Avoiding the Buyer's Fallacy: Consumer Perceptions of Products Before Purchase

By

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Abstract

Consumers are motivated to find the products that will provide the greatest benefit; however, choosing the right product is not an easy task. Consumers must choose between a myriad of products with varying features despite limited information and experience with their use. The factors that seem important at the time of purchase can be very different from what actually makes a person happy with owning and using a product. In this dissertation, I propose that consumers commit a *Buyer's Fallacy* by misjudging which product attributes will be most influential regarding their satisfaction with a product. Specifically, when deciding which product to buy, consumers often choose products with many added features offering greater functionality. However, added features can decrease a product's ease of use, and lead to less satisfaction after using the product, a process known as *feature fatigue* (Thompson, Hamilton, & Rust, 2005). This dissertation addresses how consumers demonstrate the Buyer's Fallacy by overlooking ease of use at the time of purchase, and how consumers sometimes avoid this judgment problem. Through three projects, I establish the following: 1) Ease of use is a major factor in consumer satisfaction as reported through consumer-provided online product reviews, but different product design attributes influence the same respondents' product recommendations for others; 2) Older adults show a reduction in the Buyer's Fallacy because they are more likely than younger people to focus on avoiding the negative impact of additional features on ease of use; 3) Consumers can avoid the Buyer's Fallacy by focusing on usability through a visual representation of a product's interface and features. These findings can help improve consumer decision making, and have implications for product marketing.

Chapter 1: Introduction

Consumers are faced with an exceedingly difficult decision: how to choose the product with which they will be most satisfied. It is not an easy question to answer. The market is crowded with thousands of products and brands with different attributes, features, and descriptions. Consumers must take what little information they have available, such as information in the store or in online descriptions, and make judgments about which product will best suit their needs. It is often difficult to foresee how one is going to use a product, and the factors that seem important at the time of purchase can differ from those that influence whether one is happy with their purchase. The result is consumers who are often unhappy with the product that they had purchased.

When staring at a shelf of competing products, a consumer may have a variety of questions flowing through their head. How will I use this product? What do I need it to be able to do? Is it worth paying more for more features? Will I regret the choice I make? It is often nearly impossible to accurately answer these questions, yet these are the questions that determine which product one chooses. The buyer can do little beyond making guesses and estimations of which product will be best for their needs. For example, a consumer living in Seattle may not think they need a 4-wheel drive vehicle, but they may recognize its value when on ski trips in the winter months. After purchase, the laptop we thought was the best in the store is too slow, the fashionable cell phone has terrible battery life, and the DVR we planned to use daily is rarely turned on.

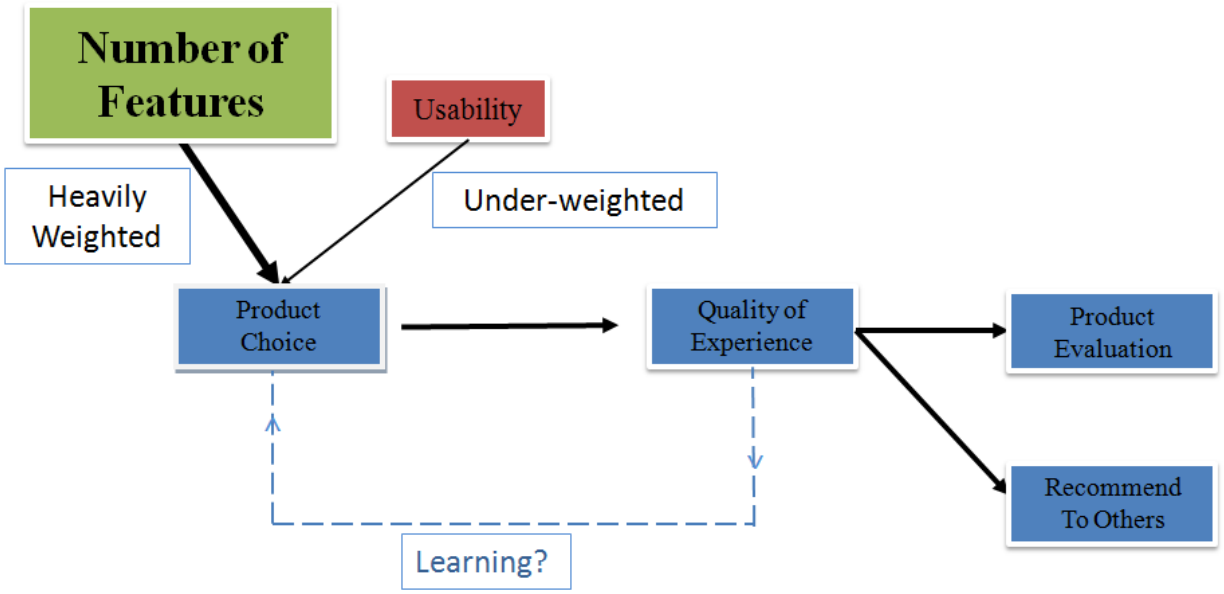
Living with a product involves experience that cannot be known when standing in the store or hovering with a mouse over an online shopping cart. Solving purchase problems is one of the most important things a consumer can do to protect their resources. Ultimately, the goal when buying any product is to improve one's life, and the best way to do that is to buy the

product that matches one's needs. Consumers waste money, time, and add stress to their lives when the wrong products come home. Understanding *how* consumers are choosing, and what can be done to help, is of great importance; however, little research has touched this subject. Too often, the emphasis in marketing is making the initial sale, ignoring the consumer satisfaction after using the product.

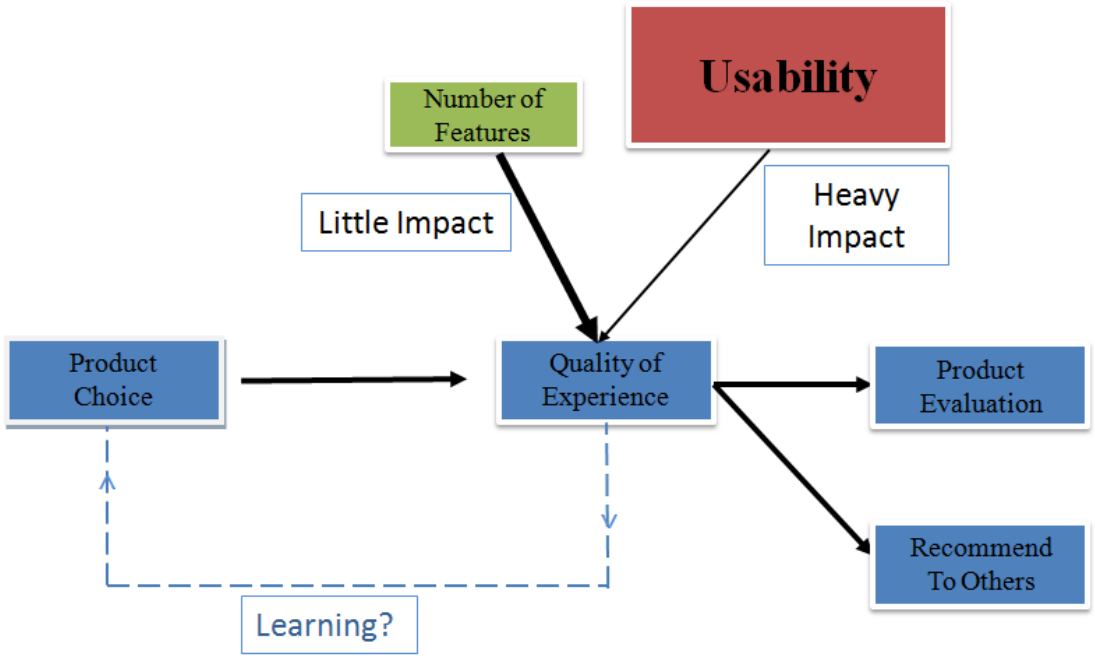
However, this strategy is short-sighted. For example, imagine a consumer who needs to purchase a simple digital athletic watch for its stopwatch functionality. Upon arriving at the store, the consumer is attracted to a watch containing many additional features, such as a heart rate monitor and calorie counter. After buying the watch, the consumer experiences the usability struggles and frustration from the additional steps and menus on the watch. It is only after using it that the consumer realizes a simple watch, which was less appealing at the time of purchase, would have actually been the better choice. The consumer incorrectly predicted which attributes are most important to their satisfaction with the product. These outcomes do have consequences for marketers and designers because unhappy consumers express their dissatisfaction through negative word-of-mouth, costly product returns, and switching to competing brands.

Figure 1-1 illustrates this example. In the figure, Product Choice has two factors which affect it: Usability and the Number of Features. Usability is often "under-weighted," meaning that consumers are putting less importance and focus on usability when making a purchase decision. Even if they are aware that usability is poor, it may have little impact on their choice. Number of Features is weighted heavily before purchase, with a large impact on product choice. These weightings lead to a product choice high on features and low on usability. But once the consumer has experience with the product, poor usability tends to lead to problems using the product and less satisfied consumers. A negative experience influences both evaluations of the product and recommendations to others. Choosing the wrong product can be costly both in terms of the financial burden of a product that is no longer desirable, and also in stress and frustration caused by difficult to use products. The problem is compounded in an online shopping environment where consumers never even touch the products prior to making a purchase. However, it is possible that after negative product experiences, learning may

occur; indeed, consumers with more experience and motivation may manage to avoid repeating the same weighting error again in the future.



A. Before Product Purchase



B. After Product Use

Figure 1-1 Influence of Product Attributes Before (top panel) and After (lower panel) Product Purchase.

The figure above demonstrates how two factors – usability and the number of features – trade off; that is, as one increases, the other decreases. Adding more features by necessity makes it more difficult to use the product. However, this model can be expanded to account for other factors influencing purchases. Attributes such as design, price, marketing, social identity, and others could result in differences between pre- and post-purchase weightings.

Consider affective forecasting effects, where people are generally poor predictors of later emotional states (Wilson & Gilbert, 2003), such as how they may feel one year after winning the lottery. In the same way, I propose that consumers are poor predictors of which product attributes will impact their satisfaction with a product. Using a lens-model approach, one can compare what a consumer predicts are important factors in their decision, and which factors are actually important once the product is used (Brunswick 1955) (see Figure 1-2). The factors listed in the boxes in the middle of Figure 1-2 are examples of some of the factors influencing purchase decisions. The consumer applies different weightings (indicated with X_1, Y_1, etc) to these factors based on their beliefs of what is important when making the product selection (left side of the figure). The right side of the figure demonstrates how each of the factors affect the actual experience with the product. If a consumer were to perfectly predict which attributes would be most influential for their product satisfaction, the weightings on each side of the figure would be the same. Figure 1-2 expands upon Figure 1-1 by demonstrating how consumer weightings when making a product choice can differ from the ideal weightings for the many factors that influence product choice.

For example, a consumer may be willing to pay more for a laptop with a 17 inch screen size over one with a 15 inch screen, believing that the larger screen makes for a better product. It is only once the consumer has bought the laptop that they experience two factors they had not correctly accounted for at the time of purchase: the increased difficulty of carrying a larger computer, and its reduced battery life. The consumer was primarily focused on the desirability of the larger screen when making the purchase decision, and was unable to account for the other factors that made the smaller screen size the better choice.

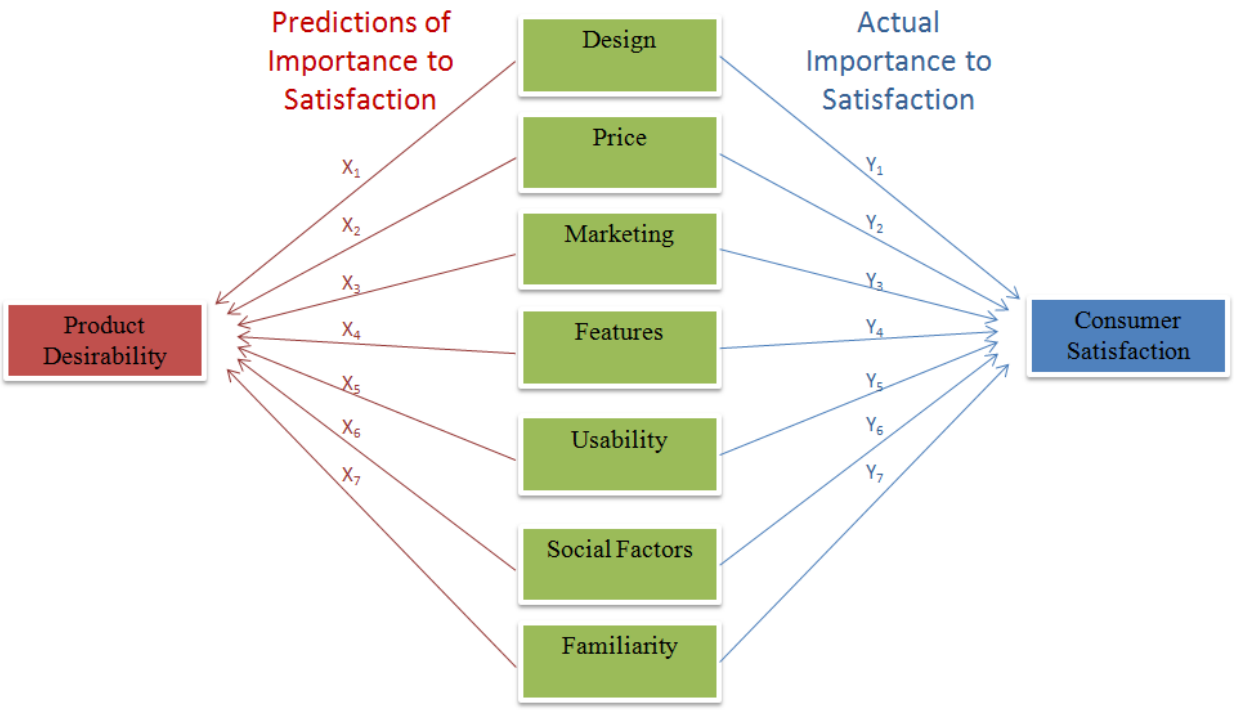


Figure 1-2: Diagram of Buyer's Fallacy

When a consumer is looking at a row of similar products on a shelf, what product design attributes make one product more attractive, and will that product actually be best for the consumer? I propose that consumers commit the *Buyer's Fallacy* by misjudging which attributes will actually be most influential on their satisfaction with a product. The B*uyer's Fallacy* states that consumers weight the importance of product attributes differently when evaluating a product than when using the product. The *Buyer's Fallacy* provides one explanation for why consumers can be unhappy with products they purchased. Attributes that seem important when making a purchase decision can in fact have little importance when using the product, while attributes that did not seem to matter much can actually be very influential on product satisfaction. Figure 1-2 demonstrates the Buyer's Fallacy through the differences in the weightings (e.g. X_1, Y_1) when making a product choice and in customer satisfaction after using a product.

The weights placed on attributes could vary for a number of reasons. The use of a heuristic could lead to focusing on one attribute too heavily, or insufficiently. A lack of experience or knowledge could cause factors to fail to come to mind when making evaluations. And overconfidence in one's abilities could cause a person to underweight attributes that they recognize may cause problems. There could also be several ways that the Buyer's Fallacy may be mitigated, such as by creating interventions that allow consumers to focus their attention on critical attributes. For example, a salesperson telling a customer that they strongly recommend buying products which are easy to use could influence attribute weightings. Repeated purchases that result in learning could also potentially reduce the Buyer's Fallacy in some instances. For example, highly experienced or motivated consumers may learn to change their weightings over time.

As the affective forecasting literature shows (Wilson & Gilbert, 2003), discrepancies between consumers' perceptions and later experiences are relatively common. Consumer choice is often based on heuristics, basic "rules of thumb" used to simplify a decision process. For example, consumers tend to follow a heuristic by assuming that more expensive products are better, an effect known as the Price Heuristic (Mitra, 1995). Although this heuristic may hold true in some situations, there are many cases where this heuristic leads to a poor choice, and a less expensive model (such as a generic) can be of equivalent or superior quality.

Although there are many factors that could lead to a Buyer's Fallacy, this dissertation focuses on the role of ease of use and the number of product features in product choices. Consumers often commit the Buyer's Fallacy by under-weighting ease of use when evaluating a product, and focus instead on the number of features available with a product.

In previous research, consumers have been found to weight ease of use as less important prior to using a product than after use (Thompson, Hamilton, & Rust, 2005; Lee & Koubek, 2010). These results suggest that consumers undervalue the importance of ease of use prior to using a product and that ease of use only becomes an important factor for consumers after using a product.

Undervaluing the importance of ease of use may not be the only problem that consumers face when evaluating a product. Evidence suggests that consumers may also be

poor judges of product ease of use. Younger adults were found to be relatively poor judges of which aspects of a product design would impact ease of use (Stephens, Carswell, & Schumacher, 2006). Other evidence suggests that perceptions of ease of use are strongly influenced by aesthetics (Tractinsky, Katz, Ikar, 2000). Consumers tend to be over confident in their ability to learn how to use a product leading to them over-predict the ease of use of a product prior to use (Billeter, Kalra, & Loewenstein, 2010).

