Seeking Simplicity In Complexity: Profiling Consumers Who Prefer Easy-To-Use Products In The DVD Recorder Market

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Abstract

Much literature has established that ease-of-use is important in determining adoption of an overall product category or activities such as online shopping and trading. Its role is less clear, however, in differentiating products within categories. The purpose of this paper is to examine this strategy and whether certain characteristics of an individual are influential in their desire for easier-to-use products within a technologically complex product category, DVD recorders. Previous studies suggest certain characteristics define those who seek easy-to-use products, but few have been conducted in contexts where trade-offs are made on other product aspects. Successful positioning one's product in terms of its simplicity will occur if it is known, a priori, which consumers will be more responsive to such strategies. Our research reveals that those who place emphasis on ease-of-use in the DVD recorder market are more likely to be older, more educated, with little awareness or knowledge of the category. Among younger persons, females are more likely to seek products that are easier to use.
Keywords: ease of use; demographics; complexity; user-centred design; choice.

Background

> "It is not sufficient for firms to deliver products that have technical excellence. Products should be easy to use and fit within the work practices, activities and context of the consumer." (Babbar, Behara, and White 2002, p. 1071)

The ease-of-use of a product is defined as its ability to address physical, cognitive and emotional needs of intended users, over and above the core need being satisfied (Babbar et al. 2002). For example, a DVD recorder option may be perceived as easy to use if it offers a logical approach to schedule recording. In turn, attention to usability in NPD may result in greater consumer acceptance of final products. Indeed, core components within Davis' (1993) technology acceptance model (TAM) are ease-of-use and usefulness. While in general it is likely consumers seek easier to use products, it is unclear whether product development with such focus risks potential development in other functional areas. In addition, differentiation incorporating ease-of-use would be more successful if it is known for which consumers its value is pertinent. Retailers and online product brokers (Haubl and Trifts 2000) often report ease of use ratings and would benefit from understanding its value in their role as information providers. This paper investigates (a) whether consumers will pay significantly more for ease of use relative to other product features; and (b) whether certain individual characteristics influence its desire. These research questions are examined in the context of a technologically complex category, DVD recorders. From a theoretical perspective, the research constitutes further examination for why specific consumers desire easier to use products.

Literature on the Design and Desire for Easy to Use Products

March (1994) suggests that traditional design largely concerns physical attractiveness (appearance, ability to carry, hold, etc.). A more challenging philosophy, however, is

incorporating aspects of cognitive attractiveness (e.g., logical to use) and emotional attractiveness (e.g., lack of frustration in use). Termed "user-centred design" (March 1994), ensuing products encompass simplicity. Many exemplars constitute its practice, often resulting in new categories (e.g., DVD players; MP3 players). In addition to technological obsolescence, it is likely elements of simplicity and non-complexity have lead to their general category adoption (Rogers 1995). This is supported in several applications of Davis' (1993) technology acceptance model, in which ease-of-use is a significant predictor of attitudes to macro activities such as online shopping (Vijayasarathy 2004) and trading (Shih 2004).

Seldom theoretical comment or empirical insight, however, has been made at a more micro level to examine the strategic value of product differentiation solely on usability dimensions within a given product category. One exception is a large qualitative study examining choices of answering machines, suggesting products communicating ergonomic values, such as ease of use, are more likely to be chosen (Creusen and Schoormans 2005). Several authors argue that it provides a mechanism to indicate dimensions of individual product quality (e.g., Babbar, Behara, and White 2002; Brucks, Zeithaml, and Naylor 2000).

No concrete empirical evidence, however, suggests ease-of-use is an attribute that demands significant value relative to other product features. For example, March (1994) discusses Apple's development team and their decision to include product features (e.g., internal disk drive; large trackball mouse) making its 'PowerBook' easier to use. This required exclusion of other internal components to meet size and weight targets, but it is unclear, whether consumers were willing to forgo these. In other words, little is known about the extent to which consumer's trade-off a product's overall ease-of-use and desirable product features. By adopting a multi-attribute perspective of decision-making (Fishbein and Azjen 1975), manufacturers such as Apple would benefit from knowing preference for ease-of-use relative to competing features (e.g., additional USB ports). In this paper, we estimate a model embedded in random utility theory (Thurston 1927) to successfully capture consumer preferences, providing better insights into the relative value of ease of use as an attribute.

