

**Definition, Measurement and Determinants of the Consumer's Willingness to Pay: a
Critical Synthesis and Directions for Further Research**

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INTRODUCTION

*Quaerimus, non quale sit quidque, sed quanti.*¹ (Seneca)

Paying and being paid: for what and why? Price is an important variable in marketing, both in corporate practices (Simon and Speckmann, 1995; Han, Gupta and Lehmann, 2001) and consumer purchasing decisions (Gabor and Granger, 1961; Hamelin, 2000; Zollinger, 2004). It contributes to sales volumes, margins and product positioning (Desmet and Zollinger, 1997). It is therefore important to assess consumer perceptions of prices.

The concept of price elasticity and the demand curve are traditionally used to set prices (Lambin, 1998; Dietsch, Bayle-Tourtoulou and Krémer, 2000). They can be used for all consumers or *a priori* segments and indicate the number of individuals willing to pay a given price. However, new pricing practices such as pay-per-use or online auctions tend to customize prices. In this context, the concept of willingness to pay (WTP) or reservation price, defined as the maximum price a given consumer accepts to pay for a product or service, is of particular interest as it is richer in individual information. How can we measure it? How can we capture it? How can we influence it by manipulating the product, prices or sales environment? Ability to measure WTP enables calculation of the demand curve according to price and to set a price that offers the best possible margin. When prices can be customized, knowing the WTP could enable optimization of both sales volumes and margins. Understanding the factors that influence WTP allows it to be raised and offers the opportunity of increasing sales volumes for a given price or, when possible, to customize prices.

The concept first appeared in economic literature more than a century ago (Davenport, 1902). WTP and its methods were designed to determine prices for pure public goods and services. It is still used for subjects as varied as the value of human life or minimization of risks threatening human life (Jennings and Jennings, 2000), public financing of the arts (theatre, music, museums...) (Thompson *et al*, 2002), programs for the prevention of domestic violence (Sorenson, 2003) or the reunification of Korea (Yoo, 2004). Its use in marketing is more recent. In 1984, Goldberg, Green and Wind, along with Horsky, evoked the question of calculating the WTP for a service package using conjoint analysis. In 1991, Kohli and Mahajan revisited the concept and proposed a model enabling calculation of WTP using data produced through conjoint analysis, then simulating the optimal price for different concepts of new products. In 1987, Cameron and James proposed using contingent valuation

¹ “We no longer wonder what things are, but how much they cost” Seneca, in his *Letters to Lucilius*.

as an alternative to existing methods traditionally used in marketing, thus initiating a research stream concerning the advantages and drawbacks of different methods for measuring WTP. Finally, in 1991, Krishna demonstrated that the frequency of promotions, when at regular intervals or perceived as strong, can influence WTP for a discounted brand. This work is the first of a series of studies designed to demonstrate the determinants of WTP that managers can influence. Recently, WTP has inspired new research: measurement in stores (Wertenbroch and Skiera, 2002), in online auctions (Jiang, 2002), in website content (Dou, 2004), for products with quality labels (Vlosky, Ozanne and Fontenot, 1999) or for a new vaccine (Sapede and Girod, 2002). Other research work has focused on definition and measurement (Le Gall, 2000; Wertenbroch and Skiera, 2002; Chung and Rao, 2003; Derbaix, Siningaglia and Zidda, 2003; Krishna, Wagner and Yoon, 2006; Wang, Venkatesh and Chatterjee, 2007).

The importance of this concept, which could directly nourish pricing decisions and influence corporate earnings, and the absence of a synthetic overview of the subject justifies the present study. Research on WTP has been developing in marketing at a brisk pace over the last decade and therefore it would be interesting to assess the progress made, but also the limitations of using this concept. Indeed, methods for measuring WTP are affected by bias resulting from unpredictable over- or under-estimation. This synthesis is limited to work devoted to marketing issues, citing economic research only when necessary, but without dwelling on specific problems raised by the monetary valuation of goods and public policies.

The first part consists in an attempt to define WTP and clarify its status compared to similar concepts. In the second part, a large number of measurement methods for the concept are presented. The third part details the determinants of WTP. Finally, in a fourth section, directions for further research are proposed.

THE CONCEPT OF WILLINGNESS TO PAY

Many different concepts are used in marketing literature to study consumer reactions to prices. As part of the price perception process, WTP is closer to price judgments (reference price, acceptable price) and is linked to other variables that influence decision-making (satisfaction, loyalty and culture).

Defining the concept of willingness to pay

Willingness to pay is defined as the maximum price a buyer accepts to pay for a given quantity of goods or services (Kalish and Nelson, 1991; Kohli and Mahajan, 1991; Wertenbroch and Skiera, 2002). WTP is assimilated to the reservation price – (Kalish and Nelson, 1991; Kristensen and Gärling, 1997; Krishna, Wagner and Yoon, 2006) or the “floor reservation price” when the latter is conceptualized in terms of margin (Wang, Venkatesh and Chatterjee, 2007). The “floor reservation price” therefore corresponds to the maximum price at which, and under which, the consumer is 100% certain to buy the product.

Studying WTP is interesting because it enables, by cumulating the buyers who accept to pay price p , $Q(\text{CAP} = p)$, or a higher price, $Q(\text{CAP} > p)$, to determine the quantity q purchased at that sale price, or $q(p) = Q(\text{CAP} = p) + \sum Q(\text{CAP} > p)$. Starting with the cumulative number of buyers who accept to pay price p or more, the law of demand as a function of price and the price elasticities revealed enable setting of a price likely to maximize turnover, or profits, or market share. A different price would be set for each of these objectives. Let us consider a simple function of demand, $q = q(p)$. The elasticity of q compared to p is determined by calculating the ratio of percentages of variations in q and p , or:

$$\eta_p = \frac{dq/q}{dp/p} = \frac{dq}{dp} \cdot \frac{p}{q}$$

The coefficient obtained gives the percentage of variation in sales expected for a variation of 1% in price. Cross elasticity measures the degree of interdependence between sales of a brand and decision variables of competing brands, e.g. price. If index i designates the brand studied and r all the competing brands, the cross price elasticity of demand would be written:

$$\eta_{pr} = \frac{\delta q_i}{\delta p_r} \cdot \frac{p_r}{q_i}$$

This elasticity measures the influence on sales of brand i of a change in competitor's prices (Lambin, 1970). Elasticities can be used to optimize sales decisions in terms of profit. Thus, Dorfman and Steiner (1954) have proposed a theorem to define the optimal level of a sales program for a company in a monopolistic position involving variables of decision, price, advertising and product quality. If we focus on price and if the goal of the company is to maximize profits, it must therefore choose the price for which the absolute value of price elasticity is equal to the inverse of the gross margin expressed in percent (Lambin, 1970;

