

# The impact of online sales promotion on consumers' online impulsive buying decisions, suggestion for AI recommendation systems

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**Abstract**—Impulse buying is making a purchase that you did not originally intend to. This could be stimulated by the external shopping environment, your internal thought-processing course, or both simultaneously. Marketers, in their own way, try to make the most of this behavior to boost sales. Online shopping has always been developing at a remarkable pace, however, with the outbreak of the COVID-19 pandemic at the beginning of 2020, recent years have seen even more significant increases in terms of online sales revenue. Combining the two notions of “impulse buying”, “online shopping”, and the marketing technique of sales promotion, this paper aims to analyze how online sales promotions affect consumers’ online impulsive buying decisions. Based on a previously proposed research model as a theoretical basis, the researcher simplified to make it more fitting and feasible due to the short period of the total research process. Primary research was carried out among people living in the city of Hanoi, Vietnam who do their shopping online daily. A structured questionnaire was used to collect relevant data from respondents of a sample size of 295. The results show that online promotions indeed affect consumers’ online impulsive buying decisions, the two opposite directions of anticipated regret have contrasting impacts on those decisions, and consumers’ inherent trait of impulsiveness does not moderate the relationship between the anticipated regret they experience and their impulsive purchase decisions.

**Index Terms**—AI, impulsive buying decision, online consumer behavior, sales promotions.

## I. INTRODUCTION

We are living in the digital age, the traditional way of life that we are all accustomed to is changing in every way. And one of the biggest, or most obvious, changes is how things are bought and sold. Online purchasing has become the go-to option for stock replenishment ever since the pandemic outbreak in early 2020, as unnecessary travel was avoided during lockdowns, and everything had to be delivered using the no-touch system.

The sellers must adjust their marketing plans appropriately as the number of online consumers rises to better suit the needs of the modern consumer. If used on a digital platform, something that was formerly profitable in a brick-and-mortar store might no longer be as effective, suggesting the need for adjustment. Even while online sales are on the rise, the epidemic had a negative impact on people's money and, as a result, on the profits of online retailers. For retailers to increase sales, it is essential to understand what is going through their consumers' minds when they search online for

the products they want. Consumers can also understand their own psychology when purchasing and base decisions on it.

As sales promotion is rather common nowadays as an instrument for online merchants to make their shops more appealing to the eyes of the customers, it is vital to analyze precisely how sales promotion is affecting customers’ impulsive buying decisions to generate more profit. Since promotions usually comes with constraints, they naturally prompt consumer to purchase right at the time they are on sale without prior planning. Such action is called impulse buying. On the sellers’ side, to increase sales and maximize profit, they must grasp the psychology behind their consumers’ behavior and strategically formulate effective marketing plans. And for buyers, understanding the principles behind the causation of impulsive purchase decisions could help them identify the temptation and manage their desires while doing their shopping, thus making better purchase choices.

## II. LITERATURE REVIEW

### A. B2C E-commerce

E-commerce is the short form of electronic commerce. E-commerce can be explained as “commercial transactions involve the exchange of value (e.g., money) across organizational or individual boundaries in return for products and services” (Laudon & Laudon, 2022). There are two main types of E-commerce including business-to-business (B2B) and business-to-consumer (B2C).

B2C refers to the direct selling of products and services between businesses and their consumers. Business-to-consumer (B2C) only involves two parties: the businesses offering products and services and the consumers who directly purchase and use those products and services without the interference of any middle person. Combining this definition of B2C with the previous explanation of e-commerce, B2C e-commerce, refers to online retailers that sell directly to consumers over the internet. The online platform on which these retailers are offering their products and services could be their home websites, mobile applications, etc. In the modern world, there are merchants who entirely moved their marketplace online, whereas some maintain both online and offline presence to keep up with the new shopping trends.

This leaves those solely selling at brick-and-mortar stores gradually experiencing a decrease in demand, popularity, and number.

### B. Stimulus-Organism-Response Model

The figure below demonstrates the most basic structure of a stimulus-organism-response model.

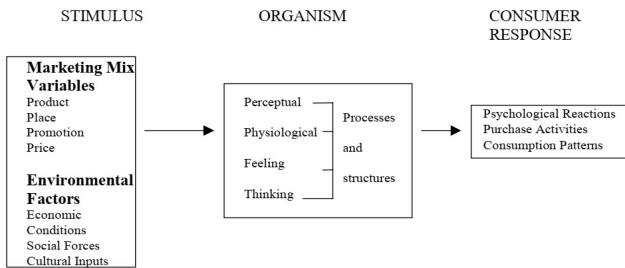


Fig 1. Stimulus-organism-response model [2]

External stimulus affects organisms, or consumers' internal emotional reactions, which eventually prompt them to act accordingly. Consumers' response, in this case, would be exactly what marketers want them to do when originally setting up those stimuli. Marketers gather information about consumers beforehand to be able to predict their next move. By doing so, they could strategically apply this model efficiently to increase consumers' consumption and at the end of the day, gain more profit, which is the goal of every business owner.

