



# Luxury

History, Culture, Consumption

ISSN: 2051-1817 (Print) 2051-1825 (Online) Journal homepage: <http://www.tandfonline.com/loi/rflu20>

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To cite this article: Russell S. Winer (2017) Online Pricing Strategies: Implications for Luxury Consumers, *Luxury*, 4:1, 7-29, DOI: [10.1080/20511817.2017.1279834](https://doi.org/10.1080/20511817.2017.1279834)

To link to this article: <http://dx.doi.org/10.1080/20511817.2017.1279834>



Published online: 20 Mar 2017.



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# Online Pricing Strategies: Implications for Luxury Consumers

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**ABSTRACT** For most products, price is the marketing variable customers react to more than any other. While this may be less so for luxury products, marketers of luxury brands still have to set a price. Most managers emphasize costs and competition when setting price. However, the third component of price, customer value or what a customer is willing to pay, is considered less often and is, in fact, much more important than costs and competition for luxury goods. Today, in this era of digital marketing, marketers have a greater ability to understand customer value and set a price accordingly. In this paper, new approaches to digital pricing that incorporate customer value are described and shown how they impact luxury good pricing.

**KEYWORDS:** pricing, customer value, digital marketing

## Introduction

No decision worries a marketing manager in any industry more than determining the appropriate price to charge customers because, for most products, price is the marketing variable customers react to more than any other. Price is an observable component of the product that results in a consumer purchasing or not, and at the same time, it directly affects margin per unit sold. Other components of the marketing mix are important, of course, because they must work together to create a unified brand image and produce sales. However, price most often makes or breaks the transaction. This is, of course, less so for luxury brands because the purchase decision is made more on the basis of brand, style and personal characteristics like ego. However, luxury brand managers still have to affix a price to their products.

In general, price is most often viewed as a way to recover costs and maintain competitiveness against other brands in the category. However, it is clear that a price developed in this way may not be an optimal price when the consumer is taken into consideration. The price could be higher than customers are willing to pay for that product. If the product is priced too low, the company loses potential profits.

Thus, while costs and competitors are important considerations when setting price, the customer is also an important factor, specifically in terms of customer value – what a product or service is worth to the customer. One way of looking at price, then, is that it captures the perceived value of the product in the minds of consumers. This combination of costs, competitors, and customer value is considered the “three-legged stool” of pricing.

The digital revolution of the twenty-first century has dramatically affected how companies set prices and how consumers react to them. Companies can now set prices tailored to individuals’ recorded behavior on websites. Prices can be set dynamically at different points in time to take advantage of the differential timings of supply and demand conditions. According to the US Census Bureau, the total amount of e-commerce in the US in 2015 was over \$357 billion. How consumers find and use price information to make price comparisons for online purchases has had a huge impact on the bricks-and-mortar retail sector. The expansion of price searches to mobile devices has created a new term, “showrooming,” where consumers inspect products in stores and shop for the best price and often transact using their mobile phones or tablets.

While luxury brands are still mainly sold in bricks-and-mortar stores, an increasing amount is being sold using the Internet. Some experts place the current amount of luxury sales using that channel at about 10 percent and rising (Knowledge@Wharton 2016). Prada recently announced that it is increasing its emphasis on e-commerce, particularly for its line of shoes (Bloomberg News, April 11, 2016). “Flash” sales sites such as Gilt and Rue La La are popular among fashionistas who are looking for a bargain on luxury brands.

Pricing in the luxury industry is unique as it does not follow the general principles stated earlier. The “three-legged stool” of pricing for

luxury items does not include costs and often not even competitors. Clearly, the pricing of luxury goods has nothing to do with the manufacturing costs of the item. In addition, comparisons to competitors is very difficult since luxury goods such as fashion and shoes do not have any direct comparisons. As a result, the main dimension of pricing luxury goods is customer value, in particular, the value that a consumer places on the brand.

The purpose of this article is to highlight the areas of this new digital era of pricing that have had significant impacts on consumer behavior in the luxury goods market. The sections of the article are as follows: Although this is not intended to be a chapter of a textbook, it is important to set the context for how digital pricing strategies have affected consumer behavior. Therefore, the first two sections will describe the role that consumers have in the pricing decision and how academics have approached measuring customer value. The main section of the article examines different pricing strategies (e.g., dynamic pricing), how they have been implemented using digital technologies, and how consumers of luxury goods have been affected by them. In addition, potential new research areas are highlighted. The conclusion presents a short summary.

### The Role of Consumer Value

As noted above, consumer behavior is central to the pricing decision. As mentioned earlier, this is particularly so for luxury products. Specifically, the concept of consumer value is how much a consumer is willing to pay for a product or service. It is operationalized here as the maximum willingness-to-pay (WTP) or the most that a consumer would pay for a product. Economists often refer to this as the reservation price or the price at which the product is eliminated from the consumer's budget. Every consumer has a psychological concept of such a price. Consumers receive price information and then assess whether it is good or bad. They compare the price being charged with the perceived value or benefits they would derive from purchasing the product. This WTP number is idiosyncratic to the individual consumer for a particular brand in a product category. It is also relative to the WTP for competing options.

