie information. Finally going to a McDonald's or a Burger King leads to a 2.02 (CI=1.57–2.61, $p=0.000$) and 2.49 (CI=1.85–3.34, $p=0.000$) increased odds, respectively, of being influenced by the labels in a healthful direction.

Discussion

Previous studies have discussed the heterogeneity in the salience of calorie labels at individual restaurants and types of restaurants.^{7,8,16} The characteristics that predict the likelihood of seeing calorie labels and using them had not been examined as extensively. Using two different datasets, we find that certain groups of people - females, whites, Hispanics, those over the age of 30, respondents with some college education or more, respondents with higher income, the overweight or obese, respondents who frequent fast food establishments often and respondents who do not believe they can eat as many calories as they want are more likely to use labels at a population level, and at fast food restaurants.

Consumers' preferences provide insight into their fast food purchasing behavior. Individuals who base their purchase on the perceived nutritional content of the food items, or both the nutritional content of the food item and the taste of the food item are more likely to notice posted calorie information and to use the calorie information when making purchasing decisions, relative to individuals who report preference for only taste of the food items.

Policy makers should recognize the fact that there might be a certain segment of the population that prefers taste when deciding to eat fast food and thus simply ignores the nutrition information. Respondents to the telephone surveys who had eaten fast food in the prior week and POP survey respondents who typically eat at fast food restaurants at least once a week are more likely to have noticed calorie labels compared to individuals who did not in the past week or do not usually eat at fast food restaurants. While the most frequent fast food eaters amongst the telephone survey participants reported that they were influenced by the labels, the frequency of fast food meal eating per week did not predict influence of calorie labels among POP survey participants.

Chain restaurant characteristics also play some role in the likelihood of reporting seeing calorie labels. For example both Burger King and McDonald's customers were less likely to notice calorie labels relative to KFC customers, but more likely to be influenced in a healthful direction if they did notice them, relative to KFC customers.

Few consumers who reported seeing the calorie information reported being influenced by the information. Similarly, a recent study concluded that individuals are more likely to use calorie information if the consumer finds the information relevant.¹⁷ Thus a reason for the low reported use of the calorie labels could be that they include information that is superfluous to consumers. Further work should be done to investigate this claim.

This study is not without limitations. As specified in past studies using the same data, there could be bias in how the individual restaurants were surveyed. In light of our survey response rate in the telephone survey, our analysis could be subject to bias due to non-randomness of unobserved variables among the consumers who opted out of participating in either the POP or telephone surveys.⁸ Since participation in either survey was voluntary and because we only sampled households with a landline telephone our findings have limited external validity. Furthermore, there were also differences in response rates and measures between the two surveys. As a result, the results of each survey are not completely comparable. Nevertheless, we also believe the measures from the two surveys represent very similar outcomes. In fact, despite these apparent differences in methods it is meaningful that we observe similar results from each sample. Finally, as these surveys rely on self-reported responses, we are not able to confirm that the fast food customers that reported purchasing fewer calories actually did so.

Independent of these limitations, this study offers a valuable contribution to the literature. Though menu labeling has been the subject of numerous studies, few specifically focus on and examine the consumer characteristics that explain the policy's effect on use of calorie information and purchasing decisions in both a fast food setting and a population based survey. We find that consumer characteristics – including reported preference of nutrition of meals, calorie knowledge, and education – all help explain the heterogeneous effect of calorie labels on consumer choice. With the national roll out of menu labeling at fast food restaurants due sometime in the next year, understanding who might use this information will be important to determine the potential impact on health disparities and whether outreach to particular groups is warranted. Policy makers should use this new information to tailor labels in a manner that can reach the populations they most care about.

