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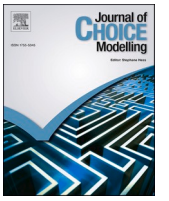

Consumer preferences for country of origin labeling: Bridging the gap between research estimates and real-world behavior☆

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ABSTRACT

Studies investigating preferences for country-of-origin labeling (COOL) often overemphasize this attribute, which risks inflating estimated market value. We address this issue by studying consumer preferences for Florida versus Mexico tomatoes in a shopping environment that allows freedom to notice or ignore COOL when making decisions. A significant portion of subjects failed to notice COOL in the study, despite expressing a preference for COOL and a habit of looking at COOL when shopping. We find a significant difference in preferences between subjects who noticed COOL and subjects who did not, which points to a potential mismatch between research results and real-world behavior.

1. Introduction

The large influx of foreign imports into the U.S. agricultural industry has intensified the focus on understanding the impact of country of origin (COO) on consumer preferences. Indeed, a long stream of research has been devoted to investigating consumer willingness-to-pay (WTP) for country-of-origin labeling (COOL) across various food products, including meat, wine, oil, dairy, and fresh fruits and vegetables (e.g., Loureiro and Umberger, 2003; Puduri et al., 2009 Zulug et al., 2015; Balcombe et al., 2016; Norris and Cranfield, 2019). From this body of work, several studies have reported significantly stronger preferences for domestic products compared to foreign alternatives (e.g., Gao and Schroeder, 2009; Peterson and Li, 2011; Meas et al., 2014; Xie et al., 2016).

When investigating consumer preferences for COO, a large body of previous work relied on designs that might place unnecessary emphasis on this attribute, either by directly asking consumers about their preferences for COO (e.g., Alfnes and Rickertsen, 2003; Umberger et al., 2003; Gao et al., 2014; Achabou et al., 2022) or by displaying this attribute explicitly in a table or image format (e.g., Dransfield et al., 2005; Ehmke et al., 2008; Lim et al., 2013; Williamson et al., 2016; Thøgersen et al., 2019). While such studies provide useful insights regarding consumer valuations of COO, they do not account for consumers' voluntary attention to COOL when choosing between different sourced products. In other words, attracting attention to COO in the study removes the researcher's ability to investigate differences in consumers' voluntary attention to COOL when making decisions between product alternatives. This can risk

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inflating the estimated WTP for COO, since although subjects might report higher WTP for a certain COO, some might fail to notice COOL on products when shopping, thus preventing the higher reported WTP for COO from materializing in the marketplace for such consumers. It is worth noting that some previous studies investigated preferences for COO by presenting subjects with product images that display COO among other attributes (e.g., Williamson et al., 2016). While this can help reduce the overestimation of the WTP for the COO attribute, these studies do not explicitly account/correct for voluntary attentiveness to this attribute in the estimation.

To address this issue, our study investigates consumer preferences for COO using an experimental design where subjects view products with different COOL in a store shopping environment, and are free to look at or ignore COOL as they report their preferences. This allows for a more realistic and representative assessment of consumer valuation for COO that considers potential heterogeneities in consumer attention to COOL information on the products.

Our study design was used to measure both consumer WTP for and choices between Florida versus Mexico tomatoes using a sample of subjects from three geographically diverse locations (Florida, Texas, and Maryland). In doing so, subjects were randomized across two scenarios: one with only the label information affixed to the tomato products in the baskets (hereafter, *COO Stickers*) and the other with an additional "from Florida" sign placed above the basket with Florida tomatoes (hereafter, *COO Sign*). This allows us to investigate the outcomes of COOL-related marketing scenarios in terms of drawing consumer attention to COOL and preferences for COO. After reporting their preferences, subjects were asked to indicate if they had noticed the different COOL on the tomato alternatives. The experimenters were asked to verify this information, to the best of their knowledge, by monitoring the subjects' interaction with the tomato products during the experiment.

Our study design was used to investigate four main conceptual hypotheses, which together shed light on a potential issue in eliciting consumer preferences for COO using designs or methods that fail to account for consumers' voluntary attention to COOL.

1. Some consumers fail to notice COOL on the tomato products as they make their choices and report their WTP.
2. Displaying COO information more prominently in the *COO Sign* marketing scenario increases consumer attention to COOL, because it makes it easier to notice this information when making decisions.
3. Consumers who notice COOL express stronger preferences for domestic (i.e., Florida) compared to imported (i.e., Mexico) tomatoes than consumers who do not notice COOL.
4. There are heterogeneities in consumer attention to COOL and preferences for COO in tomatoes.

2. Literature review

Extant literature on consumer preferences for COO documents a strong COO effect, where consumer valuations of a product significantly depend on production origin, with higher preferences for products from countries with an established link to the product (e.g., Rosenbloom and Haefner, 2009; Demirbag et al., 2010; Gao et al., 2014; Andéhn et al., 2016; Thorgensen et al., 2019). Indeed, previous research has shown that most consumers consider COO as an important factor when making purchasing decisions, and that they prefer COO information to be provided on the products they purchase (Purudi et al., 2009; Govindasamy et al., 2014). The COO effect has been observed for both food and non-food products (e.g., Mohamad et al., 2000; Lusk et al., 2006; Foroudi et al., 2019; Achabou et al., 2022). Examples of food products with significant COO effects include Italian olive oil (Chamorro-Mera et al., 2020), French wine (Cicia et al., 2013), Colombian coffee (Teuber and Roland, 2012), and Ecuadorian chocolate (Otter et al., 2018).

Several factors have been identified to explain this COO effect. Some previous studies argued that the COO of a product provides a signal about quality, leading consumers to attach higher values to production origins with superior quality reputations for a specific product (Hsieh, 2004; Lusk et al., 2006). Consumers also form brand perceptions, which draws their preferences towards familiar brands that are commonly evaluated more favorably (Govindasamy et al., 2014). This is evident in the fact that global brands carry a regional effect on consumer preferences (Rosenbloom and Haefner, 2009). Country image has also been shown to influence consumer preferences for COO (Mohamad et al., 2000; Demirbag et al., 2010). For instance, it is argued that consumers tend to prefer imported products from developed compared to developing countries (Gao et al., 2014; Thorgensen et al., 2019). Country images are based on multiple factors, including the country's level of advancement, feelings towards the country's people, desire for closer ties with the country, degree of the country's market penetration, and prior experiences with the country's products (Papadopoulos and Heslop). Preferences for products from a country with a positive country image are motivated by associations with social status or prestige and/or by a certain mystique associated with the specific country (Lusk et al., 2006). Consumers also evaluate products with different COO based on safety and environmental concerns, as well as level of trust in the producing country (Lusk et al., 2006; Thøgersen et al., 2019). Finally, individual factors, such as income, education, and consumption frequency, have also been shown to influence the COO effect (Govindasamy et al., 2014).

