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Can Willingness-To-Pay Values be Manipulated? Evidences from an Experiment on Organic Food in China

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Abstract:

Human behaviours are driven by two different types of motives: implicit and explicit motives. Psychologists have developed two main tools, namely time pressure and cognitive load, to disentangle the two motives. It implies that the values of willingness to pay (WTP) are sensitive to time pressure and cognitive load levels in practice. An experiment with 233 students is conducted in China to study the willingness to pay for organic food with consideration of different time pressures and cognitive load levels. Results show that (1) increasing cognitive load could significantly reduce consumers' WTP for organic food; and (2) time pressure does not have significant impact on WTP values. Such results remind us of being particularly cautious about the cognitive load situations of respondents during a WTP survey. Otherwise, the WTP results are unstable and inconvincible.

Key Words: Motives, Time Pressure, Cognitive Load, WTP, Organic Food, Experiments

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Introduction

The methods of eliciting willingness to pay (WTP), such as the contingent valuation methods (CVM), are prevalent in the valuation of non-market goods, even though their validity and robustness are regularly subject to debate (Diamond and Hausman 1994). For instance, the meta-analysis of Florax et al. (2005) finds that the WTP values for reductions in pesticide risk exposure are quite heterogeneous. Similarly, Yu and Gao (2010) reveal that the WTP values for Country-Of-Origin-Labelling of beef products in the US are diverse in the current literature. In order to explain and defend the nature of the heterogeneities in WTP studies, cognitive psychology has made great efforts to back the foundations of the methods, and draws theoretical insight from literature on two streams of psychology: psychophysics and decision theory (Fischhoff 2005). More specifically, psychophysics uses a complicated research design by adding features that require explicit attention, and then observes how respondents feel and react under the influence of certain stimuli. Decision theory analyzes individuals' probability and utilities for possible consequences of their action options. However, recently the two streams appear to be integrating.

Human behaviour is determined by the interaction of different motives and decision processes (McClelland, 1980 & 1985; Sanfey et al., 2003; Achtziger et al. 2011), and decision processes link different motives to behavioural results. A motive is an inner state that energizes or drives people toward the fulfilment of a goal (Kassin 2006, pp.475). Psychologists have categorized motives into those which are implicit or explicit (Brunstein 2008). Implicit motives are enduring, and affectively charged predispositions deeply rooted in an individual's personality, while explicit motives are associated with consciously reflected goals and standards that consumers set for themselves. McClelland, Koestner and Weinberger (1989) indicate that implicit motives seem more likely to be built on affective experiences with natural incentives early in life, while explicit motives are shaped by social

norms, tangible rewards, and the beliefs of individuals about themselves, developing later after concepts of the self, other and what is valuable have been acquired.

The two types of motives, implicit and explicit, are consistent with the dual-process model of decision making (Bargh, 1989; Kahneman 2003) and are, respectively, automatic and controlled processes. Driven by implicit motives, automatic processes are defined as immediate, fast, unconscious, and efficient, and hence they require few cognitive resources and capture impulsive reactions. In contrast, controlled processes, triggered by explicit motives, are slow, inefficient, and reactions are delayed and hence they are reflected upon consciously and require greater cognitive resources (Bargh, 1989).

Chocolate purchase could be a good illustrative example for explaining the two motives. On the one hand, an implicit motive may instantly tell the consumer that the sweetness of chocolates could yield plenty of pleasure. Such a motive is often driven by human nature, and the decision process is fast and efficient. On the other hand, an explicit motive may whisper that too much sweetness could cause the problem of obesity, which is not good for health and appearance. This kind of motive is often influenced by a prevalent social culture that slimness is a standard of beauty, particularly for ladies, and the decision process is slow and time-consuming. Finally, conflicts of the two motives lead to the purchase decision.

Can the two motives be intervened, so that consumers' behaviours could be manipulated consequently? Pioneered by Baddeley (1996), psychologists have developed some effective tools to separate the two motives by intervening in the human decision processes. As indicated by the illustrative example, compared with automatic processes, controlled processes require more time and more brain resources to optimize the behaviour.

Correspondingly, widely used intervention tools are (1) *time pressure* and (2) *cognitive load* (Achtziger et al. 2011).

