



# If it's healthy, it's tasty and expensive: Effects of nutritional labels on price and taste expectations<sup>☆</sup>



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## ABSTRACT

Studies on the impact of nutritional information and labeling rarely consider lay beliefs regarding a food's healthiness, taste, and affordability. If lay beliefs such as “healthy food is expensive” and “unhealthy food is tasty” exist, then nutritional information may have unintended consequences. This study elicited health, taste, and price beliefs of 60 food items in three countries—the USA, China, and Korea—and we studied how these beliefs and purchase intentions change in response to exogenous health information. We found lay beliefs are not always true and identical across countries, and they depend on prior beliefs and information. When neutral or negative exogenous information about healthfulness was provided, USA and Korea consumers tend to consider healthier foods more expensive, but this was not the case with China consumers. Interestingly, despite the commonly asserted “tasty = unhealthy” lay belief, we tended to find positive relationships between perceived health and taste. We demonstrated the interconnectedness of beliefs by simulating the impacts of health information on purchase intentions under different assumptions about the relationship between taste, health, and affordability expectations.

## 1. Introduction

One of the key mechanisms policy makers have utilized to encourage healthier eating is the provision of information via nutritional labels. However, research has shown that the provision of health information does not necessarily increase consumption of healthy foods (Ellison, Lusk, & Davis, 2014; Teisl, Bockstael, & Levy, 2001). Nonetheless, there remain concerns about high levels of obesity, diabetes, and other dietary related diseases. A possible reason for the largely ineffectual impact of nutritional labeling might be because health information not only updates consumers' health perceptions but also affects other perceptions, such as taste and affordability, which are the primary drivers of consumer purchase behavior (Glanz, Basil, Maibach, Goldberg, & Snyder, 1998; Lusk & Briggeman, 2009; Zakowska-Biemans, 2011). For example, Chang and Wildt (1994) noted a trade-off between perceived price and perceived quality, which had opposite effects on purchase intentions. Haws, Reczek, and Sample (2017) found consumers believe that healthier food is more expensive than less healthy foods. Further, many previous findings demonstrate health information could serve as a signal for taste (Kiesel & Villas-Boas, 2013; Mai & Hoffmann, 2015; Raghunatham, Naylor, & Hoyer, 2006; Werle,

Trendel, & Ardito, 2013). Despite this previous literature, less is known about the relationship between multiple perceptions (taste, health, and affordability) and their effects on food choice in an environment where one of the perceptions (health in this case) is exogenously provided. The purpose of this research is to investigate the joint effects of health, taste, and price perceptions among a large, diverse set of foods in three countries that might have divergent perception patterns.

Consumers make more than 1000 meal decisions each year, and these decisions are heavily influenced by heuristic-based decision making (Wansink & Chandon, 2006; Haws et al., 2017). This heuristic-based decision-making may affect consumers' information updating process and may lead to non-Bayesian updating (McFadden & Lusk, 2015; Kahneman & Tversky, 1972; Tversky & Kahneman, 1975). According to Bayesian decision theory, people reasonably update their posterior beliefs by allocating weights to prior beliefs and the new information. However, Rabin and Schrag (1999) argue that people have cognitive biases that lead them to misinterpret new information as supporting previously held beliefs. In the present research, we are interested in some lay theories drawn from heuristic processing, such as Healthy = Expensive and Unhealthy = Tasty. More specifically, we want to know whether these commonly asserted lay beliefs are actually

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held by consumers and whether they are identical across countries based on the generalized least square regression models with individual-specific random effects.

The next section of the paper provides a review of the literature on consumers' lay beliefs regarding the healthiness of foods. The following section discusses the methods used to investigate consumers' multiple beliefs, and the next section presents the results. The last section concludes.

## 2. Background on lay beliefs

Lay theories were first conceptualized by [Furnham \(1988\)](#) and [Furnham and Henley \(1988\)](#) as the informal and common-sense explanations people give for particular social behaviors. He argued that lay theories could function to establish a cause-and-effect relationship between phenomena and described lay theories as self-fulfilling prophecies ([Furnham, 1988, 1997](#)).

### 2.1. Relationship between beliefs about health and affordability

Healthiness and price are key drivers of consumers' food purchasing behavior ([Glanz et al., 1998](#); [Lusk & Briggeman, 2009](#); [Zakowska-Biemans, 2011](#)), and as a result, there are many research studies investigating the role of these two variables in consumer choice. [Bower, Saadat, and Whitten \(2003\)](#) showed the main reason for 'buying' and 'not buying' a fat spread with the provision of health benefits were 'healthy' and 'high price', respectively. Also, they argued that the potential health benefits for the consumers may increase the price of such products. [Hill and Lynchenhaun \(2002\)](#) found that consumers tend to perceive organic food to be healthier than conventionally grown food because of the high prices associated with organic food—that is, price signals of the quality and benefits of organic food items ([Hughner, McDonagh, Prothero, Shultz, & Stanton, 2007](#)). Further, consumers' concerns about future health affect willingness-to-pay premiums for breakfast cereals made from non-biotech ingredients, which further suggests healthy food is perceived as expensive ([Moon & Balasubramanian, 2003](#)). [Burggraf, Teuber, and Glauben \(2016\)](#) presented a conceptual model linking dietary quality to food choice while positing a health-taste tradeoff. They also considered the role of nutrient pricing, arguing that unhealthy food products are more affordable and that vitamin- and mineral-dense foods are relatively more costly. Whether healthy foods are, in fact, more expensive than unhealthy foods has been a subject of much debate, and some of the controversy seems to depend on whether cost is calculated per serving, per pound, or per calorie ([Carlson & Frazão, 2012](#)).

