This is not my jam: an Italian choice experiment on the influence of typical product attributes on consumers' willingness to pay

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Abstract

Purpose – Packaging and labelling have become essential to how food manufacturers generate and deliver value to customers. The information displayed on the packaging can be used to communicate to customers the properties and unique characteristics of a food product (e.g. nutrients, calories and country of origin). To achieve communication goals effectively, manufacturers need to understand how consumers evaluate products based on their attributes. In particular, companies should be aware of which specific product attributes affect consumer buying behaviour and which product attributes are more critical during food assessment. So, the paper aims to investigate consumer's behaviuor linked to typical product attributes indicated on the packaging.

Design/methodology/approach – The present study examines consumer willingness to pay (WTP) for a cherry jam with different attributes (brand, type of production method and price) on a sample of 2,166 Italian respondents through a choice experiment using a random parameter logit-error component model.

Findings – The results showed that WTP for jams can be affected by attributes such as brand, price and production methods; precisely, they indicated that the level of naturalness in the production process constitutes the main element for the consumer's choice; however, the considerable weight that price and brand have in influencing the purchasing behaviour of the food consumer was still confirmed: in fact, a p-value of less than 0.05 was found in all cases.

Originality/value – To the best of the authors' knowledge, this is the first study that assesses the effect of different types of production on WTP for food products. In addition, this study also reflects on the importance of the level of education for consumer choice.

Keywords Food products, Choice experiment, Willingness to pay, Naturalness, Production process, RPL-EC model

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1. Introduction

Modern consumers are highly demanding and knowledgeable, often exhibiting great concern about their food products' quality, environmental and health benefits. Consumers' increasing concerns for a healthier lifestyle and environmental issues are reshaping how we select and buy food products and our perspectives on food quality (Sajdakowska *et al.*, 2018; Petrescu *et al.*, 2019). Demand for "high-quality" food has recently increased because of market pressure, often forcing food producers and retailers to adopt a quality-driven approach (Imram, 1999; Etale and Siegrist, 2021; Petrescu *et al.*, 2019). As a result, we have witnessed significant growth in the consumption of natural products (Dominick *et al.*, 2018; Etale and Siegrist, 2021; Kumar *et al.*, 2021; Scott *et al.*, 2020). According to Allied Market Research (2020), the global natural products market for beverages and food is predicted to grow at 13.7% in the coming years. For instance, there has been an increase in speciality stores and brands focusing exclusively on natural products (Dominick *et al.*, 2018; Kumar *et al.*, 2021). In the food and beverage industry alone, Consumer Reports (2016) estimated that over two-thirds of consumers look for foods with the "natural" label. This preference for naturalness and natural products is an increasingly important driver of consumers' purchasing decisions (Scott *et al.*, 2020). Recent evidence suggests that consumers place a high value on processing techniques when assessing the naturalness of food products (Etale and Siegrist, 2021). Thus, awareness of the production method and history can affect consumers' attitudes, perceptions and purchase intention (Rausch and Kopplin, 2021; Etale and Siegrist, 2021). Research shows that foods produced using traditional methods (or inputs) are usually perceived as better than those resulting from industrial processes (or non-indigenous inputs; Cerjak, Karolyi, and Kova ˇ ci′c, 2011; Etale and Siegrist, 2021). Understanding how consumers assess the production method of food products is relevant because consumers' purchase decision-making process depends on these frames. However, it is still unclear how different degrees of production processes can affect consumers' willingness to pay (WTP) for food products. In this study, we attempt to fill the void in the literature on consumer behaviour for food products by estimating consumers' WTP for cherry jam products that are differentiated concerning different value-added attributes by using a choice experiment. We follow a similar methodology to Hu *et al.* (2012) to study the consumer WTP for jam. However, we add to the literature by analysing the effect of extrinsic cues such as different production methods on WTP. Also, we consider the Italian population and whether previous studies focusing on consumer buying behaviour for jam have been conducted in other countries outside Europe such as the USA, Colombia and the Philippines (Hu *et al.*, 2009; Hu *et al.*, 2012; Piqueras-Fiszman *et al.*, 2013). Literature suggests that, on average, Italian consumers pay more attention to food quality at the time of purchase. Studies show that Italian consumers check whether the product has quality labels guaranteeing specific characteristics compared to other European countries (Mascarello *et al.*, 2015; Covino *et al.*, 2013; EU, 2012). Thus, we study the effect of different types of production processes, prices and brands on consumers' WTP for cherry jam in different Italian cities. In particular, we investigate whether consumers' WTP for cherry jam is affected by the type of production process (no specification, homemade, traditional and industrial), price (four alternatives: from €1.5 to €4.5 with a step of €1) and brand (known or unknown). Based on this, we formulated the following research question:

RQ1. To what extent do intrinsic cues (production process) and extrinsic cues (price and brand) affect consumers' WTP for cherry jam?