The stimulus-organism-reaction model is very commonly used in research on marketing strategy in general (Luo, et al., 2021). Furthermore, most of the studies that have been made to investigate consumer impulse buying behavior are made on the stimulus-organism-response theoretical basis. Thus, this paper will also adopt the stimulus-organism-response framework to build the research model.

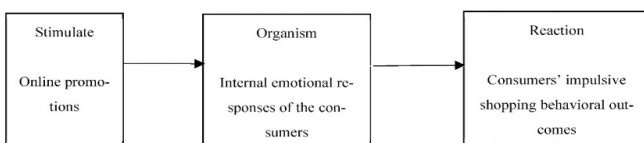


Fig 2. The basic theoretical framework of the paper [3]

In this paper, stimulus is the online promotion methods in general. The organism represents consumers' emotional reaction after experiencing the stimulus and, in this case, it is the anticipated regret. We would be discussing both directions of anticipated regret: upward and downward. Finally, the response refers to consumers' behavioral results, or in other words, how they act under the influence of the psychological process caused by the stimulus. The impulsive buying decision in this study represents behavioral outcomes of consumers as a reaction to online sales promotions (the external stimulus).

### C. Sales promotion

Sales promotion is defined as "short-term incentives to encourage the purchase or sales of a product or service" [4]. Whereas advertising offers reasons to buy a product or service, sales promotion offers reasons to buy now. Therefore,

sales promotion is now being recognized as an important marketing technique, especially in tight market competition.

Additionally, one of the most important and commonly practiced marketing models is the 4P theory, which consists of product, price, place, and promotion [5]. Since then, the definition of the word "promotion" as well as the marketing tactic of using promotions to boost sales has become widely known.

By making use of modern technology, specifically advanced communication tools, sellers can now deliver promotion information much more appealingly so they could excite consumers and eventually evoke their desire to buy. The two most common ways of promotion are: quantity-limited and time-limited promotions. The reason why these two are commonly used is that the limited nature of these promotions gives consumers a sense of urgency, which would result in them buying impulsively since they do not want to miss this once-in-a-lifetime deal, as advertised by many retailers. In practice, both promotions can grasp consumers' attention, attract them with a favorable price, then prompt them to immediately make an impulsive purchase since they are under the impression that they have to race against time and also against other consumers to be able to secure the product.

### D. Anticipated regret

Regret occurs when an individual feels sad and wishes that he or she had made a different decision in the past because the result of his or her actual choice was unfavorable and did not offer as much benefit as the other choice could have brought about. Anticipated regret refers to the anxiety caused by the individual worrying about possible loss before deciding. This could lead to hesitation and doubt before making purchase decisions. Based on the directions of counterfactual thoughts, it is easy to differentiate between the other possible courses of action and the actual outcome [6]. "When starting from the perspective of downward counterfactual thinking, people tend to compare the result of a decision with the result of a worse plan" [3]. This is called downward anticipated regret. When consumers have this direction of anticipated regret, they think that if they make this decision is not beneficial to them and it would only bring about regret in the future, thus they would choose not to perform such action to averse any risk that may occur. On the other hand, consumers with downward expectations regret, they believe that by making that decision, their benefits will increase, thus increasing the possibility of them doing so.

In short, "the upward anticipated regret commonly inhibits the individual's desire to act, while the downward anticipated regret stimulates the individual's desire to act" [3]. Therefore, this paper aims to study both directions of anticipated regret and investigates how they are related to online promotional activities as well as consumers' online impulsive buying decisions.

### E. Impulsive buying

Impulsive buying, by definition, is the act of buying on a whim without prior planning. This could be stimulated by the external shopping environment. Marketers intentionally design the shopping environment to be appealing and attractive to motivate consumers to buy products that they did not

originally mean to. When put into such an environment that has been strategically mapped out to allure them to purchase, it is usually very hard for consumers to act against those temptations. This behavior of buying impulsively is “often accompanied by happiness and passion” [3]. However, as previously explained, impulsive buying is making a purchase that one did not intend to, thus it is natural that this action is usually performed with a lack of thoughtful trade-offs. This would eventually leave consumers with regret post purchase. In short, buying impulsiveness is explained by the act when a consumer plans to buy “spontaneously, unreflectively, immediately, and kinetically” [7].

With the development of modern technology and consequently the widespread growth of e-commerce, impulsive buying behavior on digital platforms, or in other words, online impulsive buying behavior has been the main focus of many scholars. As consumers today are on their phones most of the time, it is predictable that they are surrounded by sales information all day long, which could trigger them to make impulsive purchases. Online promotion is much more appealing to consumers due to its “diversified and eye-catching forms of product presentation” [3]. Thanks to this attractive nature of online promotion, it is now considered an effective marketing tool by businesses and marketers. The purpose of this paper, as previously stated, is to investigate the link between online promotion and consumers’ online impulsive buying decisions.