Leeflang *et al*, 2000). Lambin, Naert and Bultez (1975) have extended this theorem to a competitive situation. We should note that WTP is not the only intermediary used to determine the law of demand as a function of price and elasticities. They can also be calculated directly using sales data or pricing tests (Andréani, 1997; Dietsch, Bayle-Tourtoulou and Krémer, 2000). WTP represents an interesting alternative to price elasticities of demand when market data is not available such as the case of pure public goods and services or innovative products under development. Furthermore, the distribution of WTP is interesting in its own right. In the practical framework of customized prices (pay-per-use, secondhand markets or auctions²), it allows a price to be set for each buyer at its optimal profit level.

Willingness to pay and the decision-making process

Other price concepts, widely studied in marketing, are close to willingness to pay: reference price, acceptable price and value. Other variables seem to exert an influence on the same level. This is the case of satisfaction, loyalty or culture.

Reference price, acceptable price and value

Monroe (1979) provided the first global definition for the concept of reference price (RP). He defined it as the price against which buyers compare the offered price of a product or service. The RP can be a price in the buyer's memory or the price of an alternative product. Thus, the RP can be internal (IRP, memorized price) or external (ERP, a price communicated on the market). The IRP is a multidimensional construct (Winer, 1986) represented in the form of a threshold or margin. The literature has identified ten forms of IRP (for an overview, see Chandrashekar, 2001) including the reservation price or WTP. Not all consumers use the same IRP or the same processes for shaping internal standards (Hamelin, 2000; Zollinger, 2004).

Transaction utility theory (Thaler, 1983, 1985) links the concepts of RP and WTP to utility. When a buyer evaluates a transaction, three price concepts come into play: the proposed price of the product, the WTP and RP of the buyer. Two types of utility can then be considered:

² We should note that between 2005 and 2006, in France, this type of sale increased by 9% to reach € 2.13 billion.

- The acquisition value corresponds to the pleasure expected by the buyer after purchasing the product. This depends on the utility of the good received compared to the expected expense (WTP-proposed price). If WTP is greater than the proposed price, the consumer will enjoy what economists refer to as a surplus.
- The transaction value corresponds to perception of the offer as a good deal (or not). This depends on the advantages of the exchange itself as perceived by the buyer (RP-proposed price).

Thus, RP enables the buyer to formulate a judgment about a purchase situation, a proposed offer at a given price (good or bad deal), while WTP enables him to express, in monetary terms, a judgment of the product's perceived value. Bearden *et al* (1992) have shown empirically that RP and WTP are correlated, yet distinct, concepts. In a study concerning rented accommodation, they used several price measurements (normal price, expected price and average price) and several WTP measurements (direct measurement of the maximum price the respondent would agree to pay, indirect measurement using a scale of proposed prices to determine the price producing indifference in respondents, and, finally, the maximum price he would pay for his current home). They emphasize that the RP can equal WTP, for example in situations where the RP and WTP are equal to the market price.

Based on assimilation-contrast theory (Sherif and Hovland, 1961; Sherif, 1963), the concept of acceptable price is not linked to a price, but rather a price margin, i.e. all the prices consumers are willing to pay for a good or service (Lichtenstein, Bloch and Black, 1988; Adaval and Monroe, 1995). The work of Zollinger (1993; 1995) has enabled a distinction between the concepts of RP and acceptable prices. The notion of RP is represented by a narrower price margin, which is not related to the scope of the margin of acceptability. The judgment of acceptability is distinct and posterior to formation of the RP. It is established in comparison to the RP and prices proposed on the market. WTP can be considered as the upper threshold of the acceptability margin. Thus, according to Bearden *et al* (1992), on average, WTP is higher than RP. Several studies have demonstrated that consumer information on prices and products contributed to raise the acceptability margin and in particular its upper limit (Kosenko and Rahtz, 1988; Rao and Sieben, 1992; Kalyanaram and Little, 1994; Adaval and Monroe, 1995). This final observation raises the question of WTP stability during the decision-making process. This characteristic presents both an advantage and a drawback. Its measurement is only valid within a time t in a given environment, but since it evolves, managers can influence it.

Figure 1 recaps the relations between these price concepts.

Insérer Figure 1 – Willingness to pay, reference price and acceptable prices

Global value is defined by Aurier, Evrard and N'Goala (2004) as the evaluation of experiences with an object or class of objects (usage value), based on all the sacrifices and benefits associated with it (exchange value as defined by Monroe and Krishnan, 1985 or Zeithaml, 1988). WTP corresponds to the maximum monetary sacrifice the consumer accepts to make in return for all the benefits received or that he will receive in the future. Table 1 contains a summary of these definitions.

Insérer Table 1 – Willingness to pay and price concepts: a synthesis of definitions

Satisfaction, loyalty and culture

Satisfaction is defined as the result of an evaluation after consumption or use containing cognitive and emotional elements (Oliver, 1997; Plichon, 1998; Vanhamme, 2002). According to the expectations-disconfirmation paradigm (Oliver, 1980), consumers formulate an evaluation judgment by comparing expectations shaped before consumption with the perceived performance of the product or service. Several studies have explored the links between satisfaction and WTP.