The jam sector is an excellent setting for studying such issues, as jam is a virtue, a readily available product, and relatively widespread in supermarkets and local grocery stores

(van Doorn and Verhoef, 2011). In addition, recent evidence suggests that consumers who buy jam products are sensitive to and affected by price, brands, origin and production methods (Awulachew, 2021; Caputo *et al.*, 2013; Hu *et al.*, 2009; Hui *et al.*, 2009). A choice experiment can include several product options with different attributes and prices. The participant selects the option or alternative that better reflects his/her preferences for that product (Haaijer *et al.*, 2001; van Loo *et al.*, 2011). This procedure is comparable to typical shopping decisions a consumer might face when buying products in the market. In our study, we presented consumers with different alternatives to cherry jam based on the type of production process, brand and price. To the best of the authors' knowledge, this is the first study that investigates the effect of this type of production process on WTP for jam products.

The remainder of this study is as follows: Section 2 reviews relevant literature that motivates our study. Section 3 describes the methodology used, followed by Section 4, in which the results from the choice models are presented. Section 5 summarises the results and implications regarding the findings of preference for different food attributes and the interaction effects between these food attributes. Finally, the limitations and directions of future research are also discussed.

2. Literature background

Marketing literature shows that food products possess various traits, which are substitute quality indicators for customers (Wang *et al.*, 2016). According to Olson and Jacoby (1972), these traits can be divided into intrinsic and extrinsic cues. Intrinsic and extrinsic cues are part of the product-related attributes, and the criterion for dividing them is whether they are part of a physical product (Blackmore *et al.*, 2021; Olson and Jacoby, 1972). Intrinsic cues usually refer to the product's inherent traits; extrinsic cues are attributes linked to the product but are not part of the physical product (Olson and Jacoby, 1972). When the product's intrinsic attributes are changed, the product's essence will be changed (Kirmani and Zeithaml, 1993). On the other hand, extrinsic cues can be manipulated without altering the product's essential attributes (Kirmani and Zeithaml, 1993).

Literature suggests that consumers' WTP for food products can be influenced by both intrinsic and extrinsic product cues (Printezis *et al.*, 2019; Scott *et al.*, 2020; Wang *et al.*, 2022(1); Wang *et al.*, 2022(2)), and more specifically for jam products (Hu *et al.*, 2009; Hu *et al.*, 2012; Hui *et al.*, 2009; Meas *et al.*, 2015; Printezis *et al.*, 2019; Van Doorn and Verhoef, 2011). Consumer preferences for different intrinsic and external cues could thus lead to contrasting responses to food items by altering taste impressions and WTP [1] (Brunel and Pichon, 2004; Meas *et al.*, 2015; Scott *et al.*, 2020; Silayoi and Speece, 2007). Veale and Quester (2009) argue that intrinsic cues are easier to gain customers' trust than extrinsic cues. However, consumers' assessment of intrinsic cues is often limited. Consumers cannot often judge a food product's intrinsic attributes, as they cannot try a new food product without buying it. Thus, the information provided by most intrinsic cues, such as smell, taste or other physical attributes of food, is more challenging to obtain or experience by customers (Blackmore *et al.*, 2021). Previous studies found that customers rely more on external cues in the following three situations: customers are not familiar with the product; customers cannot obtain information on internal cues; and customers cannot evaluate internal cue clues (e.g. dependent on consumer knowledge; Alvino *et al.*, 2019; Zeithaml, 1988). Brand and price are arguably the most common extrinsic cues to attract customers' attention and influence purchase decisions about food products. In fact, price and brand are often regarded as indicators of quality, socioeconomic status and, ultimately motives to purchase. Similarly, internal cues could also stand out in consumers' preferences for specific products when

consumers have a specific need or want (e.g. food naturalness). Literature shows that internal attributes such as organic and local can positively affect the WTP for jam products (Hu *et al.*, 2009; Meas *et al.*, 2015). According to Meas *et al.* (2015), consumers are willing to pay more for jam produced locally in regions more petite than a state's border than organic jam. As consumers' interest in food naturalness is rapidly increasing (Etale and Siegrist, 2021), studying food processing techniques can help consumers assess the naturalness of food products and how much food processing techniques affect consumers' decision-making. This section discusses the effect of different product cues (brand, price and food processing) and socio-demographic variables on consumers' WTP for food products.

2.1 Brand

Literature shows that brand is essential in determining consumer food choices (Burnier *et al.*, 2021; Yin *et al.*, 2017). Many consumers use the brand as a "search attribute" in their decision-making process for food products, especially when it concerns WTP (Ahmad and Anders, 2012; Yin *et al.*, 2017). In particular, studies investigate the effect of different types of brands (e.g. sore vs national brands, known vs unknown) on the WTP for food products (Burnier *et al.*, 2021; Yin *et al.*, 2017). For instance, Roheim *et al.* (2007) show that consumers are willing to pay a premium price for products carrying well-known brands. Similarly, Froehlich *et al.* (2009) found that consumers' WTP for beef was positively affected by brand preference. Finally, Burnier *et al.* (2021) found that consumers exhibit a higher WTP for a known brand than an unknown brand and a sustainable brand. Based on this, we investigate whether consumers' WTP for well-known brands of cherry jam is different (or higher) compared to unknown brands.