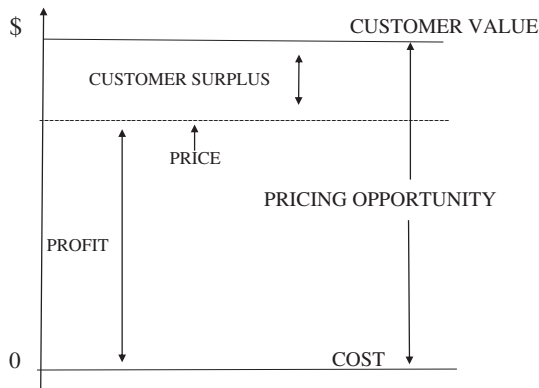
According to Anderson, Kumar, and Narus (2007), the following relationship underscores the importance of understanding consumer value:

$$(\text{VALUE}_f - \text{PRICE}_f) > (\text{VALUE}_c - \text{PRICE}_c),$$

or

$$\text{PRICE}_f < \text{PRICE}_c + (\text{VALUE}_f - \text{VALUE}_c)$$

where  $f$  refers to the focal brand and  $c$  is a competitor's brand. In other words, for a consumer to have an incentive to buy, a price can be higher than a competitor's, as long as there is a suitable value difference in its favor. Consumer value includes both actual economic value



**Figure 1**

The Basic Cost-Value Gap Concept.

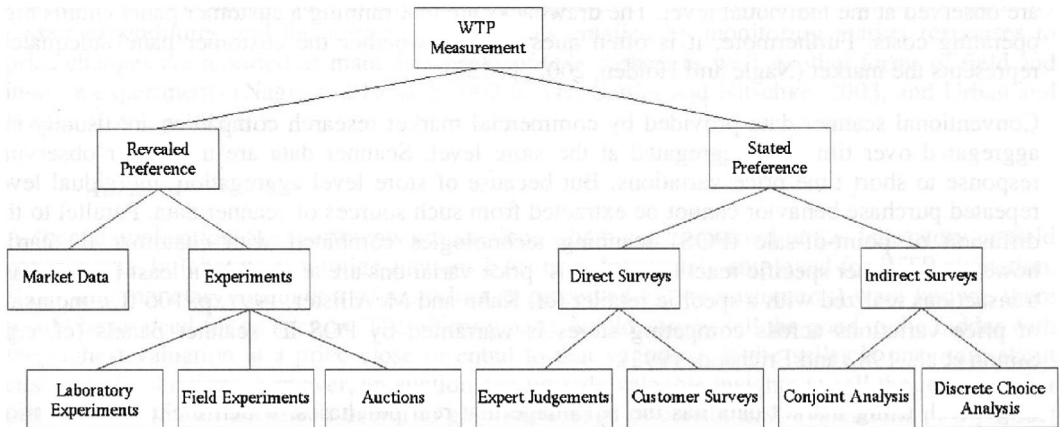
Note: \*\*The cost is the “floor” for price, customer value is the maximum a firm can charge. The gap between cost and customer value is the complete pricing opportunity. In this example, the firm has set a price below customer value so there is a gap between price and the maximum WTP; this is usually referred to as customer surplus. The gap between the price and cost is profit.

(e.g., a car costs more but saves in fuel costs) as well as perceived value (e.g., brand equity).

The utility of knowing consumer value can be shown in Figure 1. Assuming the manager will not price below cost, understanding a consumer’s WTP gives her a full range of options up to the value point. The problem then is how to share the gap between cost and customer value between the company and the consumer at a reasonable profit while maintaining competitiveness. Any price set near the WTP line implies the company keeping most of the value and sharing little with the consumer (minimizing customer surplus), while a lower price provides for more sharing of the value with the consumer. In Figure 1, the manager has decided to provide the customer with some surplus thus decreasing the potential profit.

In luxury markets, most companies tend to price close to WTP because higher prices are consistent with their images. However, some brands attempt to define themselves as “accessible” luxury by pricing below customer value, that is, offering a luxury image and style to consumers at an affordable price. Examples include Coach, Michael Kors, and Kate Spade.

Without having an estimate of WTP, the manager is totally relying on either costs or the competition for setting price. The problem is that the impact of incorrect pricing is asymmetric. If the price is higher than most consumers’ WTPs, the market obviously responds by not buying. However, if the price is lower than WTP without strategically setting it to share value, the market happily accepts the “good deal” with the company leaving perhaps a substantial amount of money “on the table.”

**Figure 2**

Classification of WTP Estimation Methods.

Source: Breidert, Hahsler and Reutterer (2006).

## Measuring WTP

The preceding discussion assumes that customer value or WTP can be measured reliably. Fortunately, this is the case as many years of managerial practice and academic research have produced a number of ways to do this.

Figure 2 from Breidert et al. (2006) shows one classification of the many approaches that have been developed to measure WTP. While a complete review of all the methods is beyond the scope of this article, it is important to note how digital technologies have improved our ability to estimate WTP reliably.

A particularly popular approach uses revealed preference data, that is, actual purchasing data from consumers in experimental settings. What are called A/B or two cell designs (experimental and control) are commonly used by e-commerce companies. For example, Amazon.com is well-known for experimenting with different prices by offering a random sample of its customers either a high or low price compared to a normal or control price. An excellent example of a more complex field experiment is reported in the paper by Kannan, Pope and Jain (2009). In that case, the company, a publisher, developed a PDF version of a book that had previously been published only in hard copy form. The company wondered what to charge for the PDF version as well as for a bundle of both the hard copy and PDF versions. In a simplified form, the prices for the PDF version were varied with levels of 110 percent, 100 percent, 75 percent, 50 percent and 25 percent of the hard copy version. Visitors to the website were randomly presented with the prices. An analysis of the experimental results showed that the profit maximizing price for the PDF version was 75 percent of the hard copy price and optimal bundle price was 120 percent of the hard copy price.

