Testing commitment cost in food choices: a non-hypothetical choice experiment approach

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Selected Paper prepared for presentation at the 2015 Agricultural & Applied Economics Association and Western Agricultural Economics Association Annual Meeting, San Francisco, CA, July 26-28

ABSTRACT:

Choice experiments (CE) are one of the most popular preference elicitation mechanisms used by applied economists. In CEs, respondents are normally asked to make choices at the moment they are asked to do so. They are also based on the assumption that the decision maker has access to and makes use of all relevant information concerning the good of interest when making their choices. However, real world choices are usually made in a dynamic context where individuals have the option to delay or reserve a transaction due to, among others, uncertainty about the product. So committing a decision at the present under conditions of uncertainty for the value of the good might have a cost (i.e., commitment cost). In this paper, we test commitment cost theory in a non-hypothetical choice experiment. Specifically, we test the possibility that gaining information about the product either at the present or in the future and the possibility of reversing the transaction in the future can influence choice behavior and WTP estimates. Our results partially support the Commitment Cost theory, suggesting that the construction of a dynamic decision context (i.e., reversibility of transaction) is important in choice experimental designs.

Keywords: Commitment Cost, Dynamic settings, Uncertainty, Real Choice Experiment, WTP

INTRODUCTION

Consumer willingness-to-pay (WTP) for both private and public goods is an important indicator of consumer response to different choice contexts. On the basis of the Hicksian welfare theory, the WTP can be interpreted as the compensating (or equivalent) variation (CV/EV), assuming that individuals' choice decisions regarding the value of a good are made in certainty and static conditions (Mitchell & Carson, 1989; Smith, 2000; Zhao & Kling, 2004). However, in real purchasing situations, individuals might be uncertain about the utility they can derive from a good or a service.

Uncertainty in decision making is a crucial aspect in various economic settings such as financial investment and environmental policy, where agents generally make choice decisions without knowing their effects on future rewards (Arrow & Fisher, 1974; Dixit & Pindyck, 1994; Dixit, 1992; Fisher, 2000). We posit that uncertainty is also an important issue in food choice settings.

Individuals' uncertainty about the product can be a key factor for new or novel products (Castaño et al., 2008; Hoeffler, 2003). However, the novelty of a food product is not the only feature that can produce uncertainty in consumer decision making. For instance, consumers' uncertainty about quality features of food products has been mostly associated with the issue of credence attributes, such as safety, origin, and sustainability (Aprile, Caputo, & Nayga Jr., 2012; Costa-Font, Gil, & Traill, 2008; Grunert, 2005; Grunert, et al., 2001; Van Wezemael et al., 2010; Vermeir & Verbeke, 2006). This is because credence attributes represent those features of the product which individuals cannot personally evaluate before or after the consumption. Hence, consumers' valuations of the credence attributes would depend upon their level of trust in the product claims and the sources of these claims.

Finally, consumers' uncertainty about the value of the good has been often associated with the degree of the availability of information about the product. In this regard, several studies have documented that individuals' WTP for a good or a service increases when information is provided, especially in cases when individuals are not familiar with the good in question (Bower, Saadat, & Whitten, 2003; Hoehn & Randall, 2002; Lusk et al., 2004; Meenakshi et al., 2012; Protiere et al., 2004; Tkac, 1998). The type of information (e.g., positive or negative) can also play an important role on consumers' valuation for a good (Bower, Saadat, & Whitten, 2003; Corrigan et al., 2009; Depositario et al., 2009; Marette et al., 2008; Nayga, Aiew, & Nichols, 2005; Protiere et al., 2004).

In real purchase or choice situations, consumers may not be able to acquire information at the moment of purchase. As such, when there is uncertainty regarding the features of a good, they could either take the chance and purchase the product now or delay the purchase until they obtain more knowledge about the quality of the product in question. Furthermore, individuals might have the opportunity to consider the purchase and return the product at a later period if they are uncertain, among others, whether its use can be beneficial or not. Hence, in contrast with the assumption of the neoclassical theory, in real choice settings, choices are mostly made in a more dynamic context, where individuals have the possibility to delay the transaction when future information can be gathered or return the product in case they do not feel comfortable with their purchase (Corrigan, Kling, & Zhao, 2008; Corrigan, 2005; Kling, List, & Zhao, 2013; Lusk, 2003; Zhao & Kling, 2004).