2.2 Price

Literature also highlights that price can affect consumers' evaluation of food products and, ultimately, WTP (Petrescu *et al.*, 2019; Wang and Li, 2012). Price, as an external cue, can be regarded as a motive to judge product quality or purchase (Petrescu *et al.*, 2019). For instance, a Malaysian study found that freshness and price were two of the most commonly used product cues for assessing the quality of fresh meat, fruits and vegetables (Chamhuri and Batt, 2015). Similarly, Petrescu *et al.* (2019) show that price was among the most important cues for Romanian and Belgian consumers for assessing food quality. Comparing different prices can also give us a better understanding of WTP for food products. Studies found that higher prices might increase the perceived quality of food products (Kovacs and Keresztes, 2022). However, whether consumers are willing to pay a higher price for food products also depends on their knowledge/sensitivity (e.g. environmental concern), type of product (e.g. organic) and sociodemographic variables (e.g. educational level and age). For instance, Hu *et al.* (2009) studied the effect of different attributes, including price, on WTP for six products (e.g. jam, yoghurt, muffin, etc.). The authors found that price had a significant negative coefficient across all six product categories. This suggests that, while keeping other factors constant, consumers are still less likely to select food products if their price is higher (although, for instance, jam is usually more expensive than yoghurt). Thus, we investigate whether different levels of price influence consumers' WTP for cherry jam.

2.3 Food processing

Food processing can be defined as "a logical basic sequence of steps to produce an acceptable and quality food product from raw material" (Smith and Hui, 2008; p. 3). Food processing can be classified according to the processing techniques (e.g. traditional and chemical), preservation techniques (e.g. cold and freezing) or type of energy used (e.g. water–

energy–food) (Brown *et al.*, 2018; Daher and Mohtar, 2015; Evans *et al.*, 2010; Meijer *et al.*, 2021; Smith and Hui, 2008). In our study, transformations were conceptualised using the transformation technique, encompassing a complete food processing classification. We can distinguish different types of processing techniques according to the number of steps and physical/chemical transformation a product undergoes, thus from natural transformation to industrially produced food (Brown *et al.*, 2018; Etale and Siegrist, 2021). Natural transformations (e.g. homemade and traditional) are defined as those that involve a smaller number of steps to produce a food product and/or result in no or minimal changes to the physical properties of the food (e.g. shape, size and no additives; Brown *et al.*, 2018; Etale and Siegrist, 2021). Instead, industrial transformation encompasses alterations to molecular composition and results in food products that are chemically distinct from the original (Etale and Siegrist, 2021). For instance, soup made with chopped, blended, pureed or dried and rehydrated vegetables is defined as a natural transformation. Instead, soup made with ingredients that have been chemically extracted from plant sources results in industrially produced food (Evans *et al.*, 2010). Literature investigates the influence of the different types of processing techniques on consumers' expectations about food and assessment of its naturalness (Brown *et al.*, 2018; Etale and Siegrist, 2021; Evans *et al.*, 2010; Meijer *et al.*, 2021). In general, studies show that excessive processing may destroy naturalness. The more processing steps a food product undergoes, the less natural a consumer perceives the product to be (irrespective of whether it resulted in a healthier or nature-like product); for instance, milk with added vitamins is perceived as less natural than skimmed milk (Etale and Siegrist, 2018; Rozin *et al.*, 2009). Thus, food produced using traditional methods is perceived as better than those produced by industrial processes or modern inputs (Cerjak, Karolyi, and Kova ˇ ci′c, 2011). Traditional methods are considered healthier and safer because they have been available for centuries (Inbar *et al.*, 2020; Siegrist and Hartmann, 2020). Similarly, homemade food is viewed "as an authentic creation of the family"; thus, companies producing homemade food attempt to preserve the character, traditions and process of food made at home (Arnould and Price, 2000; Groves, 2001; Price and Arnould, 2000). In addition, Siegrist and Hartmann, 2020 show that wine described as produced by traditional methods had higher mean hedonic ratings than wine described by a less traditional method. Similarly, Caporale and Monteleone (2004) found that beer brewed by traditional brewing technology was more appreciated than beer brewed using organic barley and hops or with yeast that had been genetically modified. Together, these findings suggest that products perceived as traditional or produced from traditional processes have higher acceptability among consumers. Instead, industrial processing is often associated with diminished naturalness because of limited human contact (Abouab and Gomez, 2015). The use of machinery and automation seems to emphasise the focus on efficiency in terms of inputs and time, instead of the quality of the final product (Cirne *et al.*, 2019). Several intrinsic product cues could elicit higher WTP in jam products (e.g. origin); however, for the above reason, the type of processing used to manufacture jam could be arguable as the most salient intrinsic cue (Blackmore *et al.*, 2021). Based on this, we investigate if different processing techniques can influence consumers' WTP for cherry jam.

2.4 Sociodemographic variables

Several studies have investigated the impact of consumers' sociodemographic (e.g. age, gender, education and income) (Hu *et al.*, 2009; Hui *et al.*, 2009), nutrition claims, local production claims and organic logos (Hu *et al.*, 2012; Meas *et al.*, 2015) on the WTP for jam products. Literature shows that demographics such as age and income levels can affect WTP for organic and local jam products (Hu *et al.*, 2009). In particular, literature shows that

education plays an important role in consumers' preferences and WTP for food products. For instance, Napolitano *et al.* (2010) found that the respondent's level of education influenced preferences for organic beef. In particular, the assimilation of organic beef was higher for people with high school or university degrees than at the secondary and primary school levels. Similarly, Vapa-Tankosić *et al.* (2020) found that higher education levels positively influence the WTP for locally produced honey. This suggests that the level of education of consumers plays a vital role in selecting ethical and healthier food, as education can improve knowledge and attitudes towards less natural food ingredients, such as additives (e.g. preservatives, additives, colourants and artificial sweeteners in foods; Dunteman and Lee, 2023; Moravejolahkami *et al.*, 2020).