Hence, the problem with consumer perceptions of ease of use appears to be both underweighting of ease of use prior to use as well as a relatively poor ability to judge ease of use. Consumers are committing what we refer to as the *Buyer's fallacy* because they are misjudging and undervaluing ease of use when making product judgments and are instead focusing on other factors such as the number of product features.

Research in marketing has established that consumers have a tendency to choose products with a higher number of features (e.g. Thompson, Hamilton, & Rust, 2005; Sela & Berger, 2012). However, too many features tend to cause usability problems, resulting in consumers who are less happy with their selection. This effect, known as *feature fatigu*e, describes one way in which the Buyer's Fallacy can lead to less satisfied customers after using a product. In one study using a digital video player, consumers used models with either 7, 14 or 21 features (Thompson, et al., 2005). Prior to use, participants rated the video player more favorably with more features. After using the product, the models with many features were evaluated less favorably and the models with fewer features were evaluated more favorably. Participants who used the models with fewer features also were more confident in their product choice and rated the choice as less difficult.

The Buyer's Fallacy, overlooking ease of use while focusing on other features at the time of purchase in this case, has downstream consequences after consumers use products particularly through feature fatigue. Learning to use new features requires time and cognitive effort, so the features which consumers initially paid more for may go unused when avoiding the toll of learning a new feature (Meyer, Zhao, & Han, 2008). More features can also cause specific usability problems as interface use becomes more difficult with increasing features. Cognitive effort increases as more features give rise to more menus, steps, and effort to find a

desired feature (Heo, Ham, Park, Song, & Yoon, 2008; Hicks, 1952). Physical challenges can also arise if buttons and text become smaller to accommodate more features (Fitts, 1952).

Construal level theory is one potential way to explain why consumers are subject to the Buyer's Fallacy. According to construal level theory, events or objects which are further away psychologically (temporally, spatially, or socially) are represented abstractedly and events or objects which are psychologically closer are represented more concretely (Liberman & Trope, 1998). Taking a concrete construal tends to cause a focus on feasibility and therefore a preference for products with higher ease of use. Taking an abstract construal tends to cause a focus on product desirability (Hamilton & Rust, 2007). Prior to using a product, consumers have a more abstract construal and therefore focus more on desirability (e.g. features, aesthetics). Using a product leads to concrete construals and a focus on feasibility (e.g. ease of use). Therefore, the low weighting that ease of use receives at the time of product evaluation may be explained by construal theory.

Another explanation for consumers ignoring ease of use by choosing products with many features is through perceptions of product capabilities (Sela & Berger, 2012). Hedonic products are those which are consumed for enjoyment, and utilitarian products are those consumed for usefulness. Since hedonic products are viewed as relatively lacking in capabilities, increasing the number of features, which increases perceived capabilities, has a larger impact on hedonic products than utilitarian products (Sela & Berger, 2012). The effect was found to be strongest when participants faced time constraints, and the effect was stronger for people low in need for cognition. These results suggested that the attraction towards products with many features is being processed heuristically and based on the belief that more features increases a products capabilities.

Consumers also focus on attributes such as aesthetics and social benefits when selecting a product instead of focusing on ease of use (Thompson & Norton, 2011). Owning a product with many features can help the product user to look more affluent, "tech savvy," and open to new experiences. Participants in a study were more likely to choose products with many features when their choices were made public (Thompson & Norton, 2011). However, participants avoided products with more features when they were told they would have to

demonstrate using the product in front of others, an exercise which could have negative social effects with products that are not easy to use. Another study found that aesthetics but not ease of use had a significant effect on consumer preferences prior to using a website; however, after using the product, ease of use was then also evaluated as an important attribute for consumers (Lee & Koubek, 2010).

People try to maximize utility. This leads to the common belief that one benefits from buying the product with the most features since each feature would add to the potential utility, assuming the product is within budget constraints. The sentiment is reiterated through popular culture and marketing. AT&T launched a marketing campaign with the slogan "more is better." The *more is better* culture is also displayed through product bundling, offering multiple components together for a lower price, and with "supersizing" products, increasing the amount purchased for a lower per unit price. It seems unlikely that consumers could benefit from products offering *less* in marketplace consistently promoting the benefits of *more*. A focus on the potential capabilities of additional features comes naturally when evaluating products because consumers are focused on maximizing what a product can add to their life. Marketers also focus on the potential benefits of more features when selling a product.

However, as the number of features increases, product usability tends to decrease, leading to less satisfied consumers after using the product. Most consumers do not, however, appear to learn from this mistake, and tend to repeat it in future purchase decisions. Using the framework of the Buyer's Fallacy, the tradeoff of excessive product features can be approached by examining how these features affect the experience of product use. When using a product, consumers often do not enjoy the increased capabilities as predicted. Learning to use new features takes time and cognitive effort that consumers are often not willing to spend. This means that those additional capabilities may never even get used. In addition, consumers often do not anticipate that additional features can actually have a *negative* effect on the product. Excessive features increase the complexity of the product interface with more buttons, menus, or longer search time to find them. Therefore, the features that consumers may perceive as increasing the usefulness of the product may actually be decreasing the overall ease of use of the product.

This dissertation addresses three main research questions related to the Buyer's Fallacy focusing on ease of use and the number of product features: Study 1 establishes that the Buyer's Fallacy impacts consumer evaluations and recommendations. Study 2 identifies a moderating factor of the Buyer's Fallacy based on consumer age. Study 3 creates an intervention to help consumers avoid the Buyer's Fallacy. Though I focus on usability, the Buyer's Fallacy framework of discrepancies between perceived importance and experienced importance can apply to a number of other attributes. For example, consumers could initially perceive products that have to be assembled as a negative factor; however, the assembly process may actually make the product significantly more satisfying to the consumer (Norton, Mochon, & Ariely, 2012). Aiding consumer decision making also has significant benefits for marketers who can better match customers with their products, potentially leading to increased brand loyalty. Product returns and negative word-of-mouth both have serious fiscal consequences that can be avoided by better matching consumers with products with which they will be satisfied.

The current literature in feature fatigue, consumer perceptions, and product design gives rise to some key questions addressed in this dissertation. Currently, there is little field work into what product design aspects affect consumer perceptions of products. The majority of work has been done in lab settings, and has typically examined the tradeoffs between two attributes. It is yet to be determined whether ease of use or other attributes are important predictors of product evaluations in the real world, where there are more factors, interactions, and products are used over a longer course of time. In order to improve consumer judgments of products based on their design, I first aim to establish which design attributes are most influential on one's satisfaction. I do this by examining product reviews to determine which product design attributes are most influential on consumer evaluation ratings. The research design also allows us to further examine construal level theory on product choice by comparing how attributes affecting evaluations differ from attributes affecting recommendations for others.

The literature to this point has suggested that people are generally prone to the Buyer's Fallacy, ignoring ease of use while focusing on other attributes such as the number of product

features. Little research has suggested whether some groups are able to avoid the negative effects of the Buyer's Fallacy by initially focusing on ease of use when choosing products. No research has been done on how age affects the Buyer's Fallacy. I address this question by examining how older adults differ from younger adults in their choice of products varying on the number of features. I aim to determine if older adults may be better at avoiding the Buyer's Fallacy, and why this may be.

The third major gap in the literature I identified is a lack of actionable advice on how consumers and marketers can avoid the Buyer's Fallacy. My work addresses this need by establishing a visual representation of ease of use to allow consumers to better evaluate the usability of a product.

Knowledge of the Buyer's Fallacy can help consumers better navigate the marketplace and avoid frustrating product experiences. A look at frustrated consumer reviews or the return line at a store is a stark reminder of just how often consumers choose products with which they are unhappy. Many people face stress and anxiety spending limited money on purchases, a situation that makes it essential that products will not cause frustration. We focus on the Buyer's Fallacy related to the attributes of ease of use and number of features in this dissertation as usability is one of the largest factors causing consumers to be unhappy with products that consumer could avoid through improved product choice. Discovering how consumers can avoid purchasing products they will not enjoy is a critical component to reducing many daily stressors.

Chapter 2: How Product Attributes Influence Online Cell Phone Reviews

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Abstract

Online product reviews are an important source of "word-of-mouth" advice on purchases. We examine whether online reviews reveal inconsistencies in product preferences; in particular, when consumers evaluate a product positively, do they always recommend its purchase? Discrepancies between product evaluations and recommendations can be considered a type of "preference reversal," potentially arising from differences in attribute weighting when making judgments. We analyzed product reviews posted publically online, and compared evaluations and purchase recommendations for cell phone products and their attributes (e.g., ease of use, design, and display). The results indicate that evaluation and recommendation judgments are influenced by different attributes. Evaluations were found to be heavily influenced by perceptions of ease of use, whereas purchase recommendations were influenced by observable attributes such as design. These findings have implications for "word-of-mouth" marketing, product design and services that rely on consumer recommendations.

Background

Consumers have always spread "word-of-mouth" advice about products and services for purchase (Dierkes, Bichler, & Krishnan, 2011); but, with the growth of the internet and online retailers such as Amazon.com, consumers are increasingly receiving product information through consumer reviews posted online (Hennig-Thurau, Gwinner, Walsh, & Gremler, 2004; Li & Zhan, 2011). Fifty-seven percent of respondents were found to consult online reviews prior to purchasing consumer electronics (Nielson Company, 2010). Consumer reviews can have a significant impact on online purchases given that the product cannot be physically handled as it can in the retail environment (Smith, Menon, & Sivakumar, 2005). For marketers, there is significant value in understanding the factors influencing evaluations and recommendations for a product. Prior research has analyzed how online reviews vary based on product type, review depth, and review quality (Mudambi & Schuff, 2010). However, little is known about the judgment processes underlying online evaluations and recommendations.

In practice, consumers' evaluations of products may not always line up with their recommendations. A product that consumers say they like does not necessarily receive positive word-of-mouth, perhaps accounting for why some products test well before launch but then fail to catch on. Do people always *like* what they recommend to others? For example, consider the articles, "*Why I love the Galaxy Nexus but can't recommend it,"* (Hiner, 2011) and "*Didn't like it, would still recommend it,*" (*A.V. Club,* Aug, 2011). In both cases, reviewers wrote about movies or products that they did not enjoy but still recommended to others and vice versa. These inconsistencies suggest one's personal evaluation of products can indeed differ from decisions to recommend them. But, what accounts for differences in these two judgments? Given the increasing availability of consumer reviews, it is important to understand how evaluations and recommendations are created.

Product reviews often include overall evaluations (such as a 1 to 5 "star" rating scale) to represent opinions about the product (Li & Zhan, 2011). Product reviews may also include ratings of individual product attributes (e.g. Bestbuy.com). Other aspects of reviews include qualitative descriptions of one's experience with the product, and whether the consumer would recommend the product to others. One might expect an evaluation, or rating, to be similar to

the recommendation of the product; however, different attribute weightings may be applied when consumers consider products for themselves versus others, potentially leading to differences between evaluations and recommendations.

Attributes Affecting Product Evaluation

Standard multi-attribute utility theory suggests that different attributes, such as value, brand, aesthetics, functionality, social desirability, ease of use, and expectations, combine to form an evaluation of a product (Huber, 1974). Some research indicates that these attribute weightings can change for an individual in different situations. Two components of product evaluation that have been found to change weightings are ease of use and the number of features. The weighting of these two attributes has been shown to change with product use (Sela & Berger, 2012; Thompson, Hamilton, & Rust, 2005). When making an evaluation at the time of purchase, the number of features was weighted more heavily, and perceived ease of use was weighted less heavily. After using the product, these valuations reversed; that is, ease of use was weighted more heavily than number of features (Thompson, Hamilton, & Rust, 2005). Aesthetics and usability have also been shown to change attribute weightings in different situations (Lee & Koubek, 2010). Before use, consumer preference was significantly affected by aesthetics, but only slightly affected by usability; after use, both usability and aesthetics were found to have a significant effect on product evaluation. So, previous research suggests that product attribute weightings can change; in these examples, a product may be evaluated by different criteria at time of purchase than after use.

In this paper, we extend this idea to evaluation and recommendation; specifically, we hypothesize that different product attributes are weighted more heavily when forming an evaluation than when making a recommendation. We consider a model where the judgment of each attribute relates to both the overall product evaluation (based on one's experiences) and one's recommendation for others. We employ a variant of Brunswik's Lens Model (1955) using two correlated dependent variables that are each comprised of five attributes. Product reviewers may apply different weighting coefficients depending on whether they are evaluating or recommending the product (see Figure 2-1).

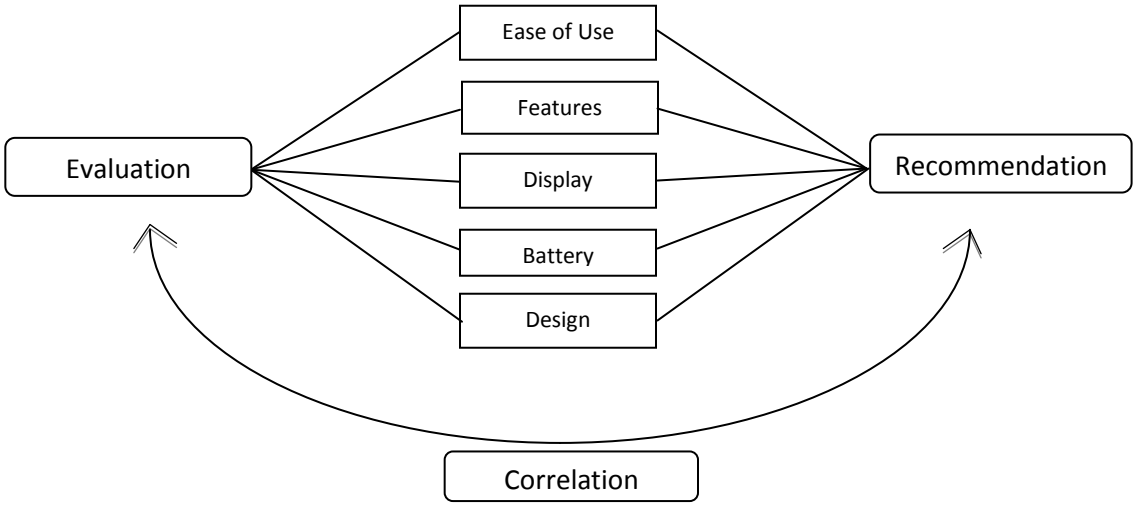

Figure 2-1. Lens Model Weightings: Overall product evaluations and recommendations for others may involve applying different weights to product attributes like "Ease of use" and "Features."

For example, consider a college student evaluating her experience with a cell phone. This individual rarely makes phone calls, and uses the phone almost exclusively for internet access and texting. Her overall evaluation of the phone is then strongly influenced by these features. However, when she is considering whether to recommend her phone to others, she notes that others may make more calls, and be concerned about call quality. Therefore, she may decide not to recommend the phone for others despite her own satisfaction with the product. Such separate evaluations for oneself vs. others has important implications for how we conceptualize online reviews and recommendations systems.

Self vs. Other Judgments

Prior studies have documented that one's own choice may be inconsistent with one's recommendation for others. When choosing between two job options, people chose a different job option if they were making a recommendation for a friend vs. choosing for themselves (Kray & Gonzalez, 1999). Similarly, in risk-taking behavior involving approaching a relationship interest, people were more willing to recommend that a friend should take the risk

(Beisswanger et al., 2003). Self-other differences have also been found in medical decisions (Zikmund-Fisher, Sarr, Fagerlin, & Ubel, 2006), waiting time decisions (Krishnamurthy & Kumar, 2002), and use of confirmatory information search (Jonas, Schulz-Hardt, & Fey, 2005). This difference in judgments for oneself vs. others does not appear to be a matter of expending lower effort for recommendations; rather, it seems the judge recognizes that other's preferences can be different from their own (Kray, 2000). One explanation offered is that attributes are more evenly weighted when making a choice for oneself, whereas a prominent attribute is emphasized when making a recommendation (Kray & Gonzalez, 1999). Based on these results, we expect that a prominent attribute will receive the highest weighting in recommendation, but attributes will be given more even weighting in evaluation.

But which attribute will be most important in a recommendation? Changes in attribute weighting based on differing situations has been addressed by construal level theory (Castaño, Sujan, Kacker, & Sujan, 2008; Trope, Liberman, & Wakslak, 2007). According to this theory, events or objects that are further away psychologically (temporally, spatially, or socially) are represented abstractly, while events or objects that are "psychologically closer" are represented more concretely. Product evaluations may induce more concrete construals, whereas the more distant task of recommendation for others may lead to more abstract construals (Liberman & Trope, 1998). Concrete construals may lead to greater emphasis on feasibility considerations, such as Ease of use, while abstract construals may lead to a greater emphasis on desirability considerations, such as Features.

Hamilton & Thompson (2007) support this construal theory prediction. They observed that after using a product, people tended to prefer products that they deemed to be more concrete, with high feasibility (ease of use) yet low desirability (fewer features). When choosing for others, people take a more abstract mental representation and are relatively less influenced by ease of use following direct product experience. For evaluations, people appear to prefer products based on concrete, feasibility concerns, such as ease of use. Choices for others, on the other hand, were more weighted toward desirability concerns such as the number of features.

