

PSYCHOLOGICAL DRIVING FACTORS OF STEAM GAME CONSUMPYION OF CHINESE UNIVERSITY STUDENTS BASED ON 4P AND ECT THEORIES

Jing Xin

An Independent Study submitted in partial fulfillment of the Requirements for the Degree of Master of Management Program in Creative Industries Management
Rattanakosin International College of Creative Entrepreneurship
Rajamangala University of Technology Rattanakosin
Academic Year 2026
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ABSTRACT

The objectives of this study were (1) to examine the formation mechanism of purchasing psychology among Chinese university students on the Steam platform, (2) to identify the core situational factors influencing the formation of purchasing psychology among Chinese university students on the Steam platform, (3) to examine the influence of information mechanisms on the purchasing psychology of Chinese university students on the Steam platform, and (4) to provide recommendations for optimizing product design and operation management on the Steam platform.

This study employed a questionnaire survey method to collect data from 483 Chinese university students with experience using the Steam platform. Convenience sampling was used to recruit respondents. The research tool included 44 measurement items constructed based on the 4P theory, Expectation Confirmation Theory (ECT), psychological factors, perceived value, and Steam game consumption. Statistical analyses included descriptive statistics, reliability analysis, validity analysis, confirmatory factor analysis (CFA), structural equation modeling (SEM), and mediation effect analysis.

Major Findings/Results: (1) The results confirmed the formation mechanism of purchasing psychology among Chinese university students on the Steam platform, with marketing perceptions, expectation-related factors, and psychological factors significantly influencing perceived value; (2) Among the situational factors, product perception, price perception, promotional perception, and platform environment awareness all had significant positive effects on perceived value; (3) Information mechanisms, including game quality expectations, future price expectations, promotional revenue expectations, and platform information credibility expectations, significantly influenced purchasing psychology through perceived value, while perceived value had a significant positive effect on Steam game consumption; and (4) Based on the empirical findings, the study suggests that optimizing product quality, pricing strategies, promotional activities, and platform information management can effectively enhance users' perceived value and promote Steam game consumption behavior.

Keywords: Steam platform, Purchasing psychology, Perceived value, 4P Theory, Game consumption, Expectation confirmation theory (ECT)

Advisor’s Signature.....

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Jing Xin

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CHAPTER 1
INTRODUCTION

This chapter mainly introduces the basic framework of the study, including the research background, research questions, research objectives, research significance, and research limitations. First, it explains the development background of the digital entertainment industry and the Steam platform, pointing out that Steam has become an important PC digital game consumption platform. Second, it analyzes the consumption characteristics of Chinese university students on Steam, suggesting that this group has strong digital platform usage ability but is also restricted by limited budgets. Therefore, their purchasing psychology may be influenced by multiple factors, such as price, promotion, game quality, user reviews, and platform trust. Based on this, the chapter proposes the research questions and objectives, focusing on the formation process of Chinese university students' purchasing psychology on Steam and how manageable platform factors influence their purchase tendency. Finally, the chapter discusses the theoretical and practical significance of the study and identifies limitations related to sample scope, the single-platform context, and the cross-sectional questionnaire design. Overall, this chapter lays a foundation for the subsequent theoretical model construction, variable measurement, and empirical analysis.

1.1 Research Background

1.1.1 Development of the Digital Entertainment Industry and the Steam Platform Ecosystem

With the continuous development of information technology and internet infrastructure, the digital entertainment industry has expanded rapidly and become an important part of young people's cultural consumption. Although mobile internet is highly popular, PCs still maintain advantages in immersive interaction and high-quality gaming experiences. According to the 54th Statistical Report on China's Internet Development, by the end of 2024, the proportions of Chinese internet users accessing the

internet through desktop computers and laptops reached 32.3% and 30.9%, respectively (China Internet Network Information Center [CNNIC], 2024), providing a stable user base for PC digital gaming platforms. Against this backdrop, Steam, launched by Valve, has gradually developed into one of the world's largest PC digital game platforms, integrating game sales, community interaction, user reviews, and digital payment functions. According to Steamworks, Steam serves more than 132 million monthly active users across approximately 250 countries, demonstrating the platform's broad global reach and continued importance in the PC digital game market (Valve Corporation, n.d.-i). The growing scale and influence of the platform suggest that Steam has become not only an important channel for digital game consumption but also a representative context for understanding digital consumption behavior and user psychology.

Therefore, under the rapid development of the digital entertainment industry and platform ecosystems, examining the Steam platform is meaningful for understanding how consumers form purchasing psychology and consumption behavior in digital gaming contexts.

1.1.2 Characteristics of Steam Consumption Behavior among Chinese University Students

Chinese university students constitute an important user group on the Steam platform and possess distinctive digital consumption characteristics. On the one hand, this group generally has high digital literacy and is familiar with online platforms, digital content, and online payment systems, enabling them to quickly access game information, promotional activities, and platform functions. On the other hand, university students are usually under budget constraints due to limited income, making their consumption decisions more cautious and value-oriented.

As a result, the Steam consumption behavior of Chinese university students often reflects a coexistence of rationality and emotion. Rational considerations are reflected in evaluations of game quality, price reasonableness, promotional discounts, and purchase risks, while emotional factors involve gaming interests, platform atmosphere, psychological expectations, and community interaction. Therefore, their purchasing decisions are not determined by a single factor but emerge through multiple psychological processes, including information acquisition, value judgment, and purchase confirmation.

However, existing studies on digital platform consumption behavior mainly focus on single factors such as price, satisfaction, or usage intention, while lacking systematic analysis of the integrated relationship between marketing elements, psychological mechanisms, and consumer behavior. In particular, empirical studies focusing on Chinese university students in the Steam context remain limited. Existing research suggests that consumer behavior in digital environments is influenced by value perception and psychological confirmation processes (Oliver, 1980; Bhattacherjee, 2001), yet related explanations in gaming platform contexts remain insufficient. Therefore, this study takes Chinese university students as the research object and combines 4P theory with expectation-confirmation theory (ECT) to examine the formation mechanism of Steam consumption behavior.

1.2 Research Question

RQ1: What is the formation mechanism of purchasing psychology among Chinese university students on the Steam platform?

This research question aims to examine the formation mechanism of purchasing psychology among Chinese university students on the Steam platform. It focuses on how product and platform perceptions, consumer expectations, and psychological factors jointly shape perceived value and subsequently influence Steam game consumption. Rather than tracing changes in purchasing psychology over time, this question emphasizes the structural relationships among the key factors involved in purchasing psychology. Answering this question helps explain how different factors work together within the Steam platform context and provides a theoretical basis for further identifying the key drivers of purchasing psychology.

RQ2: In the context of the Steam platform, what manageable situational factors constitute the core drivers of the formation of Chinese university students' purchasing psychology?

This research question aims to identify "manageable factors" that play a key role in the formation of university students' purchasing psychology from the perspective of platform management. These manageable factors mainly refer to content that the platform and operations team can adjust through mechanism design or information presentation, such as price information presentation, promotional outreach methods, user

review display, platform rule transparency, and wishlist reminder mechanisms. The core of this question lies in distinguishing between "which factors are important" and "which factors are manageable," thus laying the foundation for targeted platform optimization suggestions in the subsequent paper and enhancing the manageability of the research conclusions.

RQ3: How do information mechanisms such as price, promotion, reviews, and platform trust influence the purchasing psychology of Chinese university students?

This research question aims to explore, from the perspective of explaining management mechanisms, how key platform information mechanisms are understood, processed, and internalized by university students into their purchasing psychology. Specifically, this study focuses on how price and promotional information affect users' judgments of "perceived value" and "purchase timing," how user reviews affect their perception of game quality and purchase risks, and how platform trust enhances the certainty of their purchasing psychology. This question not only answers "which mechanisms are effective" but also further explains "why they are effective and how they are effective," thereby enhancing the explanatory power and guiding significance of the research for optimizing platform product design and operation strategies.

RQ4: Based on the formation mechanism of purchasing psychology among Chinese university students, how should the Valve platform optimize its product design and operation management?

This research question aims to transform the aforementioned research findings into platform-level management suggestions, which is the practical focus of this paper. Based on the identification of the formation process, core driving factors and mechanisms of purchasing psychology, this study will propose optimization directions from two levels: product design and operation management. These include optimizing the wish list mechanism and reminder strategy, improving the presentation of price and promotional information, enhancing the credibility of the evaluation system, and providing interface support to reduce user decision-making costs and uncertainties.

1.3 Research Objectives

O1: To develop and empirically test an integrated model based on the 4P framework and Expectation Confirmation Theory (ECT) to explain the formation mechanism of purchasing psychology among Chinese university students on the Steam platform.

This objective will be achieved by constructing a structural model that integrates marketing perceptions, consumer expectations, psychological factors, perceived value, and Steam game consumption, and by testing the relationships among these constructs using questionnaire data and structural equation modeling (SEM).

O2: To identify and compare the core situational factors influencing perceived value among Chinese university students on the Steam platform.

This objective will be achieved by estimating and comparing the standardized effects of product perception, price perception, promotional perception, platform environment perception, game quality expectations, future price expectations, promotional revenue expectations, and platform information credibility expectations on perceive.

O3: To examine the mechanism through which antecedent factors influence Steam game consumption by testing the mediating role of perceived value.

This objective will be achieved by using SEM and Bootstrap analysis to estimate the direct and indirect effects of the antecedent variables on Steam game consumption through perceived value and by assessing the significance of the indirect effects using 95% confidence intervals.

O4: To develop practical recommendations for optimizing Steam's product design and operational management based on the empirical findings.

This objective will be achieved by translating the significant path effects, relative effect strengths, and mediating effects identified in the empirical analysis into targeted recommendations concerning game information presentation, pricing and promotion strategies, platform information credibility, and user decision support.

1.4 Research Significance

1.4.1 Theoretical Significance

(1) This study extends the application of the 4P framework and Expectation Confirmation Theory (ECT) to the digital game consumption context.

By integrating the 4P framework with ECT, this study develops a unified model incorporating product perception, price perception, promotional perception, platform environment perception, consumer expectations, and psychological factors. This integration enables the study to explain Steam purchasing psychology from both external marketing stimuli and internal expectation evaluation, extending the application of these theories to digital game consumption (Bhattacherjee, 2001; Kotler & Armstrong, 2018).

(2) This study clarifies the mediating role of perceived value in Steam game consumption.

Rather than examining marketing and expectation factors separately, this study introduces perceived value as a central mediating mechanism linking these antecedent factors with Steam game consumption. This provides a clearer theoretical explanation of how marketing perceptions, expectations, and psychological factors are transformed into consumption behavior through consumers' value evaluations (Zeithaml, 1988).

1.4.2 Practical Significance

(1) This study provides targeted implications for Steam's wishlist, pricing, and seasonal promotion mechanisms.

Steam relies heavily on wishlists, price adjustments, and seasonal sales to support users' purchase decisions. By identifying the relative effects of product, price, promotion, and expectation-related factors, this study can help Steam optimize wishlist reminders, discount timing, price information presentation, and promotional strategies to improve users' perceived value and purchase decision experience (Valve Corporation, n.d.-a, n.d.-b).

(2) This study provides practical implications for Steam's review and information system.

User reviews and platform information are important sources for evaluating game quality and reducing purchase uncertainty. The findings can provide practical guidance for improving review credibility, game information presentation, and platform information transparency, thereby helping users make more reliable purchase evaluations and reducing decision-making uncertainty (Ahn & Lee, 2024; Jadil et al., 2022).

1.5 Research Limitations

(1) Limitations on External Generalization of the Sample

This study focuses on Chinese university students as the core research group, which helps effectively explain the purchasing psychology of this population on the Steam platform. However, the sample is relatively concentrated in terms of age, educational background, spending ability, and platform usage experience. Therefore, the external generalizability of the findings remains limited. Although university student convenience samples are widely used in consumer behavior and marketing studies, prior research suggests that differences in sample composition may lead to variations in variable relationships, means, and path coefficients, thereby affecting the stability and applicability of research findings (Peterson & Merunka, 2014).

Furthermore, research on generalizability has pointed out that scholars often extend conclusions beyond the actual scope of the sample and measurement context, which may weaken the explanatory accuracy of findings (Yarkoni, 2022). Therefore, the conclusions of this study are more suitable for explaining the purchasing psychology of Chinese university students on the Steam platform and should not be directly generalized to broader populations, such as all Steam users or players from different cultural and age groups.

After completing the full empirical analysis, future studies may further examine whether the relationships identified in this study remain stable across different user groups, such as non-student users, working adults, or international players. Comparative analysis between different demographic groups could help improve the external validity of the model and enhance the broader applicability of the findings. In addition, future research may also adopt cross-cultural or cross-platform comparisons to test whether similar psychological mechanisms exist in other digital gaming environments.

(2) Limitations of the Single Platform Context

This study focuses on the specific digital platform context of Steam, which provides strong platform specificity and practical value for understanding digital game consumption behavior. However, this also means that the research conclusions are subject to a certain degree of platform dependence. Existing studies on digital platforms suggest that platforms differ significantly in terms of socio-technical characteristics, governance mechanisms, information systems, and business scenarios, all of which may shape user behavior and platform management differently (De Reuver et al., 2018) Therefore, the purchasing psychology formation mechanisms and management implications identified in this study may not be fully applicable to other digital content platforms, such as mobile game platforms, console ecosystems, or short-video content platforms.

After completing the empirical analysis, future research may further examine whether the relationships identified in this study remain stable across different platform contexts. Comparative studies between Steam and other digital platforms may help verify the robustness and boundary conditions of the proposed model. In addition, future studies may explore whether platform-specific mechanisms, such as recommendation systems, community interaction, and trust governance, produce different effects on users' purchase psychology, thereby improving the broader applicability of the research findings.

(3) Limitations of Cross-Sectional Questionnaire Design and Same-Source Data

This study adopts a one-time (cross-sectional) questionnaire design to examine the relationships among variables. Although this approach is suitable for identifying associations and testing structural relationships, caution is still needed when interpreting causality. Existing studies suggest that cross-sectional data, lacking temporal sequence information, is more appropriate for explaining variable associations rather than establishing strong causal relationships. Even when using structural equation modeling (SEM), limitations in causal inference remain (Maier et al., 2023)

In addition, the independent and dependent variables in this study are mainly collected through the same questionnaire, at the same time point, and from the same respondents. This may increase the risk of common method bias, potentially leading to overestimation or underestimation of relationships among variables (Podsakoff et al.,

2024). Although this study attempts to reduce such bias through questionnaire design and statistical testing, methodological limitations still exist.

After completing the empirical analysis, future studies may further strengthen causal identification by adopting longitudinal research designs, experimental methods, or multi-stage data collection. In addition, collecting data from multiple sources or at different time points may help reduce common method bias and improve the robustness and explanatory power of the research findings.

CHAPTER 2
LITERATURE REVIEW

This chapter mainly reviews the theories and literature related to consumption psychology on the Steam platform. First, it defines Steam as a digital platform and introduces its key features, including Family Sharing, Cloud Save, refund policy, wishlist notifications, and Steam Workshop. It also analyzes Steam's operational strategies in pricing, promotions, wishlist reminders, refund guarantees, and community-based operation. Second, from the perspectives of game psychology and digital consumers, this chapter explains that Chinese university students' consumption on Steam is influenced not only by entertainment, achievement, immersion, and social experience, but also by price, promotion, platform information, and trust mechanisms. In terms of theoretical foundation, this chapter introduces Expectation Confirmation Theory and 4P theory to explain how students form perceived value based on product, price, promotion, platform environment, and future expectations. Finally, the chapter reviews related studies, clarifies the variable relationships, and proposes the effects of product perception, price perception, promotion perception, platform environment perception, game quality expectations, future price expectations, promotion benefit expectations, platform information credibility expectations, and psychological factors on perceived value, as well as the effect of perceived value on consumption behavior. Overall, this chapter provides the theoretical basis for the following model construction and hypothesis testing.

2.1 Research Context and Key Concepts

2.1.1 Definition of Steam as a Digital Platform

Steam, created by Valve in 2003, is a digital game distribution platform and has gradually evolved into a large-scale PC digital content platform. Through online distribution, account-based access, and community-linked services, Steam enables users to obtain games and related digital content while also supporting developers and

publishers in delivering products and building direct relationships with customers. Valve officially describes Steam as a platform that has grown from a digital distribution channel into an ecosystem serving thousands of creators, publishers, and millions of players (Valve Corporation, n.d.-f)

From a theoretical perspective, Steam can be understood as a typical multi-sided digital platform. Recent platform economy research suggests that multi-sided platforms create value by facilitating direct interaction between different user groups and by enabling transactions, matching, and information exchange across sides (Brühl, 2023). In the case of Steam, the platform connects game developers and publishers on one side with players and consumers on the other, thereby forming cross-side network effects through content supply, user participation, and platform-mediated interaction. This makes Steam fundamentally different from traditional retail channels and closer to a platform-based business model (Brühl, 2023).

In addition, recent studies on digital platforms emphasize that platform firms achieve expansion not only through scale, but also by reducing transaction costs, integrating information flows, and strengthening user coordination through technological architecture and governance mechanisms (Brühl, 2023). Steam exemplifies this logic through its unified payment system, game distribution infrastructure, user review system, and community functions, all of which reduce friction between developers and consumers and strengthen the platform’s role in coordinating transactions and user participation (Valve Corporation, n.d.-f).

2.1.2 Key Features of the Steam Platform

(1) Family Sharing Feature

A key feature of Steam is its "Family Sharing" mechanism, which allows users to share their game library across authorized devices and accounts. This enables family members or authorized users to access and play games in the shared library. Valve's official page explicitly states that users can still earn achievements and save their game progress to Steam Cloud after sharing, allowing "shared use" and "personal account records" to coexist (Valve Corporation, n.d.-d). This feature enhances Steam's scalability within family scenarios and social networks, making platform consumption no longer solely an isolated decision for a single user, but potentially influenced by family/peer usage contexts.

(2) Cloud Save Feature

Steam Cloud is one of the important service features of the Steam platform. According to Steamworks documentation, Steam Cloud automatically stores game files on Steam servers and automatically downloads them to new devices when a user changes devices, thus supporting cross-device access and usage continuity (Valve Corporation, n.d.-c). The document also points out that the Steam client handles file synchronization and allows users to adjust cloud synchronization settings globally or for individual games (Valve Corporation, n.d.-c). The value of this feature lies in its significant reduction of the switching costs for users when changing devices, reinstalling systems, or using multiple devices, extending the platform's consumption experience from a "one-time purchase" to a "continuous service," a key characteristic that distinguishes Steam from a simple game download channel.

(3) Refund Policy

Steam's refund policy is a significant feature of its platform governance and consumer protection mechanisms. Valve's official refund page clearly states that for games and software in the Steam store, users can apply for a refund within 14 days of purchase if the playtime is less than 2 hours (Valve Corporation, n.d.-e). Furthermore, Valve has categorized and explained the refund rules for DLC, pre-ordered content, wallet balance, and some subscription content, demonstrating a relatively clear and institutionalized management system (Valve Corporation, n.d.-e). Compared to some digital content platforms' "non-refundable" policy, Steam's refund mechanism reduces consumers' trial-and-error risk and purchase anxiety to a certain extent, which directly impacts user purchasing psychology (especially risk perception and decision certainty).

