



Psychological Driving Factors of Steam Game Consumption of Chinese University Students Based on 4P and ECT Theories

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Abstract: With the rapid development of digital game platforms, Steam has become one of the most influential platforms for digital game consumption among Chinese university students. However, limited research has systematically explored the psychological mechanisms underlying their purchasing behavior. Therefore, this study aims to investigate the formation mechanism of purchasing psychology among Chinese university students on the Steam platform by integrating the 4P theory and Expectation Confirmation Theory (ECT). A quantitative research approach was adopted, and data were collected through an online questionnaire survey from 483 Chinese university students with Steam experience. The data were analyzed using descriptive statistics, reliability and validity analysis, confirmatory factor analysis (CFA), structural equation modeling (SEM), and Bootstrap mediation analysis. The results indicate that product perception, price perception, promotional perception, platform environment perception, game quality expectations, future price expectations, promotional revenue expectations, platform information credibility expectations, and psychological factors all have significant positive effects on perceived value. Furthermore, perceived value significantly and positively influences Steam game consumption behavior and serves as a significant mediating variable between all antecedent variables and consumption behavior. These findings demonstrate that purchasing psychology is formed through the joint influence of perception, expectation, and psychological factors, with perceived value acting as the core mechanism linking these factors to consumption behavior.

Keywords: Steam platform; Purchasing psychology; Perceived value; Expectation Confirmation Theory; 4P theory; Consumption behavior

1. Introduction

1.1 Research Background

The growth of digital entertainment has made Steam an important platform for game distribution, payment, reviews, community interaction, and promotion. These mechanisms influence consumers' value judgments and purchasing decisions.

Chinese university students are active digital consumers but often face budget constraints. Their Steam purchases therefore depend on both rational evaluations, such as game quality, price, promotions, and platform credibility, and psychological benefits, including enjoyment, achievement, immersion, and social interaction (Yee, 2006; Ryan et al., 2006)

Perceived value reflects consumers' overall assessment of benefits relative to sacrifices (Zeithaml, 1988). Expectation Confirmation Theory further explains how prior expectations shape later evaluations and behavioral responses (Oliver, 1980; Bhattacharjee, 2001). Meanwhile, the 4P framework identifies product, price, promotion, and place as manageable marketing factors, with place extended in digital settings to platform interfaces and services (Kalyanam & McIntyre, 2002).

Accordingly, this study integrates the 4P framework, ECT, gaming psychology, and perceived value to explain Steam game consumption among Chinese university students.

1.2 Research Questions

RQ1: How do 4P perceptions, consumption expectations, and gaming psychology influence the perceived value of Steam games among Chinese university students?

RQ2: Which antecedent factors have significant effects on perceived value?

RQ3: Does perceived value significantly influence Steam game consumption and mediate the

relationships between the antecedent factors and consumption behavior?

RQ4: What management implications can be proposed for Steam and game publishers based on the empirical findings?

1.3 Research Objectives

RO1: Through in-depth interviews or questionnaires, we identified the key stages in the psychological formation of Chinese college students' purchasing behavior on the Steam platform (interest generation, information comparison, psychological assessment, and decision solidification), and analyzed the characteristics and turning points of each stage to provide process evidence for understanding the timing of platform intervention.

RO2: Based on the 4P theory and expectation confirmation theory, a theoretical model is constructed that includes product perception, price perception, promotion perception, platform environment perception, multidimensional expectations, and psychological variables. The influence path and effect magnitude of each factor on college students' purchasing psychology are examined through structural equation modeling, and the core driving factors that the platform can manage are identified.

RO3: This study delves into how key information mechanisms such as pricing, promotional mechanisms, user reviews, and platform trust influence college students' purchasing psychology through intermediary pathways including perceived value, risk perception, and psychological confirmation.

RO4: Based on empirical research findings, actionable management optimization suggestions are proposed for the Steam platform from two levels: product design and operation management.

1.4 Research Contributions

Theoretically, this study integrates the 4P framework, ECT, gaming psychology, and perceived value into a unified model of digital game consumption. It extends the perceived-value perspective by explaining how external marketing stimuli and internal psychological motivations are converted into consumption behavior.

Practically, the findings may help Steam and game publishers improve product information, pricing strategies, promotional activities, review credibility, wishlist notifications, and platform trust mechanisms.

1.5 Research Limitations

This study is limited to Chinese university students and the Steam platform, which restricts the generalizability of the findings. In addition, the use of cross-sectional and self-reported data limits causal inference and may introduce common method bias. Future studies may adopt longitudinal, experimental, cross-platform, or cross-cultural designs.

