

# A Study of the Effects of Product Evaluation from Others on Willingness-to-pay: Dual Process System and Social Influence View\*

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This study focuses on the elicitation of willingness-to-pay (WTP) when others provide an evaluation of WTP (WTP information). From an economic rationality perspective, value or WTP should be consistent and independent from others' evaluation. Even when WTP information affects one's WTP, it can be interpreted to deliver information about quality and value of the product under uncertainty situation without encroaching on economic rationality. However, preference anomalies, such as the WTP-WTA gap and preference reversal, and cognitive biases caused by such heuristics as anchoring challenges the economic rationality view.

In this background, this study addresses three important issues. First, the effects of WTP information may follow low-elaborative System 1 process rather than high-elaborative System 2 process which economic rationality view assumes. Second, WTP information may function as a type of arbitrary social standard against which individuals feel their responses are being measured, and people may follow this information for social affiliation and/or group acceptance. Then, WTP information works as a kind of social pressure rather than as information. The third question concerns the type of information. WTP information may provide information related to others' preference or social cost which is different from general product information assumed in the economic rationality view. These questions are theoretically and practically important regarding the stability of preference. If a WTP estimation follows a low-elaborative System 1 process, then WTP is vulnerable to various situational factors. If the WTP information communicates social costs and affects WTP, this means that WTP is dependent upon social factors, and is unstable.

Two studies were conducted to address these questions. In the first study, WTP information was provided after subjects have made initial estimate on their own WTP. In the second, WTP information was provided before initial estimation of WTP. In each study, changes in WTP, explanatory variables of WTP, and level of uncertainty about the estimates were observed.

The results indicate that high WTP information induces high WTP. This effect follows the high-elaborative System 2 process changing explanatory variables of WTP. Further, WTP information does the role of information rather than social pressure. Further, WTP information delivers social information, which is related to others' preferences as well as social costs, rather than product information. The result that social information affects WTP means that WTP is not independent of social factors, and is unstable. This study also demonstrates how the effect of WTP information relates to perceived uncertainty, which is an important aspect in estimating value and significantly affects the consumer decision process. More changes in WTP and levels of uncertainty are incurred by WTP information when high uncertainty occurs before obtaining WTP information. Further, the effect of WTP information differs according to whether a prior value estimation exists.

Key words: Willingness-to-pay, uncertainty, dual process system, conformity, social influence

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## 1. Introduction

Shoppers significantly focus on price, and price information has become easier to obtain in the Internet era. For example, Amazon.com offers a price check function, which is generally used to observe the economy of the offered price. Price gaps among stores may further affect the product's reference price and transaction utility (Mazumdar, Raj, and Sinha, 2005; Thaler, 1985). Further, price naturally plays an informational role in evaluating consumers' willingness-to-pay (WTP) for a product specifically with imperfect information, as price delivers such product information as its cost and levels of market competition and popularity.

This study considers this background, and involves price's informational role. However, as price reflects various aspects and its effects are too complex to interpret, this study will address WTP from other consumers (hereafter, WTP information), rather than price. A price's primary determinant is demand, which reflects the WTP's distribution in the market, and WTP information is thought to be the key information in price. By understanding the role of WTP information, we can also better understand the role of price. Further, much information shared in real-world situations pertains to WTP information, such as consumer reviews, starred reviews,

and satisfaction levels with a product, among others. As these contain information regarding others' evaluation of WTP, the study of WTP information can provide implications regarding their effects.

From an economic rationality perspective, value or willingness-to-pay (WTP) should be consistent and independent from others' evaluations, assuming perfect information and no effects from network externality, symbolic value, and other factors. Loosening those assumptions can explain the effect of WTP information without encroaching on economic rationality. However, it is noteworthy that many studies regarding individual choice showed preference anomalies, such as the WTP-WTA gap (Horowitz and McConnell, 2002; Plott and Zeiler, 2005; Viscusi and Huber, 2012) and preference reversal (Cubitt, Navarro-Martinez, and Starmer, 2015; Tversky and Thaler, 1990), challenging the belief that people have consistent preferences. Further, various studies indicate cognitive biases caused by such heuristics as anchoring (Ariely, Loewenstein, and Prelec, 2003; Furnham and Boo, 2011; Mussweiler, Strack, and Pfeiffer, 2000). Some social influence studies also imply that the effect of others' opinions can stem from a desire for social acceptance (Asch, 1951, 1956; Deutsch and Gerard, 1955; Skewes, Skewes, Roepstorff, and Frith, 2013). These all challenge the economic rationality perspective.

Thus, the question as to whether the economic rationality perspective can explain the effect of WTP information is noteworthy, and theoretically important. This study will focus on the uncertainty and information issue, and three important questions will be addressed.

First, the effects of WTP information may follow the low-elaborative or System 1 process, characterized by a quick, heuristic-based, automatic, and unconscious process (Dhar and Gorlin, 2013; Furnham and Boo, 2011; Wegener, Petty, Blankenship, and Detweiler-Bedell, 2010a, 2010b). Thus, WTP information can directly affect WTP without an informational process; when people are willing to pay high prices, an individual is likely to pay the same high price without much consideration. This can be seen as a distortion or simple cognitive bias, far from economic rationality.

Second, many studies regarding social influence or conformity suggested that others' evaluations may function as social pressure (Asch, 1951, 1956; Deutsch and Gerard, 1955; Skewes et al., 2013). Others' WTP information provides a type of arbitrary social standard, against which individuals feel their responses are being measured, and people may follow this information for social affiliation and/or group acceptance (Cialdini and Goldstein, 2004).

The third question concerns the type of information: if WTP information acts as information, does it play a similar role to prod-

uct information, regarding product attributes, or does this provide a different type of information? Wagner, Kirchler, and Brandstätter (1984) and Wood and Hayes (2012) indicate that WTP reflects social concern or others' preference; therefore, WTP information may provide information related to social costs. If so, WTP information would deliver a different type of information from a classical economic perspective.

These questions are also theoretically important regarding the stability of preference. If a WTP estimation follows a low-elaborative System 1 process, then WTP is vulnerable to various situational factors. If the WTP information communicates social costs and affects WTP, this means that WTP is dependent upon social factors, and is unstable.

The following section discusses the theoretical background and research hypotheses. Two experiments will then be described to test the hypotheses. The final section provides a discussion and concludes the paper.

## II. Theoretical background

### 2.1 Economic rationality view

For the convenience of discussion, independent usage and no resale will hereafter be assumed to partial out the network effect, symbolic

value, and exchange value. WTP is defined as the maximum amount of money that a customer is willing to spend on a product or service (Cameron and James, 1987; Krishna, 1991). Additionally, this measures the monetary value that a person assigns to a consumption or usage experience (Homburg, Koschate, and Hoyer, 2005).

Such simplified economic models as the vertical or horizontal differentiation model (Tirole, 1988, chap 7) illustrate WTP as a function of quality or attributes, and functional forms and parameters represent an individual's characteristics. Although WTP as a function of quality is simple, and abstracts various contextual factors, it appears to be both natural and rational. This functional view parallels not only classical economic models, but also choice-based conjoint analyses, a popular approach in measuring WTP that assumes fixed tradeoffs between WTP and the level of attributes (Miller, Hofstetter, Krohmer, and Zhang, 2011).