An alternative prediction emerges from the evaluability hypothesis, proposed as an explanation for preference reversals in joint vs. separate evaluations (Bazerman, Moore,

Tenbrunsel, Wade-Benzoni, & Blount, 1999; Hsee, Loewenstein, Blount, & Bazerman, 1999). In a separate evaluation, when assessment of attribute quality can be difficult without a comparison, attributes that are easy to evaluate may receive greater weighting. The evaluability hypothesis suggests that recommendations, where preferences of the person receiving the recommendation can be ambiguous, will result in greater weighting on easily observable attributes of a product (i.e., the concrete attributes). Readily observable attributes are preferred in recommendations because they are easier to justify by direct observation. For a cell phone, these attributes would include aesthetics (Design) or desirable capabilities (Features).

Hence, the evaluability hypothesis predicts that recommendations will give more weight to observable attributes such as "design" and "features" because they can be justified to others, whereas construal theory predicts that evaluations will give more weight to concrete attributes which are easy to relate to oneself such as Ease of use. We designed a study to test these opposing predictions using a Lens Model formulation to guide our conceptual and analytic framework. We used public data available through product websites to examine whether the evaluation of a product differs when it is evaluated for one's own use or recommended to others. We focused on publically posted online product reviews of cell phones by consumers. The database contained an overall evaluation rating, a recommendation, and evaluations of individual product attributes. We analyzed how consumers weighted these individual attributes when providing product evaluations and recommendations.

Study 1: Cell Phones

Method

Cell phones were chosen as the target product because of its large, diverse consumer market and the wide range of models available. Cell phone reviews were obtained through the website of a major US cellular phone service provider. These reviews were posted publically by customers for different cell phone models with the intent of allowing other customers to gain knowledge from the experiences of previous and current users. The phones on the website were divided between smartphones with more features and greater processing power, and

non-smartphones with a wider range of physical interfaces and fewer capabilities. Non-smart phones were selected for Study 1. To reduce effects of a changing marketplace and new technologies, only reviews posted within the prior six months were considered. Six of the nine non-smartphones on the site were included in the study because they had a minimum of 120 different consumer reviews posted within the timeframe. 120 reviews were randomly selected from the posted database for each of the six phones. The phones included 3 different brands, and the models were varied, with 2 phones with purely touch screen keyboards, 3 phones with horizontally sliding keyboards, and 1 with a vertically sliding keyboard.

Many websites, such as Amazon.com, offer consumer-entered product evaluations using a 1 to 5 star scale, along with a qualitative product review in which consumers describe their product experience. This cell phone website used the same star rating system for the overall evaluation, and in addition, consumers were asked to post ratings on five specific attributes of cell phones: Features, Ease of Use, Battery, Display, and Design (see Figure 2-2). A text block allowed free-text entry of a qualitative description of the consumer experience.

Figure 2-2: Example of a Customer Review Used in the Study

Consumers also responded to the question, "Would you recommend this product to a friend" which allowed subjects to select either "yes" or "no." Additional information was recorded from the website, including age, gender, and type of use for the phone (e.g., texting, social networking, and mobile internet).

Results

The gender distribution was 61% female and 28.3% male, with 10.7% unlisted. Reviewers reported their age in ranges on a dropdown menu: 21.1% were between ages 13-17, 16.5% were between 18-25, 14.4% were 26-35, 16.3% were 36-45, 15.8% were 46-55, 5.4% were 56+, and 10.4% were unlisted. Reviewers responded to four yes or no questions about phone usage: 33% selected yes for "heavy talker", 62% selected yes for "turbo texter", 11% selected "continuous surfer", and 18% selected "social networker" (reviewers could select more than one).

The overall evaluation for the six phones, the five attributes, and the percentage of participants recommending the phone are presented in Table 2-1. In these real-world data, evaluations are usually in the form of Likert scales while recommendations are typically on binary scales. We address this confound through statistical modeling.

Table 2-1: Product Rating Averages on 1-5 scale

	Overall Evaluation	*Features*	*Ease of Use*	*Battery*	*Display*	*Design*	*Percent Recommend*
Samsung Strive	4.1	4	4.2	4	4.2	4.1	82%
Pantech Ease	3.6	3.7	4	3.1	4	3.9	68%
Pantech Laser	3.6	3.8	4.1	2.8	4.1	4.1	63%
Samsung Evergreen	3.5	3.7	3.9	3.9	3.9	3.9	65%
Samsung Solstice	3.4	3.7	3.5	4	3.9	3.6	60%
HTC Freestyle	2.9	3.3	3.3	3.2	3.8	3.7	44%

A cross-tabulation of evaluations and recommendations shows that when the overall evaluation was 5 stars, 100% of the reviewers recommended the phone. With an overall evaluation of 4 stars, 95% of the reviewers recommended the phone. Recommendations dropped to 27% for phones with 3 star evaluations, and to 4% and 0% for phones with a 2 star evaluations and a 1 star evaluation, respectively. The point biserial correlation between evaluation and recommendation was .84, $X^2(4) = 573.7$, $p < 0.001$. This suggests that overall evaluation was significantly related to whether the phone was also recommended.

The results were then collapsed over all six phones, and a linear regression analysis was performed with overall evaluation as the dependent variable and the attribute ratings as

independent variables. All five attributes were significant predictors of the overall evaluation ($p < 0.01$), demonstrating that all were contributors to, and unique predictors, of the overall evaluation. Similar results were observed with proportional-odds ordinal regression.

A logistic regression was then performed on the binary recommendation data. Features, Ease of Use, Battery, and Design were all significant predictors ($p < 0.001$), and Display was a marginally significant predictor ($p = 0.071$). Similar results are observed when the nested structure of the data was included in the analysis (i.e., 120 reviews nested within 6 phones) through random intercept generalized linear regression models (identity function link for evaluation, logistic link function for recommendation), with the exception that for recommendation the Display variable is also statistically significant in this analysis, $p = 0.03$. This suggests that all five attributes were related to the decision about whether to recommend the phone.

Another analysis was performed using the seemingly unrelated regressions (SUR) framework to model the correlation between the evaluations and recommendations in the context of the full model. The results were the same as with the separate regressions. All five attributes were significant predictors ($p < 0.01$) of the overall evaluation, and four attributes (Features, Ease of Use, Battery, and Design) were significant predictors of the recommendations ($p < 0.001$), while Display was again marginally significant ($p = .061$). Thus, the findings from the separate regressions remain significant even after controlling for the correlation between evaluations and recommendations.

The previous analyses used a simple linear combination of main effect predictors. To examine the interactions among attribute judgments, we analyzed these data using a conditional tree algorithm that takes into account more complicated interactions between predictor variables than typically considered in multiple regression, as well as a model of the ordinal evaluation scale and the binary recommendation scale. We used the algorithm by Hothorn, Hornik and Zeileis (2006) as implemented in the *R*™ package *PARTY*. We included all five predictors, and used a Bonferroni correction in order to construct a conservative conditional tree. Each oval in the tree represents a predictor variable. The algorithm finds the optimal cut points for relevant predictors, and indicates the cut points as labels on the

branches. A Bonferroni corrected *p* value is provided next to each predictor variable. The first tree (see Figure 2-3) presents the results for the overall evaluation, and depicts a boxplot for the *n* participants who followed each path in the tree (*n* is printed above the boxplot). The top node predictor was Ease of Use, with a break point of three. When Ease of Use was ≤ 3, then Features was the second most important predictor; however, when Ease of Use was > 3, then Design emerged as the second most important predictor. The tree displayed in Figure 2-3 continues through one more branching process showing that all five variables contribute, with Ease of Use emerging as a key variable in predicting whether the median evaluation is high or low.

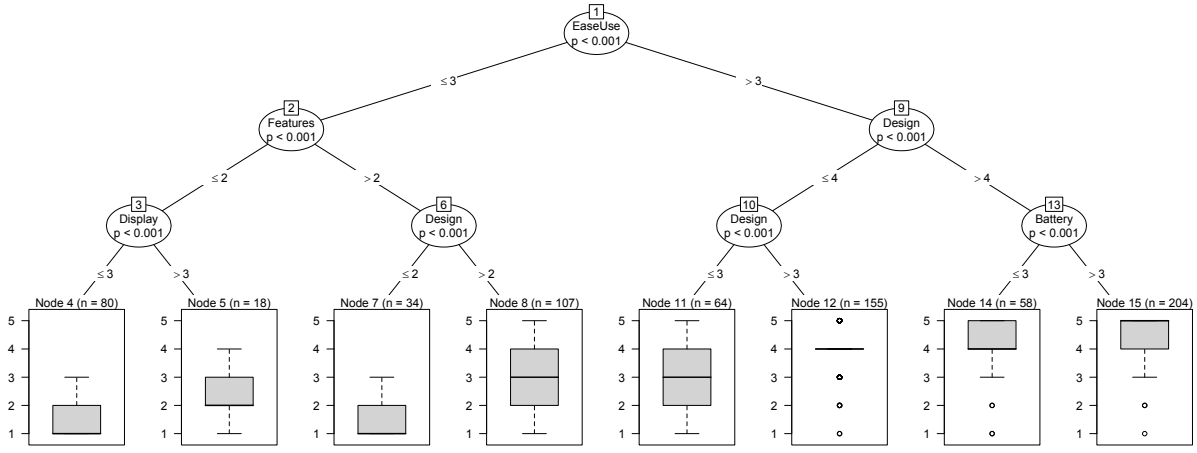

Figure 2-3: Tree Predicting Overall Evaluation

The second tree (see Figure 2-4) involves the recommendation variable (a binary variable), and includes a bar graph indicating the percentage of "no" responses at the end of each branching process. We found that Design becomes the most important predictor of recommendations, with Ease of Use and Features as the second and third most important predictors, respectively. This figure illustrates the complicated interaction patterns that tree analysis can detect. For example, for weak Designs that are perceived as Easy to Use (> 2), Features becomes the key variable determining whether the phone is recommended or not. Even a phone with a good Design (> 3) and reported to be Easy to Use (> 2) may not be recommended if the Features are not evaluated positively.

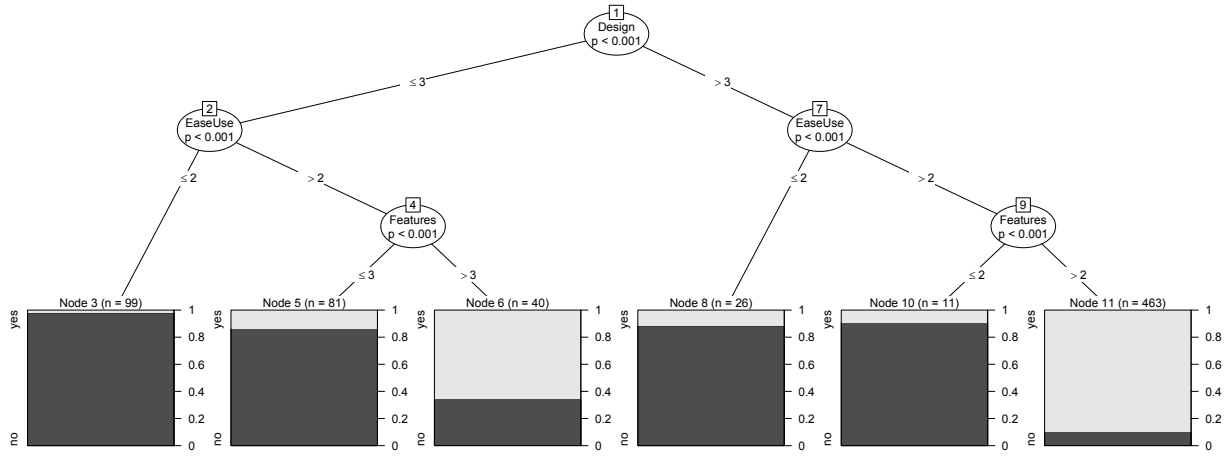

Figure 2-4: Tree Predicting Recommendation

For recommendations, Design was the first cut predictor, followed by Ease of Use at the second level, and finally Features.

These results show that reviewers used different weights and attributes depending on whether they were evaluating a product for themselves, or recommending it for others. We hypothesized that an even weighting of attributes would be used for evaluations, with a few primary attributes used for recommendations. The regression data shows some evidence for this hypothesis. All five attributes were significant predictors for evaluations, but only 4 out of 5 were significant for recommendations. The conditional tree algorithm, which demonstrated that all 5 attributes were used for evaluations, but only 3 attributes for recommendations, also supports this hypothesis.

Discussion

Based on construal theory, we predicted that evaluations would give more weight to concrete attributes easily related to oneself. The results show Ease of Use was the key predictor of evaluations, followed by Features and Design. For recommendations, the evaluability hypothesis predicted greater weight for easily justifiable, observable attributes, such as Design and Features. The results for recommendations partially support this prediction, with Design as the key predictor, followed by Ease of Use and Features. This latter finding is contradictory to a

construal level prediction that recommendations for others would focus on more abstract attributes.

Evaluating a product's Ease of Use requires experience using the product (Billeter, Kalra, & Loewenstein, 2011). Reviewers could view their ease of use experience as reflecting their own abilities, and therefore place less weight on it when considering recommendations for others. More observable attributes, such as Design and Features, may seem more important to consider when making recommendations to others.

One potential limitation of the study is that subjects could have interpreted terms such as "Design" and "Features" differently. A follow-up study asked 15 new participants to define each of the terms from the ratings task. We found that these definitions were consistent among individuals. "Design" was defined by most subjects as the "look and feel" of the phone, including aesthetics and "fit in one's hand." "Features" was defined as the capabilities of the phone beyond the basic calling functions (whether it had applications, a camera, internet access, etc). "Ease of Use" was defined as how quickly and easily one was able to complete and learn to perform tasks. "Battery" was defined as how long the battery lasts between charges. And "Display" was defined as screen brightness, clarity, and size. It appears people shared an understanding of the ratings task questions.

This study examined basic cell phones without the enhanced features of smartphone technology. In a second study, we repeated the methodology using smartphone products in order to determine whether the findings were generalizable to more sophisticated technical products.

Study 2: Smart Phones

Our predictions for discrepancies in evaluations and recommendations were the same for smartphones as for more basic phone products. Based on the evaluability hypothesis, we predicted that recommendations give more weight to observable attributes such as "design" and "features" because they can be justified to others. For evaluations, following construal theory, we predicted that evaluations give more weight to concrete attributes that are easy to relate to oneself.

Method

For study 2, smartphone reviews were collected using the same US cellular phone company website as in Study 1. One hundred and twenty reviews were recorded for each of 6 different models of phones. The phones represented 3 different manufacturers and 3 different operating systems. Four phones used the Android Operating System, 1 used the Windows Operating system, and 1 featured the Blackberry operating system. The method followed the randomized sampling of recent reviews described in Study 1.

Results

Reviewers were 38.8% female and 50.6% male (10.4% unlisted). Reviewers reported their age in ranges on a dropdown menu: 6.7% were between ages 13-17, 22.8% were between 18-25, 24.1% were 26-35, 18.4% were 36-45, 12.1% were 46-55, 6.5% were 56+ (9.5% were unlisted). Reviewers responded to four "yes or no" questions about phone usage: 37% selected "yes" for "heavy talker", 64% selected "yes" for "turbo texter", 60% selected "continuous surfer," and 54% selected "social networker." A single user contributed 2 reviews for the Samsung Captivate, so the second review was dropped from the analysis.

Descriptive statistics for the overall evaluations, the ratings on the five attributes, and the percentage of recommendations are presented in Table 2-2.

Table 2-2: Smartphone Product Rating Averages on 1-5 scale

	Overall Evaluation	*Features*	*Ease of Use*	*Battery*	*Display*	*Design*	*Percent Recommend*
Samsung Infuse	4.5	4.7	4.7	3.9	4.9	4.7	92%
Samsung Captivate	4.1	4.4	4.4	3.4	4.7	4.4	82%
Blackberry Curve	4.0	4.1	4.2	3.9	4.1	4.1	84%
Samsung Focus	4.2	4.2	4.4	3.7	4.7	4.4	87%
Motorola Atrix	4.5	4.6	4.5	4.0	4.7	4.5	92%
Samsung Galaxy S II	4.7	4.7	4.6	3.9	4.9	4.7	97%

A cross-tabulation of evaluations and recommendations shows that when the overall evaluation was 5 stars, 99.5% of the reviewers recommended the phone. With an overall evaluation of 4 stars, 94.9% of the reviewers recommended the phone. Recommendations dropped to 52.2% of reviews for phones with a 3 star evaluation, and 4.0% and 15.3% for phones with a 2 star evaluation and a 1 star evaluation, respectively. The point biserial

correlation between evaluation and recommendation was 0.72, $\chi^2(4) = 442.8$, $p < 0.001$. Again, the two tasks of evaluating the product and recommending it for others were strongly correlated.

The results were then collapsed across all six smartphones ($n = 719$). A linear regression was conducted with overall evaluation as the dependent variable, and the attribute ratings as the independent variables. Features, Ease of Use, Battery, and Design were all significant predictors ($p < 0.001$), but Display was not a significant predictor ($p = .944$). Similar results were observed with proportional-odds ordinal regression. A logistic regression was performed on the binary data for recommendations. Features, Battery, and Design were significant predictors ($p < 0.001$), Ease of Use was marginally significant ($p = 0.054$) and Display was not a significant predictor ($p = 0.214$). Identical statistical patterns were observed with generalized linear mixed models that accounted for the nesting of reviews within phones.

