

Mysterious box – Delight exposure or addictive traps? A pathway to mental health disorders and the moderating role of emotional stability

Ngoc Bich Do, Hue Minh Nguyen, Hai-Ninh Do,
Anh Huyen Tram Le, Thuy-Vy Pham

School of International Business and Marketing, University of Economics
Hochiminh City (UEH)

Corresponding author: bichdn@ueh.edu.vn

ABSTRACT

This study investigates how mysterious box consumption may foster addictive behavior and examines the mechanisms through which such consumption contributes to subsequent negative mental health effects. This study adopted the quantitative method, with a total of 395 respondents taking part who have engaged in mysterious box consumption. Three findings are uncovered. First, mystery box retention leads to three levels of consumer attachment: delight, advocacy, and addiction. Second, mystery box addiction is associated with negative mental health outcomes, including stress and depression. Finally, emotional instability negatively moderates the relationship between mystery box addiction and these mental health issues. This study contributes to the literature by uncovering the psychological mechanisms driving mystery box consumption at the individual level. While frequently marketed as trendy branded entertainment, mystery boxes contain gambling-like elements and non-substance addictive mechanisms that raise ethical concerns. The findings also offer managerial implications for firms to design and implement mystery box marketing strategies in a more ethical and socially responsible way.

Keywords: mysterious box consumption, consumer delight, consumer advocacy, addiction, and mental health issues

1. INTRODUCTION

Global consumption witnessed widespread mysterious box selling in various sectors [1], including food and beverage [2], tourism [3], toys, among others. “Mysterious box” is a sealed package that gives consumers the experience of uncertainty, curiosity, and thirst to explore unexpectedness and randomness. Recently, it has become one of the most attractive phenomena in retailing and marketing strategies. According to the data shown in a paper by [4] and Global Growth Insights (2025), the mysterious box market has risen sharply since 2016; notably, reaching \$2,364 million in 2024 and continuing to expand further in the upcoming years.

Consumers are driven by various motives regarding the purchase of and engagement with mysterious boxes. First, brands use various marketing tactics to stimulate consumers’ desire for adventure and create a fear of missing out, encouraging trial purchases, impulsive buying, and eventually habitual consumption [2,5,6]. Second, consumers engage with mystery boxes through collecting culture [7]. From a Self-Determination perspective, collecting provides a sense of achievement when individuals obtain long-desired items. As a result, collectors purchase not only out of necessity but also for the thrill of acquisition and for exchange within their communities [8].

When it comes to the younger generation, the main target of this probabilistic selling strategy, there are ongoing concerns for psychological and mental stability. According to the World Health Organization (2023), approximately 970 million people currently live with mental disorders, leading to health decline. The worry arises for the young generation when 15% of them have signs of disorders, such as anxiety and loneliness [9]. Without early indicators and treatments, those disorders might lead to a lower quality of life and further physical health issues. What if the thrill of a mysterious box could quietly lead to addictive patterns and further mental health? Opening mysterious boxes appears to occupy a borderline space between entertainment and gambling-like activities. On the one hand, it offers consumers a form of playful excitement as they have no control over the contents of the box or whether they will obtain a desirable item [7,10], creating a sense of entertainment consumption. On the other hand, consumers largely rely on chance, hoping to unbox a limited-edition item which evokes a sense of winning. In this respect, mysterious box consumption shares several psychological features with gambling-like activities [7], encouraging repeated engagement and potentially foster addictiveness [11].

While some researchers have raised concerns about overconsumption related to technologies such as smartphones [12] and social media [13], the mental health impact of powerful selling strategies like mystery boxes - which encourage repeated purchasing - remains understudied, particularly among consumers and adolescents. An examination of current literature reveals significant knowledge gaps. First, current mysterious box studies have attempted to (1) unveil the mechanism of how consumers engage in this phenomenon to provide further insights for marketers and distributors to enhance retention rate, or foster impulsive buying behavior [1,5,14], (2) other organizational positive outcomes of using mysterious boxes such as brand evangelism [2], and (3) how firms utilize mysterious box in their marketing strategy to meet business objectives [15].

Those studies refer to mysterious boxes as a marketing phenomenon or entertainment trend, focusing on user engagement, delight, or social sharing. However, those studies neglected one function of mysterious buying, being gambling. It might appear to be an innocent collectible experience with a mix of uncertainty, reward system, and emotional stimulation that keeps users buying. Over time, this cycle may gradually shift from casual enjoyment to thirst and dependence, revealing a hidden pathway from excitement to addictive behavior. Few empirical studies have attempted to uncover that over-engagement in mysterious boxes could lead to addiction [5] and increase the rate of suicide [16] in both genders. Although those findings alert scholars and individuals to some adverse outcomes exposed by mysterious box purchases, the psychological and mental health-related outcomes remain fragile and scarce. This is one of the crucial motives for this study.

Second, emotional and mental health are interconnected [17]. Previous research investigates emotional states generated through consumption, including delight [2,18,19], advocacy [20,21], and addiction [22,23]. Yet, such emotional states present three levels of emotional states and engagement of the individual in purchasing. To date, prior studies have uncovered those emotions independently in their empirical studies. This study will further integrate the aforementioned levels to examine which level of emotional states the mysterious box facilitates and their interconnections.