This abstract functional view notes that no changes in beliefs regarding quality results in no changes in WTP. Further, if people have an accurate knowledge of quality, WTP information from others cannot affect their WTP. However, when one assumes uncertainty regarding the product's quality, WTP information may change people's beliefs and affect their WTP evaluation. More specifically, when people face high WTP information, they may in-

fer that others have high WTP because quality is high, thereby changing their beliefs in a way that affects WTP. This inference also appears to be natural and rational, and we find other similar inferences, such as price as a signal for quality. Rao and Monroe (1989, p. 351) defer to Scitovsky's (1944) work by noting that "such behavior is not irrational; it simply reflects a belief that the forces of supply and demand would lead to a 'natural' ordering of products on a price scale, leading to a strong positive relationship between price and product quality."

Grossman's (1976, 1977) Rational Expectation Equilibrium (REE) model also suggested that others' bids in auction reveal their beliefs and provide information regarding the financial asset's true value; therefore, people can learn about an asset's true value by observing the auction's bids. Although REE involves financial assets rather than general products, a similar model can be built to explain the effects of WTP information in uncertain situations by introducing uncertainty to a simple vertical differentiation model (Tirole, 1988, chap 7). Assumptions and notations are as follows:

- $W_i$  : Individual  $i$ 's importance of quality, which follows a distribution  $W_i \sim \mathcal{N}(\bar{W}, \sigma_W)$ , and  $\bar{W}$  is known to everyone.
- $\bar{Q}$  : The product's true quality.

$Q_i$  : Individual  $i$ 's expectation of quality before WTP information. It follows a distribution  $Q_i \sim N(\bar{Q}, \sigma_Q)$ .

The distribution is independent from  $W_i \sim N(\bar{W}, \sigma_W)$ .

$WTP_i$  : Individual  $i$ 's expected WTP before WTP information, and  $WTP_i = W_i Q_i$ .

Then, the average of WTP information from others will be  $\bar{W} \bar{Q}$ , which includes the information of true quality  $\bar{Q}$ . Moreover, those who obtain WTP information from others can improve their estimation of quality, and obtain an expected WTP closer to their true WTP. The rational people in this model are affected by WTP information.

*H1: The evaluation of WTP for a product will tend to follow WTP information from others.*

The WTP in the above discussion is only affected by quality, with a functional relationship that represents an individual's characteristics; however, this model was simplified, and the quality represents all attributes that determine WTP. Hence, explanatory variables for WTP will be used hereafter instead of quality to cover various aspects that determine WTP. The explanatory variables for WTP will be clearly defined in the following overview of experiments.

## 2.2 Low versus high elaboration

According to the dual process system perspective, WTP information may directly influence WTP without changing beliefs regarding explanatory variables. The System 2 process is described as deliberate, rule-based, conscious, and controlled (Dhar and Gorlin, 2013; Kahneman, 2003; Kogler and Kühberger, 2007), whereas the System 1 process involves an intuitive heuristic, characterized as quick, heuristic-based, automatic, and non-conscious.

The effect of WTP information can be understood as a type of heuristic. Cialdini and Trost (1998, p. 163) note that consensus provides an easy heuristic regarding how to act, as consensus implies correctness. It is natural to think that others' opinions regarding the support of many are based on good reasons; thus, they would be correct. Despite simplification, this is a highly conscious process, and is thus regarded as a System 2 process (Dhar and Gorlin, 2013). However, this type of heuristic can differ from traditional economic rationality perspectives if it does not accompany a change in explanatory variables. People are also affected by heuristics such as representativeness heuristic, which are regarded as unconscious, automatic System 1 processes (Dhar and Gorlin, 2013). This type of heuristic, as a System 1 process, may result in cognitive bias. Similarly, WTP information may follow a System 1 process,

such as “others are willing to pay a high price, and so am I.” This can be an unconscious, automatic process. In summary, even though System 1 processes and some heuristics that follow System 2 processes can result in the same WTP information effect on WTP, these cannot be observed as following an economic rationality perspective.

Two different arguments about the underlying mechanisms of anchoring are also helpful regarding this issue. The first involves the anchoring-and-adjustment view, in which people make insufficient adjustments to yield a final estimation based on an initially presented value or parameter: those who are exposed to a higher anchor make insufficient downward adjustments. Thus, estimates are biased toward the anchor values (Furnham and Boo, 2011). The second explanation stems from selective accessibility (confirmatory hypothesis testing). Namely, the anchoring effect may be caused by activating information consistent with the anchor presented. Judges presume that the anchor value is a plausible answer and test the hypothesis that the anchor value is the correct answer. Thus, judges search for ways in which their answer approximates the anchor value, activating aspects of the target consistent with the anchor value (Furnham and Boo, 2011).

Wegener et al. (2010a, 2010b) considered anchoring-and-adjustment as a low-elaboration anchoring, characterized by a thought-

less process. Individuals in this process arrive at direct conclusions through the simple priming of a number, or through the general sense of the target’s magnitude, large or small. Conversely, selective accessibility is considered as relatively high-elaboration anchoring. The primary difference between these two anchoring types involves whether people activate the target’s aspects that are consistent with the anchor. Some may think the activation of anchor-related aspects can be non-thoughtful or low-elaborative. However, Wegener et al. (2010a, 2010b) considered the process as high-elaborative if the activated aspects affect the target estimate in a thoughtful way. The effect in selective accessibility comes from rational relationship between the activated aspects and the target estimate. Therefore, it can be considered as thoughtful, high-elaborative one.

The discussion regarding the dual process system and elaboration level can be applied to the WTP information effects. When people face high WTP information, they may insufficiently adjust the value to obtain their own WTP without activating information that supports the value. Alternatively, they may use WTP information to make inferences regarding such WTP explanatory variables as quality. If changes in explanatory variables follow WTP information, this means that WTP information does not directly change WTP estimate. That is, to justify high WTP in-

formation, beliefs about the product change and as a result explanatory variables and WTP estimate also change. The changes correspond to what Wegener et al. (2010a, 2010b) describes with the concept of high-elaborative process. In a regard that it includes change in their own beliefs, the high elaborative process which is suggested by Wegener et al. (2010a, 2010b) is much more typical system 2 process than what Cialdini and Trost (1998) and Dhar and Gorlin (2013) described, the sense that consensus implies correctness. Further, it coincides with the view of functional WTP assumed in economic rationality.

Investigating whether the effect from WTP information accompanies changes in explanatory variables is necessary in observing whether the effect follows the economic rationality perspective. The following hypothesis is proposed based on this rationality view:

*H2a: The WTP information from others will result in changes in the evaluation of explanatory variables.*

*H2b: Changes in explanatory variables will be consistent with changes in WTP.*

On the other hand, the high-elaborative System 2 process generally results in more enduring attitude changes than the low-elaboration process (Baumeister and Bushman, 2008, p. 463; Wood and Hayes 2012). Thus, if the effect of WTP information follows a

high-elaborative process, it becomes more meaningful.

### 2.3 Informational vs. normative conformity

Conformity refers to the act of changing one's behavior to match others' responses (Cialdini and Goldstein, 2004). Through a series of experiments, Asch (1951, 1956) demonstrated that most subjects conformed to at least some incorrect group responses, although the subjects later reported that they were aware that those responses had been incorrect. The result supported the "normative conformity motivation," which indicates that others provide an arbitrary social standard against which individuals feel their responses are being measured; the motivation to conform typically involves social affiliation and/or group acceptance (Cialdini and Goldstein, 2004).

However, Deutsch and Gerard (1955) differentiated normative social influence from informational social influence. They defined normative social influence as an influence to conform to others' positive expectations. Conversely, informational social influence is defined as an influence to accept information obtained from others as evidence of reality. Studies that applied conformity to such buyer behaviors as product evaluation and brand choice assume that normative and informational motivations relate to conformity (Burnkrant and Cousineau, 1975; Lord, Lee, and Choong,

2001; Stafford, 1966; Venkatesan, 1966). Although WTP information changes both WTP and explanatory variables, if the change comes from normative motivation, it is far from economically rational.