Individuals' choice behavior in dynamic settings has been investigated in environmental economics and finance fields. For example, Zhao and Kling (2001, 2004) re-examined the quasi-option value (QOV) concept to explain consumer choice behavior[1]. The authors assume that, in real choice situations, consumers' WTP does not only depend on the intrinsic value of the good (CV), but also on a variety of factors such as the level of uncertainty about a good, the timing of the

[1] Under the assumption of risk neutrality, the financial benefit in postponing an irreversible and uncertain investment is defined as Quasi-Option Value (QOV) (Dixit & Pindyck, 1994; Dixit, 1992).

decision making, and the degree of reversibility of a transaction (Zhao & Kling, 2001, 2004). Hence, committing to a decision at the moment of the transaction could have a cost for an individual. This cost has been termed by Zhao & Kling (2001, 2004) as "Commitment Cost" (CC), which can be interpreted as the "cost of forgoing the opportunity to learn more about the value of a good if a purchase is made today" (Lusk & Shogren, 2007. pp. 43). Theoretically, CC represents the difference between consumers' WTP and the static Hicksian compensating variation when: (1) individuals have uncertainty about the value of a good, (2) when there is the possibility to delay a purchase and gather future information, and (3) when the degree of irreversibility of a decision can vary (Lusk, 2003; Zhao & Kling, 2004). Zhao and Kling (2004) stated that if individuals' uncertainty about the value of a good decreases, the CC related to the choice of making the purchase *today* will decrease, while individuals' WTP will increase. On the other hand, in cases when consumers need to consider the possibility of gathering more future information, their WTP *today* will decrease and CC will increase. Finally, in cases when the reversibility of the purchase is easier, the CC for buying today will decrease and individuals' WTP will increase.

Despite the intuitive appeal of the commitment cost theory, only a few studies have tested this theory and its effects on WTP measures. For example, Lusk (2003) tested the CC theory by performing a nth price auction approach. Using a lottery ticket and a mug auction, he performed three treatments differing depending on (i) the degree of uncertainty regarding the value of the lottery, (ii) the degree of potential future learning, and (iii) the degree of reversibility of the transaction. Evidence from this study only partially confirms the CC theory. Specifically, no significant difference in terms of WTP for the lottery ticket was found by the author in case of less or more degree of uncertainty and reversibility. On the other hand, participants were willing to pay significantly less, in the case of the coffee mug auction when they were proposed to gather more information in a second round auction. Corrigan (2005), performing a n^{th} price experimental auction, verified that participants' WTP for a coffee mug was higher for subjects who perceived that

reversing the transaction (selling the good outside of the experiment) was more difficult than delaying the transaction (buying the good outside of the experiment). Corrigan et al. (2008) performed a hypothetical referendum format CV survey in Iowa to estimate residents' valuation for improved water quality of Clear Lake. Their results show that respondents were less inclined to vote yes and therefore to pay a price premium for the actualization of the referendum, in case they were offered the possibility to delay the vote and acquire new information from studying the lake. The authors concluded that when the knowledge of the good under consideration is low, making a forced decision leads to the formation of a CC. Finally, Kling, et al. (2013) tested the disparity between individuals' WTP and WTA when the transaction could be delayed or reversible. Results from their field experiment (a nth price auction of sportscards) confirm a disparity between WTP/WTA in dynamic purchasing conditions. Their findings also show that WTP increases when there is difficulty in delaying and decreases in case of reversing the transaction (difficulty in delaying or reversing the transaction was self-reported in a confidential survey).

While all of these studies tested the CC theory in different contexts, no other known study has explored this theory in the context of food choices, especially in the case of novel products. This is an important issue since novel products generally embed a source of uncertainty, which can affect CC formation and thus WTPs. In addition, no other known studies have explored the CC formation due to uncertainty regarding the nature of product characteristics. Finally, to the best of our knowledge, while most of the studies testing the CC theory used an experimental auction approach, no other known study has tested this theory using a non-hypothetical or real choice experiment (RCE) approach. This aspect is particularly important since choice experiments are now one of the most popular preference elicitation mechanisms used by applied economists. Choice experiments normally ask respondents to make their choices at the moment they are asked to do so. They are also based on the assumption that the decision maker has access to and makes use of all relevant information concerning the good of interest when making their choices. However, "real

world" choices are usually made in a dynamic context where individuals have the option to delay or reserve a transaction due to, among others, uncertainty about the product. Hence, commitment costs formation could be a factor that needs to be considered in choice experiments.