The SUR model analysis found that for evaluations and recommendations, all of the attributes were significant ($p < 0.001$) except for Display ($p = 0.94$ for evaluation and $p = 0.18$ for recommendation). Thus, Display does not appear to be a key predictor for reviewers evaluating and recommending smartphones. One possibility is that the Display variable exhibited a restriction in range given that all devices were smartphones. Seventy-seven percent of the Display ratings were perfect "5"s (in contrast to 43% in Study 1). This diminishes the role for display as a weight in either type of judgment.

The conditional tree analysis for evaluation is presented in Figure 2-5. The top node predictor was Features, with a break point at 3. Regardless of whether Features was high or low, Ease was the second most important predictor, and Battery emerged as a predictor at the 3rd level on two of the branches.

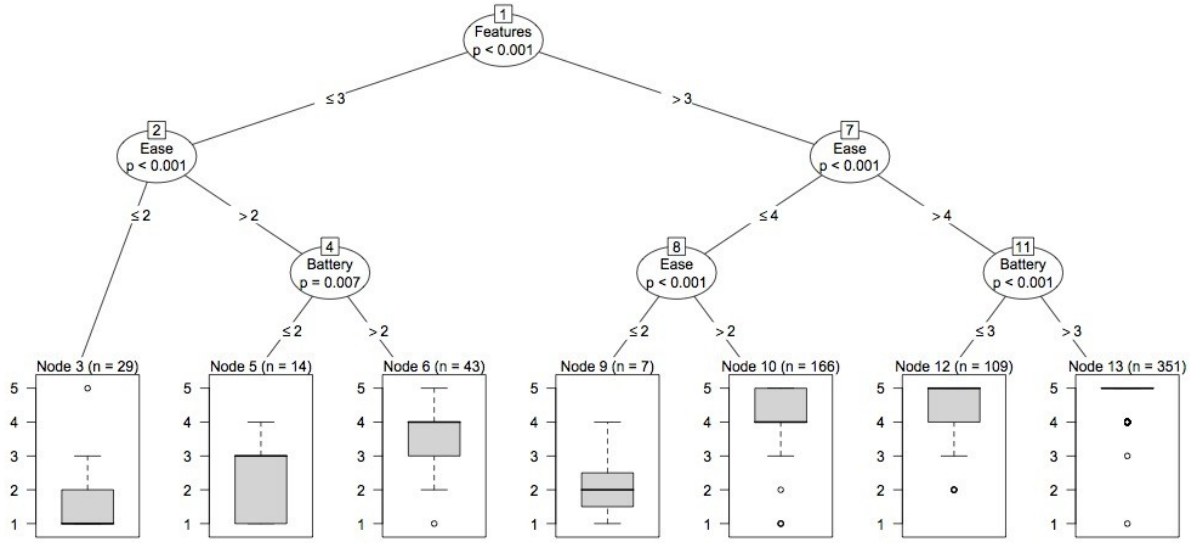

Figure 2-5: Tree Predicting Overall Evaluation

The conditional tree analysis for recommendations is presented in Figure 2-6. With recommendation as the dependent variable, Features emerges as the key predictor, with a break point at 2. When Features was rated low (≤ 2), no other attributes were significant predictors, and the phone was not recommended more than 80% of the time. With high feature ratings (> 2), Design emerged as the next most important predictor, and Battery emerged at the 3rd level only when both Features and Design were high.

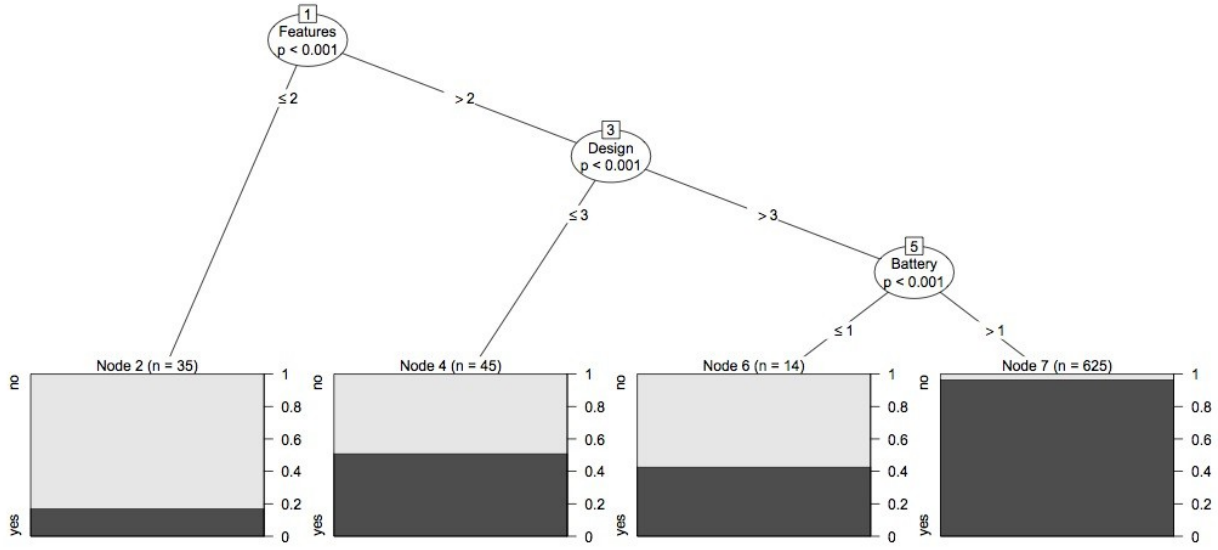

Figure 2-6: Tree Predicting Recommendation

In Study 2, the results for evaluations showed that Features, Ease of Use, Battery, and Design were all significant factors, but Display was not. For recommendations, Features, Battery, and Design were significant factors, and Ease of Use was marginally significant, but Display was not. The conditional tree analyses showed Features, Ease of Use, and Battery as prominent factors for evaluation, while the pattern for recommendation featured Features, Design, and Battery.

Discussion

These results from a sample of smartphone reviews differ somewhat from those in Study 1 with non-smartphone products. For the non-smartphones, evaluations were predicted by Ease of Use, followed by Features and Design, while recommendations were predicted by Design, followed by Ease of Use and Features. While the results are similar (see Table 2-3), the smartphone product reviews showed less concern about Ease of Use and more about Features. Apparently, when consumers spend more money for a smartphone, available features (such as internet access and GPS) represent core added benefits over non-smartphones. The smartphone owners are significantly more likely to be "continuous surfers" ($X^2(1, N = 1430) = 369.8$, $p < .001$) and "social networkers" ($X^2(1, N = 1430) = 179.8$, $p < .001$). This provides one account for why Features would be the top node for both evaluations and recommendations of smartphones.

Table 2-3: Priority of Top Two Significant Predictors in Studies 1 and 2

	Tasks	*Features*	*Ease of Use*	*Battery*	*Display*	*Design*
Study 1: Cell phones	Overall evaluation	2	1			2
	Recommendation		2			1
Study 2: Smartphones	Overall evaluation	1	2			
	Recommendation	1				2

The next level of the tree analysis in Study 2 shows a distinction between evaluations and recommendations for smartphones. Ease of Use emerged as a secondary node in the evaluation tree, but did not emerge as a node at all in the recommendation tree, indicating that

Ease of Use was uniquely applied to evaluations but not to recommendations, in support of the hypothesis that evaluations would focus more on ease of use. Design emerged as a secondary node in the recommendation tree, providing partial support for the hypothesis that recommendations focus on observable, easily justifiable attributes. Design was not a significant predictor for evaluations, indicating its unique application to recommendations.

In sum, the comparison of findings from the two studies suggests that different features were weighted more heavily for smartphones than for non-smartphones. Features emerged as a key factor in both evaluation and recommendations for smartphones, while playing a less prominent role in judgments about non-smartphones. However, as in Study 1, different features emerged as most relevant in evaluation compared to recommendation, lending support to the overall hypothesis about discrepancies in judgments between the two tasks. As in Study 1, recommendations involved fewer attributes than evaluations, but recommendations included more attributes with smartphones than with non-smartphones.

Study 3: Linguistic Analysis

In order to further explore the differences between product judgments, we examined the qualitative responses entered by consumers with their reviews. The qualitative responses can be used to verify the consistency of a reviewer to determine if phones which are positively described are also recommended and evaluated positively. We expect positive words to be correlated with positive evaluations and recommendations and negative words to be negatively correlated demonstrating the evaluations and recommendations are valid representations of reviewers' feelings. Analyzing the qualitative responses also adds to the prior analysis to determine if different linguistic aspects of responses are predictive of evaluations and recommendations. The same sample of 720 reviews of non-smartphones from Study 1 was used for an analysis of the qualitative reviews. Each review was analyzed using the Linguistic Inquiry and Word Count (LIWC) software program designed by Pennebaker, Booth, and Francis (2001). The program was used to analyze the content of the text on seven dimensions: self-references, social words, positive emotions, negative emotions, overall cognitive words, articles, and big words.

The qualitative responses were analyzed with correlations and regressions to examine the role that emotions play in evaluation versus recommendation. Table 2-4 presents a summary of the correlations and the regression betas for the evaluation and recommendation dependent variables. The number of positive words in the review was positively correlated with each of the five attributes, as well as the overall evaluations and recommendations (*r* ranges from 0.28 to 0.39, *p*s < 0.001). The number of negative words in the review was negatively correlated with each of the five attributes, the overall evaluations, and recommendations (*r* ranges from -.20 to -.27, *p*s < 0.001). A linear regression was performed with evaluation as the dependent variable and the linguistic categories as independent variables. Both positive and negative emotions were significant predictors of evaluation (*p* > 0.001). A binary logistic regression was performed with recommendation as the dependent variable; again, both positive and negative emotions were significant predictors (*p* < 0.001). In both the linear and logistic regressions, the number of self-references was also a significant predictor of evaluation and recommendation (*p* = 0.001 and *p* = 0.016, respectively). The likelihood of recommendation and of higher evaluations increased with higher degrees of self-reference. The number of articles (e.g. "a," "the") was also a significant predictor for both recommendation and evaluation (*p*s < 0.001). More articles were associated with increased positive evaluations and recommendations. The other linguistic categories were not significantly related.

Table 2-4: Correlations and Beta Values for Linguistic Analysis

	Evaluation Correlation	Evaluation Beta (OLS regression)	Recommendation Correlation	Recommendation Beta Logistic regression
Positive Emotions	.394**	.374**	.377**	.346**
Negative Emotions	-.271**	-.179**	-.275**	-.355**
Self-References	.048	.119**	.022	.062*
Social Words	.045	.047	.023	.020
Cognitive Words	.004	.002	.038	.023
Articles	.108**	.161**	.122**	.125
Big Words	-.083*	-.038	-.071	.008

***p≤ .001 *p≤ .05*

The linguistic analysis demonstrates that consumers matched the emotions in their qualitative review with their quantitative evaluations and recommendations. This finding suggests that the evaluations and recommendations provide a representation of the consumer's feelings about the product consistent with the narratives provided in their review. These results also suggest emotions play a strong role in product reviews and recommendations.

General Discussion

Studies 1 and 2 support our hypothesis that a different set of criteria are applied to one's evaluation of a product as compared to one's recommendation for others. These results suggest that some products can be well liked, yet not receive positive "word-of-mouth" recommendations. Consumers may weight their judgments of products differently when they consider whether others will feel the same about them.

Products showed different weightings of attributes for evaluations compared to recommendations. For non-smartphones that people tend to buy for their simplicity and low price, Ease of Use was weighed more heavily than with smartphones. For non-smartphones, Ease of Use was a first-cut variable for evaluations and a second-cut variable for recommendations. However, for smartphones, Ease of Use was not a predictor for recommendations, and was a second level predictor for evaluations. Instead, judgments about smartphones weighted Features more heavily. While there is substantial overlap in the first-cut predictors, there is a clear difference both in the task (overall evaluation vs. recommendation) and in the type of product (cell phone vs. smartphone).

The differences between evaluation and recommendation are apparent in the relative importance of Ease of Use and Design. In both studies, Ease of Use was a high level predictor for evaluation compared to recommendation. Both studies also had Design as a more important predictor for recommendation compared to evaluation. These results are consistent with our hypothesis that evaluation ratings are most influenced by Ease of Use. Consumers taking a different perspective when making a recommendation is apparent from when consumers considered whether others would have similar experiences. This is illustrated

through quotes from the website such as, "… if you are somewhat of a heavy talker…", "if you are a user who just wants to call and text…", and "if you're not a patient person….".

Based on the evaluability hypothesis, we predicted that recommendations would be most influenced by observable attributes that are easier to justify (Hsee, Loewenstein, Blount, & Bazerman, 1999). The higher level of importance of Design (the "look and feel" of the phone) found for recommendations is consistent with this prediction. These aesthetic attributes are an easy point of focus to justify a recommendation since positive aesthetics influence perceptions of overall product quality (Tractinsky, Katz, & Ikar, 2000). Many would likely find it difficult to recommend an unattractive phone to others even if all other attributes were acceptable simply due to the belief that aesthetics are an important factor for others.

Previous research on self-other differences led to the prediction that recommendations would focus on fewer attributes relative to evaluations. Our studies in the context of cell phone reviews provide some support for this hypothesis, with more factors considered in evaluations than in recommendations.

Finally, the analysis of the free-text responses suggests that recommendation and evaluation are valid indicators of reviewers' feelings. Reviews containing positive emotions are correlated with positive evaluations and recommendations and negative emotions are correlated with negative evaluations and recommendations.

Limitations of these studies include the use of existing consumer reviews from online recommendation systems, potentially including self-selection bias. However, this design allowed the inclusion of actual product users who wrote reviews based on their own motivations. This naturalistic study allowed us to examine consumers' judgments and their reports of product satisfaction without any manipulation or lab-based measures. While the results reflect the consumers' opinions, they also leave open many questions about what consumers are thinking regarding the attributes in the reviews, and how they think about them in making judgments. Future research could examine the role of product attributes in evaluations vs. recommendations through experimental manipulations in order to gain more information about the judgment processes.

The main finding from these studies is that overall evaluations may not be consistent with recommendations. Different attributes play more important roles in generating these two types of judgments. In the words of one of the reviews posted, “So that being said, I love my phone but I wouldn't recommend it.” For marketers, there is significant value in understanding how differing attributes influence judgments and recommendations for a product (Trusov, Bucklin, & Pauwels, 2009). Increasingly, consumers are receiving product information through consumer reviews posted online (Li & Zhan, 2011). Achieving a better understanding of these judgments may aid in the development of new, tailored evaluation systems. It is of significant, practical importance to understand how consumer evaluations and recommendations are formed, and further, such evidence can inform theories of human judgment. The implications of ease of use for evaluations has implications as a potential point of focus for both consumers and marketers aiming to improve customer evaluations.

Chapter 3: The Influence of Added Features in Product Preferences for Younger and Older Consumers

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Abstract

Feature fatigue describes how consumers are attracted to products with more features but that these products lead to usability problems and ultimately less satisfied consumers. The tendency of consumers to overlook ease of use in favor of other attributes is referred to throughout the paper as the *Buyer's Fallacy*. We investigate whether older adults are able to avoid the Buyer's Fallacy. Through three studies, we demonstrate that older adults avoid the Buyer's Fallacy by choosing products with fewer features. Older adults' product choice is found to be motivated by a focus on ease of use and accounting for the usability challenge of additional features rather than the potential benefits. The avoidance of the Buyer's Fallacy is found to be moderated by the evaluability of ease of use.

Every day, consumers choose products based on what they believe will lead to the greatest satisfaction. However, the new product which consumers buy to make their lives' better can often lead to a frustrating struggle to figure out how to use the product. The remote control which can set a DVR, cable box, and television often has so many buttons and options that just turning on a single setting can be a challenge.

Prior literature has demonstrated that at the time of purchase consumers prefer products with many features and tend to overlook ease of use (Thompson, Hamilton, & Rust, 2005). Despite the initial attraction of these products, excessive features tend to lead to worse usability and less satisfied customers once consumers use the product. We focus on consumers initial overlooking and underweighting ease of use while focusing on other attributes, which we refer to as the *Buyer's Fallacy*. Prior literature has not yet examined whether certain demographics of consumers are able to avoid the Buyer's Fallacy and attraction of products with many features. We expand on the existing literature by examining how the Buyer's Fallacy affects older adults. Furthermore, we provide evidence for the process by which older adults avoid products with many features, which provides insight into how the general population can avoid the Buyer's Fallacy and subsequent feature fatigue.