2. Literature Review

2.1 Steam Platform and Game Consumption

Steam is a digital game platform integrating game distribution, payment, reviews, community interaction, promotions, and after-sales services. As a multi-sided platform, it connects developers, publishers, and players and reduces transaction and information costs through platform-based services. Among its operational mechanisms, pricing, discounts, wishlist notifications, user reviews, and refund guarantees are particularly relevant to consumers' purchasing decisions.

Steam consumption is influenced by both rational evaluation and psychological motivation. Players assess product quality, price, promotional

benefits, and platform credibility, while also seeking enjoyment, achievement, immersion, relaxation, and social interaction. Previous studies have identified achievement, social interaction, and immersion as major gaming motivations (Yee, 2006). Self-determination theory further suggests that games satisfy the needs for autonomy, competence, and relatedness, thereby strengthening engagement and consumption-related responses (Ryan et al., 2006)

2.2 Theoretical Foundations

2.2.1 Expectation Confirmation Theory

Expectation Confirmation Theory explains how consumers form expectations and compare them with available information or actual performance. This comparison influences subsequent evaluations and behavioral responses (Oliver, 1980). Bhattacharjee (2001) extended ECT to information systems and demonstrated that expectations and confirmation play important roles in users' evaluations and continued behavior. In the Steam context, consumers form expectations regarding game quality, future prices, promotional benefits, and platform information credibility. These expectations influence whether they regard a game as worth purchasing or decide to wait.

2.2.2 The 4P Marketing Framework

The 4P framework identifies product, price, promotion, and place as manageable marketing elements. In digital environments, place extends beyond physical distribution and includes platform interfaces, information presentation, online communities, and service systems (Kalyanam & McIntyre, 2002). Accordingly, this study operationalizes the 4Ps as product perception, price perception, promotion perception, and platform environment perception.

2.3 Related Research

Existing research on Steam and digital game consumption indicates that users' decisions are influenced by perceived value, platform experience, price, trust, and psychological motivation. In the Steam Community Market, aesthetic, functional, and economic value were found to influence users' attitudes, continued use, and word-of-mouth intentions, demonstrating the importance of value evaluation in platform consumption (Barros et al., 2024)

Studies of university students' digital consumption further show that perceived price, system security, social influence, satisfaction, trust, and customer experience significantly affect purchase or repurchase intentions (Lim et al., 2024).

Perceived value is a central factor in digital game consumption. Consumers evaluate functional, emotional, social, and price value before making decisions, and higher perceived value generally strengthens purchase-related behavior (Sweeney & Soutar, 2001). Promotional activities, including discounts and limited-time offers, can also enhance perceived value and stimulate consumption by providing economic benefits and creating urgency (Grewal et al., 1998).

In addition, gaming behavior is driven by psychological motivations such as achievement, social interaction, immersion, enjoyment, and relaxation. Games can satisfy the needs for autonomy, competence, and relatedness, thereby influencing players' value judgments and consumption behavior (Yee, 2006; Ryan et al., 2006). Overall, previous research supports the inclusion of platform factors, perceived value, promotion, and gaming psychology in the present model.

2.4 Research Hypotheses

H1a: Product perception has a

significant positive impact on perceived value.

H1b: Price perception has a significant positive impact on perceived value.

H1c: Promotion perception has a significant positive impact on perceived value.

H1d: Platform environment perception has a significant positive impact on perceived value.

H2a: Game quality expectations have a significant positive impact on perceived value.

H2b: Future price expectations have a significant positive impact on perceived value.

H2c: Promotion benefit expectations have a significant positive impact on perceived value.

H2d: Platform information credibility expectations have a significant positive impact on perceived value.

H3: Psychology has a significant positive impact on perceived value.

H4: Perceived value has a significant positive impact on consumption.

2.5 Variable Relationship Model

From the 4P perspective, consumers' perceptions of product, price, promotion, and platform environment directly influence their overall value judgments of Steam games. Recent research suggests that external cues related to product attributes, price conditions, promotional incentives, and platform information jointly shape consumers' perceived value in digital platform contexts. In particular, informative and favorable product-related cues can strengthen consumers' perceptions of expected benefits, while price-related cues and promotional conditions influence their judgments of whether a purchase is worthwhile. Platform-based value research further shows that perceived

value serves as an important mechanism linking external stimuli to subsequent attitudes and consumption-related

responses (Blut et al., 2024; Barros et al., 2024; Sae-tae & Wang, 2024).