While some consumers tend to believe healthier food is more expensive ([Lee & Yun, 2015](#)), this belief is sometimes overgeneralized to contexts and products where it may not hold. [Haws et al. \(2017\)](#) showed that belief in a general Healthy = Expensive lay theory comes from a combination of biased sampling of personal experiences with food and price and exposure to messages in the mass media consistent with this relationship.

### 2.2. Relationship between beliefs about health and taste

Health information not only influences consumers' health perceptions, but also their taste perception ([Teisl et al., 2001](#); [Mai & Hoffmann, 2015](#)). Many previous findings demonstrated a negative relationship between perceived healthiness and taste. [Raghunathan, Naylor, and Hoyer \(2006\)](#) found evidence of the Unhealthy = Tasty intuition in that consumers consider less healthy items as better tasting items, more enjoyable during actual consumption, and more preferred when the hedonic goal is more salient. They also reported that American consumers tend to overcome unhealthy foods because consumers unconsciously consider unhealthy foods as tasting better than healthy foods. However, [Werle et al. \(2013\)](#) demonstrated that these

Unhealthy = Tasty lay beliefs may not generalize. Unlike US consumers, they found the opposite intuition—the Healthy = Tasty lay theory—in France. [Jo, Lusk, Muller, and Ruffieux \(2016\)](#) found the same result with French consumers: healthier items were rated as tastier. Because of these international differences, we test whether the Unhealthy = Tasty lay beliefs are valid in three different countries—USA, China, and Korea.

As shown in the aforementioned research, there isn't much research in Eastern countries on lay theories and the relationship between multiple perceptions. Also, we might expect more divergence between US and Eastern countries than between US and Western European countries. [Zhang, Doorn, and Leeftang \(2014\)](#) indicated that research into Western consumers cannot necessarily predict the behavior of Eastern consumers, and they showed the differences between Western and Eastern consumers' behavior on the link between customer equity drivers (value equity, brand equity, and relationship equity) and loyalty intentions. The lack of literature in this area and the expected differences between US and Eastern countries are the key motivations for studying US, China, and Korea consumers rather than the consumers of any other countries.

These lay theories tend to be inferred from particular products or studies that rely on correlations. However, the beliefs could be food-product specific ([Wansink, 2003](#)). Therefore, we consider 60 food items, which reasonably reflect the range of commonly consumed products. Also, by conducting the study in three different countries, we consider the cultural differences of consumers' food perceptions. Moreover, to move beyond simple correlations, we introduce exogenous health information to study how inter-related beliefs are affected.

## 3. Methods

We designed an online survey in Qualtrics and obtained completed responses from around 600 individuals in panels maintained by Survey Sampling International (SSI) in three different countries: one hundred and ninety-one people from the USA, one hundred and ninety-seven people from China, and one hundred and ninety-two people from Korea. SSI maintains panels of respondents who have agreed to take online surveys for compensation in these locations, and we asked for samples that were generally representative of the populations in each location. For the translation process of the survey into Chinese and Korean, we received help from experts on each language: a professor in the Chinese department of Seoul Women's University and a Korean teacher who majored in Korean grammar and education. Summary statistics describing the sample can be found in the [Appendix](#). Across the three countries, most participants in this survey were primary shoppers for their household who ranged in age from 18 to 74 years old, and about 50% of participants were females.

The survey asked participants to rate perceived taste, health, affordability, and purchase intention of 60 different food items after images of each were shown. Then, the rating was repeated after the subjects had received information about each food item's healthiness. A within-subject design was used so that we could investigate how subjects change their perceptions in response to the provision of health information. We randomized the order of presentation of the 60 food items. Here, a list of 60 food items was mostly compiled based on the expenditure categories used to construct the consumer price index (CPI) released by the Bureau of Labor Statistics (BLS). The CPI market basket is developed from the Consumer Expenditure Surveys for 2013 and 2014 provided from 7000 families on what they actually bought. We used this data to identify items commonly consumed in the US. In addition, to add diversity we included the most expensive six foods, which are chosen according to the price, rarity, and the difficulty in the cultivating process. Since these items are not affordable for everyone, we expect them to be uncommon food items. If we just consider highly familiar food items with people, we would expect information to have

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