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References

1. New York City Department of Health and Mental Hygiene. Notice of Intention to Repeal and Reenact Sec. 81.50 of the New York City Health Code. New York (NY): Department of Health and Mental Hygiene; 2007.
2. Public Law 111–148 Patient Protection and Affordable Care Act. Section 4205: Nutrition labeling of standard menu items at chain restaurants. 2010. Available online at <http://www.gpo.gov/fdsys/pkg/PLAW-111publ148/pdf/PLAW-111publ148.pdf>
3. Loewenstein G. Confronting reality: pitfalls of calorie posting. *Am J Clin Nutr.* 2011; 93:679–80. [PubMed: 21346094]
4. Finkelstein EA, Strombotne KL, Chan NL, Krieger J. Mandatory menu labeling in one fast-food chain in King County, Washington. *Am J Prev Med.* 2011; 40(2):122–7. [PubMed: 21238859]
5. Elbel B, Kersh R, Brescoll BL, Dixon LB. Calorie labeling and food choices: a first look at the effects on low-income people in New York City. *Health Aff.* 2009; 28:w1110–w1121.
6. Dumanovsky T, Huang CY, Bassett MT, Silver LD. Consumer awareness of fast-food calorie information in New York City after implementation of a menu labeling regulation. *Am J Public Health.* 2010; 12:2520–5. [PubMed: 20966367]
7. Krieger JW, Chan NL, Saelens BE, Ta ML, Solet D, Fleming DW. Menu labeling regulations and calories purchased at chain restaurants. *Am J Prev Med.* 2013; 44(6):595–604. [PubMed: 23683977]
8. Elbel B, Mijanovich T, Dixon B, Abrams C, Weitzman B, Kersh R, Auchincloss AH, Ogedegbe G. Calorie Labeling, Fast Food Purchasing and Restaurant Visits. *Obesity.* 2013; 1002/oby.20550
9. Nayga RM. Nutrition Knowledge, Gender, and Food Label Use. *J Consum Aff.* 2000; 34(1):97–112.
10. Cowburn G, Stockley L. Consumer understanding and use of nutrition labeling: a systematic review. *Public Health Nutr.* 2005; 8(1):21–8. [PubMed: 15705241]
11. Drichoutis AC, Lazaridis P, Nayga RM. Nutrition knowledge and consumer use of nutritional food labels. *Eur Rev Agric Econ.* 2005; 32 (1):93–118.
12. Grunert KG, Fernández-Celemin L, Wills JM, Storcksdieck genannt Bonsmann S, Nureeva L. Use and understanding of nutrition information on food labels in six European countries. *J Public Health.* 2010; 18:261–277. [PubMed: 21124644]
13. Dumanovsky T, Huang CY, Nonas CA, Matte TD, Bassett MT, Silver LD. Changes in energy content of lunchtime purchases from fast food restaurants after introduction of calorie labelling: cross sectional customer surveys. *BMJ.* 2011; 343:d4464. [PubMed: 21791497]
14. Auchincloss AH, Young C, Davis AL, Wasson S, Chilton M, Karamanian V. Barriers and facilitators of consumer use of nutrition labels at sit-down restaurant chains (a qualitative study using focus group data). *Public Health Nutr.* 2013; 6:1–8.
15. Dumanovsky T, Huang CY, Nonas CA, Matte TD, Bassett MT, Silver LD. Changes in energy content of lunchtime purchases from fast food restaurants after introduction of calorie labelling: cross sectional customer surveys. *BMJ.* 2011; 343:d4464. [PubMed: 21791497]
16. Roberto CA, Larsen PD, Agnew H, Baik J, Brownell KD. Evaluating the impact of menu labeling on food choices and intake. *Am J Public Health.* 2010; 100:312–318. [PubMed: 20019307]
17. Roseman MG, Mathe-Soulek K, Higgins JA. Relationships among grocery nutrition label users and consumers' attitudes and behavior toward restaurant menu labeling. *Appetite.* 2013; 71:274–278. [PubMed: 24012965]

Highlights

- Of POP respondents who saw calorie labels, 11.8% said it influenced purchases.
- 8.4% of POP respondents who were influenced said it was in a healthful direction.
- Of phone respondents who saw calorie labels, 41.7% said it influenced purchases.
- 17% of phone respondents who were influenced said it was in a healthful direction.
- Demographic characteristics and consumer preferences predict use of calorie labels.

Table 1

Who Noticed and Responded to Calorie Labels: Philadelphia, June–July 2010.