In a study of *time pressure,* a consumer has to make a decision constrained to a time frame, given that the two types of motives require different lengths of time for the decision process. When the decision time is short, explicit motives and controlled process could be constrained because they need more time, so that implicit motives will increasingly influence human behavioural results. Practically, such a theory can hence explain the effectiveness of the marketing strategy of limited-time discounting. In contrast, *cognitive load* studies aim at reducing participants' available cognitive capacities, such as, by simultaneously assigning two tasks, distraction or interruption. Distraction and interruption are similar as they occur when a decision maker is performing a primary task, but they are detected by different sensory channels of human (Cohen 1980; Speirer, Vessey, and Valacich 2003). They could result in cognitive load by loss of memory content or confusion among information cues residing in memory (Laird, Laird and Fruchling, 1983). As the explicit motives and controlled process may require more brain resources, such manipulations can block their effects and encourage loss of self-control in respondents. Finally, implicit motives and automatic processes increasingly dominate the behavioural results.

WTP values, particularly hypothetical ones, are heavily hinged to consumers' motives and cognitive processes (Carson and Hanemann 2005; Fischhoff 2005; Gao, Lisa, and Yu 2010; Gao, Schroeder and Yu 2010; Yu, Gao and Zeng 2014). According to the aforementioned psychological theories, which claim that motives and decision processes can be intervened, WTP values hence might be unstable and can be manipulated. If these effects are ignored in practice, the related policy implications or market strategy derived from the WTP values may be subjected to failures.

The effect of time pressure specifically reveals that WTP values are very sensitive to the response time given to a respondent. According to the dual-process model, when the response time is short, implicit motives are more likely to dominate the behavioural results, as consumers have less time to process explicit motives. The effect of cognitive load specifically implies that the brain situation of a respondent does matter for the final WTP values. For example, when a consumer has more cognitive load or is distracted, his/her brain may not have enough resources to process explicit motives. As explicit and implicit motives are often inharmonious in WTP decision process, one can speculate that the WTP values might not be robust.

Distinguishing different motives is very important for the research of WTP values, both from a methodological and policy perspective. Given the fact that WTP values are widely used in policy making processes, ignoring these effects could result in severe consequences, leading to a situation where social preferences could be manipulated (Achtziger et al. 2011).

Unfortunately, current studies on WTP values do not pay enough attention to both effects. In order to fill the gaps in the current literature, this study conducts an experiment on WTP for organic food, with consideration of time pressure and cognitive load in the case of China. The global market for organic food has developed significantly in the past decades, including in China. Consumers in China are caring more and more about food quality rather than quantity (Yu and Abler 2009; Yu, Gao and Zeng 2014). In a meta-analysis of 96 observations, Xia and Zeng (2008) find the WTP values for organic food are very diverse: The highest value even reaches 509.2%, while the lowest is only 2.3%. The mean premium is 36%. In a study on WTP for organic food in China, Yin et al. (2010) find that the premiums for organic food are higher than 130% in some Chinese cities. Yu, Gao and Zeng (2014) find that consumers in China, on average, are willing to pay 47% more for Green

vegetables and 40% more for Green meat than for their conventional counterparts, and the Green Food certification in China is less stringent than Organic Food.

In order to reveal the impact of time pressure and cognitive load on WTP values, 233 university students[1] are recruited from Nanjing Agricultural University in China in December 2013, to study the WTP for organic food with different experimental scenarios. Even though such a unique and highly homogenous group cannot represent the general attitude towards organic food in China, it enables us to conduct comparison experiments for WTP from a methodological dimension (Achtziger et al. 2011).

There are hot debates over the use of students as subjects in experiments in the literature. Student samples typically have a lower age, lower income, and more education than the general population. However, a recent study by Depositario et al. (2009) compared the WTP values for golden rice between students and non-students subjects in an experiment in Philippines, and found that the WTP values are actually not significantly different.

In addition, rather than studying WTP for organic food in China, the main purpose of this research is to test a theory of whether WTP values can be manipulated. Alfnes and Rickertsen (2011) indicate that if the objective of the experiment is to test theory or compare mechanisms, student samples are usually satisfactory. In a recent publication in *Nature*, Exadaktylos, Espın, and Branas-Garza (2013) also point out that self-selected students are an appropriate subject pool for the study of social behaviour.

Experimental Design

Before the experiment, demographic information for all 233 participants, such as gender, birthplace and monthly total expenditure, are recorded. About 77% of the participants

[1] 250 students were originally recruited, but only 233 participated in the experiment.

are female, and 40% from the local province. The average monthly expenditure for all participants is 1152 *yuan* (about $189).

Cognitive load and time pressure are usually manipulated simultaneously in the current literature (Achtziger et al. 2011). In this study, to determine their impact this study included three time pressure levels (5 seconds, 10 seconds and 15 seconds respectively for each question) and two cognitive load levels (a treatment of simple math calculation before answering questionnaires, or not), which resulted in a total of 6 treatments.