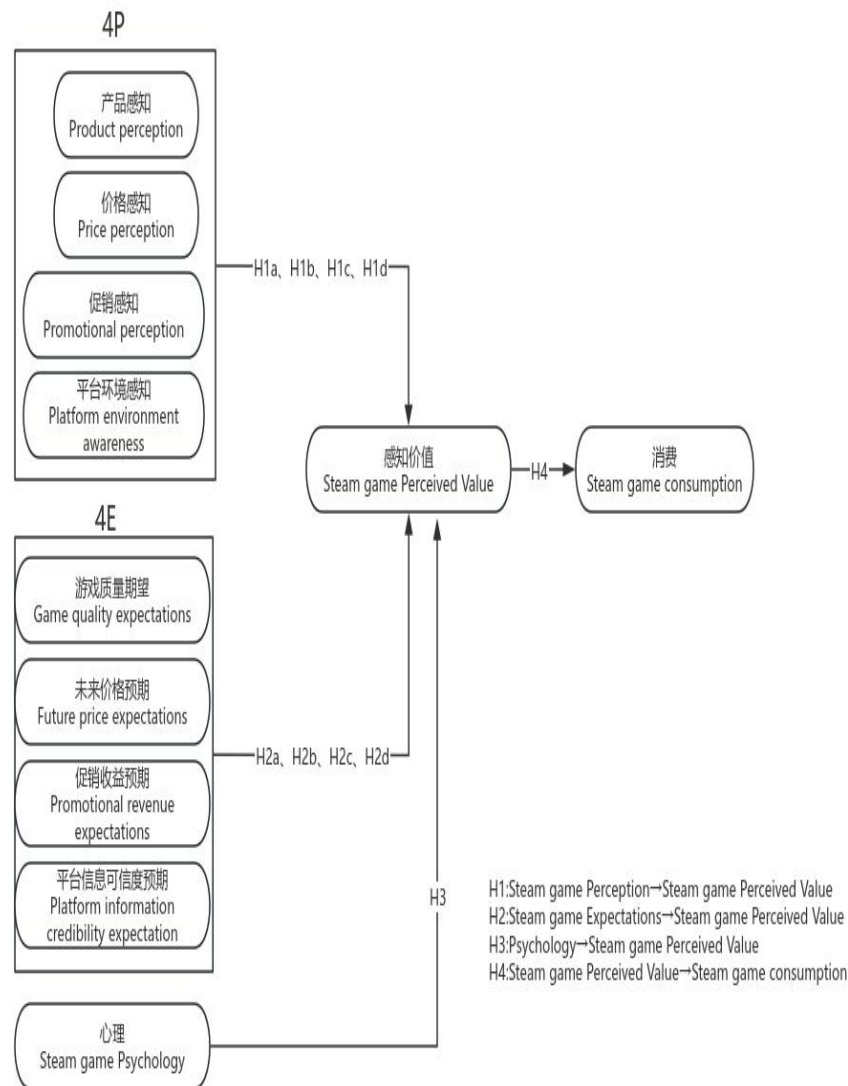


Figure 2.1

Variable Relationship Model

3. Research Methodology

3.1 Quantitative Research Methods

This study adopted a quantitative research design to examine the psychological mechanisms underlying Steam game consumption among Chinese university students. Quantitative methods are appropriate

because the study focuses on testing theoretically derived relationships among measurable latent variables, including product perception, price perception, promotion perception, platform environment perception, expectation-related factors, perceived value, and consumption behavior. Standardized measurement scales and

statistical models allow these abstract constructs to be operationalized and empirically tested.

An online questionnaire was used to collect data because it is suitable for measuring respondents' perceptions, expectations, attitudes, and behavioral responses. Chinese university students are highly familiar with digital platforms and online surveys, making this approach efficient for obtaining a sufficiently large and comparable dataset (Dillman et al., 2014)

The quantitative approach is also compatible with the 4P framework and Expectation Confirmation Theory. Both theories involve structured relationships among observable indicators and latent constructs, which can be examined through multivariate statistical analysis. Therefore, this method enables the study to test direct relationships and mediating effects within a unified theoretical model.

However, quantitative questionnaire data are based on self-reported responses and may not fully capture individual experiences or establish strict causal relationships. These limitations should be considered when interpreting the findings.

3.2 Population and Sample

3.2.1 Population

The population consisted of Chinese undergraduate and graduate students with experience using the Steam platform. Eligible respondents were required to be currently enrolled at a Chinese university and to have experience browsing, selecting, purchasing, or using games on Steam. These criteria ensured that participants could evaluate the study variables based on actual platform experience, including product, price, promotion, platform environment, expectations, perceived value, and consumption behavior.

3.2.2 Sampling Method

Data were collected through an

online questionnaire using convenience sampling combined with purposive screening. The questionnaire was distributed through university social groups, online student communities, gaming forums, and Steam-related communities. Screening questions were used to retain only current university students with Steam experience. Questionnaires with excessively short completion times, straight-line responses, or logical inconsistencies were removed during data cleaning.