Research continues to highlight the need to account for preference heterogeneity for accurate prediction and/or adequately describing behavioural phenomenon of theoretical interest (Hutchinson, Kamakura, and Lynch Jr. 2000). Heterogeneity often relates to observable characteristics which can then be accommodated in segmentation and targeting. For example, preference for ethical features (e.g., minimum wages for workers; biodegradability) relates to gender, age, and ethnicity; hence, this suggests differentiation using ethical features must cater to such differences (Auger et al. 2003). The relationship between preferences for easy to use products and observable consumer characteristics has received discussion but often restricted to category behaviour. For example, Girard et al. (2003) suggest the complexity of shopping online is dependent on the type of good (e.g., search; credence) but also on demographics. Males and the more educated exhibit greater preference to shop online for search goods where details of options can be known prior to purchase (e.g., books). Males and the more affluent are more likely to prefer online shopping for experience goods where one would not be confident in making purchases without sampling prior to purchase (e.g., televisions) (Girard et al. 2003). A recent U.K. study of older users of information communication and technology, suggests computer users were more likely to be male rather than female, married and have continued their education after sixteen years of age (Selwyn et al. 2003). Shih (2004) also relates consumer acceptance of electronic shopping to psychographic characteristics (e.g., satisfaction with the Internet). To diffidently generalise these examples beyond their context such that assertions about which consumers will typify

those that will seek easier to use alternatives rather than between category options, it is clear that variables such as age, gender, income and education are pertinent for further examination.

Alba and Hutchinson (1987) suggest differences in consumer knowledge may impact many aspects of evaluation. To extrapolate from their extensive review, as the number of product related experiences increases (i.e., familiarity) and ability to perform product related tasks increases (i.e., expertise), it is likely that consumers need for an easy to use product from the category declines. Congruent product category knowledge may create value for a related product or product category (Peracchio and Tybout 1996) such that psychological barriers related to usability can be overcome via learning through similar experiences. For example, owners of DVD players may be less inclined to seek out an easy to use DVD recorder at the expense of other features relative to those not owning the related playing device.

In summary, considerable literature examines preference for ease-of-use on overall category adoption but seldom as influencing selection of options within categories. Individual characteristics driving preference for ease of use is likely to relate to demographics such as age, education, income, and behavioural aspects such as category knowledge, and ownership in a related product category. We now turn our attention to empirical test the impact of demographic and behavioural characteristics on preference for easy-to-use products.

Methodology

Data was obtained from an online study of choices of hypothetical DVD recorders. Respondents evaluated two unlabelled DVD recorders, each described by six features: ease-of-use (2 stars; 4 stars), simultaneous record & play (yes; no), hard drive capacity (12 hrs.; 25 hrs.), navigation system/speed (Rapid^{TM}/Regular; NavQwik^{TM}) and price ($899; $1099). Rather than obtaining evaluations on all 2^6x2^6 pair combinations, a resolution IV fractional factorial 16 row design (Montgomery 1984) described one alternative and its fold-over described the second. This optimises statistical efficiency and allows estimation of main effects and two-way interactions (Burgess and Street 2003).

As per online shopping environments, respondents were given information on all features, sourced from SmartChoice.com, a hypothetical independent organization. Respondents were informed that "SmartChoice's goal is to provide consumers a guide to help you make the correct choice, preventing you from being misled by retailers or manufacturers." Products were described in their "ease-of-use" via a star rating with respondents told "Smart Choice has interviewed hundreds of consumers about their experiences with various DVD recorders to compile this star rating. Quite simply, more stars means the product is easier to use." After reading about the features, respondents evaluated all sixteen sets, indicating a preferred option and if they would buy it. Demographic and behavioural information was then collected.