Another option for estimating WTP using revealed preference data is an auction. The company eBay has popularized the so-called English

ascending bid auction online. Bidders express their perceived value through their bids and drop out when the prices exceed their WTP. More will be said on auctions later.

Methods using stated preference (see Figure 2) have also benefited from advances in digital technology. All the survey approaches noted in Breidert et al. (2006) can be implemented online today. However, conjoint analysis, a very popular approach with a wide variety of applications, has become easily implemented using online approaches. Conjoint is generally considered to be the best stated preference approach due to significant limitations of asking consumers WTP questions directly as well as the multi-attribute nature of the method forcing consumers to make tradeoffs of different levels of attributes. A good basic reference on conjoint analysis is Green and Wind (1975).

### **Digital Pricing Approaches and Mechanisms for Capturing WTP**

Having set the foundation for examining the impact of digital technologies on luxury consumers' reactions to price, I will now explore in detail how companies have taken advantage of digital technologies and how consumers have reacted and utilize that price information to make decisions in the context of luxury products.

#### ***Price discrimination***

Economists have long been interested in charging different prices to different consumers, what is referred to as price discrimination. There are three types of price discrimination. First degree price discrimination (FDPD) is defined by prices that differ by consumer. An example of second degree price discrimination is where companies offer different prices for varying quantities purchased. Third degree price discrimination is different prices for different groups (e.g., senior citizen discounts).

In the digital economy, the primary focus is on FDPD which has traditionally been very difficult to implement, particularly in retail settings.<sup>1</sup> In theory, FDPD can only exist in monopoly markets as otherwise, consumers could arbitrage by buying at a lower price and re-selling to others at a higher price. However, information imperfections permit charging individual consumers different prices since, on the Internet, people generally do not know what others are paying for the same good. In particular, the notion behind FDPD is that sellers can charge consumers their full consumer value or WTP to maximize profits rather than a uniform price to all consumers.

FDPD or "flexible" pricing is standard practice in the digital economy where technology and "big" data combine to allow companies to extract the maximum value they can from individual consumers. Online companies collect browsing data and store it in cookies on desktop and mobile devices and either use that information the next time a consumer visits a site to customize a price or uses re-targeting to "follow" the consumer around the Internet with display ads which can also

result in a customized offer if there is a click on the ad. In general, besides past purchasing or other kinds of online behavior, e-commerce merchants use FDPD on “observable” consumer characteristics such as geographic location, gender, and other segmentation variables. A particularly interesting form of FDPD occurred when the online travel company Orbitz was found to be offering hotels and other properties with higher prices to Mac users than to PC users (Mattioli 2012).

As noted above, FDPD works today because of the lack of information transparency in terms of what one consumer is paying versus another. However, the basic concept of charging different prices to different customers has not been met with enthusiasm by consumers. In 2000, Amazon was caught by a clever consumer who was offered one price for a DVD and then after deleting cookies identifying him as a loyal Amazon buyer, was offered the same DVD for a lower price. After the company was “outed,” it offered customers who paid a higher price a refund.

Some academic research has examined the reactions of consumers to price discrimination policies in general and to such policies on the Internet. Not surprisingly, consumers are not fond of flexible pricing. The underlying concept is that of a reference transaction (Kahneman, Knetsch, and Thaler 1986) where the price another consumer pays at the same time acts as a reference point. Campbell (1999) argues that consumer reaction to price discrimination is influenced by the inferred motive for the different prices. In particular, FDPD would be considered to be unfair if companies are using it to take advantage of some set of consumers. Haws and Bearden (2006) designed a study where the reference transaction prices for a subject in the context of DVD purchases were 20 percent higher, the same, and 20 percent lower for, among other conditions, different consumers. They found that both perceived price fairness and purchase satisfaction were significantly lower when the reference transaction prices were 20 percent lower.

Two papers examined the Internet context specifically. Garbarino and Lee (2003) focused on the construct of trust arguing that the opacity of the e-commerce transaction environment and its minimal physical and human contact create limited cues on which trust can be based. Their experimental results showed some impact of price discrimination of two components of trust (benevolence and competence) but interestingly demonstrate negative but weak impacts of price discrimination on overall trust. Huang, Chang and Chen (2005) conducted a survey of consumers in Taiwan seeking their reactions to different Internet pricing policies. One such policy was FDPD implemented in a variety of ways including random discounting, targeted coupons, by geography, providing lower prices to new customers, and by price elasticity. All were considered to be unfair with the policy of charging new customers lower prices than existing customers to be the most unfair.

In sum, the notion of FDPD or charging different prices to different consumers at a single point in time is generally considered to be unfair, although the results on trust were equivocal. However, there have been few studies that examine price discrimination in the context of the digi-



tal economy. The research that has been done on the impact of FDPD on consumer decision-making has not been focused on digital media and is at least ten-years-old. Given the exposure through media and other sources that consumers often pay different prices for the same good, it would be interesting to find out if, in fact, the findings of unfairness found in the literature still hold. Consumers may feel it is unfair, but are just used to it so it does not enter into their decision-making or attitudes towards e-commerce vendors. In addition, many understand that they are paying higher prices than others but are receiving a commensurate amount in value (Reinartz and Kumar 2011). This value could be in terms of customized offerings, information about new products before “non-members” receive it, and other benefits. An interesting research question is what kind of tradeoffs are loyal consumers willing to make to pay those higher prices?