The participants are randomly divided into 6 groups and assigned a treatment to each group. Originally, 250 students are recruited; 40 students for each group and the remaining 10 for reserves. Finally, 233 students showed up in our experiment, and the numbers of experimental participants for the 6 groups respectively are 39, 38, 38, 44, 36, and 38 (Table 1).

[Insert Table 1]

This study asked three sets of questions respectively regarding WTP values for organic pork, organic tomato, and organic milk. These were asked separately for each group in a laboratory with different experiment settings. The questions were automatically presented by PowerPoint with different time settings for each slide. Communication between participants was not allowed during the experiment and all answers were hand written on the paper provided.

In order to check the potential bias caused by methods, this experiment combined two types of contingent valuation methods (CVM) to estimate consumer WTP values: Open-ended and Single-bounded discrete eliciting. Ready, Buzby, and Hu (1996) concluded the methodological differences in eliciting methods for CVM. The open-ended eliciting method

is particularly straightforward, but it suffers from the problem of a large number of zero observations (Yu and Abler 2010); while the discrete methods are flexible, but can cause strategic bias due to the number of initial biddings (Ready, Buzby, and Hu 1996). As Ready, Buzby, and Hu (1996) recommend, this experiment combined the single-bounded discrete method and the open-ended continuous method together. The contents of the slides are attached in the **Appendix**.

This study sets the reference prices at 40 yuan/kg (around $6.6/ kg) for conventional lean pork, at 8 yuan/kg (around $1.3/kg) for conventional tomato, and 2 yuan/ box (120 ml) (around $0.33/ 120 ml) for conventional liquid milk. Xia and Zeng (2008) find the mean premium of WTP for organic food is 36% in a meta-analysis. Yu, Gao and Zeng (2014) find that consumers in China, on average, are willing to pay 47% more for Green vegetables and 40% more for Green meat than for their conventional counterparts, and Green Food is a food certification in China, which is less stringent than Organic Food. This study sets a slightly higher reference price premium for organic products at 50% in the discrete method, which is 20 yuan/kg and 4 yuan/kg, and 1yuan/box respectively for organic pork, organic tomato, and organic milk. After each discrete question, this experiment also inquired participants' WTP values using an open-ended question.

Separate experiments are conducted for each group. The first three groups were cognitive-load-free group. For the second three groups, this study first asked all participants to keep doing simple math calculations before answering our WTP questions, in order to consume some of their brain resources, and increase their cognitive load for answering the WTP questions. The participants are not informed how long they would do math calculation before the experiment in order to avoid task-switch expectation of the participations. During the experiment, the math calculation is interrupted after 3.5 minutes, and the participants are

immediately asked to answer the WTP questions[2]. In order to motivate the participants to consume more brain resources, this experiment gave 200 *yuan* (around $33) each to the best two scores in the math calculations, and 100 *yuan* (around $16) each to the 10 participants whose math calculation score were between No.3 and No.12.

According to psychological theory, such an intervention will increase the cognitive load. First, 3.5 minutes of math calculation are likely to consume the already limited brain resource needed for thinking about the WTP questions. Second, interruptions are defined as uncontrollable, unpredictable stressors that produce information overload, requiring additional decision-maker effort (Cohen, 1980). They could result in cognitive load by loss of memory content or confusion among information cues residing in memory (Laird, Laird and Fruchling 1983; Speirer, Vessey, and Valacich 2003),

This experiment sets the slide/question showing time as 5 seconds, 10 seconds, and 15 second per slide, with different combinations for different sets of questions in a group. That means this experiment assigns three different levels of time pressure correspondingly for three food products in a group. The assignation of time pressures is reported in Table 1, and it is not known to the experiment participants. Such a design could avoid the expectation of time pressures during the experiment. To give an incentive to participants from the first three groups who did not conduct math calculations, for participation, 10 were randomly selected and given 100 yuan (around $16) cash as a gift.

Descriptive Results

Of the 233 participants, 230, 232 and 232 answered the question of discrete choice (whether they are willing to pay a 50% premium or higher for organic food) respectively for meat, tomato, and milk. This study finds that 116 participants (50.4%), 135 participants

[2] No participants could finish all math calculations we prepared in 3.5 minutes.

(58.2%), and 203 participants (87.5%) are actually willing to pay 50% or more respectively for organic meat, organic tomato, and organic milk. Compared to meat and tomato, the participants are more concerned about the organic milk, perhaps resulting from the negative impact of the recent scandal regarding the mixture of melamine in baby milk powder (Yu 2012).

