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Utility-based Apprehension in a Single-Factor Consumer Choice Model

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Keywords: Utility; Advertising Effectiveness; Purchasing Intention, Consumer Choice Models.

Introduction

Numerous consumer choice models exist (Bray, 2008). They frequently seek to anticipate the eventual purchase behavior once the intention to buy has been expressed. While this dynamic may hold true for products that command a substantial portion of the household budget or under specific conditions such as volatile markets or distribution channels, it may not

be necessary or reflective of real-life consumer behavior in all cases. Generally, consumers tend to focus on a limited set of key attributes given a certain price and quantity, as outlined in the standard economic model of supply and demand. In the realm of online sales, for instance, security often takes precedence as a primary concern (Kim, 2007), for reasons such as incomplete information, potential privacy breaches and identity theft (Pelaez, Chen, and Chen, 2017). Frequently, consumers may not proceed to inquire about price and potential quantity to purchase, even during sales promotions, if they do not feel secure. Perceived risk is also a significant consideration for certain product categories, such as baby cribs or food items (Emilien, Weitkunat, and Lüdicke, 2017). Other decision factors may hold less immediate or pertinent weight and are only considered after consumers have crossed the initial "gate." Without a sense of security, further consideration is unlikely, regardless of promotional efforts. Thus, we feel justified in suggesting that consumer choice models can be simplified to focus on a single factor, particularly in the initial stages of the purchasing journey. This approach is anchored in reality and aligns with the longstanding advocacy for adjusting academic research accordingly. For example, Breur, former chief editor of the *Journal of Marketing Analytics*, states that "When you research the behavior and intentions of real customers buying real products (or services), you gain validity by soliciting 'real' research subjects." (p. 203).

Single factors that could be incorporated into a single-factor model include budget constraints (e.g., for essential food items for individuals facing financial hardship), emotional preferences (e.g., for travel experiences), social status (e.g., for fashion products), satisfaction (e.g., in the context of the sex trade), symbolic value (e.g., for wedding rings), and, naturally, utility (e.g., for practical tools like a wheelbarrow).

In the following section, we compare single-factor and multi-factor models along an X-axis, employing a Y-axis representing rationality and non-rationality (or "irrationality" as per behavioral economics) to illustrate a gap in the existing literature. Subsequently, we conduct two studies to investigate the viability of employing a single-factor model while introducing the concept of Utility-based Apprehension (UbA). We present our findings, analyze them, and

conclude by proposing a slight paradigm shift in consumer behavior literature and suggesting ways in which marketing professionals can enhance the efficacy of their advertising efforts.

Multi-factor Models of Consumer Choice

The Theory of Planned Behavior (TPB) has garnered considerable attention within academic discourse over the decades, although it has been criticized for lack of proper construct definition (Khademi and Farbod, 2021). The theory rests on three factors: subjective/social norms, perceived behavioral control, and attitude toward the behavior, where this attitude reflects an individual's overall positive or negative assessments regarding the execution of a specific behavior (such as buying). Drawing from a dataset comprising 185 distinct studies published until 1997, Armitage and Conner (2001) find that the TPB demonstrated explanatory power, accounting for 39% and 27% of the variance in intention and behavior, respectively. Moreover, when behavior was assessed through self-reports, the TPB exhibited an 11% higher explanatory capacity in predicting behavior compared to instances where behavior was measured objectively or observed (with R^2 values of 0.31 and 0.21, respectively). Decades before, Sheppard and Warshaw (1988) found similar results by calculating the frequency-weighted average correlation for the relationship between variables Intention and Behavior was determined to be 0.53. This correlation was derived from 87 distinct studies, encompassing a total sample size of 11,566, and demonstrates statistical significance at the 0.01 level. In short, intention leads to some degree to behavior, so that studies that examine intentions ("intention to buy" in our study) can make plausible inferences about future, consequent behaviors ("purchasing" in our study).

The Theory of Reasoned Action (TRA) derive from the prescriptive Theory of Planned Behavior (TPB) introduced by Fishbein and Ajzen (1975). It encompasses two fundamental factors: belief systems and perceived behavioral control. The incorporation of perceived behavioral control (PBC) was motivated by the aim to forecast behaviors that were not entirely within conscious control. While the Theory of Reasoned Action (TRA) could effectively

anticipate behaviors characterized by clear volitional control, instances where external constraints influenced action rendered mere intention formation insufficient for behavior prediction. Originally, Ajzen (1991) posited PBC and self-efficacy are interchangeable, but several authors, such as Terry (1993) and Bandura (1986, 1992), have proposed they are not entirely synonymous. Self-efficacy primarily revolves around cognitive perceptions of control rooted in internal factors, whereas PBC encompasses broader external factors as well. The debate continues but the bottom line is that these models include two factors.