Additionally, it has been pointed out (see, for example, Mangold and Faulds 2009) that the increased use of social media (Facebook, Snapchat etc.) permit consumers to talk to each freely and in real time and that these media are a “hybrid” part of Integrated Marketing Communications (IMC).<sup>2</sup> As a result, this could increase the flow of price information thus undermining the possibilities for FDPD. Such increased price communications flow can also create more sentiment for such a pricing policy to be considered to be unfair.

Luxury brands do practice price discrimination but it is usually in bricks-and-mortar contexts. Foreign currency fluctuations often result in different retail prices in different countries. For example, British luxury good sales recently increased when the value of the pound dropped due to the Brexit vote (Chaudhuri and Zakaria 2016). Sometimes luxury brands focus on particular countries where WTP for the brand is particularly high. Chanel raised the prices of its bags in South Korea in 2012 for this reason (Hunt 2012). Luxury brands use outlet stores to discriminate between different segments of shoppers depending upon their need for the latest lines of products and price sensitivity.

Online price discrimination in luxury markets is not yet widely practiced because luxury brands do not like to discount and hurt their image. However, the technology exists to do this. Companies can determine your geographical location from your computer’s IP address and rather than giving discounts, charge a premium for shoppers who are in, say, South Korea, where the WTP for a brand like Chanel may be higher. Also, the online version of high-end retailers’ discount stores like Nordstrom Rack easily allow consumers to purchase discounted fashion brands.

### ***Dynamic pricing***

Pricing strategies where prices change over time are referred to as “dynamic” prices. The basic idea behind dynamic pricing is that the company changes its prices over time to reflect different supply/demand conditions. Dynamic pricing may or may not be FDPD as the different prices at different points in time could be customized or offered

to all customers. Dynamic pricing has been used for many years in the airline industry, for example, where fare changes by the minute, hour, and day due to seat availability are the norm.

Two excellent examples of companies that successfully utilize dynamic pricing in digital contexts are Amazon and Uber. In a twenty-four-hour period in August, 2012, Amazon changed the price of a GE microwave oven nine times (Angwin and Mattioli 2012). These changes could be due to a number of factors including competitor's prices, inventory levels, and time of day when people are shopping online. Uber is well-known for its "surge" pricing or charging higher prices in periods of peak demand based on time of day or weather conditions.

In addition, advances in electronic shelf labels have permitted bricks-and-mortar retailers to take advantage of digital technology previously only afforded to e-merchants. For example, Nebraska Furniture Mart updates prices in price-sensitive product categories to support its lowest-price position in the local market (Davis 2015).

Several academic papers have examined the impact of dynamic pricing on consumer behavior. Kannan and Kopalle (2001) developed some propositions but did not test them empirically. These included:

1. Increased use of dynamic pricing by Internet retailers will decrease consumer use of price comparison sites. This is due to the fact that frequent price changes by e-tailers make the sites less reliable.
2. Similar to results on FDPD, consumer trust of a vendor will decline due to frequent price changes making price information less reliable.
3. Following up on Proposition #2, this effect will be less significant for perishable products/services such as airline tickets than for non-perishable products as such policies will be perceived as more justifiable for products with a short life span.

The study by Haws and Bearden (2006) cited above in the context of the fairness of FDPD or different prices between consumers at a given point in time also tested dynamic pricing. Again, both perceived price fairness and purchase satisfaction were significantly lower when a price the next day was less than today's price. In the context of hotel reservations, Rohani and Nazari (2012) hypothesized and found that involvement moderates reactions to dynamic pricing as high involvement consumers responded more positively to dynamic pricing than uniform pricing.

There are a number of areas for future research. The hypotheses raised by Kannan and Kopalle (2001) are interesting and need to be tested empirically. As is the case with price discrimination, it is possible that with the passage of time and more consumer experience with the Internet, the fairness and trust issues related to dynamic pricing have been reduced. There are probably other moderators besides involvement in terms of consumer reactions to dynamic pricing such as price knowledge (see below) and frequency of use of the Internet to buy. As was shown by Alba et al. (1999) different patterns of prices over time in terms of frequency of price cuts versus the depth of the price cuts

can affect consumer judgments of price. Dynamic pricing can create these kinds of effects.

The issue with luxury brands is not offering discounts but charging a premium even above the high price normally charged at, say, different times of the day. Since luxury buyers are generally insensitive to price, an automated system could be developed where prices can be nudged up at the peak online buying times for those luxury goods manufacturers like Louis Vuitton who have e-commerce sites.

### ***Participative pricing mechanisms***

Other pricing approaches that attempt to price at a consumer's WTP are called participative pricing mechanisms. These are those methods where, as the name implies, the consumer is involved with setting the price. Three of the most common participative price methods are auctions, Name Your Own Price (NYOP), and Pay-What-You-Want (PWYW). While they all have offline applications, they have been particularly effective in online contexts.