(4) Wishlist and Notification Mechanism

Steam's "wishlist" is not just a collection function, but also a crucial mechanism connecting platform marketing with user decision-making. Steamworks documentation states that players can add games they are interested in to their wishlist; when a game is released or discounted, the system automatically sends a notification to the relevant user (Valve Corporation, n.d.-h). The documentation further explains the triggering conditions for wishlist notifications (such as discount thresholds and duration requirements) and notification cooldown mechanisms (such as notification frequency limits within a certain period), indicating that the wishlist is not a simple "collection list," but an operational

tool deeply integrated with the platform's promotion, outreach, and conversion logic (Valve Corporation, n.d.-h). This feature is particularly crucial for your paper because it directly connects the process of "interest formation—continuous attention—reinforcement of purchase psychology."

(5) Steam Workshop Feature

Steam Workshop is a representative feature of Steam's content ecosystem. The official page defines it as a space where users can "create, discover, and download game content" (Valve Corporation, n.d.-g). This means that in some games that support the Workshop, players are not only content consumers but also content producers or derivative creators. Compared to traditional game platforms, the Workshop enhances user engagement and content extensibility, ensuring that game value comes not only from original developer content but also from the continuous contributions of the player community. This "platform + community co-creation" structure further influences users' perception of the long-term value of games and indirectly affects their purchasing psychology and platform stickiness.

2.1.3 Steam Platform Operational Strategies

(1) Standardized Pricing and Multi-Regional Pricing Support Strategy

Steam's operations do not rely solely on unified platform pricing. Instead, they adopt a "publisher pricing + platform tool support" model. According to the Steamworks pricing documentation, partners can set and manage product prices in the backend. The platform also provides multi-currency pricing and price management tools to support sales operations in different countries and regions (Valve Corporation, n.d.-b). This strategy retains the publisher's autonomy over pricing while improving pricing management efficiency through platform tools, reflecting Steam's platform-based governance characteristics in pricing operations.

(2) Promotional Management Strategy with Parallel Discount Rules and Cooldown Mechanisms

Steam's promotional operations are highly standardized. The Steamworks discount documentation shows that the platform has clear rules for discount settings, discount intervals, and certain event scenarios. For example, regular discounts usually have a cooldown period, while seasonal sales have corresponding exception mechanisms (Valve Corporation, n.d.-a). This institutionalized arrangement helps avoid price system chaos

caused by excessively frequent discounts and also helps maintain the stability of users' expectations of the platform's pricing mechanism, thereby improving the controllability of overall promotion management.

(3) Seasonal Promotions and Themed Events-Driven Traffic Operation Strategy

Steam adopts a "year-round event-based operation" approach, continuously generating platform traffic peaks through seasonal promotions and themed events. Steamworks' seasonal promotion documentation explicitly mentions platform-level promotional events for spring, summer, autumn, and winter, explaining that discounted items will appear in different display areas (specials sections) on the platform. The platform will combine tags, popularity, and recommendation relevance for exposure distribution (Valve Corporation, n.d.-a). This strategy essentially focuses user attention through event nodes and then improves product visibility and purchase conversion through the platform's traffic distribution mechanism.

(4) Wishlist-Driven "Interest Accumulation—Reminder Reach—Conversion" Strategy

Steam's Wishlist is not only a user collection function but also an important tool for platform operation. Steamworks documentation states that when a user adds a game to their wishlist, the platform sends a notification when the game is released or reaches a certain discount. The documentation also explains that wishlist emails have a cooldown period (usually 1-2 weeks) to control the frequency of reach (Valve Corporation, n.d.-h). This means Steam deeply integrates user interest data with its promotional outreach mechanism, achieving refined user operations through a path of "wishlist interest building—discount trigger notifications—return decision."

(5) Refund Policy as an Operational Guarantee Strategy to Reduce Decision-Making Risk

Steam's refund policy is a crucial trust and guarantee mechanism in its platform operations. Valve's official refund page clearly states that for games and software in the Steam store, users can apply for a refund within 14 days of purchase if they have played for less than 2 hours (Valve Corporation, n.d.-e). Compared to the "non-refundable after purchase" practice of some digital content platforms, Steam's refund system reduces users' trial-and-error costs and purchase risks at the operational level, helping to enhance users' sense of security and trust in the platform.

(6) Retention and Operation Strategy Through Community and Platform Function Integration

Steam is not just a transaction platform; its operational strategy also focuses on improving long-term user retention through community and function integration. Steam's official "About" page emphasizes that the platform includes community interaction features (such as discussions, groups, and chat), keeping users engaged in the platform ecosystem beyond just purchasing (Valve Corporation, n.d.-f). This integrated operational logic of "transaction + community + continued use" helps increase platform activity and creates a better user base for subsequent promotional outreach, wishlist notifications, and content recommendations.

Overall, Steam's operational strategy can be summarized as follows: based on a standardized pricing and discount system, generating traffic nodes through seasonal sales and themed events, driving user conversion through wishlist notifications and platform recommendation mechanisms, and achieving collaborative operation between the platform and developers through the Steamworks tool system. This strategic combination makes Steam not only a digital game sales platform but also a digital platform ecosystem with continuous user operation capabilities.

2.1.4 Game Psychology and Steam Platform Usage Motivation

In digital game research, players' continued engagement with and use of gaming platforms is not solely for the act of "playing games," but rather for the pursuit of multiple psychological satisfactions. Existing research indicates that game usage motivations primarily focus on hedonic experiences, a sense of accomplishment, immersion, social interaction, and escapism from real-world pressures. Hamari and Keronen, through meta-analysis, pointed out that the core motivations for digital game use mainly include hedonic experiences, social interaction, and the pursuit of achievement (Hamari & Keronen, 2017). Yee's research also found that the motivations of online game players can be summarized into three dimensions: achievement, social interaction, and immersion (Yee, 2006). This suggests that players not only seek pleasure during gameplay but also desire a sense of competence, social connection, and immersive experience.

From a psychological perspective, games can bring players multiple benefits. Research based on self-determination theory indicates that games can satisfy three basic psychological needs: autonomy, competence, and a sense of connection, thereby enhancing pleasure and the willingness to continue using the platform (Ryan et al., 2006) Furthermore, research indicates that video games also have positive effects on emotion regulation, stress relief, cognitive enhancement, and social development (Granic et al., 2014). Therefore, players not only gain entertainment through games but also achieve emotional relaxation, stress relief, and a temporary escape from reality.

In the context of the Steam platform, this game psychology mechanism is further integrated with the platform's characteristics. Steam not only provides a wealth of game content but also influences user decisions through information tools such as reviews, ratings, wishlists, discount notifications, and refund mechanisms. Research shows that consumer behavior in digital environments is often influenced by perceived value; that is, the comprehensive judgment of price, quality, and overall value affects their decision-making process (Zeithaml, 1988). Therefore, the behavior of Chinese university students on the Steam platform is driven by both the pleasure, sense of accomplishment, and social experience derived from the games themselves and the influence of the platform's information mechanisms, thus forming a complex consumer psychology.

Based on this, a game psychology perspective helps explain why users continue to use the Steam platform and under what conditions their purchasing psychology is formed. In other words, consumption on the Steam platform is not only a rational decision-making process, but also a psychological process driven by hedonic needs, achievement motivation, and value judgments (Hamari & Keronen, 2017).

2.1.5 Chinese University Students as Digital Consumers

Chinese university students are an important group of digital consumers and active users of online entertainment platforms. They generally possess relatively high digital literacy and are familiar with online platforms, digital content, and electronic payment methods, enabling them to quickly access and evaluate product information (Prensky, 2001). At the same time, due to limited income and budget constraints, university students tend to pay greater attention to product quality, prices, promotional activities, and perceived value when making consumption decisions. Therefore, their consumption behavior often reflects both rational evaluation and emotional preference.

Given their high level of digital engagement and distinctive consumption characteristics, Chinese university students provide an appropriate research population for examining consumption behavior on the Steam platform.

2.2 Theoreties

2.2.1 Expectation Confirmation Theory (ECT)

ECT is suitable for explaining consumers' psychological judgment process before and after decision-making. Its core logic is that consumers first form expectations about a product or service, then compare and judge them after encountering actual information or experiencing them, and thus form a psychological outcome of confirmation or non-confirmation. This cognitive process further influences their subsequent attitudes and decision-making tendencies (Oliver, 1980). In the context of this study, this logic can well explain how Chinese university students gradually form a "want to buy," "worth buying," or "wait and see" purchasing psychology when faced with game information, price information, and promotional information on the Steam platform (Oliver, 1980).

ECT has also been extended to research on the continuous use of information systems and digital platforms, indicating that this theory is applicable not only to traditional consumption scenarios but also to the explanation of user cognition and behavior in online platform environments. Related research shows that in digital platform usage contexts, there is a relatively stable explanatory relationship between confirmation perception and subsequent intention. Therefore, this theory can be used to analyze how users process platform information into persistent psychological judgments (Bhattacherjee, 2001). This aligns well with the Steam platform, as Steam users' decisions are not made in a single step but often involve a process of "attention—comparison—waiting—rejuvenation" (Bhattacherjee, 2001).

Based on this, this study focuses not on the "final purchase behavior" itself, but on the "mechanism of purchase psychology formation," specifically how college students form expectations under the stimulation of platform information and internalize them into purchase psychological judgments through comparison and confirmation processes. This theoretical foundation can provide a clear explanatory path for the "psychological driving force" theme in your paper (Oliver, 1980; Bhattacherjee, 2001).

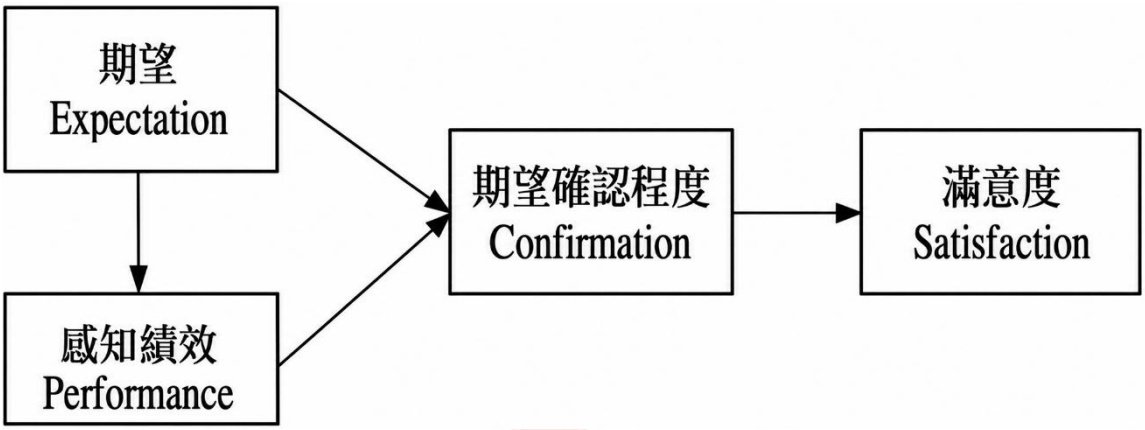


Figure 2. 1 Expectation Confirmation Theory (ECT)

2.2.2 4P Theory

The 4P theory is a classic framework used in marketing research to analyze manageable factors for businesses. It includes Product, Price, Place, and Promotion, and is widely used to connect corporate management behavior with consumer response mechanisms (Goi, 2009). In the context of digital platforms, scholars have systematically expanded the traditional 4P framework.

Kalyanam and McIntyre (2002) proposed the e-marketing mix model, which for the first time expanded the traditional 4P to "4Ps + $P^2C^2S^3$". The newly added elements, such as "Interface and Community," provide a theoretical basis for the platform-based reconstruction of the channel dimension.

Vynogradova and Drokina (2020) after comprehensively comparing various digital marketing models, pointed out that "channel" in the digital environment has transformed from a physical distribution path into a composite concept encompassing platform interfaces, information display, and user touchpoints. Based on this, this study provides a digital platform interpretation of the 4Ps: the product dimension corresponds to college students' perceptions of game content, quality, and gameplay; the price dimension corresponds to price levels, price reasonableness, and expectations of future price changes; the promotion dimension corresponds to information reach such as discount activities, holiday promotions, and wishlist notifications; and the place dimension is specifically defined as "platform environment perception," encompassing the clarity of information display, the credibility of the review system, payment convenience, refund guarantees, and rule transparency (Kalyanam & McIntyre, 2002;

Vynogradova & Drokina, 2020). In this study, the 4Ps are product, price, promotion, and platform environment. Platform environment perception is used to characterize college students' overall perception of the Steam platform's system and usage environment, including the availability of review information, the clarity of information display, payment convenience, refund guarantees, rule transparency, and system reliability. In the context of a digital platform, these environmental cues constitute important external stimuli for consumer decision-making and can influence their subsequent psychological evaluation by enhancing their sense of efficiency and security (Parasuraman et al., 2005)

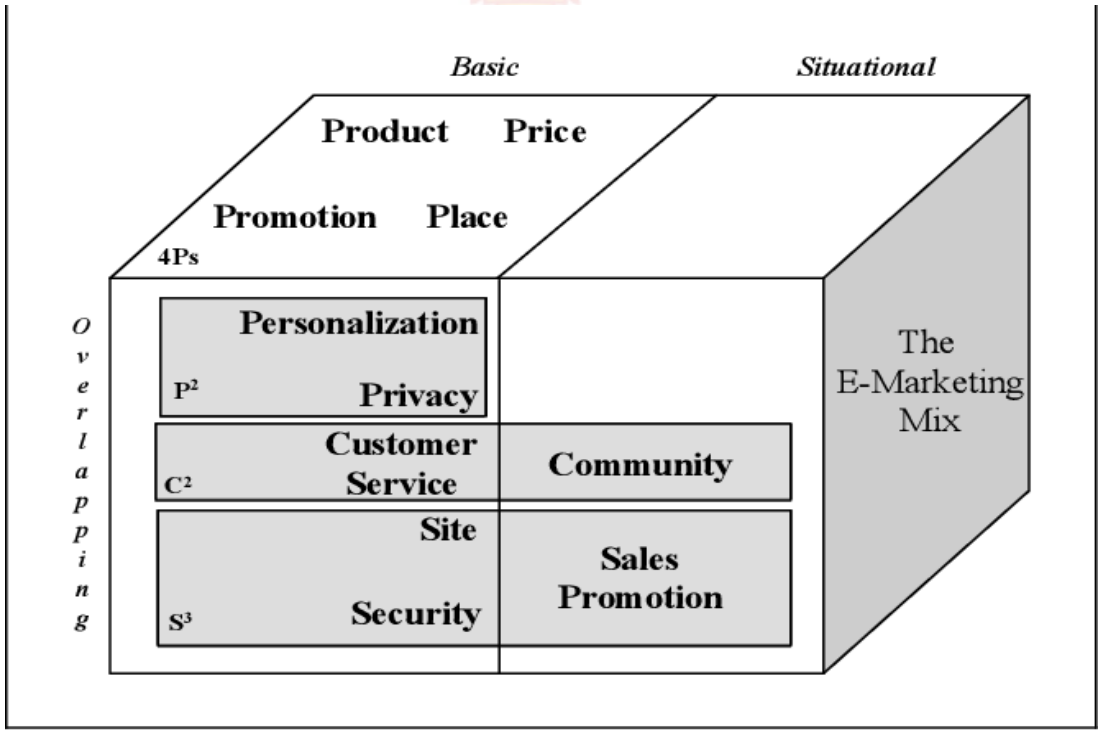


Figure 2. 2 4P Theory

Source: Kalyanam and McIntyre (2002).
4P: Products, prices, promotions, platforms

2.3 Related Research

(1) Research on the Steam Platform and User Psychology

Existing research on the Steam platform has begun to focus on users' perceived value and subsequent psychological reactions within the platform context, moving beyond discussions solely on game functionality or technical aspects. In the Steam Community Market setting, users' aesthetic, functional, and economic values of virtual

items collectively influence their platform attitudes, further impacting their intention to continue using the platform and their intention to recommend it based on word-of-mouth. Simultaneously, attitudes play a significant mediating role between perceived value and subsequent intentions. This indicates that user decision-making on the Steam platform exhibits a strong "value judgment—attitude formation—subsequent tendency" path characteristic, providing direct reference value for understanding platform consumer psychology (Barros et al., 2024).

(2) Research on College Students' Digital Product Purchase Intentions

In research on college students' digital consumption, some studies have begun to analyze college students as an independent market group. Research on students at Malaysian public universities shows that social influence, system security, and perceived price all significantly affect college students' online purchase intentions for digital products, with perceived price having the most prominent impact. This result indicates that university students, when consuming on digital platforms, not only focus on the product itself but also pay close attention to price reasonableness and platform security. This is strongly correlated with the price perception and platform environment perception that this study focuses on (Lim et al., 2024).

(3) Research on University Students' Platform Repurchase Psychology Regarding the ongoing psychological research on platform-based consumption, existing studies have analyzed the formation mechanism of online platform repurchase intentions using Columbia University students as subjects. The results show that satisfaction is the strongest predictor of repurchase intention and plays a key mediating role in the influence of customer experience, trust, and word-of-mouth on repurchase intention; simultaneously, customer experience directly affects satisfaction and word-of-mouth. This suggests that university students' platform consumption is not solely influenced by price; their psychological formation process is also affected by platform experience, trust, and social information (Amado-Mateus et al., 2025)

(4) Research on Digital Game Consumption and Perceived Value

In the field of digital game consumption, perceived value is considered an important psychological factor influencing consumer decisions. Sweeney and Soutar (2001) pointed out that consumers consider not only functional value, but also emotional value, social value, and price value when evaluating products. For digital games, players

comprehensively evaluate game quality, entertainment experience, price reasonableness, and the psychological satisfaction gained, thus forming an overall value judgment. Studies have shown that higher perceived value can significantly increase consumers' willingness to buy and their consumption behavior. Therefore, perceived value is widely regarded as an important mediating variable connecting marketing stimuli and consumer behavior (Sweeney & Soutar, 2001).

(5) Research on Promotional Activities and Consumer Buying Behavior

Promotional activities are an important marketing tool influencing consumer buying decisions. Existing research has found that price discounts, limited-time offers, and promotional information can effectively increase consumers' perception of product value and stimulate buying behavior (Grewal et al., 1998). In the digital platform environment, promotional activities can not only reduce consumers' price sensitivity but also enhance their willingness to buy by creating a sense of scarcity and urgency. For the Steam platform, seasonal discounts, limited-time offers, and bundled sales have become important mechanisms for driving user consumption. Therefore, it is necessary to further explore the impact of promotional perception on college students' consumption behavior.