Figure 1 displays the percentages of the samples willing to pay a 50% or more of a price premium for organic food for each experimental scenario. It clearly reveals consistent patterns between pork, tomatoes and milk. That is, given the same time pressure, this study finds a similar pattern for the effects of cognitive load: The likelihood to pay a 50% premium is substantially lower for all three products in all scenarios. The differences for all scenarios are statistically significant except for meat in the 15-second setting and tomato in the 5-second and 10-second settings. This evidences that cognitive load could significantly reduce WTP values for organic food in China.

However, these findings reveal no consistent patterns for different time settings between the three products, given the same cognitive load.

[Insert Figure 1]

Table 2 reports the descriptive statistics of open-ended WTP values for different scenarios. The results of the open-ended bidding indicate that the respondents are, on average, willing to pay an 18.6 yuan (93%), a 4.8 yuan (60 %), and a 2.3 yuan (115%) premium respectively, for organic meat, organic tomato, and organic milk. This is much higher than the average number of 36% found in the current literature (Xia and Zeng 2008). It is also higher than 40-47% of the WTP values for Green Food in China, but below the number of higher than 130% in Yin et al. (2010). However, the results are reasonable as the respondents are well-educated university students, and education is often positively

correlated with WTP values (Thompson 1998; Yin et al. 2010; Sirieix, Kledal, and Sulitang 2011). Once again, these findings are consistent with the results of the discrete choice questions aforementioned, that the WTP values for organic milk are significantly higher than organic meat and organic tomato.

Table 2 also presents the comparison results for open-ended WTP for different scenarios. Given the same time pressure, this study generally finds a consistent pattern, that cognitive load through math calculation reduces the WTP values. Exceptions to this pattern are the case of pork with 15 seconds of time pressure and the case of tomato with 10 seconds of time pressure, which is partly consistent with the results of the likelihood of WTP in Figure 1.

Given the same level of cognitive load, this study cannot observe any common patterns in the results between the three products.

The descriptive statistics of our results generally indicate that cognitive load could significantly decrease the WTP for organic food in China. However, no clear pattern of time pressure is observed.

[Insert Table 2]

Regression Results

In order to quantitatively study the effects of time pressure and cognitive load, this study ran regressions for the WTP values, while controlling expenditure, gender and birthplace. The results are reported in Table 3 and Table 4 for different models with different forms of time variables. Thomas (1998) points out that income, gender and education could affect the purchase behaviour of organic food. The current literature also finds that consumption of organic food is believed to support local economy, so that the students from the local province could have different WTP values (Hughner et al. 2007).

[Insert Table 3 and 4]

Table 3 reports the results with including time pressure (seconds) as a continuous variable in the econometric exercise, while time pressure is treated as discrete variables in the results of Table 4. Such a comparison of econometric exercises could help to check the robustness of our results. The results in Table 3 are highly consistent with those in Table 4, regarding coefficients and significant levels. The results are also consistent with our findings in the aforementioned descriptive statistics.

First, all coefficients for cognitive load are negative. Most of them are highly statistically significant, except for the open-ended results for meat and tomato. Such results once again confirm that cognitive load, such as interruption, could significantly reduce WTP values.

Second, the coefficients for all time variables are not statistically significant except for the open-ended result for milk, which is negative and only marginally significant. The signs of the point estimates do not show a common pattern.

Surprisingly, the four sets of estimations exhibit similar results regarding the signs and significances, regardless of eliciting method and product, which indicates that our results are very robust. The econometric findings are also consistent with the descriptive statistics in Table 1 and Figure 1.

Gender and monthly expenditure generally do not have a significant effect on the WTP in our studies. However, the students from the local province (Jiangsu Province) are more willing to pay for organic meat and organic tomato. This supports the finding in the current literature that consumption of organic food is believed to support the local economy (Hughner et al. 2007), particularly for perishable meat and vegetables.

Following Yu and Abler (2010), this paper reported WTP values in Table 5, respectively from the raw open-ended bidding data, and the predicted values of Table 3 and Table 4. However, the difference between them is very tiny. Once again, this study confirms that the results from the cognitive load treatment condition are significantly lower than those without the treatment. Using the predicted values, which have smaller variance compared to the raw data, this paper finds that a treatment of cognitive load would on average decrease a 5.5% premium for organic meat, a 6.4% premium for organic tomato, and a 34.1% for organic milk. The average WTP premiums for organic meat, organic tomato, and organic milk respectively are 94%, 59%, and 117%.