In addition, we further advance the literature in this area in two important ways. First, we use a novel food product. Examining the dynamic choice context for a novel food product is an important issue since novel products generally embed a source of uncertainty in consumers' choices that can affect CC formation. We used apple sauce as the product of interest since, while it is largely consumed in North American and Northern European countries, it is a food product that does not belong to the food traditions of the area of interest, i.e. Italy, and it has only been recently introduced in the Italian market as a healthy snack product. Second, the use of a novel food product allows us to test CC theory with a higher degree of uncertainty on individuals' valuation since the product has credence attributes (i.e., organic and local food production).

MATERIALS AND METHODS

Experimental design procedures

The data used in this study are drawn from a field RCE involving 248 consumers in a hypermarket located in Bologna, a city of Emilia Romagna region (Italy). Food shoppers were randomly intercepted and recruited at the entrance of the retail store. They were informed about the opportunity to participate in a survey on consumers' valuations for apple sauce, a food product that is novel in Italy. Interviewers approached the randomly selected participants and asked them a set of screening questions related to whether they were the main household food shoppers, verifying that each participant was at least 18 years old, and whether they were available to taste different types of

apple sauce. If the responses to all of these questions were affirmative, the interviewer started the RCE. In the case of negative responses, the interviewer randomly selected another customer and asked the screening questions until finding a participant who would be eligible to participate in the survey. Each participant was incentivized with a 5€ check-coupon.

As previously mentioned, apple sauce was used as the product of interest in this study since it is considered as a novel product in the Italian market. Hence, this product can provide a level of uncertainty for consumers in our study. Second, it is a non-perishable product and so we do not have to worry about changes in the organoleptic characteristics of the product (Gracia et al., 2011). Three attributes such as price, production method, and area of production were used to describe the different kinds of apple sauce. Four price levels were specified to approximately reflect the actual market price for apple sauce products (0.95€, 1.45€, 1.95€, 2.45€). The 2-level method of production attribute was specified as either organic or non-organic. Lastly, for the area of production attribute we used two levels: locally produced and not locally produced. All the apple sauces used in the study were produced in Italy, but the ones produced outside the borders of the Emilia Romagna region were defined as non-locally produced and the ones from Emilia Romagna were considered as locally produced. Table 1 reports the attributes and attributes' levels used in this study.

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Following Scarpa, Campbell and Hutchinson (2007), the allocation of attribute and attribute levels to product alternatives was designed using a sequential Bayesian design to minimize the Db error. Three different phases were performed. In the first phase, the choice set design follows Street and Burgess (2005). Accordingly, the selected attributes and their levels were first used to come up with a fractional orthogonal design for our first CE design, reducing the original 16 ($4x2^2$) combinations to just 8. Then, the generators described by Street and Burgess (2007) were used to

obtain a practical set of 8 pairs, with a D-efficiency of 96.6%. This design was used for the pilot survey (second phase). In the last phase, we used the data from the pilot survey to estimate a MNL model whose coefficient estimates were then used as Bayesian priors.

Before answering the RCE questions, the participants were asked to taste the four different types of apple sauce products (i.e., local/organic, non-local/organic, local/non-organic, non-local/non-organic) in order to equalize the level of experience with the product in question among the respondents. We chose to adopt a blind test approach so that the organoleptic characteristics of the different kinds of apple sauce would not affect respondent's preferences for the production origin and production method attributes. After completing the blind test, participants also had the possibility to visually examine the apple sauce products (two cups of 100g of apple sauce). Information regarding the RCE mechanism was then provided in detail to all participants. Specifically, they were first informed that they would face eight different choice tasks, each of them describing three choice options: two different apple sauce products and a “no purchase" option. Next, they were informed that after completing the eight choice tasks, one of these choice tasks would be randomly selected as the binding choice task. The participant would have to purchase the product they chose in the binding choice task if they picked one of the two product alternatives. If they chose the “no purchase” option, then they will not purchase any product and will not pay anything. Finally, the participants were clearly told that an actual payment would have to occur if they chose one of the two product options in the binding choice task and that every choice task would have the same probability to be picked as the binding choice task. Once the participants completed the RCE, they were then asked to fill out a questionnaire concerning socio-demographic information.