(6) Research on Game Psychological Motivation and Consumption Behavior

With the development of digital game research, scholars have gradually begun to focus on the impact of players' psychological motivation on consumption behavior. Yee (2006) proposed that the main motivations for players to participate in online games include three dimensions: achievement, social interaction, and immersion. Subsequently, Ryan et al. (2006), based on self-determination theory, pointed out that games can satisfy basic psychological needs such as individual autonomy, competence, and a sense of relationship, thereby increasing the likelihood of game participation and continued consumption. This indicates that the psychological benefits players gain during the game process, such as happiness, relaxation, a sense of accomplishment, and social experience, may further influence their evaluation of the game's value and their consumption behavior. Therefore, game psychological factors have become an important perspective for explaining digital game consumption behavior.

2.4 Variable Overview

This study constructs a variable relationship framework to explain the psychological driving forces behind Chinese university students' consumption on the Steam platform. On the left side of the model are two sets of pre-consumption factors. The first is platform-related perception, including product perception, price perception, promotion perception, and platform environment perception, which reflects individuals' subjective evaluations of platform cues. The second is multidimensional expectation, including game quality expectation, future price expectation, promotion benefit expectation, and platform information credibility expectation, which reflects individuals' predictive cognition of future consumption outcomes. The model takes perceived value as the core mechanism, emphasizing that consumers form an overall value assessment by weighing perceived benefits against perceived sacrifices, and that this value assessment further shapes subsequent attitudes, usage tendencies, and consumption-related behavioral responses (Barros et al., 2024; Blut et al., 2024; Sae-tae & Wang, 2024).

Independent Variables

(1) Product Perception

Product perception refers to college students' subjective evaluation of game attributes on the Steam platform, including content attractiveness, gameplay experience, quality stability, and the degree of fit with their personal interests. In digital platform consumption contexts, product-related attributes remain an important antecedent of consumer evaluation because users often rely on observable content and quality cues to judge the expected utility and attractiveness of a product before purchase. Recent studies have shown that product characteristics and product-related cues can significantly shape consumers' perceived value and subsequent purchase-related responses in online platform settings (Lin et al., 2021). Therefore, in this study, product perception is treated as one of the key external stimuli that enters the consumer's subsequent value evaluation process.

(2) Price Perception

Price perception refers to college students' subjective judgments regarding the level of game pricing, price fairness, price acceptability, and whether the price is commensurate with the content and quality of the game. In digital consumption contexts, price is an important external cue that shapes consumers' evaluations of value and

subsequent purchase-related responses. Recent studies have shown that perceived price can significantly influence perceived value, and that price fairness is an important condition under which price perceptions are transformed into positive value judgments and continued purchase tendencies (Phan Tan & Le, 2023; Soelasih et al., 2024) In addition, contemporary research on reference price indicates that consumers evaluate current prices against internal or external price benchmarks. These comparisons can influence consumers' perceived value and willingness to purchase (Guzmán Martínez & Orozco-Gómez, 2024). Therefore, in this study, price perception is treated as a key external stimulus affecting college students' value evaluation and purchase-related decision tendencies on the Steam platform.

(3) Promotional Perception

Promotional perception refers to college students' attention to and psychological reactions to information such as Steam platform discount activities, seasonal promotions, limited-time offers, and promotional reminders. Promotional incentives not only provide economic benefits but also influence consumers' overall assessments through psychological gains such as "transaction value" and "sense of gain"(Chandon et al., 2000)

(4) Platform Environment Perception: Platform environment perception describes college students' overall perception of the Steam platform's system and usage environment, including the availability of review information, clarity of information display, payment convenience, refund guarantee, rule transparency, and system reliability. In the context of digital platforms, these environmental cues constitute important external stimuli for consumer decision-making and can influence their subsequent psychological assessments by enhancing their sense of efficiency and security (Parasuraman et al., 2005)

(5) Game Quality Expectations

Game quality expectations refer to college students' anticipations regarding the future quality of the target game experience, such as playability, completeness, stability, and overall satisfaction. In digital consumption contexts, expectations are formed prior to actual use and serve as an important benchmark for subsequent evaluation and psychological judgment Recent studies grounded in Expectation Confirmation Theory have shown that expectations and confirmation processes influence perceived quality,

perceived value, satisfaction, continuance intention, and re-patronage intention across digital service and hospitality contexts (Wu et al., 2024; Xu et al., 2025). Therefore, in this study, game quality expectations are regarded as a typical pre-consumption expectation judgment that may further influence college students' value assessment of Steam games.

(6) Future Price Expectations: Future price expectations refer to college students' predictions of future price changes for target games (e.g., whether they will become cheaper, or whether a lower price window exists). These expectations are often based on reference prices and price inference mechanisms, influencing their waiting and purchasing decisions (Kalyanaram & Winer, 1995; Mazumdar et al., 2005)

(7) Promotional Revenue Expectations: Promotional revenue expectations refer to college students' expectations of potential future promotional benefits, including discount depth, bundled benefits, and transaction value. Promotional research shows that consumers form psychological benefit judgments based on their expectations of promotional benefits, thus influencing their purchasing psychology and timing preferences (Chandon et al., 2000).

(8) Platform Information Credibility Expectations: Platform information credibility expectations refer to college students' expected judgments regarding the credibility and reliability of Steam platform information (reviews, ratings, tags, rule descriptions, etc.). Research on information credibility indicates that credibility judgment affects information adoption and risk assessment, and is influenced by the media environment and the way information is presented (Flanagin & Metzger, 2000; Wathen & Burkell, 2002).

(9) Psychological: The psychological benefits and intrinsic motivations that players experience or expect to gain in the context of Steam games mainly include pleasurable experiences, stress relief, a sense of accomplishment, immersion, and meaningful use of leisure time. Existing research shows that the core motivations of digital games mainly include achievement, social interaction, and immersion (Yee, 2006). The reason why games can continue to attract players is that they can satisfy individuals' basic psychological needs such as autonomy, competence, and a sense of connection, thereby enhancing pleasure and the willingness to continue participating (Ryan et al., 2006). Therefore, in this study, "psychological" can be regarded as an important

antecedent variable affecting the perceived value of Steam games. That is, when players feel more psychological satisfaction from the game, their judgment of whether the game is "worth buying or consuming" will be more positive.

Perceived Value

Perceived value refers to consumers' overall subjective evaluation formed through a trade-off between perceived benefits and perceived sacrifices in relation to a product or service. Recent research has confirmed that perceived value is best understood as an integrative construct that incorporates both benefit dimensions and sacrifice dimensions, and that consumers' overall value judgments are shaped by this trade-off process (Blut et al., 2024) Moreover, perceived value is not determined by price alone, but also by consumers' comprehensive evaluations of quality, functional utility, emotional experience, and other relevant consumption benefits. Recent platform and digital consumption studies further indicate that perceived value often has multidimensional characteristics and can significantly influence subsequent attitudes, continued usage intention, word-of-mouth, and purchase-related responses (Barros et al., 2024; Sae-tae & Wang, 2024). In the context of Steam game consumption, consumers evaluate whether a game is worth buying not only by considering game quality and price, but also by integrating promotional activities, platform information, and psychological experience. Therefore, this study defines perceived value as Chinese university students' overall evaluation of whether Steam game consumption is "worth it," and regards it as an important antecedent variable influencing consumption behavior.

Conceptual Distinction Between Perception and Expectation Variables

To avoid conceptual overlap, this study distinguishes perception variables from expectation variables according to their temporal orientation and evaluation basis. Perception variables represent consumers' current evaluations of observable platform and marketing conditions, whereas expectation variables represent consumers' forward-looking judgments about potential future outcomes. For example, Price Perception (PRP) evaluates whether the current game price is reasonable, acceptable, and consistent with product quality, while Future Price Expectations (FPE) concern whether the game price may decrease or whether a more favorable purchasing opportunity may emerge in the future. Similarly, Promotional Perception (POP) reflects consumers' current responses to existing discounts and promotional activities, whereas Promotional Revenue

Expectations (PRE) represent anticipated benefits from future promotional opportunities. This distinction is consistent with the logic of Expectation Confirmation Theory, in which expectations provide a prospective reference for subsequent evaluation rather than representing current perceptions (Oliver, 1980; Bhattacherjee, 2001). Therefore, although these constructs relate to similar consumption cues, they represent theoretically distinct stages of consumer evaluation.

Dependent Variables

Consumer behavior in a digital platform context refers to a series of consumption-related behavioral responses that consumers exhibit around products or services, including not only purchase itself but also browsing, selecting, using, participating, and other platform-based consumption activities. Recent research in digital consumption contexts suggests that consumer behavior is shaped by individuals' overall evaluations of platform content, technological features, trust, and perceived value, rather than by a single factor alone (Handoyo, 2024; Stankevičienė et al., 2025). In addition, contemporary applications of behavioral models continue to treat behavior as the final response outcome that follows prior cognitive and psychological processes, including evaluation, intention, and value judgment (Nguyen et al., 2025; Wei et al., 2025). Therefore, this study defines consumption behavior as the set of behavioral responses shown by Chinese university students on the Steam platform based on their cognitive judgments of platform and game value, including behaviors such as selection, use, participation, and consumption actions.

2.5 Literature Review and Research Gap

Existing studies have established that product attributes, price, promotional activities, platform environment, consumer expectations, and psychological factors can influence consumers' value evaluations and purchase-related behavior. In particular, price and promotional information have been widely recognized as important determinants of perceived value, while product quality and platform information can reduce uncertainty and support consumer decision-making. Research based on Expectation Confirmation Theory also indicates that consumers' expectations play an important role in subsequent evaluations and behavioral responses.

However, several limitations remain in the existing literature. Many previous studies examine individual factors such as price, product quality, promotion, trust, or online reviews separately, rather than explaining how these factors jointly shape consumer psychology. Moreover, much of the existing research has focused on general e-commerce, mobile applications, or other digital services, while relatively limited attention has been paid to the specific consumption environment of digital game platforms such as Steam, where game quality uncertainty, seasonal discounts, wishlist mechanisms, user reviews, and platform information simultaneously influence purchase evaluations.

A further limitation concerns theoretical integration. The 4P framework mainly explains consumers' responses to current marketing stimuli, whereas Expectation Confirmation Theory (ECT) emphasizes expectations and subsequent evaluations. Existing studies provide insufficient explanation of how current marketing perceptions and forward-looking expectations jointly contribute to perceived value and consumption behavior in the digital game context. In addition, perceived value has often been examined as an outcome or direct predictor, while its role as a central transmission mechanism connecting multiple antecedent factors with game consumption requires further investigation.

Therefore, this study integrates the 4P framework and ECT, together with psychological factors, into a unified structural model in the context of Chinese university students' Steam consumption. It distinguishes between current perceptions and future expectations and examines how these factors influence Steam game consumption through perceived value. In doing so, the study seeks to provide a more systematic explanation of purchasing psychology in the digital game platform context and address the above theoretical and contextual gaps.

To address these gaps, this study integrates the 4P framework and ECT and examines the mediating role of perceived value in Steam game consumption among Chinese university students.

2.6 Research Hypotheses

H1: Perceptions → Steam Game Perceived Value

From the 4P perspective, consumers' current perceptions of product, price, promotion, and platform environment influence their evaluation of overall value. Product and price cues help consumers evaluate expected benefits and sacrifices, while promotional and platform-related cues can further shape transaction value and decision confidence (Dodds et al., 1991; Zeithaml, 1988). In the Steam context, these perceptions are formed through observable and current platform cues, including game store pages, current prices, promotional activities, user reviews, and platform services. Therefore, the following hypotheses examine how consumers' current perceptions influence perceived value.

H1a: Product perception has a significant positive impact on perceived value.

Product perception reflects consumers' current evaluation of game quality, content richness, playability, and overall product attractiveness. Previous studies indicate that perceived quality and product benefits are important determinants of perceived value (Zeithaml, 1988; Cronin et al., 2000). On Steam, users can evaluate games before purchase through store-page descriptions, screenshots, trailers, system requirements, tags, and other product information. When these cues indicate that a game offers attractive content, suitable gameplay, and satisfactory quality, users are more likely to perceive that the benefits justify the cost. Therefore, more positive product perception is expected to increase perceived value.

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

Price perception refers to consumers' current evaluation of whether a Steam game's present price is reasonable, acceptable, and consistent with its content and quality. Price is an important sacrifice component in consumers' value evaluations (Zeithaml, 1988), while favorable price perceptions and price fairness can strengthen perceived value (Phan Tan & Le, 2023). In the Steam context, users can directly compare the current listed price, discounted price, and perceived product benefits before making a purchase. When the current price is perceived as fair and appropriate relative to the expected game experience, users are more likely to consider the game worth purchasing. Therefore, positive current price perception is expected to enhance perceived value.

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

Promotional perception reflects consumers' current responses to observable promotional activities, such as discounts, limited-time offers, and promotional reminders. Promotions can generate both economic and hedonic benefits, thereby enhancing consumers' value evaluations (Sinha & Verma, 2020). Steam frequently uses seasonal sales, limited-time discounts, and wishlist discount notifications to communicate promotional opportunities. These mechanisms can reduce consumers' perceived monetary sacrifice and strengthen their perception of obtaining a "good deal." Therefore, favorable perceptions of current Steam promotions are expected to increase perceived value.

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

Platform environment perception refers to consumers' current evaluation of information clarity, review usefulness, transaction security, platform reliability, and rule transparency. Information quality and online trust can enhance perceived value and reduce uncertainty in online consumption (Jadil et al., 2022; Patma et al., 2021). Steam provides platform-specific mechanisms such as the user review system, detailed store information, payment services, and refund protection, which help consumers evaluate games and reduce the potential cost of an unsuitable purchase. When users perceive these mechanisms as reliable, transparent, and convenient, their decision uncertainty and perceived risk can be reduced, thereby strengthening perceived value.

H2: Expectations → Steam Game Perceived Value

Expectation Confirmation Theory emphasizes that consumers form expectations before consumption and use these expectations as reference points for subsequent evaluations (Oliver, 1980; Bhattacherjee, 2001). Unlike the perception variables in H1, which represent evaluations of currently observable conditions, the expectation variables in H2 represent forward-looking judgments about potential future outcomes. In the Steam context, users may anticipate future game quality, price changes, promotional benefits, and the reliability of platform information before deciding whether and when to purchase. Therefore, the following hypotheses examine how these future-oriented expectations influence perceived value.

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

Game quality expectations refer to consumers' anticipations of the future experience and performance of a game, including playability, completeness, stability, and entertainment benefits. Expectations provide an important reference for consumers' subsequent evaluations (Oliver, 1980). On Steam, users may form expectations about future game experience through trailers, screenshots, user reviews, tags, developer information, and store-page descriptions before actual purchase or extensive use. When users expect the game to provide high-quality and enjoyable experiences, they anticipate greater future benefits from the purchase, thereby increasing perceived value.

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

Future price expectations differ from current price perception because they concern consumers' predictions about subsequent price changes and future purchasing opportunities, rather than evaluations of the present price. Consumers often use reference prices and anticipated price movements when determining purchase timing (Kalyanaram & Winer, 1995; Mazumdar et al., 2005). In the Steam context, repeated seasonal sales and discount cycles allow users to anticipate whether a game may become cheaper in the future. Such expectations influence whether consumers perceive the current or anticipated purchase opportunity as economically worthwhile and consequently shape their overall value evaluation.

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

Promotion benefit expectations refer to consumers' anticipated future economic and psychological benefits from promotional opportunities. This differs from promotion perception, which evaluates promotions that are currently observable. Promotional benefits can include both utilitarian and hedonic value and therefore influence consumers' overall value judgments (Sinha & Verma, 2020). Because Steam regularly offers seasonal sales, limited-time discounts, and other promotional events, users may anticipate more favorable promotional opportunities before purchasing. When expected promotional benefits are greater, consumers are more likely to perceive higher potential transaction value.

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

Platform information credibility expectations refer to consumers' anticipations regarding whether platform information will provide a reliable basis for purchase evaluation, including reviews, ratings, tags, recommendations, and store information. Information credibility influences information adoption and can reduce uncertainty in online decision-making (Ahn & Lee, 2024; Patma et al., 2021). On Steam, users frequently rely on user reviews, review summaries, tags, recommendations, and game information pages when evaluating an unfamiliar game. When users expect these information sources to be credible and reliable, they can make purchase evaluations with greater confidence and lower uncertainty, thereby increasing perceived value.

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

In addition to external perceptions and future expectations, consumers' intrinsic psychological benefits can influence value judgments. Digital game consumption provides not only functional benefits but also pleasure, immersion, achievement, stress relief, and emotional engagement. Existing research indicates that psychological satisfaction and game-related motivations play important roles in continued game participation and value evaluation (Yee, 2006; Ryan et al., 2006). In the Steam environment, features such as achievements, community interaction, multiplayer functions, and Workshop content can extend the psychological benefits users obtain from games. Therefore, when university students expect or experience stronger enjoyment, immersion, achievement, and psychological satisfaction, they are more likely to perceive Steam game consumption as valuable.

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

Perceived value represents consumers' overall assessment of whether the benefits obtained from a product justify the associated monetary and non-monetary sacrifices (Zeithaml, 1988). Previous studies have shown that higher perceived value can lead to stronger behavioral intentions and consumption-related responses (Cronin et al., 2000; Barros et al., 2024). In the Steam context, users can add games to wishlists, receive discount notifications, compare prices and reviews, and reconsider purchases during seasonal sales. These mechanisms allow consumers to repeatedly evaluate whether a game is "worth buying." When Chinese university students perceive that the expected

quality, entertainment benefits, price, promotional benefits, and platform experience outweigh the associated costs, they are more likely to translate this positive value evaluation into Steam game consumption.