F. AI recommendations system

Artificial intelligence (AI), which was a curiosity for generations, is rapidly developing into a major applied technology with many applications in a variety of fields [8]. The rise of Big Data databases produced by the Internet, e-commerce, the Internet of Things, and social media are the main factors propelling the quick development of AI. The sharp decline in computer processing costs and the increase in processor power are considered secondary causes [1]. Customer experiences are changed because of AI technologies. The employment of talking bots is a significant example. Bots (like Alexa) can offer information about goods and businesses as well as suggestions and direction. Gangwani [8] provides the following suggestions for enhancing customer experiences:

1. Employ NLP to create user documentation. The conversation between customers and machines is also enhanced by this feature.
2. Classify photos visually (for examples, use IBM's Visual Recognition and Clarifai)
3. By examining consumer data, offer customized and segmented services. This encompasses enhancing the shopping experience and CRM.

Salesforce's Einstein is a prominent illustration of AI in CRM. Marketing professionals are also concerned with a consumer's psychological profile in addition to their classification of lifestyle [1]. An individual's needs, impulses, motivations, perceptions, and learned behaviors, including attitudes and beliefs, make up their psychological profile. Through product design, product positioning, and marketing communications, marketers try to appeal to various psychological profiles. For instance, a lot of health e-commerce

websites highlight that by giving customers knowledge about illnesses and treatments, they enable them to feel in charge of their health's course. This message is a potent appeal to the need for self-control and command over what may be a challenging, life-threatening circumstance among a rich, educated, professional, and technologically sophisticated group of web users.

III. MODEL AND HYPOTHESES

Promotions are limited-time offers or special pricing on products. The online promotion also shares the same meaning, the only difference is that promotion activities are now presented on digitalized platforms. Due to its “diverse and vivid expressions” [3], online promotion has been able to appeal itself to a wide range of merchants and has gradually become an inevitable method for marketing to many businesses. Promotions, in general, get people excited and eager enough to make a purchase immediately because there is a sense of urgency, and it is of human’s nature not to pass on something that seems like a bargain.

Online merchants offer promotions on a wide variety of goods that you probably don’t need right away or even have never purchased before, but if there is a chance to get them at a very reasonable price, then you might stock up on them immediately before the offer is over. This impulsive response is exactly what the sellers and marketers expect consumers to have when planning promotions.

Personalities and traits are innate and thus, very hard to be changed. This paper will be specifically discussing impulsive traits, which are described as inherent characteristics of an individual and rather challenging to be changed, as previously stated. “The level of impulsive traits is commonly manifested in individual impulsive willingness or differences in behavior” [3] which has been quite commonly discussed in consumer behavior study.

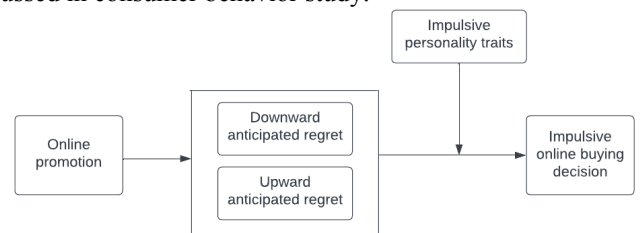


Fig 3. The researchers’s proposed research model

Due to the many limitations of the economic model and the stimulus-response that have been previously stated, these two models would not be used in this paper. Instead, this paper will use the stimulus-organism-response (SOR) model as the theoretical basis of the research model by virtue of its many advantages and highly analytical nature. In the research model, online promotions will be acting as an independent variable, with both directions of anticipated regret (upward anticipated regret and downward anticipated regret) as an intermediate indicator, and lastly consumers’ online impulsive buying decision as the dependent variable. In addition, the factor of consumers’ impulsive traits will also be used as the moderator of the relationship between anticipated regret and impulsive online buying decision.

This model was adapted from a previously proposed research model by Luo [3]. The original research model is as follows:

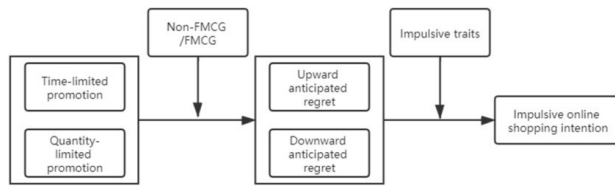


Fig 4. The original proposed model by Luo, et al. (2021) [3]

Although the research model proposed is tremendously logical and extremely well-developed, I, unfortunately, had to make certain simplifications due to the time-constraint of this paper and my limited knowledge. After some alterations, the research model has become less complicated and thus, much more manageable for me.

As mentioned above, there are a total of two directions of anticipated regret: downward and upward. Downward anticipated regret prompts the individual to act whereas upward anticipated regret inhibits their desire to do so. Online promotional activities could stimulate both these anticipations of regret, and consumers' behavioral response would be different according to each type. However, promotion usually comes in the form of limited time or quantity, which would more likely encourage consumers to make purchases rather than holding them back. The reason behind this is that restrictive conditions make consumers feel a sense of urgency and competition, thus they would choose to act and fall into this so-called trap that marketers set up. On this basis, I would propose the following hypothesis:

Hypothesis 1 (H1): Online promotions have a more significant impact on downward anticipated regret than on upward anticipated regret.