Experimental Treatments and research hypotheses

We used four RCE treatments using a between-subjects design. Hence, each participant was randomly assigned to only one of the RCE treatments. The four RCE treatments differed in terms of possibility to gain information (present or future information) and in terms of degree of reversibility of the transaction. In the first treatment, named “control treatment” (CT), 80 respondents were introduced to the RCE without receiving any information about the possibility to gain information about the product or to return it. In the second treatment (56 participants), named "*treatment with information*" (INT), we provided a brief description of the product and a brief explanation of organic certification and of "local food" movement in Italy. In order to avoid giving information that could negatively or positively influence respondents' perceptions towards the two food claims, we decided to furnish neutral information[2] (Aprile et al., 2012; Lusk et al., 2004). Fifty-six persons took part to the third treatment, named *"Delayed information treatment" (DINT).* This treatment was aimed at assessing consumers' willingness to wait for future information. Hence, right before the RCE, respondents were informed that there was a possibility that they will be provided information about the product in question and about organic and local food production (the same information that were given in the INT treatment) after they concluded their grocery shopping, at the exit of the store. They were informed that an interviewer would be available right after the cash registers to give them this information, if they were interested. They were provided with an ID number in order to be recognized by one of our interviewers. The respondents were provided with the description of the interviewer, specifying the color of the shirt and that he/she was carrying a sign indicating that he/she belonged to the University of Bologna. In addition, the interviewer was informed when a participant was selected to this treatment so that he/she could then readily identify

[2] Regarding the organic production, we introduced the definition of the organic certification according to the Council Regulation (EC) No. 834/2007 of 28 June 2007. Since in Italy a universal definition of “local” does not exist yet, we used the present regional legislative decrees and proposed regulations related to the "local food" issue. Regarding the product, we gave the following information: how to consume the product (as a snack or dessert), how to store it and that it contained only apples.

the participant at the cash register area. The interviewer then approached the respondent after the cash register and asked whether he/she wanted to be given the information. Finally, the last treatment, called the *"reversibility treatment" (RT)* was designed to determine the effect on respondents' WTP of the possibility that the participants could reverse the transaction; i.e., they could return the product if they purchased one. As such, before the RCE, participants (fifty-six subjects) were informed that in case they chose a product in the binding choice task, they had the possibility to return the product at the exit of the store after they concluded their grocery shopping. They were told that they could return the product to our interviewer who would then repay them the amount of money they paid for the product if they decided to return the two cups of apple sauce. Respondents were given an ID number[3]. They were also provided with the description of the interviewer and they were identified to the interviewer so that they could more easily be identified and approached at the exit of the store. Table 2 shows a layout of the procedures followed in the RCE treatments.

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With these RCE treatments, we could then test a set of hypothesis aimed at testing the CC theory in a choice context involving a novel food product and a set of credence attributes. In order to determine the effect of information on individuals' WTP, the estimates from the second and first treatment were compared. In regards to the first issue of the CC theory, we tested the following hypothesis:

$$H_{01} : (WTP^{INT} - WTP^{CT}) = 0$$

$$H_{11} : (WTP^{INT} - WTP^{CT}) > 0$$

[3] The duration of individuals' grocery shopping was calculated in order to determine whether this factor could influence respondents' willingness to return the product. However, only one participant returned the apple sauce and this was 25 minutes after he completed the survey.

If H_{01} is rejected, we could confirm that giving information reduces consumers' uncertainty regarding the value of the product. This would validate the assumption that when subjects are less uncertain about the value of a good, CCs decrease and WTP increases, as predicted by Zhao & Kling (2004).