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

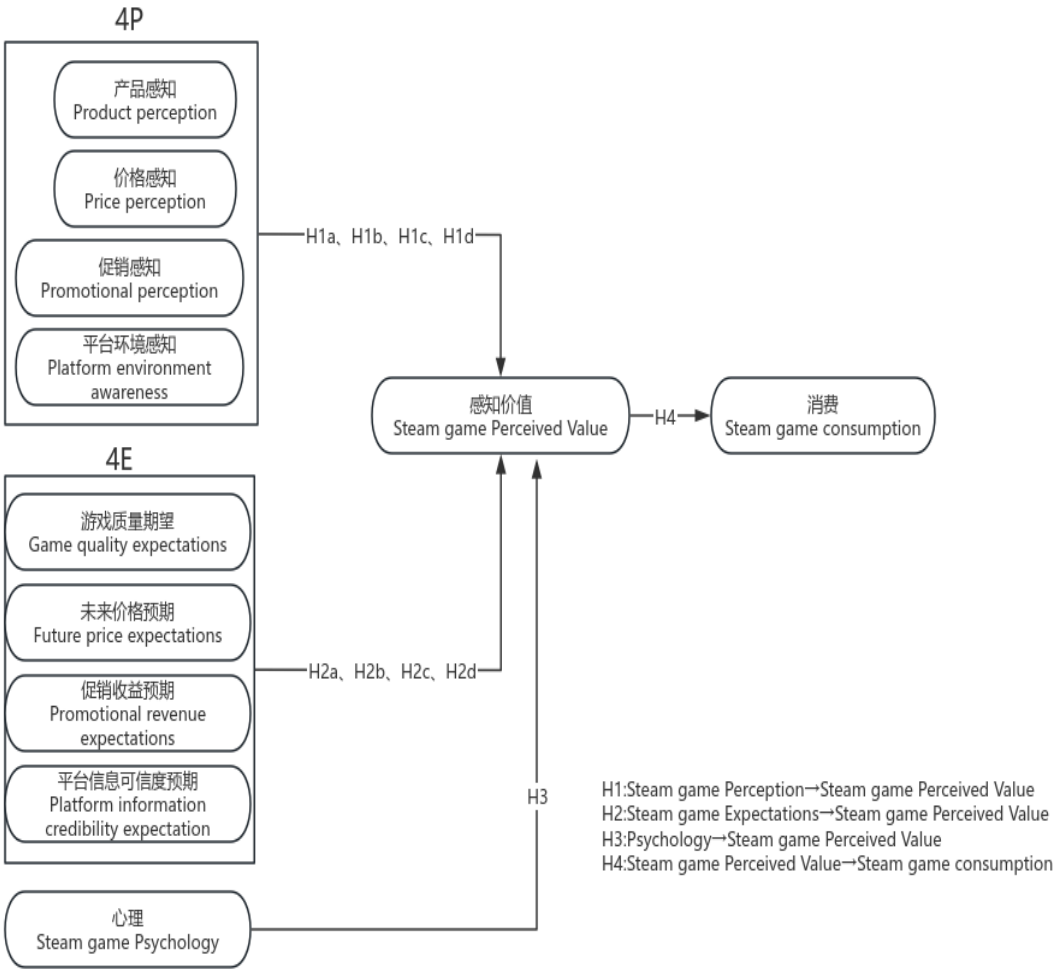


Figure 2. 3 Consumption Model

CHAPTER 3
RESEARCH METHODOLOGY

This chapter mainly introduces the research methodology and data analysis design of the study. First, it explains that this study adopts a quantitative research method and collects data from Chinese university students who have experience using Steam through questionnaire surveys, in order to test the relationships among variables under the framework of 4P theory and Expectation Confirmation Theory. Second, this chapter defines the research population as Chinese university students with Steam usage experience and adopts convenience sampling combined with purposive screening. The questionnaire will be distributed through online channels such as student communities, campus forums, Steam-related communities, and questionnaire platforms. In terms of sample size, this study sets the target valid sample size at approximately 440 based on 44 core measurement items and plans to distribute about 500 questionnaires to ensure data quality. Third, the chapter introduces the questionnaire design and measurement tools. The core variables include product perception, price perception, promotion perception, platform environment perception, game quality expectations, future price expectations, promotion benefit expectations, platform information credibility expectations, psychological factors, perceived value, and consumption behavior. All items are measured using a five-point Likert scale. Finally, this chapter explains the data analysis methods, including data cleaning, descriptive statistics, reliability analysis, validity analysis, confirmatory factor analysis, structural equation modeling, and mediation effect testing. Overall, this chapter provides a clear methodological design and statistical analysis path for the following empirical research

3.1 Quantitative Research Methods

This study employs quantitative research methods as its core research approach, aiming to systematically examine the psychological driving mechanisms of Chinese university students' game consumption on the Steam platform. Quantitative research

emphasizes variable operationalization, hypothesis testing, and relationship interpretation, and is suitable for revealing the directional relationships between variables and their influence strength, thus exhibiting high consistency with the research objectives of this study (Creswell & Creswell, 2018). In consumer behavior research, when the research focuses on abstract concepts such as attitudes, cognitions, perceived value, expectation confirmation, and behavioral responses, quantitative research is particularly suitable for measuring and validating these concepts through standardized scales and statistical models (Hair et al., 2019).

3.1.1 Selection of Quantitative Research Methods

The core issue of this study focuses on the formation process of Chinese university students' consumption psychology on the Steam platform, specifically involving antecedent variables such as product perception, price perception, promotion perception, and platform perception, as well as the structural relationship between relevant psychological cognitive variables and consumption behavior under the ECT framework. Because these variables are all operationalizable latent constructs, and a large body of consumer behavior and marketing research has already used scale items for measurement, quantitative research methods can effectively transform theoretical concepts into observable indicators and further utilize statistical analysis to test research hypotheses (DeVellis & Thorpe, 2022; Hair et al., 2019).

Furthermore, questionnaire surveys are one of the most common and effective data collection methods in quantitative research, particularly suitable for measuring respondents' attitudes, cognitions, expectations, and behavioral responses. For this study, Chinese university students, as a highly active group on online platforms, have strong accessibility to online questionnaires; simultaneously, Steam game consumption experiences mainly occur within digital platform environments, allowing respondents to directly reflect their platform perceptions, consumption judgments, and behavioral tendencies through self-reporting. Therefore, using questionnaire-based quantitative research not only helps obtain a large sample size in a shorter time but also improves the comparability, systematicity, and interpretability of the research results (Dillman et al., 2014; Babbie, 2020). Compared to qualitative research, quantitative research has a more significant advantage in this study. First, this study does not primarily aim to explore individual narrative experiences, but rather to test pathways driven by theory. Second,

this study needs to simultaneously examine the direct effects and potential mediating relationships among multiple variables, requiring a research design with strong structural and statistical testing capabilities. Quantitative research can identify significant relationships between variables and their relative influence within a unified model framework, making it more suitable for the research design used in this study (Creswell & Creswell, 2018; Hair et al., 2019).

3.1.2 Compatibility of Research Methods and Theoretical Framework

This study employs quantitative research methods, which are highly compatible with the 4P theory and ECT theory upon which it is based. The 4P theory emphasizes consumers' perceptions and evaluations of product, price, promotion, and channel or platform-related factors. These dimensions are inherently structured and suitable for measurement using scale items. The ECT theory focuses on consumers' psychological processes regarding expectations, confirmations, value assessments, and subsequent behavioral responses before and after consumption. These variables can also be operationalized using standardized items, and their inherent relationships can be identified through statistical analysis. In other words, both theories emphasize the logical chain between variables, and quantitative research is a crucial path to transforming theoretical concepts into empirical data and conducting tests (Creswell & Creswell, 2018; DeVellis & Thorpe, 2022).

Furthermore, the goal of this study is not merely to describe the consumption phenomena of Chinese university students on the Steam platform, but to attempt to explain "which perceived factors influence consumer psychology" and "how these influences are transformed into consumer behavior through specific psychological mechanisms." This type of research objective is essentially explanatory, requiring the use of quantitative data to validate theoretical models. Multivariate statistical analysis is particularly suitable for handling path relationships, effect directions, and explanatory power among multiple latent variables, thus possessing significant advantages in theory-verification studies (Hair et al., 2019)

3.1.3 Reasons and Limitations for Method Selection

Overall, this study adopts a quantitative research approach based on the following considerations. First, quantitative research enables abstract consumer psychological factors to be transformed into measurable variables, thereby improving the standardization

of the research process and the reproducibility of the findings. Second, questionnaire surveys allow efficient collection of data from Chinese university students, meeting the requirements for sample size and statistical analysis in this study. Third, quantitative methods facilitate the examination of relationships among 4P factors, ECT-related psychological mechanisms, and consumer behavior within a unified analytical framework, thereby strengthening the systematicity and explanatory power of the research findings (Babbie, 2020; Dillman et al., 2014; Hair et al., 2019).

3.2 Population and Sample

3.2.1 Population

The population of this study is defined as Chinese university students with experience using the Steam platform. This group was chosen primarily because this study focuses on the psychological drivers of consumption among Chinese university students in the context of digital gaming platforms. University students are not only important participants in digital entertainment consumption but also frequent users of online game content, thus better meeting the measurement needs of this study regarding variables such as platform perception, price perception, promotional perception, product perception, and expectation confirmation. Quantitative research emphasizes the consistency between the population and the research question; that is, the sample should come from the target group that best reflects the research phenomenon. Therefore, limiting the research population to Chinese university student Steam users has clear theoretical relevance and research suitability (Creswell & Creswell, 2018; Babbie, 2020). To ensure the validity of the sample and the relevance of the research, this paper included screening criteria in the questionnaire design, requiring respondents to meet the following basic standards: First, they must currently be undergraduate or graduate students enrolled in Chinese universities; second, they must have experience using the Steam platform; and third, they must have basic knowledge of browsing, selecting, purchasing, using, or participating in related consumption activities on the Steam platform. This overall definition helps ensure that respondents can make judgments on questionnaire items based on their actual platform experience, thereby improving the credibility and explanatory power of the measurement results. Social science research typically emphasizes that the definition of the research population must be consistent

with the applicable boundaries of the research variables; otherwise, it may weaken the representativeness of the sample and the validity of variable measurement (Babbie, 2020).

Furthermore, this study does not consider all Chinese university students as automatically eligible subjects, but rather focuses on university student users with Steam platform experience. This is because the 4P and ECT-related variables in this study are all based on specific platform experiences. For example, product perception requires respondents to form judgments about the game content itself, while price perception and promotional perception require respondents to have been exposed to the platform's pricing mechanisms and discount activities. Variables such as confirmation, perceived value, and consumption behavior also depend on respondents' existing platform experiences. Therefore, limiting the population to university students with actual platform experience is more in line with the basic requirements of variable operationalization and quantitative research (De Vellis & Thorpe, 2022; Hair et al., 2019).

3.2.2 Sample Source and Sampling Methods

This study employed an online questionnaire survey and adopted convenience sampling combined with purposive screening to collect data. Since it was difficult to establish a complete sampling frame for Chinese university students with Steam experience, convenience sampling was considered a practical approach for recruiting accessible respondents (Memon et al., 2025a).. To improve the fit between the sample and the target population, purposive screening questions were included to ensure that respondents were university students with Steam usage experience (Memon et al., 2025b).

In terms of data collection procedures, the questionnaire was distributed through online platforms commonly used by university students, including student social groups, campus-related online communities, online discussion forums, and questionnaire-sharing channels. At the same time, the questionnaire link was disseminated through online communities related to gaming interests and Steam usage experience, allowing respondents who met the target profile to voluntarily access and complete the survey. Since participants were recruited through accessible online channels rather than random selection, the sampling process aligns with the characteristics of convenience sampling (Memon et al., 2025a).

To improve the fit between the sample and the target population, this study further incorporated purposive screening procedures. Specifically, screening questions were included at the beginning of the questionnaire to ensure that only respondents who met the criteria of “being a university student” and “having Steam usage experience” were retained for formal analysis. In addition, invalid responses were excluded during data cleaning, including questionnaires with excessively short response times, straight-line answering patterns, or logical inconsistencies. Previous research suggests that, under non-probability sampling conditions, pre-screening mechanisms and post-data cleaning procedures can effectively improve sample quality and enhance the explanatory power of research findings (Memon et al., 2025a, 2025b).

3.2.3 Sample Size

This study used 11 core variables for structural equation modeling analysis, each measured by 4 items, for a total of 44 measurement items. Subsequent reliability, validity, and structural path analysis were primarily based on these 44 measurement items. Therefore, the sample size estimation in this study was mainly based on the number of core measurement items, rather than the basic information items in the questionnaire (Hair et al., 2019; Kline, 2016).

According to common experience in multivariate statistical analysis and structural equation modeling research, the sample size should typically be 5 to 10 times the number of measurement items to improve the stability of parameter estimation and meet the basic requirements for model testing. Based on the 44 measurement items in this study, an ideal sample size would be approximately 440 (Hair et al., 2019; Kline, 2016). Meanwhile, existing research has indicated that a small sample size can negatively impact the stability of model estimations, while a larger sample size enhances the reliability and explanatory power of factor analysis and structural modeling (Comrey & Lee, 1992; Wolf et al., 2013).

To ensure an adequate number of valid responses after data screening and the removal of incomplete or invalid questionnaires, this study plans to distribute approximately 500 questionnaires. Considering the possibility of missing data, straight-line responses, and other invalid cases, the target is to obtain at least 440 valid questionnaires for subsequent statistical analysis and structural equation modeling.

Based on these considerations, this study sets the target effective sample size at approximately 440 participants during the formal implementation phase. This size not only meets the basic requirements for structural equation modeling analysis across 44 measurement items but also helps improve the robustness of subsequent reliability tests, validity tests, and hypothesis path analysis, thereby enhancing the credibility and persuasiveness of the research results.

3.3 Data Collection

3.3.1 Data Collection Methods

This study used online questionnaires as the primary data collection method. Online questionnaires have advantages such as low cost, wide coverage, and high data processing efficiency, making them particularly suitable for situations where research subjects are mainly active on online platforms and geographically dispersed (Bryman, 2016; Babbie, 2020). Given that the research subjects are Chinese university students who are Steam users, their platform usage, information acquisition, and interaction behaviors mainly occur online. Therefore, online questionnaires can better match the media usage habits of the research subjects and improve the feasibility and efficiency of sample acquisition (Bryman, 2016).

Furthermore, this study primarily uses quantitative analysis, focusing on identifying the influence pathways of product perception, price perception, promotion perception, and platform environment perception on university students' purchasing psychology. All of the above variables can be operationalized using structured scales; therefore, online questionnaires can provide a usable data foundation for subsequent reliability testing, validity testing, and structural equation modeling analysis (Hair et al., 2019).

3.3.2 Questionnaire Design and Measurement Tools

This questionnaire was designed based on existing mature scales and related research, and appropriately revised to suit the functional mechanisms of the Steam platform and the user scenario of university students. The questionnaire mainly measures the following core variables: product perception, price perception, promotion perception, and platform environment perception.

Table 3. 1 Measurement Sources and Reliability & Validity Evidence

Construct	Number of Items	Core Source	Reliability & Validity Evidence
Product perception	4	Product evaluation and value judgment measurement logic (Zeithaml, 1988; Dodds et al., 1991)	Product quality/value scales are widely used in consumer research and can achieve good internal consistency and construct validity (Hair et al., 2019).
Price perception	4	Price-quality value judgment (Zeithaml, 1988); Reference price research (Kalyanaram & Winer, 1995; Mazumdar et al., 2005)	Price perception and reference price related scales have stable construct validity and explanatory power in marketing research (Mazumdar et al., 2005).
Promotional perception	4	Promotional revenue framework (Chandon et al., 2000); transaction value mechanism (Grewal et al., 1998)	Promotion perception/promotion benefit scales often demonstrate good reliability and predictive validity in promotion research (Chandon et al., 2000).
Platform environment awareness	4	The logic of electronic service quality scales (Parasuraman et al., 2005); the usefulness of online review information (Mudambi & Schuff, 2010).	The dimensions related to platform environment/online service quality have been widely validated in e-commerce and platform research, providing a basis for testing convergent validity and discriminant validity (Parasuraman et al., 2005; Hair et al., 2019).
Consumption	4	Purchase/behavioral intention measurement widely used in consumer research (Dodds, Monroe, & Grewal, 1991); Behavioral intentions scale logic (Zeithaml, Berry, & Parasuraman, 1996).	Consumption/purchase intention scales have been widely applied in marketing and service research and often demonstrate good internal consistency and construct validity, providing a solid basis for structural model testing (Zeithaml et al., 1996; Dodds et al., 1991).
Perceived value	4	Perceived value definition and trade off logic (Zeithaml, 1988); PERVAL scale (Sweeney & Soutar, 2001)	The perceived value scale has a mature multiitem measurement foundation and often demonstrates good internal consistency and convergent validity (Sweeney & Soutar, 2001).
Psychological	4	Game motivation and psychological need satisfaction in digital games (Yee, 2006; Ryan, Rigby, & Przybylski, 2006); meta-analytic support for enjoyment/achievement/social motives (Hamari & Keronen, 2017)	Game-related psychological constructs have strong theoretical support in the literature on digital game use. Prior studies show that enjoyment, achievement, immersion, and psychological need satisfaction are stable drivers of game engagement and user responses, providing a sound basis for construct operationalization and validity testing (Yee, 2006; Ryan et al., 2006; Hamari & Keronen, 2017).
Game Quality Expectations	4	The concept of expectation originates from (Oliver, 1980); the logic of service quality expectation (Parasuraman et al., 1988).	It is expected to be widely used in service and consumption research as a benchmark for pre-consumption judgment, and to have an operational and structurally verifiable basis (Oliver, 1980).
Future price expectations	4	Reference prices and price expectations (Kalyanaram & Winer, 1995; Mazumdar et al., 2005)	The construct relating price expectations and waiting propensity has stable theoretical support and measurability in price research (Mazumdar et al., 2005).

Table 3. 1 (Continued)

Construct	Number of Items	Core Source	Reliability & Validity Evidence
Expected Promotional Revenue	4	Promotional revenue framework (Chandon et al., 2000)	Promotional benefit constructs have strong explanatory power in promotional research and are often used to predict consumers' psychological purchasing responses (Chandon et al., 2000).
Platform Information Credibility Expectation	4	Research on the credibility of online information (Flanagin & Metzger, 2000; Wathen & Burkell, 2002)	Information credibility scales are widely used in information systems and communication research and have a basis for construct validity testing (Wathen & Burkell, 2002).

