Consumer Preferences for Food Labels on Tomatoes in Germany – A Comparison of a Quasi-Experiment and Two Stated Preference Approaches

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Highlights

► The results support the assumption of a social desirability effect, as results differ between the quasi-experiment and the two stated preference approaches.
► The use of a combination of methods to get an understanding of the true behavior of consumers is important as demonstrated by this paper.
► The participants in the quasi-experiment preferred tomatoes without a label to those with carbon footprint labels.
► The characteristic "grown locally" shows the highest utility in the quasi-experiment after price, indicating that local origin is preferred to organic production.

Keywords: conjoint analysis, consumer marketing, sustainability, social desirability, purchasing behavior, carbon footprint label, local production

Abstract

In many studies, consumer preferences are determined by using direct surveys. For this method social desirability is problematic. This leads to the effect that participants answer in a way that they perceive as desired by society. This leads to the stated importance of certain features in these studies not being reflected in real purchasing decisions. Therefore, the aim of the study is to compare consumer preferences measured by a quasi-experiment to those quantified by direct questions. Another objective is to quantify the part-worth utilities of product characteristics such as origin, price and food labels. Part-worth utilities are estimated on an interval scale with an arbitrary origin and are a measure for preferences. The real purchasing situation was simulated in a quasi-experiment using a choice-based conjoint analysis. The part-worth utilities were then compared with the results of a conventional preference assessment (Likert scale). For this purpose, 645 consumers from all over Germany were surveyed in 2014. The participants were on average 44 years old and 63% were women. The results of the conjoint analysis report the highest part-worth utility (2.853) for the lowest price (1.49€), followed by the characteristic "grown locally" (2.157). For the labels, the German organic label shows the highest part-worth utility (0.785) followed by Fairtrade/"A heart for the

producer" (0.200). It is noticeable that the carbon footprint labels have negative part-worth utilities compared to tomatoes without a label (-0.130 with CO_2 indication, -0.186 without CO_2 indication). The price is ranked 12th in the importance of the characteristics of purchasing tomatoes in the survey with a Likert scale, whereas it is first in the evaluation of the quasi-experiment (conjoint analysis), which supports the assumption of a social desirability bias.

INTRODUCTION

Changing consumer preferences is the second most frequently mentioned cause of fundamental changes in German horticultural companies expected for the next decade. Trends in consumer preferences for horticultural products, especially for fruits and vegetables, are convenience, functional and natural food. Natural food includes aspects such as food safety, consumption with quiet conscience (sustainability) and organic products. One way of communicating these characteristics to the customer is by labeling the product.

The carbon footprint label is one of the most recent efforts to characterize a product in terms of climate friendliness. There is a variety of studies that claim to show the market potential of climate-friendly products using a carbon footprint label (Laroche, Bergeron, & Barbaro-Forleo, 2001; Dirks, Kaiser, Klose, Pfeiffer, & Backhaus, 2010; Schlich, 2012; Vanclay et al., 2011; lal Bhardwaj, 2012). The same applies also for organic food labels (Stolz, Stolze, Janssen, & Hamm, 2011; Janssen & Hamm, 2014; Hempel & Hamm, 2016) and the Fairtrade label (Andorfer & Liebe, 2015; Ladhari & Tchetgna, 2015; Rousseau, 2015). In these surveys, participants are asked about, for example, the importance of climate change in general or about the importance of a climate-friendly production (Stocke, 2004; Dirks et al., 2010, p. 21). However, this is not reflected in buying decisions. For example, Tesco, the world's third largest retailer, stopped its carbon-labeling program in 2012 after five years due to insufficient demand.

One reason for the gap between some results of consumer research and observed buying behavior could be the effect of social desirability. Social desirability refers to the tendency of individuals to behave or respond in a way they believe society considers desirable (Crowne & Marlowe, 1960). This effect leads to the problem that the potential consumer says he/she would prefer climate-friendly products, but does not show this behavior in the real purchasing situation without being observed. One approach to solve the problem of social desirability is to perform an experiment with real purchase decisions. While the realization of an experiment is very time-consuming and cost-intensive, it also faces some legal issues and retailers would have to agree with it. Another way is to simulate an experiment. Conjoint analysis is one way to implement such a simulated experiment (Green & Srinivasan, 1978; Green & Srinivasan, 1990; Green, Krieger, & Wind, 2001).