Huber, Herrman and Wricke (2001) highlight the existence of a positive relationship between the two constructs. Homburg, Koschate and Hoyer (2005) bolster these results by underlining that the link between WTP and satisfaction evolves over time: during the first transaction, so-called transaction-specific satisfaction exerts a weaker influence on WTP than later on when it becomes cumulative. Thus, the more the consumer purchases a certain product or brand and is satisfied, the more his WTP increases. Finally, Cornelissen *et al* (2007) show that risk aversion, involvement and age positively influence this relationship and that variety seeking and level of education have a negative effect. Perceived fairness and awareness of price, social desirability, gender, income and number of children have no effect. We should also point out the existence of more isolated studies that nevertheless deal with WTP and its links with loyalty (Palmatier, Scheer and Steenkamp, 2007) or the consumer's culture (Chen, Ng and Rao, 2005).

Insérer Table 2 – Willingness to pay and the decision-making process: a synthesis of research

WTP, defined as the upper threshold of the acceptability margin, is of interest in analyzing consumer reactions to prices on an individual level. This theoretical interest must not, however, mask the measurement problems that plague the concept.

MEASURING WILLINGNESS TO PAY: METHODS AND LIMITATIONS

There are many methods used to set prices based on consumer reactions. In this part of the article, we will identify the main methods used in marketing. Unfortunately, many suffer from application or measurement problems.

Methods used to help set prices

Methods used to set prices depend, first, on the data available, which can range from:

- real data that can be analyzed using econometric methods to determine price elasticity or hedonic prices
- research data for measuring WTP or price elasticity; the most common methods are conjoint analysis (assessment of product profiles described by their attributes, including price), contingent valuation (direct interviews using an open-ended question on WTP or a closed question on purchase intention at the proposed price) and price tests using a simulated purchase price (preference between products in a context as close as possible to that of the purchase, with a single sample and a series of test prices-sequential test- or several samples with a single test price per sample -monadic test)
- response data to an ‘incentive-compatible’ price offer; the two most commonly used methods are Vickrey auctions and the BDM lottery which are similar to auctions except the final sale price is determined, respectively, by the second-highest bid or at random.

Advantages and drawbacks of different methods

Methods based on sales data

Econometric methods for estimating price elasticity

Methods based on chronological series of real sales enable the calculation of price elasticity and the demand curve for existing products and therefore the setting of prices in such a way as to maximize turnover, profit or market share for said products. Their advantage lies in their high internal validity, as purchases are observed in realistic market settings. However, the results are only reliable when the scope of price variations for the brand studied and its competitors is similar and these fluctuations are not too collinear. Moreover, the data is only available after sales of the product and therefore inexistent for products that are new or under development. They do not enable customization of prices either, since they only provide one indication of the buyer's WTP i.e. it is higher than the market price and, conversely, that of the non-buyer is lower. The buyer's exact WTP remains unknown (Werthenbroch and Skiera, 2002).

Hedonic price methods

Based on a linear or non-linear regression of certain characteristics of the offer's price derived from statistical data on the market, this method does not provide the WTP of consumers, but rather information on elements of the offer that are valued by them (Desmet and Hendaoui, 2000). The hedonic price of a characteristic is defined as the derivative of the product price in relation to the corresponding attribute. In the context of perfect competition, it is interpreted as the value consumers attribute to a supplementary unit of the characteristic. If it is close to zero, either the characteristic is not perceived or it is not considered important and therefore not valued by consumers. Other, less aggregated, measurements can be useful in setting prices.

Methods based on survey data

Conjoint analysis

Conjoint analysis can be used to calculate both WTP and price elasticities. The interest lies in revealing compromises made between different product attributes, including price (Green and Srinivasan, 1990; Kohli and Mahajan, 1991). WTP is derived from evaluations of

alternatives: ranking or rating, expression of a preference or choice³. Calculation of WTP is based on simulation of a real market that enables determination, for each individual, of the price at which the product studied is no longer selected over a competitor, using the utility function of the consumer, which can take on different forms depending on the hypotheses formulated by the analyst (Ben-Akiva and Lerman, 1985). WTP can also be expressed directly as the sum of money that leaves respondents indifferent between the product and the money offered (Kalish and Nelson, 1991; Carmon and Simonson, 2001; Jedidi and Zhang, 2002). However, conjoint analysis can suffer from hypothetical bias. This type of bias appears when, placed in a hypothetical situation, particularly in the context of a questionnaire, the respondent does not take into consideration all the constraints that would affect his choice in a real situation (budget available, financial consequences of a poor choice, availability of the product or competitor's products...). Therefore, there is a difference between what the respondent says and what he would accept to pay in a real situation.

Contingent valuation

A method developed in economics (Mitchell and Carson, 1989), contingent valuation also enables calculation of WTP and price elasticity. It requires the respondent to directly express his WTP for a product– *open-ended contingent valuation* – (“Please indicate the highest price you would accept to pay for this offer”) or answer several successive questions on whether he would, or would not, buy the product at a given price– *closed-ended contingent valuation* – (“Would you be willing to pay X dollars for this offer?”). While easy to use, this method provides little encouragement for the respondents to reveal their true WTP (Wertenbroch and Skiera, 2002; Völckner, 2006). Without real purchase of the product, like conjoint analysis, it suffers from hypothetical bias. Open-ended questions are even further from reality as consumers set their own prices. A strategic bias, which appears when respondents deliberately formulate their answers to influence the outcome of the survey to further their own interests, can also affect results. Thus, respondents tend either to overestimate WTP (to influence launch of the product or service on the market, please the interviewer or avoid expressing a preference for a lower quality, cheaper alternative) or to underestimate it (to push the price down).

³ Conjoint analysis of the so-called *trade-off*, consisting in comparison of pairs of product attributes and prices, only provides information on the acceptable additional charge for the attribute.

Psychological price methods

Similar to contingent valuation and, in the past, highly popular in marketing, these methods can be used to calculate price elasticities. They consist in a direct approach that involves asking the respondent the highest price he would accept to pay considering his income and the lowest price he would accept to pay without fearing a significant drop in quality (Stoetzel, 1954 ; Adam, 1958). In an indirect approach, the respondent is asked if he would accept to pay a given price for a product considering the same constraints of income and quality (Gabor and Granger, 1961; 1964). Simple, easy to understand and inexpensive, they also suffer from hypothetical and strategic bias.