The concept of uncertainty becomes important in determining WTP information's role. As Skewes et al. (2013) noted, informational influence occurs in evaluating an ambiguous object. Other studies also noted that uncertainty, ambiguity, or complexity that results in uncertainty is considered as foremost factors that determine the motivation of conformity (Baumeister and Bushman, 2008; Burnkrant and Cousineau, 1975; Lord et al., 2001). In this view, information is basically sought to reduce uncertainty. Other studies also argue that people search for information to lower risk or uncertainty (Cho, Kang, and Cheon, 2006; Howard and Jagdish, 1969). Further, information under economic rationality provides a narrower probabilistic distribution for the target estimate, and helps people choose this estimate, which means that the information reduces uncertainty. Grossman's (1976, 1977) mathematical model as well as the model built in Section 2.1 explain this reduction of uncertainty. In contrast, if the effect is normative, the purpose of processing WTP information solely involves social acceptance, and not uncertainty. Therefore, if WTP information reduces uncertainty, then the effect can be observed as informational.

*H3: The WTP information will reduce uncertainty regarding WTP.*

Analyzing moderating effect of uncertainty before WTP information (hereafter, "pre-uncertainty") can also be helpful in observing whether WTP information incurs informational or normative conformity. Anchoring studies indicate that such factors as sufficient information, knowledge, or experience, which decrease uncertainty, can also eliminate the anchoring effect (Chapman and Johnson, 1994; DelVecchio and Heath, 2012; List, 2011). Therefore, those with lower uncertainty tend to be less sensitive to outside stimuli. This will be the same regarding WTP information, if it is informational. When an individual knows nothing about the target estimate, others' opinions become the primary information used to make judgments and decisions. Conversely, in an extreme situation in which an individual is definitely certain about his or her WTP, additional information would have no value as information. In summary, the greater the uncertainty surrounding the target estimate, the greater the degree to which others' opinions will tend to be informational and change WTP. If WTP information incurs normative conformity, in contrast, people follow others' opinions although they are certain regarding the target estimate, as indicated in experiments by Asch (1951, 1956). As a result, pre-uncertainty will not moderate the effects of



WTP information.

This study's experiment will measure WTP, explanatory variables, and uncertainty as dependent variables. The WTP and explanatory variables are target estimates, and their changes will be moderated by the level of pre-uncertainty if WTP information is informational. Further, H3 argues that WTP information will reduce uncertainty if it is informational. Thus, if those who experience more pre-uncertainty accept WTP information as more informational, they will indicate a higher reduction in uncertainty. Assuming that WTP information works as information, the following can be hypothesized:

*H4a: Subjects who feel more pre-uncertainty will demonstrate more changes in WTP after learning the WTP information.*

*H4b: Subjects who feel more pre-uncertainty will demonstrate more changes in uncertainty after learning the WTP information.*

*H4c: Subjects who feel more pre-uncertainty will demonstrate more changes in explanatory variables after learning the WTP information.*

Alternatively, if the WTP information is informational, the change in uncertainty can also be moderated by the level of WTP before WTP information (hereafter, "pre-WTP"). According to confirmation bias, individuals

tend to favor consistent information over that which is inconsistent to avoid cognitive dissonance (Festinger, 1962; Nickerson, 1998; Pennebaker and Skelton, 1978). Considering confirmation bias, subjects whose pre-WTP is similar to the WTP information will tend to accept the WTP information as information, and tend to more positively reinforce their beliefs (Nickerson, 1998; Pennebaker and Skelton, 1978). As a result, their uncertainty will significantly decrease. On the other hand, when pre-WTP is far from WTP information, subjects will be uncomfortable and doubtful about the WTP information. Thus, their uncertainty will not significantly decrease, even though they may modify their estimate. This argument can also be applied only when WTP information functions as information because normative conformity does not involve uncertainty. One additional factor to consider is that the moderation of pre-WTP will only occur regarding uncertainty, and not regarding either WTP or the explanatory variables. If pre-WTP does not significantly differ from the WTP information, then the WTP will naturally remain relatively unchanged. Similarly, the explanatory variables will not substantially change. The following is hypothesized based on this discussion:

*H5: Subjects whose pre-WTP approximates the WTP information will indicate more change in uncertainty after learning*

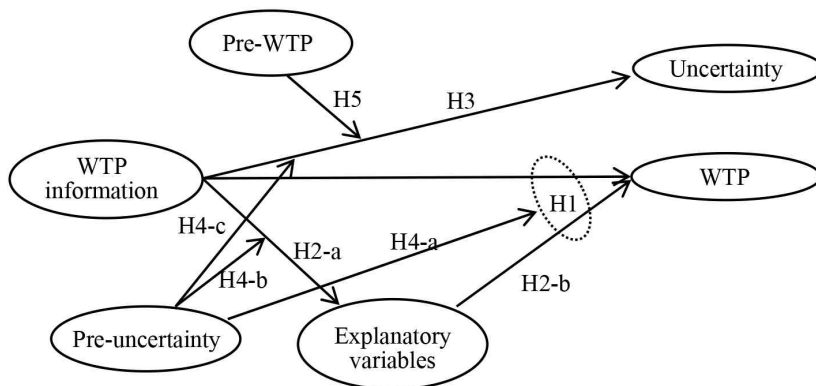
the WTP information.

Figure 1 illustrates this study's research model. One noteworthy item is that H1 does not specify the path: the effects of WTP information can be observed through a direct path from WTP information to WTP, or through an indirect path mediated by explanatory variables. The direct path can be explained by normative conformity or a cognitive bias similar to anchoring, among others. This study focuses on whether the indirect path (H2a- and H2b) is significant. Additionally, H3, H4, and H5 test whether the effects of WTP information are informational or normative, are hypothesized based on the assumption that WTP information functions as information, and can complement H2. These are also meaningful as the level of uncertainty is an important aspect in estimating a value, and highly affects the consumer decision-making

process (Dowling, 1986).

#### 2.4 WTP information and product information

An additional question involves whether WTP information plays the same role as product information. Wood and Hayes (2012) argued that social concerns are significant in purchase decisions: "Are my friends using this product?" "Will my spouse like it?" Wagner et al. (1984) noted that a consumer's spouse objecting to a purchase affects the consumer's well-being. These arguments are related to the normative motivation to conform to others' opinions, but means that this motivation really affects purchasers' WTP. If others like the product, the purchaser can earn more value from the product. If others dislike the product, the purchaser feels less value and more risk even though other product related aspects are fixed. Hereafter, social cost is



〈Figure 1〉 Research model

used as the term which means the effect of others' preference on WTP regardless of whether it is negative or positive. Even though this term is not so clearly defined, this concept can be useful to investigate the role of WTP information which contains the information about others' preference.

We further discuss this by defining two different types of information: product information and social information. Product information involves the product's attributes that help customers to evaluate its value from independent usage. Social information concerns others' preferences and relates to social cost, which does not relate to one's own value from the traditional economic rationality perspective.

The WTP information, which shows the valuation from others, inherently includes social information. Thus, if WTP information acts as information, it will be compelling to observe what type of information is generally delivered. If WTP information delivers social information and is reflected in WTP, this extends the concept of traditional rationality. Further, this provides another insight into social influence studies, as these studies previously used a dichotomy of informational and normative concepts; however, if the target estimate relates to social costs like WTP (Wagner et al., 1984; Wood and Hayes, 2012), the motivation for social affiliation and/or group acceptance can be informational.