Results

Recruited via an online panel, 496 useable responses were obtained, with a broad representation of consumers. 52.2% were female, and mean age of 40.4 (standard deviation of 15.12) years. Only six percent of respondents did not own a DVD player. 79% of respondents owned a DVD player only and 15% owned both a player and recorder. One person owned a recorder but not a player. A multinomial logit model estimated the probability of choice as a

function of performance characteristics of options and respondent characteristics (see Table 1). Since alternatives were unlabelled, generic parameters describe the impact of product features. Covariates were interacted with all main effect product features. While our interest is only the parameters involving the ease-of-use attribute, all interactions are included in the model to minimise bias due to preference heterogeneity (Hutchinson et al. 2000).

Table 1: Model Estimates

Coefficient	Estimate	s.e.	t-stat.	p-value	
Propensity to Buy	-0.0961	0.0200	-4.7932	0	**
Ease of Use (EOU)	0.2780	0.0250	11.1178	0	**
Simultaneous Record and Play	0.5450	0.0150	36.2719	0	**
Hard Drive Capacity	0.1959	0.0147	13.3117	0	**
Navigation Search System	0.0137	0.0146	0.9342	0.3502	
Price	-0.2443	0.0148	-16.5485	0	**
EOU x Age	0.0598	0.0140	4.2577	0	**
EOU x Age squared	0.0205	0.0152	1.3489	0.1774	
EOU x Income	0.0196	0.0143	1.3746	0.1693	
EOU x Income squared	-0.0027	0.0124	-0.2183	0.8272	
EOU x Aware	0.0465	0.0182	2.5529	0.0107	**
EOU x Interest	0.0160	0.0183	0.8737	0.3823	
EOU x Desire	-0.0397	0.0196	-2.0239	0.0430	**
EOU x Action†	-0.0228	0.0187	-1.2193	0.2228	
EOU x Early leaver	-0.0549	0.0245	-2.2451	0.0248	**
EOU x High school only	-0.0119	0.0189	-0.6300	0.5287	
EOU x Trade, diploma, etc.	0.0368	0.0176	2.0931	0.0363	**
EOU x University†	0.0300	0.0203	1.4754	0.1401	
EOU x Male	-0.0325	0.0116	-2.7949	0.0052	**
EOU x Male x Age	0.0237	0.0133	1.7838	0.0745	*
EOU x Dependent children	-0.0160	0.0127	-1.2595	0.2078	
EOU x Own DVD player	0.0023	0.0222	0.1057	0.9158	

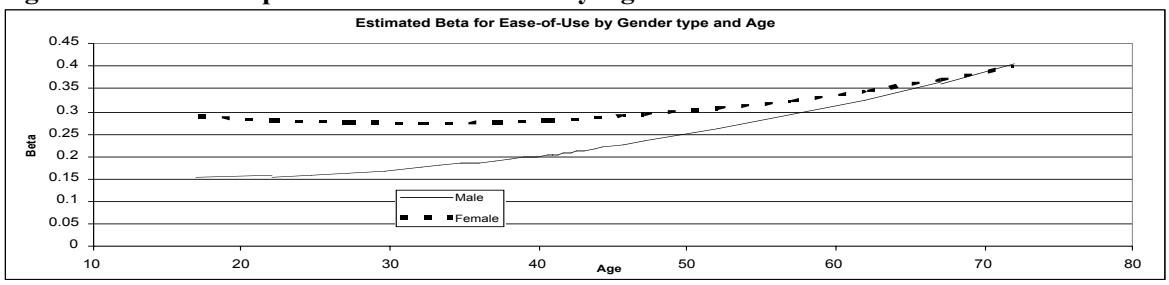
† - base level, implied estimate shown; * - significant at .10 level; ** - significant at .05 level;
Log-L (0): -16502.4 ; Log-L model: -13985.5; McFadden Pseudo R-square: 0.1525
Note: The model contains 85 estimates. For brevity, only relevant estimates are reported. Remaining parameters refer to two-way interactions between design variables (e.g., SRPxHDC); and interactions between remaining design variables and covariates (e.g., SRPxAge). All variables are effects coded.