Table 3. 2 Measurement Sources and Adaptation of Fan Motivation Variables

Construct	Original Scale Source	Example Original Item	Adapted Item in This Study	Modification Type
Product perception	Product evaluation/value judgment measurement logic (Dodds et al., 1991)	This product seems to be of high quality. The overall performance of this product appears to be good. This product seems reliable. This product appears to have good workmanship.	PP1. When browsing a game, I am first attracted by its content or gameplay. PP2. I judge whether the game is worth paying attention to based on the information displayed on the page (screenshots/videos/descriptions). PP3. I perceive the overall quality of Steam games as important when evaluating them. PP4. I perceive Steam games that match my interests and preferences as more attractive.	Brand/product → Steam game context
Price perception	Price Value Judgment (Zeithaml, 1988)	The price is acceptable for what I get. The price of this product seems reasonable. The product is fairly priced. The price reflects the value of the product.	PRP1. I pay attention to whether the current price of the game is within my acceptable range. PRP2. I judge whether the price matches the game's content/quality. PRP3. I think the current price of many Steam games is relatively high. PRP4. I compare the current price with my expected acceptable price before evaluating a game.	Generic price → Steam pricing context
Promotional perception	Promotional revenue framework (Chandon et al., 2000)	This promotion provides good value for money. The promotion makes the purchase more attractive. The promotion makes me feel that I am getting a good deal. The promotion increases the attractiveness of the offer.	POP1. Steam's discount events significantly increase my interest in purchasing games. POP2. I pay attention to major promotional events such as the Summer Sale and Winter Sale. POP3. Wishlist discount reminders make Steam promotions more noticeable to me. POP4. Limited-time offers and countdowns make Steam promotions more attractive to me.	Promotion → Steam discount context

Table 3. 2 (Continued)

Construct	Original Scale Source	Example Original Item	Adapted Item in This Study	Modification Type
Platform environment awareness	Quality of electronic services (Parasuraman et al., 2005)	The site makes it easy to find what I need. The website is easy to use. The system works reliably.	PEA1. The information displayed on the Steam store page is clear and easy to understand. PEA2. Steam provides sufficient product-related information on its store pages. PEA3. Steam's payment process and purchase operation are relatively convenient for me. PEA4. Steam provides a stable and reliable purchasing environment.	Website → Steam platform context
Perceived value	Perceived Value Definition and Scale (Sweeney & Soutar, 2001)	This product is good value for money. The product offers good value compared with its price. Buying this product would be worthwhile. Overall, the product seems worth what I would pay.	PV1. Overall, I think buying this type of game is worthwhile. PV2. For me, the benefits (experience/fun) from this type of game outweigh the costs (time/money). PV3. Compared to other forms of entertainment spending, buying games on Steam offers higher value. PV4. Overall, I believe Steam game purchases provide good value for money.	Product value → Digital game value
Game motivation / psychological need satisfaction	Game motivation / psychological need satisfaction in digital games (Yee, 2006; Ryan, Rigby, & Przybylski, 2006)	"I like being immersed in a game world." "I enjoy the challenge and sense of achievement in games." "Games help me relax and escape from stress." "I enjoy interacting with others in games."	SGP1. Playing games on Steam helps me relax and relieve stress. SGP2. Playing games on Steam brings me joy and pleasure. SGP3. Playing games on Steam gives me a sense of accomplishment or satisfaction. SGP4. Playing games on Steam makes my leisure time more enjoyable.	Online game motivation / psychological need → game psychological
Game Quality Expectations	Expectations as an evaluation criterion (Oliver, 1980; Parasuraman et al., 1988)	I expect the service to be excellent. I expect the quality of the product to be high. I expect the product to perform very well. I expect a high level of overall experience.	GQE1. I expect the actual experience of this game to be of high quality. GQE2. I expect the gameplay and content of this game to meet my needs. GQE3. I expect the overall completion of this game to be high and the experience to be stable. GQE4. I expect this game to provide a stable and satisfying playing experience.	Service quality → Game quality expectation
Future price expectations	Reference price/price expectation (Mazumdar et al., 2005)	I think the price will be lower later. I expect the price to decrease in the future. I believe waiting may lead to a better price. I expect the product to become cheaper later.	FPE1. I expect the price of this game to be lower in the future. FPE2. I expect it to be more cost-effective after a period of time (such as a major sale). FPE3. I expect the price of this game to fluctuate significantly with the promotional cycle. FPE4. My expectations of future prices influence my evaluation of the current price.	Reference price → Steam future price

Table 3. 2 (Continued)

Construct	Original Scale Source	Example Original Item	Adapted Item in This Study	Modification Type
Promotional Revenue Expectations	Promotional revenue logic (Chandon et al., 2000)	I expect to gain more from buying during promotions. Promotions will allow me to save money. Buying during promotions would give me better value. Promotions would make the purchase more beneficial.	PRE1. I expect to get higher returns (more cost-effectiveness) by purchasing during promotional periods. PRE2. I expect major sales/ discounts to significantly reduce my purchase costs. PRE3. I expect promotions to increase my satisfaction of "getting a good price". PRE4. I expect promotional information to provide useful price-saving opportunities.	Promotion benefit → Steam sale benefit
Platform Information Credibility Expectation	Credibility of online information (Flanagin & Metzger, 2000)	I consider the information on this site credible. The information provided by this site seems trustworthy. I believe the information on this site is reliable. The information from this site appears accurate.	PICE1. I expect the reviews and ratings on Steam to be generally credible. PICE2. I expect the information on the Steam page (tags/descriptions/ configurations, etc.) to support my judgment. PICE3. I expect Steam's platform rules and policy information to be reliable. PICE4. I expect the information provided by Steam to be accurate and trustworthy.	Web credibility → Steam reviews credibility
Steam game Consumption	Behavioral intentions / purchase intention measurement logic (Zeithaml, Berry, & Parasuraman, 1996; Dodds, Monroe, & Grewal, 1991)	I will do more business with this company in the future. I would consider purchasing from this company. I am likely to buy this product. I would recommend this product to others.	SGC1. I intend to buy games on Steam in the future. SGC2. I am very likely to buy games on Steam in the near future. SGC3. Overall, I am willing to allocate my budget to buying games on Steam. SGC4. I have a positive intention to buy games on Steam.	Service behavioral intention → Steam game purchase intention

To improve the validity and contextual relevance of the questionnaire, this study focused on localizing the questionnaire design to incorporate features specific to the Steam platform. For example:

1) Product information: Incorporating common platform information such as game content, gameplay experience, and user reviews;

2) Price: Incorporating price reasonableness, price acceptance, and expectations of price reductions;

3) Promotions: Incorporating Steam's discount events, seasonal promotions, and wishlist reminders;

4) Platform environment: Incorporating the review system, refund guarantee, payment convenience, and clarity of information display (Valve Corporation, n.d.-a, n.d.-b, n.d.-c, n.d.-d).

3.3.3 Questionnaire Distribution Channels and Implementation Process

This study plans to distribute the questionnaire through online channels actively used by Chinese university students, including university student communities, class groups, campus forums, questionnaire platform link sharing channels, and online discussion communities related to Steam games. This approach aligns with the online usage characteristics of the research participants and also helps improve questionnaire return efficiency (Dillman, Smyth, & Christian, 2014; Babbie, 2020). The questionnaire will be completed anonymously, without collecting any personally identifiable information, to reduce respondents' concerns and increase the authenticity of their responses. The questionnaire's first page will include research instructions and screening questions, clearly explaining the research objectives, anonymity principles, and data usage. Screening criteria will ensure that only Chinese university student Steam users who meet the research criteria proceed to the formal questionnaire, thereby improving sample quality and research relevance (Dillman et al., 2014; Babbie, 2020).

3.3.4 Data Quality Control Measures

To ensure data quality, this study will implement several control measures during the questionnaire design and data processing stages. First, core items will be set as mandatory and expressed in concise and clear language in order to reduce missing data and comprehension bias, which is consistent with recent recommendations for improving the rigor of online survey design and administration (Koo & Yang, 2025; Torrejón-Guirado et al., 2024). After data collection, the returned questionnaires will be screened according to response time, answer patterns, screening results, and logical consistency so as to identify and remove obviously invalid responses, which is also in line with recent discussions on online survey data-quality control and fraudulent-response detection (Gottfried, 2024; Ng et al., 2025). In addition, to reduce the influence of common method bias, the questionnaire will distribute items from different constructs appropriately, avoid leading wording, and use anonymous completion to lower social desirability pressure. Recent methodological research suggests that such procedural remedies can help reduce method bias at the survey design stage and improve the credibility of empirical results (Yao & Xu, 2024).

3.4 Data Analysis

This study employed statistical analysis techniques to systematically analyze the questionnaire data. The analysis process included data preprocessing, descriptive statistical analysis, reliability analysis, preliminary factorability assessment, confirmatory factor analysis (CFA), structural equation modeling (SEM), and mediation effect analysis. Since the measurement items were adapted from established scales and the theoretical structure of the constructs had been specified in advance based on the 4P framework and Expectation Confirmation Theory (ECT), the formal measurement analysis was primarily confirmatory rather than exploratory. Therefore, CFA was used as the main method for evaluating the measurement model, while exploratory analysis was limited to the pilot stage as a preliminary reference for questionnaire applicability (Hair et al., 2019; Kline, 2016).

3.4.1 Data Processing and Descriptive Statistical Analysis

After data collection, the questionnaire data will first be preprocessed, including missing value checking, outlier screening, variable coding, and identification of invalid questionnaires. Following data cleaning, frequency analysis and descriptive statistical analysis will be conducted to summarize the demographic characteristics of the respondents, such as gender, age, major, Steam usage experience, and consumption-related characteristics. This process helps provide an overall understanding of the sample structure and serves as the foundation for subsequent empirical analysis. Previous studies have emphasized that data cleaning and descriptive statistical analysis are essential preliminary steps before model testing, as data quality directly affects the accuracy of parameter estimation and the reliability of research findings (Hair et al., 2019).

In addition, descriptive statistics, including means and standard deviations, will be calculated for the main research variables. These variables include product perception, price perception, promotion perception, platform environment perception, expectations, psychological factors, perceived value, and consumption behavior. The results will provide a preliminary understanding of respondents' overall response patterns and serve as a basis for subsequent reliability testing, validity assessment, and structural relationship analysis.

3.4.2 Reliability Analysis

Before the formal survey, a pilot test was conducted with 60 respondents to assess the basic applicability, clarity, and internal consistency of the 44 measurement items. The overall Cronbach's Alpha coefficient was 0.961, substantially exceeding the recommended threshold of 0.70 and indicating high internal consistency (Nunnally & Bernstein, 1994). The KMO value was 0.624, exceeding the minimum acceptable level of 0.60 but remaining relatively close to the threshold, suggesting that the pilot sample provided only preliminary evidence of suitability for factor analysis (Kaiser, 1974).

Minor revisions mainly involved simplifying ambiguous wording, standardizing terminology related to Steam pricing and promotional mechanisms, and improving the contextual clarity of several items. These revisions did not alter the theoretical meaning, construct assignment, or total number of measurement items.

Following the pilot test, the measurement items were reviewed based on respondents' feedback and preliminary statistical results. No measurement items were deleted because no serious problems were identified in item interpretation or internal consistency. Minor wording and presentation adjustments were made to improve clarity and ensure consistency with the Steam platform context, while the original construct structure and the 44 measurement items were retained.

Therefore, the pilot test was used primarily to verify the basic reliability, comprehensibility, and applicability of the questionnaire rather than to establish definitive construct validity. Given the relatively small pilot sample and the KMO value of 0.624, the reliability and validity of the measurement instrument were further evaluated using the full formal sample through reliability analysis, confirmatory factor analysis (CFA), composite reliability (CR), average variance extracted (AVE), and discriminant validity assessment.

Table 3. 3 Pre-test

Test	Value
Number of respondents	60
Number of items	44
Cronbach's Alpha	0.961
KMO	0.624
df	946
Sig	＜0.000

3.4.3 Validity Analysis and Confirmatory Factor Analysis (CFA)

Since the measurement items in this study were adapted from established scales and assigned to theoretically predefined constructs, Confirmatory Factor Analysis (CFA) was adopted as the primary method for evaluating the formal measurement model. CFA was used to examine whether the observed items adequately represented their corresponding latent constructs and whether the proposed measurement structure was consistent with the theoretical framework.

The measurement model was evaluated using standardized factor loadings, Composite Reliability (CR), and Average Variance Extracted (AVE). Generally, standardized factor loadings should reach an acceptable level, CR values above 0.70 indicate satisfactory composite reliability, and AVE values above 0.50 provide evidence of convergent validity (Fornell & Larcker, 1981; Hair et al., 2019). Discriminant validity was further assessed by comparing the square root of each construct's AVE with its correlations with other constructs.

Therefore, the formal validity assessment of this study focused on CFA-based measurement model evaluation rather than exploratory identification of the factor structure.

3.4.4 Structural Model Analysis and Hypothesis Testing

After completing the measurement model testing, this paper will further use AMOS to construct a structural equation model to test the research hypotheses. The core purpose of structural model analysis is to examine whether the path relationships between the 4P-related antecedent variables, the ECT-related psychological variables, and the final consumption behavior variables are significant, and to verify the research

hypotheses through standardized path coefficients, significance levels, and directional results. The advantage of SEM is that it can simultaneously handle the relationships between multiple latent variables within the same model framework, making it particularly suitable for theoretical models like this one, which have multivariate, latent structural, and path testing requirements.

Model goodness of fit will be comprehensively evaluated through multiple indicators, including the chi-square value to degrees of freedom ratio (χ^2/df), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Root Mean Square Error Approximation (RMSEA). The classic study by Hu and Bentler suggests that a good fit index should be judged comprehensively by combining multiple indicators, rather than relying on a single standard. In empirical studies, a low χ^2/df, CFI and TLI close to or above 0.90, and RMSEA below 0.08 are generally considered to indicate an acceptable level of model fit. Kline's work on structural equation modeling also emphasizes that model fit should be comprehensively evaluated based on multiple indices.

3.4.5 Mediation Effect Analysis

To further examine the mechanism through which the antecedent variables influence Steam game consumption, this study will conduct mediation effect analysis with perceived value (PV) as the mediating variable. Specifically, the analysis will examine whether product perception, price perception, promotional perception, platform environment perception, game quality expectations, future price expectations, promotional benefit expectations, platform information credibility expectations, and Steam game psychology indirectly influence Steam game consumption through perceived value.

The mediation effects will be tested using the Bootstrap method with 5,000 resamples. Compared with relying solely on the significance of individual regression paths, Bootstrap analysis directly estimates the indirect effect and its confidence interval and is widely recommended for mediation testing (Preacher & Hayes, 2008; Hayes, 2018). A 95% confidence interval (CI) will be used to determine the significance of each indirect effect. If the confidence interval does not include zero, the indirect effect will be considered statistically significant.

The analysis will report the direct effect, indirect effect, total effect, 95% confidence interval, and significance level. Through this procedure, the study will determine whether perceived value serves as a significant transmission mechanism between the antecedent factors and Steam game consumption, thereby providing further evidence for explaining how marketing perceptions, consumer expectations, and psychological factors are translated into actual consumption behavior.



CHAPTER 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	40.6%
	View user comments	219	45.3%
	Participate in platform	189	39.1%
	promotion activities	246	50.9%
	Purchase games or related	389	80.5%
	digital content	483	100%
	Download games from Steam		
Age	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%

Table 4. 1 (Continued)

Question	Options	Frequency	Percentage
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%
Income level	1001-2000RMB	333	68.9%
	2001-3000RMB	70	14.5%
	500-1000RMB	49	10.1%
	Less than 500 RMB	14	2.9%
	More than 3000 RMB	17	3.5%
Usage time	1-2 years	125	25.9%
	3-4 years	95	19.7%
	5-6 years	151	31.3%
	7 years or more	91	18.8%
	Less than 1 year	21	4.3%
Purchase game time interval	About once every 6 months	133	27.5%
	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%
Main game types	operate	241	17.8%
	Adventure	258	19.1%
	role play	176	13.0%
	Strategy/Simulation	227	16.8%
	Casual/Independent	250	18.5%
	Sports/Racing	202	24.9%

Table 4. 1 (Continued)

Question	Options	Frequency	Percentage
Frequently Played Mode	Depending on the specific game	127	26.3%
	Mainly play single-player mode	115	23.8%
	Mainly plays team/multiplayer mode	116	24.0%
		125	25.9%
Information for reference before purchasing the game	Game trailer/screenshots	214	44.3%
	Game introduction page	188	38.9%
	User comments	232	48%
	Media/up comments	116	24%
	Discount amount / Lowest historical price	104	21.5%
	Friend Acommendations/Social Discussions	82	17.0%
	System Requirements	89	18.4%
	Refund Policy/Risk Considerations	141	29.2%
Main reasons for playing games	Entertainment	296	61.3%
	Relax your mind and body and relieve stress	162	33.5%
	Sense of achievement	235	48.7%
	idle away	147	30.4%
	make money	198	41.0%
Reasons for adding the game to the wishlist	Save for later use	260	53.8%
	Waiting for a discount	237	49.1%
	Limited budget	137	28.4%
	Observe changes in reviews/reputation	240	49.7%
	I'm interested in games, but haven't decided yet	171	35.4%
	Added based on a friend's recommendation	208	43.1%
Stimulating purchasing psychology	Game content and gameplay	163	18.8%
	Price	172	19.8%
	Discount	161	18.6%
	Evaluation/Rating	206	23.8%
	Friend Recommendation	165	19.0%
Playing games during specific time periods	00:00-05:59	122	25.3%
	06:00-11:59	30	6.2%
	12:00-17:59	80	16.6%
	18:00-23:59	251	52.0%

As shown in Table 4.1, a total of 483 valid questionnaires were collected from Chinese university students. In terms of gender, male respondents accounted for 59.4% (n = 287), while female respondents accounted for 40.6% (n = 196). Regarding age, respondents aged 18–22 years constituted the largest proportion (59.6%), followed by those aged 23–26 years (29.8%), indicating that the sample was mainly composed of traditional university-age students. In terms of educational level, bachelor's degree students accounted for the largest proportion (41.0%), followed by master's degree students (25.5%) and associate degree students (24.8%). The respondents represented a wide range of academic disciplines, with Medicine (15.5%), Natural Sciences (13.9%), and Literature and Art (13.7%) accounting for relatively larger shares. Overall, the sample demonstrates good diversity and is representative of Chinese university students with Steam gaming experience.

Regarding Steam usage characteristics, most respondents reported a monthly disposable income between RMB 1,001 and RMB 2,000 (68.9%). Users with 5–6 years of Steam experience accounted for the highest proportion (31.3%), followed by those with 1–2 years of experience (25.9%). In terms of purchasing frequency, 27.5% of respondents purchased games approximately once every six months, while 25.1% purchased games about once a month. In addition, the majority of respondents reported either rarely using (39.5%) or occasionally using (37.5%) the Steam wishlist function.

It should be noted that the variables Participating in Steam-related events over the past December, Main game types, Information for reference before purchasing the game, Main reasons for playing games, Reasons for adding the game to the wishlist, and Stimulating purchasing psychology were designed as multiple-response questions. Therefore, respondents were allowed to select more than one option according to their actual experiences and preferences. Consequently, the total frequencies reported for these variables exceed the actual sample size of 483, and the cumulative percentages may be greater than 100%. This is a common characteristic of multiple-response data and reflects the fact that consumers may simultaneously exhibit multiple gaming preferences, information sources, motivations, and purchasing considerations rather than a single behavioral characteristic (Field, 2018; Hair, Black, Babin, & Anderson, 2019).

Among the multiple-response items, downloading games from Steam (28.0%) and purchasing games or related digital content (22.6%) were the most frequently reported platform activities. Adventure games (19.1%), Casual/Independent games (18.5%), and Action games (17.8%) emerged as the most popular game genres. Before making purchasing decisions, respondents primarily relied on user comments (19.9%), game trailers and screenshots (18.4%), and game introduction pages (16.1%). Entertainment (28.5%), a sense of achievement (22.6%), and making money (19.1%) were identified as the major motivations for playing games. Furthermore, saving games for future purchase (20.8%), observing changes in reviews and reputation (19.2%), and waiting for discounts (18.9%) were the main reasons for adding games to the wishlist. Evaluation and ratings (23.8%) were found to be the most influential factors stimulating purchasing psychology, followed by price (19.8%) and friend recommendations (19.0%).

Overall, the descriptive statistics indicate that the respondents possess relatively rich Steam usage experience and active participation in platform-related activities. Their purchasing decisions are influenced not only by product-related information and pricing factors but also by social evaluations, platform interactions, and psychological motivations, providing a solid foundation for the subsequent reliability, validity, and structural model analyses.