Finally, exploring mysterious boxes remains one of the key motives for young consumers. With this population cohort, the young experience emotional instability due to the life transition phase [24]. When an individual has emotional instability, they are likely to experience greater difficulties in goal setting [25], impulse control, and further negative emotions such as anger or anxiety [26]. Such empirical evidence demonstrates the relationships between emotional instability, as an individual-level factor, and possible mental health disorders; however, the findings remain fragmented and have not been sufficiently examined in the mysterious box context to explain variations.

Based on the aforementioned gaps, we integrate Self-determination theory and the Stress Vulnerability model to understand how mysterious box consumption may escalate into addictive behavior and subsequently contribute to adverse mental health outcomes. The authors further expand the examination to unveil the moderating role of personal emotional instability to explore the mechanism of what individuals mentally experience in the case of mysterious box retention. Two research questions are raised to navigate this study:

RQ1: What is the mechanism among mysterious box consumption, consumers' emotional states, addictive behavior, and consequent psychological outcomes of consumers?

RQ2: How does personal emotional instability play a moderating role in the relationship between consumer addiction and mental health issues?

This study is one of the pioneering studies that unveils the psychological and mental side effects of mysterious box consumption to contribute to the current literature. Taken from research findings, mysterious box consumption and retention present a paradox for

consumers. It generates joy, excitement, and positive emotional engagement; meanwhile, excessive purchasing - particularly among young consumers - can foster addictive tendencies that heighten the risk of mental disorders, such as stress and depression. Yet, the feeling of loneliness has unclear consequences. Second, the most interesting result from this study is that emotional instability negatively moderates the relationships between addiction towards stress and depression. The findings of our study provide new insights for both consumers and marketing practitioners to alter their frequency of mysterious box campaigns and provide aid to become an ethical brand for young consumers.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1 Mysterious box as a phenomenon

According to [2], traditional consumer behavior often involves direct product observation and evaluation before purchasing. However, a new consumer trend is emerging despite uncertainty before unboxing. Mysterious boxes are sealed packages containing random items, often small collectible toys with various designs [5]. The key attractions of mysterious boxes for consumers are their anonymity, unpredictability and gambling-like nature, which create a sense of anticipation and excitement. According to [14], this unpredictability mimics the mechanics of gambling, where the uncertain reward structure can stimulate impulsive and repetitive consumption behaviors, particularly among young consumers. This behavior mirrors loot-box mechanisms in gaming, despite the low certainty of desired outcomes. Moreover, [27] found that alongside the thrill of unpredictability, factors such as limited-edition designs, social media hype, and influencer support also contribute to addictive consumption. These marketing cues enhance product desirability, override rational decision-making, and normalize frequent engagement through emotional stimulation. It can be said that this marketing tactic demonstrates its attractiveness and virality in online communities, particularly among the younger generation. Young users are willing to pay a considerable amount for this enjoyable experience, even though product prices have been driven unreasonably high in comparison to the average income. Furthermore, the number of members in the mysterious box social network group is rapidly approaching a new peak, indicating that people may be developing addictive tendencies (based on the definition of consumer behavior research). However, a significant concern is the impact on the mental health of young people, who may be influenced by addiction yet remain indifferent. This issue necessitates further exploration and empirical studies.

Theory underpinnings

This research framework integrates Self-Determination Theory (SDT) and the Stress Vulnerability Model (SVM) to capture the dual-pathway of the blind box consumption. SDT explains the first stage of the consumption where the unboxing experience satisfies basic psychological needs for autonomy (i.e. voluntary choice in product engagement) and competence (i.e. achievement in hunting rare items), and relatedness (i.e. social exchange with community). These satisfied needs might foster high hedonic value that

drives delight and advocacy [28]. However, the sense of accomplishment from acquiring rare or desired items reinforces intrinsic motivation, which can lead to habitual or even addictive engagement, especially among emotionally invested consumers.

SVM complements the research framework by addressing the impact phase, where addiction among younger consumers acts as a chronic factor that interacts with individual emotional instability [29] and triggers mental health disorders. According to [30], coping capability refers to an individual's psychological resources and strategies to manage stressors. In the context of blind boxes, consumers with limited coping abilities may be more prone to compulsive buying, emotional dysregulation, and over-dependence on the pleasurable feedback loop that mysterious boxes offer.

In brief, this integrated approach provides a more comprehensive understanding of the transition from entertainment to pathology than either theory applied independently.

2.2 Hypothesis development

Mysterious box experience positively impacts User delight

The mysterious boxes experience enables transitioning from a cognitive state of curiosity to an emotional response through the mechanism of information gaps. The study of [31] investigates the curiosity-evoking potential of different curiosity triggers (information gaps, ambiguity, and novelty). Mystery box strategies rely on this information gap - the difference between known and unknown information - which stimulates curiosity and a desire to obtain the missing information [32].