Next, in order to answer our research question related to the effect of willingness to wait for future information, we tested the following hypothesis:

$$H_{02} : (WTP^{DINT} - WTP^{CT}) = 0$$

$$H_{12} : (WTP^{DINT} - WTP^{CT}) < 0$$

If we fail to reject H_{02}, we could confirm that when subjects expect to gather more information regarding the good, the CCs increase and WTP decreases. The rejection of H_{02} would confirm Zhao & Kling's (2004) CCs theory, which assumes that an individual's WTP *today* decreases when there is the possibility of being able to gather information in the future.

Finally, our third hypothesis is related to individuals' WTP formation in case of a change in the degree of reversibility of the purchase. According to CC theory, individuals' WTP for a good should be higher when there is a possibility that one could reverse or return a purchase. Accordingly, the following hypothesis was tested:

$$H_{03} : (WTP^{RT} - WTP^{CT}) = 0$$

$$H_{13} : (WTP^{RT} - WTP^{CT}) > 0$$

If H_{03} is rejected, we could confirm that when subjects expect that reversing the transaction is easier, then CCs decrease and WTP increases, validating the prediction of Zhao & Kling (2004) CCs theory.

Econometric Analysis

To test the research hypotheses concerning the CCs formation, we estimated the effect of the treatments on WTP estimates. The derivation of WTP measures across treatments requires as a first step the selection of the econometric model to be used for the data analysis. Different model specifications were explored such as the Multinomial Logit Model (MNL), the panel Random Parameter Logit Model (RPL), and the panel Random Parameter Logit Model with Error Component (RPL-EC). From this exploratory analysis, the RPL-EC model was selected. RPL-EC models are now popularly used in the analysis of discrete choice models in environmental economics and also in food choice studies (Gracia, Louriero, and Nayga 2011; Caputo, Nayga, and Scarpa 2013; Van Loo et al. 2014; Van Wezemael et al., 2014). Besides the fact that the RPL-EC model accounts for unobserved taste heterogeneity, it was chosen since our experimental design included a no-purchase option (status quo), which can cause systematic effects associated with both the status-quo and correlated random effects across the utilities between product alternatives in the choice set design (see Scarpa , Ferrini, and Willis, 2005; Scarpa, Willis and Acutt, 2007).

When estimating choice models with random coefficients, as a second step, researchers should determine how to specify the utility function. If the utility function is specified in preference space, then researchers should assume a distribution for the random coefficients and then derive the WTP for an attribute as the ratio of the attribute coefficient and an estimate of the marginal utility of money. In several choice studies that assessed differences in WTPs across choice data, the price coefficient is held constant across individuals, whereas the coefficients of the other attributes and attribute levels are treated as random variables following a normal distribution. This restriction is commonly used despite the fact that it implies that the standard deviation of the unobserved utility

(scale parameter) is the same across all observations. As pointed out by Train and Weeks (2005), it can assure that the distributions of WTP can be calculated easily from the distribution of the non-price coefficient (normal distribution), since the two distributions take the same form (Train and Weeks 2005). It also avoids identification problems, which can occur in a model with all random coefficients (Ruud 1996; Train and Weeks 2005).

In the preference space approach, the utility function for selecting alternative *j* in choice situation *t* is a function of the price and the non-price attributes. Accordingly, in this application, the model is specified as follows:

$$U_{njt} = ASC + \alpha_1 . PRICE + \beta_1' . ORGANIC_{njt} + \beta_2' . LOCAL_{njt} + \eta_{njt} + \varepsilon_{njt} \qquad (1)$$

where ASC is a dummy variable indicating the selection of the no-buy option; the price (PRICE) is a continuous variable represented by the four experimentally designed price levels; the non-price attributes such as ORGANIC and LOCAL are dummy variables taking the value +1 if the product carries the corresponding labels, and 0 otherwise; η is an error component distributed normally but with zero mean, which inflates the variance of utility for the options different from the status quo (no-buy option); ε_{njt} is an unobserved random term that is distributed following an extreme value type I (Gumbel) distribution, i.i.d. over alternatives, and independent of α and β.