It's natural that consumers want to maximize their utility while shopping for goods. To do so, they would have to weigh their decisions carefully prior to the actual purchase. There are two types when it comes to consumers' anticipation of regret: downward and upward. Among these two, upward anticipated regret is referred to as the action effect, and downward anticipated regret is referred to as the inaction effect. If consumers think that they can buy the exact same product later at a lower price, they will regret if they buy it now and thus reduce the possibility of making an impulsive decision; if consumers think they will no longer be able to buy the product at such a bargain after promotion, they will think that not buying this immediately could cause regret in the future. Based on the above statement, I propose the following two hypotheses:

Hypothesis 2 (H2): Upward anticipated regret negatively affects consumers' online impulsive buying decisions.

Hypothesis 3 (H3): Downward anticipated regret positively affects consumers' online impulsive buying decisions.

Individual impulsive traits are inherent and are the personality characteristics of consumers. Impulsivity in traits could translate to impulsivity in purchases. Consumers with a high level of impulsivity would more easily fall into the trap of promotion and make buying decisions immediately upon those offers. On the other hand, those with less impul-

sivity would weigh the consequences of available options more carefully, thus less likely to make impulsive decisions. Based on these statements, we can hypothesize:

Hypothesis 4 (H4): Impulsive personality traits moderates the relationship between consumers' anticipated regret and online impulsive buying decisions

#### IV. MATERIALS AND METHODS

This paper aims to study the impact of online promotional activities on consumers' impulsive buying decisions and consumers' impulsive personality traits are chosen as the moderating variables, based on the proposed research model. Some successful findings and experiences in earlier research were used as references for measurement indicators.

This paper collects primary data by using questionnaires. The questionnaire is divided into four parts: part one collects people's personal information to gain demographic insights, part two presents a scenario for people to make decisions upon to test which direction of anticipated regret they lean more towards, part three examines the impulsivity level in their personalities and finally, part four rates their online impulsive buying decisions. As mentioned, there is a specific scenario in part two, which serves the aim of putting respondents into a situation as realistic as possible, thus they could better visualize and immerse themselves in the situation. By doing so, the authenticity of answers can be improved drastically compared to questionnaires with no specific promotion scenes.

The scenario is as follows: You intend to buy a t-shirt on an e-commerce platform. While browsing the website to choose which design to purchase, you happen to see a pair of shoes that suit your style, and it has also received pretty good reviews from previous buyers. You can absolutely afford to buy these shoes at their original price. However, this product is currently being discounted by 20% and this promotion will expire within the next 3 days.

Table 4.1 shows the items used to measure the four variables in the questionnaire: upward anticipated regret, downward anticipated regret, impulsive personality traits, and impulsive online purchase decisions.

The questionnaire was released digitally on Google Form and all participants were given the same scenario as explained above. A total of 295 questionnaires were collected, and they were all valid. All valid questionnaire data were collected and analyzed by the statistical software, SPSS20.0.

In order to test Hypotheses H1 (online promotions have a more significant impact on downward anticipated regret than on upward anticipated regret), I used the paired-sample t-test for verification. The reason is that in this case, it is of the researcher's interest to investigate the difference between two variables (upward anticipated regret and downward anticipated regret) for the same subject (online promotions).

This paper uses the regression analysis to test H2 (upward anticipated regret negatively affects consumers' online impulsive buying decisions), H3 (downward anticipated regret positively affects consumers' online impulsive buying decisions), and H4 (impulsive personality traits moderates the

TABLE I  
RESEARCH VARIABLES MEASUREMENT INDICATORS AND MEASUREMENT ITEMS

Research Variables	Measurement Indicators	Measurement Items	Reference Scale	
<i>Upward anticipated regret</i>	UR1	There's a chance that this product will be discounted at a lower price in the future. If I buy it now, I will regret it.	Hetts, et al. (2000)	
	UR2	I could find the same product at a lower price in other stores in the future. If I buy it now, I will regret it.		
	UR3	I need more time to consider buying this product. I could still afford it if it wasn't on sale anyways. If I buy it now, I will regret it.		
	UR4	Buying will cost more than not buying at all. If I buy it now, I will regret it.		
<i>Downward anticipated regret</i>	DR1	Once the product is sold out, it might be out of production for good. If I don't buy it now, I will regret it.		
	DR2	The product will be restored to its original price once the promotion period is over. If I don't buy it now, I will regret it.		
	DR3	I might not be able to buy the same product for a better price in other stores in the future. If I don't buy it now, I will regret it.		
	DR4	Being able to buy the product I want for a good price makes me feel like I'm a conscious/smart consumer. If I don't buy it now, I will regret it.		
<i>Impulsive personality traits</i>	IT1	I act on the spur of the moment.		Patton, et al. (1995)
	IT2	I often say things without thinking much.		
	IT3	I often do things without thinking much.		
	IT4	I get bored easily when solving thought problems.		
	IT5	I make up my mind quickly.		
	IT6	My self-control level is rather low.		
<i>Impulsive online buying decision</i>	ID1	When shopping online, I usually buy what I like instead of what I really need.	Jones, et al. (2003)	
	ID2	When shopping online, I usually buy things that are not on my shopping list.		
	ID3	Upon seeing a promotional item, I will want to buy it although it is outside of my shopping plan.		

relationship between consumers' anticipated regret and online impulsive buying decisions).