[Insert Table 5]

Psychological theories proclaim that cognitive load can ruin self-control (Achtziger et al. 2011), and makes implicit motives dominate human decision. Our experiment reveals that cognitive load, such as interruption, significantly reduced WTP values for organic food. This implies that implicit motives make the WTP for organic food less in contrast to explicit motives.

McClelland (1980, 1985) and McClelland, Koestner and Weinberger (1989) indicate that implicit motives represent affective preferences that evolve gradually through learning and experience, particularly with natural incentives early in life, while explicit motives are shaped by social norms, tangible rewards, and the beliefs of individuals about themselves, developing later after concepts of the self, other and what is valuable have been acquired.

Tian and Yu (2013) point out that Chinese consumers are experiencing a nutrition transition from a traditional stage of caring more about nutrition to a modern stage of caring more about other attribute, such as tastes, appearances, status, convenience and variety. In such an emerging country as China, the implicit motives about the food for most Chinese

consumers possibly evolved from their early stage of hunger when nutrition was the major concern. Chen (2013), and Yu, Gao and Zeng (2014) indicate that the value of organic food is largely affected by social norms and social status, and only relative rich people prefer premium food. The concept of organic food is a consciously reflected goal and standard that consumers set for themselves, and still not deeply rooted into consumers' personality. In other words, the value of organic food is mainly mirrored by consumers' explicit motives.

In addition, Chen (2013) points out that trust plays an important role in linking WTP values to actual purchase. Yin et al. (2010), Sirieix et al. (2011) and Chen (2013) indicate that consumers in the society do not have a high level of trust in organic food certification in China. This social norm could also partially explain why implicit motives for consumers reduce WTP for organic food in China. Consequently, it is reasonable that an increase in cognitive load would decrease the WTP value for organic food.

Though this paper has not detected significant impact of time pressure on WTP values[3], it does find strong evidence that the WTP values are sensitive to cognitive load, such as interruptions in the experiment. It reminds us that WTP values could be manipulated or biased, for instance, in a survey of consumers with many interruptions. The policy implications derived from the related research should be cautiously scrutinized in order to avoid failures.

Conclusions

Cognitive psychology has made great efforts to link WTP to the human decision process. It evidences that human behaviour is driven by the interaction of different motives,

[3] One reviewer pointed out that three time settings of 5, 10 and 15 seconds in the experiment might be generally too short to identify the effect of time pressure, and lead to the insignificant results for time pressure. Given the current experiment setting, we cannot test this hypothesis. Thus, a future research topic for us would be to identify the ideal decision time for different motives.

which can be categorized into implicit and explicit motives. Implicit motives are enduring, and affectively charged predispositions deeply rooted into an individual's personality; while explicit motives are associated with consciously reflected goals and standards that consumers set for themselves. Motives and behaviours are bridged by different decision processes. Psychologists have developed two main tools, *time pressure* and *cognitive load*, to intervene in human decision processes and to reveal human motives.

The current literature proposes that time constraints and cognitive load could make the WTP values unstable. Social preferences could be manipulated when the WTP values are used for policy making. In order to test the hypotheses, this study conducts an experiment on WTP for organic food (specifically, pork meat, tomato, and milk) with different time pressure and cognitive load treatments.

First, this study has not detected significant impact of time pressure on WTP values in our study. However, this study finds strong evidence that WTP values are sensitive to cognitive load (in this case, interruptions). A treatment of cognitive load (3.5 minutes of simple math calculation) would decrease the WTP premium by 5.5% for organic meat, 6.4% for organic tomato, and 34.1% for organic milk.

The current literature proposes that cognitive load can ruin self-control (Achtziger et al. 2011), and makes implicit motives dominate human decision. Our findings imply that implicit motives make consumers less willing to pay for organic food in contrast to explicit motives. It is possible that the value of organic food is largely affected by social norms, and still not deeply embedded into the personalities of consumers in China. This implies that a further promotion of organic food could increase its premium. The low-level trust of certification of organic food could be partially attributable to this result.

Such results raise questions about the application of WTP values in practice. Put simply, they indicate that social preferences could be manipulated if we do not pay more attention to the situation of cognitive load of the respondents during the survey. The related policy implications derived from the current WTP research, for instance, with a survey of many interruptions, could be biased and should be carefully scrutinized in order avoid possible failure.