Previous studies highlighted that evoking emotions like surprise, joy, thrill, and exceptional satisfaction can enhance customer experience [18,19]. Through the lens of SDT, this affective surge serves as a psychological reward that satisfies the need for competence and autonomy. According to [33], products that meet or exceed customer expectations could enhance customer delight. This resulting delight also manifests the fulfilled psychological needs. As [34] confirms, a surprise and/ or exclusivity could drive customer delight through self-enhancement when future reward uncertainty is high. [2] explored the benefits and risks of the mysterious box selling strategy and revealed that the hedonic benefits associated with mysterious boxes have a positive influence on customer delight. Accordingly, we posit as follows.

H1a. Mysterious box experience positively impacts user delight.

Mysterious box experience positively impacts user advocacy

User advocacy refers to voluntary, proactive behaviors by customers to support and promote a brand or product [35]. Purchasing mysterious boxes has the potential to uncover buyers' exploratory needs, since they are blind as to what items are inside until unboxing [2]. The uncertainty and surprise elements stimulate ongoing curiosity and intrinsic interest in terms of discovery. Notably, hunting successfully for preferred products or limited editions triggers buyers' sense of competence, particularly with high-value content. For mysterious trends, consumers tend to engage in purchasing, exchanging, and sharing their experience with 'like-minded' individuals on social media

platforms and even offline groups, which later enhances the feeling of relatedness. Through the lens of SDT, those attributes could facilitate the advocacy behavior [28]. Moreover, hedonic value, the affective states, significantly impact future buying intention [20] and repetition behavior [36, 37]. Such justification suggests a pathway to user advocacy. Based on the above discussion, the following hypothesis is proposed.

H1b: Mysterious box experience positively impacts user advocacy.

User delight positively impacts user addiction

User addiction is conceptualized as an individual's psychological state involving consumption patterns, intense emotional attachment to a product or a brand, and constant urges to own the brand's products/ services [38]. Driven by an earlier argument, the mysterious box may induce a sense of delight, which facilitates repeated buying action [39]. When examining the underlying mechanism of the mysterious box, it shares several commonalities with gambling. First, a mysterious box, as its name suggests, consumers are blind as to the outcomes, and they buy the product by chance. Such uncertainty might lead to impulsive action [40]. Second, occasionally, they can purchase limited editions or wish-list items, which can be considered a reward or a big win. When individuals experience the 'winning' emotions, their brains release dopamine to increase the excitement level [41], thereby further reinforcing the addiction likelihood. Thus, the following hypothesis is proposed.

H2: User delight positively impacts user addiction.

User advocacy positively impacts user addiction

Mysterious boxes have a substantial impact on customer addiction and purchasing behaviors [42]. Advocates often discuss and think about the product or brand, which can lead to mental obsession, a recognized symptom of behavioral addiction [43], as reinforced by previous studies [23,44]. High engagement behaviors, such as advocacy, are manifestations of strong affective ties and may lead to deeper forms of relationships, such as addiction. Moreover, research by [45] and [22] mentioned that the strongest feelings often inspire advocacy, which then transforms into caring or even addictive devotion. [46] refers to the gambling risk of mysterious box marketing, as such purchases generate excitement and mimic gambling by employing randomized outcomes with near-win effects. These mechanisms are characteristic of gambling and can lead to addictive behaviors.

Based on the information presented, this study proposes the following hypothesis.

H3: User advocacy positively impacts user addiction.

Positive Impact of User Addiction on Depression, Stress, and Loneliness

From a consumer behavior perspective, mysterious box addiction represents a form of compulsive buying [47,48], which consistently correlates with negative psychological outcomes, including emotional distress and depression [16]. Furthermore, the gambling-like nature of mysterious box purchases has been referred to as a moderate-high risk for severe distress [49], anxiety, depression, and even suicide [16].

Similarly, loneliness is both a contributor to and an outcome of compulsive buying behaviors [50]. Research indicates that socially isolated individuals may seek comfort through purchasing, though the relief is often temporary. Excessive spending can lead to regret or withdrawal, exacerbating long-term isolation. Ultimately, addicted buyers may feel socially isolated, rejected, and alienated [49,51]. The review of [50] synthesized that stress, depression, and loneliness are among the common co-occurrences of disorders and psychiatric symptoms in compulsive buyers. Drawing on existing literature across gambling and shopping addiction domains, we hypothesize a direct positive relationship between mysterious box addiction and negative psychological outcomes, specifically depression, stress, and loneliness. Taken together, next hypothesis examining user addiction and sequential mental health disorders is proposed.

H4: User addiction positively impacts (a) Depression, (b) Stress, (c) Loneliness.

The Moderating Role of Emotional Instability in the Relationship Between User Addiction and Psychological Outcomes

While mysterious box addiction is likely to harm psychological well-being generally, certain individual characteristics may exacerbate these adverse effects [52]. Emotional instability is an important component of emotional regulation that impacts daily functioning [53,54]. It refers to the frequency, speed, and range of changes in affective states [54]. Several studies have demonstrated that emotional dysregulation often predicts mental health problems and disordered behavior [52-54]. Hence, emotional instability appears to be a critical moderating factor deserving careful examination.