#### *Auctions*

Auctions have, of course, been around for centuries. Auctions are obviously designed to capture bidders' WTP as generally a consumer will not bid higher than his or her reservation price. The spectacular rise of eBay in the late 1990s–early 2000s is testimony to consumers' interest in the English auction (ascending) format popularized by the company. Because of the popularity of the auction format, there has been a considerable amount of research examining its impact on consumer behavior. As a result, I will select only a few representative studies.

Ariely and Simonson (2003) develop a framework for online bidding behavior. Their framework divides online auction behavior into three temporal components: auction entry decisions, bidding during the auction, and bidding at the end of the auction. The decision to enter an online auction is dependent upon whether a consumer is interested in a particular item type, whether to enter a specific auction, and whether to enter any other auctions. Ultimately, the decision to bid on an item in a specific auction is based on an assessment of the perceived value of bidding. Likewise, as the auction progresses and new bidders enter and some drop out, consumers continue to assess the value of remaining in the bidding process. Of particular distinction in the middle of the process is what is called decision dynamics. An example of these dynamics is escalation of commitment where emotional involvement in the action kicks in. At the end of the auction, the bidder has to decide how much s/he wants to win. Again, dynamics are important here as bidders are thinking ahead of how they will feel if they lose or even if they win and pay too much (the so-called “winners curse”).

A different perspective on whether to get involved with an online auction comes from the information science literature. Stafford and Stern (2002), for example, posit that the decision to bid is a function of

a consumer's acceptance of technology, affinity with the computer, and involvement with the auction process. All three dimensions are posited to be positively related to the propensity to bid at auction sites.

Cheema et al. (2005) take a broader perspective and develop a set of economic, psychological, and social factors that influence consumer involvement with online auctions. Economic factors include transaction costs (e.g., time and effort expended to prepare a bid and participate) and risk preferences. Psychological factors include reference points and loss aversion, dynamic factors during the bidding process (as noted above in Ariely and Simonson's paper), and post-auction regret. Social factors relate to interactions with other bidders. Some bidders, for example, may use participation in an auction as way of signaling membership in a community of collectors or hobbyists.

Even though auctions have been studied extensively, a few unanswered research questions can be suggested. In terms of participation in an online auction, confidence in WTP may play a factor, that is, if a consumer has a pretty good idea of her WTP, she is more likely to participate than one who does not. Also, the pattern of price changes in the auction are somewhat like dynamic price changes. As a result, the magnitudes of observed bids and the sizes of the gaps of the bids may affect either initial or continued participation or both.

#### *Name-your-own-price*

The NYOP pricing is also referred to as a reverse auction. In this pricing format, rather than the buyer bidding for the seller's product, the multiple sellers determine whether they want to sell at the bidder's offered price. The best-known online version of the NYOP model is Priceline.com which has been in business since 1997 matching buyers and sellers of travel services. With Priceline, consumers offer their bid price for, say, a hotel room, which reveals their maximum WTP. However, you are only offered the opportunity to bid once; if your bid is below the minimum price that suppliers are willing to sell, the bid is unsuccessful. There are other NYOP sites, however, where you are allowed to revise a rejected bid upwards.

Some research has examined NYOP from the consumer perspective. Spann and Tellis (2006) study the latter situation where bidders can increase what they are willing to pay. In particular, they attempt to determine if bidders' behavior is rational relative to an economic model. Their optimal bidding model has three normative components (Spann, Skiera, and Schäfers 2004). First, consumers should begin with the lowest price they feel is reasonable in order to collect information about the sellers. Second, if an offer is rejected, consumers should increase their bids up to their WTP until a seller accepts their price. Third, consumers should increase their bids in increments of decreasing size. Using data from an e-tailer selling airline tickets and a low-cost airline, they find that consumers deviated from rational behavior in both cases with smaller deviations in the case of the airline due to perhaps the fact that consumers of the low-cost airline are already more sensitive to price.

*Pay-what-you-want*

Unlike NYOP, the seller cannot reject a PWYW offer. In an auction, someone can bid higher. This is pricing mechanism that gives the buyer complete control over price. Like NYOP and auctions, a PWYW situation captures the buyer's WTP.

This pricing approach is not commonly used and many PWYW contexts do not involve digital technology. For example, in Kim, Natter, and Spann (2009), the contexts for their three empirical studies were two restaurants and a movie theater. However, it clearly can apply to online situations. Perhaps the most famous implementation of PWYW was the British band Radiohead's use of it for the 2007 release its album *In Rainbows*. For two months, consumers could download the album and pay what they wished to with only a small handling fee being required. The album was downloaded three million times at an average price of \$2.26 and \$6 per paid download. Another well-publicized application of PWYW was when Panera Bread in 2010 experimented with it at its St. Louis area restaurants.

Like the Kim et.al. referenced above, the research investigating PWYW has generally utilized offline contexts. In that paper, the authors study a number of underlying influences on consumer reaction to PWYW policies. Their first hypothesis is that prices paid when the interactions with the seller are face-to-face will be greater than zero.<sup>3</sup> Their other hypotheses related to the proportion of the reference price – the price at which they thought the product would be normally priced – that the buyers would give the seller. Factors hypothesized to positively affect that proportion were fairness, altruism, satisfaction, and loyalty. Field experiments in face-to-face settings (the two restaurants and movie theater mentioned above) showed that no buyers chose a zero price. Fairness and satisfaction were significantly related to the proportion but altruism and loyalty were not. Santana and Morwitz (2013) ran three lab experiments and one using Mechanical Turk and found similar results on the amount paid in that no respondent paid zero. Interestingly, they found that some consumers paid more than the reference price. They also hypothesized and found that social value orientation (SVO) has an important impact on how much they paid.