Thus, three different roles can be assumed for WTP information. The first is product information, which is explained by traditional economic rationality. The second is social information, which is helpful in evaluating a product's social cost. This role is not explained in traditional economic rationality or previous social influence studies. The final role is social pressure, which may result in a change in written WTP without a change in actual beliefs, and corresponds to genuine normative conformity.

Social uncertainty is defined to learn what type of information is delivered, as this differs from the concept of total uncertainty used in the discussion thus far. The following experiment will measure people's perceptions of product information's credibility and sufficiency before the WTP information, as well as total uncertainty. These two characteristics reflect the uncertainty related to product information (hereafter, "product pre-uncertainty"). If the product pre-uncertainty's effect is controlled from total uncertainty, the result can be perceived as social uncertainty, assuming that total uncertainty is composed of both product and social uncertainty.

After a decision is made as to whether social or product pre-uncertainties better explain the changes in both WTP and uncertainty, this can be used to test which information type is delivered through WTP information. The following hypothesis is offered based on

the assumption that social information is delivered through WTP information:

*H6a: Social pre-uncertainty will better explain the change in WTP than product pre-uncertainty.*

*H6b: Social pre-uncertainty will better explain the change in uncertainty than product pre-uncertainty.*

These hypotheses do not consider the explanatory variables of WTP because some of the explanatory variables primarily relate to product information. Alternatively, H4a and H4b can also be tested with the concept of social uncertainty to verify that social uncertainty better explains these than total uncertainty. This can complement the testing of H6.

### III. Experiment overview

Two studies were conducted to test the hypotheses. In the studies, two different contexts were presented in the questionnaire; the first included WTP information, and the second did not. The effect of WTP information on an individual's decision-making regarding WTP can be investigated by comparing the results between the two contexts.

#### 3.1 Subjects and experiment product

The questionnaires were created using Qualtrics, an online survey program, and were distributed using Mechanical Turk, an online subject-recruiting service managed by Amazon.com. Subjects were restricted to residents of the United States, aged 18 to 60 years. Initially, the survey's purpose was explained simply as an academic survey regarding the willingness-to-pay. The subjects were paid \$1.50 or \$1.00, according to the type of survey completed.

The product used in the following experiments was an infrared-ray electric grill because it was assumed that most people were unaware of this product, as the possibility of informational conformity might be excluded when a familiar product without uncertainty is used. Further, it was likely that knowing the product's market price, or having purchased the product, could affect the evaluation of WTP. Thus, this study sought to prevent such confounding effects. With the same consideration, responses of those who had information regarding the product and the price level before the survey were excluded from the analysis.

Product information was expressed through text accompanied by a picture, as shown in Appendix 1. Subjects assessed the textual information first, and the graphic was provided on a subsequent, separate page. The product

information included the price and a picture of the generic electric grill, one of the best sellers on Amazon.com. Absolute valuations of goods and experiences are thought to have a large arbitrary component, but relative valuation with a reference product is relatively easy and stable (Ariely et al., 2003; Ariely, Loewenstein, and Prelec, 2006). The generic electric grill was used as a reference product for the elicitation of WTP, and for responses regarding questions for the explanatory variables of WTP.

### 3.2 Measurement of variables

After providing the product's information, the questionnaire asked the following regarding WTP: "Assume that a retailer offers you the above product now for purchase. What would be the maximum price you are willing to pay for the product above? \$\_\_." The following sentence was also added before the WTP question in the WTP information situation: "The average willingness-to-pay for the infrared-ray electric grill was approximately \$113.00 in the previous survey." The value \$113.00 was adopted to be much higher than the real average WTP.

Explanatory variables for WTP were then measured: quality, or overall quality, convenience, and taste; utilitarian value; hedonic value; and substitutes. First, a product's quality is thought to be an important

determinant of WTP. The questions concerning quality were adopted and modified from those by Rao and Monroe (1988), who studied price as a signal of quality. The questions involving overall quality, convenience, and taste were as follows: "In comparison to generic electric grills, the infrared-ray electric grill appears to be of"; "The infrared-ray electric grill appears more convenient than generic electric grills"; and "The infrared-ray electric grill will cook more tasty steaks than generic electric grills." The first question, regarding overall quality, used a 9-point scale, anchored by: "1. Very good quality"; "3. Moderately good quality"; "5. Neither good nor poor quality"; "7. Moderately poor quality"; and "9. Very poor quality." The two subsequent questions used a 9-point scale, anchored by: "1. Strongly agree"; "3. Moderately agree"; "5. Neither agree nor disagree"; "7. Moderately disagree"; and "9. Strongly disagree."

Second, WTP by its very definition reflects the product's perceived value. The utilitarian and hedonic concepts reflect two basic aspects of value. Hedonic products are desired for pleasure, fantasy, and fun, whereas utilitarian items tend to fulfill basic needs or accomplish functional or practical tasks (Khan and Dhar, 2010; Strahilevitz and Myers, 1998). The questions were based on the two concepts' definitions, and were modified for ease in understanding: "The infrared-ray electric grill appears to be more useful to me than

generic electric grills,” and “The product offered in this study seems to give more pleasure and fun than generic electric grills do.”

The last question regarding substitutes was based on findings from Chan, Kadiyali, and Park (2007); the level of competition among items reduces the level of WTP in auction situations. Although the product value is significantly high, the WTP of a product that is competitive and available anywhere is generally low. Because subjects seem to experience some difficulty in evaluating the level of competition, the “existence of better substitutes” was used, instead of competition: “There are better products in the market than the product shown on the previous page.”

Among the explanatory variables for WTP, those regarding quality may be reflected in the value concepts; however, quality was an important variable in previous WTP studies. Further, a primary concern involves addressing the factors that affect WTP as broadly as possible. We are interested in examining the role of explanatory variables as a whole, rather than that of each variable. This study included quality despite a conceptual overlap.

A question regarding the certainty of the subjects’ evaluations followed. Previous anchoring studies measured the level of certainty using one question, but the question slightly differed among studies (Englich, Mussweiler, and Strack, 2005, 2006; Erb, Bohner, Rank, and Einwiller, 2002; Raju,

1977). Similarly, this study’s question was modified to be appropriate to this experiment’s context: “I am very certain about my evaluation of the product illustrated on the previous page.” The perceived level of product information was then measured, with two questions regarding the credibility and sufficiency of the product’s information: “The information about the infrared-ray electric grill provided on the previous page was sufficiently credible”; and “The information provided on the previous page was sufficient enough to evaluate the value of the infrared-ray electric grill.” All of the questions, other than overall quality, used the same 9-point scale, ranging from “strongly agree” to “strongly disagree.”

Two “yes or no” questions were then asked regarding subjects’ prior knowledge of the experimental product and its price. These questions were used to eliminate the subjects with prior knowledge. The final section was composed of questions regarding demographic variables, including the respondents’ gender and age.

## IV. Study 1: Feedback on the same person

### 4.1 Methods and subjects

Subjects in Study 1 participated in the sur-

vey twice. The first survey (hereafter, "Study 1-1") explained that the survey consists of two parts, and only those who provide an e-mail address to invite them to the second survey can participate in the first survey. Study 1-1 was conducted without WTP information. The second survey (hereafter, "Study 1-2") was conducted three days after the first survey. Among the subjects of Study 1-1, those who satisfied the below criteria received an invitation e-mail to Study 1-2. The latter study was the same as Study 1-1, except that it included WTP information and did not ask questions regarding the subjects' prior knowledge of the experimental product or demographic data to prevent duplication.