3. Methods

3.1 Data collection and participants

A questionnaire was developed to conduct the experiment, composed exclusively of sociodemographic and choice experiment parts. Before sending out the questionnaire, it was validated through a pre-test conducted on a sample of 12 professionals to check the validity and reliability of the questions. Only minor changes were made after the pre-test. In total, the questionnaire took approximately 5 min to answer. The questionnaire was distributed online, using e-mails, social networks and instant messaging clients, between June 1, 2021 and August 31, 2021. The study was subjected to the ethical approval of the independent IRB of the authors' institution (regional research centre, ethics/approval number prot. no. 0391). In addition, participants signed an online informed consent form before participating in the survey. Children and young adults (under 18 years old) were not allowed to participate in the survey.

To ensure greater accuracy and consistency, the questionnaire included only closed-end questions, and information was collected concerning the time of the interview. At the beginning of the questionnaire, respondents were provided with a concise description of the aim of the research and a detailed explanation of different types of stimuli. Respondents were asked to choose their preferred alternative for cherry jam over different hypothetical scenarios. Each scenario is a function of different product attributes (including price), and each attribute varies at different levels. Based on the theory of experimental economics, each respondent was offered only 4 of the 16 choice cards created; however, all 16 cards were equally distributed in the considered sample. This is to ensure that the respondent's level of attention remains high.

The questionnaire was addressed to consumers in Italy, specifically in three major cities (Milan, Rome and Naples). The questionnaire was mainly directed to the person in charge of the buying choices within a household (purchase maker). The final sample was made up of 2,166 respondents. This can be considered satisfactory, considering that the sample was closer to a small effect size (sample size requirement = 3,132) than a medium effect size (sample size requirement = 432). Therefore, the present sample size is considered suitable (Cohen, 1988).

3.2 Experimental design

Our choice experiment studies the behavioural responses of consumers, households or even organisations in various sectors (Louviere *et al.*, 2010). Its design provides the development, testing and optimisation of an experimental survey. Identifying the most significant attributes is fundamental, and, as a rule, monetary value is always included. In this way, when individuals make their own choices, they implicitly reveal the trade-offs between

attribute levels in the various alternatives presented in a choice set (Coast *et al.*, 2012; Hensher *et al.*, 2005; Alpízar *et al.*, 2003; Ryan and Gerard, 2003; Hanley *et al.*, 1998).

In this research, three attributes with 2, 4 and 4 levels, respectively, are present. Hence, 32 potential combinations of choice ($2 \times 4 \times 4$) are generated. Because of the impossibility of submitting to respondents too many scenarios (Train, 1998), a fractional factorial (orthogonal) design was used, which only considers a valid and representative subset of scenarios, avoiding even getting answers with low accuracy. For this purpose, the SPSS software (ver. 25.0) was used; the original 32 combinations were reduced to 16 and divided into four groups of 4. The main results are as follows: number of choice sets: 16; main effects are uncorrelated; and efficiency optimal design size $m = 2$: 98.03%.

Four different cards were submitted to every interviewee. Each card represented a different choice scenario with two product alternatives (A and B) and the not-choice (alternative C).

The response data were modelled within a utility function, providing information on whether the given attributes are important, the relative utility of different attributes and their combinations, the rate at which individuals are willing to trade between attributes (trade-off) and the total satisfaction or utility that respondents derive from the product. Attributes and their levels were chosen based on the aim of our research, literature background and focus group discussions while considering constraints related to the experiment's implementation (Scarpa *et al.*, 2005). The number of attributes included in the experiment design was limited to (the most important) three: a specific known brand, a particular feature relating to the preparation of the product and price. The first attribute (BRAND) has two levels, i.e. the absence and presence of a specific known brand. The second attribute (labelled TYPE) has four levels depending on the absence (the first level) or presence of a particular feature in the production of the cherry jam detected by the other three levels: i.e. a jam produced with classic industrial processing (labelled INDUSTR), a jam produced with homemade processing (labelled HOME) and a jam produced with traditional processing (labelled TRADIT) (each representing at least one specific characteristic of the offered food product). The third attribute is the price (labelled PRICE), which is a quantitative variable; in this case, the presented four levels are just the price for one piece, starting from a slightly lower value than the actual average market value for an equivalent product until a slightly higher value (according to a steady step of 1): in particular, price levels were generated considering those prevailing in most local foodstuffs and consultations with specific food producers and marketing researchers; therefore, the price range was generated to reflect both the low-end price of less differentiated jams and the high-end price for jams found in more niche markets, such as speciality food shops and farmers' markets.

3.3 Data analysis

Data were analysed using the random utility theory (McFadden, 1973), which assumes that a given alternative is selected if the perceived utility provided by such a choice is the highest among the different possibilities (Thurston, 1927). Utility comprises the constituent attributes of an alternative (Lancaster, 1966) and comprises two parts – i.e. observable and unobservable components (Manski and Lerman, 1977).