A common finding stemming from literature on the COO effect is that consumers tend to favor domestic over imported products, a notion that has been termed domestic bias or home bias (Balabanis and Diamantopoulos, 2004; Lopez et al., 2006; Ghazalian, 2012; Bosbach et al., 2015). A predominant driver for domestic bias is consumer ethnocentrism. Previous studies showed that consumers who report higher degrees of ethnocentrism exhibit stronger domestic bias when evaluating local versus imported products (Balabanis and Diamantopoulos, 2004; He and Wang, 2015). Other factors, such as cultural identity and concern for the domestic economy, were also found to contribute to domestic bias (Lusk et al., 2006; He and Wang, 2015). A similar notion branching from domestic bias is consumers' tendency to favor production origins with closer geographic proximity to where they live (Fernández-Ferrín et al., 2018; Pedersen et al., 2018; Hasanzade et al., 2022). However, it is worth mentioning that some studies have reported reverse domestic bias, especially in developing countries, where consumers held higher preferences for imported compared to local products (Achabou et al., 2022; Wang et al., 2022).

Despite strong assertions for the important role of COO in consumer preferences and valuations, the degree to which COO influences consumers' ultimate choices and WTP depends highly on consumers' awareness of COO when making purchases. Consumer attention to product attributes, and weighing of different attributes, when shopping has been heavily investigated using several approaches. This led to a stream of research that coined the term attribute non-attendance (ANA) to refer to how consumers attend to different product attributes when making purchasing decisions. In this literature, consumer attendance is used to describe the importance consumers place on different product attributes in their consideration set, which is represented by the weight of each attribute in the consumer's utility function. In one approach, ANA is modeled econometrically, and inferred from consumers' choice patterns (Scarpa et al., 2013). This allows for direct measurement of consumer attendance from their choice patterns, but necessitates strong assumptions that such choice patterns are indeed driven by attribute non-attendance, rather than other individual factors. Another approach is to include ex-post questions, following preference elicitation, where subjects provide information on their attendance to the different product attributes presented (Chalak et al., 2016; Caputo et al., 2018; Shen et al., 2018). This approach helps to more accurately identify the effect of ANA on consumers' ultimate preferences, since respondents are providing information about the degree to which they considered each attribute when making their choices. However, it requires the implicit assumption that respondents' reported importance of each attribute directly translates to their attention to the attribute when making purchases.

Another stream of research utilized eye-tracking technology to investigate consumers' visual attention to different product attributes in a choice environment (Lewis et al., 2016; Rihn et al., 2016; Krucien et al., 2017; Van Loo et al., 2018). In this literature, visual attention is taken as a proxy of consumers' awareness of the different attributes in a product, where consumers are assumed to be aware of attributes that they place visual attention to, but unaware of attributes that did not receive visual attention. While prior ANA studies are very useful in highlighting between-subject heterogeneities in attendance (or attention) to certain attributes, they commonly use choice experiments that are conducted on a computer screen (or paper form) and that directly display the list of attributes associated with each product.

Our study contributes to this work by investigating heterogeneities in attention to COO as consumers make decisions in a shopping environment where this attribute is displayed in a way that is more closely aligned with a real-world setting (i.e., using COOL on the product), where they are free to look at or ignore this attribute. In doing so, our study combines the benefits of high internal validity from experimental research (by investigating consumer decisions in a controlled setting) with high external validity from broader empirical research (by investigating consumer preferences for COO using labels similar to those affixed to products in a real shopping environment). This can improve policymakers' understanding of consumer demand for local versus foreign agricultural products, which can help inform future food policies. Additionally, this study allows us to deliver valuable insights to U.S. growers and producers by more accurately assessing the effectiveness of different marketing strategies in stimulating higher consumer awareness and valuation for domestic/local products.

The applicability of this study stretches beyond COOL. Examining voluntary consumer attention to product attributes in a design that doesn't overemphasize the attributes in question can help improve our understanding of consumer preferences for other important quality attributes around which food policies are usually considered. These include organic, GMO, hormone-free, farm-raised, grass-fed products, and food safety attributes (e.g., Alfnes, 2004; Nalley et al., 2004; Umberger et al., 2009; Bernard and Bernard, 2010; Napolitano et al., 2010; Colson and Huffman, 2011; Denver and Jensen, 2014; McFadden and Lusk, 2017; Gao et al., 2019). To our knowledge, this strand of research relies heavily on methods that overemphasize the attribute being studied. To this extent, another contribution of our study is to provide a benchmark for improving the representativeness of research investigating consumer preferences for food labels.

It is worth noting that while some studies have used in-store questionnaires to survey consumers in their natural shopping environments, they also relied on conventional designs that directly ask subjects about their WTP for specific attributes (Loureiro et al., 2001; Janssen and Hamm, 2012; Gracia et al., 2014; Delmond et al., 2018). Our study builds on this work by investigating whether and how consumers pay attention to COOL in a setting that does not place specific attention on this attribute.

3. Materials and methods

3.1. Participants

An experiment was conducted in a shopping mall to investigate consumer preferences for COO (Florida versus Mexico) in tomato products. The experimental study took place in April 2014. Fresh tomato was used as the focal product due to the importance of tomatoes in the US agricultural industry. The US is one of the world leaders in fresh tomato production. Yet, domestic tomato production in the US accounts for only 40% of total domestic demand, with the rest of the demand being met through imports, mostly from Mexico and Canada (USDA-AMS, 2015). This increases the relevance of studying US consumer preferences for COO in tomatoes.

The study was conducted in three geographically diverse locations: Tampa (Florida), Dallas (Texas), and Baltimore (Maryland). This enabled the investigation of city-level heterogeneities in consumer awareness of COO and preferences for domestic versus imported tomatoes. Florida was selected due to its location and Floridians' familiarity with Florida tomatoes. Texas was selected due to its

Table 1
Summary of sample characteristics by city and treatment.

	Dallas (n = 116)		Baltimore (n = 112)		Tampa (n = 120)	
	COO Sticker	COO Sign	COO Sticker	COO Sign	COO Sticker	COO Sign
	Mean (Std. Dev.)	Mean (Std. Dev.)	Mean (Std. Dev.)	Mean (Std. Dev.)	Mean (Std. Dev.)	Mean (Std. Dev.)
Male	0.49 (0.50) $p^a = 0.704$	0.46 (0.50)	0.47 (0.50) $p = 0.882$	0.48 (0.50)	0.40 (0.49) $p = 1.000$	0.40 (0.49)
Age	39.71 (17.18) $p = 0.121$	34.65 (13.85)	29.75 (10.16) $p = 0.833$	30.19 (11.38)	42.17 (16.62) $p = 0.985$	42.67 (18.45)
Household Size	2.10 (0.76) $p = 0.435$	2.23 (0.68)	2.33 (0.82) $p = 0.575$	2.25 (0.76)	2.15 (0.71) $p = 0.663$	2.11 (0.81)
Number of Children	1.18 (1.07) $p = 0.192$	0.94 (1.11)	0.88 (1.10) $p = 0.786$	0.93 (1.10)	0.91 (1.06) $p = 0.928$	0.98 (1.27)
Education	1.76 (0.82) $p = 0.757$	1.79 (0.75)	1.73 (0.80) $p = 0.109$	1.96 (0.77)	2.09 (0.80) $p = 0.386$	1.96 (0.82)
Income	3.54 (1.72) $p = 0.482$	3.26 (1.59)	3.82 (1.95) $p = 0.051$	4.56 (2.04)	3.71 (2.11) $p = 0.284$	3.18 (1.52)
Weekly Food Expenditure	3.63 (1.95) $p = 0.411$	3.88 (1.96)	4.25 (2.33) $p = 0.556$	4.25 (1.96)	3.05 (1.37) $p = 0.123$	3.51 (1.71)
Caucasian	0.34 (0.48) $p = 0.741$	0.37 (0.49)	0.57 (0.50) $p = 0.467$	0.63 (0.49)	0.72 (0.45) $p = 0.461$	0.78 (0.42)
Hispanic	0.31 (0.46) $p = 0.936$	0.30 (0.46)	0.07 (0.25) $p = 0.846$	0.06 (0.24)	0.14 (0.35) $p = 0.858$	0.13 (0.34)

