How Online Descriptions of Used Goods Affect Quality Assessment and Product Preferences: A Conjoint Study

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Online sellers need to provide information about used products. This study answers two important related questions: (1) what kinds of product information should online sellers provide, and (2) how do different kinds of used product information affect online buyers' preference and perception of quality? We find that when a used product is a high-involvement one, buyers' preference of the product is more influenced by its physical condition than by price; however, when the product is a low-involvement product, its price is more important than the physical condition. Other information cues have a less significant impact on buyers' preference.

INTRODUCTION

In typical online marketplaces, such as Amazon and eBay, used items account for significant portions of sales of many product categories such as book and consumer electronics. For example, as Table 1 shows, in the category of "Electronics" on eBay, used items usually account for approximately 20% to 60% of all the items listed under different sub-categories. Buyers may be interested in buying used or pre-owned products for several different reasons. First, probably most importantly, used items are often significantly cheaper than brand-new items. Particularly, buying used items of high-value products such as cars saves money. Second, some people may believe the latest models have more technological or quality risks than older models which have already been widely used for a longer time. One recent example is Samsung's disastrous Galaxy Note 7. Third, people may buy used products for collection or investment purposes (ex. antiques). Last, for some products there may not be any brand-new items for

sales due to a variety of reasons including discontinuation of production, while there is still a demand for them among some buyers, e.g., auto parts for old models.

TABLE 1
PERCENTAGES OF USED ITEMS IN THE SAMPLE PRODUCT CATEGORIES LISTED ON EBAY ON SEPTEMBER 6, 2018

Category	Sample Sub-Category	Number of Used Items	Number of All Items[1]	Used/All
Camera & Photo	Point & Shoot Digital Cameras	13,271	22,973	57.8%
	Camera Lenses	117,256	200,849	58.4%
Cellphones, Smart Watches, & Accessories	Unlocked Phones	26,288	114,398	23.0%
Computers, Tablets & Network Hardware	Laptops & Netbooks	44,636	98,377	45.4%
	Tablets & eReaders	22,192	96,228	23.1%
TV & Video Equipment	TVs	4,112	21,275	19.3%
Video Games & Consoles	Sony PS4 Consoles	1,225	4,450	27.5%
	Microsoft Xbox One Consoles	1,708	3,187	53.6%

While buying used items online provides benefits, it involves risks from the buyers' perspectives. According to Roselius (1971) and Jacoby and Kaplan (1972), there are six different types of risks in a typical shopping transaction: financial, performance, physical, psychological, social, and time lost. For purchases of used goods online, all the risks mentioned above still are present. Some of the risks, particularly the performance risk, could be more significant than when purchasing new items. This is because different used items of the same brand or model may be significantly different in terms of their performance and condition, since their previous owners' may have highly different use patterns. For example, a smartphone that "has been used lightly" and "always kept in a protective case" should be more favored by buyers than one "heavily used" and "covered by some noticeable wears and scratches."

In typical online marketplaces such as Amazon and eBay, shoppers interested in an item has access to three different types of information. First, they can see product information provided by the seller regarding the item's attributes including specifications, physical conditions, etc., typically accompanied by one or multiple images of the item. Second, the seller also specifies its price, shipping time and fee, and warranty. Third, previous customers who have purchased and used the product can post their reviews on that product and their purchase experiences with the seller, typically on 5-star scales. We can call the third type of information electronic word of mouth (eWOM) because they are provided by other buyers rather than by the seller[2].

This study focuses on the first type of information, particularly, how sellers describe their used products. We examined thousands of used items in dozens of product categories sold on Amazon.com and eBay.com. In addition to product specifications, we found the following four types of product information provided by sellers are most common regarding used products. Table 2 shows some examples of these four types of product information.

TABLE 2
EXAMPLES OF VERBATIM DESCRIPTION ABOUT USED PRODUCTS PROVIDED BY SELLERS

Attribute	Example
Physical condition	Excellent; Near mint; In great condition; Very clean; Everything on it works; Is fully functional; Shows some signs of use but there are no major imperfections; Some Cosmetic Wear;
Duration of ownership	Bought it last month; purchases brand new from Best Buy a couple years ago;
Extent of usage	Never used! Looks like it has barely been used only used a few times; Used regularly;
Reason for selling[3]	Sell because I won't use it anymore; Just bought a (newer model), so I am selling this (item);

While we suspect that these product attributes from the seller shoppers are relevant to address product uncertainty, it is unclear to what extent each of these informational cues affects online shoppers' preferences and perceived quality. This study specifically investigates two important questions regarding online sellers' selling strategy for used products: (1) what kinds of product information should online sellers provide, and (2) how do different kinds of used product information affect online buyers' preference and perception of quality?