Formally, the ith consumer's utility of choosing alternative j can be expressed by the following utility function:

$$U_{ij} = V_{ij} + \varepsilon_{ij} \tag{1}$$

The ith consumer's utility function U_{ij} of choosing the alternative j is composed of a deterministic component V_{ij} – the observed portion of utility – and a random stochastic component OBJ – the unobserved portion of utility. The latter arises because not all effects on an individual's choice can be thoroughly captured by data without neglecting the idiosyncrasies of some of them.

Random parameter logit (RPL) and random parameter logit-error component (RPL-EC) models extend the multinomial logit (MNL) model by overcoming the independence of irrelevant alternative assumptions and preference homogeneity. In particular, the RPL model allows the utility coefficients to vary across consumers according to continuous probability distribution functions (Chang *et al.*, 2009). It captures a more significant variability of preferences for choice-specific attributes across individuals (Train, 2000) and allows for identifying how preferences vary in a population (Greene and Hensher, 2003; Colombo *et al.*, 2009).

Because there is reason to believe that consumers exhibit both random preference heterogeneity and non-proportional substitution patterns, we move on to more recent developments in random utility theory, which can handle both aspects (Hensher *et al.*, 2005; Greene and Hensher, 2003). As participants were asked to choose one alternative between the three options listed in each choice task, which included two profiles of food products (in this case, cherry jams) and one no-buy option (status quo), the RPL-EC model would also capture correlation across utilities and taste parameters. As argued by Van Wezemael *et al.* (2014) and Scarpa *et al.* (2007), the presence of the opt-out alternative in the experimental design might cause systematic effects associated with both the opt-out and correlated random effects across utilities between alternatives of choice set designs. Studies by Caputo *et al.* (2013) and Hess and Rose (2009) found error components of this type to improve model fit in similar choice contexts consistently. By considering the error components that induce heteroscedasticity and correlation over alternatives in the unobserved portion of utility, the utility function becomes:

$$U_{ij} = x_{ij}\beta_i + \eta_{ij} + \varepsilon_{ij} \tag{2}$$

where η_{ij} represents the error components that induce heteroscedasticity and correlation over alternatives in the unobserved portion of utility and ε_{ij} is the Gumbel distributed error term (Van Wezemael *et al.*, 2014; Scarpa *et al.*, 2005, 2007).

The probability that the ith consumer chooses alternative j of choice set, C_i, is:

$$Pr_i(j|X_{ij}) = \int \frac{e^{x_{ij}\beta}}{\sum_{k=1}^{j} e^{x_{ij}\beta}} f(\beta_i|\theta)d\beta_i \qquad \text{with } k \in C_i \tag{3}$$

where $f(\beta_i|\theta)$ is the density of the coefficients β_i, with θ referring to parameters of the density function (mean and variance). There is no closed-form solution; thus, the probabilities are approximated through simulation using Halton draws, which give a more efficient simulation than random draws (Van Loo *et al.*, 2011; Bhat, 2003; Train, 2000). In other words, RPL-EC models accommodate heterogeneity by iteratively taking draws of β's from the underlying distribution and averaging the results. The "mixing" of β's induces correlation into unobserved utility, ε_j.

Finally, the RPL-EC model also allows the estimation of consumer WTP for each product attribute. WTP for attribute k is understood as the price change associated with a unit increase in a given attribute. WTP is computed as the ratio of the partial derivative of the

utility function concerning the attribute of interest and the derivative of the utility function concerning the variable "price" (Gracia *et al.*, 2009; Morrison *et al.*, 2002). It is equal to the negative ratio of the estimated parameter for attribute k and the price parameter:

$$WTP_{Attribute} = \frac{\frac{\partial U_{ij}}{\partial Attribute}}{\frac{\partial U_{ij}}{\partial Price}} = -\left(\frac{\beta_k}{\beta_p}\right) \quad (4)$$

So, a card example for the present study is shown in Table 1 and the levels of the product attributes are described in Table 2.

4. Findings

In this section, we analysed the results obtained from the survey, the main links between all the variables considered and the most important indications and reflections that derive from them. As the RPL-EC model assumes variation in the utility coefficients across individuals according to continuous probability distribution functions, it enabled us to test the hypothesis of preference heterogeneity across consumers' choices and capture correlation across utilities and taste parameters. As for MNL models, we assumed the price coefficients to be invariant across respondents (Revelt and Train, 1998). The coefficients of the attributes and their levels were assumed to be random parameters following a normal distribution (Van Loo *et al.*, 2011; Gao and Schroeder, 2009; Tonsor *et al.*, 2005). This assumption allows

Card 1	Alternative A	Alternative B	Alternative C
Brand (known brand)	Yes	No	
Typology (product feature)	Homemade processing	Industrial processing	Neither A Nor B
Price (Euros for one piece)	3.5	2.5	

Notes: Each respondent was given a set of cards, for each card he had to make a choice between two alternatives of the same product with different characteristics and the non-choice. All the choices of each respondent were subsequently codified according to the usual procedures of a choice experiment and statistically analysed to understand the consumer's behaviour
Source: Authors' own creation

Table 1. An example of the 16 cards created: each alternative represents the product with the three attributes

Attributes	Levels			
Known brand	No	Yes		
Product feature	Nothing	Industrial processing	Homemade processing	Traditional processing
Price (Euros for one piece)	1.5	2.5	3.5	4.5

Notes: For the considered product, according to the usual procedures of a choice experiment, three attributes and, for each of them, corresponding levels were identified: two for the known brand, four for the product feature and four for the price
Source: Authors' own creation

Table 2. Cherry jam attributes and their levels

the WTPs for each product attribute to be normally distributed. A p-value of less than 0.05 was used to designate the statistical significance of all analyses.