Background

Research in the area of *Feature Fatigue* suggests that at the time of purchase consumers tend to choose products that offer more features over those with fewer features (Thompson, Hamilton, & Rust, 2005). However, after using the product, models with many features tend to cause using the product to be more difficult and consumers end up less satisfied with the product. Consumers who choose models with fewer features tend to be more satisfied with their product choice after using the product as they face fewer difficulties using the product. At the time of purchase, consumers are aware that models with many features will be more difficult to use. However, usability is not a very important attribute at the time of purchase and receives relatively little weighting. The additional capabilities provided by models with many features is very important to consumers at the time of purchase leading to the number of features being weighted heavily when choosing a product. It is only after using a product that

the weightings change and consumers prefer products with fewer features that are easier to use. Construal theory has been used to explain how consumers balance desirability and feasibility (Hamilton & Thompson, 2007). Indirect product experience (pre-purchase evaluation) leads to an abstract construal and therefore a focus on desirability. Direct product experience (using a product) leads to a concrete construal and a focus on feasibility (usability).

Additional features beyond what is necessary for a product can be appealing to consumers for a variety of reasons. Features are an indicator of product capability; each capability is an additional reason to choose the product particularly for products lacking in perceived usefulness (Sela & Berger, 2012). Feature loaded models can also provide social benefits by making consumers of more complex products appear more "tech-savvy," and open to new experiences (Thompson & Norton, 2011). Even trivial features can be beneficial in helping provide a reason for consumers to choose between multiple competing models when only one model possess a unique feature (Carpenter & Brown, 2000).

A series of studies by Sela and Berger (2012) demonstrated that the number of features can be perceived as a cue for the usefulness of a product. The mere number of product attributes presented influenced choices. Perceptions of utility increased with more features listed even when the content appeared in a different language. More features resulted in increased option attractiveness; however, this effect was more evident when practicality was at issue. In their studies, hedonic choices were made more practical by added features that justified the choice. For utilitarian options, the added features had less impact on choice, presumably because their value was already apparent. In other words, adding features helps when the utility of the product is in question, but less so if it is already justified.

Added features can create a downside when they require additional learning time, or create confusion during product use. Added features typically increase the complexity of a product's interface and operation. After having the opportunity to use a product, consumers who choose models with fewer features are more satisfied, and have more confidence in their choice. Those who choose products with more features are less satisfied and less confident (Thompson et al, 2005). Increasing the functions on a product can also lead to interfaces which are more difficult to use according to Fitts' Law due to limited interface space (Fitts, 1954).

Affective forecasting literature has detailed how decisions are based on assessments of how different options will make one feel (Wilson & Gilbert, 2003). People are often poor judges of the impact and duration of future events. Correctly matching one's needs and abilities to a product can be challenging (Burson, 2007). Consumers tend to display overconfidence in their abilities (Alba and Hutchinson, 2000), which could lead one to over predict the benefits derived from additional product features and display overconfidence in their ability to use these features. Part of the reason why additional features lead to worse outcomes is that consumers do not end up using the features for which they were willing to pay more at the time of purchase (Meyer, Zhao, & Han, 2008). Consumers focus on the benefits of a feature at the time of purchase and do not adequately account for the learning costs. When faced with actually using the product, consumers avoid the short-term cost of learning how to use the new features and therefore often do not utilize them. Problems can still arise when consumers do try new features because they often over predict how long it will take them to learn how to use that feature and abandon the feature all together (Billeter, Kalra, Loewenstein, 2011).

Prior studies have indicated that increasing the number of features increases product desirability despite the usability tradeoff. Could certain consumers avoid the Buyer's Fallacy by focusing on the importance of product usability? Some successful products targeted at aging consumers, such as the Jitterbug(TM) cell phone, are marketed as simpler designs with fewer features (GreatCall, Inc., 2013). This suggests that older adult consumers could be attracted to products advertising *fewer* features. Understanding the feature preferences of this group is an important challenge for marketers and product designers with consumers over the age of 60 forming one of the fastest growing demographic segments (United Nations, 2011).

Literature on aging gives some indication how preference for products with many features could potentially vary with the age of the consumer. Decision making, memory, and consumer behavior have been found to change as people age. Cognitive declines in motor performance, sensory perceptions, and working memory capacity that are associated with aging might affect product use (Charness, Champion, & Yordon, 2010). Years of experience, however, can also lead to better knowledge (Salthouse, 1993) or greater use of heuristics

(Yoon, 1997) to counteract these effects. Research has found that older adults are better able to regulate their emotions and avoid negative affect (Mather, 2006). Although stereotypes might predict that older adults are prone to avoid risk, such as that associated with buying an unfamiliar product, older adults have generally been found to be no more risk adverse than younger adults (Mather, 2006). Contrary to stereotypes, older adults are not scared of technology and generally hold positive opinions about technologies and the benefits they provide. Motivation to adapt new technology appears to be largely driven by perceived benefits rather than avoiding negatives (Melenhorst, Rogers, Bouwhuis, 2006). Focus groups have found older adults like technology for its support of activities, convenience, and features (Mitzner, Boron, Fausset, Adams, Charness, Czaja, Dijkstra, Fisk, Rogers, & Sharit, 2010). Furthermore, older adult performance using technology devices is also not necessarily worse than younger adults. Older adults were found in two studies to have equal or only slightly worse success relative to younger adults when the interface design on cell phones was simple (Jastrzembski & Charness, 2007; Zeifle & Bay, 2005).

Human factors research has also shown that older adults are better at identifying which aspects of a product's design are likely to impact usability (Stephens, Carswell, & Schumacher, 2006). As a result, older consumers may be more sensitive to cues relating to ease of use. They may recognize the usability costs of added features and successfully predict that those products will be harder to use. If so, older consumers should demonstrate preferences opposite of the Buyer's Fallacy: Rather than preferring as many features as possible to maximize the capabilities of the product, older consumers may use the number of features as an index of the difficulty of use, and so avoid products with more numerous features.

In our present research, we hypothesize that older adults may choose to *avoid* added features in consumer products, avoiding the Buyer's Fallacy. Older consumers may be better able to spot usability challenges, and decide to avoid the negative affect associated with them (e.g., Stephens, Carswell, & Schumacher, 2006; Mather, 2006). As a result, product choice may be driven by different factors depending on age group. We predict that younger adults may attend to the potential benefits provided by added product features, and choose products based on the utility provided by additional features. We predict that older adults may instead

avoid added features in order to evade usability issues. The present study contributes to the current literature by testing whether a large (but understudied) portion of the population may be avoiding the feature fatigue that results from choosing products with excessive features; that is, focusing on the usability challenge of added features rather than on their potential utility. In the study, we also seek evidence regarding the cognitive processes behind avoidance of the Buyer's Fallacy; in particular, we predict that:

H_1: Older adults will prefer products with fewer features;

H_2: Preference for products with fewer features in older adults will be motivated by a desire to avoid negative usability experiences;

H_3: Preference for products with fewer features in older adults will be moderated by the ability to evaluate ease of use.

Study 1: Choice among Product Models

In study 1, we investigate hypothesis H_1 to determine whether younger and older consumers vary in product choice. We also examine hypothesis H_2 to determine how motivation for product choice varies between age groups.

Method

Volunteer participants included 62 older adults (Mean age = 73; SD = 73; range 61-90; 63% female) and 61 younger adults (Mean age = 21; SD = 3.0; range 18-35; 49% female). Younger adults were recruited in an atrium on a large, Midwestern university campus. Older adults were recruited at a continuing education lecture series in the same city. For both sets of participants, a table was set up with a sign requesting help with a short research survey. Participants were handed a printed copy of the survey, and encouraged to sit down nearby to complete it. Each participant viewed a single product image, and four models were presented with differing numbers of features. Model 1 had 3 features, model 2 had 7 features, model 3 had 14 features, and model 4 had 21 features. Specific features were listed next to the product image for each mode. Product features were taken from existing consumer products and

ranged from basic, necessary features to superfluous, uncommon features. The model with the fewest features had only the most essential features, the next model had all of the features of the previous model plus the next most useful features, and so on, until the last model with 21 features included all of the features of the previous models plus the least necessary features.

Participants were instructed that price was not a factor. They were asked to select the model that they would most prefer for themselves and then to write a rationale for their choice. This procedure was repeated for three products in the study, including an alarm clock, a digital camera, and a media player. Participants then rated their experience with each of the product categories on a four point scale ranging from 1 = "No experience" to 4 = "Very experienced." The survey was completed by most participants within two to four minutes.

Results

Proportions of participants choosing a product model was compared between older and younger participants for each product using a series of logistic regressions. Younger adults were more likely than older adults to choose the model with 21 features for all three products - the alarm clock (B=1.33, p=.004), digital camera (B=1.76, p≤.001), and media player (B=2.36, p≤.001), (see Table 3-1). Older adults were more likely than younger adults to choose the two simplest models (with 3 or 7 features) for all three products - alarm clock (B=-1.62, p≤.001), digital camera (B=-2.22, p≤.001), and media player (B=-1.60, p≤.001).

Table 3-1: Choice Distribution by Age Group

	Age Group	Model 1 (3 Features)	Model 2 (7 Features)	Model 3 (14 Features)	Model 4 (21 Features)
Alarm Clock	Older Adults	18%	48%	21%	13%
	Younger Adults	16%	11%	37%	36%
Camera	Older Adults	2%	30%	49%	18%
	Younger Adults	0%	5%	39%	57%
Media Player	Older Adults	21%	34%	29%	16%
	Younger Adults	3%	16%	15%	66%

A proportional odds model was calculated to account for the ordinal nature of the data and compare choice differences across models varying in the number of features. A separate proportional odds analysis was computed for each product type with model choice as the dependent variable, age group as an independent variable, and gender and experience with that product category as covariates (see Table 3-2). Age group was a significant predictor of the model choice for each of the three products ($p<.001$) indicating that older and younger adults make different choices based on the number of features a product has. Gender and experience with each product were not significant predictors for any of the three products. The results of the choice analysis support hypothesis H_1 that older adults prefer products with fewer features.

Table 3-2: Significance of Age Group in Proportional Odds Analysis

	Beta value	*P Value*
Alarm Clock	-.750	≤.001
Digital Camera	-1.078	≤.001
Media Player	-1.110	≤.001

Younger adults reported similar levels of experience for all three products, and were more experienced than older adults for the digital camera, and media player but reported less experience than older adults with alarm clocks (ps < .05) (see Table 3-3). Older adults reported being most experienced with alarm clocks of the three products (ps < .001).

Table 3-3: Product Experience Means (4 = very experienced)

	Alarm Clock	*Camera*	*Media Player*
Older Adults	M = 3.48 (SD = .671)	M = 2.69 (SD = .861)	M = 2.41 (SD = .866)
Younger Adults	M = 3.11 (SD = .777)	M = 3.08 (SD = .802)	M = 3.10 (SD = .907)

Of the 124 responses from the study, 47 older adults and 58 younger adults provided written responses to the question, "Why did you select the model that you did?" These responses were scored by an independent coder blind to the condition and hypotheses. The responses were coded into categories including "ease of use /avoiding excessive features," "wanting more features," and "getting more for the money." Responses could be coded for

multiple categories. A second coder was used on a subsample of 60 responses to verify the accuracy of the coding (*Kappa* = .880, *p* <.001). The percent of participants providing a specific reason for their choice are shown in Table 3-4.

Table 3-4: Percentage of Responses Mentioning Choice Reason

	Age Group	*Ease of Use/ Avoiding Excess*	*Wanting More features*	*Better Value*	*Familiarity*	*Desire to Learn New Technology*
Alarm Clock	Older Adults	77%	2%	0%	2%	4%
	Younger Adults	57%	31%	10%	2%	0%
Camera	Older Adults	40%	9%	0%	4%	11%
	Younger Adults	32%	40%	11%	0%	0%
Media Player	Older Adults	53%	5%	2%	0%	7%
	Younger Adults	26%	38%	3%	3%	2%

Responses were split by age group to compare proportions of older adults to younger adults on how they explained their choices. Chi-square tests were computed to compare the older and younger adults on each of the coded response categories. Older adults were more likely to explain their product choice with responses about the *ease of use* (e.g. "simpler is less apt to have trouble", "Model 4 has more functions than I would use; probably a pain to figure out") for the alarm clock ($X^2(1, N=105) = 4.47$, p=.034) and the media player ($X^2(1, N=101) = 8.03$, p=.005). These responses provide evidence in support of hypothesis H_2 that feature avoidance in older adults is motivated by a desire to avoid negative usability experiences.

Younger adults were more likely to express a desire to have *more features* (e.g. "Of course take the most", "has more options") for the alarm clock ($X^2(1, N=105) = 14.63$, p<.001), digital camera ($X^2(1, N=102) = 12.78$, p<.001), and media player ($X^2(1, N=101) = 15.09$, p<.001). Younger adults were also more likely to explain their product choice by saying they are *getting more for their money* by choosing feature loaded models (e.g." You get the most bang for your buck", "A plethora of options and money isn't a factor") for the alarm clock ($X^2(1, N=105) = 5.15$, p=.023) and digital camera ($X^2(1, N=105) = 5.15$, p=.023).

Both age groups were equally likely to mention familiarity as impacting their decisions. Older adults were more likely to mention wanting to learn how to use more complicated digital cameras compared to younger adults ($X^2(1, N=102) = 6.60, p=.01$), suggesting that it is not a fear of technology driving the results and that the older adults who are choosing feature loaded models are doing so out of a desire to learn.

Discussion

The results across all three products demonstrate that younger adults are more likely to choose products with more features, while older adults demonstrate an avoidance of the Buyer's Fallacy by choosing product models with fewer features in support of hypothesis H_1. This finding is noteworthy because prior research has found that consumers prefer more features (Thompson, Hamilton, & Rust, 2005); however, when comparing age groups, it is clear this holds true only for younger consumers. Contrary to previous literature, this study finds that for older consumers, increasing the number of features can be undesirable. This suggests a major portion of the consumer market is sensitive to added features in an unexpected direction.

We analyzed the reasons that participants gave for their product choices. The responses demonstrate that older adults focus on obtaining just the necessary benefits and avoiding the potential negative impact of unnecessary features on a product. Older adults were more likely to mention "ease of use" or "avoiding excess" as their rationale. Younger adults focus on obtaining the additional benefits of more features. Younger adults mentioned "wanting more features" or "getting more value." Younger adults focused on the potential benefits of features, seeing each additional feature as adding value to the product. In contrast, older adults focused on taking only the features they needed. Common statements from older adults when choosing products with fewer features included, "It has everything I need," and "Simpler is less apt to have trouble."

Older consumers appear to be following different heuristics in their judgments about products (Yoon, 1997). They appear to choose products with fewer features because they lead to a better user experience. This suggests that older adults may have an advantage in weighing

usability earlier in the process, well before the point of first product use. Some research suggests that older adults with the least decline in high-order cognitive abilities avoid making explicit tradeoffs between features in order to avoid negative affect associated with these tradeoffs (Mather, Knight, McCaffrey, 2005). Similarly, a heuristic of choosing a product without excessive features may be adapted to avoid the negative affect associated with usability problems. This heuristic may also provide a way of avoiding making difficulty tradeoffs of usability and features.

One potential limitation of the present study is that the feature choices were specific to the products. However, the same results occurred across all three products, with differing features listed in each case. In addition, the products were shown to involve differing levels of familiarity, and included categories ranging from digital to tangible products.

Another possible explanation for the results could be that younger participants were more familiar with the products presented. However, the alarm clock was more familiar to older subjects, yet the same pattern of choices was obtained (younger participants were more likely to choose feature loaded models). Thus, product familiarity cannot account for the observed differences in choice between age groups.

The results suggest that added features are not a universal lure for all consumers. This study demonstrates that older adults prefer simpler models due to their perceived ease of use. However, the within-subject design of study 1 may make usability differences among models more salient. Participants directly compared models of the same product that differed only in number of features, highlighting this potential complication in use. In Study 2, we provide a stronger test of these hypotheses by employing a between subject design.

Study 2: Rating Sole Models

Study 2 used the same 3 products (alarm clock, digital camera, and media player) and similar feature lists as study 1. Study 2 used in a between-subjects design in contrast to the within subjects design of study 1. The number of features displayed was counterbalanced in a 3 x 3 Latin-square design, with participants randomly assigned to one of three variations. Each

participant viewed only one model from each of the three products with either 6, 12, or 18 features. The between-subjects design reduced indications of potential variation in the number of features available and made ease of use less apparent. Hypothesis H_3 predicts that limiting the evaluability of ease of use will limit Feature Avoidance among older adults.

Method

Younger adults consisted of 99 undergraduate psychology students at a major Midwestern University recruited to complete the study online for course credit (Mean age = 18.6, SD = 1.0; 78% female). Older adults consisted of 98 participants (Mean age = 68.9, SD = 4.7; 57% female) who were recruited through a nationwide database and completed the study online. Highest level of completed education was high school or less for 14.1% of older adults and at least some college for 85.9%. Participants provided ratings of ease of use, capability, and liking on a 7 point scale and provided written responses of willingness to pay for each model.

Results

Liking:

A 3 (Product) x 2 (Age Group) x 3 (Number of Features) ANOVA was computed with liking as the dependent variable. There was a significant main effect for the age group ($F(1,558)=6.39$, $p=.012$) and number of features ($F(2,558)=13.78$, $p<.001$). There was no main effect for product type. There were significant interactions of product and age group ($F(2,558)=6.71$, $p=.001$), age group and number of features ($F(2,558)=6.96$, $p=.001$), and for product and number of features ($F(4,558)=3.33$, $p=.010$). The three-way interaction was not significant. Due to the main effects and interactions, the data were split by age group, product, and number of features to compare means (Table 3-5).