LITERATURE REVIEW

Online Consumer Informational Cues

In general, consumers use cues of product attributes to infer product quality (Zeithaml, 1988). Because product quality is an important factor for purchase decisions, the process of finding attribute cues needs to be performed before making a purchase. In an online environment, this process becomes more important, since consumers cannot see or touch the actual product and thus the ability to assess product quality is more limited in an online environment. For online purchases, consumers actively seek cues from online information about the product (e.g., product description on the retailer's website, product reviews by other consumers) (Pan & Chiou, 2011). Those cues influence product quality assessment, product choice, and purchase intention.

Zeithaml (1988) categorizes quality-signaling cues into two groups: intrinsic and extrinsic cues. Intrinsic cues are product attributes that exist within the product, and extrinsic cues are attributes that exist outside the product (e.g., price, brand name, warranty). In the context of used goods retailing, while both intrinsic and extrinsic cues are important for quality perception and purchase intention, consumers would evaluate intrinsic cues (e.g., the condition of the product, the duration that the product was in use) first before considering extrinsic cues (e.g., price) because a poor product condition signals poor product quality. However, multiple positive extrinsic cues can also counteract the effects of negative intrinsic cues. Hence, the present research investigates how different levels of intrinsic and extrinsic cues influence consumers' quality perception and product choice among used product options in online retailing settings.

Used Product Literature

In the area of marketing, very few previous studies have investigated consumer behavior related to used, refurbished, or remanufactured products. Starhilevitz and Loewenstein (1998) investigate how the duration of ownership is related to selling price of pre-owned products. Based on the loss aversion and endowment effect theories, they find that longer duration of current ownership leads to higher price posted by sellers. Essoussi and Linton (2010) find that for products with reused content, consumers' willingness to pay is significantly affected by their perceived functional risk. Even for environmentally oriented consumers, the possibility of either functional or cognitively-evaluated types of risk remains highly important when they have an overall positive attitude toward buying recycled products. Consumers may switch from a recycled product to a new product within a smaller range of price for products with high functional risk. Mugge et al. (2018) examine how visual (signs of wear and tear) or verbal (textual description) information about used products affect consumers' evaluations of refurbished products. They find that overall visual information about prior use has a negatively affects consumers' evaluations of refurbished products. The effect of verbal information is negatively significant when there is no sign of wear or tear due to confusion among consumers. Verbal information about prior use has insignificantly effect when signs of wear or tear are present. Zhou and Gupta (2018) consider pricing strategy for new and remanufactured products across multiple generations. Using data from eBay, they examine prices of different generations of iPhones, new and refurbished, and identify the factors affecting pricing. They find product related variables including product condition are the most critical factors determining prices while the percentage of positive reviews on the seller also has significance.

Consumer Involvement

The concept of consumer involvement has been researched extensively by marketing scholars (Quester & Smart, 1998). Past studies on this topic reveal that consumer involvement significantly influences consumers' decision-making processes (Laurent & Kapferer, 1985). In the context of eWOM, Park and Lee (2008) use the elaboration likelihood model (ELM) to argue that consumers who are highly involved with a product would utilize cognitively intensive processing of online product reviews, while consumers who are less involved would engage in rather superficial processing of online product reviews. Their experimental studies support their arguments, confirming that consumer involvement affects how a consumer processes online information presented to her. Consumer involvement has also been shown to influence consumers' decision-making in offline settings. In the context of red wine purchases at brick-and-mortar retailers, Quester and Smart (1998) conduct a conjoint study to find that the high-involvement group and the low-involvement group put different weights on each of the red wine attributes in different consumption settings. They conclude that consumer involvement plays a mitigating role in the relationship between consumption situations and consumers' red wine preferences. Building on the above research findings, we expect that highly involved consumers and less involved consumers would process online descriptions of product attributes differently in used-product buying situations.

RESEARCH METHOD

Conjoint Analysis

Marketing researchers have been using conjoint analysis as a multivariate technique widely to determine how consumers develop their preferences for different options such as brands (Green & Srinivasan, 1990). It is based on the premise that consumers form preference (utility) of a product by adding separate amounts of utility for each separate attribute of that product, called a part-worth. Conjoint analysis requires that the researcher first create a set of hypothetical products with attributes at different pre-selected levels, and then the set of product profiles will be presented to the respondents. The respondents compare the profiles, make trade-off among different good and bad features, and then rate or rank these profiled according to their preferences. The researcher can decompose the preferences into part-worths to determine the importance of different product attributes. Conjoint analysis can also be used

to estimate the market shares of different brands since we can assume that each customer would choose the option with the highest utility.

