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# The Impact of Product Classification for Online Auctions

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## ABSTRACT

Consumers usually prefer to touch and feel, smell, and try on products before purchasing. Consequently products with high sensory requirements are likely to be perceived as more risky to buy online. Products with variable functionality, such as electronics, are also difficult to evaluate prior to purchase and fragile items run the risk of being damaged during delivery. Furthermore, while commodities are usually easy to specify, specialized products with high product description complexity are more of a challenge to specify accurately for the consumer online. Negative feedback posted on eBay is analyzed to calculate the rate of complaints for different product categories. We hypothesize that high sensory, complex products with variable functionality and high fragility generate more complaints than low sensory, simple products with little variable functionality and low fragility. This study has important implications for research as well as for online auctions, buyers and sellers.

**Keywords:** online auction, product, commodity, economics of information.

## INTRODUCTION

Although online auctions offer a surprising diversity of products, the limitations and uncertainty of the virtual environment may result in dissatisfied consumers who post negative feedback. An important area for research is to understand the characteristics of the products that are transacted effectively online (Kauffman and Walden 2001, Lucking-Reiley 2000). The objective of this study is to determine the impact for online auctions of the product dimensions: sensory requirements, complexity of product description, variable functionality and fragility. The findings will have important implications for e-business research as well as for auction sites, and online buyers and sellers.

In the next section we draw on the economics of information literature on information search, information asymmetry, asset specificity and agency theory to support our hypotheses on the impact of the four product dimensions for online auctions.

## THEORETICAL BACKGROUND

The marketing literature on product classification has a long history and draws on the economics of information (Smith and Bush 2000). The difference between search and experience goods is a focal paradigm (de Figueiredo 2000, Girard et al. 2002, Klein 1998, Smith and Bush 2000). Attributes of search goods can be explored for evaluation before purchase and use. In contrast, experience goods require consumers to rely more heavily on their own or others' product experience because of the inability (or high cost) to obtain adequate product information prior to use. For the online consumer, while commodities are usually easy to specify, specialized products with many attributes and high product description complexity are more of a challenge to specify accurately (de Figueiredo 2000, Jahng et al. 2000).

### Product description complexity

Commodities have low asset specificity (Malone et al. 1987). This means that they can be used and purchased without special arrangements or relationships. Information specificity is derived from asset specificity (Choudhury and Sampler 1997). Commodities can be described relatively easily and explicitly (Malone et al. 1987). Because of their precise description, commodities are considered search products. The source of a commodity is irrelevant since the product is the same no matter its origin. Sellers compete on price since the product itself is not differentiated. Consumers can compare prices with a search engine when buying commodities online (Bakos 1998, Shapiro and Varian 1999). The lower search cost makes online purchase more favorable than a trip to several stores. Quasi-commodities, such as books and CDs, behave similarly online to commodities once the specific product is chosen (de Figueiredo 2000).

The degree of differentiation of the product influences how effectively it can be sold online (Peterson et al. 1997). For example, the low asset specificity of aircraft parts (Choudhury, Hartzeland Konsynski 1998) and computerized loan origination systems (Hess and Kemerer 1994) make them suitable for electronic markets.

Hypothesis 1:

*Products purchased in online auctions with high asset specificity are more likely to generate consumer complaints.*

Consumers that purchase items with high asset specificity in an online auction are likely to complain that the item they receive is not as described. Sellers should attempt to give sufficient detail in their product description. Nevertheless, when a product has many attributes and high product description complexity, such as one of a kind collectibles and vintage items, an inexperienced seller is likely to fall short in communication of details (de Figueiredo 2000).

### **Sensory products**

Sensory products are experience goods. De Figueiredo (2000) recognized the importance of sensory product categorization for electronic commerce. His continuum of product categories includes “look and feel” and “look and feel with variable quality.”