Table 3 shows the sociodemographic characteristics of the participants in the three cities. The distributions by city on gender, age, education, occupation and marital status show that the sample covered a relatively wide and varied range of individuals.

Table 4 displays the results from the RPL-EC models estimated separately for the three Italian cities. The null hypothesis that all coefficients are zero is rejected by the likelihood ratio tests (p-value < 0.01). There is clear evidence for the opt-out option, which in the hypothetical choice sets was presented to respondents with the "not buying" option (Van Wezemael *et al.*, 2014). A statistically significant and positive coefficient would indicate, in this case, a higher propensity to choose the opt-out alternative. In all three cities, the positive coefficients of the opt-out alternative demonstrate that, holding other product attributes and price constant, consumers prefer having nothing rather than one of the two presented food products (cherry jam). Consumers perceived that the quality level of the options in the choice set did not surpass their subjective threshold utility level (Balogh *et al.*, 2016; Hu, 2006; Kontoleon and Yabe, 2003).

In the RPL-EC specification, the modelled heterogeneity across consumer preferences is expressed by the coefficients that vary among the respondents following, in our case, a

Sociodemographic characteristics	Total		Milan		Rome		Naples	
Gender								
Male	1235	(57)	324	(53)	323	(54)	526	(55)
Female	931	(43)	288	(47)	275	(46)	430	(45)
Age group								
18–29	801	(37)	233	(38)	227	(38)	363	(38)
30–39	628	(29)	165	(27)	155	(26)	258	(27)
40–49	368	(17)	98	(16)	90	(15)	153	(16)
50–59	217	(10)	67	(11)	72	(12)	105	(11)
>59	152	(7)	49	(8)	54	(9)	76	(8)
Education level								
Secondary	996	(46)	330	(54)	335	(56)	516	(54)
Bachelor	412	(19)	67	(11)	66	(11)	124	(13)
Master	585	(27)	165	(27)	155	(26)	249	(26)
PhD	173	(8)	49	(8)	42	(7)	67	(7)
Professional status								
Student	628	(29)	147	(24)	150	(25)	239	(25)
Unemployed	152	(7)	49	(8)	42	(7)	76	(8)
Housewife	173	(8)	61	(10)	60	(10)	96	(10)
Employee	585	(27)	165	(27)	173	(29)	287	(30)
Self-employed	563	(26)	165	(27)	144	(24)	220	(23)
Retired	65	(3)	24	(4)	30	(5)	38	(4)
Marital status								
Unmarried	1170	(54)	343	(56)	335	(56)	545	(57)
Married	650	(30)	196	(32)	185	(31)	277	(29)
Other (separated, divorced, widowed)	347	(16)	73	(12)	78	(13)	134	(14)
Sample size	2,166		612		598		956	

Notes: Characteristics of the sample are analysed in total and for individual cities (in quantity and percentage) on the basis of gender, age, education, employment and marital status
Source: Authors' own creation

Table 3.
Sociodemographic characteristics of the sample by city: number (n) and percentage (%)

Variables	Milan Estimates ± Std. error	Rome Estimates ± Std. error	Naples Estimates ± Std. error
Random main effects parameters in utility function			
BRAND			
Mean	1.09 ± 0.06	1.17 ± 0.05	0.45 ± 0.04
St. dev.	0.68 ± 0.05	0.67 ± 0.05	0.27 ± 0.03
INDUSTR			
Mean	–0.39 ± 0.07	–0.46 ± 0.07	–1.16 ± 0.05
St. dev.	0.25 ± 0.10	0.28 ± 0.10	0.69 ± 0.06
HOME			
Mean	–0.14 ± 0.04	–0.21 ± 0.05	–0.58 ± 0.07
St. dev.	0.19 ± 0.09	0.23 ± 0.09	0.34 ± 0.07
TRADIT			
Mean	0.18 ± 0.08	0.16 ± 0.08	0.17 ± 0.06
St. dev.	0.25 ± 0.09	0.13 ± 0.08	0.19 ± 0.07
Non-random parameters in utility functions			
Opt-out	0.69 ± 0.26	0.73 ± 0.26	0.91 ± 0.24
PRICE	–0.54 ± 0.04	–0.59 ± 0.03	–0.57 ± 0.039
Error component	2.53 ± 0.23	2.79 ± 0.17	2.24 ± 0.14
Sample size	612	598	956
N	7,344	7,176	11,472
Log likelihood	–3,164	–2,879	–4,703

Notes: All the computed *p*-values were less than 0.05 and they were considered statistical significant
Source: Authors' own creation