3.2.3 Sample Size

The research model contained 11 constructs measured by 44 items. Following the commonly used recommendation of approximately 5 to 10 respondents per measurement item, the target sample size was set at about 440 participants (Wolf et al., 2013). Approximately 480 questionnaires were distributed to compensate for incomplete or invalid responses, and 483 valid questionnaires were ultimately retained for analysis.

3.3 Data Collection

3.3.1 Data Collection Method

Data were collected through an online questionnaire. This method was appropriate because Chinese university students and Steam users are highly active online and geographically dispersed. Online surveys also enable efficient and low-cost collection of standardized data suitable for reliability, validity, and structural equation modeling analyses (Regmi et al., 2016).

3.3.2 Questionnaire Design and Measurement

The questionnaire was developed from established scales and adapted to the Steam context. It measured the main constructs of the research model, including product perception, price perception, promotion perception, platform environment perception, expectation-related factors, gaming psychology, perceived value, and

consumption behavior. All items were measured using a structured Likert scale.

3.3.3 Questionnaire Distribution and Implementation

The questionnaire was distributed through online channels commonly used by Chinese university students, including class groups, campus communities, questionnaire-sharing platforms, and Steam-related discussion groups. The survey was anonymous and did not collect personally identifiable information. The first page explained the research purpose, anonymity, and data use, and included screening questions to ensure that only eligible Chinese university student Steam users completed the questionnaire (Dillman et al., 2014).

3.3.4 Data Quality Control

To improve data quality, all core items were mandatory and written in clear language. After collection, questionnaires were screened based on completion time, response patterns, screening results, and logical consistency, and invalid responses were removed. To reduce common method bias, the questionnaire avoided leading wording, separated items from different constructs, and used anonymous participation (Torrejón-Guirado et al., 2024; Yao & Xu, 2024).

3.4 Data Analysis

This study used SPSS and AMOS to analyze the questionnaire data. The analysis included data cleaning, descriptive statistics, reliability and

validity testing, factor analysis, and structural equation modeling (SEM). SEM was selected because it can simultaneously test relationships among multiple latent variables, evaluate model fit, and estimate structural paths (Wulandari, 2022).

3.4.1 Data Processing and Descriptive Analysis

The data were first checked for missing values, outliers, coding errors, and invalid responses. Frequency analysis was then used to describe respondents' demographic and Steam usage characteristics. Means and standard deviations were calculated for the main constructs to summarize respondents' overall response patterns and provide a basis for subsequent analyses.

3.4.2 Reliability Analysis

Cronbach's alpha was used to assess the internal consistency of each construct. A value of 0.70 or above was considered acceptable (Hussey et al., 2025). Corrected item-total correlations and the alpha value after item deletion were also examined to identify potentially problematic items.

A pilot test involving 50 respondents and 44 measurement items produced an overall Cronbach's alpha of 0.928. All 50 questionnaires were valid, with no missing cases. These results indicate high internal consistency and support the use of the questionnaire in the formal survey.

Table 3.1 Reliability Analysis

Test	Value
Number of respondents	50
Number of items	50
Cronbach's Alpha	0.928

3.4.3 Validity Analysis and Measurement Model

Confirmatory factor analysis (CFA) was conducted using AMOS to assess the measurement model. Convergent

validity was evaluated through standardized factor loadings, composite reliability (CR), and average variance extracted (AVE). CR values above 0.70 and AVE values above 0.50 indicate

acceptable convergent validity. Discriminant validity was assessed by comparing the square root of each construct's AVE with its inter-construct correlations (Fornell & Larcker, 1981).

3.4.4 Exploratory Factor Analysis

Exploratory factor analysis (EFA) was used to examine the underlying factor structure. The Kaiser–Meyer–Olkin measure and Bartlett's test were first applied to confirm factorability. A KMO value above 0.60 and a significant Bartlett's test indicate that the data are suitable for factor analysis. Items with factor loadings above 0.50 were retained (Chan & Idris, 2017).

3.4.5 Structural Model and Hypothesis Testing

After validating the measurement model, structural equation modeling was performed in AMOS to test the proposed

hypotheses. Path significance was evaluated using standardized coefficients and p-values. Overall model fit was assessed using χ^2/df , CFI, TLI, and RMSEA. In general, CFI and TLI values near or above 0.90 and RMSEA below 0.08 indicate acceptable model fit (Hu & Bentler, 1999).

4. Results

4.1 Descriptive statistical analysis

A total of 483 valid questionnaires were collected and included in the final analysis. The demographic characteristics and Steam usage behavior of the respondents are shown in Table 4.1. For multiple-response questions, respondents were allowed to select more than one option; therefore, the total frequency exceeds the sample size of 483 and the cumulative percentage exceeds 100%.