The general area of online auctions has been well-studied by scholars from a wide variety of disciplines and is probably the area covered by this article that is the least in need of further work. However, while they are interesting pricing policies, there has been little work on NYOP and PWYW. That is at least partly due to the fact that they are not used that much in practice. Few firms are willing to take a chance with a PWYW policy except for short periods in order to gain some publicity and generate word-of-mouth. Other than Priceline.com, some B-to-B applications, and a few small businesses, NYOP is also not commonly employed.

In general, luxury goods have not adopted any participative pricing mechanisms except for pre-owned goods. An exception is for luxury travel-related products such as hotels and first-class air tickets can be purchased on NYOP sites such as Priceline and others.

### **Price comparison sites**

Price comparison sites are mechanisms for allowing consumers to purchase products at prices below their WTP. It is easy to compare prices for many products using price comparison sites such as Google Shopping, NexTag, PriceGrabber and others. Normally, consumers can obtain information on the seller's reputation, price offered, and total price including shipping and sales tax to help make their choice. Using these price comparison sites allows a consumer to find the seller that is offering a price below their WTP while simultaneously reducing their search costs.

The effects of online shopping comparison sites on consumer price sensitivity have been studied in the academic literature. As would be expected, a number of studies (e.g., Degeratu, Rangaswamy and Wu 2000) have shown that these sites attract consumers that are price sensitive (Iyer and Pazgal 2003) and that consumers' price sensitivity increases after using these sites (Cho and Song 2002). This price sensitivity, however, is reduced when products are more differentiated and when the websites produce more product information (Lynch and Ariely 2000). In addition, Smith and Brynjolfsson (2001) show that even though price comparison site users are price sensitive, they also prefer well-known e-tailers or those with whom they have had prior purchasing experience. Su (2007) delineates three different retailer choice strategies at price comparison sites encompassing price, retailer brand name, and retailer credibility: expected value across all three attributes; brand-seeking where the consumer chooses the best-known retailer; and price aversion which chooses the lowest-price retailer. Experimental results supported retailer credibility dominating retailer brand name and lowest price.

Alba et al. (1994) studied the price image of stores in a bricks-and-mortar context. They manipulated subjects' prior beliefs of the price images of two stores and what they termed data-based cues – frequency and magnitude of price advantage. They found that frequency of price advantage dominated both prior beliefs and the magnitude of price advantage in forming price perceptions. Following these results, in our online context, while Amazon may have the strongest (low) price image, if other retailers can beat Amazon frequently on prices across a number of product categories on a price comparison site, they have the opportunity to replace Amazon in a consumer's mind as the low-price option.

There is a "dark" side to price comparison sites sometimes referred to as price "obfuscation." Ellison and Ellison (2009) describe a number of actions firms take on these sites that make it difficult for consumers to determine and compare prices. Some of these actions include whether or not shipping costs are included but may also describe situations where companies advertise a low price for a low-quality product but charge a large re-stocking fee for returns. They argue that these obfuscation policies have a negative impact on the consumer welfare gained by these sites. Chioveanu and Zhou (2013) describe airline and travel agencies that charge card payment fees in different ways such as

a flat amount per person booking or a percentage of the total booking amount. Their theoretical model makes normative predictions about firm behavior but does not have any consumer behavior implications. While most writers argue that the Internet should produce greater clarity in pricing (see, for example, Urbany 2014), this is not necessarily the case in practice. This is an important area for future research in marketing.

There are some price comparison resources for luxury buyers. For example, the online site Spottedfashion has a section devoted to comparing prices across different parts of the world (<http://www.spotted-fashion.com/?s=price+comparisons>). Of course, automobile websites like eBay Motors have enabled consumers to look at prices for new luxury cars for many years.

### **Odd pricing**

There is a considerable literature on the impact on consumers of “odd” prices or prices not ending in zero. Many retailers use non-zero price endings to signal discounts and for other reasons. Of particular interest are prices with nine endings. The interesting question is why products with prices at \$1.99 are preferred to those with prices set at \$2.00 when there is only a penny difference. While many researchers have been skeptical that such small price differences can matter to consumers, both scanner data results (Stiving and Winer 1997) and studies from the lab (Thomas and Morwitz 2005) confirm that there is a left-to-right processing mechanism that operates in many purchasing situations. Some results have also found that changing prices from odd to even can boost sales (Bray and Harris 2006).

There have been few studies examining odd pricing in the context of digital prices. A large-scale study examined daily prices from ten product categories sold by ninety internet retailers over a two-year period (Lee, Kauffman, and Bergen 2009). They found that 64 percent of the prices for these categories ended in either 5, 8, or 9 cents with only 16 percent ending in zero. Of the 64 percent, 39 percent were 9 endings. A further analysis of their data showed that Internet sellers with higher reputations (based on reviews) used fewer 9-endings than others. In addition, Internet retailers that charged higher prices used 9-endings less frequently. Taken together, these results support a signaling story consistent with bricks-and-mortar stores usage of 9-endings in that higher quality retailers with concomitant higher prices tend to use prices with 9-endings less often than other retailers.