Simulated purchase tests

These tests can be used to calculate price elasticity. Monadic price tests on paired samples, in which the product or service and its competitors are presented as equal and in a context as close as possible to the purchase situation, enable control of the aforementioned biases. These are assumed to vary only slightly for each price tested and deviations analyzed present little bias. Sequential price tests consist, in the same context, of using only a single sample and asking several questions successively about purchase intention with several price hypotheses for the product tested while the competitor's prices remain the same. These tests are significantly less expensive than monadic tests, but overestimate price elasticities as the respondent seeks to influence the manager (Andréani, 1997).

The problem of heterogeneous populations in the estimation of models produced with survey data, and therefore measurement of WTP, must be emphasized. Several solutions have been proposed, but the procedures remain complex. It is possible:

- to define *a priori* segments when homogenous groups are distinguished and estimate a model for each one (McCurtley Hortman *et al*, 1990 ; Batsell and Louviere, 1991)
- to estimate a latent class model in order to determine simultaneously the segments and function parameters of specific responses of these segments (Desarbo *et al*, 1992)
- to estimate a random coefficient model, by postulating continuous distributions of parameters (Layton, 2000 ; Baltas and Doyle, 2001)

The first method is simple, but can only be used when the heterogeneity of respondents is based on a few easily identifiable and measurable criteria. The two other methods do not require the identification of *a priori* segmentation criteria, but estimation of such models remains complex.

“Incentive-compatible” methods

Since the beginning of the 90s, incentive-compatible methods (Hoffman *et al*, 1993), from the field of experimental economics, have been used in marketing. They can be used to measure WTP.

Vickrey or second-price sealed-bid auctions

Participant's bids are collected simultaneously and the highest bidder must buy the product for the sum of the second-highest bid (Vickrey, 1961; Prelec and Simester, 2001; Nunes and Boatwright, 2004; Völckner, 2006; Kaas and Ruprecht, 2006). We should note that Vickrey auctions are different from traditional English or first-price sealed-bid auctions (McAfee and McMillan, 1987). In the latter, the highest bidder buys the product at the price he has offered. It is in the interest, therefore, of participants to underestimate their offer, since it can influence the sale price (Hoffman *et al*, 1993).

Becker, DeGroot and Marschak or BDM lotteries

Each participant sets a maximum price for the product offered and the final sale price is determined randomly (for example, by drawing a ball with the price marked on it from an urn). If the price drawn at random is lower or equal to the WTP expressed, the participant must buy the product for the randomly determined price. Otherwise, the participant cannot buy the product (Becker, DeGroot and Marschak, 1964; Prelec and Simester, 2001; Wertenbroch and Skiera, 2002; Nunes and Boatwright, 2004; Wang, Venkatesh and Chatterjee, 2007).

Vickrey auctions and BDM lotteries place participants in a situation where their bids cannot influence the sale price. Theoretically, a rational bidder is encouraged to reveal his real WTP, thus limiting the occurrence of strategic bias (McAfee and McMillan, 1987; Kagel, 1995; Shogren *et al* 2001). Another major advantage of these procedures is they can be applied to real choice situations, notably the point of sale (Wertenbroch and Skiera, 2002). Indeed, it has been demonstrated that the context of the transaction plays a highly important role in determining WTP (Thaler, 1985). However, these methods differ from the decision-making process of a consumer in a store (Hoffman *et al*, 1993). Participants are in competition to buy a product in a limited quantity, whereas in a store the offer is almost unlimited. Responses of bidders also depend on hypotheses formulated concerning the bids of others (Noussair, Robin and Ruffieux, 2004). These methods therefore apply to highly

specific market situations. However, online auctions are developing at such a pace that they justify, in themselves, an evaluation of the advantages and limitations of these methods.

Insérer Figure 2 – Advantages and drawbacks of different methods for measuring willingness to pay

Comparative studies of methods for measuring WTP

Comparative studies in marketing have all revealed differences in estimations between methods (Wertenbroch and Skiera, 2002; Blackhaus *et al* 2005; Völkner, 2006; Kaas and Ruprecht, 2006; Le Gall-Ely and Heuzé, 2008). These are due either to hypothetical bias, which is particularly the case of surveys without a real purchase, or a strategic bias, which concerns both surveys and incentive-compatible methods and can result in unpredictable over- or underestimation of WTP⁴.

Insérer Table 3 – Contributions of comparative methodology studies in marketing

Hypothetical bias

In economics, many research studies, in particular the analysis of 39 comparative studies by Harrison and Rutström (2002), have demonstrated that methods based on hypothetical contexts, without real purchase of the product, lead to significantly higher estimates of WTP. However, these studies have exhaustively dealt with the question to the extent that response formats differ between real and hypothetical settings (Frykblom, 2000). Certain studies concern both settings, but deal with only one method e.g. the work of Neill *et al* (1994) concerning Vickrey auctions, the study by Ding, Grewal and Liechty (2005) on conjoint analysis or the work of Cummings, Harrison and Rutström (1995), Kealy and Turner (1993), Frykblom (1997) and Loomis *et al* (1997) on contingent valuation.

Wertenbroch and Skiera (2002) also demonstrate that WTP results derived from the BDM method involving a real purchase are significantly lower than those obtained through

⁴ All methods based on studying a sample of consumers using a questionnaire are also likely to suffer from some form of bias linked, for example, to lack of clarity of the questionnaire (poor specification of the product evaluated or the market) or sampling issues. However, careful design of the study can limit bias.

hypothetical contingent valuations, thus supporting the hypothesis of an overestimation bias in survey methods. However, question formats also differ between hypothetical and real settings.

Völckner (2006) demonstrated that the setting (hypothetical/real) influences WTP obtained using four different methods (first-price and Vickrey auctions, contingent valuation and conjoint analysis). The WTP were always higher in the hypothetical setting. She emphasizes, however, that the obligation to buy is not always easy to integrate in a survey (implications in terms of stock management or cash flow for the respondent in cases of big-ticket items) or simply impossible e.g. when testing new product concepts. She proposes and tests, in a second study, an alternative method with partial obligation to pay– *partial real payment setting*). This appears to significantly reduce overestimation of WTP. When using a method in a hypothetical context, she recommends considering the resulting WTP as grossly overestimated (from 15 to 30% depending on the method).