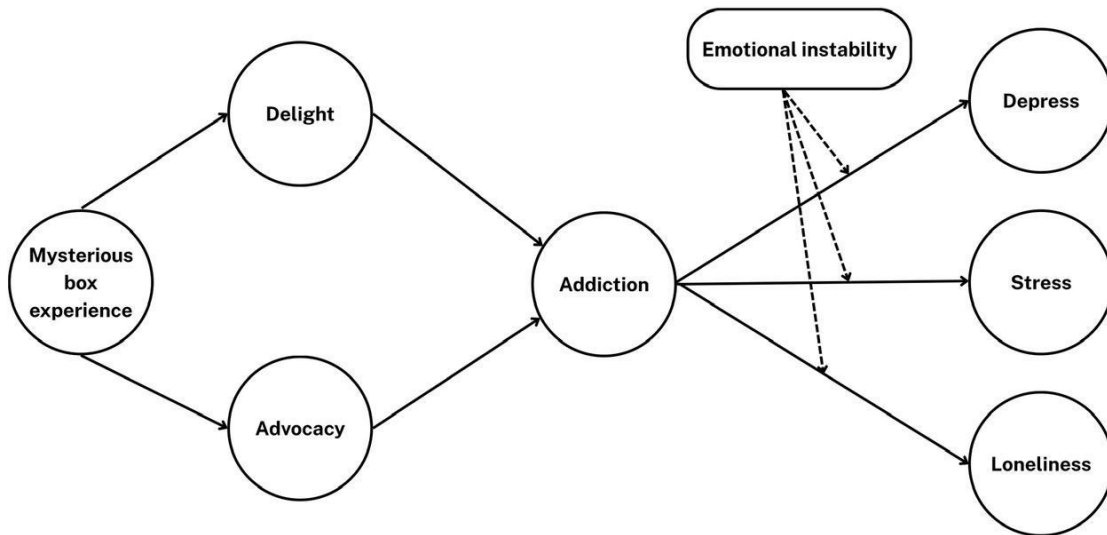
In the view of self-regulation theory, for emotionally unstable individuals, the effects of addiction on mental health are amplified [52]. Poor emotional regulation skills mean higher likeliness of experiencing intense frustration when autonomy is compromised through compulsive urges. The tendency toward negativity emphasizes feelings of incompetence when faced with disappointing, mysterious box outcomes [42].

The SVM further suggests that the effects of addiction are not uniform across all individuals [55]. Mysterious box addiction introduces multiple stressors: financial pressure, disappointment from unwanted items, and social complications [16,50]. However, the stressor exposures and the outcomes might vary among different buyers. Furthermore, in the extension of SVM, [30] emphasizes the role of coping capability. [56] have discussed the possible moderating role of emotional stability as a protective function against harmful psychological consequences, suggesting that individuals with a more emotionally stable disposition are better able to manage their negative emotional experience. Building on this perspective, our study extends the discussion from a contrast perspective, focusing on the role of emotional instability. Specifically, when an individual with high emotional instability engages in addictive purchasing, their emotional instability may amplify the negative emotional fallout from their behavior regulation. That means emotional instability is expected to negatively influence the strength of linkages between addictive behavior and negative psychological outcomes, including

depression, stress, and loneliness. Based on the above discussions, the following hypothesis is proposed:

H5: Emotional instability negatively moderates the relationship between (a) User addiction and depression, (b) User addiction and stress, and (c) User addiction and loneliness

Figure 1 presents the proposed research model.



3. METHODOLOGY

3.1 Population and sampling

Young people are the primary market of mysterious box companies [57]. Therefore, the target population for this study is young consumers. According to statistics from Demographic Changes in Asia and the Pacific (2023), the proportion of Vietnamese young people in the age group between 15 and 29 is approximately 22.8%, while the total population of Vietnam is about 100.1 million [58]. As such, the estimated population for this study would be around 22.8 million people. Following the guidelines provided by [59], the authors calculated the sample size at a 95% confidence level and allowed a 5% margin of error; the suggested sample size was 385. Thus, the minimum number of collected data points should be within $\pm 5\%$ of 385, ranging from 365 to 405 responses, to ensure the representativeness of the research sample. Following prior studies, gender and income were included as control variables to account for potential confounding effects.

3.2 Measures and questionnaire

The measures to examine seven constructs in the research model were adapted from previous literature. Specifically, measures for mysterious box experience were adopted from [60], which included three question items evaluating how customers feel when they have experience with mysterious boxes. Second, measures for user delight, which indicate

the emotional excitement when opening a mysterious box, were adapted from [2]. Third, [61] developed three questions for user advocacy assessment, which our study adapted to measure advocacy and enthusiastic behavior towards the mysterious box experience, indicating customers' willingness to promote it to others. Fourth, user addiction comprising three items was adopted from [62] to evaluate the signs of addictive tendencies with mysterious box purchasing, and even with negative emotions if buying mysterious boxes is prevented. Fifth, measures for depression, which refer to the negative feelings such as sadness, discomfort, and hopelessness when the mysterious box is absent, were adopted from [63] and [64] with three measurement items. Sixth, measures for stress, which reflect psychological issues such as mental tension or emotional exhaustion associated with the mysterious box, included three items adapted from [65]. Seventh, loneliness was evaluated by three questions inherited from [66] and [67] to capture the social disconnection feelings without mysterious box purchasing. Finally, emotional instability, which captures the symptoms experienced by customers who overspend on mysterious boxes, such as anxiety, exhaustion, or emotional instability, was measured by three items adapted from [68]. All items were slightly revised and reworded to fit the mysterious box context. To ensure content validity, the questionnaire was reviewed by three academic experts who have 10 years of teaching consumer behavior courses and pilot-tested with 30 respondents. Feedback from the pilot study confirmed the clarity and appropriateness of the measurement items. The detailed measurement items for all constructs are presented in Appendix 1.