Using the estimated coefficients from equation (1), we then calculated the marginal WTPs across treatments as the ratio of the partial derivative of the utility function with respect to the attributes of interest, divided by the derivative of the utility function with respect to the price variable. The WTPs and the standard errors of each attribute levels were obtained using the Krinsky and Robb (1986) bootstrapping method, resulting in a distribution of 1,000 WTP values for each attribute. In particular, the 1,000 observations were drawn from a multivariate normal distribution

parameterized by using the estimated means and variances from the RPL-EC model estimated for each RCE treatment. The generated 1,000 WTP estimates were then used to perform the computational method suggested by Poe et al. (2005) to test our research hypotheses about the CCs formation.

Admittedly, the derivation of WTP estimates from models specified in preference space with the price coefficient treated as a fixed variable has some limitations. Hence, in addition to utility specifications in preference space, the utility function can also be expressed in the WTP-space (Cameron and James, 1987; Train and Weeks, 2005; Scarpa and Wills, 2010). In the WTP space approach, the utility is re-parameterized and thus the coefficients can directly be interpreted as marginal WTP effects (Scarpa and Willis, 2010). In other words, the researchers make a prior assumption of the distribution of the WTP rather than attribute coefficients. Several studies have reported the advantages of using WTP-space instead of preference space (Balcombe, Chalak and Fraser, 2009; Train and Weeks, 2005, Scarpa and Willis, 2010, Thiene and Scarpa, 2009). According to Scarpa and Willis (2010), for instance, the use of WTP-space can be more practical for derivations of welfare estimates and when accounting for interpersonal scale variation. Also, it provides more reasonable distributions of WTP (Train and Weeks, 2005) and it can potentially produce more stable WTP estimates (Balcombe, Chalak and Fraser, 2009).

Hence, to assess the robustness of our results, we also specified the RPL-EC model in WTP space, where the price coefficient is treated as a random variable. The basic specification in WTP space can be expressed as follows:

$$U_{njt} = \theta_{njt}(ASC - 1PRICE_{njt} + \omega_1 ORGANIC_{njt} + \omega_2 LOCAL_{njt} + \eta_{njt}) + \varepsilon_{njt} \quad (2)$$

Here $\theta = \lambda/\alpha$, where λ is the Gumbel scale parameter and α is the coefficient of price. This term is distributed log-normally, which ensures randomness of the price coefficient in a fashion correlated with scale; and η is an error component. As shown in de-Magistris, Gracia, and Nayga (2013),

differences in WTPs between treatments involved in a certain hypothesis can be tested by conducting tests on pooled samples in which treatments are adequately identified by dummy variables. Accordingly, in our case it can be specified as follows:

$$U_{njt} = \theta_{njt}(ASC - 1PRICE_{njt} + \omega_1 ORGANIC_{njt} + \omega_2 LOCAL_{njt} +$$

$$\delta_1\left(ORGANIC_{njt}\ x\ dtr\right) + \ \delta_2\left(LOCAL_{njt}\ x\ dtr\right) + \ \eta_{njt}) + \varepsilon_{njt} \qquad (3)$$

The significance of the estimated δ and their signs will establish the effect of the treatment based on the marginal WTP estimate of interest. A joint restriction can then be tested using a likelihood ratio test, while a single restriction can be tested using a t-test on the coefficient estimate. A total of three extended utility functions were specified, one for each research hypothesis to be tested.

RESULTS

Table 3 reports summary statistics of socio-demographic information across the RCE treatments (gender, age, education, income). A chi-square test was used in order to test whether our RCE treatments differ in terms of gender, age, education and income. Results show that the hypothesis of equality of means between socio-demographic characteristics across the treatments failed to be rejected at the 5% significance level. We can then affirm that participants were equally distributed across the treatments in terms of socio-demographic characteristics.

-- Insert Table 3--

The coefficients estimates from the RPL-EC models were used to calculate the marginal WTPs across treatments. We then tested our hypotheses about the CCs formation using the combinatorial non-parametric Poe test (Poe, Giraud, & Loomis, 2005), which was performed with the 1000 WTP estimates derived by the application of the parametric bootstrapping method proposed by Krinsky and Robb (1986). Table 4 displays the marginal WTPs as well as the p-value of the Poe test.

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As can be seen from table 4, our first hypothesis (H_{01}: (WTP^{INT} - WTP^{CT}) = 0; H_{11} = (WTP^{INT} - WTP^{CT}) > 0), is rejected in the case of the organic claim, indicating that respondents' WTPs significantly increased when information about the meaning of this attributes was provided to them.