A non-descriptive, so-called "analytical" approach, the Theory of Buyer Behavior presented by Howard and Sheth (1969), stipulates that many factors shape consumer perceptions, attitudes, and behavior, including significative, symbolic, and social stimuli. They argue that understanding the interplay of these stimuli is essential for marketers to effectively influence consumer decision-making processes and develop targeted marketing strategies.

The 1968 Consumer Decision (Engel-Blackwell-Miniard) Model has many elements that resemble of the Theory of Buyer Behavior but is more complex. It delineates a seven-stage decision process, spreading the recognition of a need to divestment. Purchasing decisions are impacted by two primary factors: the stimuli received and processed by the consumer and environmental influences such as culture, social class, personal influence, family, and situation.

The economic Utility Theory provides a framework for understanding how individuals make decisions in situations involving uncertainty, risk, and scarcity, by comparing two sets of products along indifference curves that express how consumers choose between them based on their preferences. Preferences refer to individuals' rankings or orderings of different goods, services, or outcomes based on their perceived utility. Preferences are typically assumed to be transitive, complete, and reflexive, meaning that individuals can consistently rank options, have preferences for all possible pairs of options, and prefer any given option over itself. The two factors are therefore product A and product B. An example of an application in economy and marketing is the CAPM, whereby consumers make choices based on the expected outcomes of their decisions.

According to Regret Theory, consumers make decisions by considering not only the expected utility of different options but also the emotional consequences of those choices. Anticipated regret theory (Bell and Raiffa, 1988) focuses on how consumers consider the potential for experiencing regret when making decisions to purchase a product. The two factors are related to time: the action of buying now is compared to the expected emotion (regret) that may appear later. Interestingly for our study, utility is considered, but it is put in a two-factor time perspective. Another such dual factor model in economy is that of opportunity: consumers debate whether to buy products now (thus, spending money that cannot earn interest if it were invested) versus buying products later (thus, earning interest of the money but losing immediate satisfaction).

Cognitive Dissonance refers to the psychological discomfort experienced by consumers when they hold conflicting beliefs, attitudes, or behaviors related to a purchase decision (Festinger, 1957; Costanzo, (2013). This state of tension or dissonance that motivates them to reduce or resolve this discomfort. Obviously, this is a multi-factor model. It is particularly time-sensitive: consumers emit doubts about their recent purchase to the point that they may return the product to the store.

Prospect Theory (Loss Aversion versus Gains Model) is encapsulated in the phrase "losses loom larger than gains"; it underscores a fundamental aspect of consumer behavior (Brenner et al., 2007; Kahneman and Tversky, 1979). This asymmetry in consumer response to framed losses (e.g., prices exceeding a reference brand) *versus* gains (e.g., prices below a reference brand) holds significant implications for the competitive strategies of retailers. This observation has forced firms to adapt their product positioning strategies to optimize profits (Heidhues and Kőszegi, 2008; Elsantil, Moustafa, and Hamza, 2021). This model is a two factor model because losses and gains operate vastly differently. The standard curve present to reflect this reality consist in fact of two different curves— one for gains, and one for losses. Indeed, the neurobiological mechanisms that explain this difference speaks for themselves. In the case of gains, the prefrontal cortex (calculation), the XXX and the ventral-tegmental area (VTA,

reward) are mostly solicited; in the case of losses, the hippocampus (memory) and the brain amygdala (emotions) are mostly active.

In stark contrast to the above rational perspective, Freud's psychodynamic point of view is that behaviors are influenced by biological drives, as opposed to individual cognition or environmental stimuli. After the 1960, academics started to emphasize the importance of emotional (or non-rationality) in consumer behaviors (Nataraajan and Bagozzi, 1999)

Bagozzi and Warshaw's Theory of Trying, as presented by (1990) evaluates the effort to act. It posits subjective norms, attitude toward the process or means of attempting, attitudes and expectations of success, and attitudes and expectations of failure as the primary antecedent variables influencing the intention to try.

The Theory of Consumption Values by Sheth, Newman, and Gross (1991), suggests that consumers derive value from products not only based on their functional attributes (utility) but also on the symbolic and experiential benefits associated with consumption (which implies that the intention to buy was acted). As can be assessed, this theory relies on utility but merges it with other considerations. It is thus a multi-factor model.