In total, there are 24 question items evaluating eight main constructs of the research model. All items were measured by a five-point Likert scale ranging from 1, implying "strongly disagree", to 5, meaning "strongly agree". In addition to the main measurement items, filter questions were included to ensure that respondents are the target group of young consumers who are interested in and have experience with mysterious boxes. Moreover, demographic questions were added to gain a further understanding of respondents' characteristics.

3.3 Data collection

After finalizing the questionnaire, ethics approval for this study was obtained from the Scientific Research Council of the University of Economics Ho Chi Minh City (UEH). Participation was voluntary and anonymous, and informed consent was obtained from all respondents before data collection. Data were collected in two stages. In the first stage, data were collected for a pilot study to test the clarity, comprehensibility, and content validity of the questionnaire. The survey was distributed to 30 target customers who had experience with mysterious boxes. Their responses were input into SmartPLS 4.0 to evaluate the reliability and validity of the measurement scales. Besides answering the questionnaire, the participants were invited to join a group interview to provide feedback about the contents, wording, and overall readability of the questionnaire. The results from the measurement test, along with respondents' comments obtained from the interview, helped to refine the questionnaire, ensuring that the final version was clearer and easier to understand.

In the second stage, the refined questionnaire was input into Google Forms and distributed online to target respondents for large-scale data collection. The target respondents of this study are young people aged 15 and 29 who are interested in mysterious boxes and have been purchasing mysterious boxes for the past three months. Therefore, the link was spread through social network communities such as “Mysterious box favorite group” on Facebook, “Mysterious box opening group” on TikTok, university student forums, and online groups interested in Japanese and/or Korean culture, J-pop, and/or K-pop, which together comprise approximately 1,500 members. After three months of promoting the link with engaging content about mysterious box trends, the authors collected 395 valid responses, resulting in a usable response rate of about 26%.

After three months of promoting the link with engaging content about mysterious box trends, the authors collected 395 valid responses. This number is within the sampling range of $385 \pm 5\%$, confirming the representativeness of the research sample. The data was then input into SmartPLS 4.0 for analysis.

4. DATA ANALYSIS

As the study targeted young consumers of mysterious boxes aged between 15 and 29, no further age group breakdown was applied. Our sample size targeted only this specific group of customers. Table 1 shows that 66.83% of all respondents were female, while the male count was 33.17%. These results may reflect the stronger appeal of mysterious boxes among female consumers, as such products often emphasize collectible value, aesthetically pleasing design, and suitability as gifts, which may resonate more strongly with female preferences. In terms of education, undergraduate students constituted the largest group (50.88%), followed by respondents with college-level education or below (26.83%) and those with graduate education (22.29%), suggesting that mysterious boxes are particularly attractive to university-aged consumers. Regarding income, most respondents reported a monthly income or allowance below 5 million VND (64.81%), indicating that mysterious box consumption is especially prevalent among younger consumers with relatively limited financial resources.

Table 1. Sample Characteristics

Item	Characteristic	Frequency	%
Gender	Female	264	66.83
	Male	131	33.17
Education	College degree and below	106	26.83
	Undergraduate degree	201	50.88
	Graduate degree	88	22.29
Income	Lower than 5 Million VND	256	64.81
	From 5 to 10 Million VND	81	20.5
	From 10 to 15 Million VND	48	12.15
	Higher than 15 Million VND	10	2.54

N = 395

The common method bias (CMB) was mitigated through several steps. Initially, during the procedural design, the survey was crafted in collaboration with senior academics

specializing in consumer behavior and psychology, utilizing pre-survey interviews and a pilot study with a small group of younger customers. Respondents were encouraged to answer neutrally and honestly, emphasizing that there were no correct or incorrect answers. Subsequently, a post-hoc investigation of CMB was performed using one-factor test [69] alongside the marker-variable approach proposed by [70]. The one-factor extracted variance was 35.473%, which met the threshold criterion of being below 50% [71]. This outcome suggests that CMB was unlikely to pose a problem for this study, as most of the variance was attributed to multiple factors [72].