On average, people prefer products rated higher in ease of use (t=11.18), however, this feature is not as important as simultaneous record & play (t=36.27) or hard drive capacity (t=13.31). No significant two-way interactions between features were observed. A useful behavioural measure of importance is willingness to pay. Using a measure constructed in the probability space (Burke 2004), on average, consumers are willing to pay $227.59 more for a product four-star rated in ease-of-use relative to an identical two-star rated product.

The results indicate heterogeneity exists in preference for ease-of-use as indicated by significant interactions between the design variable, ease-of-use, and covariates. Income, whether one had dependent children living at home, and characteristics of DVD player ownership had no significant impact on moderating the evaluation of ease-of-use. Interactions relating to age, gender, education and category awareness were significant and now discussed.

Age was modelled using mean centred orthogonal linear and quadratic polynomials. A significantly positive linear effect (t=4.25) but insignificant non-linear term (t=1.34), suggests older people prefer easier to use products relative to younger people. Males place less value on EOU (t=-2.79). The effect of gender, however, depends on age, with a significant interaction at the 90% level between EOU, gender and age (t=1.78). This implies that differences in evaluation of EOU due to gender are not significant in older people (Figure 1).

Figure 1: Relative Importance of Ease-of-Use by Age and Gender



Ease of use is sought after by those educated relative to those less educated. Preference also relates to an individual's position in a hierarchy of effects model of category knowledge. People in earlier stages of adoption (awareness) are more likely to seek out easier to use products (t=2.55); those intending to buy (desire) give it significantly less value (t=-2.02); and those already purchasing (action) devalue its importance, although this is insignificant.

Discussion and Conclusion

On average, all persons prefer easier to use products but those more likely to seek out such products, are likely to be older; be female amongst younger consumers; be more educated; and have little category knowledge. The findings are consistent with previous studies (e.g., Selwyn et al. 2003) in which older persons are more resistant to technologies seeking mechanisms by which their discomfort can be overcome. The results indicate an inverse relationship between product category knowledge and more pronounced requirement for products that encompass simplicity. In turn, this supports the proposition implicit in Alba and Hutchinson (1987) that without category knowledge, either via a lack of experience and/or limited expertise, one is more inhibited in one's ability to use and enjoy the product. In turn, there may be strategic value for manufacturers to develop options differentiated on aspects of ease of use, targeting consumers buying products in the market for the first time. It was not conclusive, however, that purchases in related product categories provide such knowledge. Specifically, ownership of a DVD player did not moderate the average desire for ease-of-use. Psychological barriers relating to usability may not be overcome simply by owning products in a similar product category (Peracchio and Tybout 1986). Indeed, it is likely that ownership, as measured in this study, does not constitute an accurate portrayal of which psychological barriers still exist. Familiarity and expertise, as offered by Alba and Hutchinson, in both the target (DVD recorder) and related (DVD player) category may provide a superior mechanism to assess barriers and subsequent demand to remove such barriers. That is, future research would be better served by including dimensions of expertise, not just ownership, for both the target and related product categories examined. In addition, our results must be viewed with caution since the effects aforementioned relate to deviation from the average consumer and in this study a high prevalence of ownership in the related category of DVD players existed.

In relation to other effects, those more educated may seek ease of use due to time constraints and/or frustrations with technology experienced in employment. The less educated may be less equipped to assess risk/uncertainty or be overly confident, hence, not requiring easier to use options. Overconfidence may also explain effects relating to younger males. In any case, the empirical results warrant investigation to determine underlying reasons for why certain characteristics determine preference for ease of use. Managerially, the results point to significant differentiation and segmentation strategies, as well as obvious calls for new product development to foster user-centred design philosophies.

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