V. RESULTS

A. Reliability Analysis

The reliability analysis of the research is shown in KMO value and Bartlett's sphericity test results of anticipated regret show that each variable has a Cronbach's Alpha coefficient greater than 0.6, indicating that all the items used to study a variable have relatively high internal consistency and the reliability of the whole questionnaire is at an acceptable level. KMO value of the mediator: anticipated regret is 0.808,  $p < 0.001$ , which indicates that the data collected through the questionnaire are well-fitted for factor analysis.

The result in KMO value and Bartlett's sphericity test of impulsive traits shows that the KMO value of the moderator: impulsive traits is 0.798,  $p < 0.001$ , which indicates that the data collected through the questionnaire are well-fitted for factor analysis. The result in KMO value and Bartlett's sphericity test results of impulsive buying decision shows that the KMO value of the dependent variable: impulsive buying decision is 0.715,  $p < 0.001$ , which indicates that the data collected through the questionnaire are well-fitted for factor analysis.

TABLE II  
EXPLORATORY FACTOR ANALYSIS RESULTS OF ANTICIPATED REGRET

	Component	
	1	2
<b>UR1</b>	0.665	0.509
<b>UR2</b>	0.688	0.498
<b>UR3</b>	0.669	0.440
<b>UR4</b>	0.641	0.407
<b>DR1</b>	-0.621	0.387
<b>DR2</b>	-0.554	0.598
<b>DR3</b>	-0.702	0.506
<b>DR4</b>	-0.724	0.428

The results of exploratory factor analysis are shown for the mediator - anticipated regret, for the moderator - impulsive traits, and for the dependent variable - impulsive buying decision. The load value of each index is larger than 0.5, all variables are valid for further analysis.

B. Hypothetical Test

In the test of H1, the researcher will be using the method of paired sample t-test since in this specific hypothesis, we are interested in the difference between two variables for the same subject. The analysis results in Table 5.8 shows that the significance level  $p = 0.049 (< 0.05)$ , which means promotions indeed affect consumers' anticipated regret in general. In the next step, it is also clear that upon facing an online promotion, overall, consumers would have an average upward anticipated satisfaction of 3.2070. This figure is lower than that of the downward anticipated regret, with an average of 3.3773. Based on this, we can conclude from this analysis result that between the two directions of anticipated regret, online promotions have a more significant impact on downward anticipated regret (because  $3.3773 > 3.2070$ ). Hypothesis H1 is proved.

TABLE III  
IMPACT OF PROMOTIONS ON ANTICIPATED REGRET

Variable	Average	Standard Deviation	Significance (two-tailed)
Upward anticipated regret	3.2070	1.02775	0.049
Downward anticipated regret	3.3773	1.02924	

The test results of H1 prove that online promotional activities have a more profound influence on consumers' downward anticipated regret than they do on the opposite direction of regret. This is straightforward and easy to comprehend. This result is also consistent with the previous findings. Consumers find an item being on sale at a favorable price, then it is natural that they choose to make a purchase so as not to miss out on the opportunity. When offered a great deal, consumers would fear the opportunity loss, which is also known as the inaction regret, or downward anticipated regret.

In the test of H2 and H3, the significance level  $p = 0.000$  ( $<0.05$ ). This means that anticipated regret indeed affects consumers' online impulsive buying decisions. There is a significant linear relationship between anticipated regret and impulsive online purchase decision, and the regression equation can be made to test the hypotheses.

TABLE IV  
REGRESSION COEFFICIENT<sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig
	B	Std. Error	Beta		
(Constant)	1.718	0.316		5.430	0.000
UR	-0.092	0.058	-0.089	-1.578	0.016
DR	0.459	0.058	0.445	7.897	0.000

<sup>a</sup>Dependent variable: impulsive online buying decision

According to the analysis results in Table 5.9, the coefficient of the influence of the upward anticipated regret on impulsive online shopping decision is  $-0.092$  ( $<0$ ),  $p = 0.016$  ( $<0.05$ ), meaning that there is a significant relation between the two and that relationship is an inverse one. It can be concluded that upward anticipated regret affects consumers' impulsive online purchase decision negatively. H2 is proved.

The coefficient of the influence of downward anticipated regret on impulsive online shopping decision is  $0.459$  ( $>0$ ),  $p = 0.000$  ( $<0.05$ ), meaning there is a positive relationship between the two variables. Or in other words, downward anticipated regret has a positive effect on consumers' online impulsive buying decision. H3 is proved. The test results of H2 and H3 are also in line with the definitions of two directions of anticipated regret in the works of other scholars and researchers. Downward expectation of regret positively affects consumers' impulsive purchase decisions whereas the upward expectation of regret also affect consumers' impulsive purchase decision but in a opposite direction.