Conceived by Arnould and Thompson (2005), the Consumer Culture Theory (CCT) refers to the complexity of culture, recognizing that consumers evolve in a complex framework of commercially generated images, texts, and objects with various meanings. As such, this model is not strictly linked to consumer behavior but suggests that consumers are influenced by a combination of factors.

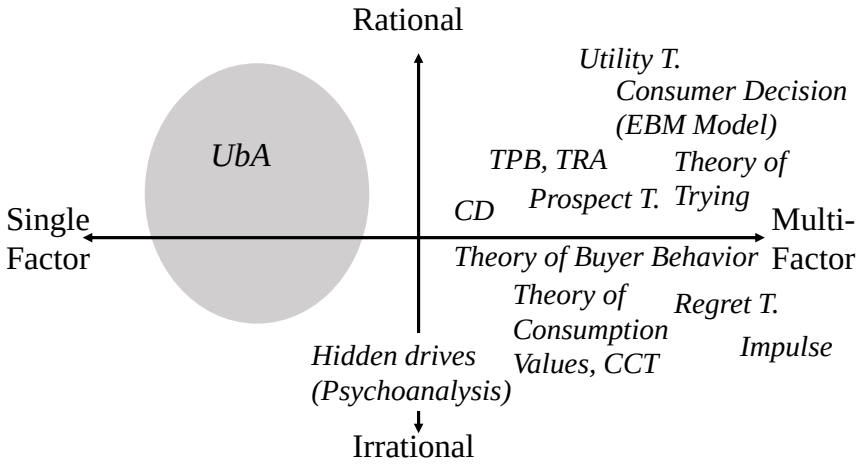
The phenomenon of impulse buying among consumers has garnered significant attention in consumer research. Its complexity arises from being driven not only by various internal psychological factors but also by external stimuli within the market environment. A meta-analysis by *Iyer et al.* (2019) consolidating insights from 231 diverse samples encompassing over 75,000 consumers found that key triggers of impulse buying include sensation-seeking, utilitarian and hedonic motivations, consumer resources (e.g., time, money), and marketing stimuli. As such, we consider the understanding of impulse buying as a multi-factor model, one that is linked in part to non-cognitive inputs (sensation-seeking).

One-factor Model of Consumer Choice

As can be seen from the above review, most models call for multicriteria analysis. There are no models that assign a single factor model, beyond the traditional price-quantity equation, to a purchasing intention. Figure 1illustrates how we position our proposal for a single-factor model to the multi-factor model, highlighting the gap in the consumer behavior literature, using a perceptual/Cartesian maps. Such maps are valuable tools in marketing as they help clarify a theorist or manager's vision by contrasting points of views (or brands or products) along orthogonal axes (Iacobucci and Grisaffe, 2018).

[Insert figure 1 about here]

Figure 1. A Cartesian Map of the Consumer Choice/Behavior Models — Estimated Positioning



Even though we estimated the positioning of the models, it is evident from Figure 1 that many models rely on intricate analyses and assume that consumers invest significant effort and time into making purchasing decisions, regardless of the types of products they buy and the channel of distribution.

Advertising

Advertising plays a pivotal role in shaping consumer behavior by influencing perceptions, attitudes, and purchase decisions. Many studies have proven that advertising can be efficient in achieving its goal. As an example, an analysis by Eisend and Tarrahi (2016) of 324 meta-analytic effect sizes derived from 44 meta-analyses, encompassing over 1,700 primary studies involving more than 2.4 million participants, points to the effectiveness of advertising. Morwitz, Steckel, and Gupta (2007) findings suggest that findings suggest that intentions exhibit stronger correlations with purchases in several scenarios for existing products compared to new ones, durable goods in contrast to non-durable goods, and for short time horizons as opposed to long ones.

Decades before, Assmus, Farley, and Lehmann (1984) conducted an examination of estimated parameters extracted from 128 models documented in 22 studies published prior to 1981, focusing on the influence of advertising on sales. Their analysis revealed that, for frequently purchased items, models ought to integrate factors such as product type (e.g., food) and the geographical location of the purchase. Prevalent advertising strategies encompass informative advertising, persuasive advertising, comparative advertising, testimonials, and endorsements from celebrities or experts (Kardes *et al.*, 2021). Moreover, visual elements such as engaging visuals, color combinations, and captivating imagery can augment the persuasive effectiveness of advertisements (Meyers-Levy & Peracchio, 2020).