Overestimation of WTP is generally attributed to the hypothetical bias that affects survey methods. However, another explanation could lie in the existence of a strategic bias affecting WTP estimates. This bias would result in an underestimation of WTP, or an overestimation, and would explain the divergences sometimes observed in research studies.

Strategic bias in auction methods

We have emphasized above that survey methods are subject to strategic bias leading to either an overestimation (to encourage launch of the product, please the interviewer or hide a preference for low quality, cheap goods) or an underestimation of WTP (to push the price down or due to heightened rationality in the context of an in-store survey).

Different studies in the field of experimental economics have highlighted the influence this type of bias can have on results derived from auction methods (Hoffman *et al*, 1993; Rutström, 1998). Thus, for Vickrey auctions, an underestimation bias has been demonstrated in many research studies. The respondent has the impression that he can force down prices without diminishing his chances of winning the auction (Coppinger, Smith and Titus, 1980; Cox, Robertson and Smith, 1982; Kagel, Harstad and Levin, 1987; Kagel and Levin, 1993).

In marketing, Kaas and Ruprecht (2006) have compared the results of Vickrey auctions and a BDM lottery with evaluations of the final sale price on an 11-point scale (with items ranging from "much too expensive" to "a really good deal"). The winners of auctions or lotteries who estimate, according to this scale, that the product is too expensive have overestimated their response, while the losers who estimate the price is a really good deal

have underestimated their response. In the Vickrey auction and the BDM lottery, respectively, 24% and 22% of respondents underestimated their WTP and 7% to 9% overestimated it. The authors go on to develop a model based on expected utility theory enabling the prediction of over- and underestimation, depending on the degree of risk aversion and perceptions the bidder has of the relationship between his WTP and the average bid. The authors predict a strong underestimation bias when risk aversion is strong and WTP is uncertain or perceived as below average, but also in cases where uncertainty and risks are high (new or high involvement products). Conversely, overestimation bias is strong when the bidder has no aversion to risk and is convinced his WTP is above average. The excitement of competition and the thrill of winning could also explain that bids are higher than WTP in a more usual purchasing process⁵. However, this model deserves to be tested empirically.

At the end of our overview, we can observe the current difficulties in measuring WTP:

- methods based on real data cannot be applied to new products or new pricing practices
- methods based on survey data, without an obligation to buy, are affected by hypothetical bias and generally result in an overestimation of WTP
- incentive-compatible methods, which diverge from usual market situations, are subject to strategic bias whose effect on WTP remains unpredictable

It is therefore urgent to conduct methodological studies to improve the validity and reliability of WTP measurements. These are all the more important in that many determinants of WTP, which the brand managers or stores can influence, have already been revealed.

EXTERNAL DETERMINANTS OF WILLINGNESS TO PAY

Many studies have demonstrated that WTP can be increased by variables that brand managers or stores could manipulate: product features (presentation, customization or brand), price policy (means of payment and rates) or the environment (prices displayed at the point of sale and atmosphere).

Product features and WTP

⁵ We would like to thank anonymous reviewer 1 for this suggestion, which could explain overestimation bias in addition to the proposals of Kaas and Ruprecht (2006).

Sevdalis and Harvey (2006) have demonstrated, confirming the obvious, that the quantity of product served influences WTP. Thus, WTP depends on the quantity (the larger the real or perceived quantity, the higher the WTP) and desirability of the portion (over a certain limit marginal WTP is null).

Focusing on mass personalization, defined as "an offer that allows the consumer to take part in a co-design experience in which he can modify certain components of the product himself, from a set of predetermined options, and buy the co-built product", Merle (2007) has produced a synthesis of research work on willingness to pay a higher price for a customized product. In these studies, between 43% and 88% of respondents were willing to pay more for customization, the price difference varying between 10% and 207% more. The products studied were quite varied and the percentage accepted is generally higher for cheap products (cell phone cases) than for high-priced items (shoes). However, we should note that mass personalization only concerns certain product categories.

From the standpoint of differentiated targets, service packages or bundles also offer an opportunity to capture heterogeneous WTP (Goldberg, Green and Wind, 1984; Stremersch and Tellis, 2002; Jedidi, Jagpal and Manchada, 2003). We will not develop the issue of *bundling* here, which has inspired new research studies in both the fields of economics and marketing, but is not within the scope of this synthesis.

Price policy and WTP

Means of payment (credit card or cash) and the type of pricing also influence WTP. Prelec and Simester (2001) show that consumers who pay by credit card are likely to have a higher WTP than those who pay with cash, whatever the amount concerned and whether the price is known in advance or not, thus refining the results obtained by Feinberg in 1986.

Lambrecht and Skiera (2006) focused on choices made by customers of an ISP between three-part tariffs⁶ or traditional two-part tariffs⁷ within the framework of WTP. They conclude that the choice of tariff depends on the degree of uncertainty as to future consumption: the more uncertain the level of consumption, the more consumers choose a three-part tariff, though this choice could turn out to be more costly later on. Lambrecht, Seim

⁶ These rates include access, a consumption allowance and an additional charge for each use over the fixed limit. This pricing policy has become highly popular in the telecoms sector (cell phones, internet access) or online services (music downloads, press).

⁷ This type of rate includes a subscription and a small fee for each use.

and Skiera (2007) expand on these results: consumers are ready to pay more, especially for a subscription, to disconnect consumption from payment and to prevent costs from rising with additional uses. They derive greater utility from not having to pay for each additional use. They also seek assurance against the risk of price fluctuations. They can therefore prefer a rate causing only minor monthly fluctuations of their bill, simplifying management of their budget. High WTP can also result in overestimation of future use and a preference for a subscription rate (Nunes, 2000). These results have been demonstrated in the choice of internet access rates, but could reasonably be extended to other services such as cell phones, car rental or fitness clubs.