In the test of H4, the analysis results are shown in two tables: Table 5.10 and Table 5.11 below, with the  $p$  values of each interaction item of anticipated regret and impulsive traits greater than  $0.05$ , indicating there does not exist a rela-

tionship between anticipated regret and impulsive traits. Impulsive traits do not act as a moderator in the relationship of consumers' anticipated regret and their online impulsive buying decisions. This finding contrasts the previous findings of Luo [3]. Hypothesis H4 is not proved.

TABLE V  
INTERACTION OF UPWARD ANTICIPATED REGRET AND IMPULSIVE TRAITS

	Co-efficient	Standard Deviation	t	Significance
constant	1.0340	0.5071	2.0389	0.0424
upward anticipated regret	-0.1699	0.1369	-1.2413	0.2156
impulsive traits	0.8606	0.1792	4.8031	0.0000
upward anticipated regret – impulsive traits	-0.0007	0.0495	-0.0143	0.9886

TABLE VI  
INTERACTION OF DOWNWARD ANTICIPATED REGRET AND IMPULSIVE TRAITS

	Co-efficient	Standard Deviation	t	Significance
constant	-0.7076	0.4610	-1.5350	0.1260
downward anticipated regret	0.4586	0.1410	3.2530	0.0013
impulsive traits	1.0166	0.1786	5.6925	0.0000
downward anticipated regret – impulsive traits	-0.0799	0.0507	-1.5755	0.1163

The results of all the proposed hypothesis are summarized in the table.

TABLE VII  
HYPOTHESIS TEST RESULTS SUMMARY

Hypothesis	Result
H1: Online promotions have a more significant impact on downward anticipated regret than on upward anticipated regret	Support
H2: Upward anticipated regret negatively affects consumers' online impulsive buying decisions.	Support
H3: Downward anticipated regret positively affects consumers' online impulsive buying decisions.	Support
H4: Impulsive personality traits moderates the relationship between consumers' anticipated regret and online impulsive buying decisions.	No support

In conclusion, after the quantitative analysis of all the proposed hypotheses, the research objectives of this research have been fulfilled and the research questions have also been answered with solid numerical evidence. Firstly, online promotions affect both directions of anticipated regret, with the impact on the downward direction more significantly than the upward one. Secondly, the relationship between upward anticipated regret and consumers' impulsive buying decisions as well as the relationship between downward anticipated regret and consumers' impulsive buying decision was proved to be in line with the research of previous scholars and the definition of both types of regret. Lastly, an individual's impulsive traits do not act as the moderator in the anticipated regret – online impulsive buying decision relationship.



## VI. DISCUSSION

Through the above analysis, we can draw the following discussions:

### *A. The effect of online promotional activities on consumers' anticipated regret*

Online promotional activities with constraints (e.g., time-restricted, quantity-limited promotions) will bring psychological pressure to consumers, prompting them to have different emotional responses, which would eventually lead to different levels of willingness. These levels have profound and direct impact to how consumers shop and make their purchases. Consequently, consumers would easily be swayed to make the purchase decision rather than stray from them. This is because we learned from the analysis that online promotions affect downward anticipated regret more significantly than they are to upward anticipated regret.

Through the paired sample t-test, we compare the impact that online promotions have on both directions of anticipated regret. Under the psychological oppression caused by promotions' constraints, consumers would be more concern about the opportunity that might be loss from not taking actions immediately, which enhances downward anticipated regret. Aside from the significant impact that online promotions have on downward anticipated regret, they also affect the opposite direction of regret, just not as much. Contrary to consumers whose expectation of regret move downwards upon seeing promotions, there are still those who consider for even a longer amount of time before buying if there are online promotions. This type of consumers could see discount programs as risks and try to averse from it, which enhances upward anticipated regret.

### *B. The impact of consumers' anticipated regret on their online impulsive purchase decisions*

Before choosing to purchase, it is common for consumers to anticipate the consequences of those decisions. As stated in the previous chapters, anticipated regret is divided into two types, or two opposite directions: downward anticipated regret and upward anticipated regret. Downward anticipated regret is also known as inaction regret, whereas upward anticipated regret is commonly called action regret. In the context of this research, consumers having the downward anticipation of regret think that they will regret if they do not make the purchase now. While on the contrary, consumers with upward expectation of regret think that buying now equals loss and that they will regret having made that decision. Using counterfactual thinking, consumers will carefully evaluate and assess all alternatives available then make a decision that can minimize their regret, which is the best option they think they could make in a particular situation.

Through regression analysis, upward anticipated regret has a negative effect on consumers' online impulsive buying decisions, whereas downward anticipated regret affect their impulsive purchase decisions positively. This is perfectly in line with the definitions of the two types of regrets: regret in the upward direction inhibits actions, and regret in the downward direction stimulate their desires to act.