Our Research

Adopting the standard Stimulus-Organism-Response Model of Decision Making, we endeavored to measure how purchasing intention can be explained by advertising effectiveness, which should promote such intention, and a single factor that acts as "gate" and that we name "Utility-based Apprehension" or (UbA). This construct refers to the idea that consumers assess utility of a product when invited to buy it. Should we find an effect even for products that the

consumers do not need to buy now, then this would indicate that a single-factor model could be used in assessing consumer behaviors, at least to a degree. In other words, we propose that marketing experts should isolate the variables that can account for purchasing intentions before engaging in complex, multi-factor models, to minimize the risk of ignoring multiple, complex correlations among sets of variables hypothetically used in multi-criteria analyses that the average consumers would perform.

Protocol and Participants

To eliminate as much as possible the element of perceived risk, we chose a brand that has offered and still offers the most reliable product over the last 25 years, that is, Toyota. We chose a single durable product, a SUV vehicle because utility is often a key factor in choosing such vehicle, and we opted for an advertisement that had no verbatim (to limit the input of information) and that communicated the fact that said vehicle was useful in tough environments (link to the ad: https://www.youtube.com/watch?v=pDLtstuxuRw).We also concentrated our study to the Southeastern part of the USA. We opted for a conventional fuel as opposed to an electric vehicle, because environmental concerns are a key concern for electric vehicles besides functionality (Xia, Wu, and Zhang, 2022). We used a questionnaire adapted from Mesly (2010) who did a study of 14 dealerships in Canada in 2010, including at Sherbrooke Toyota, where both qualitative and quantitative measures we obtained. We ensured adherence to appropriate psychometric standards and established a one-dimensional scale ranging from 1= “I do not agree at all” to 5= “I completely agree”.

We utilized a random sample sourced through Prolific, an online research platform facilitating participant recruitment and management for online studies. The sample was selected based on two criteria: 1) respondents residing in the Southeastern part of US (where the ad had high relevance because it depicts a similar geographical background), and; 2) English as their native language. Participants were invited to view the advertisement via a provided YouTube link and subsequently complete the questionnaire. The message prompt was as stated below:

"Thank you for participating in this questionnaire. We kindly request that you review the enclosed advertisement while envisioning yourself as a potential consumer interested in this type of vehicle. Your responses will be kept confidential, and this should only take a few minutes of your time. Should you have any questions or feedback, please don't hesitate to contact us at [contact information]"

A total of 701 participants were obtained (the sample size was determined using Mesly, 2015).

Results

The key metrics are presented in Table 1 (constructs correlations) and Table 2 (items).

[Insert Tables 1 and 2 about Here]

Table 1. Key Statistics and Correlations

	Mean	Standard Deviation	PI	UBA
			Correlations	
PI	2.414	1.214	1	-0.543
UBA	2.787	0.944	-0.543	1
AdEff	3.483	0.933	0.592	-0.361

Note: All correlations are statistically significant at $p < 0.01$, using a five-point Likert scale.

Table 1 indicates that purchasing intentions are positively influenced by advertising effectiveness but negatively impacted by Utility-based Apprehension, as expected. UbA plays a signification role in the dynamic between AdEff and PI.

Table 2. Items-related Key Statistics

Items	Factor			Cr. Alpha	AVE
	PI	Ad	UbA		
Purchase Intention (PI)					
PI_01: I am considering buying the vehicle.	0.967			0.966	90.7
PI_02: I have made up my mind to purchase the vehicle.	0.948				
PI_03: I am fully committed to buying the vehicle.	0.964				
PI_04: I feel compelled to buy the vehicle.	0.931				
Advertising Effectiveness (AdEff)					
ADEFF_01: The advertisement message regarding the vehicle seemed highly credible to me.		0.855		0.858	70.7
ADEFF_02: The advertisement effectively captured my attention about the vehicle.		0.829			
ADEFF_03: The advertisement prompted me to continue watching it.		0.855			
ADEFF_04: The advertisement convinced me that the vehicle would deliver on its promises.		0.824			
UbA					
UbA_01: I may return the vehicle to the dealership if I find it of no use.			0.809	0.820	65.7
UbA_02: I will likely want to get rid of the vehicle once I acquire it if proven of no use.			0.859		
UbA_03: I worry about the potential difficulty of returning the vehicle if I choose not to keep it.			0.828		
UbA_04: I am uncertain about what I will do with the vehicle if I decide not to keep it.			0.741		

The factor loadings (all above 0.8 but one above 0.7), the Cronbach Alphas (all above 0.8, but one) and the Average Variance explained (all above 65%) fall within the typical benchmarks[1]. Overall, respondents exhibited high purchase intention and positive perceptions of advertising effectiveness, albeit with some apprehensions about the utility of the vehicle.

Regressions

We tested the linear regression as follows:

$$PI = Adeff - UbA \qquad \text{(Equation 1)}$$

at a p=0.000 (F= 335,974), with an adjusted R^2 of 0.474 (Durban-Watson within close range of 2 at 2.061) and the following coefficient (Table 3).