Since the Internet allows for very precise targeting, it would be interesting to know if there are identifiable differences between consumers who are sensitive to odd prices compared to those who are not. While there have not been any such studies on odd pricing on the Web, a paper by Baumgartner and Steiner (2007) looked for heterogeneity in consumer response to odd prices using a conjoint task. Although they did not find any gender differences or any results related to stated price importance, they did find that consumers without a clear brand

preference tended to prefer round prices while those with clear preferences preferred 9-ending prices. Thus, an implication for Internet e-commerce sites where price discrimination is being used is that odd prices should be used for consumers who are registered with the site and round prices for “guests.” Other than studying heterogeneity, the odd pricing area seems ripe for the kind of A/B testing that is common in testing different price levels. If round prices are less preferred than others, what is (are) the optimal price ending(s) and are these results similar for durables vs. non-durables and hedonic vs. non-hedonic products?

Since luxury products are sold on the basis of prestige and not price and no luxury manufacturer would like to signal a deal with its pricing, one would not expect a significant use of odd pricing, particularly prices ending in \$.99. However, a quick scan of Burberry.com shows that its men’s suits are sold for \$1395, \$1995, and \$2295 which are clearly odd prices as they are just beneath the relevant even prices. While there is no deal being signaled at these price levels, there is some indication that the company believes in left-to-right price processing.

### **Digital Pricing and Psychological Aspects of Price**

The previous sections of this article covered how different firm digital pricing strategies affect consumer behavior. However, some fundamental aspects of how consumers process price information have also been affected by firm online pricing strategies. These include the price–quality relationship, reference prices, and price knowledge.

#### ***The price–quality relationship***

The research literature on the relationship between price and perceived product quality is large but consistent. Rao and Monroe (1989) conducted a meta-analysis of thirty-five studies with eighty-five effects and show a statistically significant relationship between them for consumer products. This result was upheld by a meta-analysis examining research through 2006 (Völckner and Hofmann 2007). As a result, the positive relationship between price and perceived product quality continues to be an empirical generalization in marketing and one of our fundamental relationships.

In the context of digital marketing, the problem becomes more complex as perceived quality today is greatly affected by online consumer ratings or what is called user generated content (UGC). That is, not only is price seen on an e-commerce or price comparison site a cue for product quality, but the relationship between price and perceived quality is moderated by any quality ratings a consumer has seen. Further complicating this is that recent research has shown that online consumer ratings of product quality are not highly correlated with actual quality (de Langhe, Fernbach, and Lichtenstein 2016) indicating that they may not be reliable. At the same time, this does not mean that consumers are not using the ratings to form their quality perceptions



(Winer and Fader 2016) since, as we know, perceptions are more important in consumer decision-making than real, objective attribute quality. In addition, in non-Internet settings, perceptions of quality have been found to be positively correlated with actual quality (Lichtenstein and Burton 1989).

Unquestionably, luxury good managers believe in the price–quality relationship. While economists preach downward sloping demand curves where higher prices result in lower demand, the opposite can hold in luxury product categories. Although UGC is not widely used in luxury markets, it will definitely increase over time as more companies appeal to millennials who have grown accustomed to providing ratings and comments in various online outlets. Thus, there is the potential in the future for an increased amount of impact of UGC on the price–quality relationship in luxury markets.

No research has examined the price-perceived quality relationship in online environments. While it is outside the scope of this article to develop a theoretical model, a reasonable conjecture is that given the robustness of the finding from previous research, the main effect holds but that there will be a strong interaction effect depending upon the overall valence of the observed product reviews in that average negative reviews will dampen the main effect while average positive will strengthen it. In addition, because of the number of different prices a consumer may see for the same item due to price discrimination, price comparison sites etc., more uncertainty is introduced which will further diminish the relationship. Völckner and Hofmann (2007) found that the average effect size has decreased since the earlier Rao and Monroe (1989) study, but it is not possible to conclude that this is due to increased shopping on the Internet.

### **Reference prices**

A reference price is normally considered to be a standard against which an observed price is compared (Monroe 1973). Although there are a number of different price concepts that could be used for a reference price (Winer 1988), the most generally accepted one is called a predictive or expected price, the price in a consumer's mind that she or he expects to see at point of purchase (Mazumdar, Raj, and Sinha 2005). This type of reference price is also referred to as an internal reference price (IRP). This expectation-based or IRP is formed by two information sets: (1) past prices paid and observed; and (2) current prices observed in the marketplace.

There is no question that the reference price concept holds in luxury goods markets. Luxury buyers do have internal price standards against which an observed price is compared from both sources, past prices and current observed prices. Sharp increases in the prices of some brands in the last few years have resulted in decreased demand as buyers have noted the increases relative to their IRPs and compared them to their WTP (Kapner and Passariello 2014).

A number of hypotheses can be developed that account for consumer price search and purchases in both bricks-and-mortar and online environments. We know that more recent price information from both purchases and browsing is more important than past information in the formation of IRPs (Mazumdar, Raj, and Sinha 2005). Since price information is easier to collect online than offline, it may be the case that Web price information is more important than offline price information, in particular, non-purchase-based price information. We also know that deal-based purchases and low prices in general drive down the IRP. Since the dynamic pricing environment discussed previously can feature periodic cuts in prices and some online merchants like Amazon feature very low prices, it is likely that IRPs for consumers who utilize both online and offline price information will be lower than for those consumers who do not exhibit much online browsing behavior. Finally, it is possible that consumers can separate their reference prices from offline and online behavior. Kannan and Kopalle (2001) speculate that consumers can have different reference prices for the same product and that the demand for products using both channels is driven by reference prices from both.