Table 3-5: Mean Liking Ratings (7: Strongly Like)

Liking		*6 Feature Model*	*12 Feature Model*	*18 Feature Model*
Older Adults	Alarm Clock	5.23 (1.22)	5.94 (.95)	5.39 (1.27)
	Digital Camera	5.09 (1.04)	5.34 (1.14)	5.69 (1.04)
	Media Player	5.27 (1.04)	5.06 (1.24)	4.96 (1.20)
	Collapsed	5.19 (1.09)	5.46 (1.16)	5.37 (1.26)
Younger Adults	Alarm Clock	3.88 (1.43)	4.97 (0.99)	5.57 (1.26)
	Digital Camera	4.74 (1.31)	5.47 (0.99)	5.66 (0.97)
	Media Player	4.96 (1.06)	5.03 (1.18)	5.56 (1.04)
	Collapsed	4.49 (1.36)	5.16 (1.07)	5.59 (1.10)

Separate simple effects were computed for older and younger adults. The effect for the number of features (6, 12, or 18) was computed for each product. For older adults, there was a significant effect for the number of features for the alarm clock ($F(2,273)=3.36$, $p=.031$), there was a marginal effect for the digital camera ($F(2,273)=2.38$, $p=.094$) and no effect for the media player. Contrasts were computed to determine the preferred level of features for each product. For the alarm clock, the 12 feature model was most preferred (ps <.05). For the digital camera, the 18 feature model was rated as liked more than the 6 feature model ($p=.03$), but not significantly more than the 12 feature model. There were no significant contrasts for the media player.

For younger adults, there was a significant effect for the number of features for the alarm clock ($F(2,277)=18.45$, $p\leq.001$), Digital Camera ($F(2,277)=5.72$, $p=.004$), and a marginal effect for the media player ($F(2,277)=2.45$, $p=.088$). Contrasts were computed comparing the different number of features. The 18 feature model was preferred for the alarm clock ($ps\leq.031$), the 12 and 18 feature models were preferred over the 6 feature model for the digital camera ($ps\leq.002$), and the 18 feature model was marginally preferred over the 6 and 12 feature models ($ps\leq.063$) for the media player.

Results were collapsed across products and simple effects were computed for the number of features at each of the age groups. There was no effect for number of features for older adults. There was a significant effect for younger adults ($F(2,562)=21.12$,$p\leq.001$).

Contrasts were computed indicating that 18 features was preferred over 6 or 12 features (ps≤.009).

These results indicate that older adults did not demonstrate a clear preference for products based on the number of features due to the reported preference for the 12 feature model for the alarm clock, a slight preference for the 12 and 18 feature conditions for the digital camera, and no effect for the number of features for the media player. When collapsed across products, there was no effect for the number of features. Younger adults demonstrated a consistent preference for models with more features across all three products and a preference for 18 features when collapsed across products.

Ease of Use:

A 3 (Product) x 2 (Age Group) x 3 (Number of Features) ANOVA was computed with ease of use as the dependent variable (Table 3-6). There were main effects for product type ($F(2,550)=20.08$, $p\leq.001$), number of features ($F(2,550)=36.32$, $p\leq.001$), and age group ($F(1,550)=7.94$, $p=.005$). The interaction of product and age group was significant ($F(2,550)=3.94$, $p=.020$). No other interactions were significant.

Separate simple effects were computed for older and younger adults. The effect for the number of features (6, 12, or 18) was computed for each product. For both older and younger adults, there was a significant effect for the number of features for all three products (ps≤.007). Contrasts indicate that both older and younger adults perceived that as the number of features increased, product usability decreased for all 3 products.

Table 3-6: Mean Ease of Use Ratings (7: Very Easy to Use)

Ease of Use		*6 Feature Model*	*12 Feature Model*	*18 Feature Model*
Older Adults	Alarm Clock	5.76 (1.07)	5.61 (1.07)	4.81 (1.35)
	Digital Camera	5.27 (1.00)	5.13 (1.30)	4.36 (1.41)
	Media Player	4.86 (1.27)	4.29 (1.00)	3.82 (1.30)
	Collapsed	5.39 (1.23)	4.91 (1.30)	4.33 (1.33)
Younger Adults	Alarm Clock	5.91 (1.13)	5.13 (1.22)	4.82 (1.46)
	Digital Camera	5.94 (0.63)	5.47 (0.86)	4.66 (1.15)
	Media Player	5.32 (1.34)	4.87 (1.09)	4.34 (1.40)
	Collapsed	5.29 (1.35)	5.39 (1.02)	4.80 (1.33)

Capabilities:

A 3 (Product) x 2 (Age Group) x 3 (Number of Features) ANOVA was computed with capabilities as the dependent variable (Table 3-7). There were main effects for the number of features ($F(2,548)=63.42, p\leq.001$) and age group ($F(1,548)=9.12, p=.003$). There was no main effect for product type. There was a significant interaction of age group and the number of features $F(2,548)=9.28, p\leq.001$). No other interactions were significant.

Table 3-7: Mean Capabilities Ratings (7: Many Capabilities)

Capabilities		*6 Feature Model*	*12 Feature Model*	*18 Feature Model*
Older Adults	Alarm Clock	4.82 (1.27)	5.85 (.78)	5.66 (1.29)
	Digital Camera	4.68 (0.99)	5.37 (1.17)	5.63 (1.11)
	Media Player	5.00 (0.87)	5.38 (1.25)	5.57 (1.10)
	Capabilities	4.83 (1.05)	5.55 (1.09)	5.62 (1.16)
Younger Adults	Alarm Clock	3.76 (1.47)	5.03 (1.09)	5.88 (1.13)
	Digital Camera	4.31 (1.32)	5.35 (1.15)	5.66 (0.84)
	Media Player	4.28 (0.73)	5.06 (1.02)	6.09 (0.92)
	Capabilities	4.10 (1.27)	5.15 (1.09)	5.88 (0.98)

Separate simple effects were computed for older and younger adults. The effect for the number of features (6, 12, or 18) was computed for each product. For older adults, there was a significant effect for the number of features for the alarm clock ($F(2,269)=7.36, p\leq.001$) and digital camera ($F(2,269)=9.01, p=.002$). Contrasts indicate that for all three products the 6 feature model was viewed as having the fewest capabilities, but there was no difference between the 12 and 18 feature conditions in perceived capabilities. This indicates that at the highest level of features, older adults may not perceive additional benefit of the increased number of features.

For younger adults, there was a significant effect for all three of the products ($ps<.001$) and contrasts indicate that younger adults perceived capabilities as increasing as the number of features increased. This demonstrates that younger adults perceive benefits of more features consistent with prior literature.

Willingness to Pay:

Participants also reported willingness to pay for each product they viewed (Table 3-8). A 3 (Product) x 2 (Age Group) x 3 (Number of Features) ANOVA was computed with willingness to pay as the dependent variable. There were main effects for product ($F(2,549)=131.23$, $p\leq.001$), number of features ($F(2,549)=10.16$, $p\leq.001$), and age group ($F(1,549)=43.45$, $p\leq.001$). The interaction of product and age group was significant ($F(2,548)=6.42$, $p=.002$). Separate simple effects were computed for older and younger adults. The effect for the number of features (6, 12, or 18) was computed for each product. For older adults, there was a main effect for the number of features for the digital camera ($F(2,270)=5.06$,$p=.007$) and no effect for the alarm clock or the media player. For younger adults, the number of features had a significant effect on willingness to pay for the digital camera ($F(2,279)=3.95$, $p=.020$) and a marginal effect for the media player ($F(2,279)=2.90$,$p=.057$).

Although somewhat limited by high variances in reported willingness to pay, these results indicate that products with more features are perceived by both age groups to be of greater financial value. Willingness to pay appears to more closely mirror perceptions of cost than product liking for older adults. Older adults also rated a higher willingness to pay than younger adults for every model presented indicating that feature avoidance among older adults is not being driven by fiscal motivation to avoid expensive products.

Table 3-8: Willingness to Pay

Willingness Pay		*6 Feature Model*	*12 Feature Model*	*18 Feature Model*	*Mean*
Older Adults	Alarm Clock	$23.83 (14.40)	$32.49 (16.57)	$36.01 (23.44)	$31.01 (19.12)
	Camera	$105.69 (57.57)	$128.62 (85.11)	$151.63 (90.39)	$128.65 (80.24)
	Media Player	$76.19 (58.01)	$100.70 (68.65)	$87.88 (59.26)	$88.42 (62.50)
Younger Adults	Alarm Clock	$15.76 (9.50)	$20.50 (12.54)	$33.88 (26.27)	$23.60 (19.45)
	Camera	$79.17 (51.62)	$94.70 (49.40)	$109.33 (69.25)	$93.64 (57.58)
	Media Player	$33.72 (48.44)	$39.42 (35.18)	$59.37 (51.81)	$44.93 (46.20)

Discussion

The previous feature fatigue literature (Thompson et al., 2005, etc.) asserts that prior to using a product, people prefer products with more features and perceive these products as having more capabilities but lower ease of use. The additional features are viewed as additional capabilities and therefore provide an added value to the customer (Sela & Berger, 2012). The sample of younger adults in our study consistently replicated these findings across three products.

Contrary to what previous research predicts, older adults did not demonstrate a preference for products with more features. However, older adults also did not demonstrate a preference for fewer features as in study 1. In study 1, older adults preferred models with fewer features for all 3 products. In study 2, older adults rated a preference for a model with only 12 features for the alarm clock, but reported a marginal preference for the camera with 18 features, and reported no effect for features for the media player. The key difference between studies 1 and 2 was the evaluability of ease of use. Study 1 was a between subject evaluation and study 2 was a within subject separate evaluation. This is evidence in support of H_3 that avoidance of the Buyer's Fallacy is moderated by evaluability of ease of use. Older adults also did not perceive an increase in capabilities between the 12 and 18 feature models suggesting that older adults do not perceive extra features as added capabilities. Older adults viewed the models with more features as having lower ease of use. Products with more features are viewed as minimally increasing in capabilities but decreasing in ease of use by older adults limiting the desirability of models with more features.

One potential critique of studies 1 and 2 is that due to the increase in the number of features over time, older adults may expect alarm clocks, cameras, and digital media players to have fewer features than younger adults. There is some evidence counter to this cohort effect argument. Older adults reported higher familiarity with alarm clocks than younger adults who often rely on phone alarms rather than alarm clocks.

In studies 1 and 2, it is possible that older adults are choosing products based on features which they have had positive experiences with in the past. Older adults may be more likely to choose these products because their memories have a positive bias for past choices

(Mather & Carstensen, 2005; Mather & Johnson, 2000)." In order to remove this potential confound, we eliminate the mention of specific features in study 3.

Study 3A: Rating Product Reviews

Study 3 was designed to eliminate confounds potentially created by specific product features. We directly state ease of use and feature levels by showing participants product reviews rather than having subjects infer ease of use from listed features. We hypothesize, consistent with H_1, that older adults will rate their likelihood of purchase higher for the product described as easy to use with few features. We also predict that younger adults will rate likelihood of purchase higher for the products described as difficult to use with many features.

Method

A blender was chosen as a neutral product category familiar with both younger and older adults. Participants were told to imagine that they were in the market for a new blender and that they would view a review for a blender costing $40. Participants were then randomly directed to one of two variations of a review for the blender. Both review variations gave the product a 5/5 star rating. The minimal feature review stated "Easy to use, has just the minimum features and nothing more." The many feature review stated "Complicated to use, but has just about every feature you could imagine" (see Figure 3-1). Participants provided ratings of likelihood to purchase and usefulness of the review on a 5 point scale.

Figure 3-1: Product Reviews Displayed

Results

A 2 (Product difficulty) x 2 (Age Group) ANOVA was computed with likelihood to purchase as the dependent variable (See Table 3-9). There was a significant effect for both product difficulty ($F(1,193)=4.16$, $p=.043$) and age group ($F(1,193)=10.62$, $p\leq.001$). The

interaction term was not significant. Contrasts were performed to evaluate each age group separately. Older adults rated being more likely to purchase for products described as "easy to use with few features" than products described as complicated to use (t=2.57, p=.011). The difficulty of the product had no effect on younger adults. Younger and older adults reported equal likelihood to purchase easy to use products but older adults reported being less likely to purchase products described as difficult (t=3.52, p = .001).

A separate ANOVA was computed with ratings of the usefulness of the review as the dependent variable. There were no main effects or interactions for age group or product difficulty.

Table 3-9: Product Review Rating Means on 5 point scale

		Easy to use: Few Features	*Difficult to use: Many Features*
Purchase Likelihood	Older Adults	2.50 (1.01)	2.02 (.99)
	Younger Adults	2.74 (.87)	2.69 (.82)
Review Usefulness	Older Adults	3.27 (1.16)	3.33 (1.12)
	Younger Adults	3.00 (1.00)	3.35 (.99)

Discussion

Study 3, consistent with hypothesis H_3, demonstrates avoidance of the Buyer's Fallacy by older adults. The study used a neutral stimuli and avoids confounds from product features. Contrary to our prediction, younger adults who demonstrated a preference for feature loaded products in study 1 and 2 no longer demonstrated a preference for feature loaded products in study 3. The key difference from the prior studies was that ease of use was explicitly stated and unavoidable. Younger adults tend to perceive added features as additional capabilities and ignore the tradeoff that may occur. However, in study 3, the nature of the review forced younger adults to consider ease of use and the tradeoff. Younger adults tend to prefer feature loaded products; however, this preference is mitigated by making explicit the difficulties associated with many features. Making this tradeoff clear reduces the perceived benefit from additional features. Older adults perceive the tradeoff of additional features and will avoid

access features when they are able to judge ease of use. There was no difference in perceived usefulness of the reviews across age groups or product difficulty conditions indicating that both review conditions were viewed similarly and that usefulness of the review did not mediate liking for older adults.

Study 3B: Product Familiarity

The goal of study 3B was to rule out that a cohort effect was driving the results of study 1 by using a product which was far more familiar with older adults. Therefore, we replicate the study 1 design using a record player which older adults have greater familiar with feature heavy variations relative to younger adults. This product controls for the possibility of product familiarity driving feature avoidance since the maximum number of features on a classic record player has not increased. The features listed are from actual models of record players available in the 1970's. We hypothesize that older adults will continue to be less likely than younger adults to choose the model with many features thereby demonstrating that a cohort effect is not driving feature avoidance.

Method

Younger adults consisted of 101 undergraduate psychology students at a major Midwestern University recruited to complete the experiment online for course credit (Mean age = 18.6, SD = 1.0; 78% female). Older adults consisted of 99 participants (Mean age = 68.9, SD = 4.7; 57% female) who were recruited through a nationwide database and completed the experiment online. Highest level of completed education was high school or less for 14.1% of older adults, some college for 30.3%, an associate or 4 year degree for 36.3% and a Master's degree or higher for 19.2%.

Results

Older adults reported a much higher level of familiarity with the record players on a 7-point scale (M = 5.78, SD = 1.24) than the younger adults (M = 2.18, SD = 1.44). The proportions of younger and older adults choosing each product model were compared through a series of logistic regressions (Table 3-10). A larger proportion of younger adults choose the record

player model with 21 features (46%) than older adults (35.1%); however, this difference was not significant (p = .179). Older adults were more likely than younger adults to choose the model with 14 features (B=.821, p=.017). Younger adults were marginally more likely than older adults to choose the model with 7 features (B=-.611, p=.065). More older adults chose the model with 3 features (12.4%) than younger adults (5%); however, this difference was not significant (p=.117). A proportional odds generalized linear model was computed and found that participant age group is not a significant predictor (*B* = .137, p = .387). Participants were also asked to provide a written explanation for why they chose the model that they did. Younger adults were more likely to mention *wanting many features* (p = .015). There was not a statistically significant difference between younger and older adults mentioning *ease of use*, *avoiding excess*, or *familiarity* as their reasoning.

Table 3-10: Proportions Choosing Each Model

	Model 1 (3 Features)	Model 2 (7 Features)	Model 3 (14 Features)	Model 4 (21 Features)
Record Player				
Older Adults	12.4%	20.6%	32%	35.1%
Young Adults	5%	32%	17%	46%

Conclusion

The record player was chosen as a product which would be far more familiar with older adults. Younger adults reported very little familiarity while older adults reported a high level of familiarity. There were mixed results for product choice. Although younger adults appeared somewhat more likely to choose the model with the most features and older adults were somewhat more likely to choose the model with the least features, the results were generally mixed. Younger adults reported little familiarity and have little need for a record player; therefore, additional features added little value likely limiting attraction to products with more features. Even though older adults reported a much higher level of familiarity with the record player, still a relatively low number of older adults (35%) chose the model with the most

features. These results indicate that avoidance of the Buyer's Fallacy by older adults cannot be explained by familiarity. However, familiarity and potential use of the product do appear affect the results, they do not appear to be the driving factor behind the results of study 1.

Study 3C

Study 3C further examines the cause for feature avoidance in older adults by questioning participants on which criteria they focus their attention without being first asked to select a product as in the prior studies. We test whether older adults will still focus on ease of use and whether younger adults will focus on features and capabilities in a condition where they are have not been presented with a product nor asked to make any product choices. Participants were asked to respond in a sentence to the open ended question "When looking to buy a cellular phone, what aspects of the phone's design do you use to decide which phone to choose?". Participants were also given the option to check a box if they would not purchase a cell phone. 101 younger adult responses and 87 older adult responses were coded.