Notes: [a]Indicates the *p*-value for tests comparing each characteristic between the COO Sticker and COO Sign treatments for each study location to ensure balance across treatments. As shown by the *p*-values, there are essentially no statistically significant differences in characteristics between subjects in the COO Sticker and COO Sign treatments.

close proximity to Mexico and Texans' familiarity with Mexico tomatoes. Maryland was selected as a neutral area, having no close proximity to either Florida or Mexico.

Eligible subjects were adult (at least 18 years old) primary shoppers (make the majority of grocery purchases in their household) who purchase fresh tomatoes at least once a month. Table 1 provides a summary of the subjects' characteristics by geographical region (i.e., Dallas, Tampa, Baltimore) and treatment (i.e., COO Sticker and COO sign). A total of 348 subjects were collected from the three geographical locations.[1] The sample sizes for each city are reported in Table 1, which also shows balance between the two treatments

[1] The initial sample size was 425 subjects, however, 16 subjects submitted unreasonably high WTP and were excluded as outliers, and another 61 subjects were excluded for having missing information (5 for not reporting education level and 56 for not reporting income level). This led to a final sample size of 348 subjects. We followed the standard procedure to identify and eliminate outliers, where every observation that is farther than 4 times the interquartile range from the 75th percentile was identified as an outlier.

for each city.[2] Subject recruitment was done using an intercept approach, where subjects were randomly approached in the shopping mall and asked to participate in the study. Recruitment efforts were also supplemented using a database of subjects, in each city, who voluntarily signed up to be informed about opportunities to participate in research studies.

3.2. Experimental design

Unlike most previous studies, which rely on internet or mail surveys, this study was conducted in a shopping environment, where subjects viewed baskets of tomatoes similar to what they see in the produce section of a grocery store. This study also differs in that the subjects were not directly asked to state their preferences for COO, nor were they told that this was the purpose of the experiment. They were simply presented with tomato baskets with different COOL and were not prompted to check the COO on the tomato products as they made their decisions. This way, our study accounts for consumers' voluntary attention to COOL, rather than draw too much attention to this attribute by directly asking for their preferences for COO.

After providing consent, the subjects completed several tasks. First, subjects answered questions regarding the frequency and location of their grocery purchases. Subsequently, each subject was presented with the two tomato baskets. The baskets were placed next to each other and attention was paid to establishing homogeneity between the baskets in all aspects except COOL. The location of the baskets (i.e., which basket was placed on the left vs. right) was randomized across days. As shown in Fig. 1, the baskets were the same size and contained the same number of tomatoes. The tomatoes in both baskets were chosen to look the same in color, size, and general appearance. The only difference was the COO information, which was varied exogenously between the two baskets so that one basket contained Mexico-labeled tomatoes and the other basket contained Florida-labeled tomatoes.

Participants were randomized across two marketing scenarios. In the first scenario, *COO Stickers*, Florida and Mexico COO sticker labels were placed on the tomatoes in the first and second basket, respectively. The second scenario, *COO Sign*, was similar to the first scenario, except that the country of origin for the Florida tomatoes was made more prominent using an additional "from Florida" sign that was placed on top of the basket containing the Florida tomatoes. This allows us to examine consumers' voluntary attention to COO in scenarios that vary the prominence of the COO information. As mentioned in the research objectives, we hypothesize that a significant fraction of subjects will fail to notice COOL as they report their preferences, but that providing this information more prominently (i.e., in the COO Sign treatment) will increase consumers' voluntary attention to this attribute. Random 3-digit numbers were assigned to the tomatoes in each scenario to allow subjects to respond to questions about each basket without calling specific attention to COOL. Subjects were able to inspect the tomatoes in each basket (i.e., touch, feel, smell), in any order they wished, as they made their decisions.

In each marketing scenario, participants were asked to indicate the basket they would prefer to purchase tomatoes from when buying 1 pound of tomatoes at the grocery store. They also reported their WTP for the tomatoes in each basket. For the choice decision, participants could choose either basket of tomatoes or report no preference, which removes issues associated with forcing a choice between the two baskets. Subjects' WTP was elicited using the open-ended contingent valuation method (CVM), where each subject reported the price they were willing to pay for 1 pound of the tomatoes in each basket. Subjects were provided with a range of reference prices for the tomatoes, which were based on the national, fresh tomato retail prices between January 4, 2013 and March 14, 2014 (USDA-AMS, 2013).

After reporting their choices and WTP, subjects answered questions regarding their demographic and socioeconomic characteristics. This was followed by questions about whether or not they paid attention to COOL as they reported their preferences, what information about the tomatoes they considered important, and their general consumption preferences for tomatoes. Table 2 includes a summary of the information collected following preference elicitation. The experimenters were tasked with validating the subjects' responses regarding their attention to COOL during the experiment, to the best of their knowledge, by monitoring the subjects' interaction with the tomato products as they made their choices and reported their WTP. The experimenters closely watched how subjects interacted with the tomatoes (i.e., picked the tomatoes up, looked at the sticker labels for COO, looked at the COO sign in the second scenario) as they reported their preference, but did so without raising subjects' awareness that they were being watched. The experimenters reported this information for each subject after the subject had completed their participation and left the research site. This was done to increase the discreetness of this step and the information collected from the experimenters was used to validate subjects' self-reports regarding attention to COOL when reporting their preferences.

3.3. Data analysis

A test of proportions was used to investigate consumer attention to COOL under the two marketing scenarios (i.e., COO Sticker and COO Sign). Consumer preferences for Florida and Mexico tomatoes were also investigated between scenarios, and across individuals who noticed and failed to notice COOL, using comparison of means tests (*t*-test).

Regression analysis was used to further investigate the effect of COOL awareness and the *COO Sign* scenario on the main outcome

[2] A comparison of subject characteristics between cities, along with comparisons between the sample and the census population characteristics for each city, are reported in Tables A1 and A2 in the appendix. We do observe significant differences between cities, and in comparison to the census population characteristics. This is likely due to the fact that our population of interest was adult primary shoppers who purchase fresh tomatoes at least once per month, which could differ from the general population that includes all age groups, primary and nonprimary shoppers, and individuals who do and don't consumer fresh tomatoes at least once a month.

a.

b.