Under the effect of downward anticipated regret, it is almost impossible not to buy since those have this direction of

anticipated regret, they think their benefits will increase after the purchase and buying is the best options among all. On the other hand, consumers with downward anticipated regret would not choose to purchase goods simply because they are on discount. When being offered such a bargain, they would take a lot of things into consideration and after carefully analyzing all alternatives, they would choose to averse from risk.

### *C. The moderating effect of impulsive traits on the relationship between consumers' anticipated regret and their impulsive purchase decisions*

Impulsive traits are inherent characteristics of an individual, thus very difficult to change. When put under the pressure of having to choose to risk the loss of a seemingly favorable opportunity, impulsive traits would be the deciding factor and directly affect consumers' physical reactions. However, through the analysis, it is found that impulsive traits do not act as a moderator in this relationship. This contradicts the previous findings of Luo [3].

Luo [3] found out through their research that when consumers encounter online promotions, they will generate expected emotions based on their inherent traits. And when this happens, these traits will affect their decision to act. The higher the impulse characteristics of consumers, the more likely they are to make impulsive buying decisions.

However, this contradictory finding could be attributed to the lack of questionnaire data and the sample size is not ideal enough to represent all online shoppers living in Hanoi, Vietnam. Therefore, in the recommendations of this research, the researcher would still give suggestions for online merchants to deal with consumers of impulsive traits since the results and analysis of Luo [3] is, without a doubt, more professionally tampered with. Furthermore, prevention is always better than cure, merchants should always be prepared in any situation, thus it is best to still act upon the tendencies of those who are highly impulsive in nature to obtain more profits.

## VII. RECOMMENDATIONS

According to the above quantitative analysis, I have put forward several suggestions for online merchants and consumers with a view to providing valuable tips for merchants to maximize their profits and guiding consumers to shop smarter.

### *A. Sellers should use online promotions reasonably and strategically to avoid counter-effectiveness*

Online merchants should make reasonable use of promotions for them to take maximum effect. Rather than being used alone, online promotions are commonly paired with some constraints to increase attractiveness and effectiveness. The restrictive conditions of promotions could be one of the two following: time-limited promotion and quantity-limited promotion.

Both the length of the promotion period and the number of products being sold at a discount should be taken into careful consideration. If the time-limited promotions are being dragged on for a long period of time, this would consequently tremendously decrease the sense of urgency, making

merchants lose many of their buyers since buyers would think they can buy the product at any other time, thus thinking that there is no need to hurry and buy this right now. The same situation applies with the large quantity of goods being put on discount. Too many products on discount means that they can no longer bring a sense of competition to consumers to prompt them to buy impulsively anymore. In both situations, the psychological suppression that restrictive online promotions bring about in consumers to urge them to make impulsive purchases would no longer take effect. The marketing technique of using promotions could be considered counter-effective in this circumstance.

At the same time, even with the appropriate length of promotion or adequate number of products being put on discount, overusing the marketing technique of promotion is not suggested. However great results the promotions may bring, too much frequency would lessen the products' perceived value in the eyes of consumers. It could even raise doubts about the quality of the products being on sale.

#### *B. Sellers should also cater for consumers with impulsive characteristics and applying AI recommendations systems*

Merchants should come up with suitable promotion strategies for consumers with impulsive characteristics [9]. As previously mentioned, merchants should always be prepared in any situation, even when it is dealing with impulsive consumers to maximize their profits. When working on their promotion plans, merchants should carefully consider beforehand how consumers with different impulsive characteristics might react. According to this paper, a consumer's upward anticipated regret inhibits the chance of a purchase, whereas anticipated regret in the downward direction enhances the likelihood of a purchase [10]. As a result, online merchants must manage to boost consumer's downward trend while decreasing regret in the opposite direction. Slogans like "The lowest prices ever", "Don't miss out", "The only chance this year" might be used as examples.

Recommendations in order to provide tailored suggestions that fit each customer's tastes and preferences across all of the retailer's touchpoints, AI draws on that experience and expertise in machine learning. Convenience and individualized experiences will be the primary differentiators for customers by 2025. An intelligent recommendation system looks at the available data to build a detailed, individual portrait of each customer and make predictions about their preferences and behavior, especially their propensity to make purchases. When a customer is comparison shopping or simply looking, retailers adopt a different engagement strategy than when the customer is ready to make a purchase straight away. In order to apply a strategy that encourages a sale without unnecessarily reducing margins, retailers must be able to distinguish between serious shoppers and window shoppers using data from a variety of sources, such as propensity modelling. For instance, merchants may provide a discount to entice comparison shopping, but a buyer with a high propensity to purchase may be more interested in features and upgrades than discounts. Retail businesses will be able to reach new levels of personalisation by utilizing AI-powered data to better serve their customers. One of the best tools a store or brand can use to deliver a tailored experience

and, ultimately, deepen the consumer relationship is a recommendation engine [11]. The use of recommendation engines boosts crucial e-commerce KPIs including gross merchandise volume, sales conversion rates, website traffic, and click-through rates, which increases revenue. The Artificial Intelligent Recommender System improves its quality in the first iteration by adapting iteratively to the customer and acquiring relevance based on customer feedback. Through learning from consumer behavioural patterns as well as customer and profile information, these systems give things and/or content to customers that they may like to buy or engage with impulsive buying.