Basically, conjoint analysis is a multivariate method for the analysis of preferences and benefit structures of individuals. It works with decompositional processes in which the product is first judged completely (considered jointly). Starting from this overall assessment, the importance of individual characteristics of the product is determined. Thus, the overall analysis of the products is divided into so-called part-worth utilities, which reflect the relevance of a product's characteristics for consumers. The participants are presented with a selection of products in a category (for example, tomatoes), each of which possesses different properties (characteristic values). These are

generally referred to as “stimuli.” Participants are then requested to choose one from among these alternatives.

There are some widely recognized shortcomings of conjoint methods in general. One example is that respondents sometimes use simplification strategies to answer difficult full-profile tasks. Respondents may consider only the most important attributes; this would result in exaggerated differences in importance between the most and least important factors. Particularly in high-involvement purchases, respondents exert more effort making real-world decisions than they do making judgments in a conjoint online survey. However, for an everyday purchase decision on comparatively low-value (and low-involvement) products such as tomatoes, the effort will be limited also in real purchase decisions. Thus, the hypothetical choice will not differ that strongly in our case as for high-involvement purchases.

The aim of the study is to compare consumer preferences measured by a quasi-experiment to those quantified by direct questions to examine the assumption of social desirability and to quantify the part-worth utilities of product characteristics such as origin, price and food labels. As there is a wide discussion about the use of the relatively new carbon footprint label in Germany, this label is under special consideration in the present study.

This paper presents a study with 645 consumers participating in a quasi-experiment using a choice-based conjoint analysis, to identify the part-worth utilities of different food labels and compare them to those of other characteristics such as the price and the origin of the vegetable (in this case tomatoes). In this study design the participant has to choose between products with different characteristics, in this case origin, price and a variety of food labels. He/she may also choose not to buy any of the products. The part-worth utilities of the characteristics are then calculated based on the decisions of all participants. Participants were also asked to rate the characteristics on Likert scales and to sort the labels according to their importance for the purchasing decision. The findings show differences between the results of the choice-based conjoint analysis and the other elicitation methods, which are possibly caused by socially desirable answering behavior.

MATERIALS AND METHODS

Vine tomatoes were used as an example product in the quasi-experiment, because they are a common vegetable in Germany and are produced both domestically and abroad. The current investigation involved a survey with (in this order) 25 choice sets to perform a choice-based conjoint analysis and measures such as a ranking task and the evaluation of different product characteristics on a Likert scale (Likert, 1932) to evaluate the importance of product characteristics such as price, the origin of the product and different food labels. In addition, participants were asked to provide some sociodemographic data, such as their current employment situation, the number of adults as well as number of children under 12 living in the household, the place of residence, net household income, gender, age, level of education and the residential neighborhood (urban or rural).

Description of the Sample

To evaluate consumer preferences for purchasing vine tomatoes, a questionnaire with 40 questions was provided in both paper-and-pencil and web-based formats. The questionnaire was distributed through social media, personal contacts and several e-mail lists, and was also administered in personal interviews. About 300 participants were

recruited via social media and through personal contacts. Approximately 500 participants were recruited via the e-mail lists, which included about 7,000 e-mail addresses from German households; the participants from this channel were mainly women. Around 100 interviews with mainly older participants were performed personally. This was done to collect data from older people, who are generally less familiar with online surveys and/or not able to handle an online questionnaire. Another point was that older people could not easily be reached through social media and e-mail channels. The participants were not compensated for participating in this study. The survey was conducted from June to December 2014 in Germany.

In total, 925 consumers participated in the study. As conjoint analysis can be performed only on complete data sets, all reported data/results including the sample description and also the ranking task and Likert scale parts are based on the sample of 645 choice set completers. No significant differences, in terms of socio-demographic characteristics, were found between completers and non-completers of the quasi-experiment (choice sets). For the sample of completers the socio-demographic characteristics shown in Table 1 apply. Among the choice set completers, the majority were female. The average age of the completers was 44.1 years, which is very close to the population mean of 44.9 years in 2011. The bulk of the completers came from western and northern Germany. Lower Saxony is overrepresented in this study. A proportion of 38.3% of the completers graduated from a technical college or university, which is more than twice the proportion of the total population in 2012 (14.7%).