Telephone Survey sample				POP Survey Sample												
Sample				Who saw labels in last 3 months		Who saw and was influenced by kcal labels		Who saw and was healthful direction by kcal labels		Who saw labels during this restaurant visit		Of those who saw labels, who was influenced		Who saw and who was influenced in healthful direction by kcal labels		
	n	%		n	%	n	%	n	%	n	%	n	%	n	%	
Full sample	702	100	461	65.7	293	41.7	119	17	669	100	235	35.1	79	11.8	56	8.4
Sex																
Female	490	69.8	345	70.4 ***	225	45.9 ***	94	19.2 ***	292	44.8	114	39 **	42	14.4 **	31	10.6
Male	212	30.2	116	54.7	68	32.1	25	11.8	360	55.2	112	31.1	33	9.2	25	6.9
Race/ethnicity																
White	219	31.2	149	68	91	41.6	44	20.1 ***	104	15.6	46	44.2	24	23.1 ***	18	17.3
Black	348	49.6	225	64.7	148	42.5	53	15.2	470	70.3	156	33.2	44	9.4	30	6.4
Hispanic	56	8	37	66.1	27	48.2	14	25	74	11.1	24	32.4	9	12.2	7	9.5
Other	79	11.2	50	63.3	27	34.2	8	10.1	21	3.14	9	42.9	2	9.5	3	14.3
Age																
18–30	122	17.4	79	64.8	44	36.1	17	13.9 ***	261	39.2	93	35.6	20	7.7 **	13	5
31–50	263	37.5	183	69.6	122	46.4	49	18.6	242	36.3	94	38.8	38	15.7	31	12.8
>50	307	43.7	192	62.5	123	40.1	53	17.3	163	24.5	47	28.8	20	12.3	14	8.6
Education																
High School Degree or less	313	44.6	176	56.2 ***	106	33.9 ***	43	13.7 ***	421	66.7	126	29.9 ***	43	10.2 ***	31	7.4
Some college	212	30.2	159	75	94	44.3	34	16	121	19.2	46	38	14	11.6	11	9.1
BA or more	177	25.2	126	71.2	93	52.5	42	23.7	89	14.1	54	60.7	21	23.6	15	16.9
Household Annual Income																
<20K	166	23.7	96	57.8 ***	66	39.8 ***	27	16.3 ***	n/a	n/a	n/a		n/a	n/a	n/a	n/a

Telephone Survey sample				POP Survey Sample															
				Who saw labels in last 3 months		Who saw and was influenced by kcal labels		Who saw and was influenced in healthful direction by kcal labels		Who saw labels during this restaurant visit		Of those who saw labels, who was influenced		Who saw and who was influenced in healthful direction by kcal labels					
Sample		n	%	n	%	n	%	n	%	n	%	n	%	n	%				
b/w 20K and 40K				175	24.9	112	64	70	40	23	13.1	n/a	n/a	n/a	n/a				
b/w 40K and 60K				120	17.1	89	74.2	53	44.2	20	16.7	n/a	n/a	n/a	n/a				
>60K				148	21.1	111	75	77	52	37	25	n/a	n/a	n/a	n/a				
Missing				93	13.3	53	57	27	29	12	12.9	n/a	n/a	n/a	n/a				
Weight status																			
Under or Normal Weight				188	26.8	110	58.5 *	57	30.3 ***	20	10.6 ***	313	47.8	117	37.4	34	10.9	27	8.6
Overweight				245	34.9	163	66.5	105	42.9	44	18	137	20.9	42	30.7	14	10.2	8	5.8
Obese				239	34.0	167	69.9	118	49.4	49	20.5	205	31.3	39	19	30	14.6	22	10.7
Fast food meals consumed during prior week																			
0				351	50	209	59.5	122	34.8 ***	58	16.5 ***	59	8.8	11	18.6 **	6	10.2	5	8.5
1-2				209	29.8	152	72.7	102	48.8	35	16.7	99	14.8	38	38.4	15	15.2	12	12.1
3-4				62	8.8	45	72.6	32	51.6	10	16.1	118	17.6	51	43.2	19	16.1	13	11
5+				80	11.4	55	68.8	37	46.3	16	20	393	58.7	135	34.4	39	9.9	28	7.1
I can eat as many calories as I want and not gain weight																			
No				580	83.8	406	70 ***	265	45.7 ***	113	19.5 ***	501	75.5	182	36.3	62	12.4	47	9.4
Yes				112	16.2	49	43.8	25	22.3	5	4.5	163	24.6	53	32.5	17	10.4	12	7.4
What was most important when you decided what to eat today?																			
Nutrition				n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	88	13.6	37	42 ***	19	21.6 ***	15	17 *
Taste				n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	380	58.6	115	30.3	23	6.1	15	3.9
Both				n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	181	27.9	81	44.8	36	19.9	27	14.9