Results

Older adults were more likely to mention avoiding excess (e.g. "Simple", "fits needs") $X^2(1, N = 188) = 13.91, p < .001$. Older adults were marginally more likely to mention ease of use $X^2(1, N = 188) = 6.82, p = .009$. Older adults were also more likely to mention aspects of the product design which would benefit the ease of use of the external components of the phones such as the button size $X^2(1, N = 188) = 13.91, p < .001$.

Younger adults were more likely to mention newest or most popular models $X^2(1, N = 188) = 7.19, p = .007$. Younger adults were also more likely to mention specific features and capabilities they wanted $X^2(1, N = 188) = 21.80, p < .001$. Younger adults were marginally more likely to mention aspects of internal features of the phone such as the operating system interface which could benefit ease of use $X^2(1, N = 188) = 2.93, p = .087$. There were no significant differences for mentions of affordability or brand familiarity.

Conclusion

The results confirm the findings of study 1 that older adults are more focused on ease of use while younger adults are focused on benefits that a product can offer such as specific features and capabilities. This study expands on the prior study by avoiding priming or justification of one's choice as no products were presented and participants merely explained what attributes they look for when buying a cellular phone.

General Discussion

While previous findings indicate that consumers prefer products with more features prior to using the product, we found that older adults demonstrate feature avoidance by resisting products with many features and focusing on ease of use and avoiding excess. Avoidance of the Buyer's Fallacy was moderated by the salience and ability to evaluate ease of use.

Younger adults see each additional feature as an additional capability and one more potential reason to buy a product (Sela & Berger, 2012). Although younger adults recognize that ease of use will be lower, there is little weight placed on ease of use and therefore, each additional feature is seen as having a net benefit leading to the feature fatigue effect. Prior literature has not examined whether age affects product choice based on number of features. Our work demonstrates that older adults are able to avoid the feature fatigue effect. Older adults demonstrated feature avoidance in study 1 by intentionally choosing products with fewer features. The free-text responses in study 1 and the ratings provided in study 2 indicate that older adults do not view added features as potential capabilities. A common explanation of product choice for older adults was "avoiding excess" indicating that excess features are not viewed as potential benefits. The free-text responses indicate that older adults focus on ease of use. Each feature beyond what is needed is seen as a decreasing the usability. Older adults place a greater amount of weight on ease of use, which makes the decreased usability from extra features particularly impactful on the overall liking of a product, leading to an avoidance of the Buyer's Fallacy.

The ability of older adults to avoid the Buyer's Fallacy is moderated by their ability to evaluate ease of use. Study 1 used a within subject design where participants chose between multiple models varying on the number of features. Joint evaluation makes ambiguous attributes easier to evaluate by providing a comparison (Hsee, Loewenstein, Blunt, & Bazerman, 1999). Therefore the joint evaluation in the between-subject design makes usability relatively simple to evaluate resulting in older adults avoiding feature loaded models. Study 2 consisted of a between subject separate evaluation where participants viewed only one version of a product and were not made aware of other variations. This study design made usability relatively more difficult to evaluate. Older adults demonstrated mixed preferences with no clear pattern of feature avoidance or preferring more features. These results indicate that older adults do not tend to view added features as increased capabilities like younger adults; however, with ease of use relatively difficult to evaluate, the negative usability impact of feature loaded products is not strongly affecting the overall liking evaluation. Study 3 supports this interpretation of the results. Study 3 used product reviews to directly inform participants that a product evaluated as having many features is also more difficult to use and that the product with few features is easy to use. The study design made the usability tradeoff apparent and simple to evaluate. The result was older adults preferred the model with fewer features. Younger adults in this study did not demonstrate the typical preference for products with more features indicating that feature fatigue can be moderated in younger adults by indicating that the usability tradeoff of additional features will affect their experience with the product.

An alternative hypothesis could be that even though price is held constant, older adults could be avoiding products which they think are more expensive. However, the results do not appear to be driven by older adults avoiding high monetary costs associated with feature loaded products. In study 2, older adults preferred the digital camera and digital media player models for which they also rated as being willing to pay the most. In addition, older adults reported a higher willingness to pay than younger adults for all 3 products. Another hypothesis could be that holding price constant while increasing the number of features in study 1 could cause a product with more features to appear of lower quality. However, study 2 did not state a price for the product and studies 2 and 3 both used a between subject design limiting a

quality effect. One could also hypothesize that younger adults are more motivated than older adults to choose products with many features due to the social benefits. However, the study addresses this since they are not actually choosing the product to be used and studies 2 and 3 are merely evaluations.

Although products will have varying expectations of how many features are excessive, the results are not explained by product familiarity as avoidance of the Buyer's Fallacy by older adults was displayed both for familiar and unfamiliar products in study 1. Similarly, a cohort effect- older adults being more familiar with products having fewer features- does not explain the results as study 3 did not list specific features at all and in study 1 older adults reported being more familiar with alarm clocks than younger adults.

The implications of our findings are that products marketed towards older adults should avoid excessive features. Each additional feature beyond what is necessary could be viewed by older adults as being a negative and decrease the desirability of the product. Simple products should be displayed in ways which make ease of use apparent through joint evaluations or customer reviews. Simple products targeted at younger adults can benefit by drawing attention to the usability tradeoff of excess features thereby decreasing the preference for feature loaded products. Future extensions on this work should evaluate alternative methods of increasing the salience of product usability during product evaluations.

Chapter 4: Influencing Consumers to Purchase Easy to Use Products

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Abstract

Consumers have a tendency to commit the Buyer's Fallacy by overlooking ease of use and instead focusing on other attributes prior to using a product. Consumers tend to focus on the number of features on a product by choosing products with more features. Choosing more features can have negative usability effects and lead to less satisfied customers. This article examines using a unique display technique, *Feature Mapping*, to increase consumers' ability to evaluate ease of use. Feature mapping consists of visually connecting product images and features in a way which communicates to the customer how features will be used and their effect on usability. Feature mapping is found to increase liking for products with relatively few features primarily by increasing the weighting of ease of use. Feature mapping has the opposite effect for some products with many features, decreasing liking and decreasing perceptions of ease of use. The findings have important implications for firms marketing products with fewer features.

Introduction

Consumers are often poor decision makers when buying products. This should be of little surprise as consumers often buy products which they have never actually used. Choices are based on their best, but often flawed, judgments of only what can observed from product packaging or a picture and short description on the internet. Poor purchase decisions can often mean buying a product which is too difficult to use and poorly matched for one's abilities. We focus on the *Buyer's Fallacy*, the tendency of consumers to overlook ease of use at the time of purchase while instead focusing on other attributes. Businesses have a strong incentive for consumers to purchase products which are easier to use. Usability problems can damage brand equity, reduce repeat purchases, and cause negative word of mouth. What can marketers do to improve consumer decision making so that consumers choose products which are easier to use?

Background

A major problem with product purchases is that consumers focus on factors that they perceive will be important, but these factors often have little positive benefit once consumers begin using the product. Ease of use is a factor which often receives little attention prior to using a product but ultimately has a significant effect on consumer satisfaction once the product has been used (e.g. Thompson, Hamilton, & Rust, 2005; Lee & Koubek, 2010). Consumers commit the *Buyer's Fallacy* by misjudging product ease of use and the importance of ease of use at the time of purchase while instead focusing on the desirability of other attributes.

At the time of purchase, consumers perceive aesthetics as important, but after using the product the importance of usability increases in relative importance (Lee & Koubek, 2010). Consumers also tend to think that the number of features on a product is very important; however, these extra features cause usability problems and lead to less satisfied consumers (Thompson et al., 2005). This effect, know as feature fatigue, happens because ease of use receives a relatively low weighting while capabilities receives a higher weighting at the time of

purchase. It is only after a person has used a product that ease of use is weighted heavily and capabilities are weighted much lower.

Increasing the number of features on a product can cause multiple usability problems. As the number of features increases, a single control is sometimes required to manipulate multiple functions (Heo, Ham, Park, Song, & Yoon, 2008). For example, a digital watch may require consumers to hold down a button to access some features while simply pressing the button once may manipulate a different feature. An alternative to increasing the number of features controlled by a button is to add more buttons; however, many products have limited interface space which requires buttons to get smaller. Smaller buttons increases the difficulty of using a product per Fitts' Law (Fitts, 1954). One might hypothesize that these effects would not exist in a digital environment, but increasing the number of features also increases search time for a desired feature and can lead to more menus, settings, and options, causing clutter. Hick's Law describes how increasing the number of stimuli decreases reaction times (Hicks, 1952).

Research has demonstrated that there are some ways to moderate the extent to which feature fatigue is exhibited. Product type can moderate the perceived benefit of additional features (Sela & Berger, 2012). The number of product features is a cue to customers for product usefulness. Hedonic products, consumed for fun or enjoyment, are relatively lacking in perceived usefulness and benefit more from the additional capabilities of more features. Utilitarian products, consumed for usefulness, are already high in perceived usefulness and benefit less by adding more features. Mental construal has been demonstrated to influence consumer focus when choosing products (Hamilton & Thompson, 2007). Participants preferred an easy to use MP3 player if they had a concrete construal compare to an abstract construal. The desirability of products with many features can also be reduced through the social context (Thompson & Norton, 2011). Participants in a study were more likely to choose products with many features when their product choice was made public. This effect was motivated by the social benefits of buying products with many features, such as appearing more tech savvy.

One of the challenges of ease of use is that it can be difficult to determine from viewing a product. Younger adults were found in a human factors study to lack intuition for which product modifications would be most influential on ease of use (Stephens, Carswell, & Schumacher, 2006). Human-computer interaction research has similarly demonstrated using MP3 player software and web pages that perceptions of usability change before and after using a product (Hassenzahl, 2004; Lee & Koubek, 2010). These results demonstrate that consumers are not particularly accurate with their judgment of product usability. Consumers often under predict the difficulty of learning how to use additional features (Billeter, Kalra, & Loewenstein, 2010). These studies also indicated that usability is heavily influential on product liking after a product has been used, but usability is under weighted prior to use. Hence, the problem with usability appears to be two-fold. Prior to trying a product, ease of use it is underweighted in importance and usability is also not accurately predicted.

Some current research indicates that consumers may be less attracted to products with many features when ease of use is made transparent through product reviews (Chapter 3). We hypothesize that demonstrating how a product is used can increase consumers' ability to evaluate ease of use. Product features are usually displayed separate from the pictured product (e.g. Amazon.com). Displaying the features in this way may be allowing customers to evaluate the benefits of features without considering how those features impact product use. The method we propose for increasing consumer ability to evaluate ease of use is through a technique we refer to as *Feature Mapping*. In feature mapping, product features are connected visually to the product controls (see Figure 4-1). This visual connection, we hypothesize, will enable consumers to cognitively connect the number of product features with the effect on ease of use. We hypothesize that for products with 6 features, feature mapping will increase perceived ease of use and liking. Products which have 6 features and 6 buttons should have more transparent ease of use with feature mapping as it becomes clear that each button will only be manipulating a primary feature. We hypothesize that feature mapping will make the challenge of controlling multiple features with a button more apparent to consumers. Hence, we expect that for products with 18 features and 6 buttons, feature mapping will lead to reduced perceptions of ease of use and decreased liking. We believe that the changes in

product liking caused by feature mapping will be driven by both a change in weighting of ease of use and perceived ease of use.

H_1 : Feature Mapping will increase perceived ease of use for products with 6 features and a 1:1 feature to button ratio

H_2 : Feature Mapping will decrease perceived ease of use for products with 18 features and a 3:1 feature to button ratio

H_3: Feature Mapping will increase liking for products with 6 features and a 1:1 feature to button ratio

H_4: Feature Mapping will decrease liking for products with 18 features and a 3:1 feature to button ratio

H_5: The effect of feature mapping on liking will be caused by changes in both weighting and evaluation of ease of use

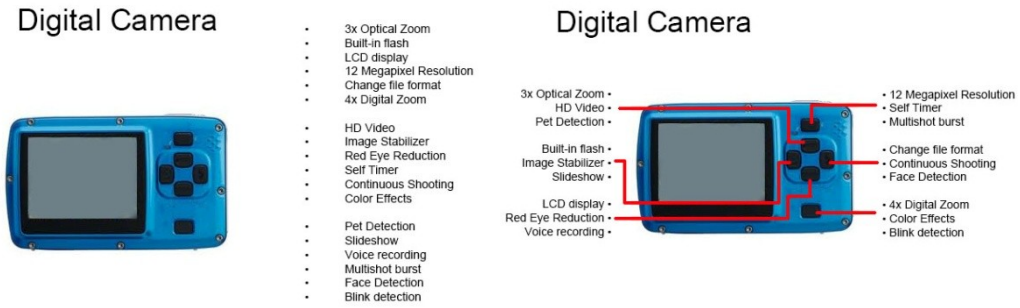


Figure 4-1: Example of Presentation Types: Standard Presentation (left) and Feature Mapping

Method

135 participants were recruited through an online subject pool and asked to complete a study for monetary compensation. One subject was excluded from further analysis due to missing questions. Participants had a mean age of 30 (Range: 19, 65) and 37% were female. Highest completed education levels were 9.4% high school, 44.8% some college, and 45.7% bachelor's degree or higher.

Each participant viewed images of 4 products: a microwave, a trail camera, an athletic watch, and a digital camera. Next to each image was a list of product features. The product image remained the same for each group. Each of the product images had 6 visible display buttons and the number of buttons was held constant. The number of features was manipulated between participants with 6 features or 18 features. The 6 features variation included the 6 most essential features while the 18 feature version included those features from the first model and 12 additional features. The order in which the products were presented was counterbalanced within each group so that a product with 6 features was followed by one with 18 features. Participants provided ratings of liking and ease of use on a 7 point scale after viewing each product.

Following the initial presentation of the four products, participants were told that they would view an alternate image of each product demonstrating the features that each button controls. Participants were instructed to evaluate the new image independently of their prior rating. This alternate presentation type we will refer to as *Feature Mapping*. Feature Mapping connects features and product images to demonstrate which buttons hypothetically are the primary controller for each of the features. All four products had 6 visible control buttons so that there was one primary button per feature in the 6 feature condition and 3 potential features that could be toggled through a single button in the 18 feature condition. Participants were then shown the feature mapped versions of the same products they viewed in the initial part of the study and were asked to provide ratings of ease of use and liking.

Results

Ease of Use:

Ease of use ratings were analyzed through a 2 between subject x 2 repeated measures ANOVA for each product (Table 4-1). Two of the four products (microwave and digital camera) reported a significant effect for the presentation type (ps<.001) indicating lower ease of use ratings for the feature mapping condition compared to the standard display type. All four products reported a significant effect for the number of features (ps <.001) indicating products with fewer features were rated as easier to use. The interaction of the number of features and

the presentation type was significant for the 3 products: microwave (p<.001), trail camera (p=.020), and digital camera (p<.001). The interaction indicates that feature mapping has a different effect on ease of use when the number of features is 6 compared to when the number of features is 18.

Simple effects were computed for the number of features at each level of presentation type (standard/ feature mapping). For both standard display and feature mapping, there was a significant effect for the number of features on perceived ease of use for all four products (ps≤.001). These results indicate that products with 6 features are consistently evaluated as easier to use than products with 18 features with both display styles.

Simple effects were computed for the presentation type at each level of level of number of features. For products with 6 features, there was a marginal effect for presentation type for the trail camera (p=.07) but no effect for the other three products indicating that feature mapping has a small effect at increasing the perceived ease of use score of a product with 6 features. For products with 18 features, there is a significant effect for the presentation type for the microwave (p<.001) and the digital camera (p=.001), indicating that feature mapping can make certain products with many features perceived as more difficult to use.

Table 4-1: Ease of Use ratings on a 7 point scale (7 = Very Easy to Use)

	Number of Features	Standard	Feature Mapping
Microwave	6	6.53 (.68)	6.42 (.81)
	18**	5.97 (.90)	5.19 (1.51)
Trail Camera	6*	4.76 (1.45)	5.10 (1.32)
	18	3.95 (1.45)	3.67 (1.51)
Athletic Watch	6	5.73 (1.07)	5.97 (.95)
	18	4.45 (1.40)	4.44 (1.58)
Digital Camera	6	5.74 (.98)	5.82 (1.21)
	18**	5.10 (1.21)	4.27 (1.52)

*** p≤.05 *p≤.07*

Liking:

Liking ratings were analyzed through a 2 between subject x 2 repeated measures ANOVA for each product (Table 4-2). The number of features was manipulated between subjects and the presentation type (standard/ feature mapping) was treated as the within subjects repeated factor. Presentation type did not have a significant effect for any of the 4 products. The number of features on a product was a significant predictor of liking for the trail camera (p=.003) and had a marginal effect for the athletic watch (p=.071) both indicating stronger liking for the models with more features. The number of features was not significant for the trail camera or the athletic watch. The interaction of the number of features and the presentation type was significant for the microwave (p=.003), the trail camera (p=.041), the digital camera (p=.008) and marginally for the athletic watch (p=.102). The interaction indicates that feature mapping has a different effect on liking ratings when the number of features is few (6) compared to when the number of features is many (18).