Fifty-two percent of the completers were living in larger cities. Most of completers were fully employed. The proportions of employment status reported in Table 1 are very close to the total population. Most of the completers lived in households consisting of two persons. In the majority of cases there were no children under 12 in the household. In the present study, the main share had, as in the entire German population, a net household income of between 2,600 and 4,500 €. The distribution is also comparable.

Some 77.8% (1.1% are missing) of the completers bought vine tomatoes in the last two weeks. Most completers buy less than 500 g or 500–1,000 g vine tomatoes within a fortnight. Most completers buy their vine tomatoes at discount stores, followed by supermarkets, farmers' markets and wholefood shops.

Choice-Based Conjoint Analysis

Among the two existing standard methods, the traditional conjoint analysis (TCA) or preference-based conjoint analysis and the choice-based conjoint analysis (CBCA) are distinguished. The TCA directly asks for preferences, whereas the CBCA mimics the consumer's purchase decision more realistically by observing a number of selection decisions (Green & Srinivasan, 1978; Green & Srinivasan, 1990; Green, Krieger, & Wind, 2001).

For the implementation of the CBCA in this study seven steps had to be performed: design of the stimuli, design of the selection situation, specification of a utility model, specification of a selection model, estimation of the utilities, interpretation and implementation and disaggregation of the utilities.

The combination of the characteristics and their specifications shown in Table 2 finally result in 125 (5^3) different stimuli (characteristic profiles). The characteristics used in the conjoint analysis are those that are usually shown on the display on the packages of vine tomatoes in Germany. The grade of goods (Klasse 1) and the amount of 500 g were fixed to limit the combinations of characteristics. The countries of origin in the study

were chosen to reflect the actual choices the consumer has in Germany. Most tomatoes in Germany are imported from other European countries. More than the half of imports in 2012/2013 came from the Netherlands (56%) and Spain (26%). Most tomatoes from non-European countries were imported from Morocco (6%) in 2012/2013. Only about 9% of all tomatoes on the German market are grown in Germany. The labels used in the study reflect different categories of labels available. In terms of organic labeling, there are many organic labels in Germany, some of them are from nongovernmental organizations such as Demeter, Naturland or Bioland, others are state-controlled like the European organic label and the German organic label. The best-known (72%) and most trusted (54%, Eberle et al., 2011) is the German organic label, which was also used in the present study. Organic vegetables have a market share of 14% in the fresh vegetable segment in Germany (Behr, 2015, p.139). To evaluate the social dimension, the Fairtrade and "Ein Herz für den Erzeuger" (A heart for the producers) label was used. The Fairtrade label is known by 61% and trusted by 50% of the participants in a study by von Meyer-Höfer and Spiller (2013). In the case of tomatoes of German origin the Fairtrade label cannot be used and is replaced by the "Ein Herz für den Erzeuger" label, which is also well known in Germany.

Tomatoes have attained the highest market share among fresh vegetables for many years in Germany. Average prices range from min. 1.47 € to max. 2.56 € (2009–2013) for 500 g of organic vine tomatoes and from min. 0.65 € to max. 1.47 € (2009–2013) for 500 g of conventional vine tomatoes (Behr, 2013). The prices in German stores are usually close to the 50-cent or one-euro mark, for example 1.49 € or 2.99 €, and for this reason a price range from 1.49 € to 3.49 € is used in this study to reflect real prices in stores as customers would expect them. The slightly higher price range was chosen as the focus of this study is mainly on tomatoes with special features such as the food labels, and these tomatoes are more expensive than without those features.

The selection situation (step two) was designed by creating an orthogonal reduced factorial design (using SPSS, orthoplan), which lead to 25 cards. To build the final choice design the factorial design (after shifting (cyclic variation)) was loaded into SPSS and the 25 choice sets were created using the plancards function. The first of these choice sets can be seen in Figure 1. After three initial questions on recent purchases and where vine tomatoes were bought, the participant was asked to perform a quasi-experiment, where he or she had to choose between five different products (stimuli) and the none option (see Figure 1).

