



Investigating the Role of Visual Food Cues in Obesity Prevention Policy

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OBJECTIVES

Current Obesity Prevention Policy

More than 37% of American adults are obese, leading to serious and costly chronic diseases, such as diabetes, hypertension, and cardiovascular disease. Food-marketing strategies used to promote high fat and high sugar foods are contributing to these and other health issues faced by Americans. Unfortunately, most food-marketing regulations intended to encourage healthy-eating are not well positioned to compete with various food-marketing tactics, including visual appeals. For example, FDA-mandated Nutrition Facts tables are typically found back-of-package in less persuasively valuable areas. Further, food industry self-regulation efforts to place simplified nutrition and calorie labels front-of-package—where consumers are more likely to use them—have been similarly ineffective because visual marketing tactics (i.e., tasty looking food) are used to draw attention intentionally away from this information.



From a Behavioral Ecology Perspective

High fat and high sugar foods are more likely to draw attention and encourage eating due to their high energy value and human biological predispositions, especially when they look visually appealing. But, theory from a behavioral ecology perspective also suggests that the amount of food present at the time and the ease with which it can be obtained are key factors affecting our decision-making.

Objectives for Current Work

All of this means unregulated elements of packaging and menus can interfere with the success of obesity prevention calorie-labeling initiatives, especially for less health-motivated individuals. The current work examined how visual marketing tactics (i.e., tasty looking food images), the level of energy density of the foods, and the amount of foods to be chosen from interacted with calorie labels to influence how many calories individuals selected to eat in typical meals.

Objectives and Risks for Long-Term Work

Currently, labeling interventions that rely on motivated, able consumers are the only form of packaging intervention being entertained by the FDA, but the PI's previous data indicate that regulating visual food cues may be able to affect consumption choices in actual eating and purchasing contexts. The additional information gained in the current study adds nuance and important considerations for how to best accomplish evidence-based obesity prevention policies.

The long-term goal of this portion of the PI's research agenda is to make policy recommendations to help create healthier eating patterns. Focusing on restricting the availability of visual food cues and altering eating decision contexts influence individuals' decisions at a biological level, potentially making these interventions more likely to be effective across age, education, race, class, and other risk factor lines than interventions that rely on nutritional arguments.

The main risk of pursuing this line of work is ultimate ineffectiveness of the policy recommendations due to First Amendment considerations. Will these components of food marketing be deemed outside the scope of elements that can be regulated in commercial speech?

METHODS

Participants

N=115 young adults ($M_{age} = 21.23, SD_{age} = 4.8$), predominantly female ($N=80$)

Design

2 (Calorie Label: Present/Absent) x 2 (Food energy density: higher, lower) x 2 (Visual Food Cue: Present/Absent) x 2 (Array Size: 18 choices, 6 choices) x 3 (repetition of menu) mixed factorial design.

Independent Variables

Calorie Label. Calorie labels were present under the food label or not.

Food Energy Density. Two levels of energy density were presented. Higher energy density items included higher calorie items (e.g., bacon, cheese, etc.). Lower energy density items included lower calorie items (e.g., salads, more vegetables).