Study 1-2 approximates the scheme in the anchoring experiment; however, subjects in this study have already determined their initial WTP estimate in Study 1-1. Further, the price of the generic electric grill was revealed before seeing the WTP information, a situation that differs from a typical anchor situation.

Although 133 subjects participated in Study 1-1, only 89 subjects received invitation e-mails to participate in Study 1-2. Six subjects were excluded because they had prior knowledge about the experiment's product and its price. Further, as the online survey can measure the response duration for every survey page, 38 subjects were eliminated using the criteria of duration for submitting responses. For example, subjects who spend less than

eight seconds reviewing the product information were omitted. Additionally, subjects who spend less than an average of three seconds per question were also eliminated. The criteria were determined by observing several subjects who participated in a pre-test. The average WTP ( $\mu$ ) of 89 responses was \$61.68, with a standard deviation ( $\sigma$ ) of \$20.83. The value of WTP information, \$113.00, corresponded to  $\mu + 2.5\sigma$ .

Of the 89 subjects, 60 carried out Study 1-2, and they all satisfied the screening criteria. Thus, their responses were used for the analysis. Among the 60 subjects, 29 were male and 31 were female. The average age was 38.4 ( $\sigma$  of 8.71), ranging from 24 to 59.

## 4.2 Results

Data was analyzed from the 60 subjects who completed Study 1-2 using SPSS version 21. Some of the data was reverse-coded before analyzing it for explanatory variables, such that a high value implies high WTP; quality; convenience; taste; and utilitarian and hedonic values. The variable name for "substitute" was changed to "low-substitute," and "certainty" was replaced with "uncertainty" because high values are related to high uncertainty. Additionally, the product information's credibility and sufficiency were merged as "product pre-uncertainty" using an arithmetic mean, as they both queried re-

garding the perceived level of product information (correlation coefficient = .876; Cronbach's  $\alpha$  = .932).

The average WTP in Study 1-1 was \$61.748 from the 60 subjects who completed Study 1-2, and the average value in Study 1-2 was \$78.381. The difference between the two was statistically significant (paired sample *t*-test,  $t = 5.102$ ,  $p < .001$ ). Therefore, H1 was supported.

Next, regarding H2, we are interested in examining explanatory variables' collective role, rather than that for each variable. Therefore, the arithmetic mean (hereafter, "mean\_exp") of six variables was used to test H2. Table 1 demonstrates that the mean\_exp significantly differs ( $p < .05$ ) when a paired sample *t*-test is applied. Therefore, H2a is supported. Table 1 also displays the results of *t*-tests for all six variables for reference. All variables, except taste, changed to support an increased WTP, but only hedonic val-

ue ( $p < .05$ ) and low-substitute ( $p < .1$ ) displayed significant differences.

Alternatively, H1 does not consider which factor incurs  $\Delta$ WTP, or the gap in WTP between Study 1-1 and Study 1-2. A regression analysis was additionally conducted to reveal whether  $\Delta$ mean\_exp, which is the gap in mean\_exp between Study 1-1 and Study 1-2, significantly explains  $\Delta$ WTP, and the result is noted in Table 2. The B of  $\Delta$ mean\_exp is significant ( $p < .1$ ). Even though the significance level is somewhat high, we should consider that mean\_exp includes various potential explanatory variables for WTP. It is natural that some of them do not explain WTP well. If the less significant variables are omitted, the significance level will become lower. Considering this, H2b is regarded to be supported. This support economic rationality view explained in Section 2.1. However, the constant coefficient is also significant ( $p < .01$ ).  $\Delta$ WTP is significantly greater than zero

<Table 1> One-sample *t*-tests of  $\Delta$ explanatory variables of WTP (N = 60)

	Mean	S.D.	<i>t</i>	p-value
$\Delta$ mean_exp	.23	.748	2.329	.023**
$\Delta$ quality	.03	.843	.306	.760
$\Delta$ convenience	.27	1.755	1.177	.244
$\Delta$ taste	-.12	1.136	-.795	.430
$\Delta$ utilitarian	.18	1.790	.793	.431
$\Delta$ hedonic	.58	1.690	2.673	.010**
$\Delta$ low-substitute	.40	1.618	1.915	.060*

\*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .001$  (all are the same in the following tables).



〈Table 2〉 Simple regressions of ΔWTP with Δmean\_exp

Model	R <sup>2</sup>	Unstandardized		Standardized	t	p-value
		B	S.E.	Beta		
Constant	.054	14.869	3.342		4.449	.000***
ΔMean_exp		7.839	4.310	.232	1.819	.074*

even after controlling for the effect from mean\_exp. This may imply that all explanatory WTP variables are not included in this study, or that normative conformity or cognitive bias, similar to anchoring, also incurs ΔWTP.

The gap in uncertainty between Study 1-1 (mean 4.02) and Study 1-2 (mean 3.80), Δuncertainty, was analyzed using a paired sample *t*-test. The mean value of Δuncertainty was negative (-.22) as expected, but was insignificant (*t* = -1.477, *p* = .145). Therefore, H3 is not supported.

Social pre-uncertainty was calculated before testing H4. First, total pre-uncertainty (total uncertainty from Study 1-1) was regressed by product pre-uncertainty; *B* = .460 (*p*-value = .001, *R*<sup>2</sup> = .180). As the perceived level of information decreases, the uncertainty

increases, as expected. Therefore, social pre-uncertainty was defined by controlling for the effect of product pre-uncertainty, as follows:

$$\text{social pre-uncertainty} = \text{total pre-uncertainty} - .460 \cdot \text{product pre-uncertainty.} \quad (1)$$

The ΔWTP is regressed by the total pre-uncertainty and social pre-uncertainty, and Table 3 summarizes the results. The *p*-value was higher than .10 for total pre-uncertainty, but lower than .05 for social pre-uncertainty. Therefore, H4a is supported from the social pre-uncertainty perspective. The Δuncertainty was also regressed by total pre-uncertainty and social pre-uncertainty, and Table 3 also illustrates that the *p*-values were less than

〈Table 3〉 Simple regressions with pre-uncertainty

Dependent Variable	Model	R <sup>2</sup>	Unstandardized		Standardized	t	P-value
			B	S.E.	Beta		
ΔWTP	Total	.040	2.414	1.577	.200	1.551	.126
	Social	.094	4.105	1.669	.307	2.459	.017**
Δuncertainty	Total	.117	-.186	.067	-.342	-2.767	.008***
	Social	.154	-.236	.073	-.392	-3.243	.002***
Δmean_exp	Total	.013	.041	.047	.115	.883	.381

.01 in both regressions; therefore, H4b is also supported. The  $\Delta\text{mea\_exp}$  was regressed only by the total pre-uncertainty, as some of the explanatory variables primarily relate to product information. The results in Table 3 indicate the expected sign, but are insignificant ( $p > .1$ ). Therefore, H4c is not supported.

The  $\Delta\text{uncertainty}$  was also regressed by pre-WTP, and the results are summarized in Table 4. When the entire sample is used ( $N = 64$ ), B is not significant ( $p > .1$ ) and H5 is not supported. However, when people are uncertain of their WTP estimation, WTP is less meaningful. The effect of WTP on  $\Delta\text{uncertainty}$  may be significant only when people have more than a particular level of certainty. The results in Table 6 indicate that this hypothesis is supported. When social pre-uncertainty is used for the criteria, B is significant ( $p < .05$ ), but only in the low pre-uncertainty group, although it is not significant ( $p > .1$ ) when total pre-uncertainty is used for the criteria. The level of pre-un-

certainty moderated pre-WTP's effects on  $\Delta\text{uncertainty}$ ; thus, H5 is regarded as being supported.