In step three (specification of a utility model), the part-worth model was used because the characteristics of origin and labels have individual benefits for each respondent and cannot be predicted. As in the CBCA, choices made by respondents are observed. In addition to the utility model, a behavior model or choice model is needed (step four). This is to describe and explain the decision-making process of a person. As is usual, we used the multidimensional logit choice model for the CBCA. In the logit choice model the selection probability is determined just by the differences in the utilities. The estimation of the utilities (step five) is done by maximizing a log-likelihood function (to estimate the parameters of a density or probability function) using a quasi-Newton method (for solving nonlinear minimization problems). Step six is the interpretation and implementation. The absolute amount of the estimated part-worth utilities and total utility values are not relevant when using the present value model. As mentioned earlier, only the differences matter. The part-worth utilities are a dimensionless measure indicating the utility of a characteristic specification relative to a base specification.

After the survey was conducted, part-worth utilities were calculated using a Cox regression. To prepare the data for the Cox regression a variety of tasks have to be performed (Backhaus et al., 2013, pp. 227 ff.). In this procedure, a structure with the same model is used for the logit choice model, which maximizes the same likelihood function in the implementation of the layered Cox regression, as it occurs also in the CBCA.

For the likelihood ratio statistic, which is chi-square distributed, the value is 21,711.239 (degrees of freedom (13)). The origin "Morocco," the price level "3.49 €" and the characteristic specification "no label" were chosen as the base categories in the Cox regression to calculate the part-worth utilities in the choice-based conjoint analysis. Their part-worth utilities are therefore set to zero. Based on these basic categories, the part-worth utilities of the other characteristics can be interpreted. With a p-value of 0.00 the estimated model is highly significant. Every part-worth utility is also highly significant ($p<0.01$), except for the carbon footprint with CO_2 emission indication ($p=0.02$) and the origin Spain ($p=0.36$).

Ranking of the Labels

In preference ranking, participants order characteristics (for example labels) according to their preferences from more important to less important. Ranking involves performing a succession of choices where the participant is forced to discriminate between characteristics, without, however, revealing the degree of appreciation (Hein, Jaeger, Tom Carr, & Delahunty, 2008). Rating and ranking methods have previously been compared in a number of studies (Kozak & Cliff, 2013; Lagerkvist, 2013; Villanueva, Petenate, & Da Silva, 2005), often with a general focus on mean population results comparisons (Almli, Øvrum, Hersleth, Almøy, & Næs, 2015). As described earlier, the participants were also asked to rank the labels, when buying vine tomatoes, from rank one for most important to rank four for least important; this was done when viewing the labels alone. The labels were shown in a randomized order for each participant in the online survey. Using their computer mouse the participant had to drag and drop the labels in their preferred order on the right-hand side of the question.

Evaluation of Consumer Preferences Using Likert Scales

Another common way to determine the preferences of consumers is Likert scales. A variety of characteristics, including the characteristics also used for the CBCA, had to be rated on a scale with six items from unimportant to essential. As previously mentioned, the characteristics to be rated using Likert scales include those that were also covered by the conjoint analysis. These are origin (regional, Germany, Europe), value for money, climate and/or environmentally friendly production and labeling. These characteristics were found to be important in studies among consumers in the US (Oltman, Jervis, & Drake, 2014; Carroll, Bernard, & Pesek, Jr., 2013). Furthermore, the present study includes Likert scales for characteristics that can be observed by the customer at the point of sale, such as the size and packaging as well as the color, the smell of tomatoes and whether they are too hard or too soft. Other characteristics, e.g. the taste, the saltiness and the skin thickness, are relevant for the consumer as well (Causse et al., 2010) but cannot easily be evaluated at the point of sale and are therefore not included in the present study.

RESULTS

Part-Worth Utilities of Product Characteristic Specifications as a Result of the Choice-Based Conjoint Analysis

The resulting part-worth utilities are presented in Figure 2. The lowest price has the highest part-worth utility of 2.853 followed by the second lowest price (1.99 €) with 2.227. After the price, the origin "grown local" yields the third highest part-worth utility (2.157), followed by the origin Germany (1.575) and the price 2.49 € (1.391). Only after the prices below 2.99 € and the domestic origin does the German organic label exhibit a high part-worth utility of 0.785. As mentioned earlier, only differences matter, which means the part-worth utilities have to be interpreted in comparison to the reference value in the first place.