Media richness theory explains the limitations of electronic media for the senses (Daft and Lengel 1986). An online environment needs to be richer for products with high sensory requirements (Jahng et al. 2000). The perception of being there, telepresence, is enabled with technology, such as virtual reality, which helps people to perceive they are in the presence of an environment although they are not (Steuer 1992, Shih 1998). Real estate sites have virtual tours to encourage sales online. Similarly, product presence is the perception of interacting with a product online as if it was physically present (Jahng et al. 2000). Animation, high-resolution graphics, audio and video clips increase the richness online. Nevertheless, consumers are more likely to purchase products online, which do not make demands on the senses (Totty and Grimes 2002). If consumers perceive a need to touch, smell or listen to products before making a purchase then they are inclined to go to a physical store. Similarly, clothing is a challenge online for evaluating fit, quality and comfort unless the consumer trusts the brand (Brady 2000, Kauffman and Walden 2001).

The failure of most pure play online grocers, such as WebVan, has been at least partially blamed on the fact that consumers like to “squeeze the tomatoes” or avocados, and smell the melons and other aromatic produce before purchasing. Similarly, online furniture failures are often attributed to the need to bounce on a couch before committing to buying it (Scott 2004).

Hypothesis 2:

*Products purchased in online auctions with high sensory requirements are more likely to generate consumer complaints.*

Consumers that purchase products with high sensory requirements in an online auction are likely to complain about the item not meeting their expectations. They may be disappointed with its appearance, texture, size, fit, sound or smell.

### **Variable functionality and “lemons”**

As products become more complex, buyer uncertainty about item quality increases (Akerlof 1970). Consumer concern is that the product is a “lemon”, meaning that it will not work properly. The market for “lemons” is not new with the Internet (Akerlof 1970, Bakos and Kemerer 1992, Resnick et al. 2000, Kauffman and Walden 2001). Nevertheless, products that might not function as intended are a greater risk to purchase online, especially from a seller that does not have a physical store and does not accept returns (Girard et al. 2002, Resnick et al. 2000). Online auction sites, such as eBay, sell complex products, such as electronics and cars, in huge numbers. eBay’s Feedback Forum increases trust (Resnick et al. 2000) and third party services such as warranties, inspection and escrow services mitigate the perceived risk for consumers to some extent (Lucking-Reiley 2000, Kauffman and Walden 2001). However, the rate of fraud for computer and consumer electronics at 5% is much higher than for products on average at 1% on eBay (Warner 2003).

Hypothesis 3:

*Products purchased in online auctions with high functionality requirements are more likely to generate consumer complaints.*

Consumers who purchase products, which have high variability in functionality, in an online auction are likely to complain that the item does not work as expected. In many cases these buyers accuse the seller of fraud. The implication is that the seller is aware that the item does not function. The information asymmetry between the buyer and seller obviously puts the buyer at a disadvantage (Bakos and Kemerer 1992, Kauffman and Walden 2001).

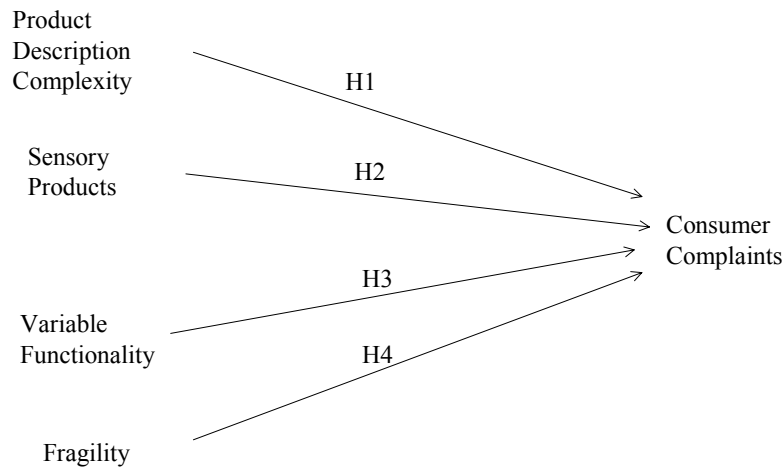
### **Fragility and distribution**

Internet technology makes possible new kinds of products, called digital goods, such as downloadable computer software, MP3 music, news articles or reports (Kauffman and Walden 2001), which can be distributed quickly, easily and cheaply (Shapiro and Varian 1999). Thus while the variable cost of distributing digital goods over the Internet is close to zero (Rayport and Sviokla 1994, Bakos 1998), physical products are not as convenient for online purchase as digital goods