We conducted some pilot studies to identify used book as a low-involvement product and used camera as a high-involvement product. For each of the five attributes including price, two different levels were selected as Tables 3a and 3b show. For both used products, the low prices and medium prices were 80% and 90% of the prices of their brand-new counterparts, respectively. For each product, five attributes with each having two levels would generate 32 profiles. These profiles could be too time-consuming and burdensome for respondents to rank without feeling undue fatigue. As a result, we used SPSS to create a fractional design and reduced the number of profiles to 9. We decided to add two options for each product, one was used and with only asked price and the other was brand new with a full price.

TABLE 3A
PROFILES OF USED PRODUCTS - DIGITAL CAMERA

Item	Physical Condition	It has been owned for	Usage	Reason for Selling	Asked Price
1	Shows signs of wear and has some scratches	3 months	Normal use	I don't use it much anymore	$630
2	Like new; no scratch or wear	12 months	Hardly used	I've upgraded to a more advanced model	$630
3	Shows signs of wear and has some scratches	3 months	Normal use	I've upgraded to a more advanced model	$560
4	Shows signs of wear and has some scratches	12 months	Hardly used	I've upgraded to a more advanced model	$560
5	Shows signs of wear and has some scratches	3 months	Hardly used	I've upgraded to a more advanced model	$630
6	Like new; no scratch or wear	12 months	Normal use	I don't use it much anymore	$560
7	Like new; no scratch or wear	3 months	Normal use	I don't use it much anymore	$560
8	Shows signs of wear and has some scratches	12 months	Normal use	I've upgraded to a more advanced model	$630
9	Like new; no scratch or wear	3 months	Hardly used	I don't use it much anymore	$630
10	Used; no additional information available				$630
11	Brand new; sealed in original box				$700

TABLE 3B
PROFILES OF USED PRODUCTS – REFERENCE BOOK

Item	Condition	It has been owned for	Usage	Reason for Selling	Asked Price
1	Shows signs of wear and has some notes	3 months	Normal use	I don't use it much anymore	$135
2	Like new; no scratch or notes	12 months	Hardly used	I've upgraded to a newer edition	$135
3	Shows signs of wear and has some notes	3 months	Normal use	I've upgraded to a newer edition	$120
4	Shows signs of wear and has some notes	12 months	Hardly used	I've upgraded to a newer edition	$120
5	Shows signs of wear and has some notes	3 months	Hardly used	I've upgraded to a newer edition	$135
6	Like new; no scratch or notes	12 months	Normal use	I don't use it much anymore	$120
7	Like new; no scratch or notes	3 months	Normal use	I don't use it much anymore	$120
8	Shows signs of wear and has some notes	12 months	Normal use	I've upgraded to a newer edition	$135
9	Like new; no scratch or notes	3 months	Hardly used	I don't use it much anymore	$135
10	Used; no additional information available				$135
11	Brand new; sealed in original box				$150

There were 120 students from two universities in the U.S. participated in this study. The 11 product profiles for the two products were presented to the participants individually on hard-copy questionnaires. For each of the two products, the participants were asked to rank the 11 offerings in terms of their preference from 1 (most preferred) to 11 (least preferred) and their perceived quality from 1 (most durable) to 11 (least durable). The participants were also asked to rate how expensive each of the two products appeared to them and how important and risky they perceived a purchase of each of the two products was on a seven-point scale.

Results and Discussion

Paired sample t-test results confirmed that the camera was perceived to be with higher involvement than the reference book. For the participants, the camera was more expensive (mean 5.51/7 vs. 4.16/7, $p<0.001$), and purchase of the camera was more important (mean 6.02/7 vs. 4.47/7, $p<0.001$) and riskier (mean 5.04/7 vs. 2.80/7, $p<0.001$).

We use conjoint analysis to analyze the ranking of the participants' preferences and perceived quality of the hypothetical offering profiles. The estimated part-worths and relative importance of the five attributes are shown in Table 4a and 4b.