Out of the four origins under investigation, participants prefer the local product most, followed by the domestic product. The difference between the part-worth utilities of these origins and vine tomatoes from the Netherlands is very high. Not surprisingly, the participants prefer the lowest prices of 1.49 € for 500 g vine tomatoes. When it comes to food labels, the German organic label is ranked highest, followed by Fairtrade and "Ein Herz für den Erzeuger" (Engl. "A heart for the producer"). Most remarkably, both carbon footprints (with and without a CO_2 emission indication) are attributed a negative part-worth utility compared to a product without any label.

Resulting Order of the Ranking Task

If we rank the part-worth utilities, price is the most important characteristic of vine tomatoes, followed by the domestic origin. After these characteristics the German organic label is preferred by the participants and even Fairtrade and "Ein Herz für den Erzeuger" yield a higher part-worth utility than the origin Netherlands. In a second task, participants were asked to rank the labels. Rank coefficients were calculated by multiplying the number of participants who assigned a particular label to a rank by four for the first place, three for the second, two for the third and one for the fourth place. The results of the ranking task show a different picture than the choice-based conjoint analysis. In the ranking task the highest rank coefficient is observed for Fairtrade/"Ein Herz für den Erzeuger" (1,851), followed by the German organic label (1,604), the carbon footprint without a CO_2 emission indication (979) and the carbon footprint with a CO_2 emission indication (790, N=534).

This result is surprising as the German organic label showed a four times higher part-worth utility than the Fairtrade/"Ein Herz für den Erzeuger" label in the quasi-experiment, which might be an indicator of socially desirable behavior in the ranking task.

Consumer Preferences Measured by a Likert Scale Compared to Those of the Other Methods

The third method used to determine consumer preferences for vine tomatoes in Germany was the classical Likert scale (1=unimportant to 6=essential) – the most commonly applied method. Figure 3 presents the results (average values) of the evaluation of characteristics preferred by consumers when purchasing vine tomatoes.

The participants' answers measured using a Likert scale are in line with the results of the choice-based conjoint analysis for the characteristics "grown locally" and domestic

origin (marked dark gray in Figure 3). After this, the third most important characteristic is that producers get a fair (decent) price for their products (marked dark gray in Figure 3).

DISCUSSION

As previously mentioned, both carbon footprints are attributed a negative part-worth utility compared to a product without any label, and "grown locally" showed a more than two times higher part-worth utility than the German organic label. These results support the conclusion that "local (regional) is the new organic," but also indicate that the carbon footprint label in the current design, which is also used by Frosta and had been used by Tesco (2012), is not a suitable marketing tool (Gadema & Oglethorpe, 2011; Schlich, 2012). To put it more clearly, it is not only the design of the carbon footprint label but also the difficult interpretation (Schlich, 2012) and its unclear message (Hartikainen, Roininen, Katajajuuri, & Pulkkinen, 2014; Röös & Tjärnemo, 2011). It may also be the case that consumers prefer first and foremost an affordable, safe and healthy product and only after that are they willing to pay for social and climate issues, with the former playing a much bigger role than the latter. Respondents also might view "climate issues" as not controllable through purchasing packages of tomatoes or by reducing their carbon footprint. The negative part-worth utilities for the carbon footprint label show a clearly different picture for its market potential than the majority of other studies in this field (Dirks et al., 2010; Schlich, 2012; Vanclay et al., 2011; lal Bhardwaj, 2012). In a study by Dirks et al. (2010), consumers responded that climate issues are very important (37.8%) or important (38.4%) for their food purchase decisions, a very different picture to the present study (Figure 3) where climate-friendly production lies in the middle and the carbon footprint in the lower ranks. This might be another example of social desirability, but other possible effects might also play a role.

In the present study the results of all three approaches are comparable in the case of the carbon footprint label (lowest rank in quasi-experiment, ranking task and Likert scales). But when participants are asked about the importance they attach to a climate-friendly production, the average is much higher (Figure 3). This may be due to multiple reasons, such as social desirability in the case of the importance of a climate-friendly production and/or a lack of knowledge, and understanding of or trust in the carbon footprint label.