Fig. 1. Tomato baskets used in the study.

variables related to preferences (i.e., choice and WTP), while controlling for sociodemographic information. The WTP outcome variable was calculated as the difference between subjects' WTP for Florida and Mexico tomatoes (i.e., $WTP_{FL} - WTP_{Mex}$). This helps us investigate the relationship between the explanatory variables and relative WTP for FL tomatoes. Considering the continuous nature of this variable – spanning negative values when $WTP_{Mex} > WTP_{FL}$, zero when $WTP_{Mex} = WTP_{FL}$, and positive values when $WTP_{Mex} < WTP_{FL}$ – a linear OLS regression was estimated. To investigate the relationship between explanatory variables and subjects' choices between Mexico and FL tomatoes, we used each subjects' choice between the two tomato baskets to construct an ordered categorical choice variable. Specifically, since each subject made one choice from three options (choose Mexico tomatoes, choose neither basket, choose FL tomatoes), the choice variable took one of three values based on the subjects' choice as follows: 1 = choice of Mexico tomatoes, 2 = choice of neither basket, 3 = choice of FL tomatoes. This coding ensures consistency across the two outcome variables (WTP and Choice) since a higher value of either variable indicates departure of preferences away from Mexico tomatoes and towards FL tomatoes. An ordered Logit regression was estimated for the choice variable to account for its ordered categorical nature.[3] The two regression models (i.e., linear regression for WTP and ordered Logit regression for choice) used the same explanatory variables following equation (1), and each was estimated separately for each geographical location (i.e., Baltimore, Dallas, Tampa). Considering

[3] The ordered Logit regression was estimated in Stata15 using the command ologit.

Table 2
Summary of sociodemographic and behavioral information collected.

Variable	Description
Sociodemographic	
Male	1 = male; 0 = female
Age	Subjects' age in years
Education	1 = less than high school; 2 = high school or equivalent; 3 = some college; 4 = four-year college; 5 = postgraduate; 6 = professional degree
Income	1 = less than $15,000; 2 = $15,000-$24,999; 3 = $25,000-$34,999; 4 = $35,000-$49,999; 5 = $50,000-$74,999; 6 = $75,000-$99,999; 7 = $100,000-$149,999; 8 = $150,000-$199,999; 9 = $200,000+
Food spending per week	1 = less than $50; 2 = $50-$99; 3 = $100-$149; 4 = $150-$199; 5 = $200-$249; 6 = $250-$299; 7 = $300-$349; 8 = $350-$399; 9 = $400-$449; 10 = $450-$499; 11 = $500+
Household size	1 = single individual; 2 = 2–3 individuals; 3 = 4–6 individuals; 4 = 7–9 individuals; 5 = 10+ individuals
Caucasian	1 = Caucasian; 0 = not Caucasian
Hispanic	1 = Hispanic; 0 = not Hispanic
Behavioral	
Read COOL	1 = reported looking at the COOL info when indicating preferences between the two baskets; 0 = reported not looking at the COOL info when indicating preferences between the two baskets
COOL is important	1 = somewhat important or extremely important; 0 = somewhat unimportant or not important at all
Normally reads COOL	1 = normally looks at COOL when buying tomatoes; 0 = normally doesn't look at COOL when buying tomatoes
Normally doesn't read anything	1 = normally does look at any product-specific info when buying tomatoes; 0 = normally checks product-specific info when buying tomatoes
Usually prefer US to Mexico tomatoes	1 = usually prefers US to Mexico tomatoes; 0 = usually doesn't prefer US to Mexico tomatoes
Usually prefer FL to Mexico tomatoes	1 = usually prefers FL to Mexico tomatoes; 0 = usually doesn't prefer FL to Mexico tomatoes

the interrelatedness of these two outcome variables, a system of equations was estimated to account for potential correlations in the error terms in the two regressions.

$$y_i = \beta_0 + \beta_1 COO_{Sign} + \beta_2 Read_{COOL} + \beta_3 Male + \beta_4 Age + \beta_5 Education + \beta_6 Income + \beta_7 Caucasian + \beta_8 Hispanic + \beta_9 Food_{Spending} + \beta_{10} Household_{Size} + u_i \quad (1)$$

In the equation above, y_i is the outcome variable of interest (choice and WTP), *COO_Sign* is an indicator variable for the marketing scenario displaying the COO information for the FL tomatoes more prominently through a "from Florida" sign placed above the basket, *Read_COOL* is an indicator variable taking the value 1 if the subject reported looking at COOL in the choice and WTP tasks, and the other variables represent sociodemographic characteristics that are controlled for in the model. The coefficients of interest in this model are β_1 and β_2, which measure the effect of the *COO Sign* scenario and the effect of noticing COOL, respectively, on subjects' preferences.

We investigate heterogeneities in attention to COOL, and preferences for COO, in two ways. The first approach is by conducting a sub-analysis based on city, which helps uncover heterogeneities across geographical location of subjects. The second approach is a Latent Class Analysis (LCA) model that was estimated to investigate potential heterogeneities in preferences arriving from COOL-related behavioral factors, which were collected after preference elicitation and are summarized in Table 2. This helps to segment the market into different consumer groups that differ in their COOL-related behavioral tendencies, and to investigate differences in attention to COOL, and preference for COO, among these consumer groups. We follow the procedure outlined by Collins and Lanza (2009), where each subject is assumed to belong to one of C latent classes that differ in their behavior towards COOL. The number of classes is specified by the researcher and is usually based on model fit and/or professional judgment.

Let Y be a latent categorical variable that describes class membership and $X = (X_1, \ldots, X_j, \ldots, X_J)$ be a set of J observable variables influenced by Y. If x_{ij} represents a particular value of X_j for individual i and K_j is the number of possible outcomes for X_j, then the probability of observing a particular response pattern for individual i is the weighted sum of the class-specific probabilities and can be written as:

$$P(\boldsymbol{X_i} = \boldsymbol{x_i}) = \sum_{c=1}^{C} \pi_c \prod_{j=1}^{J} \prod_{k=1}^{K_j} \left(\theta_{jk|c}\right)^{I\left(x_{ij}=k\right)} \quad (2)$$

where $\boldsymbol{X_i}$ is a vector of observed responses, π_c is the probability of belonging to class c, $\theta_{jk|c}$ is the conditional probability of observing response k in variable X_j given membership in class c, and $I(x_{ij} = k)$ is an indicator variable of whether individual i chooses response k for variable X_j.

The observable variables used in the LCA are COOL-related behavioral factors, which were collected following preference elicitation and are summarized in the lower panel in Table 2. A total of five variables were used. The first variable indicated whether subjects viewed COOL as an important factor when purchasing tomatoes. The second and third variables were related to subjects' self-reported habitual attention to COOL and other information, respectively, when making purchasing decisions. The last two variables

were linked to subjects' preferences for COO and were used to record whether subjects normally prefer U.S. to Mexico tomatoes and whether they prefer Florida to Mexico tomatoes, respectively. The LCA model was estimated using a sequence from 2 to 9 classes. The data only supported models with 2 and 3 classes, as the model failed to converge with a larger number of classes. The model with 3 classes was adopted in this analysis as it had a lower AIC and BIC compared to the model with 2 classes.