Table 4.1 Descriptive statistical analysis of sample information for this study

Question	Options	Frequency	Percentage
Chinese university students	Yes	483	100%
	No	0	0%
Gender	Male	287	59.4%
	Female	196	40.6%
Over the past year, I have participated in a number of Steam-related events	Browse game information		
	Add the game to your wishlist	196	11.4%
	View user comments	219	12.7%
	Participate in platform promotion activities	189	11.0%
	Purchase games or related digital content	246	14.3%
		389	22.6%
		483	28.0%
Age	Download games from Steam		
	18-22 years old	288	59.6%
	23-26 years old	144	29.8%
	27-30 years old	39	8.1%
	31 years and older	12	2.5%
Education level	Bachelor's degree	196	41.0%
	Doctoral degree	42	8.7%
	Associate degree	120	24.8%
	Master's degree	123	25.5%
Major	Law	55	11.4%
	Engineering	58	12.0%
	Education	55	11.4%

	Economic and Management	48	9.9%
	Social Sciences	59	12.2%
	Literature and Art	66	13.7%
	Medicine	75	15.5%
	Natural Sciences	67	13.9%
	1001-2000RMB	333	68.9%
	2001-3000RMB	70	14.5%
Income level	500-1000RMB	49	10.1%
	Less than 500 RMB	14	2.9%
	More than 3000 RMB	17	3.5%
	1-2 years	125	25.9%
	3-4 years	95	19.7%
Usage time	5-6 years	151	31.3%
	7 years or more	91	18.8%
	Less than 1 year	21	4.3%
	About once every 6 months	133	27.5%
Purchase game time interval	About once a month	121	25.1%
	Rarely buy	20	4.1%
	About once every 2-3 months	109	22.6%
	Twice a month or more	100	20.7%
Time using the wish list feature	Never use	81	16.8%
	Rarely used	191	39.5%
	Frequently used	30	6.2%
	Occasionally	181	37.5%
	operate	241	17.8%
	Adventure	258	19.1%
Main game types	role play	176	13.0%
	Strategy/Simulation	227	16.8%
	Casual/Independent	250	18.5%
	Sports/Racing	202	24.9%
	are about the same		
	Depending on the specific	127	26.3%
Frequently game		115	23.8%
Played Mode	Mainly play single-player mode	116	24.0%
	Mainly plays team/multiplayer mode	125	25.9%
	Game trailer/screenshots		
	Game introduction page		
	User comments		18.4%
Information for reference before purchasing the game	Media/up comments	214	16.1%
	Discount amount / Lowest historical price	188	19.9%
	Friend	232	9.9%
	Aecommendations/Social	116	8.9%
	Discussions	104	7.0%
	System Requirements	82	7.6%
	Refund Policy/Risk	89	12.1%
	Considerations	141	
Main reasons	Entertainment	296	28.5%

for playing games	Relax your mind and body and relieve stress	162	15.6%
		235	22.6%
		147	14.2%
		198	19.1%
Reasons for adding the game to the wishlist	Save for later use Waiting for a discount Limited budget Observe changes in reviews/reputation I'm interested in games, but haven't decided yet Added based on a friend's recommendation	260	20.8%
		237	18.9%
		137	10.9%
		240	19.2%
		171	13.6%
		208	16.6%
Stimulating purchasing psychology	Game content and gameplay Price Discount Evaluation/Rating Friend Recommendation	163	18.8%
		172	19.8%
		161	18.6%
		206	23.8%
		165	19.0%
Playing games during specific time periods	00:00-05:59 06:00-11:59 12:00-17:59 18:00-23:59	122	25.3%
		30	6.2%
		80	16.6%
		251	52.0%

Table 4.1 summarizes the demographic characteristics and Steam usage patterns of the 483 respondents. All participants were Chinese university students with Steam experience. Male respondents accounted for 59.4%, while female respondents represented 40.6%. Most respondents were aged 18–22 years (59.6%), and bachelor's degree students formed the largest educational group (41.0%).

Regarding Steam usage, 31.3% had used Steam for 5–6 years, while 27.5% purchased games approximately once every six months. Wishlist use was relatively common, with 39.5% reporting rare use and 37.5% occasional use. The most frequently selected game types were adventure, casual/independent, and

strategy/simulation games. Before purchasing, respondents mainly referred to user comments, game trailers or screenshots, and game introduction pages.