Telephone Survey sample				POP Survey Sample									
				Who saw and was influenced by kcal labels		Who saw and was influenced in healthful direction by kcal labels		Who saw labels during this restaurant visit		Of those who saw labels, who was influenced		Who saw and who was influenced in healthful direction by kcal labels	
Sample	Who saw labels in last 3 months	Who saw and was influenced by kcal labels	Who saw and was influenced in healthful direction by kcal labels	Sample	Who saw labels during this restaurant visit	Of those who saw labels, who was influenced	Who saw and who was influenced in healthful direction by kcal labels	Sample	Who saw labels during this restaurant visit	Of those who saw labels, who was influenced	Who saw and who was influenced in healthful direction by kcal labels		
n	%	n	%	n	%	n	%	n	%	n	%	n	%
Order type:													
Eat-in	n/a	n/a	n/a	n/a	24.6	72	46.5 ***	31	20 ***	23	14.8		
To Go	n/a	n/a	n/a	n/a	75.4	143	30.2	41	8.6	29	6.1		
Restaurant:													
McDonald's	n/a	n/a	n/a	n/a	59.9	119	29.7 ***	41	10.2 ***	30	7.5		
Burger King	n/a	n/a	n/a	n/a	26.9	81	45	33	18.3	23	12.8		
KFC	n/a	n/a	n/a	n/a	13.2	35	39.8	5	5.7	5	5.7		

Chi-squared significance test:

*** p<0.01,
** p<0.05,
* p<0.1

Table 2

Predicted odds of reporting having seen posted nutrition information: Philadelphia, June–July 2010^a. 95% confidence intervals are shown in parenthesis.

	Telephone Survey	POP Survey
	Odds of reporting having seen calorie labels	Odds of reporting having seen calorie labels
<i>Age</i>		
18–30	1	1
31–50	0.97 (0.57 – 1.67)	0.96 (0.57 – 1.62)
>50	0.61* (0.36 – 1.03)	0.61 (0.26 – 1.46)
<i>Sex</i>		
Male	1	1
Female	1.89*** (1.29 – 2.78)	1.59*** (1.22 – 2.08)
<i>Race/ethnicity</i>		
White	1	1
Black	0.70 (0.46 – 1.07)	0.88 (0.65 – 1.20)
Hispanic	1.23 (0.60 – 2.55)	0.64 (0.22 – 1.81)
Other	0.82 (0.44 – 1.55)	1.4 (0.28 – 7.09)
<i>Education</i>		
High school degree or less	1	1
Some college	2.28*** (1.48 – 3.52)	1.27 (0.78 – 2.04)
BA or more	1.49 (0.92 – 2.39)	3.63*** (3.34 – 3.95)
<i>Household Annual Income</i>		
<\$20k	1	n/a
b/w \$20K and \$40K	1.40 (0.85 – 2.31)	n/a
b/w \$40K and \$60K	2.11** (1.16 – 3.82)	n/a
>\$60K	2.55*** (1.42 – 4.56)	n/a
Missing	0.90 (0.50 – 1.62)	n/a
<i>Weight status</i>		
Under or Normal Weight	1	1
Overweight	1.32 (0.83 – 2.11)	0.64*** (0.54 – 0.76)
Obese	1.49 (0.91 – 2.45)	0.67* (0.45 – 1.01)
<i>I can eat as many calories as I want and not gain weight</i>		
No	1	1
Yes	0.43*** (0.26 – 0.71)	0.86** (0.76 – 0.98)
<i>Fast food meals consumer in prior week</i>		