The participants' answers measured using a Likert scale are comparable with the results of the choice-based conjoint analysis for the characteristics "grown locally" and domestic origin. After this, the third most important characteristic is that producers get a fair price. This result is comparable to the result of the ranking task, where the Fairtrade/"Ein Herz für den Erzeuger" label ranks first, but cannot be observed in the quasi-experiment (Figure 2). In the choice-based conjoint analysis this is attributed only a part-worth utility of 0.200, which is only 9% of the part-worth utility of the characteristic "grown locally" or 7% of the part-worth utility of the lowest price.

Most notably, the Likert scale elicitation ranks the low price 12th (marked medium gray in Figure 3) whereas the lowest price (1.49 €) showed the highest part-worth utility in the quasi-experiment (Figure 2). At this point it can be concluded that there are major differences in the results of direct questions such as with the Likert scale or a ranking task and the quasi-experiment performing a choice-based conjoint analysis. One possible reason for these differences in the same sample is the effect of social desirability, which leads to answers to direct questions that the respondent believes to be socially favorable. The results of studies investigating consumer preferences in terms of food labels based on

direct questions are, then, questionable. The use of a combination of methods to get an understanding of the true behavior of consumers is important, as demonstrated by this study. For examples of other methods and a discussion of conjoint analysis see Beckley, Paredes, and Lopetcharat (2012).

Strengths and Limitations

Bearing in mind some limitations in the sample composition as mentioned above, the findings of the present study are to some extent transferable to Germany. This might not be the case for Europe as a whole given that, for example, the popularity of organic food differs a lot between countries. In Germany, organic food is popular (as well as in Denmark, Luxembourg, Austria and Switzerland) but it does not play a significant role in other European countries (e.g. in Portugal, Greece, Ireland or Turkey).

One limitation for the evaluation of the carbon footprints is that only one number (600 g CO_2) is shown on the carbon footprint label indicating CO_2 emission, which represents an average of the results for fresh tomatoes of Tesco's (2012) measurement. This limitation was accepted to reduce the choice sets included in the conjoint analysis. Only giving one value to the participants, however, precludes an evaluation of how people might use this label to compare across products, which might lead to an underestimation of the label's impact.

Other explanations beyond the possible social desirability effects suggest to be the main explanation of the differences between the results of the different methods need to be mentioned. For example, the choice of item wording in the Likert scale element may influence the rating.

Another limitation for the quasi-experiment in this study was the relatively high number of choice sets (25), which was challenging for the participants and led to a number of noncompleters, who, however, do not differ in terms of demographic attributes from the group of completers.

Future Research

An interesting challenge would be to evaluate the different part-worth utilities of different label designs, especially in the case of the carbon footprint label.

A follow-up study might also be suggested where consumers are given either real or virtual money and asked to vote through their purchases or repeated purchases. Also, analogous studies of other types of products might be required to corroborate social desirability effects in direct preference elicitation.

CONCLUSION

At this point it can be concluded that there are major differences in the results of direct questions such as with the Likert scale or a ranking task and the quasi-experiment. One possible reason for these differences in the same sample is the effect of social desirability. Thus results of studies investigating consumer preferences in terms of food labels that mainly use direct questions might be biased towards the preference for socially valued characteristics. The use of a combination of methods to get an understanding of the true behavior of consumers is important, as demonstrated by this study.

The results show a rather different picture for the market potential of carbon footprint labels than many other studies in this field. The finding that carbon footprint labels are associated with negative part-worth utilities shows that confronted with connected choices involving price, production location etc., consumers do not find a

benefit in such a label. This is contrary to evidence from direct measurements as reported, for example, by Dirks et al. (2010). It also implies that there may be less scope for acting on climate change when purchasing food items than is advocated by activists and media promoting carbon footprint labeling.