#### *C. Consumers should make decisions more carefully*

On the consumers' side, they should learn to control their impulsiveness while doing their shopping online to avoid excessive unnecessary purchases. To become a smarter shopper and make better, more necessary purchases, consumers should firstly think more carefully not to be ensnared in the trap that marketers have set up. Consumers should give themselves much time to mull over a purchase decision to consider if they need to buy it, and keep in mind that there is no need to rush since there are still plenty of occasions to buy items for a good price. Consumers should only buy when the promotional item is in their demand, or the item's functionality and applicability is good for the price offered.

Lastly, if consumers find it hard to resist themselves and make a careful decision, it might be of help to recall their own previous unsatisfactory impulsive purchases. Being offered products at attractive prices, it is natural for consumers to be swayed and buy them impulsively. However, if you have previously had bad experience with purchases made on impulse, it is highly possible that you will be more guarded with similar situations and carefully weigh the pros and cons of promoted items to make better purchase decisions.

## VIII. CONCLUSION

The successful research and development of new recommendation architectures and algorithms has strongly stimulated the growth of the sector and helped the responsive retailers to maintain the profit margin, even though there is still a long way to go before the technology is industrialized to the point of general absorption by retailers. In the interim, the recommender can be enhanced through the use of AI technologies that make use of multi-modal information, such as images. To make it simpler for customers to find the products they want, there will be app-specific models in addition to the recommendation engine that produce trending, personalized, and random content. From a technical perspective, retailers should make investments now to be well-prepared and outfitted with the skills and knowledge to successfully leverage technologies to succeed in business and overcome new industry challenges. This is especially true in light of impulsive buying and artificial intelligence recommendation systems.



REFERENCES

[1] K. C. Laudon, & J. P. Laudon, Management Information Systems: Managing the Digital Firm. Pearson Education Limited, 2022, pp. 108.

[2] L. H. Teunter, "Analysis of Sales Promotion Effects on Household Purchase Behavior". ERIM Ph.D. Series Research in Management, 2022, pp. 10.

[3] H. Luo, et al., Research on the Impact of Online Promotions on Consumers' Impulsive Online Shopping Intentions. Theoretical and Applied Electronic Commerce Research, Volume 16, 2021, pp. 2386-2404.

[4] P. Kotler, G. Armstrong, J. Saunders, & V. Wong, Principles of Marketing. 8th ed., Prentice Hall, 1999, pp.22.

[5] E. J. McCarthy, Basic Marketing: A Managerial Approach. Illinois: Richard D. Irwin, Inc, 1960, pp. 120.

[6] B. Li, M. Hu, X. Chen, & Y. Lei, "The Moderating Role of Anticipated Regret and Product Involvement on Online Impulsive Buying Behavior", Frontiers in Psychology, 2021, pp. 11.

[7] D. W. Rook & R. J. Fisher, "Normative Influences on Impulsive Buying Behavior", Journal of Consumer Research, 22(3), 1995, p. 305-313.

[8] T. Gangwani, "3 Ways to Improve Customer Experience Using A.I." CIO Contributor Network, October 12, 2016.

[9] J. J. Hetts, et al., "The influence of anticipated counterfactual regret on behavior", Psychology & Marketing, 17(4), pp. 345-368, 2000.

[10] M. A. Jones, K. E. Reynolds, S. Weun, & S. E. Beatty, "The product-specific nature of impulse buying tendency". Journal of Business Research, 56(7), 2003, pp. 505-511.

[11] J. H. Patton & M. S. Stanford, "Factor structure of the Barratt impulsiveness scale". Journal of Clinical Psychology, 51(6), 1995, pp. 768-774.

APPENDIX

**Table A1.** Sample statistical characteristics

Statistical Features		Number of people	Percentage
<b>Gender</b>	Female	233	77.4%
	Male	62	20.6%
<b>Age group</b>	Under 18	67	22.3%
	18-25 years old	196	65.1%
	25-40 years old	31	10.3%
	Above 40	1	0.3%
<b>Education</b>	Highschool	79	26.2%
	College degree	7	2.3%
	Undergraduate	197	65.4%
	Master's degree or above	12	4%
<b>Profession</b>	Full-time student	200	66.4%
	Employed	85	28.2%
	Unemployed	10	3.3%
	Retired	0	0%
<b>Monthly income</b>	Under VND 5 million/month	196	65.1%
	VND 5-10 mil/month	57	18.9%
	VND 10-20 mil/month	30	10%
	Above VND 20 mil/month	12	4%
<b>Preferred online purchase platform</b>	Social media (e.g., Facebook, Instagram, etc.)	60	19.9%
	E-commerce sites (e.g., Shopee, Lazada, Tiki, etc.)	231	76.7%
	Brands' official website (e.g., Locknlock.vn, Uniqlo.com, etc.)	4	1.3%