TABLE 4A
ESTIMATED PART-WORTHS AND IMPORTANCE: PREFERENCE

Attribute	Levels	Part-worths		Importance (%)	
		Camera	Book	Camera	Book
Condition	Like New	-2.558 (.158)	-1.931(.198)	30.564	23.774
	Wear and scratch	-5.116(.316)	-3.863(.396)		
Duration of ownership	3 months	-1.418(.129)	-.866(.162)	17.299	12.896
	12 months	-2.835(.258)	-1.732(.324)		
Usage	Hardly Used	-.956(.139)	-.772(.174)	15.649	13.304
	Normal Use	-1.911(.277)	-1.544(.348)		
Reason for selling	No use	.120(.176)	-.063(.220)	11.16	10.696
	Upgraded	.240(.352)	-.125(.441)		
Price	90% New Price	1.972(.120)	3.214(.151)	25.328	39.330
	80% New Price	3.943(.240)	6.428(.301)		

Note: Standard errors are in parentheses.

A comparison of the two sets of part-worths in Table 4a shows how the impacts of the five attributes on preference change from camera to book. For the camera, condition is the most important attribute, followed by price. For the book, price is the primary attribute which accounts for about 40% of the preference, followed by condition. Duration of ownership and extent of usage have equal weight in preference but are both less important than condition and price. Participants did not give much consideration to reason for selling.

TABLE 4B
ESTIMATED PART-WORTHS AND IMPORTANCE: PERCEIVED DURABILITY

Attribute	Levels	Part-worths		Importance (%)	
		Camera	Book	Camera	Book
Condition	Like New	.301(.208)	-2.943(.141)	36.607	33.948
	Wear and scratch	-3.060(.416)	-5.885(.282)		
Duration of ownership	3 months	-6.121(.170)	-1.412(.115)	21.436	22.068
	12 months	-1.428(.340)	-2.823(.230)		
Usage	Hardly Used	-2.857(.183)	-.980(.124)	18.378	19.371
	Normal Use	-.861(.365)	-1.959(.248)		
Reason for selling	No use	-1.722(.232)	-.042(.157)	11.088	9.915
	Upgraded	-.011(.463)	-.085(.314)		
Price	90% New Price	-.022(.158)	.620(.107)	12.491	14.697
	80% New Price	.460(.316)	1.240(.214)		

Note: Standard errors are in parentheses.

In comparison, the five attributes have very similar impacts on participants' perceived durability of both products. Condition is the most important attribute, followed by duration of ownership and extent of usage. Although price is either the first or second most important attribute when it comes to preference, it is as unimportant as the reason for selling in determining perceived quality. Apparently, price's different weights in determining preference and durability suggest that participants did not apply the "high price = high quality" heuristic in their judgment of durability.

TABLE 5A
PERCENTAGE OF BUYERS INDICATING THEIR FIRST CHOICE: PREFERENCES

Item#	1	2	3	4	5	6	7	8	9	10	11
Camera	0.0%	3.3%	1.7%	2.5%	1.7%	3.3%	45.0%	0.0%	11.7%	0.8%	30.0%
Book	0.8%	3.3%	3.3%	5.0%	0.0%	5.0%	57.0%	0.0%	9.1%	0.0%	16.5%

Assuming each participant would choose the product with the highest utility when the 11 products are sold simultaneously, we can calculate the "market shares" of the 11 profiles as shown in Table 5a. An examination of these market shares generates more insights into consumer's preferences.

First, of both product categories, item #7 is the most popular choice and accounts for approximately half of the market, followed by #11 and #9. On the one hand, the popularity of item #7 suggests that consumers are willing to choose a used item over a less used or a brand-new one when its price is reasonably low. On the other hand, although item #9 is like new and has hardly been used, more customers select the brand-new item #11 which is more expensive. This suggests that lower prices of used items can compensate for their poorer conditions only to a certain extent.

Second, when comparing the market shares of the two most popular items, #7 and #11, we can see how the preferences of a higher-priced brand-new item and a lower-priced used item change from camera to book. While the used and lower-priced #7's market share increases from 45% (camera) to 57% (book), the market share of the brand-new and higher-priced #11 decreases by almost 50% (30.0% vs. 16.5%). In other words, participants are almost twice as likely to buy a brand-new camera than a brand-new book.

Furthermore, the market share of item #10, which is without product information, is close to the market shares of items #1, #2, #5, and #8, which have the same price with different other attributes. It seems that providing no product information at all is almost as bad as providing negative information.