4. Results

4.1. Analyzing attention to COOL

The fraction of subjects who indicated that they paid attention to COOL while reporting their preferences for tomatoes is broken down by marketing scenario and city in Fig. 2. A sizable fraction of consumers failed to notice COOL when reporting their preferences. In fact, less than half the subjects in the *COO Stickers* scenario noticed the COO of the tomatoes. As expected, displaying the country of origin more prominently by placing the "from Florida" sign above the basket with Florida-labeled tomatoes (i.e., *COO Sign* scenario) drew more attention to COOL. However, this was only the case for subjects from Tampa, and the *COO Sign* scenario did not significantly affect the reported COOL awareness of subjects in Baltimore and Dallas. Also notably, a significant fraction of subjects still failed to notice COOL even when it was displayed more prominently in the *COO Sign* scenario.

The importance of accounting for consumers' voluntary attention to COOL is highlighted in Fig. 3, where subjects' stated awareness of COOL during the experiment is plotted against their stated general awareness of COOL when grocery shopping and their stated importance of COOL in their purchasing decisions in panels a and b, respectively. The results show a clear mismatch between subjects' attention to COOL during the study and their reported importance of COOL when grocery shopping. Specifically, a significant portion of subjects who indicated they usually look at COOL, and reported high importance for this attribute, failed to notice the country of origin on the tomatoes in the study.

The analysis of subjects' reported awareness of COOL during preference elicitation leads to our first result, which supports hypotheses 1 and 2.

Result 1. *A significant fraction of subjects fail to notice the COOL on the tomatoes when reporting their preferences. Displaying COOL more prominently using a "from Florida" sign on top of the basket containing FL tomatoes increases subjects' awareness of COOL, however, this only holds true for subjects from Tampa.*

4.2. Analyzing preferences between Florida and Mexico tomatoes

Subjects' choices between the two tomato baskets are presented in Table 3. A breakdown of the difference in WTP for Florida and Mexico tomatoes (i.e., $WTP_{FL} - WTP_{Mex}$) across scenario and city is provided in Table 4. First, we notice generally higher preferences for Florida tomatoes in terms of both choices and WTP across both scenarios. However, subjects' preferences between the two marketing scenarios did depend on the location of the study. Specifically, the COO Sign scenario increased choices of Florida tomatoes for subjects from Tampa, while having an opposite effect on subjects from Baltimore and Dallas. Additionally, the difference in WTP for Florida and Mexico tomatoes did not significantly change across the two marketing scenarios for any of the geographical locations studied.

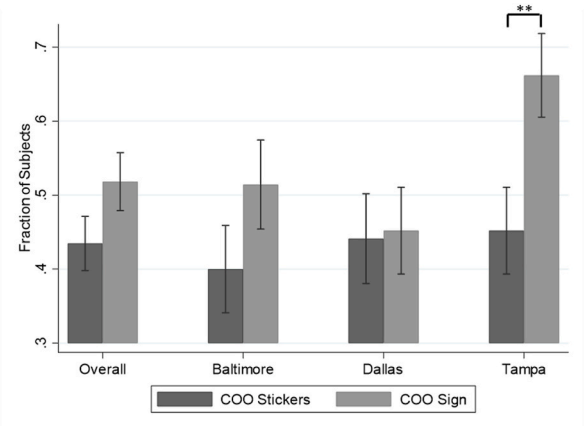

Fig. 2. Fraction who read the COOL by scenario and city.
Notes: The fraction of subjects who read the COOL was compared between the COO Stickers and COO Sign treatments for each study location as well as the overall sample. Significance levels are indicated with asterisks as follows: * = 10%, ** = 5%, *** = 1%.

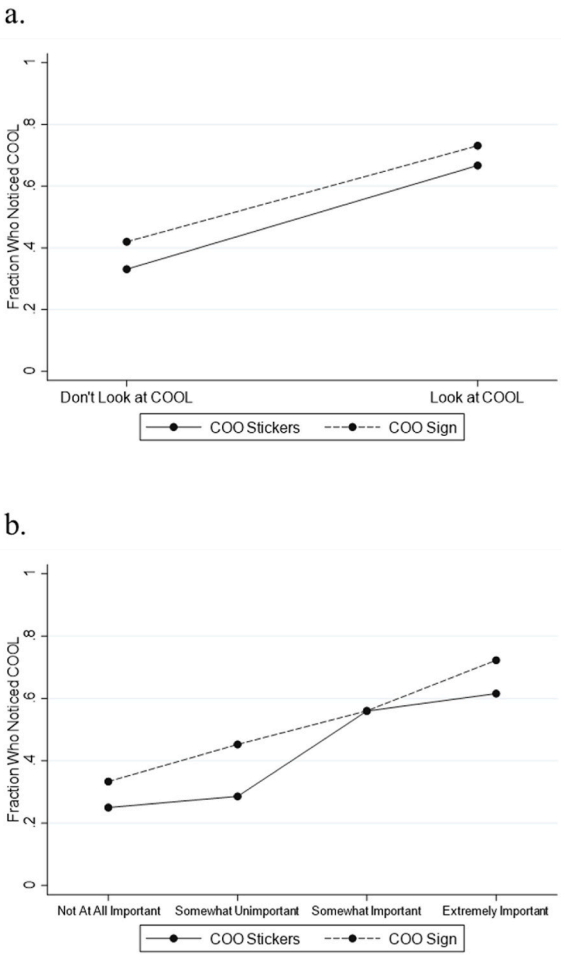

Fig. 3. COOL awareness during the study versus when grocery shopping.
Notes: Panel a plots the fraction of subjects who noticed COOL in the study (y-axis) against subjects' stated general awareness of COOL when grocery shopping (x-axis). Panel b plots the fraction of subjects who noticed COOL in the study (y-axis) against subjects' stated importance of COOL in their shopping decisions (x-axis).

Table 3
Summary of choices between Florida and Mexico tomatoes.

Variable	Baltimore		Dallas		Tampa	
	COO Stickers	COO Sign	COO Stickers	COO Sign	COO Stickers	COO Sign
Florida tomatoes	61.67	57.69	64.41	59.65	49.23	60.00
No preferences	13.33	13.46	10.17	1.75	13.85	18.18
Mexico tomatoes	25.00	28.85	25.42	38.60	36.92	21.82
Sample size	60	70	59	57	65	55

Note: The percentage of individuals choosing Florida, Mexico, and "no preference" is reported by city and marketing scenario.

4.3. Combining consumer preferences and attention to COOL

Preferences between Florida and Mexico tomatoes are broken down across subjects who indicated that they read the COOL information while making their decisions and subjects who indicated they did not. Average choices and WTP for subjects in those two groups are shown in panel a and b of Fig. 4, respectively. While subjects generally favored Florida tomatoes, those who noticed COOL while making their decisions exhibited stronger preferences in this direction. This is evident in that approximately 67% of the subjects who noticed COOL chose the Florida tomatoes compared to 51% of the subjects who did not notice COOL. The difference in WTP

Table 4
Willingness-to-pay by scenario and city.