Environment, price perceptions and WTP

An important research stream has shown the influence of environmental factors on price judgments, notably reference prices (for a complete overview, see Krishna *et al*, 2002 or Zollinger, 2004). However, very few studies have dealt with the influence of these factors on WTP.

One study has focused on the impact of promotions, which are by definition temporary, on WTP. Krishna (1991) shows that in cases where the perceived frequency of promotions is strong or the real frequency of promotions is regular WTP is lower. On the other hand, if the real frequency of promotions is erratic, no effect is observed for WTP.

Several studies have concerned the presence of products at extreme prices in the purchasing environment of the product studied and the lasting impact these could have on WTP. Krishna, Wagner and Yoon (2006) have studied the impact on WTP of introducing an extremely high-priced item in a catalogue. Extreme prices influence WTP for a product category and a specific product. This effect is increased by the similarity of the extremely priced product with the one under consideration, their proximity in the catalogue and recent exposure of the consumer to the extreme reference. For example, to increase consumer WTP, a mail order catalogue designer should include an extremely expensive, premium brand swimsuit with the same features as other standard swimsuits on the following pages. Nunes and Boatwright (2004) conclude that *incidental prices*, which neither buyers nor sellers consider related to the prices of the product they are buying or selling, can have an effect. These exist, without the consumer's attention being focused on them or a conscious comparison being made with the price of the product he wants to buy. The effect is stronger

when the consumer is exposed just before making his decision, despite the presence of relevant prices communicated by the seller (competitor's prices or those of similar goods).

Finally, online auctions offer an interesting environment for the study of WTP. According to Chan, Kadiyali and Park (2007), WTP in online auctions is influenced by product features, the individual (in particular his experience of online auctions), but also by site content. Thus, WTP declines when competing products are also offered and is lower still if these products are by the same brand and a wide range is offered. If the website has a good reputation, this can have a positive impact on WTP (a bad reputation has no impact).

Table 4 – Managerial variables and willingness to pay: a synthesis of research

Marketing research on WTP has revealed some of its determinants, which can be manipulated by managers. However, there are still many grey areas such as the validity and reliability of WTP measurements from methods based on survey or incentive-compatible data or concerning marketing variables likely to influence WTP (brand, prices, very low prices, characteristics of the purchasing environment) that offer many possibilities for future research.

CONCLUSION AND DIRECTIONS FOR FUTURE RESEARCH

Several conclusions can be reached based on this synthesis. Willingness to pay is defined as the maximum price the consumer accepts to pay or the upper limit of the acceptability margin. It enables setting of a price to maximize turnover, profits or market share, including cases of customized prices. Three types of method have been proposed to help set prices: methods that use real data to calculate price elasticities or hedonic prices, methods that use surveys to estimate WTP (conjoint analysis and contingent valuation) or to estimate price elasticities (conjoint analysis, contingent valuation and price tests via simulated purchases) and incentive-compatible methods (Vickrey auctions and BDM lotteries). Methods for estimating WTP suffer from application or measurement problems. The latter are all the more crucial as the number of determinants of WTP are known and the implications for brand managers or stores could be interesting. Thus, the physical features of the product and its presentation, as well as its customization, positively influence WTP. Various price policy factors also offer opportunities to capture consumer WTP: three-part tariffs, bundled offers and payment by credit card. Finally, the purchasing environment can influence WTP. Thus,

promotions that are regular and perceived as frequent have a negative influence on WTP. The presence of products at high, extreme or incidental prices has a positive effect on WTP. The presence of competing products seems to have a negative effect on WTP (online auctions).

Since research on WTP in marketing is recent and the approaches highly diversified, there are many possibilities for future studies. However, the measurement difficulties outlined earlier indicate that methodological research should be a priority. Two themes are particularly interesting.

It has already been emphasized that, in certain situations, when there is no market (or not yet) for example, survey methods are the only viable method (Le Gall-Ely and Heuzé, 2008). As a follow-up to the work of Cummings and Taylor (1999), Posavac (2001), Ding, Grewal and Liechty (2005) and Vöcklner (2006), it would be interesting to design methods enabling a reduction in the gap between hypothetical and real settings by integrating a purchasing constraint. However, the case of very high prices is difficult to deal with because of cash flow problems that are likely to reduce WTP in real settings. The solution of vouchers, used in the context of Designor® simulated market tests by Ipsos Novaction, could be adapted to surveys. A voucher is given to the respondent before the purchase simulation: either the respondent is reimbursed the difference if he does not spend the entire sum, or he must pay the difference if he purchases more than the voucher's value (Bloch and Manceau, 2000; Le Nagard-Assayag and Manceau, 2005).⁸

Incentive-compatible methods, on the other hand, have only been applied in monopolistic situations. How would they perform in a competitive context, when substitutions for the product studied are available at the point of sale? Respondents could need more time and information to make a selection, resulting in a much more complex research framework. These questions remain unexplored.

In a second phase, knowledge of external determinants could be deepened.

The question of the product's nature (durable or consumer goods, products or services, physical or virtual, public or private, new or familiar) offers many avenues of investigation. Despite initial results, concerning store brands obtained by Nies and Natter (2007), the question of brand influence on WTP remains unexplored. WTP for discount brands or, on the opposite end of the spectrum, luxury and premium brands, as well as the link between POS image and WTP, raise numerous unsolved questions.

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We would like to thank reviewer 2 for this suggestion.

Concerning the price variable, the impact of rates on WTP and the causes of bias in rate choices (e.g. *flat-rate bias* in favor of subscriptions or, on the contrary *pay-per-use bias*) are worth studying in depth and particularly the effects of introducing or eliminating rate options. Despite the results obtained by Krishna (1991), explorations of the relationship between promotions and WTP are lacking. Finally, questions concerning the effects of extreme or incidental prices on WTP are also numerous: How long do these effects last? To what extent can the IRP modulate them? What effects would these prices have on WTP in sales environments other than catalogues, and particularly ones containing a heterogeneous selection of goods or virtual environments? Researchers have above all focused on the effect of extremely high prices on WTP. The effect of low prices, or none at all, as well as the symmetry of effects between high and low prices, is worth exploring. Le Gall-Ely *et al* (2007) have also demonstrated that free services could have positive effects, but also pernicious ones, on the decision-making process and visiting behaviors for museums and historic monuments. The effect of elements in the environment other than ERP (store atmosphere or human factors...) or the purchase situation (time constraints, support...) on WTP also remains to be studied.

