



# Cornhusker Economics

## Weight Status Perceptions and Food Choice

Does your weight status—whether your height and weight put you into the normal weight, overweight, or obese category—predict your food choices, or even the types of food you'll pay attention to when making a choice? What about the weight status you perceive yourself to be? These are important questions because the percentage of the population that is overweight or obese in the U.S.—and worldwide—has been increasing for decades despite a wide range of efforts aimed at slowing/reversing its growth. In the U.S., over 70 percent of the population is overweight or obese. High body weight has numerous consequences for individuals and society, placing the individual at greater risk for a variety of serious health issues, increasing direct and indirect healthcare costs, and decreasing economic productivity by causing workers to miss more days of work due to illness and be less productive even when present at work.

While national policy efforts that were motivated by concerns about high body weight are not specifically targeted to overweight/obese individuals, clinical guidance on nutrition is supposed to target individuals with high weight status. Weight status is formally defined by a person's body mass index (BMI), which is based on their weight and height. Specifically, the formula for BMI is weight (in kilograms) divided by height (in meters) squared. The specific number coming out of this formula is then used to categorize an individual as underweight, normal weight, overweight, or obese.

Weight status is not, however, always—or even frequently—communicated to the patient. In a study using measured height and weight data from a survey conducted by a branch of the U.S. government, approximately 75 percent of overweight and nearly 33 percent of obese individuals reported that they had never received a diagnosis of overweight/obesity (respectively). Without receiving information about their weight status from their physician,

many people are left to rely on their perception of their weight status when considering the need to make changes in their food consumption and exercise habits. Note that the body weight category labels are both vague but also clearly communicate a preferred weight status (that is, normal weight). With so many people not receiving guidance from their healthcare providers about their weight status, individuals are likely to make their own judgments about their weight status rather than calculating BMI. (Even doctors have a difficult time with this: in a study of residents in internal medicine—physicians whose work will require them to treat obese patients on a regular basis—over one-third of the residents incorrectly calculated their own BMI by more than 10 percent, even though they had the use of a calculator, and more than half of them could not identify the BMI cut-off value that classifies an individual as obese).

Research has shown that people who perceive themselves to be overweight are much more likely to report that they are dieting and/or exercising than people who perceive themselves to be normal weight, even when taking into account the person's actual measured weight status. That is, between two people who are—based on their measured height and weight—overweight, the one who thinks she is overweight will be much more likely to report undertaking a diet and/or exercise program than the one who thinks she is normal weight. However, previous research relied on self-reported behaviors—whether a survey respondent said she was dieting or exercising regularly—rather than directly observing these behaviors. In a couple of recent studies, colleagues and I have attempted to address this gap by documenting the relationship between measured/perceived weight status and directly observable outcomes: namely, calories selected in a

food choice experiment and the set of products the individual chose to examine prior to choice in a grocery shopping experiment.

### **1. Calories and food choice**

In the first experiment, we examined the relationship between calculated and perceived weight status and the number of calories that participants ordered in a build-your-own sandwich environment (Mbarushimana et al., 2021). Participants selected the ingredients for a sandwich, which they were instructed to imagine they were subsequently going to eat, from five categories: 1) meat/protein, 2) cheese, 3) spread/dressing, 4) bread, and 5) vegetables. Participants completed a component of the survey that focused on demographic, health, and nutritional questions. Two key variables in our analysis are weight status based on BMI calculated from self-reported height and weight data and perceived weight status, in which participants were asked if they considered themselves to be underweight, normal weight, overweight, or obese (they could also indicate that they did not know). To provide a more direct comparison of the relationship between calculated and perceived weight status, we created a variable that denoted whether an individual respondent perceived themselves to be in a heavier weight category, the same weight category, or a lighter weight category than the category they were in based on their BMI.

Over four-fifths (82.8%) of normal weight participants accurately perceived their weight status, while 12.9 percent reported themselves to be overweight and 4.3 percent underestimated their weight status (i.e., perceived themselves to be underweight). Among overweight participants, 69.2 percent accurately perceived themselves to be overweight, while 29.1 percent underestimated their weight status and 1.7 percent overestimated their weight status. For obese participants, 50.2 percent accurately perceived their weight status, while nearly half—49.8 percent—underestimated their weight status. Among obese participants who underestimated their weight status, 93.5 percent said they were overweight while 6.5 percent thought they were normal weight.