Table 4.
Random parameter logit-error component (RPL-EC) estimates by city

normal distribution. The upper part of Table 4 shows the random (respondent-specific) coefficients, which are described by their mean and standard deviation. These coefficients allow us to describe the role explained by the three labels in the consumer buying process of cherry jam. The coefficients of all three labels are statistically significant for all three cities; however, their different magnitude and sign reflect the different importance and role that consumers give to these labels in their choice decisions, as also proven by the statistical significance of the standard deviation of the coefficients. Results show that the standard deviation parameters estimated for the three labels of cherry jam are all significantly different from zero, implying heterogeneity in consumer preferences, which allowed us to put aside the hypothesis of homogeneous preference in the MNL models. On average, the three labels address different consumer behaviours towards the presented food product. The attitude towards the three types of the same product gradually decreases as the focus shifts from the first label to the second one, until it becomes a more proactive attitude for the third one. However, this does not mean it necessarily turns into an actual buying behaviour until the consumer's utility levels reach a certain threshold. The results suggest that, in all three cities, consumers tend to choose cherry jam with the third label (TRADIT) more and, to a lesser extent, the one with the second label (HOME) and, even more, the one with the first label (INDUSTR). The random coefficients (means) are consistently negative for both INDUSTR and HOME. However, these coefficients show a lower level of disutility attached to HOMEs than that associated with INDUSTRs.

The random coefficients (means) associated with TRADITs are significantly positive for all three cities. It means that low but positive utility levels are attached to the third label, which allows for providing a higher quality. This can likely also be traced back to recent

food trends, which are increasingly oriented towards traditional and typical foods whose market has been expanding rapidly in industrialised countries (Cranfield *et al.*, 2011), especially where producers can declare the health benefits (Boccia *et al.*, 2013). Unlike INDUSTRs and HOMEs, whose negative impact on buying behaviour was stronger for Naples, the positive coefficients for TRADIT are similar in all three cities. This suggests that there are similar utility levels across cities. Also, the difference between INDUSTR and TRADIT utilities is particularly relevant for the city of Naples (as shown in Table 4).

Our results also show that brand plays a crucial role when buying food products. The brand has a positive value, especially for the city of Milan and Rome. It means that higher preferences for a product with a brand result in a higher WTP more for a product (compared with products without a brand). This is in line with previous studies on the topic, thus suggesting that consumers often rely on the brand name's reputation to make choices about food products (Boccia and Sarnacchiaro, 2020). Instead, the price parameter is consistently negative, confirming consumer preference for lower prices over higher prices in all three cities. This suggests that a price increase would decrease consumers' utility and thus their likelihood of purchase; this is also in line with previous studies (Wang *et al.*, 2022; Kumar *et al.*, 2021; Ahmad and Anders, 2012). The stronger negative values for INDUSTR traits were also established by the WTPs estimated for the whole sample of consumers, confirming how INDUSTR attributes are valued less by consumers (as shown in Table 5). Contrarily, the values for TRADIT traits remain significantly positive and very similar between the three cities.

5. Discussion

While buying products, customers face the uncertainty of decision-making and specific information search costs (Haridasan *et al.*, 2021). Consumers do not often envision which products to buy before shopping, especially for goods such as food or beverages. Studies show that we make between 60% and 70% of purchase decisions at the point of sale (Panda *et al.*, 2021). Thus, relevant information about the product provided at the point of sale becomes a critical factor in consumer buying. In addition, consumers (often) cannot taste products at the point of sale. Thus, they often relate to other factors that help them make decisions about food products (Meas *et al.*, 2015; Panda *et al.*, 2021), such as type of brand, price, colour, labels and information displayed, could influence consumers' intention to purchase food products (Meas *et al.*, 2015; Buchmüller *et al.*, 2022; Wang *et al.*, 2022; Odaman *et al.*, 2020). Food manufacturers use a range of product attributes (e.g. flavour, price, brand, nutritional information, packaging, etc.) to attract and sustain attention, helping consumers select and ultimately buy products; also known as intrinsic cues (e.g. physical product differences) and extrinsic cues (e.g. price, brand) (Szybillo and Jacoby, 1974). This information is also used for communication, branding and attracting customers (Buchmüller *et al.*, 2022;

Table 5. Willingness-to-pay (WTP) estimates for attributes on the sample based on coefficients of the RPL-EC models by city

Attribute	Milan	Rome	Naples
BRAND	1.91	1.89	0.77
INDUSTR	–0.78	–0.78	–1.82
HOME	–0.24	–0.31	–0.98
TRADIT	0.33	0.21	0.29

Notes: All the computed p-values were less than 0.05 and they were considered statistical significant
Source: Authors' own creation

Wang *et al.*, 2022). In real life, customers are exposed to extrinsic and intrinsic cues simultaneously; however, their effect on preferences and these cues is usually studied separately (Blackmore *et al.*, 2021; Wang *et al.*, 2022). To understand how extrinsic and intrinsic cues can affect consumer experience, it is desirable and essential to study them together (Blackmore *et al.*, 2021). Our study examined the effect of different product attributes on consumer buying behaviour for food products. We try to answer the following research question: *To what extent do intrinsic cues (production process) and extrinsic cues (price and brand) affect consumers' willingness to pay for cherry jam?* To answer this question, we use a choice experiment and follow a similar methodology of Hu *et al.* (2012) to investigate whether different types of production processes, price levels and types of brands affect consumers' WTP for jam products.