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553 **Tables**

554

555 *Table 1.* Summary Statistics of the 645 Choice Set Completers

Characteristics	Characteristic specifications	Frequency	Percentage
Gender	Female	403	62.5
	Male	186	28.8
	Missing	56	8.7
Mean age		590	44.14 (15.76)
Education	Did not finish graduation	5	0.8
	Still pupils	2	0.3
	Certificate of secondary education	56	8.7
	General certificate of secondary education	141	21.9
	High school graduation or equivalent	126	19.5
	Technician/specialist degree	48	7.4
	Technical college/university degree	247	38.3
	Missing	20	3.1
Residential area	Rural region	255	39.5
	Urban area	337	52.2
	Missing	53	8.2
Employment status	Full-time employee	256	39.7
	Part-time employee	110	17.1
	In education	112	17.4
	Retired/pensioner	69	10.7
	Housewife/homemaker	42	6.5
	Unemployed	8	1.2
	Missing	48	7.4
Mean persons in household		612	2.59 (2.20)
Mean children in household		532	0.21 (0.61)
Net household income	Refuse to answer	109	16.9
	< 500 €	31	4.8
	500 - 900 €	53	8.2
	900 - 1,300 €	46	7.1
	1,300 - 1,700 €	61	9.5
	1,700 - 2,000 €	49	7.7
	2,000 - 2,600 €	88	13.4
	2,600 - 4,500 €	128	19.8
	> 4,500 €	47	7.3
	Missing	33	5.1
Tomatoes bought in the last 2 weeks	< 500 g	225	34.9
	500 g - 1,000 g	253	39.2
	1,001 g - 1,500 g	55	8.5
	> 1,500 g	32	5
	Missing	80	12.4
Place of purchase (multiple choice)	Supermarket	312	51.1
	Discount stores	444	72.7
	Farmers' markets	119	19.5
	Wholefood shops	65	10.6
	Missing	34	5.3

Table 2. Characteristics and Their Specifications of Vine Tomatoes Analyzed in the Choice-Based Conjoint Analysis

Characteristics	Characteristic specifications
Origin	Morocco, Germany, Spain, the Netherlands, Local
Price	1.49 €, 1.99 €, 2.49 €, 2.99 €, 3.49 €
Label	German organic label, Fairtrade/“Ein Herz für den Erzeuger” label (Engl. A heart for the producer), no label, carbon footprint (with the amount of CO_2 emitted), carbon footprint (without the amount of CO_2 emitted)

Figures

Figure 1. The first of the 25 choice sets in the questionnaire for the choice-based conjoint analysis.