Simple effects were computed for the number of features at each level of presentation type (standard/ feature mapping). In the standard display type without feature mapping, there was a main effect for the number of features for the microwave (p=.051), trail Camera (p=.001), and athletic watch (p=.025) indicating higher liking ratings for models with 18 features. With feature mapping, there was only an effect for the number of features for the trail camera (p=.039). These results indicate that with standard presentation 3 out of 4 products were significantly more desirable in the condition with 18 features, but by presenting the products with feature mapping, only 1 out of 4 products presented a preference for the 18 features condition. These results indicate that feature mapping reduces the attractiveness of products with 18 features.

Simple effects were also computed for the presentation type at each level of level of number of features (6 or 18). When the products had 6 features, there was a significant effect for presentation type for the trail camera (p=.038), athletic watch (p=.025), and a marginal effect for the microwave (p=.063) which indicate that the liking of the products with 6 features increased with feature mapping. When the products had 18 features, there was a significant

effect for the presentation type for the microwave (p=.016) and the digital camera (p=.021) both indicating that feature mapping can make products with many features less desirable.

Table 4-2: Liking Ratings on a 7 Point Scale (7 = Strongly Like)

	Number of Features	Standard	Feature Mapping
Microwave	6*	4.88 (1.01)	5.05 (1.25)
	18**	5.21 (.97)	4.97 (1.14)
Trail Camera	6**	4.03 (1.42)	4.25 (1.35)
	18	4.86 (1.12)	4.79 (1.27)
Athletic Watch	6**	4.32 (1.50)	4.58 (1.59)
	18	4.89 (1.32)	4.89 (1.24)
Digital Camera	6	4.33 (1.42)	4.47 (1.48)
	18**	4.44 (1.51)	4.16 (1.63)

*** p≤.05 *p≤.07*

Participants also provided familiarity ratings for each product with the microwave rated as most familiar (M=4.84, SD=.40), followed by the digital camera (M=4.44, SD=.65), athletic watch (M=3.98, SD=1.04), and trail camera (M=2.27, SD=1.23).

Discussion

The results of the analysis of liking and ease of use ratings indicate that consistent with prior literature, when a product is presented with the standard formatting, increasing the number of features on a product increases liking ratings but decreases perceived ease of use. The preference for products with 18 features is a concern as products with many features tend to lead to lower ease of use. This attraction to the number of features while ignoring ease of use at the time of purchase is an example of the Buyer's Fallacy and can lead to feature fatigue when consumers use the product and are faced with usability challenges associated with too many features.

Displaying products with feature mapping had a different impact on the products with 6 than those with 18 features. When products had 6 features, feature mapping led to 1 out of 4 products having higher ease of use ratings, partially in support of H_1. Liking, however, increased for 3 out of 4 products supporting H_3. The pattern of results indicate that for

products with 6 features, feature mapping has a small impact in increasing perceived ease of use but has a larger impact on increasing the weighting of ease of use, supporting H_5.

When products had 18 features, feature mapping led to 2 out of the 4 products decreasing in perceived ease of use, partially supporting H_2. Liking also decreased for only these two products partially supporting H_4. The pattern of results indicates that for products with 18 features, feature mapping can decrease perceived ease of use but it is unclear whether weighting of ease of use is also influenced providing only partial support for H_5.

Conclusion

Feature mapping was an effective method for increasing the liking of simple products with 6 features and decreasing the liking of some products with 18 features. Importantly, the results indicate that feature mapping was consistently positive or neutral on product liking for products with fewer features. This indicates the potential benefit for products with fewer features. Feature mapping appears to increase both the weighting and evaluation of ease of use, thereby increasing liking for products with fewer features. For products with 18 features, two of which decreased liking with feature mapping, the change in liking was driven primarily by decreasing the perceived ease of use. These results indicate that for simple products, there is little weighting for ease of use when a standard display I used but the weighting can be increased through feature mapping. For the products with 18 features, liking only decreased using feature mapping when feature mapping also decreased perceived usability. This indicates that feature mapping may only be lowering perceived ease of use for complex products when consumers would not otherwise fully anticipate the potential usability challenges of many features.

The effect of feature mapping was not the same for all products. This raises important questions about which products are affected and why. It may be that certain models and product variations are less prone to be analyzed for ease of use unless prompted to do so. The two products which were significantly affected by ease of use in the 18 feature condition

(microwave and digital camera) were evaluated as the two products with which participants were most familiar. It is possible that because these products were more familiar, participants were less likely to consider their ease of use unless prompted to do so. In the 18 feature condition, there was less difference between the products with 3 of the 4 products demonstrating a significant increase in liking. When few features are listed, consumers may be putting little thought toward ease of use. However, feature mapping can be used to remind consumers that ease of use is an important factor. Hence, feature mapping may be most beneficial for situations in which ease of use would otherwise have little salience. Future research should further investigate this hypothesis.

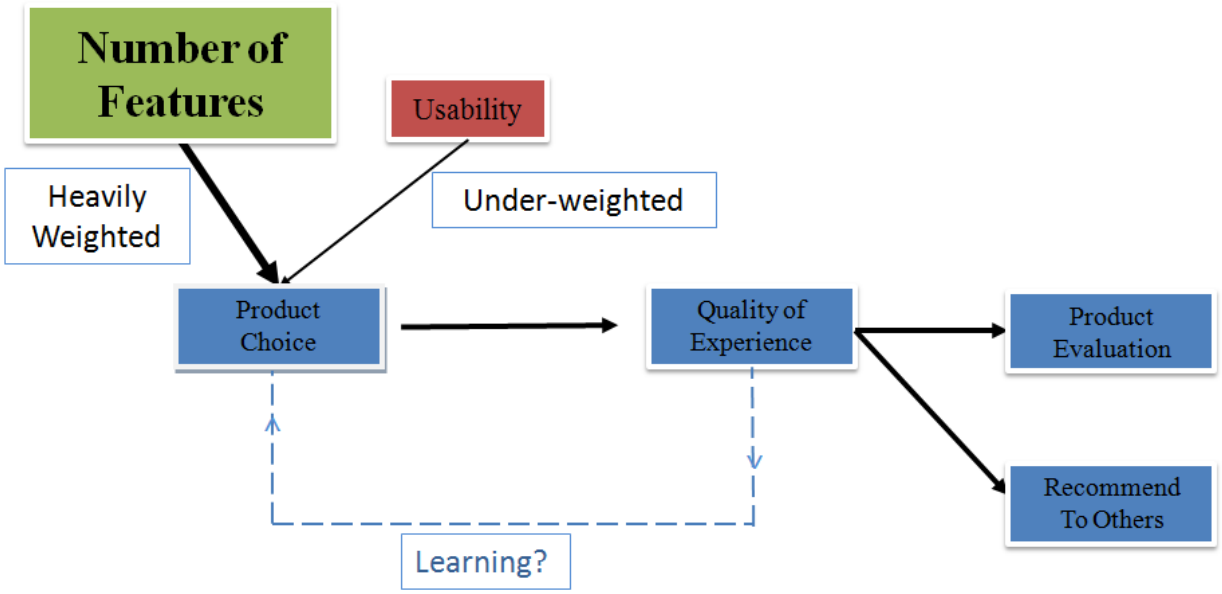
A possible limitation of this research is that the number of buttons was held constant making it less clear whether the results are primarily driven by the number of features or the ratio of buttons to features. Future extensions of this work should examine further the role of button to feature ratios. There also is a possibility that specific features or images could impact the effectiveness of feature mapping. More work should be done with different variations on how feature mapping is displayed and other potential techniques for directing consumer focus towards ease of use.

One of the major benefits of feature mapping is that it is a way to influence consumer perceptions towards easier to use products without adding additional costs. Firms entering the marketing with products which have fewer features can benefit by displaying their products with feature mapping to increase the importance of ease of use to the customers. Furthermore, it allows consumers to draw their own conclusions and provides them with more information.

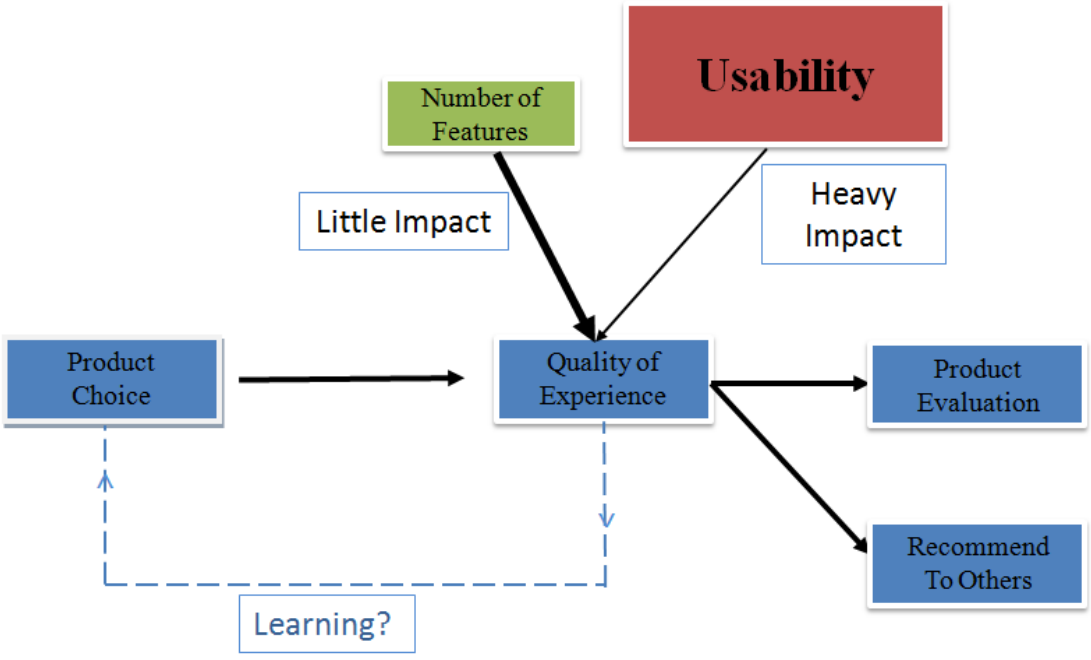
Chapter 5: Conclusion

Consumers are faced with a challenge of buying products with which they will be happy. Products that consumers find undesirable after purchase can cause stress, anger, and a financial burden. Companies likewise can face lost brand equity, negative word-of-mouth, and product returns when consumers buy products that they are unhappy with during use of the product. The problem arises because consumers are unable to correctly predict which product attributes will actually be most influential on their post-use satisfaction. This dissertation addressed how consumers choose products before purchase and how that process can be improved.

The projects within this dissertation define and address the Buyer's Fallacy in consumer purchases. The Buyer's Fallacy describes how consumers misjudge the importance of product attributes, and leads to the purchase of products that result in negative consumer experiences. This dissertation focuses specifically on how consumers commit the Buyer's Fallacy with product usability and the number of product features (see Figure 5-1). Consumers place too much weight on the number of features and too little weight on usability at the time of making a purchase decision. When using a product, the number of product features has relatively little impact while usability has a much larger impact on the quality of the consumer experience. Study 1 establishes the Buyer's Fallacy by demonstrating that ease of use has a large impact on product evaluations, which indicates that consumers will benefit from choosing products which are easy to use. Study 2 identifies a moderating factor of the Buyer's Fallacy based on consumer age indicating that older adults place more importance on product usability when selecting a product. Study 3 creates an intervention to help consumers avoid the Buyer's Fallacy by increasing the weighting of usability when selecting a product.



A. Before Product Purchase



B. After Product Use

Figure 5-1 Influence of Product Attributes Before (top panel) and After (lower panel) Product Purchase.

Research has demonstrated the consumers benefit from choosing products that are easier to use (e.g. Thompson et al., 2005; Lee & Koubek, 2010); however, consumers often

overlook ease of use and focus on other attributes during purchase decisions, such as aesthetics, capabilities, and social benefits (Lee & Koubek, 2010; Sela & Berger, 2012; Thompson & Norton, 2011). Ease of use has been established as an important factor in consumer preferences after using a product in experiments; however, these findings had not been established in real world settings where consumers use products over much longer periods of time. In our study using actual consumer product review posted online (Chapter 2), ease of use is established as an important factor in consumer reviews. This finding demonstrates that, in actual market conditions, ease of use is a major factor in consumer evaluations. Therefore, there is a need for understanding the factors influencing perceptions of ease of use prior product purchase. The data also demonstrate the importance of ease of use for firms, as consumer reviews are a significant form of word-of-mouth marketing.

The differences found between factors influencing evaluations and recommendations support the construal level theory explanation of consumer preferences, in line with previous literature on product preferences (e.g. Hamilton & Thompson, 2007). However, these results are somewhat limited in the range of products that were tested in this naturalistic setting. The strength of the project lies in the fact that the data come from real customers who used the products over an extended period of time without any experimenter influence.

In Chapter 3, we investigate whether the Buyer's Fallacy is a major influence for all types of consumers. Prior literature suggests that consumer groups are largely all drawn to products with more features (Thompson et al., 2005). However, simple products aimed at older adults suggest that some consumers may be able to avoid the Buyer's Fallacy. We establish that older adults do focus on ease of use, specifically the negative aspects associated with additional features. The result of this focus on ease of use among older adults demonstrates avoidance of the Buyer's Fallacy, and of feature fatigue, through a preference for products with fewer features. However, older adults' preferences may be moderated by a greater ability to evaluate ease of use based on past experience. The results of the study indicate that consumers are capable of avoiding the Buyer's Fallacy, and that one method of doing so is by focusing on avoiding the negative effects of excessive features.

These results also indicate that one's ability to evaluate ease of use can moderate the ability to avoid the Buyer's Fallacy even when consumers have a desire to weight ease of use more heavily. Other literature has suggested that consumers who are high in need for cognition and consumers who process information heuristically are more prone to choose products with many features (Sela & Berger, 2012). However, older adults also tend to process information more heuristically (Yoon, 1997). Contrary to prior results (Sela & Berger, 2012), the findings from Chapter 4 indicate that older adults use heuristics to *avoid* the Buyer's Fallacy rather than using heuristics to choose products with more features. Older adults appear more prone to follow heuristics based on learned experience over time, and so recognize that more features can create usability problems. The heuristics explored by Sela and Berger (2012) are based on the belief that additional features are increased capabilities, not potential usability problems. This reconciles the two findings through specification of the heuristics used by consumers. The results in Chapter 3 are important because they provide insight into how to design and market products for a large and growing demographic segment. Furthermore, the results provide insight into ways that the general population can avoid the Buyer's Fallacy.

In summary, Chapters 2 and 3 established that ease of use should be an important factor for consumers when choosing a product, and that some consumers are able to successfully choose products that are easier to use. Chapter 4 expands on these previous works by creating a method for marketers to aid consumers in avoiding the Buyer's Fallacy. Feature mapping is used to connect product features and interfaces in order to increase both the ability to evaluate ease of use and the salience of ease of use. Feature mapping was successful in increasing the desirability of products with fewer features, and decreasing the desirability of some products with many features. These findings are important for marketers and firms selling simpler products because they provide a method for highlighting how a product is used and its resulting ease of use. A limitation of this method is that feature mapping is difficult with more complex product interface interactions; however, this method does provide a technique for directing consumer attention towards product use. Further extensions of this work can explore other methods to help consumers evaluate ease of use when considering product purchases.

Summary of Contributions:

Project 1:

- Establishes which product design attributes are most influential on consumer evaluations in support of the Buyer's Fallacy
- Discovers how choices for oneself differ from recommendations for others in the context of product reviews

Project 2:

- Finds that the Buyer's Fallacy does not apply to all consumers and is avoided by older adults
- Determines the limiting factors for older adult avoidance of the Buyer's Fallacy

Project 3:

- Creates and validates new method for countering the Buyer's Fallacy by clarifying a product's ease of use.

The findings of this research also provide important implications in a broader context. I address how consumers can avoid the pitfall of choosing an option which has immediate and apparent short-term desirability (products with many features) in order to choose an option which offers a less apparent benefit (easy to use products). This paradigm is one that can be applied in a number of settings. For example, similar challenges may arise when making a health decision such as exercising, which has less initial appeal but provides a greater long term benefit. Similarly, purchasing energy efficient products may have a less attractive initial cost but greater long term cost benefits. My research suggests marketers can devise representations of product features that assist consumers in weighing the less apparent, but very important, contributors to satisfaction.

The findings of this dissertation have strong implications for consumers hoping to avoid buying "the wrong" product. Purchase choices can be improved by recognizing ways that consumers poorly predict which attributes are most important. Avoiding the Buyer's Fallacy

could lead to not only happier customers, but also reduced purchase anxiety, increased brand equity, and greater sales for companies by aiding consumers in avoiding the Buyer's Fallacy.

Future work should further investigate different consumer strategies for choosing products that lead to greater satisfaction for purchasers. Beyond product usability, there are many other product design attributes which contribute to consumer satisfaction. Expanding this research will ultimately help improve the often difficult process that consumers face when trying to make purchase decisions in a world of many choices.

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