The hypothesis H6 was tested by conducting multiple regressions, using  $\Delta\text{WTP}$  and  $\Delta\text{uncertainty}$  as dependent variables and social and product pre-uncertainties as independent variables. The results summarized in Table 5 note that only social pre-uncertainty significantly explains  $\Delta\text{WTP}$  ( $p < .05$ ) and  $\Delta\text{uncertainty}$  ( $p < .01$ ). Therefore, H6a and H6b are supported. Further, social pre-uncertainty better explained  $\Delta\text{WTP}$  and  $\Delta\text{uncertainty}$  than total pre-uncertainty in the tests for H4a, H4b, and H5 (Tables 3 and 4). This can be considered as additional support for H6.

In summary, all the hypotheses are supported except H3 and H4c. It is noteworthy that the path hypothesized by H3 is significantly moderated by pre-uncertainty (H4b) and pre-WTP (H5), which could explain why H3 is not supported. The WTP information reduces uncertainty only with high pre-un-

〈Table 4〉 Simple regressions of  $\Delta\text{uncertainty}$  with pre-WTP

Sample <sup>+</sup>	R <sup>2</sup>	Unstandardized		Standardized	t	p-value
		B	S.E.	Beta		
Whole sample (N=60)	.026	-.010	.008	-.161	-1.245	.218
High total pre-uncertainty (N=29)	.035	-.015	.015	-.187	-.990	.331
Low total pre-uncertainty (N=31)	.085	-.011	.007	-.292	-1.643	.111
High social pre-uncertainty (N=31)	.001	.002	.016	.023	.126	.901
Low social pre-uncertainty (N=29)	.142	-.015	.007	-.377	-2.118	.044**

<sup>+</sup>The number of group members determined to include subjects with the same value in the same group.

〈Table 5〉 Multiple regressions with pre-uncertainties

	Model	R <sup>2</sup>	Unstandardized		Standardized	t	p-value
			B	S.E.	Beta		
	Constant		20.856	8.877		2.349	.022**
ΔWTP	Social	.129	4.106	1.651	.307	2.487	.016**
	Product		-2.450	1.625	-.186	-1.508	.137
	Constant		.122	.394		.311	.757
Δuncertainty	Social	.155	-.236	.073	-.392	-3.217	.002***
	Product		.019	.072	.032	.261	.759

certainty and pre-WTP.

Study 1 indicated that WTP information affects the evaluation of WTP. Further, the explanatory variables' average (mean\_exp) significantly changed, and the mean\_exp explains ΔWTP significantly, supporting the idea that WTP information has high-elaborative System 2 process effects. The level of pre-uncertainty moderated this effect, as subjects with high pre-uncertainty demonstrated greater changes in both WTP and uncertainty levels. High pre-WTP also relates to a greater change in uncertainty, and specifically with low pre-uncertainty. These findings all support the informational role of WTP information. Collectively, Study 1 supports an economic rationality perspective: H6 is also supported, and indicates that WTP information will perform a social information role, rather than product information.

## V. Study 2: Single survey with WTP information

### 5.1 Overview of Study 2

Unlike Study 1, in which subjects provide their estimation of a target before WTP information, subjects in Study 2 receive WTP information during the initial estimation. The situation in Study 2 is theoretically interesting in and of itself. Further, Study 2 can correct two types of potential distortions in Study 1. First, subjects in Study 1 could be affected by confirmation bias (Festinger, 1962; Nickerson, 1998). This somewhat differs from the discussion regarding H5, which addresses the issue of accepting WTP information as information. Deutsch and Gerard (1955) and Kelly and Shapiro (1954) noted that when subjects record their own perceptions before exposure to the group response, the tendency to conform to the group response decreased.

Then, subjects who recorded their pre-WTP in Study 1-1 may demonstrate little change after receiving the WTP information in Study 1-2. Second, when subjects were asked to re-evaluate their WTP in Study 1-2, they could experience more pressure to conform to WTP information. The request to re-evaluate could be a signal that their previous valuation in Study 1-1 was incorrect. This may increase a change in WTP and other variables.

Study 2 escapes these distortions by offering WTP information at the initial estimation. However, pre-uncertainty and pre-WTP do not exist in Study 2, and cannot be measured. Thus, H4 and H6 cannot be tested, although H1 through H3 can be tested by a comparison with Study 1-1.

The relationship between post-WTP and post-uncertainty should be noted here, as this will be determined by three effects hypothesized in H4 and H5. Let us assume that pre-uncertainty and pre-WTP have no correlation. The actual correlation coefficient was .027, and was insignificant in Study 1. Therefore, H4a first indicates that high pre-uncertainty results in high post-WTP. Second, H4a and H4b collectively mean that  $\Delta$ WTP and  $\Delta$ uncertainty negatively correlate. Third, H5 implies that pre-WTP and post-uncertainty negatively correlate. The first effect implies a positive correlation between post-WTP and post-uncertainty, and the second and third effects imply a negative correlation between

them. Thus, the relationship between post-WTP and post-uncertainty cannot be hypothesized because of these different effects. Actually, the correlation coefficient between them was insignificant in Study 1 ( $r = -.007$ ).

However, the information process in Study 2 differs from the process in the situation in which WTP information is offered after an initial estimation. A negative correlation between (post-) WTP and (post-) uncertainty can be hypothesized in Study 2 for the following reasons:

First, pre-uncertainty does not exist in Study 2, and the effect hypothesized in H4 is difficult to consider. However, the confirmation bias discussed relative to H5 has a significant effect. When estimated WTP is high and similar to the WTP information, the subject's belief will be reinforced and uncertainty will decrease. When the estimated value is low, WTP information will increase uncertainty or have less of an effect because it will not be accepted as information.

Second, Study 2 is similar to the anchoring situation (Ariely et al., 2003; Mussweiler et al., 2000; Northcraft and Neale, 1987), and differs from Study 1, in which WTP information is offered after an initial estimation. A primary difference between this study and a general anchoring study is that the former shows reference product, generic electric grill, with the price before the WTP information. According to coherent arbitrariness suggested

by Ariely et al. (2003), a product's absolute numeric valuation is highly arbitrary, although people are relatively strong in their relative valuation. Subjects will then be able to judge that the value of the experiment product is higher or lower than that of reference product with relative ease, which is a relative judgment rather than absolute judgment. Further, subjects have two numbers: the price of reference product and WTP information. Subjects will accept WTP information as hypothesized in H5 in the case of a relatively high valuation, and an anchor-type situation will occur. This differs somewhat from Study 1, in which subjects who already determined pre-WTP similar to WTP information do not have a reason to change their high pre-WTP. When the relative valuation is low, in contrast, subjects will not accept WTP information. The reference product's price may be considered, rather than the WTP information, and the WTP information's effect will be restrictive. An asymmetric effect, in summary, will occur. This will increase the negative correlation between WTP and uncertainty.

Third, providing WTP information after an initial estimation can function as an artificial pressure to change the pre-WTP, as aforementioned. This pressure would be stronger specifically for those with low pre-WTP, although the WTP information may have weak informational value. This may weaken the negative correlation between post-uncertainty

and post-WTP in Study 1, which will not occur in Study 2.

The above discussion solely addresses WTP, but the first argument, which is based on H5, indicates that a high valuation implies lower uncertainty, and can also be applied to explanatory variables. The following hypothesis substitutes for H4 and H5 in Study 2 are as follows, based on this discussion:

*H7: The WTP and explanatory variables will indicate higher values in low-uncertainty subjects than in those with high uncertainty.*

As both WTP information and product information are simultaneously provided in Study 2, social uncertainty cannot be measured and H6 cannot be tested.