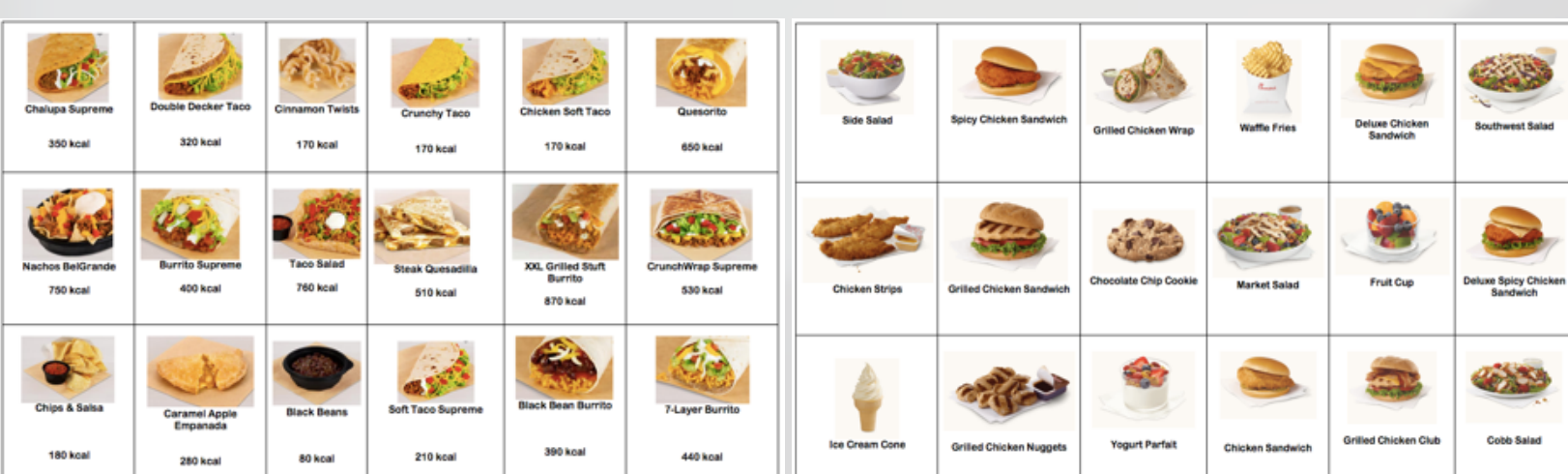
Visual Food Cue. An image of the food item was present or absent.

Array Size. Menus had either 18 or 6 items from which to choose. This was not fully crossed with other factors. All 18 size arrays had a mixture of high and low density items. All small arrays had either high or low density items.

Repetition. Three fast food restaurants were used to be able to generalize to a set of food types rather than a specific food. This was not fully crossed. Individuals were randomly assigned to make selections from calorie label/energy density/array size sets from one of the restaurant menus.

Stimuli

27 menus were created that varied the factors above. Individuals viewed and selected from 9 of them. Examples below.



Dependent and Control Variables

Calories Selected for Consumption: Individuals were asked to make selections from food menus for items they would select in a typical meal. The reported calories for the items selected were summed.

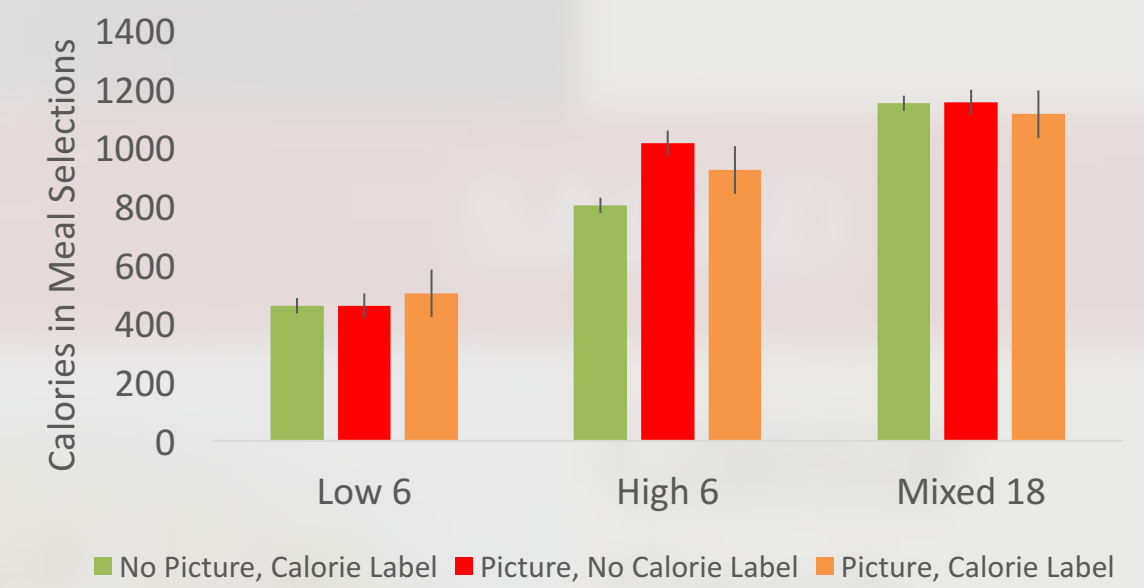
Nutrition Knowledge. Individuals completed the General Nutrition Knowledge Questionnaire.