Looking at the results of our second hypothesis, we can state that the hypothesis of equality between the WTP estimates of INDT and CT (H_{02} : (WTP^{DINT} - WTP^{CT}) = 0; H_{12} : (WTP^{DINT} - WTP^{CT}) < 0) failed to be rejected. This suggests that the potential future information did not significantly affect respondents' WTP formation.

Finally, in the case of our third hypothesis (HP_{03} : (WTP^{RT} - WTP^{CT}) = 0; HP_{13} : (WTP^{RT} - WTP^{CT}) > 0), the null hypothesis of equality between the WTPs from the CT and the RT is rejected for both attributes (local and organic), indicating that the WTPs for both organic and local labels are higher when the purchase transaction was reversible. Consistent with Kling, List and Zhao (2013), this result confirms the CC theory.

As mentioned in the data analysis section, we also estimated the RPL-EC in WTP space to test the robustness of our results. Table 5 reports the estimates of the local production and organic parameters and the corresponding p-values of the t-test for the dummy variables indicating the

treatment effects (δ). As can been seen, the results are consistent with the ones we obtained from the model in preference space using the Poe et al. (2005) test.

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DISCUSSION AND CONCLUSION

In real purchasing situations, uncertainty and the potential to delay or reverse a transaction can affect choice decisions. Hence, the measurement of WTP under uncertainty conditions differs from Hicksian compensating variation because of the formation of the so-called "Commitment Costs" (CC) (Zhao and Kling,2001, 2004). According to the CC theory (Zhao & Kling 2001, 2004), CCs decrease and WTP increases when individuals are less uncertain about the value of a good and when it is possible to reverse a transaction. In this study, we revisit the three main theoretical predictions of the CC theory. We used a RCE approach to test individuals' WTP formation for organic and locally produced apple sauce by examining the effect of (1) a higher degree of information about the product in question, (2) potential delayed information, and (3) a change in the degree of reversibility of the purchase.

Our results show that WTP increases when consumers are provided with information regarding the meaning of the products of interest. This is consistent with CC theory prediction that making a choice in conditions of less uncertainty induces a CC formation and therefore an increase in WTP for the good in question. However, our findings are consistent with the CC theory just for the organic attribute. At first glance, it might be possible to deduce that the cause of these diverging results might be the nature of the given information. However, we provided neutral information for both attributes by giving a simple description of the regulations concerning organic certification and the proposed regulations for local production in Italy. We chose to give neutral information

precisely in order to avoid any potential induced preference for one of the two attributes. What we could verify in regards to the difference between the organic and local production attributes is that the former has a universally regulated certification characterized by a specific label. In contrast, the Italian food system still lacks a regulation that governs the identification or labeling of local food products. Hence, it is possible that the awareness of a controlled certification system might significantly affect individuals' decision making and induce a decrease of uncertainty for the quality of the food product in question. The introduction of a "Local Food" label might, then, play an important role in providing information and encouraging the commercialization of local food products even at the level of conventional forms of outlet, such as big retail chain.

Consistent with the results of Lusk (2003) from his coffee mug auction, we did not observe any significant decrease in the WTPs when the possibility to gain delayed information was offered to respondents, neither in the case of the organic certification attribute nor in the case of local production attribute. The failure to reject our hypothesis on this aspect of the CC theory cannot be attributed to the methodological approach used to elicit consumer WTPs since Lusk (2003) also obtained a similar outcome using an experimental auction approach. A possible explanation can be related to the nature of the attributes used to describe our products. In particular, we used two credence attributes in our RCE design. Individuals cannot personally evaluate credence attributes before or after consumption and so they could be a source of uncertainty to individuals when they are making choices. As such, it is possible that we would have gotten different results if we used search or experience attributes. Hence, testing WTP formation in dynamic settings using search or experience attributes could be an interesting area for future research.