## 5.2 Subjects and methods

The survey was conducted using Mechanical Turk, and subjects were restricted to United States residents aged 18 to 60 years, as in Study 1. Although 101 subjects participated in the survey, responses from 61 subjects were analyzed using the same screening methods as in Study 1. Among the 61 subjects, 34 were male and 27 were female. The average age was 35.4 ( $\sigma = 9.62$ ) years, and the ages ranged from 21 to 60 years.

Subjects were provided with the product in-

formation from Study 1-1, as well as the following sentence below the picture of the product, similar to Study 1-2: "The average willingness-to-pay for the infrared-ray electric grill was approximately \$113.00 in the previous survey." Variables related to product information were not measured. All other questions, and the rules for coding variables, were the same as in Study 1.

### 5.3 Results

The average value of WTP obtained from 61 subjects was \$82.21. The value approximated that (\$78.38) of Study 1-2, and indicated no statistically significant difference ( $t = -.718$ ,  $p\text{-value} = .474$ ); however, the value significantly differed from the average value (\$61.75) in Study 1-1 ( $t = -4.702$ ,  $p < .001$ ). Therefore, H1 was again supported.

H2a was tested by examining the  $\Delta\text{mean\_exp}$  between Study 2 and Study 1-1 using an independent sample  $t$ -test. Although the difference's sign is as expected, the difference is not significant ( $\Delta\text{mean\_exp} = .18$ ,  $t = .917$ ,  $p = .361$ ). Thus, H2 is not supported. It is

noted that each subject in Study 1 participated in the two surveys, both before and after WTP information, and values can be compared on an individual subject level. However, the comparison in Study 2 occurs at the group level, which makes the  $p$ -values relatively higher than in Study 1. As H2a is not supported, H2b is not tested.

The total uncertainty was then compared to that in Study 1-1. The value in Study 2 was less than that in Study 1-1 (3.92 versus 4.02), as expected; however, the difference was not statistically significant (independent-sample  $t$ -test,  $t = .266$ , one-tailed  $p\text{-value} = .395$ ). Hence, H3 is not supported in Study 2.

Table 6 summarizes the results of independent sample  $t$ -tests for both WTP and  $\text{mean\_exp}$ , and between high- and low-uncertainty subjects. Subjects who demonstrated uncertainty equal to or greater than 4 were classified into the high-uncertainty group. In the case of WTP, the  $t$ -test did not reveal significance ( $p > .1$ ), and H7a is not supported. However, the  $\text{mean\_exp}$  indicated a significant difference ( $p < .01$ ), and H7b is supported.

〈Table 6〉 Independent sample  $t$ -tests of WTP and  $\text{mean\_exp}$  between high- (N = 32) and low- (N = 29) uncertainty subjects

	Mean difference	Standard error	$t$	$p$ -value	Correlation coefficient with uncertainty ( $p$ -value)
WTP	-7.153	7.327	-.976	.333	-.167 (.199)
$\text{mean\_exp}$	.853	.253	3.375	.001***	-.372 (.003***)

Study 2 supports both H1 and H7b. However, H2, H3, and H7a are not supported. Although this revealed that WTP information induces a significant change in WTP, more discussion is necessary regarding the underlying mechanism in Study 2.

Explanatory variables did not indicate significant differences to support H2, which concerns whether the WTP information's effect stems from the highly elaborative System 2 process. However, Table 7 clearly illustrates that high WTP information induced more certainty among the subjects with high valuation in explanatory variables. This means that WTP information relates to the estimation of explanatory variables, as discussed regarding H7. Thus, the WTP information's effect can be interpreted as derived from the high-elaborative System 2 process, although H2 is not supported.

H3, which assumes an informational perspective and argues that WTP information will reduce uncertainty regarding WTP, is not supported. As H7 argued, subjects with high valuation regarding the product might have strengthened their beliefs and decreased their uncertainty. H7 is also interpreted as subjects with low valuation can have more uncertainty due to WTP information. Thus, the differences in uncertainty between Study 1-1 and Study 2 can become collectively insignificant, even under an informational perspective. This is similar to Study 1, in

which H3 was not supported, and this was explained by the moderation effects from pre-uncertainty and pre-WTP.

In summary, the support for H7b provides important evidence that the WTP information's effect follows the high-elaborative System 2 process and informational perspective.

## VI. Discussions

Studies 1 and 2 indicated that WTP information from others significantly affects the evaluation of WTP, and investigated the underlying mechanism from the elaboration level and information perspective. Two findings are noted in this study regarding the elaboration level. Significant changes in explanatory variables were observed in Study 1, and while the changes in explanatory variables were not significant in Study 2, a significant relationship did exist between the level of explanatory variables and uncertainty. These findings signify that WTP information affects the estimation of explanatory variables as well as WTP. Therefore, the WTP information's effect can be interpreted as stemming from the high-elaborative System 2 process, in which people think about their reasons and try to justify their judgments.

Further, Studies 1 and 2 consistently demonstrated that level of uncertainty relates to

the effects of WTP information. This implies that the effect is informational rather than normative, as discussed in Section 2.3. The WTP information's effect, in summary, is a high-elaborative System 2 process, as well as informational. This is consistent with traditional economic rationality, rather than simple cognitive bias or normative conformity.

Another topic is also quite meaningful regarding the type of information delivered through WTP information. Social information was defined in Section 2.4, and noted as both revealing others' preferences and being related to social costs. This differs from product information, which concerns the product's attributes, and evaluates the value from independent usage. The testing of H6 supported the assertion that WTP information delivers social rather than product information.

The social information concept extends the traditional rationality view, which does not consider social cost. Further, social influence studies have considered dichotomous causes: informational and normative. However, the social information concept is somewhat mixed. The basic motivation in reflecting others' opinions is to conform to others' positive expectations, as in the explanation of normative social influence; however, it is informational in the regard that the opinion affects an individual's own WTP and reduces WTP-related uncertainty.

These results have two different implications

regarding WTP stability. As the WTP information's effect stems from the high-elaborative System 2 process, this supports the economic rationality view, which means that people can achieve stable WTP by gaining sufficient information. However, social information affects WTP, which means that WTP is not independent from social factors, and is unstable. This result is theoretically critical.

This study also noted that the WTP information's effect differs according to whether a prior value estimation exists. This is clearly denoted by the fact that the relationship between uncertainty and valuations of explanatory variables exists only when WTP information is offered at the initial estimation. When WTP information is offered after this initial estimation in Study 1, the effect strengthens with high uncertainty in the initial estimation, and with a high initial WTP estimation. However, in Study 2 where the concept of pre-uncertainty does not exist, a confirmation bias largely explains this effect.

The results also carry managerial implications. Although stores carefully handle consumers' reviews or product satisfaction levels, they do not often focus on price's effect on value or a willingness-to-pay (WTP) evaluation. This study's results imply that revealing the high prices in other stores may increase WTP for the product if the price delivers WTP information. This emphasizes price's role differently than



the discussions regarding reference price (Chandrashekar, 2001; Chandrashekar and Jagpal, 1995; Mazumdar et al. 2005; Monroe 1973).

Specifically, this study's results noted that the informational effect strengthens with respect to changes in WTP and uncertainty when the perceived uncertainty is higher. When the estimated WTP and WTP information were similar, the effect also strengthened, and specifically regarding the decrease in uncertainty. This indicates that the information can be more effective among inexperienced potential customers, and for new unfamiliar products. The information may also effectively enforce experienced customers' beliefs with positive valuations; however, it is relatively difficult to change negative valuations among experienced customers.

The social information concept also can be helpful for firms to organize the information delivered to customers. Firms should provide information that is balanced between the product itself and social information.