Table 2. Measures, loadings, construct reliability, and validity

Constructs	Items	$\beta > 0.8$	CR > 0.7	AVE > 0.5
<i>Mysterious box experience</i>		0.803	0.828	0.834
	EXP1	0.894***		
	EXP3	0.932***		
<i>User Advocacy</i>		0.914	0.915	0.854
	ADV1	0.921***		
	ADV2	0.929***		
	ADV3	0.922***		
<i>User Delight</i>		0.900	0.925	0.832
	DEL1	0.862***		
	DEL2	0.934***		
	DEL3	0.938***		
<i>User Addiction</i>		0.847	0.847	0.868
	ADD2	0.931***		
	ADD3	0.932***		
<i>Emotional instability</i>		0.884	0.885	0.812
	UNE1	0.908***		
	UNE2	0.889***		
	UNE3	0.906***		
<i>Depress</i>		0.921	0.922	0.864
	DEP1	0.936***		
	DEP2	0.921***		
	DEP3	0.932***		
<i>Loneliness</i>		0.875	0.880	0.800
	LON1	0.900***		
	LON2	0.915***		
	LON3	0.867***		
<i>Stress</i>		0.876	0.877	0.801
	STR1	0.907***		
	STR2	0.891***		
	STR3	0.887***		

Note: NS = Not significant; β = Beta. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

The reliability indicator was confirmed, with all outer loadings surpassing 0.70 (see Table 2). Subsequently, the convergent and discriminant validity of the constructs was evaluated by calculating their composite reliabilities and average variance extracted

(AVE) scores [73]. All composite reliabilities exceeded 0.70, ranging from 0.847 to 0.925, signifying strong internal consistency. Each construct also achieved convergent validity, as its AVE scores were 0.50 or higher [73]. Lastly, according to the results in Table 2, all squared correlations between construct pairs were lower than the smallest AVE score, confirming that each construct displayed discriminant validity [73].

Table 3. Discriminant analysis

	1	2	3	4	5	6	7	8
1. <i>User addiction</i>	0.931							
2. <i>User advocacy</i>	0.825	0.924						
3. <i>User delight</i>	0.601	0.605	0.912					
4. <i>Depress</i>	0.428	0.420	0.276	0.930				
5. <i>Emotional instability</i>	0.374	0.330	0.302	0.817	0.901			
6. <i>Mysterious box experience</i>	0.721	0.743	0.623	0.263	0.144	0.913		
7. <i>Loneliness</i>	0.364	0.383	0.263	0.875	0.820	0.184	0.894	
8. <i>Stress</i>	0.395	0.363	0.267	0.861	0.826	0.219	0.831	0.895

This study employed the bootstrapping procedure with a sample of 5000 to test the hypotheses. As seen in Table 4, most of the hypotheses were supported. However, one hypothesis was rejected at 95%, while another was supported at 95%. As proposed in H1a, the mysterious box experience positively influences customer delight (H1a: $\beta = 0.623$; p-value = 0.000) and customer advocacy (H1b: $\beta = 0.743$; p-value = 0.000). User delight positively affects addiction (H2: $\beta = 0.160$; p-value = 0.000). User Advocacy positively impacts user addiction (H3: $\beta = 0.728$; p-value = 0.000). User addiction positively correlates with depression (H4a: $\beta = 0.133$; p-value = 0.000) and stress (H4b: $\beta = 0.089$; p-value = 0.005), while User addiction did not influence loneliness (H4c: $\beta = 0.058$; p-value = 0.096). H5a – H5b – H5c proposed that the effect between customer addiction and depression (H5a: $\beta = -0.094$; p-value = 0.000), stress (H5b: $\beta = -0.108$; p-value = 0.000), and loneliness (H5c: $\beta = -0.085$; p-value = 0.001) would be negatively moderated by emotional instability.

Table 4. Hypothesis test results

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
<i>H1a</i>	0.623	0.623	0.034	18.431	0.000
<i>H1b</i>	0.743	0.744	0.024	30.432	0.000
<i>H2</i>	0.160	0.160	0.046	3.508	0.000
<i>H3</i>	0.728	0.728	0.038	19.177	0.000
<i>H4a</i>	0.133	0.133	0.037	3.583	0.000
<i>H4b</i>	0.089	0.089	0.032	2.816	0.005
<i>H4c</i>	0.058	0.057	0.035	1.663	0.096
<i>H5a</i>	-0.094	-0.095	0.026	3.570	0.000
<i>H5b</i>	-0.108	-0.108	0.023	4.627	0.000
<i>H5c</i>	-0.085	-0.086	0.027	3.204	0.001

Moreover, to further evaluate the robustness and practical usefulness of the proposed model, an out-of-sample predictive power test was conducted using PLSpredict [74, 75]. A Q^2 value greater than zero indicates adequate predictive relevance [76]. The results in Table 5 show that all endogenous constructs achieved positive Q^2 values, ranging from 0.325 to 0.711, confirming satisfactory predictive performance. In particular, stress ($Q^2 = 0.711$), loneliness ($Q^2 = 0.705$), and depression ($Q^2 = 0.700$) demonstrate strong predictive power, while advocacy ($Q^2 = 0.509$), addiction ($Q^2 = 0.447$), and delight ($Q^2 = 0.325$) also show acceptable predictive capability. Overall, these findings support the predictive validity of the proposed model.