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
Price perception	PRP1	3.358	1.216
	PRP2	3.391	1.190
	PRP3	3.333	1.191
	PRP4	3.381	1.188
Promotional perception	POP1	3.398	1.147
	POP2	3.317	1.144
	POP3	3.381	1.154
	POP4	3.371	1.155

Table 4. 2 (Continued)

Item		Mean	Std. Deviation
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 Expectations	GQE1	3.356	1.188
	GQE2	3.255	1.219
	GQE3	3.387	1.188
	GQE4	3.261	1.192
Future price expectations	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 Expectation	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 all measurement items ranged from 3.234 to 3.447, while the standard deviations ranged from 1.102 to 1.219. Since this study adopted a five-point Likert scale, all mean values were above the theoretical midpoint of 3.00, indicating that respondents generally expressed a moderately positive level of agreement with all measurement items (Norman, 2010). Descriptive statistics, including the mean and standard deviation, are commonly used to summarize respondents' perceptions and attitudes before conducting further inferential analyses (Hair, Black, Babin, & Anderson, 2019).

Among all items, PICE4 obtained the highest mean value (M = 3.447, SD = 1.157), indicating that respondents attached the greatest importance to the credibility of platform information when evaluating Steam games. This finding suggests that reliable platform information plays an important role in enhancing users' evaluations of game value. In contrast, PV2 recorded the lowest mean value (M = 3.234, SD = 1.165). Although it was the lowest among all items, it remained above the midpoint of the scale, indicating that respondents still held a relatively positive perception toward this aspect of perceived value (Norman, 2010).

Regarding response variability, GQE2 showed the largest standard deviation (SD = 1.219), suggesting greater differences among respondents in their expectations regarding game quality. By comparison, PP4 exhibited the smallest standard deviation (SD = 1.102), indicating relatively high consistency in respondents' evaluations of this product perception item. In general, a larger standard deviation indicates greater dispersion in responses, whereas a smaller standard deviation reflects greater consistency among respondents (Field, 2018). Overall, the descriptive statistics indicate that respondents generally held positive perceptions of the constructs measured in this study, while maintaining an appropriate degree of response variation, providing a sound basis for subsequent reliability, validity, and structural equation model analyses (Hair et al., 2019).

4.2 Trust level analysis

This study used Cronbach's Alpha coefficient and Corrected Item-Total Correlation (CITC) to assess the reliability of the measurement scales. According to Nunnally and Bernstein (1994), a Cronbach's Alpha value greater than 0.70 indicates acceptable reliability, while values above 0.80 indicate good reliability.

Table 4. 3 Reliability analysis variables

Variable	items	Sample Volume	Corrected Item-Total Correlation	Cronbach's AIpha	AIpha
Product Perception	PP1	483	0.447	0.944	0.945
	PP2		0.469	0.944	
	PP3		0.518	0.944	
	PP4		0.458	0.944	
Price Perception	PRP1	483	0.528	0.944	
	PRP2		0.525	0.944	
	PRP3		0.549	0.943	
	PRP4		0.527	0.944	
Promotional Perception	POP1	483	0.541	0.943	
	POP2		0.544	0.943	
	POP3		0.540	0.943	
	POP4		0.558	0.943	
Platform Environmen t awareness	PEA1	483	0.457	0.944	
	PEA2		0.472	0.944	
	PEA3		0.502	0.944	
	PEA4		0.477	0.944	
Perceived Value	PV1	483	0.607	0.943	
	PV2		0.640	0.943	
	PV3.		0.582	0.943	
	PV4		0.631	0.943	
Game quality expectations	GQE1	483	0.573	0.943	
	GQE2		0.511	0.944	
	GQE3		0.535	0.943	
	GQE4		0.549	0.943	
Futrue price expectations	FPE1	483	0.534	0.944	
	FPE2		0.502	0.944	
	FPE3		0.548	0.943	
	FPE4		0.544	0.943	

Table 4. 3 (Continued)

Variable	items	Sample Volume	Corrected Item-Total Correlation	Cronbach's AIpha	AIpha
Promotional Revenue Expectations	PRE1	483	0.475	0.944	0.95
	PRE2		0.501	0.944	
	PRE3		0.484	0.944	
	PRE4		0.516	0.944	
Platform Information Credibility Expectations	PICE1	483	0.459	0.944	
	PICE2		0.474	0.944	
	PICE3		0.437	0.944	
	PICE4		0.499	0.944	
Steam game Psychology	SGP1	483	0.471	0.944	
	SGP2		0.520	0.944	
	SGP3		0.469	0.944	
	SGP4		0.498	0.944	
Steam game Consumption	SGC1	483	0.480	0.944	
	SGC2		0.471	0.944	
	SGC3		0.489	0.944	
	SGC4		0.500	0.944	

As shown in Table 4.3, the CITC values of all measurement items ranged from 0.437 to 0.640, exceeding the recommended threshold of 0.30, indicating that each item exhibited satisfactory discrimination and was appropriately correlated with its corresponding construct (Hair, Black, Babin, & Anderson, 2019). Meanwhile, the Cronbach's Alpha coefficients ranged from 0.943 to 0.944, which are substantially higher than the recommended value of 0.70, suggesting excellent internal consistency and reliability of the measurement scales (Nunnally & Bernstein, 1994; Hair et al., 2019). These results indicate that all constructs, including Product Perception, Price Perception, Promotional Perception, Platform Environment Perception, Perceived Value, Game Quality Expectations, Future Price Expectations, Promotional Revenue Expectations, Platform Information Credibility Expectations, Psychology, and Consumption, exhibit excellent internal consistency. Therefore, the questionnaire used in this study demonstrates high reliability and is suitable for subsequent validity analysis and structural equation modeling.

4.3 Validity analysis

Validity analysis was conducted to assess whether the measurement items accurately reflected the constructs designed in this study. Before conducting factor analysis, the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's Test of Sphericity were employed to evaluate the suitability of the data for factor analysis (Hair, Black, Babin, & Anderson, 2019).

The KMO statistic examines the adequacy of correlations among variables. Generally, a KMO value above 0.80 indicates that the dataset is highly suitable for factor analysis, while a value above 0.90 is considered excellent (Kaiser, 1974). Bartlett's Test of Sphericity examines whether the correlation matrix significantly differs from an identity matrix. A significance level below 0.05 indicates that sufficient correlations exist among variables and that factor analysis can be performed (Bartlett, 1954). Therefore, the KMO measure and Bartlett's Test provide important evidence regarding the appropriateness of the data for subsequent exploratory factor analysis and construct validation.

Table 4. 4 KMO and Barlett's Test

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

As shown in Table 4.4, the KMO value of this study is 0.933, which exceeds the recommended threshold of 0.90, indicating excellent sampling adequacy. In addition, Bartlett's Test of Sphericity produced a Chi-square value of 11083.465 with 946 degrees of freedom, and the significance value was 0.000 ($p < 0.001$). This result demonstrates that the correlation matrix is not an identity matrix and that significant correlations exist among the measurement variables.

Therefore, the questionnaire data collected in this study are highly suitable for factor analysis and possess satisfactory construct validity. The results provide a solid foundation for subsequent confirmatory factor analysis and structural equation modeling.

4.4 Confirmatory Factor Analysis and Measurement Model Assessment

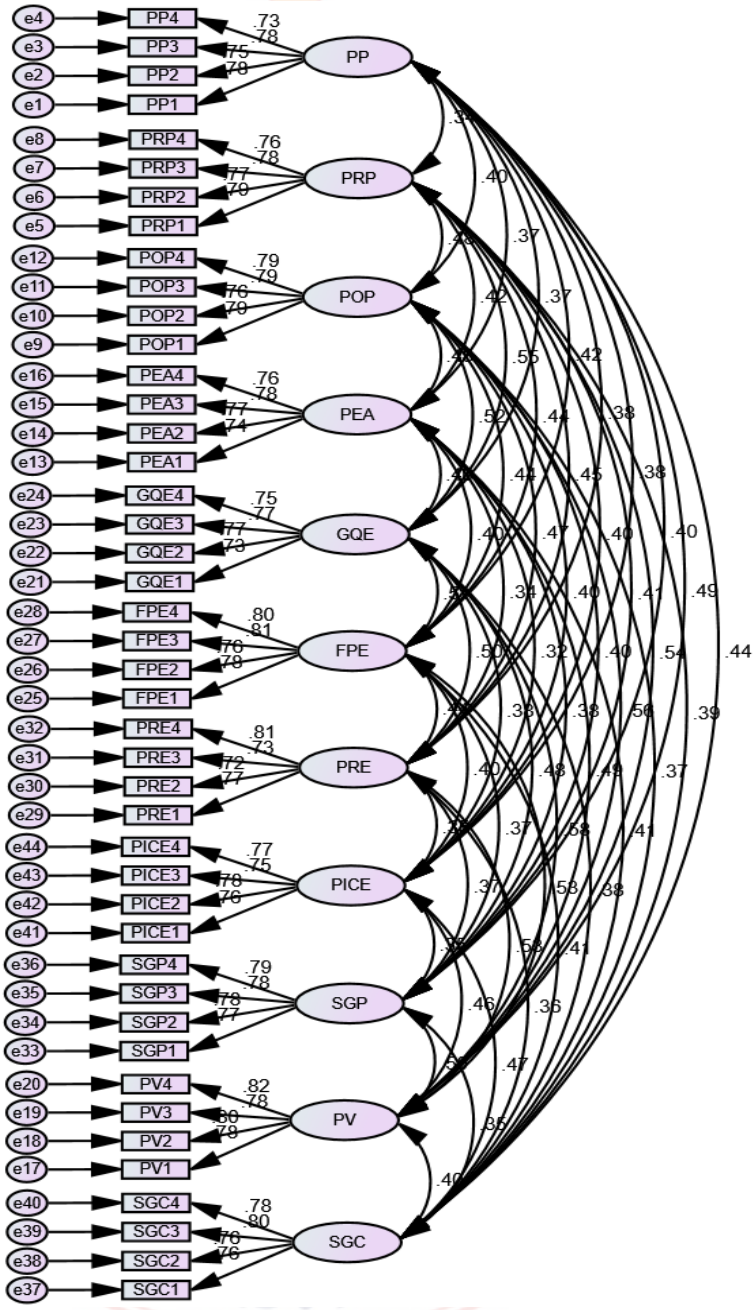


Figure 4. 1 Exploratory factor analysis

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		
PV	PV1	0.782	0.872	0.631
	PV2	0.798		
	PV3	0.780		
	PV4	0.816		
GQE	GQE1	0.733	0.841	0.569
	GQE2	0.768		
	GQE3	0.766		
	GQE4	0.751		
FPE	FPE1	0.779	0.866	0.619
	FPE2	0.760		
	FPE3	0.807		
	FPE4	0.799		
PRE	PRE1	0.769	0.843	0.573
	PRE2	0.718		
	PRE3	0.729		
	PRE4	0.808		
SGP	SGP1	0.771	0.861	0.607
	SGP2	0.776		
	SGP3	0.780		
	SGP4	0.789		

Table 4. 5 (Continued)

Latent Variable	Item	Standardized Loading	CR	AVE
SGC	SGC1	0.764	0.860	0.605
	SGC2	0.758		
	SGC3	0.805		
	SGC4	0.784		
PICE	PICE1	0.759	0.850	0.586
	PICE2	0.781		
	PICE3	0.754		
	PICE4	0.768		

This study conducts a systematic examination of the convergent validity and reliability of the scale measurement model through confirmatory factor analysis. The standardized factor loadings of all measurement items corresponding to each latent variable demonstrate excellent fitting performance, with all loading values ranging from 0.718 to 0.816, which are consistently higher than the recommended threshold of 0.70 (Hair, Black, Babin, & Anderson, 2019). This indicates that all measurement items selected in this study can effectively correspond to their respective latent variables, there are significant and stable internal correlations between items and latent variables, and the individual measurement validity of the scale is well verified.

The composite reliability values of each latent variable are satisfactory. The CR values of the eleven latent variables including PP, PRP, POP, PEA, PV, GQE, FPE, PRE, SGP, SGC, and PICE are 0.844, 0.858, 0.865, 0.847, 0.872, 0.841, 0.866, 0.843, 0.861, 0.860, and 0.850, respectively, all of which exceed the recommended threshold of 0.70 (Fornell & Larcker, 1981; Hair et al., 2019). Such results reflect a high degree of internal consistency among the measurement items of each latent variable, confirming the excellent overall reliability of the scale and its capability to stably and reliably measure the latent constructs of the core research variables.

In terms of average variance extracted (AVE), which is a key indicator of convergent validity, the AVE values of all latent variables range from 0.569 to 0.631, all exceeding the recommended criterion of 0.50 (Fornell & Larcker, 1981). This further verifies that each measurement dimension can effectively explain the variance of its corresponding latent variable. Therefore, the measurement model demonstrates

satisfactory convergent validity, and the aggregation effectiveness of the measurement dimensions conforms to established academic research standards (Hair et al., 2019)

Table 4. 6 Discriminant Validity: Correlations Between Latent Variables and Square Roots of AVE

	PICE	**SGC**	**SGP**	**PRE**	**FPE**	**GQE**	**PV**	**PEA**	**POP**	**PRP**	**PP**
PICE	0.766										
SGC	0.471	0.778									
SGP	0.348	0.35	0.779								
PRE	0.349	0.36	0.372	0.757							
FPE	0.401	0.408	0.368	0.444	0.786						
GQE	0.376	0.382	0.479	0.502	0.506	0.755					
PV	0.456	0.399	0.5	0.526	0.532	0.582	0.794				
PEA	0.316	0.414	0.377	0.337	0.398	0.404	0.489	0.762			
POP	0.398	0.366	0.397	0.473	0.443	0.517	0.563	0.479	0.785		
PRP	0.401	0.386	0.41	0.45	0.442	0.548	0.544	0.42	0.481	0.776	
PP	0.378	0.438	0.404	0.38	0.423	0.368	0.494	0.367	0.399	0.339	0.758

This study further verifies the discriminant validity of the model by comparing the correlation coefficients between latent variables with the square roots of AVE values. The square roots of AVE for PICE, SGC, SGP, PRE, FPE, GQE, PV, PEA, POP, PRP, and PP are 0.766, 0.778, 0.779, 0.757, 0.786, 0.755, 0.794, 0.762, 0.785, 0.776, and 0.758 respectively, all of which are significantly higher than the Pearson correlation coefficients between the corresponding latent variables, with the correlation coefficients between any two distinct latent variables ranging from 0.339 to 0.582. No correlation coefficient between variables exceeds the square root of the corresponding AVE value, which fully demonstrates that the latent variables constructed in this study have reasonable correlations with one another while maintaining adequate discriminant validity, different measurement dimensions can effectively distinguish the connotations of diverse research variables without dimensional overlap or ambiguous variable discrimination. The comprehensive evaluation of all test indicators proves that the scale adopted in this study achieves ideal levels of overall reliability, convergent validity, and discriminant validity, the measurement model presents satisfactory fitting quality, and

the variable measurement data is authentic, effective, and scientifically robust, which can provide solid and rigorous data support and a reliable model foundation for subsequent empirical hypothesis testing and variable relationship analysis.

4.5 Structural equation model assumptions

4.5.1 Structural Model Fit Assessment

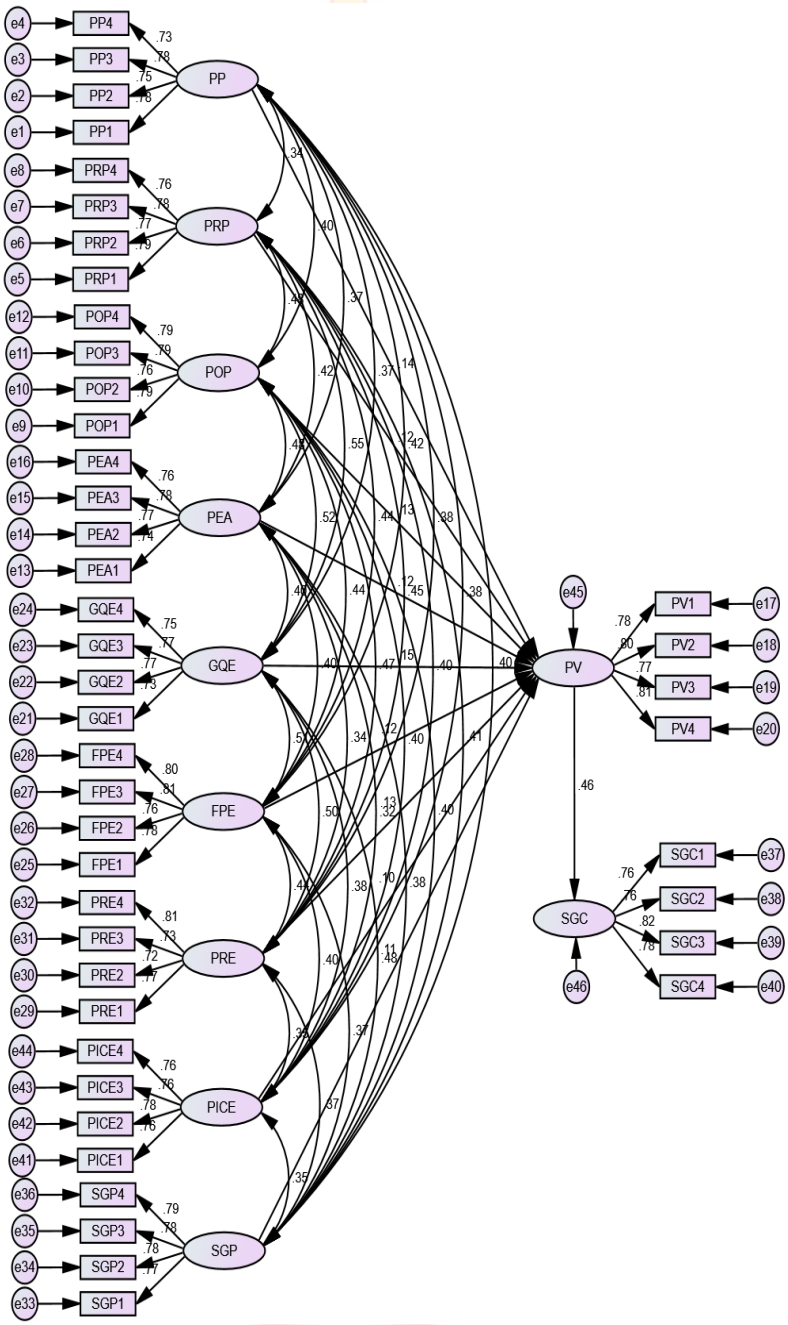


Figure 4. 2 Structural equation model assumptions

PP: Product perception

PRP: Price perception

POP: Promotional perception

PEA: Platform environment awareness

GQE: Game quality expectations

FPE: Future price expectations

PRE: Promotional revenue expectations

PICE: Platform information credibility expectation

SGP: Steam game psychology

PV: Steam game Perceived Value

SGC: Steam game consumption

Table 4. 7 Goodness-of-Fit Test for Structural Equation Model

Fit Index	Criterion	Value
$\chi 2$	-	940.971
df	-	856
$\chi 2$/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

This study adopted a series of mainstream fit indices to systematically evaluate the overall fitness of the constructed structural equation model, and all calculated indices conformed to the well-recognized goodness-of-fit criteria in academic research, which effectively verified the favorable matching and adaptation between the established model and the actual survey data. The chi-square degree of freedom ratio of the model was 1.099, which was far below the critical threshold of 3, indicating that the overall

adaptation deviation of the model was within a reasonable range without obvious poor fitness problems and could objectively reflect the internal correlation among research variables. As a core index for evaluating the absolute fit of the structural equation model, the RMSEA value was 0.014, which was considerably lower than the standard cutoff of 0.10 and further demonstrated the low overall error level of the model as well as the high accuracy and reliability of parameter estimation results.