Next, we examined the implications of inaccurate perceptions of weight status on food choices. Weight status calculated using the BMI equation did not explain food choices. However, the relative relationship between perceived and calculated weight status was important in predicting differences in calories ordered. Individuals who accurately perceived their weight status ordered 32 fewer calories than individuals who underestimated their weight status. Those who thought they were heavier than their calculated BMI indicated ordered 81 fewer calories—over 13 percent of the average number of calories ordered—than people who underestimated their weight status.

We found that people's perceptions of their current weight status is an important predictor of their food choices in a controlled food choice experiment. This suggests that communication between healthcare providers and patients is important—but not just because some people will believe themselves to be in a lower weight category than they are. Overestimating one's weight status is also potentially deleterious to one's health and can lead to unnecessarily restrictive eating patterns. However, our findings also show that those who underestimate their weight status choose more highly caloric foods than individuals who accurately perceive their weight status.

### **2. Incomplete attention to products in complex assortments**

In a second study, we examined the relationship between calculated weight status and the healthiness of the products participants chose to consider in an online supermarket choice setting (Gustafson, Arslain, and Rose, 2021). For this discussion, we have extended the analysis to incorporate perceived weight status so that we can again examine differences in calculated and perceived weight status. A significant amount of attention has been paid to the relationship between the food environment and people's weight outcomes. In particular, food deserts—areas with limited access to stores offering healthy options—have been linked to higher levels of obesity. However, research on the impact of supermarkets opening in a food desert tends to show that even though residents recognize that they have better access to healthy options, their food choices do not change meaningfully. Recent research suggests food deserts reflect demand characteristics of the population (Allcott et al., 2019).

An overlooked element of shoppers' interactions with the food retail environment is that shoppers can direct their (limited) attention to a subset of products rather than considering all the options that are available in the store. In our study, we sought to examine the relationship between participants' calculated weight status and the healthiness of the set of products they chose to make a food choice from. Here, we additionally discuss the impact of including perceived weight status on these relationships.

In this study, participants selected products from bread, cereal, and crackers categories in an online supermarket environment. As in the real-world, shoppers could examine all available options in each category or limit their attention to a subset of products. We documented this choice—which products to consider—and

recorded the healthiness levels of products in each set of items considered by participants.

Gustafson, Arslain, and Rose (2021) show that obese individuals were significantly more likely (by 10 percentage points) to pay attention to unhealthy products than normal-weight participants were. Incorporating perceived weight status into the analysis strengthens this relationship; obese (by calculation) individuals were now 13 percentage points more likely to view a product subset that lacked the healthiest options. However, participants who perceived themselves to be overweight or obese were much more likely to pay attention to product sets that contained the healthiest items. Participants who perceived themselves as overweight were 8.5 percentage points more likely to view a healthy subset of products, while those who believed they were obese were over 11 percentage points more likely to view a healthy set of products. Of course, including a product in the set of products considered is a necessary pre-condition to choosing the product. The tendency by participants to view sets of products that are nutritionally quite similar also has important implications for the design of policies to promote healthier choices. These policies in the U.S. tend to focus on providing nutrition information, but if shoppers only pay attention to products that are fairly similar to start with, providing information may not guide them to a markedly healthier choice.

This research suggests that—to address the obesity epidemic—policies or interventions that change what people pay attention to are necessary. Recently, studies examining health prompts have shown promise in real-world supermarkets (Gustafson, Kent, Prate, 2018). Experimental evidence suggests that prompts work by changing the set of products and the nutrition information that people pay attention to when making choices, leading to an increase in the overall health of products selected (Arslain, Gustafson, and Rose, 2021).

## Further Reading

- Allcott, Hunt, Rebecca Diamond, Jean-Pierre Dubé, Jessie Handbury, Ilya Rahkovsky, and Molly Schnell. "Food deserts and the causes of nutritional inequality." *The Quarterly Journal of Economics* 134, no. 4 (2019): 1793-1844.
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