Table 5. PLS Predict results

	Q^2 predict	RMSE	MAE
User advocacy	0.509	0.707	0.524
User delight	0.325	0.830	0.645
User addiction	0.447	0.748	0.504
Depression	0.700	0.552	0.398
Loneliness	0.705	0.547	0.398
Stress	0.711	0.542	0.406

5. DISCUSSIONS AND IMPLICATIONS

5.1 Discussion and conclusion

This study aims to uncover the mechanism of how mysterious box consumption leads to addiction and subsequent negative mental health issues. Few studies have attempted to investigate mental health issues related to mysterious box purchases. The first four hypotheses we investigated (*H1a*, *H1b*, *H2*, and *H3*) provide valuable insights into the relationship between mysterious box experience, user delight, user advocacy, and user addiction. *H4a*, *H4b*, and *H4c* examine the contribution of addiction to negative mental health issues, while *H5a*, *H5b*, and *H5c* were moderating hypotheses.

Firstly, the mysterious box experience has a more substantial positive relationship with user advocacy than user delight, which is consistent with previous research. There is a strong and positive relationship between surprise and delight [77]. [4] affirmed that

curiosity is positively related to impulsive buying behavior in the context of mysterious boxes. Due to the uncertainty and randomness of mysterious boxes, consumers are encouraged to express their intention to purchase and repurchase. [78] explored how joyful hedonic-oriented self-services stimulate delight. In our research, we do not focus on any precise emotion such as joy, surprise, or thrill; the mysterious box experience includes all kinds of emotions that can be elicited from a mysterious box purchase.

Furthermore, three components (user delight, user advocacy, and user addiction) in the research model reflect the three levels of loyalty in the sequential loyalty model (SQLM) - affective, conative, and action loyalty, respectively [46]. However, the empirical results indicate that users' loyalty does not follow a progressive increase. Both user delight and user advocacy positively affect user addiction. There is no empirical finding for the transition from user delight to user advocacy.

Secondly, both user delight and user advocacy positively impact user addiction. However, the effect of user advocacy on user addiction is much higher than the effect of user delight. This result is consistent with the research of [39], customer delight has a very significant positive impact on customers' repeated purchase intention. [42] also suggests the different levels of addiction. The more consumers know about mysterious boxes, the higher the possibility they become addicted when buying mysterious boxes, and the less they know, the lower the possibility they will become addicted. Mysterious box selling not only improves customer advocacy but also promotes the continued development of this marketing strategy. It stimulates deep emotional engagement at the psychological level, which leads to repeated purchases. However, we also consider the negative effects of mysterious boxes, especially on mental health.

The findings regarding the relationships between mysterious box addiction and mental health outcomes both confirm existing literature and offer novel insights. Aligning with the previous studies of mysterious box purchase and addicted shopping [42,49,50] the results confirmed that mysterious box addiction significantly predicts increased depression and stress. These findings reinforce the understanding that random-reward purchasing behaviors [49] share harmful psychological mechanisms with gambling disorders [42,50].

On the other hand, our study makes a notable contribution by uncovering an unexpected pattern regarding loneliness. Contrary to our hypothesis, mysterious box addiction did not significantly predict increased loneliness, resulting in H4c being rejected. The social context surrounding mysterious box consumption plays a crucial role in this unexpected finding. In our study, many respondents reported engaging with mysterious boxes not as isolated individuals but as participants in a vibrant social media environment, including online networking, social media trends, and live unboxing events on TikTok. Through these channels, mysterious box consumption becomes embedded in social practices that provide connection, shared excitement, and community belonging. This social dimension may create a buffering effect against loneliness, at least during the early and moderate stages of engagement. While addiction and loneliness were often depicted as a bidirectional relationship [51,52], our findings suggest that mysterious box purchasing

may function primarily as a socially motivated activity rather than an escape from loneliness.

We observed a negative coefficient for the moderation effect. Our findings reveal an unexpected pattern: individuals with lower emotional instability showed a stronger relationship between mysterious box addiction and psychological distress, contradicting our initial hypotheses. This surprising negative moderation effect demands theoretical reconsideration.

One plausible explanation lies in the psychological profile of our respondents. This study was conducted among general consumers, not clinical populations. Many participants were not pre-exposed to emotional dysregulation but began engaging in mysterious box purchases due to an external desire to follow social media trends. Initially perceived as harmless or even socially rewarding, mysterious box buying gradually evolved into compulsive behavior due to its gambling-like nature [42,50] and manipulative marketing tactics such as scarcity, random rewards, and influencer promotions [27].

This interpretation aligns with SDT, which posits that behavior incongruent with one's internal sense of autonomy, competence, and integrity undermines well-being. For emotionally stable individuals, the compulsive nature of mysterious box addiction may conflict with their need for autonomy and self-consistency, leading to increased psychological distress. Similarly, the SVM [29,30] suggests that stress-related outcomes depend not only on trait vulnerabilities (e.g., emotional instability) but also on situational appraisals and coping capabilities. In this case, emotionally stable individuals may experience the addiction as a more acute violation of self-regulatory norms. Without these established coping pathways, they experience the full psychological impact of this self-concept violation, resulting in the stronger relationship between addiction and distress that we observed in our study.