[Insert Table 3 about Here]

Table 3. Regression Data

	Non-Standardized		Standardized		
Model	B	Error	Bêta	t	Sig.
(Constant)	1.744	0.194		8.994	0.000
AdEff	0.586	0.037	0.456	15.974	0.000
UbA	-0.492	0.037	-0.379	-13.271	0.000

As revealed by this regression, UbA exercises an influence on PI about as strong as AdEff, but in opposite direction. We ran ANOVAs to check for the influence of the sociodemographic particulars and found that gender affects none of the three variables of interest. The education level at p=0.000, revenue (p=0.002), and age (p=0.005) all impact AdEff, suggesting that people with more experience are more sensitive to the Toyota advertising, perhaps because the car that was advertised is a rather expensive, appealing to a higher social class.

Discussion and Conclusion

[1] For a Table of statistical benchmarks, see Ordener, Ivanaj, and Mesly, 20023.

Marketers can launch campaigns by focusing on single criteria without worrying about missing others if those factors do not significantly impact the purchasing process. We argue that the complex multi-factor models promoted by academics may lead practitioners to overstretch their budgets for minimal incremental benefits.

Our findings indicate that a single-factor model could effectively predict the likelihood of a potential client purchasing a product or at least indicate what barrier to intention to buy might exist. This may be true at certain points during the purchasing process, as consumers do not always conduct multi-criteria analyses, especially if the desired product does not require such mental effort. This implies that in specific scenarios, marketing analysts may not require intricate, multifactor models nor do they always need huge amount of data in all circumstances. Notably, complex models can pose challenges in maintaining control over variables. Additionally, some variables may turn out to be very difficult to measure and highly contextual. Table 4 summarizes our argumentation.

[Insert Table 4 about Here]

Table 4. Pros and Cons of Multifactor Models

	Multifactor Model	**Single-Factor Model**
Advantages		
Interpretability	Provides insight into the relative importance of different factors influencing the outcome.	Offers simplicity and ease of interpretation, especially when a limited number of variables suffices to take managerial decisions.
Flexibility	Allows for the inclusion of multiple variables, capturing the complexity of real-world phenomena.	Suitable for situations where a single dominant factor explains most of the variation in the outcome.
Enhanced Predictive Power	Can potentially yield more accurate predictions by considering various factors simultaneously, if they can be adequately measured.	May lead to more straightforward models with fewer parameters, reducing the risk of overfitting and misinterpretations.
Identification of Interactions	Enables the exploration of interactions between different factors, uncovering nuanced relationships if this brings significant value.	Explicitly consider simple interactions between variables, making it easier to implement and interpret.
Consumer	Do not necessarily reflect how consumers think and behave, especially for certain types of products and channels	May adequately reflect how the average consumer behaves and think.
Manager	May create conceptual structures that are unmanageable in daily activities	May be used intuitively by managers

	Multifactor Model	Single-Factor Model
Academic	Encourage reflection	Force experts to highlight the key factors that are important in the daily life and shopping experience of consumers
Technique	May imply advanced managerial technique that could be beneficial in complex environments	Can serve as an initial assessment of an advertising during a trial test, thus holds potential in terms of productivity and efficient use of organization resources.
Disadvantages		
Complexity	Requires a larger sample size and computational resources, as well as more sophisticated statistical techniques.	May oversimplify the underlying relationships, overlooking important nuances and interactions.
Data Requirements	Demands comprehensive data collection efforts to measure multiple variables accurately, which can be time-consuming and costly.	Relies on the assumption that a single factor adequately represents the phenomenon, potentially ignoring relevant influences.
Interpretation Challenges	Interpreting results can be challenging due to the interplay of multiple factors and interactions, requiring careful consideration and expertise.	May overlook the relative importance of different variables, leading to a less nuanced understanding of the phenomenon.
Increased Risk of Overfitting	Runs the risk of overfitting the model to the data, especially with many variables, which can compromise generalizability.	Less susceptible to overfitting due to its simplicity but may sacrifice some predictive power by neglecting relevant factors.

Our research's limitations lie in its reliance on a single model applied to a solitary group of consumers for a specific product. This approach may overlook the nuances and complexities inherent in different consumer segments, diverse product categories, and varied market conditions. Consequently, the findings may lack generalizability and fail to capture the full spectrum of factors influencing consumer behavior across broader contexts.

We suggest conducting research across diverse distribution channels and product types to pinpoint a pivotal factor that could function as an initial screening criterion for assessing consumer behaviors.

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