	Telephone Survey	POP Survey
	Odds of reporting having seen calorie labels	Odds of reporting having seen calorie labels
0	1	1
1–2	2.23*** (1.46 – 3.41)	1.42** (1.01 – 1.99)
3–4	2.58*** (1.33 – 5.02)	2.21*** (1.84 – 2.65)
5+	1.84** (1.04 – 3.28)	1.79** (1.05 – 3.08)
<i>What was most important when you decided what to eat today?</i>		
Taste	n/a	1
Nutrition	n/a	2.03*** (1.36 – 3.02)
Both taste and nutrition	n/a	1.69*** (1.20 – 2.40)
<i>Order type:</i>		
To go	n/a	1
Eat-in	n/a	2.06** (1.03 – 4.12)
<i>Restaurant:</i>		
KFC	n/a	1
McDonald's	n/a	0.66*** (0.64 – 0.68)
Burger King	n/a	0.89 (0.67 – 1.18)
<i>Constant</i>	0.594 (0.231)	0.28*** (0.14 – 0.58)
<i>Observations</i>	663	548

^a95% Confidence intervals in parenthesis using robust standard errors are clustered at the restaurant chain level in the POP sample

p<0.01,

**
p<0.05,

*
p<0.1

Table 3

Predicted odds of reporting having changed behavior as a result of seeing posted nutrition information: Philadelphia, June-July 2010^a. Standard errors are shown in parentheses.

	Telephone Survey	POP Survey
	Odds of reporting having changed behavior in a healthful direction as a result of seeing posted nutrition calorie information	Odds of reporting having changed behavior in a healthful direction as a result of seeing posted calorie information
<i>Age</i>		
18–30	1	1
31–50	0.96 (0.49 – 1.89)	2.70 ** (1.25 – 5.84)
>50	0.86 (0.43 – 1.74)	1.33 (0.59 – 3.02)
<i>Sex</i>		
Male	1	1
Female	1.72 ** (1.05 – 2.83)	1.85 *** (1.41 – 2.43)
<i>Race/ethnicity</i>		
White	1	1
Black	0.65 (0.40 – 1.05)	0.52 (0.21 – 1.28)
Hispanic	1.56 (0.70 – 3.47)	0.82 (0.48 – 1.38)
Other	0.53 (0.22 – 1.27)	2.17 ** (1.03 – 4.54)
<i>Education</i>		
High School	1	1
Degree or less		
Some college	1.12 (0.65 – 1.93)	1.05 (0.59 – 1.87)
BA or more	1.66 * (0.93 – 2.97)	1.72 * (0.97 – 3.06)
<i>Household Annual Income</i>		
<\$20k	1	n/a
b/w \$20K and \$40K	0.87 (0.45 – 1.68)	n/a
b/w \$40K and \$60K	1.11 (0.56 – 2.18)	n/a
>\$60K	1.54 (0.81 – 2.91)	n/a
Missing	0.91 (0.41 – 2.04)	n/a
<i>Weight Status</i>		
Under or Normal Weight	1	1
Overweight	1.54 (0.81 – 2.94)	0.47 ** (0.22 – 0.98)
Obese	2.03 ** (1.04 – 3.94)	0.83 (0.44 – 1.55)
<i>I can eat as many calories as I want and not gain weight</i>		
No	1	1
Yes	0.29 ** (0.11 – 0.79)	0.51 *** (0.45 – 0.57)

	Telephone Survey	POP Survey
	Odds of reporting having changed behavior in a healthful direction as a result of seeing posted nutrition calorie information	Odds of reporting having changed behavior in a healthful direction as a result of seeing posted calorie information
<i>Fast food meals consumer in prior week</i>		
0	1	1
1–2	1.13 (0.67 – 1.90)	1.08 (0.40 – 2.88)
3–4	1.13 (0.53 – 2.42)	0.99 (0.18 – 5.41)
5+	1.81* (0.93 – 3.52)	0.89 (0.34 – 2.31)
<i>What was most important when you decided what to eat today?</i>		
Taste	n/a	1
Nutrition	n/a	4.83*** (2.10 – 11.12)
Both taste and nutrition	n/a	3.92*** (3.60 – 4.27)
<i>Order Type:</i>		
To Go	n/a	1
Eat-in	n/a	2.31*** (1.46 – 3.65)
<i>Restaurant:</i>		
KFC	n/a	1
McDonald's	n/a	2.02*** (1.57 – 2.61)
Burger King	n/a	2.49*** (1.85 – 3.34)
<i>Constant</i>	0.09*** (0.03 – 0.26)	0.0143*** (0.00 – 0.05)
Observations	655	548

^a95% Confidence intervals in parenthesis using robust standard errors are clustered at the restaurant chain level in the POP sample

p<0.01,

**
p<0.05,

*
p<0.1