(Peterson et al. 1997). Not only do consumers need to pay for delivery, they sacrifice instant gratification, and the product may arrive damaged. Businesses that pack goods professionally and have experience with deliveries are not as problematic as individuals on eBay selling items that come from cleaning out their wardrobes and attics. The more fragile the item, the greater the risk that it will arrive broken or in unsatisfactory condition. Agency theory explains the lack of goal congruence between the buyer and seller (Eisenhardt 1989). The sellers should perceive themselves as agents of the buyers. If the buyers receive damaged products then it should have repercussions for the sellers. Otherwise the sellers might not be motivated to pack carefully. It might require intervention from the online auction site to align the goals of the buyers and sellers.

Hypothesis 4:

*Products purchased in online auctions with high fragility are more likely to generate consumer complaints.*



**Figure 1. Impact of Product Dimensions on Consumer Complaints**

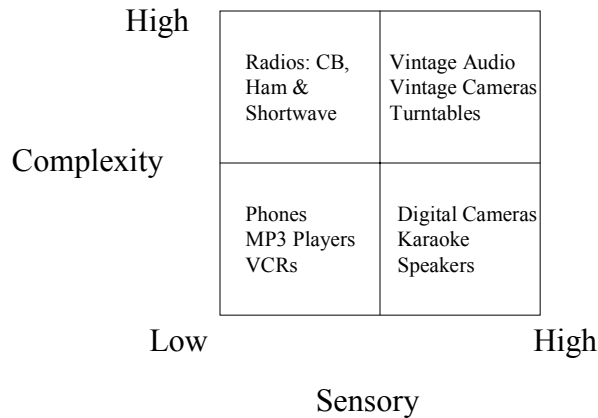
Consumers who purchase highly fragile products in an online auction are likely to complain that the item arrives damaged in shipping. The buyers will often accuse the seller of inadequately packing the item. The problem could be due to the seller's lack of knowledge on how to package the fragile item appropriately and the seller's inexperience with this task.

In summary, the four product dimensions, (description complexity, sensory, variable functionality and fragility), shown in Figure 1, are likely to influence the rate of consumer complaints in online auctions.

## METHODOLOGY

Negative feedback posted on eBay is analyzed to calculate the rate of complaints for different product categories. We chose electronic products in this study because supposedly they generate more complaints on eBay than other products. To control for some attributes, we assume that all electronics have high functionality and high fragility. Consequently, in this preliminary analysis we focus on product complexity and sensory characteristics. See Figure 2.

**Electronics**  
(assume high functionality & high fragility)



**Figure 2. Electronic Product Categories**

Phones, MP3 players and VCRs are chosen as low complexity, low sensory products. The characteristics of these quasi-commodity items can usually be articulated easily and consumers do not need sensory experiences at a physical store prior to purchase. CB, ham and shortwave radios, although low in sensory requirements, are more specialized complex products that are more difficult to describe online. Digital cameras<sup>1</sup>, karaoke players and speakers, although they can be described adequately, usually require physical inspection for visual and/or auditory features. Vintage audio, cameras and turntables are often unique and vary in so many attributes that they are difficult to describe and consumers usually prefer to inspect them physically for functionality, as well as for visual and auditory quality, before purchase.

For this study, 182,647 products were examined from the targeted electronic product categories in Figure 2. 113,031 of these items received bids and 13,850 received feedback. Of these feedback records, 334 were negative and 232 were neutral. We analyze these complaints to determine the influence of variable functionality, fragility, sensory and complexity product dimensions.

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<sup>1</sup> Jahng et al. 2000, 2001 classify digital cameras as complex. However, vintage cameras are even more complex to specify because they may be unique. Although consumers could inspect digital cameras in a store and then bid online, vintage items are harder to find.

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