Finally, internal determinants of WTP could be researched. It would be particularly interesting to study optimal levels of satisfaction in terms of WTP and profitability for companies. The study of potential moderators of links between satisfaction, loyalty and WTP could also be pursued. Certain individual consumer traits such as socio-demographic characteristics (income, socio-professional category, education, age, gender, household size...), familiarity or perceived risk and involvement play a mediating role between external determinants of WTP (Derbaix, Siningaglia and Zidda, 2003 ; Dou, 2004).

Insérer Table 5 – Proposed themes for future research

Table 1 – Willingness to pay and price concepts: a synthesis of definitions

| Concepts | Definition | Form and type of judgment |
|---------------------------|--|--|
| Reference price | Price or set of prices the consumer uses to compare and evaluate the price of a proposed good or service. | Estimation of an interval Judgment focused on transaction utility (perception of price as a good or bad deal). |
| Acceptable prices | Set of prices that the consumer is ready to pay for a good or service. | Estimation of an interval Judgment focused on acquisition utility (expected pleasure derived from the purchase) formulated after judgment of the reference price. |
| Willingness to pay | Maximum price a consumer accepts to pay for a given quantity of goods or services | Periodic estimation Judgment focused on acquisition utility |
| Value | Evaluation of experiences with an object or class of objects (usage value), based on all the sacrifices and benefits associated with it (exchange value) | Periodic estimation Judgment focused on acquisition utility after consumption |

Table 2 – Willingness to pay and the decision-making process: a synthesis of research

| Author | Determinant studied | Methods | Good or service | Population tested | Results |
|---|--|--|--|---|--|
| Huber, Herrman and Wricke (2001) | Influence of satisfaction on WTP | Conjoint analysis | Hotel services | 378 customers of different hotels | Positive links between satisfaction and WTP |
| Homburg, Koschate and Hoyer (2005) | Influence of transaction-specific and cumulative satisfaction on WTP | Open-ended question in study 1 BDM lottery in study 2 | Restaurant meal in study 1 Training CD-ROM in study 2 | 80 students in study 1 157 students in study 2 | Stronger positive link between satisfaction and WTP for cumulative satisfaction than for transaction-specific satisfaction |
| Cornelissen <i>et al</i> (2007) | Moderators of links between satisfaction, loyalty and WTP | Open-ended question | Hairdressing services | 442 students | Positive link between satisfaction and WTP Moderating effects of risk aversion, involvement, variety-seeking and level of education |
| Palmatier, Scheer and Steenkamp (2007) | Influence of loyalty to the firm and salesman on WTP a surcharge | Open-ended question | Industrial goods and services | 362 dyads of industrial buyers and sellers | Positive link between loyalty to the firm and salesman and WTP |
| Chen, Ng and Rao (2005) | Influence of culture and form of message on WTP a surcharge for more rapid delivery, considered an approximate measurement of impatience | Open-ended question | Delivery service for a novel | 149 bicultural students | Positive link between western culture and WTP a higher price for more rapid delivery |

Table 3 – Contributions of comparative methodology studies in marketing

| Author | Objective | Methods | Product or service | Population tested | Results |
|--------------------------------------|--|--|--|---|---|
| Wertenbroch and Skiera (2002) | Testing the impact of incentives; research of viable methods for the POS; impact of the product's nature | BDM lottery Open contingent valuation Closed contingent valuation | A can of Coke and a piece of cake in studies 1 and 2 A ballpoint pen in study 3 | 200 visitors to a beach in study 1 and 200 ferry passengers in study 2 255 students in study 3 | WTP higher for contingent valuations than for BDM lottery Higher validity and reliability for the BDM lottery than for open and closed contingent valuations Demonstration of the importance of obligation to buy (real setting) in results of the BDM lottery Interest of the BDM lottery at the POS for consumer goods or low cost durable goods |
| Blackhaus <i>et al</i> (2005) | Hypothetical bias test | Open contingent valuation and limit conjoint analysis | A weekend vacation in three European capitals | 434 students | Differences in terms of estimating WTP WTP higher with conjoint analysis than contingent valuation Hypothetical bias affected contingent valuation, but not conjoint analysis |
| Völckner (2006) | Test of hypothetical bias and effect of incentives on estimation of WTP Proposal of an alternative method | First-price and Vickrey auctions, contingent valuation and conjoint analysis for study 1 Vickrey auctions and BDM lottery in a partial real payment setting for study 2 | Prepaid phone card for study 1 Glass of mulled wine and cake for study 2 | 1,089 respondents (90% students and 10% staff at a university) for study 1 189 students in study 2 | Differences between methods compared two by two from 2% to 26% average expressed WTP WTP significantly higher in a hypothetical setting compared to real conditions for the four methods used (from 15 to 30%) Demonstration that an obligation to pay 10% is enough to considerably reduce overestimation of WTP |
| Kaas and Ruprecht (2006) | Test of the effect of underestimation on auction systems | Vickrey auctions BDM lottery Open contingent valuation | A chocolate bar | 161 students | WTP lower for auction systems, especially Vickrey auctions |
| Le Gall-Ely and Heuzé (2008) | Test of differences between methods | Contingent valuation with credit card and conjoint analysis | An innovative information and multimedia service package | 385 and 162 tenants in social housing projects | Differences in terms of estimating WTP WTP higher with contingent valuation than conjoint analysis |