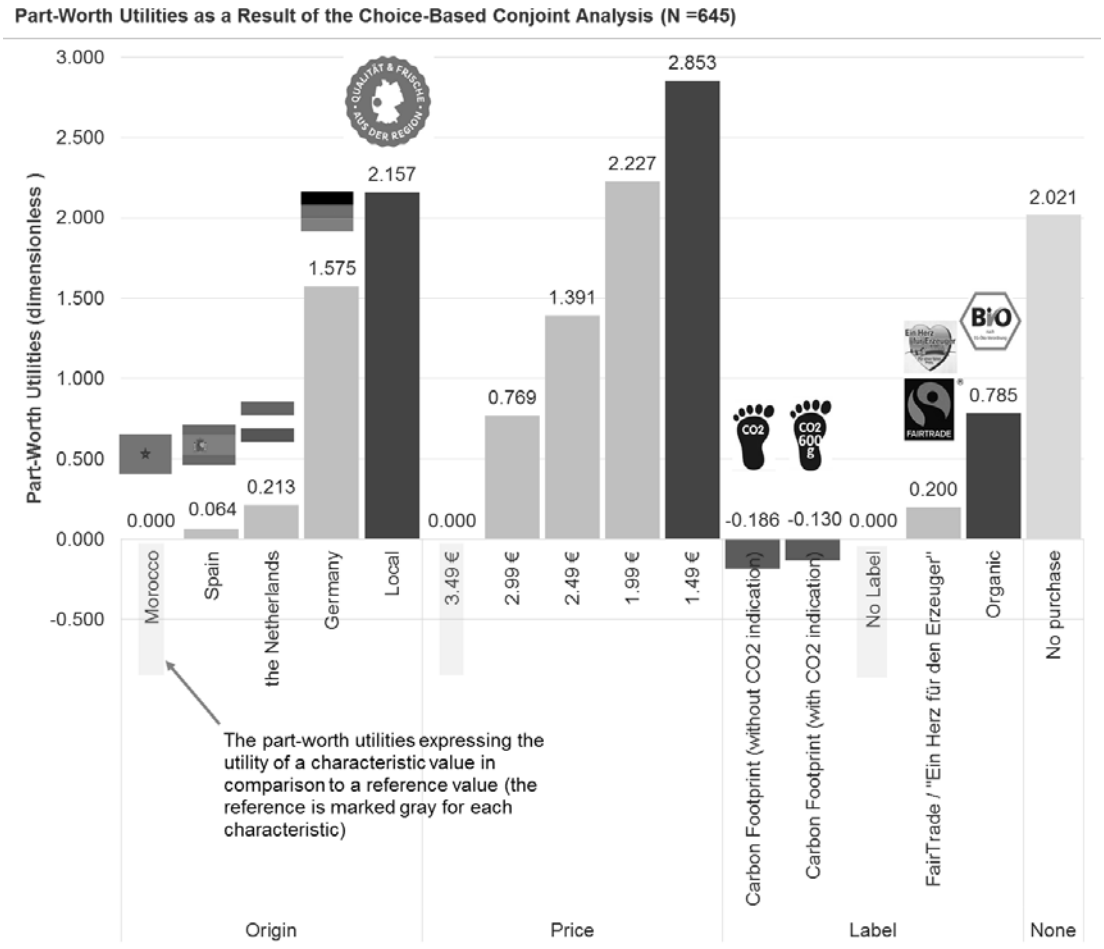

Figure 2. Results of the choice-based conjoint analysis.

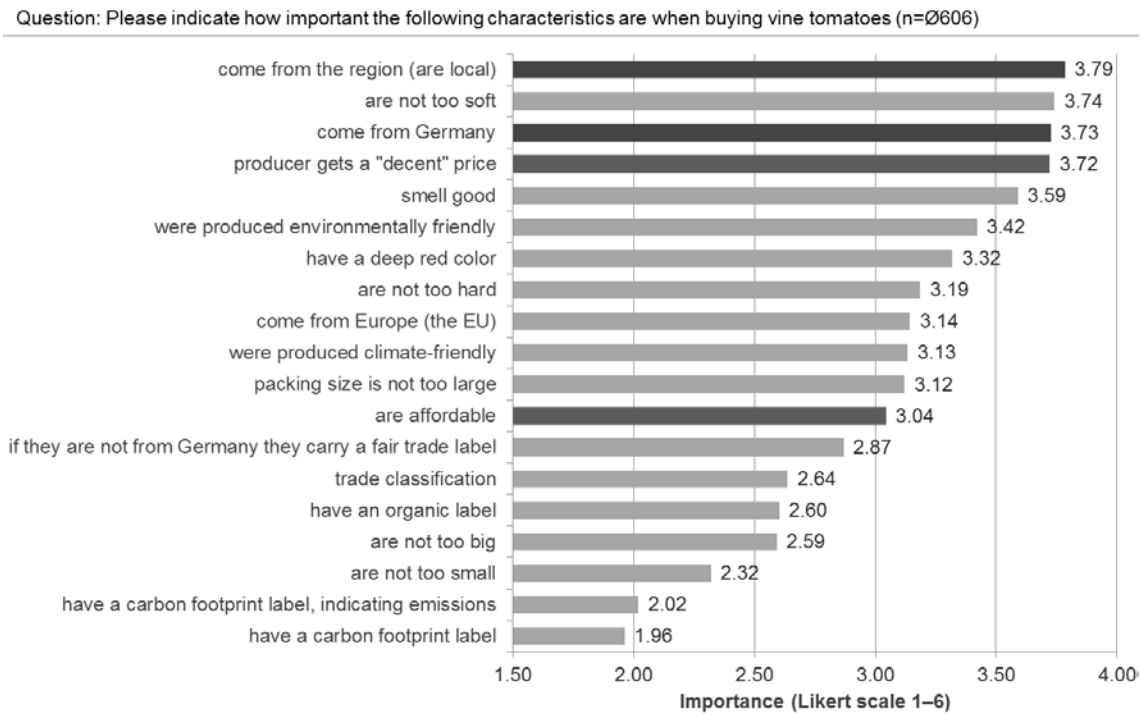

Figure 3. Results of the evaluation using a Likert scale.