Additionally, this study carries implications regarding the methodology of eliciting potential customers' WTP. Considering the effects of WTP information, the WTP formation process is, to a significant extent, a gradual process of convergence toward a social agreement. An evaluation of WTP can be unstable without sufficient WTP information. This logic compels us to design an elicitation process to

effectively provide feedback of WTP information to subjects. Unfortunately, this does not seem to have been developed any further.

## VII. Limitations and future directions

This study contributes to the theoretical understanding of the effects of others' opinions on the evaluation of WTP. Despite its important contributions, this study has some limitations.

First, this study is an exploratory study; therefore, any generalization must be made with caution. Specifically, this study used only one product in its experiment. Different product types are likely to produce different effects. For example, WTP information may not be effective for products with little social uncertainty. Conversely, WTP information may function as a source of social pressure rather than information for the products with very low uncertainty. Such effects must be more systematically investigated across different products. This study revealed that the uncertainty regarding WTP and the similarity between the initially estimated WTP and WTP information moderates the informational effect; however, various possible moderating factors should be investigated.

Second, this study is motivated by the idea that price will deliver WTP information. This

argument has not been often studied, and is worthy of additional investigation. Further, the type of information in experiments, or WTP information, must also be discussed. A variety of information shared in real-world situations pertains to WTP information, but when this is represented numerically, the effects can differ from such qualitative information as consumer reviews, starred reviews, and satisfaction levels with a product, among others. Various types of opinions of others and their roles must be studied.

Third, the type of information that is delivered through WTP information requires greater study. Specifically, this study used the concept of social uncertainty for its investigation. However, the level of social information can be measured using various other methods, such as direct questioning. More effective methodologies for this issue should be developed.

Finally, the result in this study showed that only hedonic value and existence of substitute changed significantly among six explanatory variables of WTP. The significantly changed variables can be categorized into subjective and intuitive type. Those seem to be less objective than variables like quality, utilitarian value. Because WTP information does not contain specific information, it can have more effect on those relatively subjective and intuitive variables. It may be related to the finding that WTP information is mainly about social information. However, this in-

ference is not systematically supported in this study. The question that which kind of attributes WTP information mainly affects can be meaningful to study.

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〈Appendix〉 Product information used in the experiments

*Infrared-ray Electric Grill*

Use infrared-ray emitted from the top part as direct cooking heat source

**Following information is edited from various consumers feedback**

- No smoke. No oil splashes. Prevent the generation of cancer causing substances.
- Meat is cooked from the inside, and thus meat juice is kept. The meat texture becomes soft, and tasty.
- Heat level is somewhat weaker than generic electric grill.

**\* The price of generic electric grills (Amazon Best Seller) is \$53.99.**

〈Figure A1〉 Product information expressed by text

*Infrared-ray Electric Grill*



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**\* The price of generic electric grills (Amazon Best Seller) is \$53.99.**



〈Figure A2〉 Product information expressed as a picture

## 타인들의 지불의사가격이 개인의 제품 평가에 미치는 영향에 대한 연구: 이중정보처리 시스템 및 사회적 영향 관점\*

송재도\*\*

### 요 약

본 연구는 타인들의 지불의사가격 정보가 개인의 지불의사가격 추정에 미치는 영향을 분석하였다. 경제학적 합리성 관점 하에서 개인의 지불의사가격은 일관성을 유지하며, 타인들의 지불의사가격에 영향을 받지 않아야 한다. 설사 타인들의 지불의사가격이 영향을 미칠지라도 타인의 지불의사가격은 불완전 정보 하에서 제품의 품질 또는 가치에 대한 정보를 전달하는 역할을 하는 것으로 볼 수 있으며, 이 경우 경제적 합리성 관점 하에서 해석될 수 있다. 그러나 Willingness-to-pay Willingness-to-accept gap, 선호역전현상(preference reversal)과 같은 선호이상현상(preference anomaly) 또는 앵커링(anchoring)과 같은 인지적 편향 현상 등 경제적 합리성 개념을 위협하는 현상들이 보고되고 있다.

이런 배경 하에서 본 연구는 다음의 세 가지 문제들을 다룬다. 첫 번째, 타인들의 지불의사가격 정보의 영향은 경제적 합리성 관점이 가정하는 정교한(high-elaborative) 시스템 2 절차가 아닌 비정교한(low-elaborative) 시스템 1 절차에 의해 발생할 수 있다. 두 번째, 타인들의 지불의사가격 정보는 개인들이 자신의 반응을 비교, 평가하는 사회적 기준의 기능을 수행할 수 있으며, 이런 현상은 개인들이 사회적으로 받아들여지고 소속되고자 하는 기대에 의해 발생한다. 이 경우 타인들의 지불의사가격은 정보로 기능하기 보다 사회적 압력의 역할을 하는 것으로 해석되어야 한다. 세 번째로 타인들의 지불의사가격이 전달하는 정보의 유형을 다룬다. 하나의 가설은 타인들의 선호나 사회적 비용과 관련된 정보를 전달한다는 것이며, 이는 경제적 합리성 관점이 가정하는 제품정보와는 다른 것이다. 이런 이슈들은 선호의 안정성과 관련하여 이론적으로나 실용적으로 중요한 의미를 갖는다. 만약 타인들의 지불의사가격에 대한 영향이 시스템 1 절차를 따른다면 이는 지불의사가격이 다양한 상황적 요인에 영향을 받을 수 있음을 의미한다. 또한 제품정보 보다는 사회적 정보를 전달한다면 이는 지불의사가격이 사회적 요인들에 영향을 받으며 불안정한 특성을 보임을 의미하는 것이다.

이런 문제들을 검토하기 위해 본 연구에서는 두 가지 실험을 수행하였다. 첫 번째 실험에서는 피실험자들이 지불의사가격에 대해 초기 추정을 마친 후에 타인들의 지불의사가격 정보가 제시되었으며, 두 번째 실험에서

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는 초기 추정 상황에서 타인들의 지불의사가 가격 정보가 제시되었다. 각 상황에서 개인의 지불의사가 가격, 지불의사가 가격에 대한 설명변수들, 그리고 추정치에 대한 불확실성의 인식 수준들이 비교, 분석되었다.

분석 결과 타인들의 높은 지불의사가 가격이 제시되는 경우 개인들의 지불의사가 가격이 증가하였다. 또한 이 과정에서 지불의사가 가격의 설명변수들이 함께 변화하는 현상이 관찰되었으며, 이는 이 과정이 정교한 시스템 2 절차를 따름을 의미한다. 또한 타인들의 지불의사가 가격은 제품정보와는 달리 타인들의 선호나 사회적 비용을 반영하는 사회적 정보를 전달하는 것으로 나타났다. 이 결과는 개인들의 지불의사가 가격이 사회적 요인들에 독립적이지 않으며, 불안정한 것임을 의미하는 것으로 해석할 수 있다. 한편 본 연구에서는 타인들의 지불의사가 가격이 개인들의 추정치에 대한 불확실성 인식에 어떤 영향을 미치는지도 분석되었다. 분석결과 타인들의 지불의사가 가격 정보 제시 이전에 불확실성을 높게 인식하였던 피실험자들이 지불의사가 가격과 불확실성 수준에서 더 큰 변화를 보였다. 또한 타인들의 지불의사가 가격의 영향은 피실험자들이 정보를 제공받기 이전에 지불의사가 가격을 추정하였는지 여부에 따라 다르게 나타남을 보여주었다.

주제어: 지불의사가 가격, 불확실성, 이중정보처리시스템, 순응, 사회적 영향

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