	COO Stickers	COO Sign
	Mean	Mean
Variable	(Std. Error)	(Std. Error)
Average WTP		
Florida Tomatoes	1.82	1.75
	(0.076)	(0.085)
Mexico Tomatoes	1.66	1.55
	(0.086)	(0.078)
Difference in WTP (Florida – Mexico)		
Overall	0.15*	0.20**
	(0.080)	(0.092)
Baltimore	0.30**	0.36**
	(0.145)	(0.163)
Dallas	0.19	0.06
	(0.118)	(0.155)
Tampa	−0.02	0.20
	(0.149)	(0.159)

Notes: The average willingness-to-pay (WTP) for Florida and Mexico tomatoes is reported by marketing scenario (*COOL Stickers*, *COOL Sign*) in the top panel of the table. Differences in WTP for Florida and Mexico tomatoes (WTP Florida – WTP Mexico) is reported by marketing scenario and city in the bottom panel. Significance levels: *:10% **:5% ***:1%.

between Florida and Mexico tomatoes was also larger in magnitude for subjects who noticed COOL and was only statistically significant for this group ($p < 0.01$).

The effect of COOL awareness on subjects' choices and WTP is further analyzed in the regressions in Table 5. As previously mentioned, two regressions were estimated for each geographical location to investigate the impact of reported COOL awareness, and the *COO Sign* scenario, on subjects' choices and WTP. The coefficient on the binary variable *COO Sign* was not statistically significant in any model, suggesting that the marketing scenario displaying COOL more prominently using a "from Florida" sign above the basket containing FL tomatoes does not significantly impact consumers' overall choices or WTP. Notably, however, we do observe a positive and significant coefficient on the indicator variable Read COOL, but this was only the case for subjects from Dallas and Tampa. For the Dallas sample, the results suggest that individuals who notice COOL while reporting their preferences exhibit both higher choices and WTP for the FL tomatoes. On the other hand, subject awareness of COOL only increased the choices of FL tomatoes for subjects from Tampa, but did not significantly impact their WTP. Finally, COOL awareness had no significant impact on the preferences of subjects from Baltimore, both in terms of choices and WTP.

The analysis of subject preferences for Florida and Mexico tomatoes uncovers interesting results that support our third hypothesis. Noticing COOL when making decisions results in a significant increase in preferences toward the Florida tomatoes, however this result depends on study location and does not hold for consumers from Baltimore. Also notably, presenting COOL more prominently in the *COO Sign* scenario does not significantly influence subjects' preferences for the Florida and Mexico tomatoes. This highlights an inherent problem in research designs that explicitly ask consumers to report their preferences for COO in products (or place too much emphasis on this attribute). As we show, while consumers tend to favor local (i.e., Florida) over imported (i.e., Mexico) tomatoes when they are aware of COO, a significant fraction fail to notice this information when making decisions between tomatoes with different COOL. It is therefore important to account for consumers' voluntary attention to COOL when eliciting preferences for COO. We thus present our second result.

Result 2. *Subjects who notice COOL when making their decisions between the tomato baskets indicate higher preferences for FL over Mexico tomatoes. However, persistent failure to notice COOL among a significant fraction of subjects attenuates the effect of marketing scenarios that highlight this information more prominently.*

4.4. Latent Class Analysis results

Having investigated consumer attention to COOL, and preferences for Florida versus Mexico tomatoes, we now present results from the LCA model investigating potential heterogeneities in preferences arriving from COOL-related behavioral factors. Table 6 provides summary statistics of these observable variables for the 3 classes specified in our LCA model.

For class A, around half the members specified COOL as somewhat or extremely important. This class was also characterized by a relatively low awareness of COOL and a striking indifference between local and imported tomatoes. Hence, we label this class the *indifferent consumers*. Class B had the lowest fraction of individuals who normally read COOL information and the highest fraction who normally don't look at any labeling information when buying tomatoes. Subjects in this class also expressed a relative importance for COO and stronger preferences for US/FL over Mexico tomatoes. Based on these characteristics, we label this class the *negligent consumers*, who fail to notice COOL despite higher stated preference for local over imported varieties. Finally, class C had the highest

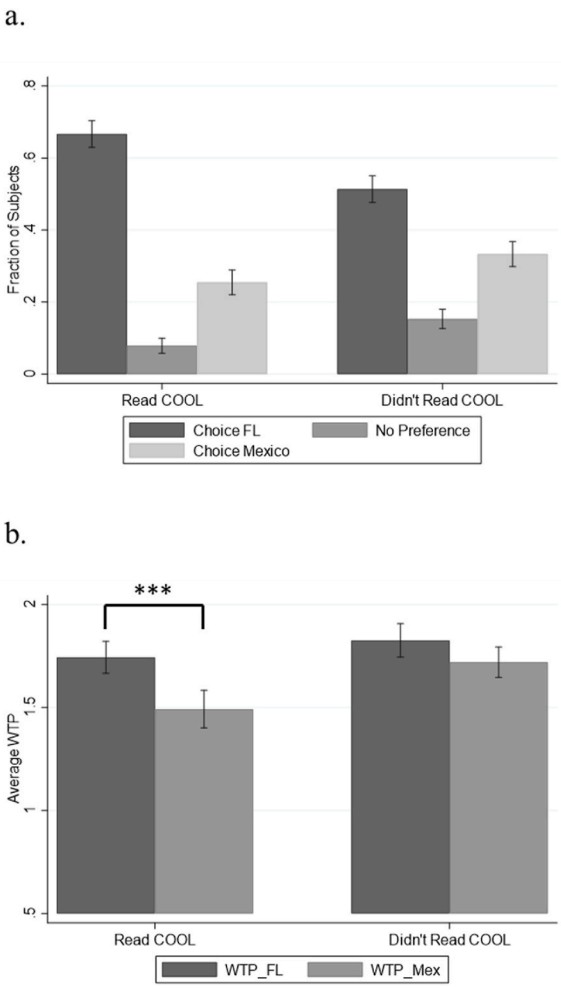

Fig. 4. Breakdown of choice and willingness-to-pay by COOL awareness.
Notes: A comparison between average WTP for FL tomatoes and Mexico tomatoes was conducted for both subjects who read and didn't read COOL. Significance levels are indicated with asterisks as follows: * = 10%, ** = 5%, *** = 1%.

proportion of individuals who consider COO important and who usually read COOL information when buying tomatoes. Moreover, only 2.7% of those individuals normally don't read any labeling information, and the overruling majority prefer US/FL over Mexico tomatoes. These individuals are thus labeled *attentive consumers*.

The fraction of subjects in each class who indicated they noticed COOL during the experiment is shown by marketing scenario in Fig. 5.