The incremental and parsimonious fit indices of the model all presented excellent fitting performance. Among them, GFI and AGFI reached 0.921 and 0.908, respectively, both exceeding the recommended threshold of 0.90, indicating that the model possessed strong explanatory power for the observed data and effectively captured the core characteristics of the sample data (Hair, Black, Babin, & Anderson, 2019).

The incremental fit indices, including CFI, NFI, RFI, TLI, and IFI, were 0.992, 0.918, 0.909, 0.991, and 0.992, respectively. All values were higher than the recommended criterion of 0.90, suggesting that the proposed model achieved a substantially better fit than the null model and that the structural relationships among the latent variables were highly consistent with the observed data (Hair et al., 2019; Kline, 2016).

Furthermore, according to the model fit criteria suggested by Hu and Bentler (1999), CFI and TLI values above 0.90 indicate acceptable model fit, while values above 0.95 indicate excellent fit. Therefore, the obtained results demonstrate that the structural equation model exhibits outstanding goodness-of-fit and a scientifically sound structural design. The model is thus considered appropriate for subsequent analyses, including path coefficient estimation and hypothesis testing among variables (Hu & Bentler, 1999; Kline, 2016).

4.5.2 Structural Model Path Analysis

Table 4. 8 Path Coefficients of Structural Equation Model

Path	Unstandardized Coefficient	S.E.	C.R.	P	Standardized Coefficient	Significant
PV <---PP	0.145	0.049	2.932	0.003	0.140	Supported
PV <--- PRP	0.117	0.050	2.317	0.021	0.121	Supported
PV <--- POP	0.133	0.054	2.474	0.013	0.131	Supported
PV <--- PEA	0.126	0.052	2.447	0.014	0.118	Supported
PV <--- GQE	0.158	0.063	2.521	0.012	0.145	Supported
PV <--- FPE	0.119	0.052	2.304	0.021	0.116	Supported
PV <--- PRE	0.134	0.054	2.500	0.012	0.126	Supported
PV <--- PICE	0.107	0.049	2.187	0.029	0.101	Supported
PV <--- SGP	0.121	0.051	2.395	0.017	0.115	Supported
SGC <--- PV	0.437	0.051	8.530	***	0.458	Supported

This study conducts an empirical test on the direct influence paths between various variables by constructing a structural equation model. The path coefficient analysis results of the model clearly reflect the direct influence effects of each antecedent variable on PV and the causal relationship between PV and SGC. All tested paths reach the statistical significance level, which verifies the validity and rationality of the correlation among the research variables. Among the influence paths of antecedent variables on PV, nine variables including PP, PRP, POP, PEA, GQE, FPE, PRE, PICE, and SGP can significantly and positively predict PV. GQE exerts the strongest direct driving effect on PV among all antecedent variables, with an unstandardized path coefficient of 0.158 and a standardized path coefficient of 0.145. The critical ratio of this path is 2.521 and the P value is 0.012, which meets the statistical significance standard and effectively facilitates the improvement of PV levels. PP presents the second-most significant influence on PV, with an unstandardized coefficient of 0.145 and a critical ratio of 2.932, the highest among all paths. The extremely high significance level with a P value of 0.003 indicates that the improvement of PP can prominently promote the optimization of PV. PRE and POP also have prominent positive influences on PV, with unstandardized path coefficients of 0.134 and 0.133 and corresponding P values of 0.012

and 0.013 respectively, both passing the significance test and stably affecting PV. Although the direct influence coefficients of PRP, PEA, FPE, PICE, and SGP on PV are relatively lower, all variables show significant positive predictive effects, with unstandardized coefficients ranging from 0.107 to 0.126 and P values concentrated between 0.014 and 0.029, which possess definite statistical significance. In the core transmission path, PV has a significant positive direct effect on SGC, with an unstandardized path coefficient of 0.437 and a standardized path coefficient of 0.458. The critical ratio reaches 8.530 with high statistical significance, proving that PV, as a core mediating variable, can strongly drive the development of SGC and serve as a key factor influencing SGC levels, which also lays a solid foundation for the establishment of subsequent mediating effects.

4.5.3 Explanatory Power of the Structural Model

Table 4. 9 Squared Multiple Correlations of Endogenous Variables

Construct	R^2
PV	0.598
SGC	0.210

In addition to examining the significance of structural paths, the explanatory power of the model was evaluated using the Squared Multiple Correlations (R^2) values of the endogenous variables. R^2 represents the proportion of variance in an endogenous construct explained by its predictor variables (Hair et al., 2019).

The results showed that the R^2 value of perceived value (PV) was 0.598, indicating that the nine antecedent variables, including perception factors, expectation factors, and psychological factors, jointly explained 59.8% of the variance in perceived value.

Furthermore, the R^2 value of Steam game consumption (SGC) was 0.210, suggesting that perceived value explained 21.0% of the variance in Steam game consumption behavior.

Overall, the structural model demonstrated acceptable explanatory power in explaining the formation of perceived value and Steam game consumption among Chinese university students. The results indicate that the proposed model can effectively

explain how platform-related perceptions, expectations, and psychological factors contribute to users' purchasing-related decisions through perceived value.

4.6 Mediation effect

4.6.1 Bootstrap Mediation Effect Test

The mediating effect test based on the Bootstrap method was conducted to examine whether perceived value (PV) mediates the relationships between antecedent variables and Steam game consumption (SGC). According to Preacher and Hayes (2008), the significance of an indirect effect can be determined by examining whether the Bootstrap confidence interval contains zero. If zero is not included within the confidence interval, the indirect effect is considered statistically significant.

The Bootstrap analysis was conducted with 5,000 resamples and a 95% confidence interval. As shown in Table 4-9, the confidence intervals of all indirect effect paths did not include zero, indicating that all nine mediation paths were statistically significant. Therefore, product perception (PP), price perception (PRP), promotional perception (POP), platform environment perception (PEA), game quality expectations (GQE), future price expectations (FPE), promotional revenue expectations (PRE), platform information credibility expectations (PICE), and Steam game psychology (SGP) indirectly influenced Steam game consumption through perceived value.

Table 4. 10 Bootstrap Mediation Effect Results

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

Table 4. 10 (Continued)

Parameter	Estimate	Lower	Upper	P	Result
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

4.6.2 Comparison of Indirect Effect Strength

To further examine the relative strength of the mediation effects, the indirect effect values of different mediation paths were compared. The results show that the magnitude of indirect effects varied across different paths.

Among all mediation paths, GQE → PV → SGC showed the strongest indirect effect, with an estimated effect value of 0.067 and a 95% confidence interval of [0.003, 0.126]. The second strongest indirect effect was PP → PV → SGC, with an estimated effect value of 0.064 and a 95% confidence interval of [0.020, 0.112].

The indirect effect values of POP → PV → SGC, PRE → PV → SGC, PRP → PV → SGC, PEA → PV → SGC, FPE → PV → SGC, and SGP → PV → SGC ranged from 0.053 to 0.060. Meanwhile, PICE → PV → SGC showed the lowest indirect effect value (0.046) with a 95% confidence interval of [0.003, 0.093]. Although its effect magnitude was relatively smaller, the mediation effect remained statistically significant.

Overall, the Bootstrap results confirm that perceived value serves as a significant mediating variable through which perception factors, expectation factors, and psychological factors influence Steam game consumption behavior.

4.6.3 Mediation Model Explanation

The proposed structural model conceptualizes perceived value as the main transmission mechanism between antecedent variables and Steam game consumption. Therefore, the mediation analysis focused on examining the significance and relative strength of indirect effects.

The results demonstrate that perceived value provides an important pathway linking users' perceptions, expectations, and psychological factors with Steam game consumption. Through the formation of perceived value, different platform-related factors are transformed into consumption decisions among Chinese university students.

4.7 Hypothesis test results

Table 4. 11 Hypothesis test results

Hypothesis	Path	β	P	Result
H1a	PP → PV	0.140	0.003	Supported
H1b	PRP → PV	0.121	0.021	Supported
H1c	POP → PV	0.131	0.013	Supported
H1d	PEA → PV	0.118	0.014	Supported
H2a	GQE → PV	0.145	0.012	Supported
H2b	FPE → PV	0.116	0.021	Supported
H2c	PRE → PV	0.126	0.012	Supported
H2d	PICE → PV	0.101	0.029	Supported
H3	SGP → PV	0.115	0.017	Supported
H4	PV → SGC	0.458	<0.001	Supported

The proposed hypotheses were examined using the structural equation model. The significance of each hypothesized relationship was evaluated based on the standardized path coefficient (β) and p-value. A hypothesis was considered supported when the path coefficient was statistically significant ($p < 0.05$).

4.7.1 Effects of Perception Factors on Perceived Value

The results of hypothesis testing show that all perception-related hypotheses were supported. Product perception (PP), price perception (PRP), promotional perception (POP), and platform environment perception (PEA) had significant positive effects on perceived value (PV).

Specifically, product perception had a significant positive effect on perceived value ($\beta = 0.140$, $p = 0.003$). Price perception also significantly influenced perceived value ($\beta = 0.121$, $p = 0.021$). Promotional perception had a significant positive effect on perceived value ($\beta = 0.131$, $p = 0.013$), while platform environment perception significantly affected perceived value ($\beta = 0.118$, $p = 0.014$).

Therefore, H1a, H1b, H1c, and H1d were supported.

4.7.2 Effects of Expectation Factors on Perceived Value

The hypothesis testing results indicate that all expectation-related hypotheses were supported. Game quality expectations (GQE), future price expectations (FPE), promotional revenue expectations (PRE), and platform information credibility expectations (PICE) significantly influenced perceived value.

Specifically, game quality expectations showed a significant positive effect on perceived value ($\beta = 0.145$, $p = 0.012$). Future price expectations significantly affected perceived value ($\beta = 0.116$, $p = 0.021$). Promotional revenue expectations had a significant positive effect on perceived value ($\beta = 0.126$, $p = 0.012$), and platform information credibility expectations also significantly influenced perceived value ($\beta = 0.101$, $p = 0.029$). Therefore, H2a, H2b, H2c, and H2d were supported.

4.7.3 Effect of Psychological Factors on Perceived Value

The results indicate that Steam game psychology (SGP) had a significant positive effect on perceived value (PV), with a standardized path coefficient of $\beta = 0.115$ ($p = 0.017$). Therefore, H3 was supported.

4.7.4 Effect of Perceived Value on Steam Game Consumption

The results show that perceived value (PV) had a significant positive effect on Steam game consumption (SGC), with a standardized path coefficient of $\beta = 0.458$ ($p < 0.001$). Therefore, H4 was supported

4.7.5 Summary of Hypothesis Testing Results

Table 4.11 summarizes the hypothesis testing results. The results indicate that all proposed hypotheses (H1a–H1d, H2a–H2d, H3, and H4) were supported. The perception factors, expectation factors, and psychological factors significantly influenced perceived value, while perceived value significantly influenced Steam game consumption behavior.

CHAPTER 5
DISCUSSION AND RECOMMENDATIONS

5.1 Conclusion

Based on the analyses presented in Chapter 4, this study collected a total of 483 valid questionnaires from Chinese university students who have experience using the Steam platform. Through descriptive statistical analysis, reliability and validity testing, confirmatory factor analysis, structural equation modeling, and bootstrap mediation analysis, the proposed research model was empirically examined and validated. The results indicate that the respondents were mainly male students (59.4%) and predominantly aged between 18 and 22 years old (59.6%). Most respondents reported a monthly disposable income of RMB 1,001–2,000 and had several years of experience using Steam, suggesting that the sample possessed sufficient platform familiarity and purchasing experience to support the objectives of this study.

The findings reveal that the four dimensions of the 4P framework, namely product perception, price perception, promotional perception, and platform environment perception, all have significant positive effects on perceived value. This suggests that Chinese university students evaluate not only the quality and content of games but also pricing fairness, promotional attractiveness, and the overall platform environment when making purchasing decisions. At the same time, the four expectation dimensions derived from Expectation Confirmation Theory, including game quality expectations, future price expectations, promotional revenue expectations, and platform information credibility expectations, were also found to significantly and positively influence perceived value. In addition, Steam game psychology demonstrated a significant positive effect on perceived value, indicating that psychological satisfaction and emotional engagement play important roles in shaping students' perceptions of game value.

Furthermore, the results confirmed that perceived value has a significant positive influence on Steam game consumption behavior. The bootstrap mediation analysis also demonstrated that perceived value significantly mediates the relationships between 4P factors, expectation-related factors, Steam game psychology, and consumption behavior. Therefore, all proposed hypotheses in this study were supported. These findings indicate that Chinese university students' Steam game consumption behavior is not determined by a single factor but rather by the combined influence of marketing factors, expectation-related factors, and psychological factors. Perceived value serves as a key mechanism through which these factors are transformed into actual consumption behavior.

Overall, this study provides empirical evidence supporting the application of the 4P theory and Expectation Confirmation Theory in the context of digital game consumption. The results contribute to a better understanding of the psychological and behavioral mechanisms underlying Steam game consumption among Chinese university students and provide a theoretical foundation for improving platform operation strategies and enhancing user consumption experiences.

5.2 Answers to the Research Questions

5.2.1 Answer to Research Question 1

RQ1: What is the formation mechanism of purchasing psychology among Chinese university students on the Steam platform?

The results demonstrate that Chinese university students' purchasing psychology on the Steam platform is formed through the combined influence of perception factors, expectation factors, and psychological factors. Specifically, 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 significantly influence perceived value, which subsequently affects Steam game consumption behavior.

Therefore, the formation mechanism of purchasing psychology can be summarized as a value-based evaluation process in which multiple external and internal factors jointly shape perceived value and further influence consumption decisions.

5.2.2 Answer to Research Question 2

RQ2: In the context of the Steam platform, what manageable situational factors constitute the core drivers of the formation of Chinese university students' purchasing psychology?

The findings indicate that the core manageable situational factors include product perception, price perception, promotional perception, platform environment perception, game quality expectations, future price expectations, promotional revenue expectations, and platform information credibility expectations.

Among these factors, game quality expectations and product perception showed relatively stronger effects on perceived value, indicating that product-related factors are important drivers of purchasing psychology formation among Chinese university students.

5.2.3 Answer to Research Question 3

RQ3: How do information mechanisms such as price, promotion, reviews, and platform trust influence the purchasing psychology of Chinese university students?

The results show that information mechanisms influence purchasing psychology mainly through perceived value. Price information, promotional information, user reviews, and platform information credibility enhance users' evaluation of potential benefits and reduce uncertainty before purchase.

Therefore, information mechanisms affect purchasing psychology by helping users form stronger perceived value judgments rather than directly leading to consumption behavior.

5.2.4 Answer to Research Question 4

RQ4: Based on the formation mechanism of purchasing psychology among Chinese university students, how should the Valve platform optimize its product design and operation management?

The findings suggest that Valve should improve users' perceived value through multiple dimensions, including product information presentation, pricing strategies, promotional mechanisms, platform information credibility, and user experience optimization.

Therefore, Steam platform optimization should focus on enhancing value formation efficiency and reducing uncertainty during users' purchase decision-making processes.

5.3 Discussion

5.3.1 Discussion Related to O1

O1 aimed to explain the formation mechanism of purchasing psychology among Chinese university students on the Steam platform.

This objective was mainly addressed through the examination of the effects of perception factors, expectation factors, and psychological factors on perceived value. The results showed 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 had significant positive effects on perceived value.

These findings indicate that Steam purchasing psychology is not formed by a single factor, but through the integration of external platform information, consumer expectations, and internal psychological evaluations. Unlike traditional physical product consumption, digital games are experience-based products that cannot be fully evaluated before purchase. Therefore, users need to rely on available information, expected benefits, and psychological satisfaction to determine whether a game is valuable.

From the perspective of Expectation Confirmation Theory (Oliver, 1980; Bhattacherjee, 2001), consumers form expectations before purchase and continuously evaluate whether the expected benefits justify the cost. This study extends previous research by demonstrating that, in the digital game platform context, perceived value functions as a central psychological mechanism connecting multiple information cues and purchasing decisions.

5.3.2 Discussion Related to O2

O2 focused on identifying the core situational factors influencing the formation of purchasing psychology among Chinese university students on the Steam platform.

The results showed that all perception dimensions and expectation dimensions significantly influenced perceived value. Among these factors, game quality expectations ($\beta = 0.145$) and product perception ($\beta = 0.140$) showed relatively stronger effects,

indicating that game content quality and product characteristics play particularly important roles in students' value evaluations.

This finding can be explained by the experiential nature of digital games. Unlike ordinary products, consumers cannot fully experience gameplay, entertainment value, and long-term engagement before purchase. Therefore, students rely heavily on expected game quality and available product information to estimate whether the potential benefits are worth the purchase cost.

Furthermore, Chinese university students usually have relatively limited discretionary budgets, which makes value evaluation especially important. They are not only concerned with whether a game is attractive but also whether the expected entertainment benefits are sufficient compared with the monetary sacrifice. Therefore, purchasing psychology on Steam is jointly influenced by product characteristics, pricing mechanisms, promotional incentives, platform environment, and future expectations.

This finding supports the integration of the 4P framework and Expectation Confirmation Theory, demonstrating that digital game consumption decisions are based on multiple value-related evaluations rather than a single marketing stimulus.

5.3.3 Discussion Related to O3

O3 examined how information mechanisms, including price, promotion, reviews, and platform information credibility, influence purchasing psychology.

The results showed that price perception, promotional perception, future price expectations, promotional revenue expectations, and platform information credibility expectations significantly influenced perceived value. In addition, Bootstrap analysis confirmed that perceived value significantly mediated the relationships between antecedent variables and Steam game consumption.

The findings suggest that information mechanisms do not directly determine purchasing behavior; instead, they influence consumption decisions by helping users develop clearer value judgments. This mechanism is particularly important in digital game platforms because consumers often face information uncertainty before purchase. Users cannot fully evaluate game quality in advance and therefore depend on price information, promotional signals, screenshots, trailers, and user reviews to reduce uncertainty.

For Chinese university students with limited budgets, reliable information mechanisms help them determine whether a game provides sufficient entertainment benefits relative to its cost. Therefore, Steam's review system, promotional information, and platform credibility mechanisms serve not only as information sources but also as value formation mechanisms.

This extends previous studies on online reviews and trust by showing that, within the Steam context, information quality and platform credibility influence purchasing psychology mainly through perceived value formation.

5.3.4 Discussion Related to O4

O4 focused on providing optimization suggestions for Steam product design and operational management based on the identified purchasing psychology mechanism.