Finally, the average WTP premiums for organic meat, organic tomato, and organic milk respectively are 94%, 59%, and 117% for a sample 233 university students in China. Compared with the current literature (e.g. Xia and Zeng 2008; Yin et al. 2010; Yu, Gao and Zeng 2014), theses relatively high WTP values are reasonable, even though they are obtained from a sample of university students.

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Appendix:

The following slides are presented during the experiment:

[Slide 1], ***Background***

Contrast to conventional food, Organic Food is considered healthier and more environmentally friendly, so that Organic Food is usually more expensive in the market. Please answer the following three sets of questions:
[Attention: You only have relatively short time to answer each question.]

[Side 2], ***Questions of Set 1***

[Slide 3], *Currently, conventional lean pork price is **40** yuan/kg in the market*

[Slide 4], Then, *are you willing to pay **20** yuan more for organic lean pork? A, Yes, B, No*

[Slide 5], Please *give a specific price premium for organic pork?* _____

[Side 6], ***Questions of Set 2***

[Slide 7], currently, *conventional tomato price is **8** yuan/kg in the market*

[Slide 8], *Then, are you willing to pay **4** yuan more for organic tomato? A, Yes, B, No*

[Side 9], Please *give a specific price premium for organic tomato price?* _____

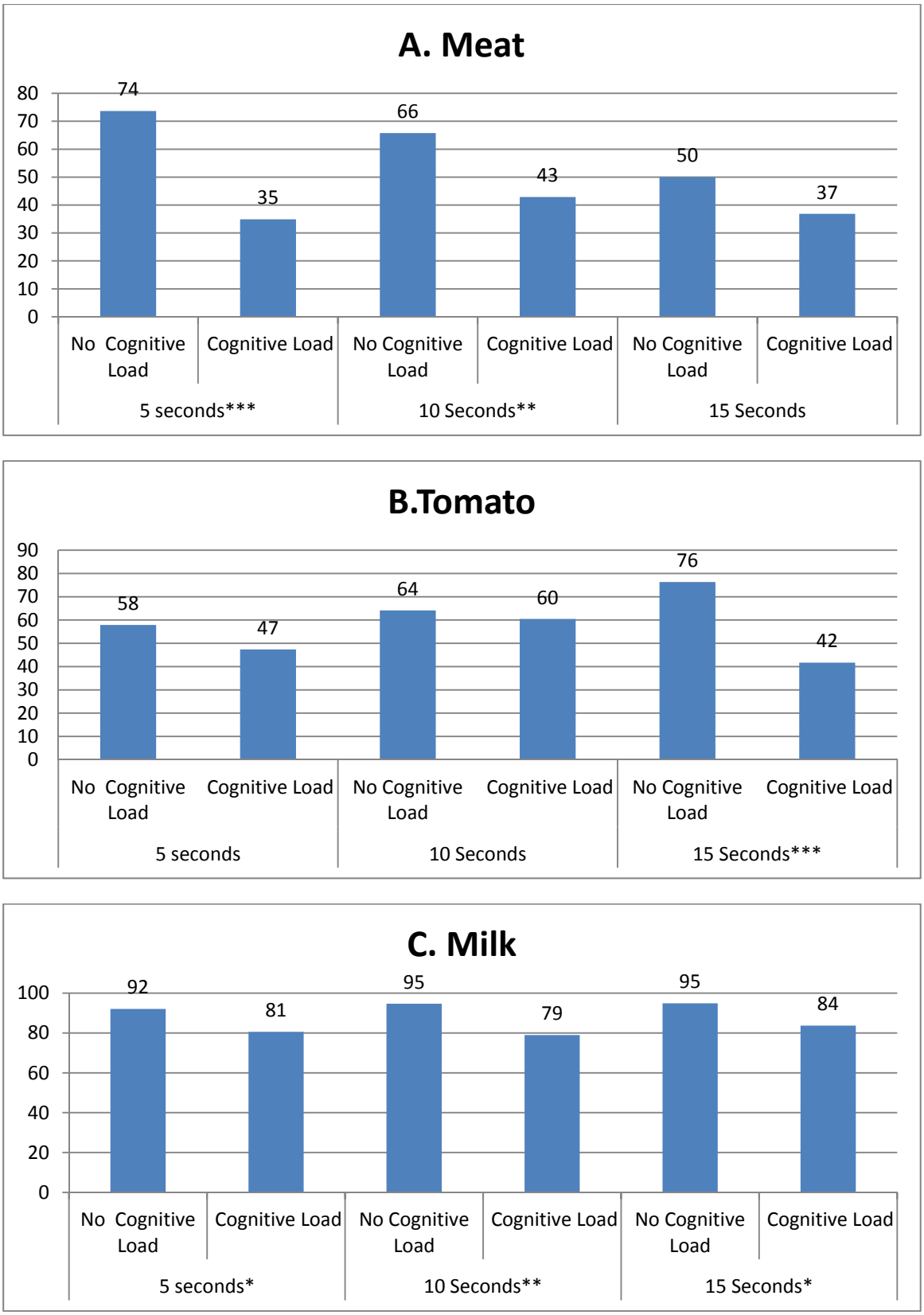
[Side 10], ***Questions of Set 3***

[Slide 11], currently, *conventional liquid milk is **2** yuan/ box (120 ml) in the market*