Tableau 4 – Managerial variables and willingness to pay: a synthesis of research

| Author | Determinant studied | Methods | Good or service | Population tested | Results |
|-----------------------------------|--|--|--|---|--|
| Chan, Kadiyali and Park (2007) | Characteristics of online auctions | First-price auctions | Laptop computers | 21,952 offers for 2,322 auctions | Influences of product features, the individual and the auction on WTP |
| Sevdalis and Harvey (2006) | Physical features of the product and its presentation | Direct question for both studies | Ice cream in study 1 Orange juice in study 2 | 40 students in study 1 47 students in study 2 | WTP influenced by quantities of product offered (or perceived quantities when this information was not explicit) and desirability of good reputation |
| Krishna (1991) | Influence of real and Mass personalization | Purchase of a product at a certain price and open-ended question | 2 brands of soft drink | 159 students | of portion served |
| Merle (2007) | perceived frequency of promotions on WTP for a brand | Synthesis of studies performed Contingent valuation and conjoint analysis in study 2 | Mass personalization program Nike Id | 467 individuals | Negative effect of WTP: 10% to 20% more than the standard price for a significant share of consumers (between 43 and 88%) Negative effect of frequency of promotion, only when regular, on WTP |
| Prelec and Simester (2001) | Use of a credit card | Vickrey auctions in study 1 | Tickets for a sporting event in study 1 | 64 students in study 1 | WTP influenced primarily by use of a credit card |
| Krishna, Wagner and Yoon (2006) | Influence of the presence of an extremely high price for a similar, or different, product in a sales environment on WTP for | Open-ended question BDM lottery in study 2 | Camera in study 1 Gift certificate in study 2 Gym mat in study 3 | 168 students in study 1 197 students in study 2 72 individuals in study 3 | Whether the product involved and whether product the price was known in advance Mediation of satisfaction of choice of a three-part tariff |
| Lambrecht and Skiera (2006) | Two-part tariffs (subscription + marginal price) or three-part tariffs (subscription + consumption allowance + marginal price) | Observation of the subscriptions selected | Internet access | 11,717 customers of an ISP | tariffs influenced by consumer uncertainty of exposing future consumption reference |
| Nunes and Boatwright (2004) | Incidental | BDM lottery in study 1 | CD/T-shirt for study 1 | 60 beach merchants in | Influence of an irrelevant price on WTP |
| Lambrecht, Seim and Skiera (2007) | Tariffs on WTP for a particular product | Observation of tariffs selected in study 1 Choice of tariffs in study 2 Choice of tariff in a survey and observation of tariffs selected for study 3 | Dinner for 2 in a restaurant/tickets for a basketball match in study 2 Used cars sold in auctions for study 3 | 40,881 customers of an ISP in study 1 587 students in study 2 2,417 students in study 2 941 customers of an ISP in study 3 | WTP on higher price particularly via a subscription Disconnection of consumption from payment, to avoid increasing cost attention Additional desirable product risk of price fluctuations |

| Theme | Deepen/Explore | Direction of research |
|--|---|---|
| Measurement of WTP | Expand on the work of Cummings and Taylor (1999), Posavac (2001), Ding, Grewal and Liechty (2005) and Vöcklner (2006) | Adaptation of survey methods to minimize hypothetical bias |
| Measurement of WTP | Expand on the work of Kaas and Ruprecht (2006) | Analysis of strategic bias affecting results from incentive-compatible methods |
| Measurement of WTP | Explore | Application of incentive-compatible methods in a competitive environment and for high-priced items |
| Influence of satisfaction | Expand on the work of Cornelissen <i>et al</i> (2007) | Study on the moderating variables of influence of satisfaction on WTP |
| Influence of other internal factors | Explore | Study on the impact of involvement |
| Influence of external determinants | Explore | Influence of the product's nature on WTP (durable or not, physical or virtual, public or private, new or familiar) |
| Influence of external determinants | Expand on the work of Nies and Natter (2007) | Influence of the brand on WTP (discount brands, premium and luxury brands) |
| Influence of external determinants | Expand on the work of Lambrecht and Skiera (2006) and Lambrecht, Seim and Skiera (2007) | Influence of prices and analysis of bias in choice of price |
| Influence of external determinants | Expand on the work of Krishna (1991), Krishna, Wagner and Yoon (2006) and Nunes and Boatwright (2004) | Effect of prices communicated in the environment (duration of effects, mediation of price, effects of extremely low prices) |
| Influence of external determinants | Explore | Effect of atmosphere and social effect in the sales environment |
| Mediation of individual variables on the link between external determinants and WTP | Explore | Effect of income, socio-professional category, education, age, gender, household size, perceived risk and involvement |

Table 5 – Proposed themes for future research

Figure 1 – Willingness to pay, reference price and acceptable prices

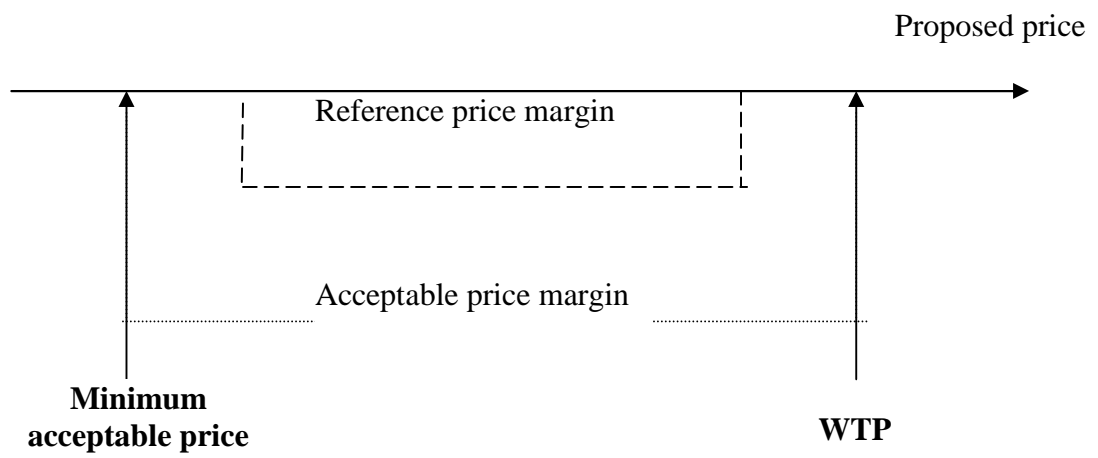


Figure 2 – Advantages and drawbacks of different methods for setting prices