5.2 Implications

This study offers several implications for both academics and practitioners.

Academic implications: This study pioneers an integrated dual-pathway framework by intertwining SDT and SVM to explain the transition from healthy entertainment to pathological consumption. On the one hand, the study extended SDT to integrate consumer behavior management into psychological perspectives. The study demonstrated that customers' needs with trendy consumption are still rooted in basic psychologies. On the other hand, the SVM effectively explained the causal effect of mysterious box addiction on mental health issues among the youth. The study enriches the interdisciplinary literature by capturing the complexity of how personal feelings interact with addiction behavior as well as their negative effects on emotional well-being in non-clinical populations.

Moreover, our findings highlighted three escalating attachment levels, which explain the emotional progression in shaping addiction behavior. This finding opens the door to a conceptual framework describing a progressive emotional involvement that enables

further understanding of the mechanism through which emotional states would be gradually transformed through consumer behavior into addiction.

Practical implications: Our findings provide insights for business managers and policymakers. The study raised a significant concern that the mysterious box might be harmful to young people who have been unintentionally exposed to addiction. Initially, they just want to follow a trend, but ultimately become addicted consumers and suffer from negative mental health issues.

From the firms' perspective, although mysterious boxes can be considered an effective and trending marketing tool to quickly drive customer curiosity and engagement, heavily relying on such an entertainment mechanism can lead to consumers' psychological issues and result in undesirable brand perception. For e-commerce practitioners, we advocate for a shift from aggressive uncertainty-based tactics to "mindful consumption" strategies to preserve ethical brand perception.

From the regulatory standpoint, the study raises a need for consumer protection policies, particularly for young and vulnerable customers. Policymakers should strictly require transparent product information, such as origin, functions, and usage instructions to avoid information asymmetry. Besides, an age restriction needs to be applied to control eligible consumers for mysterious boxes, as these random products can be potential sources of impulse buying and addiction, particularly for minors. It is believed that a strict regulatory framework can not only protect minor consumers but also contribute to shaping a transparent and sustainable market.

5.3 Limitations

Although the research findings follow the gambling and addictive perspectives of the mysterious box, which unveil its adverse outcomes to mental health and notably the moderating effect of emotional instability, this research has three shortcomings for future studies. First, this study focused on the consumers who engage in buying mysterious boxes or have a retention rate. Future studies could examine the long-term effects of longitudinal studies to unveil whether addiction and negative mental health issues could shift and fluctuate during different phases of consumption. Furthermore, scholars can divide the usage rate into different scales to examine the variation of effects. Second, additional personal factors should be considered to unveil the possible impact of addiction and negative mental issues, such as personality traits, cultural, and social groups. Third, the current study attempted to investigate negative mental health without classifying mental health issues. Further studies should address other mental disorder symptoms as well as psychological well-being, for instance, life satisfaction and emotional balance, and use them as control variables to further investigate the differences among different groups of consumers. Finally, although procedural and statistical remedies were applied to mitigate CMB, the reliance on self-reported cross-sectional data may still introduce potential bias. Future research is therefore encouraged to employ longitudinal or multi-source data to further reduce CMB concerns.

6. ACKNOWLEDGMENT

This study is supported by the University of Economics, Hochiminh City (UEH) under grant number 2025-04-02-2864.

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Appendix 1. Measurement Scale

Construct	Items	Source
User delight	I feel very excited when opening a mysterious boxes	[2]
	I feel energized when opening a mysterious boxes	
	I feel very happy when opening a mysterious boxes	
Mysterious box experience	Buying mysterious boxes is an enjoyable experience for me.	[60]
	The mysterious boxes meets my needs and covers my expectations	
	I find buying mysterious boxes more enjoyable than other activities.	
User Advocacy	I enthusiastically recommend others to buy and open mysterious boxes.	[61]
	Even without being asked, I actively introduce mysterious boxes to people around me when appropriate.	
	When possible, I actively share positive reviews about the mysterious boxes experience	
User Addiction	I spend a lot of time thinking of or planning shopping/buying mysterious boxes	[62]
	I think a lot about buying mysterious boxes.	
	I feel an urge to buy mysterious boxes even when I should not.	
Depression	I feel sad and depressed without mysterious boxes.	[63, 64]
	Without mysterious boxes, I feel my future is bleak and hopeless.	
	I find it difficult to tolerate not having mysterious boxes.	
Stress	I find it difficult to relax when thinking about buying mysterious boxes.	[65]
	I tend to overreact when Blind Box outcomes do not meet expectations.	
	I feel I expend a lot of mental energy on buying mysterious boxes.	
Loneliness	I often feel distant when not participating in mysterious box purchases.	[66, 67]
	I feel empty when not buying or owning mysterious boxes.	
	I feel separated from friends and acquaintances who share the same interest in mysterious boxes.	
Emotional Instability	When I buy too many mysterious boxes, I often feel anxious and tense, which is difficult to control.	[68]
	Buying too many mysterious boxes easily puts me in an overexcited emotional state that is hard to calm down quickly.	
	When buying too many mysterious boxes, my emotions change abnormally, sometimes uncontrollably angry, other times unable to control crying.	