[Slide 12], *Then, are you willing to pay **1** yuan more for organic milk? A, Yes, B, No*

[Side 13], Please *give a specific price premium for organic milk price?* _____

Figure 1: Percent of Willingness to Pay 50% Premium for Organic Food



Note: ***, ** and * respectively denote the statistical significant levels of 1%, 5% and 10%.

Table 1. Sample Distribution and Experimental Design

Cognitive load	Group ID	No. of Participants	Time Pressure (Seconds)		
			Meat Questions	Tomato Questions	Milk Questions
No math calculation	1	39	5	10	15
	2	38	10	15	5
	3	38	15	5	10
Math caculculation	4	44	5	10	15
	5	36	10	15	5
	6	38	15	5	10

Note: 250 students are originally recruited, but only 233 finally showed up in our experiment. Self-selected students are an appropriate subject pool for the study of social behaviour (Exadaktylos, Espın, and Branas-Garza 2013).

Table 2: Comparisons of Open-Ended WTP between Different Scenarios

2A: WTP for Organic Pork

Cognitive Load			No Cognitive Load			Cognitive Load		
	Time		5 Sec.	10 Sec.	15 Sec.	5 Sec.	10 Sec.	15 Sec.
		Mean WTP (yuan)	21.8	20.4	14.5	17.0	19.7	18.3
No Cognitive Load	5 Sec.	21.8			***	*		
	10 Sec.	20.4			**			
	15 Sec.	14.5					*	
Cognitive Load	5 Sec.	17.0						
	10 Sec.	19.7						
	15 Sec.	18.3						
Total Sample		18.6						

2B: WTP for Organic Tomato

Cognitive Load			No Cognitive Load			Cognitive Load		
	Time		5 Sec.	10 Sec.	15 Sec.	5 Sec.	10 Sec.	15 Sec.
		WTP	4.9	4.6	5.5	4.9	4.7	3.9
No Cognitive Load	5 Sec.	4.9						
	10 Sec.	4.6						
	15 Sec.	5.5						*
Cognitive Load	5 Sec.	4.9						
	10 Sec.	4.7						
	15 Sec.	3.9						
Total Sample		4.8						

2C: WTP for Organic Milk

Cognitive Load			No Cognitive Load			Cognitive Load		
	Time		5 Sec.	10 Sec.	15 Sec.	5 Sec.	10 Sec.	15 Sec.
		Mean WTP (yuan)	2.8	3.0	2.2	2.1	2.3	1.6
No Cognitive Load	5 Sec.	2.8				**		***
	10 Sec.	3.0			*			***
	15 Sec.	2.2						*
Cognitive Load	5 Sec.	2.1						*
	10 Sec.	2.3						*
	15 Sec.	1.6						
Total Sample		2.3						

Note: ***, ** and * respectively denote significant levels of 1%, 5% and 10%.

Table 3. Regression results for WTP (Result 1)

	Meat				Tomato				Milk			
	Single-Bounded (Probit)		Open-ended (OLS)		Single-Bounded (Probit)		Open-ended (OLS)		Single-Bounded (Probit)		Open-ended (OLS)	
	Coef.	z-value	Coef.	t-value	Coef.	z-value	Coef.	t-value	Coef.	z-value	Coef.	t-value
Female	-3.05	-0.83	-7.62	-0.17	4.04	1.07	1.24	0.12	-2.81	-0.69	-6.43	-1.66*
Female *ln(Expenditure)	0.42	0.81	1.38	0.22	-0.57	-1.06	-0.12	-0.08	0.35	0.61	0.96	1.74*
ln(Expenditure)	0.28	0.63	1.49	0.33	0.46	0.97	0.16	0.15	0.41	0.87	-0.23	-0.55
Local Province	0.05	0.28	6.96	2.93***	0.48	2.76***	1.60	2.55**	-0.05	-0.23	-0.18	-0.62
Time	-0.03	-1.22	-0.22	-0.89	0.01	0.66	-0.03	-0.50	0.02	0.77	-0.05	-1.80*
Cognitive Load	-0.69	-4.00***	-0.84	-0.41	-0.40	-2.35**	-0.43	-0.77	-0.73	-3.16***	-0.68	-2.55**
Intercept	-1.32	-0.41	6.62	0.21	-3.14	-0.94	3.21	0.43	-1.11	-0.34	4.65	1.54
sample size	230		221		232		226		232		222	