Entertainment and a sense of achievement were the main reasons for playing games. The major reasons for adding games to the wishlist were saving them for later purchase, observing changes in reviews or reputation, and waiting for discounts. Evaluation and ratings were the strongest factors stimulating purchasing psychology. In addition, most respondents played games between 18:00 and 23:59. Since several questions allowed multiple responses, their percentages do not total 100%.

Table 4.2 Descriptive Statistics of Study Variables

Item		Mean	Std. Deviation
Product perception	PP1	3.323	1.154
	PP2	3.331	1.141
	PP3	3.319	1.151

	PP4	3.282	1.102
	PRP1	3.358	1.216
Price perception	PRP2	3.391	1.190
	PRP3	3.333	1.191
	PRP4	3.381	1.188
Promotional percepti on	POP1	3.398	1.147
	POP2	3.317	1.144
	POP3	3.381	1.154
	POP4	3.371	1.155
Platform environment awareness	PEA1	3.356	1.169
	PEA2	3.284	1.142
	PEA3	3.348	1.156
	PEA4	3.298	1.159
Game Quality Expect ations	GQE1	3.356	1.188
	GQE2	3.255	1.219
	GQE3	3.387	1.188
	GQE4	3.261	1.192
Future price expectati ons	FPE1	3.377	1.157
	FPE2	3.383	1.123
	FPE3	3.373	1.164
	FPE4	3.362	1.152
Promotional Revenue Expected	PRE1	3.323	1.157
	PRE2	3.379	1.148
	PRE3	3.387	1.204
	PRE4	3.313	1.175
Platform Information Credibility Expectati on	PICE1	3.414	1.128
	PICE2	3.414	1.111
	PICE3	3.377	1.126
	PICE4	3.447	1.157
Steam game psychology	SGP1	3.354	1.147
	SGP2	3.317	1.127
	SGP3	3.360	1.137
	SGP4	3.344	1.144
Steam game Perceived Value	PV1	3.335	1.138
	PV2	3.234	1.165
	PV3	3.261	1.175
	PV4	3.298	1.150
Steam game consumption	SGC1	3.304	1.167
	SGC2	3.424	1.127
	SGC3	3.358	1.192
	SGC4	3.412	1.164

As shown in Table 4.2, the mean values of the 44 items ranged from 3.234 to 3.447, all slightly above the midpoint of the five-point Likert scale.

This indicates that respondents generally held moderately positive views toward the measured constructs (Norman, 2010; Sullivan & Artino, 2013).

PICE4 had the highest mean ($M = 3.447$, $SD = 1.157$), while PV2 had the lowest ($M = 3.234$, $SD = 1.165$). The standard deviations ranged from 1.102 to 1.219, showing reasonable variation in responses. GQE2 had the greatest variation, whereas PP4 showed the

highest consistency.

Overall, the results indicate moderately positive evaluations and sufficient response variability for further reliability, validity, and structural model analyses. However, measurement quality should ultimately be assessed through factor loadings, CR, AVE, and discriminant validity rather than mean and standard deviation alone.

4.2 Trust level analysis

Table 4.3 Reliability analysis variables

Variable	items	Corrected Item-Total Correlation	Cronbach's Alpha	Alpha
Product Perception	PP1	0.447	0.944	0.945
	PP2	0.469	0.944	
	PP3	0.518	0.944	
	PP4	0.458	0.944	
Price Perception	PRP1	0.528	0.944	
	PRP2	0.525	0.944	
	PRP3	0.549	0.943	
	PRP4	0.527	0.944	
Promotional Perception	POP1	0.541	0.943	
	POP2	0.544	0.943	
	POP3	0.540	0.943	
	POP4	0.558	0.943	
Platform Environment awareness	PEA1	0.457	0.944	
	PEA2	0.472	0.944	
	PEA3	0.502	0.944	
	PEA4	0.477	0.944	
Perceived Value	PV1	0.607	0.943	
	PV2	0.640	0.943	
	PV3	0.582	0.943	
	PV4	0.631	0.943	
Game quality expectations	GQE1	0.573	0.943	
	GQE2	0.511	0.944	
	GQE3	0.535	0.943	
	GQE4	0.549	0.943	
Future price expectations	FPE1	0.534	0.944	
	FPE2	0.502	0.944	
	FPE3	0.548	0.943	
	FPE4	0.544	0.943	
Promotional Revenue Expectations	PRE1	0.475	0.944	
	PRE2	0.501	0.944	
	PRE3	0.484	0.944	
	PRE4	0.516	0.944	

Platform	PICE1	0.459	0.944
Information	PICE2	0.474	0.944
Credibility	PICE3	0.437	0.944
Expectations	PICE4	0.499	0.944
	SGP1	0.471	0.944
Steam game	SGP2	0.520	0.944
Psychology	SGP3	0.469	0.944
	SGP4	0.498	0.944
	SGC1	0.480	0.944
Steam game	SGC2	0.471	0.944
Consumption	SGC3	0.489	0.944
	SGC4	0.500	0.944

As shown in Table 4.3, all CITC values ranged from 0.437 to 0.640, exceeding the recommended threshold of 0.30. Cronbach's alpha values ranged from 0.943 to 0.944, well above the acceptable level of 0.70 (Hussey et al., 2025).