Motivation to Restrict Calories. Individuals completed the Restricted Eating Scale of the Dutch Eating Behavior Questionnaire.

RESULTS

Key Take-Aways

1. Pictures of food still increase consumption, in general, even when a calorie label is present
2. When more food is present (i.e., larger array), individuals choose to eat more.
3. In choice contexts where all selections are likely problematic (i.e., highly energy dense), the calorie labels make the most difference, especially when pictures are not present.
4. These results are not affected by nutrition knowledge, but are affected by motivation to restrict calories, as would be expected.



CONCLUSION

In sum, the preliminary results of this study indicate first, that the type of cues that are available play a part in our decision making about food, and second, that the amount and types of food available are important in constraining our choices as well.

Why does this matter? The cues used on packaging and on menus are unregulated appeals and they drive a considerable amount of behavior via biological mechanisms. In the absence of higher-order motivation to control calorie intake, visual food cues are a key predictor of consumption of greater calorie intake. This means that unless one is particularly motivated to watch their eating, they are likely to gain weight due to these marketing techniques.

Calorie labels are only useful in decreasing calorie intake when the only choices are highly energy dense, but again, most of this variance is due to higher-order motivation to restrict calories.

Lastly, the amount and types of foods available play a significant role apart from visual food cues. From a behavioral ecology perspective, organisms choose foods which are more energy dense in general, especially when they are easier to obtain. Further, when food is plentiful, individuals eat more in general, to maximize their energy stores for lean times. These biological predispositions work against those in an obesogenic food environment, leading to weight gain and chronic illness. Further, empirical data from the field of nutrition have shown that individuals have a psychological bias they use as a heuristic when selecting foods that may also be related to these biological underpinnings. When individuals are consuming foods they consider healthier (i.e., more nutrient dense), they tend to underestimate the amount of calories they are consuming. In effect, individuals eat more calories than they might when eating only foods they consider unhealthy. The data presented here support these previous findings. When more food choices were available, individuals selected overall more calories to eat than when only low or high energy density foods were available. Thus, individuals may have selected a highly energy dense item AND a lower energy density item rather than only one or the other.

It is important to note that nutrition knowledge didn't account for these effects, and even more importantly, motivation to control calories didn't account for the effect of density of array. Individuals still selected more calories overall when more food options were available, regardless of their higher-order eating motivations.

Unfortunately, almost all fast food outlets have now created "healthier" options and have many items from which to select. The findings presented here indicate that this is one more way food marketing is contributing to the obesity epidemic.

FUTURE WORK

Much more work needs to be done. The data presented here do not control for current hunger or environment in which individuals completed the tasks. We also do not know exactly how individuals were using the cues available to make their decisions. This project intends to collect data that also investigates what people are looking at when they make their decisions and how they are physiologically responding while they are making their choices. These data will be collected in a controlled setting, but field data may also be of great importance in future studies.

We'd also like to expand our samples to include populations who are most at risk including lower SES groups and children.



Finding community and research partners who would like to participate in creating and testing obesity interventions utilizing these results is also of key importance to disseminating and making these findings useful in the real world.

Lastly, actually engaging policy makers with evidence-based solutions is the ultimate goal for this line of work. Food is a primary motivator for all organisms, including humans, and we must consider our biological predispositions when deciding how to encourage healthier behaviors in environments that do not support them.

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