TABLE 5B
PERCENTAGE OF BUYERS INDICATING THEIR FIRST CHOICE: QUALITY

Item#	1	2	3	4	5	6	7	8	9	10	11
Camera	0.8%	2.5%	0.8%	0.0%	0.8%	4.2%	15.1%	0.0%	0.0%	0.0%	75.6%
Book	0.0%	0.0%	0.8%	0.0%	0.0%	4.2%	13.4%	0.8%	1.7%	0.8%	78.2%

It is not surprising to see that the majority of the participants believed the brand-new item is the most durable one, as shown in Table 5b. Somewhat unexpected is the fact that about 15% of the participants believed item #7, which is used, is more durable than item #11 which is brand new. One logical explanation is that although item #7 had been used for a short period, it was tested by the previous user and already proved to be good, while item #11 had not been tested so it may be found later to be less durable.

CONCLUSION AND MANAGERIAL IMPLICATION

The purpose of the present research is to investigate how consumers evaluate multiple cues of used products to form judgments on product quality and preferences in the online retailing context. To gain insights into consumers' usage of multiple cues of used products, we conducted a conjoint study with used digital camera and used book as focal product categories. The conjoint analyses reveal that, for used digital camera, product condition is the most important cue that consumers use when choosing a product. Price is the second most important cue. Consumers do not put much weight on ownership duration, usage level, and reason for selling while making a choice. For used book, price is the most important cue for forming preferences, followed by product condition. These findings suggest that consumers evaluate the

importance of product condition and price differently, depending on the types of used products. Because digital cameras are sophisticated high-involvement products, a slight damage to a few parts could result in poor performance of a digital camera, which would cause consumer dissatisfaction. Recognizing this risk, consumers consider the product condition of a used digital camera as a more effective cue for product quality, compared to the price of the used digital camera. On the other hand, a slight damage to a used book does not affect the content of the book negatively and thus would not affect satisfaction levels for most consumers. Given this lower level of sensitivity to physical condition, price becomes a much more important factor when buying a used book, as it predominantly determines the overall value of the used book.

In assessing perceived durability, consumers use product condition and ownership duration as the most important cues in both product categories. Consumers understand that product condition would directly affect how durable a used product could be. They apply this logic to used book purchase situations as well as used digital camera purchase situations. After product condition, consumers consider ownership duration as another important cue in judging durability of a used product. Although usage level is not far behind in importance, it appears that consumers value more the information that ownership duration provides, compared to the information that usage level provides.

The present research offers important implications for practitioners. First, for online resellers of used high-involvement products such as digital cameras, it is important to describe product condition of their products in detail, since consumers would process the information about product condition first before making a purchase decision. Second, for online resellers of used low-involvement products such as books, their prices should be very competitive on the online retail platform. For such used products, price is the dominant factor for purchase decisions, as product condition would not affect consumption experience significantly for most consumers. Our research further suggests that prices for used products in like-new conditions should be close enough to those for used products in normal conditions. In other words, resellers are advised not to charge significantly higher prices because their used products are in excellent conditions. Particularly, in low-involvement product categories, consumers do not perceive that used products in like-new conditions would provide significantly better consumption experience than used products in normal conditions would.

FUTURE DIRECTIONS

Some online market places such as Amazon and eBay allow sellers to post images and even videos of the item for sale. Although this study would be too complicated if visual aids were included in the product profiles, we are curious about how the presence of these non-verbal informational cues affects the outcomes. In addition to the product information and price provided by sellers, online shoppers also have access to other customers' evaluations of the product and its sellers including the rating of the product and sellers' previous transaction records and reputation score. We can call them the electronic word of mouth (eWOM) which is a rich area for research in online consumer behavior. Further studies are needed to investigate how eWOM of the product and seller will interfere with the impact of product information and price on shoppers' preference and evaluation.

ENDNOTES

1. Note: On eBay, each of listed items fits one of seven conditions: "New", "New other", "Manufacturer refurbished", "Seller refurbished", "Used" and "For parts or not working", and "Not Specified". We only considered those items listed as "Used".
2. eWOM is a highly active research area in marketing. See Anand et al. (2017) and Cheung and Thadani (2012) for literature reviews.

3. According to statista.com, the top four reasons for U.S. consumers selling used items in 2017 were: (1) "I didn't use it anymore"; (2) "I wanted to earn money" ;(3) "I wanted to get rid of old things"; (4) "I wanted to create space for something new". However, out of thousands of used items sold online, we did not find any sellers of them who explicitly listed "want to make money" as a reason for selling. For simplicity, we decided to combine reasons (1) and (3) into one in our survey study.

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