Note: 1, *Female*- Dummy variable for female=1 and male=0; *Local Province*- Dummy variable for birth place, Jiangsu province=1 and other province=0; *Expenditure*- Real monthly expenditure; *Time*- answering time (5 second, 10 seconds, and 15 seconds); *Cognitive Load*- dummy variable, did match calculation=1 and others=0.

2, ***, ** and * respectively denote significant levels of 1%, 5% and 10%.

3, Robust t-ratios are reported.

Table 4. Regression results for WTP (Result 2)

	Meat				Tomato				Milk			
	Single-Bounded (Probit)		Open-ended (OLS)		Single-Bounded (Probit)		Open-ended (OLS)		Single-Bounded (Probit)		Open-ended (OLS)	
	Coef.	z-value	Coef.	t-value	Coef.	z-value	Coef.	t-value	Coef.	z-value	Coef.	t-value
Female	-2.86	-0.76	-4.37	-0.10	3.82	1.01	1.41	0.14	-2.80	-0.69	-6.75	-1.69*
Female *ln(Expenditure)	0.40	0.74	0.91	0.15	-0.54	-1.00	-0.15	-0.10	0.35	0.60	1.00	1.77*
ln(Expenditure)	0.30	0.65	1.71	0.38	0.43	0.91	0.18	0.17	0.41	0.86	-0.22	-0.49
Local Province	0.04	0.24	6.88	2.90***	0.49	2.82***	1.60	2.52*	-0.05	-0.23	-0.15	-0.53
Dummy for 10 Seconds	-0.04	-0.18	0.22	0.09	0.25	1.20	-0.25	-0.40	0.07	0.24	0.28	0.70
Dummy for 15 Seconds	-0.25	-1.22	-2.28	-0.91	0.14	0.64	-0.32	-0.50	0.21	0.76	-0.43	-1.68*
Cognitive Load	-0.68	-3.98***	-0.82	-0.40	-0.40	-2.37**	-0.43	-0.77	-0.73	-3.16***	-0.69	-2.60***
Intercept	-1.55	-0.48	3.60	0.11	-2.95	-0.89	2.95	0.39	-1.00	-0.30	4.16	1.32
sample size	230		221		232		226		232		222	

Note: 1, *Female*- Dummy variable for female=1 and male=0; *Local Province*- Dummy variable for birth place, Jiangsu province=1 and other province=0; *Expenditure*- Real monthly expenditure; Dummy for 10 Seconds – 10 seconds for answering time; Dummy for 15 Seconds – 15 seconds for answering time; *Cognitive Load*- dummy variable, did match calculation=1 and otherwise=0.

2, ***, ** and * respectively denote significant levels of 1%, 5% and 10%.

3, Robust t-ratios are reported.

Table 5. Calculation of WTP Values

		No Cognitiv Load			Cognitiv Load			Full Sample		
		Raw Data	Prediced by Table 3	Prediced by Table 4	Raw Data	Prediced by Table 3	Prediced by Table 4	Raw Data	Prediced by Table 3	Prediced by Table 4
Meat	WTP value	19.0	19.3	19.3	18.2	18.2	18.2	18.6	18.7	18.7
	(S.D.)	13.4	4.0	4.0	17.5	3.7	3.8	15.6	3.9	4.0
	% in price	94.8	96.4	96.5	91.1	90.9	90.9	92.9	93.6	93.7
Tomato	WTP value	5.0	5.0	5.0	4.5	4.5	4.5	4.8	4.8	4.8
	(S.D.)	3.8	0.8	0.8	4.6	0.8	0.8	4.2	0.8	0.8
	% in price	62.6	62.7	62.7	56.3	56.3	56.3	59.4	59.4	59.5
Milk	WTP value	2.7	2.7	2.7	2.0	2.0	2.0	2.3	2.3	2.3
	(S.D.)	2.2	0.3	0.4	1.9	0.3	0.4	2.1	0.5	0.5
	% in price	133.8	133.8	134.0	99.0	99.7	99.4	116.6	116.5	116.5