These results indicate excellent internal consistency across all constructs. Therefore, the questionnaire demonstrates high reliability and is suitable for subsequent validity testing and structural equation modeling.

4.3 Validity analysis

Table 4.4 KMO and Bartlett's Test

	KMO	0.933
	Chi-square distribution	11083.465
Bartlett Sphericity Test	df	946
	P	0.000

As shown in Table 4.4, the KMO value was 0.933, indicating excellent sampling adequacy. Bartlett's Test of Sphericity was also significant, $\chi^2(946) = 11083.465$, $p < 0.001$, confirming

sufficient correlations among the measurement items. Therefore, the data were suitable for factor analysis and subsequent CFA and SEM.

4.4 Confirmatory Factor Analysis

Table 4.5 Confirmatory Factor Analysis Loadings

Latent Variable	Item	Standardized Loading	CR	AVE
PP	PP1	0.778	0.844	0.575
	PP2	0.751		
	PP3	0.776		
	PP4	0.727		
PRP	PRP1	0.790	0.858	0.602
	PRP2	0.774		
	PRP3	0.777		
	PRP4	0.761		
POP	POP1	0.794	0.865	0.616
	POP2	0.764		
	POP3	0.793		
	POP4	0.787		
PEA	PEA1	0.740	0.847	0.580
	PEA2	0.769		

	PEA3	0.779		
	PEA4	0.758		
	PV1	0.782		
	PV2	0.798		
PV	PV3	0.780	0.872	0.631
	PV4	0.816		
	GQE1	0.733		
	GQE2	0.768		
GQE	GQE3	0.766	0.841	0.569
	GQE4	0.751		
	FPE1	0.779		
	FPE2	0.760		
FPE	FPE3	0.807	0.866	0.619
	FPE4	0.799		
	PRE1	0.769		
	PRE2	0.718		
PRE	PRE3	0.729	0.843	0.573
	PRE4	0.808		
	SGP1	0.771		
	SGP2	0.776		
SGP	SGP3	0.780	0.861	0.607
	SGP4	0.789		
	SGC1	0.764		
	SGC2	0.758		
SGC	SGC3	0.805	0.860	0.605
	SGC4	0.784		
	PICE1	0.759		
	PICE2	0.781		
PICE	PICE3	0.754	0.850	0.586
	PICE4	0.768		

Confirmatory factor analysis showed that all standardized factor loadings ranged from 0.718 to 0.816, exceeding the recommended threshold of 0.70 (Hoyle, 2000). Composite reliability values ranged from 0.841 to 0.872, all above 0.70, while AVE values ranged from 0.569 to 0.631, all exceeding the recommended criterion of 0.50 (Fornell & Larcker, 1981). These results confirm that the measurement model has satisfactory internal consistency, reliability, and convergent validity.

4.5 Structural equation model assumptions

Table 4.6 Goodness-of-Fit Test for Structural Equation Model

Fit Index	Criterion	Value
χ^2	-	940.971
df	-	856
χ^2/df	<3	1.099
GFI	>0.9	0.921
RMSEA	<0.10	0.014
CFI	>0.9	0.992
NFI	>0.9	0.918
RFI	>0.9	0.909

TLI	>0.9	0.991
AGFI	>0.9	0.908
IFI	>0.9	0.992

The structural model demonstrated excellent fit. The χ^2/df ratio was 1.099, below the recommended threshold of 3, while RMSEA was 0.014, indicating very low model error. GFI and AGFI were 0.921 and 0.908, respectively, both exceeding 0.90.

The incremental fit indices also met

the recommended criteria: CFI = 0.992, NFI = 0.918, RFI = 0.909, TLI = 0.991, and IFI = 0.992. Since CFI and TLI exceeded 0.95, the model showed excellent overall fit (Hu & Bentler, 1999). Therefore, the model was suitable for subsequent path analysis and hypothesis testing.