### **Price knowledge**

In reaction to the research on reference prices that assumed that consumers use knowledge of past prices to form their price perceptions, Dickson and Sawyer (1990) performed a study in supermarkets asking people to recall the prices on products that they had just placed in their shopping baskets. Among a number of findings, their research produced results that consumers often did not check the prices of products they bought and over half could not specify the price of the item. Following up on this study, Vanhuele and Drèze (2002) instead use a combination of price recall, price recognition, and deal recognition to measure the degree to which consumers use auditory verbal, visual Arabic, or analogue magnitude representations to memorize prices. Their results suggest that the price knowledge involved in reference prices may often not be accessible to recall but shows up in price recognition and deal recognition. They also find that frequent promotions increase consumers' ability to remember regular prices and that store switchers do not possess better price knowledge than other shoppers.

While no study has directly examined price knowledge on the Internet, as has been noted before in this article, the variation in prices both online and offline and the number of prices to which a consumer is exposed should make it more difficult for consumers to recall a price paid than if she was shopping in one bricks-and-mortar store alone. This might force consumers to construct a mean reference price but with higher variance than would be the case in a non-digital world.

There is less price variation both online and offline for an individual product in luxury contexts so price recall should be better. However, there is a considerable amount of variation in style and materials which can make both price comparisons and recall difficult. For example, a

particular handbag can come in a variety of sizes, colors, and leather types with large price differences between them.

### **The Impact of Mobile Devices**

The global diffusion of mobile devices, particularly smart phones and tablets, has changed the nature of marketing both in terms of communications through digital advertising as well as a new channel for transactions. Nielsen data show that in 2013, daily time spent viewing mobile devices passed TV for the first time. The four major distinguishing features of mobile devices for marketers are:

1. Ubiquity. Consumers can receive information and execute transactions wherever they are.
2. Personalization. The information contained in a mobile device is unique to the individual who customizes it based on his or her preferences.
3. Localization. This enables companies and other organization to contact consumers when they are in specific locations.
4. Two-way communications. Communications between parties is enhanced since these devices are always on or can be turned on very quickly.

These features have had important implications for many retailers and has led to the term “showrooming” where consumers shop at a bricks-and-mortar retailer such as Best Buy, find an item they wish to purchase, check the price for the same or similar item online, and then purchase it from an online vendor. As a result, bricks-and-mortar retailers have had to adopt price matching policies where the store will match the lowest price that a consumer finds online.

While luxury goods sellers do not have to deal with most of the above issues and online sales of luxury products are still relatively low, it is still the case that online in general and mobile in particular will become an important source of information about brands and store locations. A 2014 McKinsey study showed that more than half of luxury shoppers’ searches use mobile devices and more than 20 percent of the respondents to their survey said that they often or always use their mobile devices to do research before purchasing (Dauriz, Remy, and Sandri 2014).

All of the pricing policies and concepts described previously apply in a mobile shopping environment. For example, using geo-fencing technology, companies can identify if a customer is in the store and use price discrimination through discounts and/or temporary promotions. Dynamic pricing can also be employed where the price changes while the consumer is in the store or shopping mall. Additionally, reference prices for the same product may be different between offline and mobile channels.

Do consumers process price information differently on mobile devices versus desktops? To answer this question, we have to con-

sider the in-store shopping environment. Typical of this environment are situational factors such as time pressure, distractions such as children, in-store displays, salespeople, store knowledge, and others. Given this environment, it is unlikely that consumers will spend too much time browsing the web with their mobile devices for the best price for a product they see in the store. As a result, it would be expected that there would be a greater use of price comparison websites in a mobile environment relative to a desktop at home or in the office. Following this logic, it is less likely that a consumer will use a participative pricing policy as the different mechanisms take too much involvement and time.

## Conclusion

Research on consumer processing of price information has been conducted for over fifty years. Given that the Internet was established in the early 1990s but e-commerce did not really accelerate until the new century, it is not surprising that there has been relatively little research placing the earlier pricing research into the context of the Internet. In this article, I have attempted to show the implications for research of the major pricing policies used on the Internet, a number of psychological pricing concepts, and mobile computing. While some areas like price discrimination and dynamic pricing have begun to be studied, most of the others have not. The increased usage of the Internet for shopping and information-gathering makes this a fascinating laboratory for better understanding how changes in the way companies are expanding their channels and, at the same time, their pricing policies are affecting consumer behavior.

With respect to luxury goods marketers in particular, the increased use of the internet for selling luxury products means that a number of the areas of digital pricing noted either are or will become relevant in the near future. The successes of online luxury bazaars such as Net-a-Porter and Farfetch shows that a new generation of luxury buyers is willing to forego the classic bricks-and-mortar shopping environment for e-commerce sites. As a result, luxury goods marketers will have to better understand the role of pricing and, importantly, how consumers process price information in making decisions in the online environment.

## Disclosure statement

No potential conflict of interest was reported by the author.

## Notes

1. Although price discrimination and dynamic pricing are often used synonymously, in this article, I distinguish them by defining the former as charging different prices to different consumers at a single point in time versus the latter where consumers may pay different

- prices for the same product over time. Dynamic pricing issues are covered in the next section.
2. I thank a reviewer for pointing this out.
  3. 62 percent of the people who downloaded *In Rainbows* paid only the handling fee.

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