As expected, *attentive consumers* had the highest awareness of COOL during both marketing scenarios. Still, a sizable fraction of this class failed to notice COOL during the experiment, even in the *COO Sign* scenario where this information was more obvious. Notably, the *COO Sign* scenario did not significantly influence the COOL awareness of *negligent* and *attentive* consumers and was only successful in increasing the awareness of *indifferent* consumers. Perhaps the low propensity of the *negligent* type to notice COOL means that we need a stronger prime to induce them to pay attention to country of origin. On the other hand, *attentive* consumers usually notice this information without the aid of more obvious framing (i.e., *COO Sign*), which could explain why the *COO Sign* scenario did not significantly influence their attention to COOL.

Regressions analyzing subjects' choices and WTP across each class are presented in Table 7. For each class of individuals, a system of equations was estimated to account for interrelatedness between the two outcome measures (choice and WTP). The outcome variables were coded in the same way as in Table 5 and the same covariates were used.

The coefficient on the variable "*COO Sign*" was not statistically significant for either outcome variable across all three classes. This implies that the *COO Sign* treatment did not significantly affect the preferences of subjects in any class. On the other hand, the coefficient on the variable "Read COOL" was positive and significant under both outcome variables (choice and WTP) for *attentive consumers,* indicating that these subjects significantly increase their preferences for Florida tomatoes when they notice the country of origin. Importantly, results from the LCA model highlight significant heterogeneity in attention and preferences toward COOL across classes. This leads to our third result, which supports hypothesis 4.

Table 5
Factors affecting preferences for Florida and Mexico tomatoes.

Variable	Baltimore		Dallas		Tampa	
	Choice Ordered Logit	Diff WTP Linear Regression	Choice Ordered Logit	Diff WTP Linear Regression	Choice Ordered Logit	Diff WTP Linear Regression
COO Sign	−0.176	0.043	−0.439	−0.119	0.496	0.214
	(0.411)	(0.213)	(0.426)	(0.188)	(0.408)	(0.218)
Read COOL	−0.050	−0.065	1.730***	0.452**	0.742*	0.070
	(0.420)	(0.220)	(0.482)	(0.191)	(0.398)	(0.214)
Male	−1.037**	−0.222	0.078	−0.131	−0.557	−0.265
	(0.427)	(0.218)	(0.431)	(0.190)	(0.431)	(0.224)
Age	−0.024	0.011	−0.007	−0.003	−0.015	0.000
	(0.018)	(0.010)	(0.015)	(0.006)	(0.014)	(0.007)
Education	−0.271	0.106	−0.371**	−0.028	0.014	−0.006
	(0.171)	(0.092)	(0.183)	(0.080)	(0.160)	(0.085)
Income	0.040	−0.041	−0.033	−0.058	0.093	0.0342
	(0.120)	(0.061)	(0.138)	(0.062)	(0.114)	(0.063)
Caucasian	0.797*	0.310	−0.298	−0.170	1.458**	0.668**
	(0.432)	(0.229)	(0.518)	(0.227)	(0.575)	(0.309)
Hispanic	0.821	0.417	−0.060	−0.015	0.025	0.566
	(0.919)	(0.445)	(0.587)	(0.253)	(0.700)	(0.381)
Weekly Food Spending	−0.174*	−0.055	0.118	−0.003	−0.217	−0.083
	(0.102)	(0.053)	(0.125)	(0.052)	(0.142)	(0.075)
Household Size	0.022	0.0176	−0.604	−0.226	−0.813***	−0.293*
	(0.263)	(0.143)	(0.369)	(0.150)	(0.295)	(0.153)
Cutoff 1 (Mex/No Choice)	−3.253***		−2.818**		−2.231	
	(1.170)		(1.272)		(1.362)	
Cutoff 2 (No Choice/ FL)	−2.562**		−2.494**		−1.399	
	(1.154)		(1.266)		(1.354)	
Constant		−0.065		0.995*		0.270
		(0.594)		(0.539)		(0.714)
Observations	112		116		120	
Log Likelihood	−265.603		−247.304		−288.139	

Notes: Standard errors are in parentheses. Significance levels: * = 10% ** = 5% *** = 1%.

Table 6
Description of classes from latent class analysis model.

Variable	Indifferent	Negligent	Attentive
	Parameter	Parameter	Parameter
COO is important (somewhat or extremely)	0.426	0.338	0.915
Normally reads COOL	0.194	0.069	0.787
Normally doesn't read anything	0.490	0.586	0.027
Usually prefer US to Mexico tomatoes	0.000	0.869	0.959
Usually prefer FL to Mexico tomatoes	0.049	0.852	0.909
Class Membership Percentage	0.428	0.282	0.290

Notes: "COOL is important" is defined as a binary variable that takes the value 1 for "somewhat important" and "extremely important" and 0 for "not important at all" and "somewhat unimportant". "Normally looks at COOL" takes the value 1 if the subject selected COOL as one of the things they normally read when making fruit and vegetable purchases; "normally doesn't read anything" takes the value 1 if the subject indicated they don't read any information when making fruit and vegetable purchases; "usually prefer US to Mexico tomatoes" and "usually prefer FL to Mexico tomatoes" take the value 1 if the subject indicated a general preference for US over Mexico and Florida over Mexico tomatoes, respectively, when making regular purchases.

Result 3. *We find significant heterogeneity in subjects' attention to COOL and preferences for COO. This heterogeneity holds true across geographical location as well as COOL-related behavioral factors.*

5. Discussion and conclusions

In this study, we elicited subjects' choices and WTP for local (Florida) vs. imported (Mexico) tomatoes using a research design where subjects were presented with baskets of tomatoes similar to what they see in the produce section of a grocery store. Importantly, our design allowed us to investigate preferences for COO without drawing emphasis on this attribute. In doing so, we were able to examine consumers' voluntary attention to COO as they made decisions between tomato products with different COOL. We also examined the effect of a marketing strategy that displayed COOL more prominently (i.e., *COO Sign*) on consumer attention to COO and

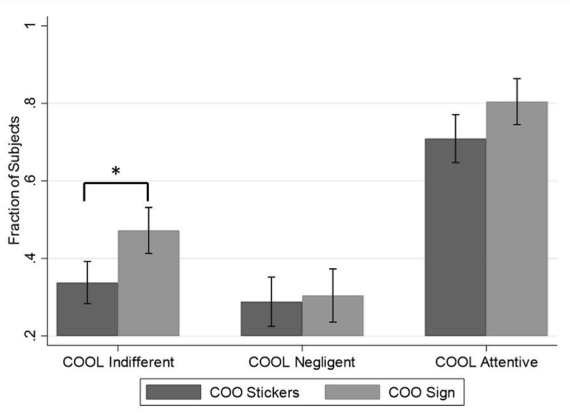

Fig. 5. Fraction who read COOL by scenario and class.
Notes: The fraction of subjects who read the COOL was compared between the COO Stickers and COO Sign treatments for each class in the LCA. Significance levels are indicated with asterisks as follows: * = 10%, ** = 5%, *** = 1%.

Table 7
Factors affecting preferences for Florida and Mexico tomatoes by class.