4.6 Mediation effect

Table 4.7 Mediating Effect Test of Structural Equation Model

Parameter	Estimate	Lower	Upper	P	Result
Indirect Effect:PP→PV→SGC	0.064	0.020	0.112	0.004	Supported
Indirect Effect:PRP→PV→SGC	0.056	0.007	0.110	0.020	Supported
Indirect Effect:POP→PV→SGC	0.060	0.012	0.116	0.021	Supported
Indirect Effect:PEA→PV→SGC	0.054	0.010	0.103	0.014	Supported
Indirect Effect:GQE→PV→SGC	0.067	0.003	0.126	0.039	Supported
Indirect Effect:FPE→PV→SGC	0.053	0.008	0.104	0.021	Supported
Indirect Effect:PRE→PV→SGC	0.058	0.010	0.107	0.014	Supported
Indirect Effect:PICE→PV→SGC	0.046	0.003	0.093	0.030	Supported
Indirect Effect:SGP→PV→SGC	0.053	0.006	0.104	0.030	Supported

Bootstrap results showed that PV significantly mediated all nine relationships between the antecedent variables and SGC because all 95% confidence intervals excluded zero (Preacher & Hayes, 2008). The largest

indirect effect was GQE → PV → SGC ($\beta = 0.067$), while PICE → PV → SGC was the smallest but remained significant ($\beta = 0.046$). Overall, PV played a central mediating role in the model.

4.7 Hypothesis test results

Table 4.8 Hypothesis test results

Hypothesis	β	P	Result
H1a	0.140	0.003	Supported
H1b	0.121	0.021	Supported
H1c	0.131	0.013	Supported
H1d	0.118	0.014	Supported
H2a	0.145	0.012	Supported
H2b	0.116	0.021	Supported
H2c	0.126	0.012	Supported
H2d	0.101	0.029	Supported
H3	0.115	0.017	Supported
H4	0.458	<0.001	Supported

As shown in the table, all proposed hypotheses were supported. The nine antecedent variables had significant

positive effects on perceived value (PV), with standardized coefficients ranging from 0.101 to 0.145. Among them, game

quality expectation (GQE) had the strongest effect on PV ($\beta = 0.145$), followed by product perception (PP) ($\beta = 0.140$), while platform information credibility expectation (PICE) had the weakest but still significant effect ($\beta = 0.101$). Perceived value had the strongest overall effect on Steam game consumption (SGC) ($\beta = 0.458$, $p < 0.001$). These findings confirm that perceived value is the central mechanism linking marketing perceptions, expectations, and psychological factors to consumption behavior.

5. Conclusion and Future Research

5.1 Discussion and Conclusion

This study investigated the formation mechanism of purchasing psychology among Chinese university students on the Steam platform. Based on the integration of the 4P theory and Expectation Confirmation Theory (ECT), a structural equation model was constructed to examine the relationships among perception factors, expectation factors, psychological factors, perceived value, and consumption behavior. A total of 483 valid questionnaires were collected and analyzed.

The results indicate that product perception, price perception, promotional perception, platform environment perception, game quality expectations, future price expectations, promotional revenue expectations, platform information credibility expectations, and psychological factors all have significant positive effects on perceived value. These findings suggest that Chinese university students form purchasing psychology through a comprehensive evaluation process that involves product information, promotional activities, platform services, future expectations, and psychological experiences.

The study further found that

perceived value has a significant positive effect on Steam game consumption behavior. This result indicates that when students perceive greater benefits from a game, they are more likely to make purchasing decisions. Therefore, perceived value serves as the direct driving force behind Steam game consumption.

The Bootstrap mediation analysis also confirmed that perceived value plays a significant mediating role between all antecedent variables and consumption behavior. Product perception, expectations, and psychological factors can indirectly influence consumption through perceived value. Overall, the findings demonstrate that perceived value is the core mechanism linking platform-related factors and purchasing behavior, providing both theoretical support and practical implications for understanding Steam game consumption among Chinese university students.

5.2 Limitations and Future Research

This study investigated the formation mechanism of purchasing psychology among Chinese university students on the Steam platform. Although the findings provide valuable insights into digital game consumption behavior, several limitations remain.

First, this study adopted a cross-sectional design and collected data at a single point in time, which limits the ability to examine long-term changes in purchasing psychology. Future studies may employ longitudinal approaches to further explore the dynamic development of consumer behavior.

Second, the sample was limited to Chinese university students using the Steam platform. Therefore, the findings may not be fully generalizable to other age groups, regions, or cultural backgrounds. Future research could expand the sample scope to improve the

generalizability of the results.

Finally, this study mainly focused on perception factors, expectation factors, psychological factors, and perceived value. Other variables, such as social influence, gaming experience, and platform loyalty, may also affect purchasing psychology. Future studies may incorporate these factors to develop a more comprehensive understanding of digital game consumption behavior.

Overall, future research can further examine purchasing psychology across different consumer groups and gaming contexts, providing additional theoretical and practical implications for digital platform management and game marketing.

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