The results showed that perceived value had a significant positive influence on Steam game consumption ($\beta = 0.458$, $p < 0.001$). Furthermore, mediation analysis demonstrated that perceived value acted as an important transmission mechanism between antecedent factors and consumption behavior.

These findings suggest that Steam should not focus only on short-term promotional strategies, such as increasing discounts, but should enhance users' overall perceived value through multiple dimensions. For example, improving game information presentation, strengthening review credibility, optimizing recommendation systems, and enhancing wishlist reminder mechanisms can help users form more confident purchase evaluations.

Compared with traditional digital commerce platforms that mainly emphasize price incentives, Steam consumption depends more strongly on the combination of product experience, information transparency, psychological benefits, and platform support. Therefore, Steam's operational optimization should focus on improving the efficiency of value formation and reducing users' uncertainty during purchase decisions.

5.4 Research Limitations and Future Research

5.4.1 Research Limitations

Despite obtaining 483 valid responses, which provided an adequate sample size for structural equation modeling, this study has several limitations. First, convenience sampling and an online questionnaire were used to recruit Chinese university students,

mainly through Steam user communities, student forums, and related online channels. Consequently, the sample may contain a relatively high proportion of students who frequently use Steam, have a strong interest in digital games, or are more willing to participate in online surveys. Self-selection in web-based surveys may create selection bias and limit the generalizability of the findings to the broader population of Chinese university student Steam users (Bethlehem, 2010). Future studies should employ stratified or quota sampling and include respondents from different regions, university types, and educational levels.

Second, this study adopted a cross-sectional research design, in which all variables were measured at a single point in time. Although structural equation modeling identified significant relationships among product perception, price perception, promotional perception, expectation-related factors, psychological factors, perceived value, and consumption behavior, cross-sectional data mainly reveal statistical associations rather than actual temporal changes or causal processes (Rindfleisch et al., 2008). Therefore, the purchasing psychology formation mechanism identified in this study should be interpreted as a theoretically supported structural relationship rather than a complete description of how users' psychology develops over time.

Future research could employ longitudinal tracking to observe changes in users' purchasing psychology across different decision stages, such as adding games to wishlists, receiving discount notifications, evaluating reviews, and completing purchases. In addition, experimental designs could manipulate specific Steam platform factors, such as price discounts, promotional information, review presentation, and recommendation mechanisms, to further verify the causal effects of these factors on perceived value and consumption behavior.

Third, the independent variables, mediator, and dependent variable were measured using the same self-reported questionnaire. Although procedural controls such as anonymity, clear wording, and the separation of variable sections were applied, recall bias, social desirability, and consistency tendencies may still have caused common method bias. Such bias may inflate or reduce the observed relationships, particularly when predictors and outcomes are reported by the same respondents at the same time (Podsakoff et al., 2003). Future studies should combine questionnaire responses with objective behavioral data, such as actual Steam purchase records, gaming time, wishlist

changes, and promotional click behavior, and measure key variables at different times or from different sources.

Finally, although all nine antecedent variables had significant positive effects on perceived value, their standardized path coefficients ranged from 0.101 to 0.145, indicating that the individual effect of each antecedent was relatively modest. Perceived value had a stronger effect on Steam game consumption behavior ($\beta = 0.458$, $p < 0.001$); however, actual consumption may also be influenced by disposable income, game genre, peer influence, impulsive buying, self-control, gaming time, and the use of alternative platforms. Moreover, because this study focused exclusively on Steam, the findings may not be directly generalizable to the Epic Games Store, console platforms, or mobile gaming markets. Future research should incorporate additional economic, social, and behavioral factors and conduct cross-platform or multigroup analyses to examine the stability of the proposed model.

5.4.2 Future Research Directions

Future studies may expand the research population by including different age groups, occupational groups, and users from different countries or cultural backgrounds to enhance the generalizability of the findings.

In addition, future research may adopt longitudinal research designs to examine how purchasing psychology and consumption behavior evolve over time, especially during major Steam promotional events such as seasonal sales and game launch periods.

Future researchers may also incorporate additional variables, such as social influence, online community participation, game involvement, trust, and customer loyalty, to further explore the complex mechanisms underlying digital game consumption behavior.

Finally, comparative studies across different digital gaming platforms, such as Steam, Epic Games Store, PlayStation Store, and Xbox Marketplace, may provide deeper insights into platform-specific consumer behavior and contribute to the development of more effective platform management strategies

5.5 Recommendations.

5.5.1 Recommendations for the Steam Platform

The empirical findings indicate that perceived value is the key mechanism influencing Steam game consumption, and game quality expectations (β = 0.145) and product perception (β = 0.140) were the strongest factors affecting perceived value. Therefore, Steam should prioritize improving the presentation of game quality information and product-related content. Specifically, Steam can optimize store pages by providing more detailed gameplay demonstrations, clearer screenshots, developer information, system requirements, and trial experiences. These improvements can help users better understand expected game quality before purchase and reduce uncertainty regarding digital products.

In addition, price and promotion-related factors significantly influenced perceived value. Therefore, Steam may further optimize its pricing and promotional mechanisms by providing clearer historical price information, lowest-price records, discount comparison functions, and personalized wishlist discount notifications. Since university students often have limited discretionary budgets, transparent price information and timely promotion reminders can help users identify valuable purchasing opportunities and strengthen purchase confidence.

Furthermore, platform information credibility was found to positively influence perceived value. Since user reviews are one of the important information sources considered before purchase, Steam should continue improving its review management system by enhancing review authenticity identification, improving review classification functions, and providing more reliable evaluation summaries. These measures can reduce information uncertainty and improve users' trust in platform information.

Finally, Steam should further enhance personalized recommendation mechanisms by integrating users' preferences, game histories, and interaction behaviors. More accurate recommendations can increase perceived relevance, strengthen psychological satisfaction, and improve the overall consumption experience.

5.5.2 Recommendations for Game Developers

The results show that game quality expectations and product perception are the strongest determinants of perceived value. Therefore, developers should focus on improving actual game quality while effectively communicating product value. High-

quality gameplay, stable performance, continuous content updates, and innovative game design can strengthen users' expectations regarding future experience.

Moreover, developers should provide more comprehensive and realistic product information on Steam store pages. Detailed gameplay videos, development updates, feature explanations, and transparent descriptions can help users form accurate expectations before purchase. Since digital games are experience-based products, reducing the gap between expected and actual experience is important for improving perceived value.

Developers should also actively maintain communication with players through Steam communities, feedback systems, and update announcements. Continuous interaction can enhance psychological engagement and strengthen users' emotional connection with the game, thereby increasing long-term perceived value.

5.5.3 Recommendations for University Student Consumers

The findings indicate that university students' purchasing decisions are influenced by multiple factors, including game quality, price, promotion, platform information, and psychological benefits. Therefore, students should evaluate games based on overall value rather than relying only on discounts or temporary promotional activities.

Before purchasing, students are encouraged to consider multiple information sources, including gameplay demonstrations, user reviews, screenshots, and community discussions. Such information can help reduce uncertainty and improve the accuracy of purchase decisions.

Additionally, because promotional activities can increase purchasing motivation, students should establish reasonable consumption plans according to their financial conditions. Evaluating whether a game provides sufficient long-term entertainment value compared with its cost can help achieve more rational digital consumption.

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APPENDIXES

APPENDIX A

Questionnaire

Appendix A: Questionnaire

Psychological Driving Forces Behind Chinese University Students' Steam Platform Consumption Based on 4P and ECT Theories

This questionnaire is for academic research purposes only. All data will be processed anonymously and will not involve any personal privacy. Please answer based on your true situation.

Rating Criteria: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

Part 1 Screening Questions and Research Instructions

Q1. Are you a current student at a Chinese university (Associate's/Undergraduate/Master's/Doctoral degree)?

□ Yes □ No (If you select "No", the questionnaire will end automatically)

Q2. In the past 12 months, have you engaged in any of the following Steam-related activities? (Multiple selections allowed)

□ Browse game information

□ Add games to your wishlist

□ View or read user reviews

□ Participate in platform promotions

□ Purchase games or related digital content

□ Download, play, or use games on the Steam platform

□ No of the above → Questionnaire ends

Part 2 Demographics

Q3. Gender: □ Male □ Female

Q4. Age: □ 18–22 years old □ 23–26 years old □ 27–30 years old

□ 31 years old and above

Q5. Current Education Level:

□ Junior college Degree □ Bachelor's Degree □ Master's Degree

□ Doctoral Degree

Q6. Major:

□ Economics and Management

□ Engineering

□ Natural Sciences

□ Literature and Arts

□ Education

□ Law

□ Medicine

□ Social Sciences

□ Other: _____

Q7. Your Monthly Disposable Amount for Entertainment/Consumption:

□ Below 500 RMB □ 500–1000 RMB □ 1001–2000 RMB

□ 2001–3000 RMB □ Above 3000 RMB

Part 3 Steam Usage Habits (Background)

Q8. How long have you been using Steam:

□ Less than 1 year □ 1–2 years □ 3–4 years

□ 5–6 years □ 7 years or more

Q9. How often do you buy games (including DLC) on Steam on average?

□ Rarely buy □ About once every 6 months

□ Once every 2–3 months □ About once a month

□ 2 times or more a month

Q10. How often do you use the Steam Wishlist feature:

□ Frequently use □ Occasionally use

□ Rarely use □ Never use

Q11. What are the main types of games you play on Steam? (Multiple selections allowed, up to 5 items)

□ Action

□ Adventure

□ Role-Playing (RPG)

□ Strategy / Simulation

□ Casual / Indie

□ Sports / Racing

□ Other: _____

Q12. What mode do you play most often on Steam? (Single choice)

□ Primarily Single-player □ Primarily Team/Multiplayer

□ Both are roughly equal □ Depends on the specific game

Q13. What information do you usually refer to most before purchasing a game? (Select up to 3 items)

□ Game trailers/screenshots

□ Game introduction page

□ User reviews

□ Media/UP reviews

□ Discount amount/historical low price

□ Friend recommendations/social discussions

□ System requirements

□ Refund policy/risk considerations

□ Other:_____

Q14.What are your main reasons for playing Steam games? (Multiple selections allowed)

☐ Entertainment

☐ Relaxation and stress relief

☐ Sense of accomplishment

☐ Pass the time

☐ Make Money

☐ Other____

Q15. What are your main reasons for adding games to your wishlist? (Multiple selections allowed)

□ To save it for later

□ To wait for a discount

□ Limited budget

□ To observe changes in reviews/reputation

□ Interested in the game but haven't decided yet

□ Added after a friend's recommendation

□ Other: _____

Q16. What do you think are the key factors most likely to trigger your "want to buy" mentality? (Select up to 2 items)

□ Game content/gameplay □ Price □ Discount □ Reviews/ratings

□ Friend's recommendation

Q17.During which time period do you usually play games on Steam?

□ 00:00 – 05:59

□ 06:00 – 11:59

□ 12:00 – 17:59

□ 18:00 – 23:59

Part 4 4P

Note: Please select the level of agreement for the following statements based on your actual feelings (1 = strongly disagree, 5 = strongly agree).

(1) Product Perception

PP1. When browsing a game, I am first attracted by its content or gameplay.

PP2. I judge whether the game is worth paying attention to based on the information displayed on the page (screenshots/videos/descriptions).

PP3. I perceive the overall quality of Steam games as important when evaluating them.

PP4. I perceive Steam games that match my interests and preferences as more attractive.

(2) Price Perception

PRP1. I pay attention to whether the current price of the game is within my acceptable range.

PRP2. I judge whether the price matches the game's content/quality.

PRP3.I think the current price of many Steam games is relatively high.

PRP4.I compare the current price with my expected acceptable price before evaluating a game.

(3) Promotional Perception

POP1. Steam's discount events significantly increase my interest in purchasing games.

POP2. I pay attention to major promotional events such as the Summer Sale and Winter Sale.

POP3. Wishlist discount reminders make Steam promotions more noticeable to me.

POP4. Limited-time offers and countdowns make Steam promotions more attractive to me.

(4) Platform Environment Perception

PEA1.The information displayed on the Steam store page is clear and easy to understand.

PEA2. Steam provides sufficient product-related information on its store pages.

PEA3. Steam's payment process and purchase operation are relatively convenient for me.

PEA4. Steam provides a stable and reliable purchasing environment.

Part 5 Perceived Value

PV1. Overall, I think buying this type of game is worthwhile.

PV2. For me, the benefits (experience/fun) from this type of game outweigh the costs (time/money).

PV3. Compared to other forms of entertainment spending, buying games on Steam offers higher value.

PV4. Overall, I believe Steam game purchases provide good value for money.

Part 6 ECT

Note: The following questions focus on "pre-purchase expectations/expectations" (1 = strongly disagree, 5 = strongly agree).

(1) Game quality expectations

GQE1. I expect the actual experience of this game to be of high quality.

GQE2. I expect the gameplay and content of this game to meet my needs.

GQE3. I expect the overall completion of this game to be high and the experience to be stable.

GQE4.I expect this game to provide a stable and satisfying playing experience.

(2) Future price expectations

FPE1. I expect the price of this game to be lower in the future.

FPE2. I expect it to be more cost-effective after a period of time (such as a major sale).

FPE3. I expect the price of this game to fluctuate significantly with the promotional cycle.

FPE4. My expectations of future prices influence my evaluation of the current price.

(3) Promotional Revenue Expectations

PRE1. I expect to get higher returns (more cost-effectiveness) by purchasing during promotional periods.

PRE2. I expect major sales/discounts to significantly reduce my purchase costs.

PRE3. I expect promotions to increase my satisfaction of "getting a good price".

PRE4. I expect promotional information to provide useful price-saving opportunities.

(4) Platform Information Credibility Expectations

PICE1. I expect the reviews and ratings on Steam to be generally credible.

PICE2. I expect the information on the Steam page (tags/descriptions/configurations, etc.) to support my judgment.

PICE3. I expect Steam’s platform rules and policy information to be reliable.

PICE4.I expect the information provided by Steam to be accurate and trustworthy.

Part 7 Steam game Psychology

SGP1. Playing games on Steam helps me relax and relieve stress.

SGP2. Playing games on Steam brings me joy and pleasure.

SGP3. Playing games on Steam gives me a sense of accomplishment or satisfaction.

SGP4.Playing games on Steam makes my leisure time more enjoyable.

Part 8 Steam game Consumption

SGC1. I intend to buy games on Steam in the future.

SGC2. I am very likely to buy games on Steam in the near future.

SGC3. Overall, I am willing to allocate my budget to buying games on Steam.

SGC4. I have a positive intention to buy games on Steam.

Part 9 Open Question

Q17. (Open-ended question, optional) Please briefly describe: What thought process do you usually go through when forming a purchase intention on Steam?

APPENDIX B

Article

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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

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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; Bhattacherjee, 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.

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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). Bhattacherjee (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.

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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

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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).

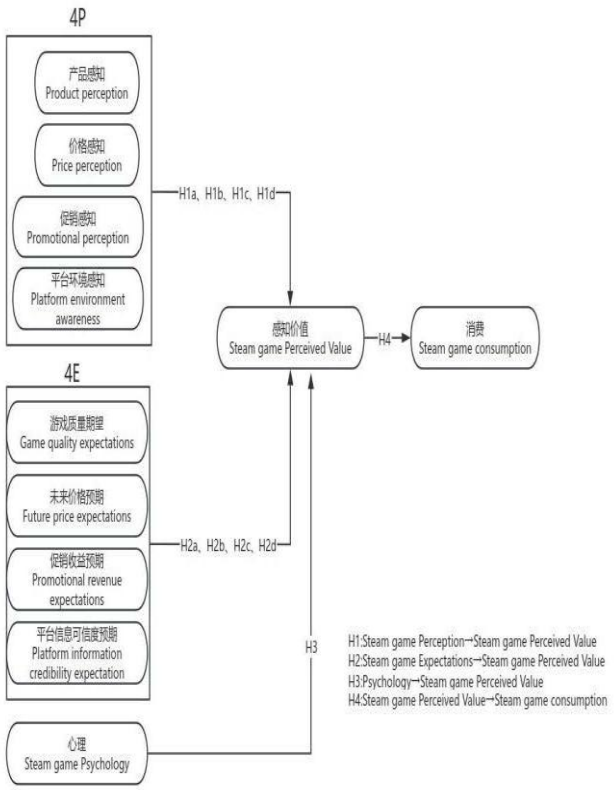


Figure 2.1

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

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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

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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

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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

Questiom	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	189	11.0%
	promotion activities	246	14.3%
	Purchase games or related	389	22.6%
	digital content	483	28.0%
	Download games from Steam		
Age	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%

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	Economic and Management	48	9.9%
	SocialSciences	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%
	Never use	81	16.8%
Time using the wish list feature	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 Played Mode	game	115	23.8%
	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	188	19.9%
	historical price	232	9.9%
	Friend	116	8.9%
	Aecommendations/Social	104	7.0%
	Discussions	82	7.6%
	System Requirements	89	12.1%
	Refund Policy/Risk	141	
	Considerations		
Main reasons	Entertainment	296	28.5%

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

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

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	PP4	3.282	1.102
Price perception	PRP1	3.358	1.216
	PRP2	3.391	1.190
	PRP3	3.333	1.191
	PRP4	3.381	1.188
Promotional perception	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 Expectations	GQE1	3.356	1.188
	GQE2	3.255	1.219
	GQE3	3.387	1.188
	GQE4	3.261	1.192
Future price expectations	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 Expectation	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.

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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 AIpha	AIpha
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	
Futrue 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	

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

Table4.4 KMO and Barlett's Test

	KMO	0.933
Bartlett Sphericity Test	Chi-square distribution	11083.465
	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		

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	PEA3	0.779		
	PEA4	0.758		
PV	PV1	0.782	0.872	0.631
	PV2	0.798		
	PV3	0.780		
	PV4	0.816		
GQE	GQE1	0.733	0.841	0.569
	GQE2	0.768		
	GQE3	0.766		
	GQE4	0.751		
FPE	FPE1	0.779	0.866	0.619
	FPE2	0.760		
	FPE3	0.807		
	FPE4	0.799		
PRE	PRE1	0.769	0.843	0.573
	PRE2	0.718		
	PRE3	0.729		
	PRE4	0.808		
SGP	SGP1	0.771	0.861	0.607
	SGP2	0.776		
	SGP3	0.780		
	SGP4	0.789		
SGC	SGC1	0.764	0.860	0.605
	SGC2	0.758		
	SGC3	0.805		
	SGC4	0.784		
PICE	PICE1	0.759	0.850	0.586
	PICE2	0.781		
	PICE3	0.754		
	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
$\chi 2$	-	940.971
df	-	856
$\chi 2$/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

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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 (β = 0.067), while PICE → PV → SGC was the smallest but remained significant (β = 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

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quality expectation (GQE) had the strongest effect on PV (β = 0.145), followed by product perception (PP) (β = 0.140), while platform information credibility expectation (PICE) had the weakest but still significant effect (β = 0.101). Perceived value had the strongest overall effect on Steam game consumption (SGC) (β = 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

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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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