In this study, we focus on the Italian population in three different cities, as Italian consumers are considered very attentive to food quality in Europe (Dangelico *et al.*, 2022; EU, 2012; Mascarello *et al.*, 2015). We also chose jam as a stimulus as it is a virtue, a readily available product and relatively widespread in supermarkets and local grocery stores (van Doorn and Verhoef, 2011). Our results show that extrinsic cues (brand and price) still play an essential role in consumers' decision-making processes. In fact, both price and brand can strongly influence the WTP for food products. In particular, a well-known brand increases the WTP for a product. Instead, an extreme increase in price decreases the WTP for a product. These results are in line with previous studies (Boccia and Sarnacchiaro, 2020; Wang *et al.*, 2022; Kumar *et al.*, 2021; Ahmad and Anders, 2012; Laforet, 2011). However, unlike other studies, we find that intrinsic characteristics (production process) are more accidental; as a matter of fact, they can have a stronger impact on buying behaviour than extrinsic cues (Blackmore *et al.*, 2021; Wang *et al.*, 2022). Our findings also show that different production processes can strongly affect consumers' decisions about food products. Thus, the level of naturalness of the production process can affect the WTP for a product (Wunderlich and Gatto, 2015). Our results show a strong consumer aversion towards INDUSTRs (the general process of industrial foods). This suggests that consumers understand that this excessive processing may destroy the naturalness of the product, thus reducing their WTP for it. Instead, increasing levels of naturalness in the production process (TRAD and HOME) can improve the feeling of goodness and familiarity of the food product and reduce the uncertainty related to the quality of the raw material used, confirming previous studies (Kumar *et al.*, 2021; Lusk and Coble, 2005). Thus, food produced using traditional methods is perceived as better than those produced by industrial processes or using modern inputs (Cerjak *et al.*, 2011; Inbar *et al.*, 2020; Siegrist and Hartmann, 2020).

The role of intrinsic cues given by foods remains central in the decision-making process for consumers, who demand sensations of tradition and quality/health-related aspects. The level of individual education plays a crucial role in that process. Significant differences can also be noticed among consumers with different educational levels, thus demonstrating the value of segmentation. Even the adverse role of INDUSTRs (and sometimes HOMEs) becomes less incisive for consumers with high education, and, as for the brand, TRADITs are valued more by well-educated consumers. In our study, sociodemographic variables such as age, sex and marital status were not considered for the analyses because of their negligible influence on consumption choices. Instead, we also find that the educational level variable impacts consumer choices. Previous research underlies the importance of consumers' level of education in making healthier food choices and attitudes towards food additives (Napolitano *et al.*, 2010; Vapa-Tankosić *et al.*, 2020). Although formal education does not necessarily imply knowledge about the product (Boccia *et al.*, 2018), our results suggest that a higher educational level can increase the tendency of people to be influenced

by messages that evoke feelings of quality, healthiness or the traditional nature of a food product; this is also in line with previous literature on the topic (Li and Powdthavee, 2015; Boccia, 2015; Lleras-Muney, 2005).

The findings of our study could be beneficial for companies to identify target markets or market niches for their products. Studying consumers' willingness to purchase different products based on the production processes (industrial versus homemade) can help jam producers better understand their target audience's different needs and wants. This study shows that consumers' preferences and awareness about product naturalness can vary greatly. Understanding which types of consumers are more sensitive to these issues is vital to developing more effective positioning, pricing and distribution strategies. For instance, understanding where consumers might have a greater awareness and preference for industrial or homemade products (e.g. Rome) has a great impact on the distribution of such products. Generating awareness among consumers about the differences in the production process and changes in product price might be challenging. We also hope our findings are relevant for policymakers and marketers seeking to justify a price premium for product attributes depending on the type of production method used.

Overall, displaying such information effectively is the key to success for many food products (Boccia and Sarno, 2013; Silayoi and Speece, 2007; Brunel and Pichon, 2004; Scott *et al.*, 2020). To achieve effective marketing strategies, food manufacturers must understand consumers' responses to their product attributes and integrate consumer preferences for internal and external cues into food design (Silayoi and Speece, 2007).

6. Limitations and future directions

The present work comes with limitations. To the best of the authors' knowledge, this was the first conjoint study investigating consumer preferences for different levels of industrial processes, brands and price ranges for food products. However, we only considered one product (cherry jam) as a product for our study. Therefore, we suggest other researchers focus on other food products in the same category (e.g. jelly, peanut butter) for further empirical validation of this study. We also suggest investigating whether consumers' preferences for the naturalness of the production process change depending on the type of product (e.g. hedonic vs utilitarian). Finally, our sample was addressed to consumers living in Italy. We suggest replicating the study, including respondents from other countries. This would allow for measuring the impact of cultural and ethnic backgrounds on the study while controlling for country-specific factors. Finally, our study investigates the psychological aspects of consumers' purchasing choices for different types of product cues. However, a questionnaire can provide a limited understanding of the biases underlying psychological aspects of consumer choice. Thus, we suggest researchers replicate this study by using a neuromarketing experiment. Using neuroscience tools can give insights into the unconscious and subconscious reactions of consumers while they scan food products. In particular, using neuroscience tools can be beneficial to understand consumers' unconscious biases and preferences towards naturalness, hence the type of production process.

Note

1. Willingness to pay can be defined as "the highest price an individual is willing to pay for a product or service" (Balderjahn, 2003, p. 389).

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