On the other hand, our results strongly confirm that individuals' WTPs decrease and CCs increase in case of reversibility of the transaction. Respondents' WTPs were significantly higher when they had the chance to reverse the transaction, although in most of the cases they decided to keep the purchased product (i.e., just one subject returned the apple sauce). This might suggest that

the option value related to the reversibility issue can be a crucial aspect that should be remembered when designing RCEs. In the real market, retailers generally have policies concerning the reversibility of customers' purchases. Hence, in real purchasing situations, consumers are usually aware of the possibility that they could return the product they just purchased. This suggests that the irreversibility conditions which generally characterize RCEs could be source of bias in individuals' WTP estimation.

Overall, results from this study partially support the predictions of CC theory, given that we could confirm two of the three main CC theory predictions. Importantly, our results strongly confirm that transaction reversibility can significantly affect consumers' WTP formation, suggesting that this issue should be taken into account when designing real choice experiments.

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TABLES

Table 1: Attributes and Levels

Attributes	**Levels**
Price	- 2.45 €
	- 1.95 €
	- 1.45 €
	- 0.95 €
Origin	- Local (Produced in Emilia Romagna)
	-Non-local (Produced in Italy, but outside Emilia Romagna)
Method of production	- Organic
	- Non-organic

Table 2: Layout of the Real Choice Experiment (RCE) treatments

	CT	INT	DINT	RT
Blind test	√	√	√	√
Visual examination	√	√	√	√
Information RCE mechanism	√	√	√	√
Neutral information		√		
Information given about organic and local production after their grocery shopping			√	
Possibility to return the product				√
RCE questions	√	√	√	√

Table 3: Socio-demographic characteristics of the sample

	CT	INT	INDT	RT	TOT
Gender					
Female	55%	64%	64%	59%	38%
Male	45%	36%	36%	41%	62%
Pearson Chi-square (3) =1.7177					
Pv = 0.633					
Age					
18-34	20%	20%	27%	11%	19%
35-49	20%	27%	21%	25%	23%
50-64	32.5%	39%	34%	39%	36%
> 64	27.5%	14%	18%	25%	22%
Pearson Chi-square (9) = 8.5825					
Pv = 0.477					
Education					
< Highscholl	29%	16%	17%	23%	23%
Highschool	31%	50%	43%	34%	38%
Laurea Degree	32.5%	23%	31%	37.5%	31%
> Laurea degree	7.5%	11%	9%	5%	8%
Pearson Chi-square (9) = 9.0546					
p-value = 0.432					
Income					
< 15.000€	23%	22%	11%	14%	19%
15.000€ - 29.999	42%	38%	41%	22%	37%
30.000-44.999€	23%	24%	27%	47%	30%
45.000-59.999€	5%	12%	14%	8%	9%
> 60.000 €	7%	2%	7%	8%	6%
Pearson Chi-square (12)= 17.4182					
P-value = 0.135					

Table 4: Marginal WTP (€/two cups 100g each of apple sauce) across Treatments and Hypothesis Tests

Hypothesis Tests	**Local**	**Organic**
H_{01} : (WTP^{IN} - WTP^{CT}) = 0		
WTP^{IN}	0.70	1.07
WTP^{CT}	0.53	0.80
p-value	<0.2042	<0.0805
H_{02} : (WTP^{CT} - WTP^{IND}) = 0		
WTP^{CT}	0.53	0.80
WTP^{IND}	0.42	0.92
p-value	<0.2796	<0.7582
H_{03} : (WTP^{RT} - WTP^{CT}) = 0		
WTP^{RT}	0.96	1.14
WTP^{CT}	0.53	0.80
p-value	<0.0299	<0.0576

Table 5: Hypotheses Tests using Estimates from RPL-EC Model in WTP Space (€/two cups 100g each of apple sauce)

Hypothesis Tests	Coefficient	Standard Error	p-value
H_{01} : (WTP^{IN} - WTP^{CT}) = 0			
Loc x dtreat	0.19	0.33	0.5642
Org x dtreat	0.69**	0.34	0.0416
H_{02} : (WTP^{CT} - WTP^{IND}) = 0			
Loc x dtreat	-0.27	0.30	0.3983
Org x dtreat	0.36	0.32	0.2314
H_{03} : (WTP^{RT} - WTP^{CT}) = 0			
Loc x dtreat	0.63**	0.31	0.0426
Org x dtreat	0.62**	0.32	0.0455