Variable	Indifferent Type		Negligent Type		Attentive Type	
	Choice Ordered Logit	Diff WTP Linear Regression	Choice Ordered Logit	Diff WTP Linear Regression	Choice Ordered Logit	Diff WTP Linear Regression
COO Sign	−0.118	−0.042	−0.225	0.120	−0.291	−0.033
	(0.352)	(0.173)	(0.409)	(0.242)	(0.492)	(0.218)
Read COOL	0.047	0.052	0.446	−0.115	1.438***	0.734***
	(0.376)	(0.182)	(0.472)	(0.271)	(0.527)	(0.245)
Male	−0.937***	−0.205	−0.159	−0.196	−0.334	−0.368
	(0.357)	(0.175)	(0.445)	(0.255)	(0.523)	(0.224)
Age	0.003	0.004	−0.020	−0.013	−0.034**	0.001
	(0.015)	(0.007)	(0.014)	(0.008)	(0.016)	(0.007)
Education	−0.560***	−0.033	−0.085	0.073	0.103	−0.034
	(0.158)	(0.074)	(0.179)	(0.106)	(0.186)	(0.082)
Income	0.135	−0.053	0.014	0.099	0.036	−0.011
	(0.117)	(0.054)	(0.115)	(0.068)	(0.149)	(0.064)
Caucasian	−0.174	−0.064	1.176**	0.642**	0.500	−0.025
	(0.421)	(0.204)	(0.477)	(0.282)	(0.596)	(0.251)
Hispanic	−0.680	−0.232	−0.457	0.532	0.967	0.465
	(0.474)	(0.235)	(0.781)	(0.445)	(0.887)	(0.348)
Food Spending	−0.170	−0.009	0.081	−0.065	−0.096	−0.002
	(0.108)	(0.053)	(0.117)	(0.069)	(0.126)	(0.056)
Household Size	−0.201	−0.164	−0.534*	−0.274	−0.836*	−0.093
	(0.219)	(0.109)	(0.303)	(0.183)	(0.463)	(0.203)
Cutoff 1 (Mex/No Choice)	−3.834***		−2.003		−3.207*	
	(1.048)		(1.307)		(1.690)	
Cutoff 2 (No Choice/ FL)	−3.328***		−1.104		−2.779*	
	(1.036)		(1.298)		(1.683)	
Constant		0.884*		0.503		0.142
		(0.479)		(0.788)		(0.736)
Observations	149		98		101	
Log Likelihood	−340.438		−248.658		−215.085	

Notes: Standard errors are in parentheses. Significance levels: * = 10% ** = 5% *** = 1%.

their preferences between FL and Mexico tomatoes.

Our results provide useful insights to producers and policymakers, as well as researchers investigating preferences for COO. First, we find that a large portion of consumers failed to notice COOL in this study, despite expressing an interest in this attribute and a habit of reading COOL information when making grocery purchases. This result conforms with previous findings in attribute non-attendance (ANA) literature, mainly that consumers only pay attention to a subset of the available attributes and might miss certain attributes when making decisions between different product alternatives (e.g., Caputo et al., 2018; Van Loo et al., 2018). It also highlights the importance of accounting for consumers' voluntary attention to COOL, and potentially other food labels, when estimating market valuation for product attributes.

Second, we show that while attendance to COOL significantly increases when this information is more prominently displayed using

a "from Florida" sign, a significant fraction of subjects still failed to notice COOL in this marketing scenario. This sheds light on the extent of consumer unawareness of COOL, and motivates future research to investigate alternative marketing strategies that can further increase attention to COOL.

Third, we find that consumers who notice COOL when making their decisions exhibit stronger preferences for the local compared to the imported tomatoes, a result that is in line with the extant literature on domestic/home bias (e.g., Ghazalian, 2012; Bosbach et al., 2015; Xie et al., 2016). However, a practical marketing scenario aimed at increasing attention to COOL by more obviously displaying this information using signs placed on top of the product basket does not significantly impact consumers' relative preferences for the FL and Mexico tomatoes. This highlights an important issue in designs that explicitly ask subjects to report their preferences for products with different COO, or place too much emphasis on this attribute. While such designs may accurately measure consumers' intrinsic preferences for COO, they fail to account for the role of consumer attention to this attribute, and the resulting impact of inattention on the market value for COOL. This threatens the accuracy of the implications of these studies to producers and policymakers, who might be mistakenly led to perceive a higher market value for this attribute. Specifically, designs that explicitly ask consumers about their preferences for COO can lead researchers to report market valuations that do not manifest in real markets, mainly because many consumers fail to notice this information when making purchases. This might explain the continued struggle of the domestic tomato industry with foreign competition, despite significant premiums for local tomatoes reported across several studies (Li et al., 2022).

Fourth, we show significant heterogeneity in consumer attention to COOL and preferences for COO based on both geographical location and COOL-related behavioral factors. The *COO Sign* scenario significantly increased attention to COOL only for consumers in Tampa and the market segment labeled as indifferent consumers. Additionally, attention to COOL increased preferences for FL over Mexico tomatoes only for consumers from Dallas and Tampa, and the consumer group labeled as attentive. This provides critical information to producers and policymakers regarding the consumer groups who are more likely to notice and use COOL information when forming their preferences. It also motivates further research to design alternative strategies that can more effectively target less responsive consumer groups.

Overall, our study points to the importance of accounting for consumers' voluntary awareness of COOL when examining preferences for COO. The results of this study can provide producers and policymakers with a more representative estimate of the market outcomes underlying COOL advertising techniques. Knowing which type of consumer has a higher propensity to notice and respond to COOL can help U.S. producers tailor their strategies to more effectively attract consumers toward local varieties. It will also help policymakers in accurately assessing the impacts of different policies mandating COO disclosure. Finally, this study can be used as a baseline to test different ways that can attract higher attention to COOL.

When considering the advantages of our study design, it is also important to note a few inherent limitations, which shed light on the inevitable tradeoffs faced when eliciting consumer preferences for COO, and potentially other product attributes. First, by using real tomatoes in a natural shopping environment, we cannot guarantee absolute homogeneity between the two baskets of tomatoes, no matter how much effort goes into ensuring the tomatoes in the two baskets look exactly the same. Additionally, assessment of subjects' awareness of COOL in this study was made using self-reports, which are susceptible to misreporting. Although the experimenters were tasked with verifying this information, to the best of their knowledge, by monitoring subjects' interaction with the tomatoes, this does not necessarily provide a definitive measure of subjects' true attention to COOL during the experiment, since some subjects may have read the COOL without necessarily touching or inspecting the products. In this regard, using mobile eye-tracking technology (e.g., eye-tracking glasses) might provide a more objective measure of subjects' true attendance to COOL during the experiment. Finally, while our study shows that a significant fraction of individuals fail to notice COOL when buying tomatoes, it does not compare these results with conventional studies that directly ask subjects to report their preferences for COOL. Future research could examine such comparisons to estimate the exact size of the bias that might be induced by placing too much emphasis on COOL.

Author statement

Xiang Cao, Zhifeng Gao, Lisa A. House, and Zhengfei Guan led the research conceptualization and data collection efforts. Bachir Kassas led the formal data analysis, interpretation of results, and wrote the original version of the manuscript. All authors shared responsibility of reviewing and editing the final version of the manuscript.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jocm.2023.100429.

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