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Behavioral Consequences of Value Perception in Steam Community Market Users

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ABSTRACT

Objective: besides free access to online games that adopt the free-to-play business model, players may purchase items to customize the game's appearance in a consumer-to-consumer (C2C) marketplace. However, the aesthetic value of the virtual items has yet to receive attention in the literature. For this type of game, this study examines a conceptual model of user participation in purchasing virtual goods, testing the relationships between perceived value dimensions (aesthetic, functional, and economic), continued usage intention, and word-of-mouth (WOM) recommendation, with attitude as a mediating factor. **Methods:** a survey sample of 157 Brazilian users was analyzed with structural equation modeling. **Results:** the three types of perceived value were supported as antecedents of attitude, which mediates the relationships between perceived value and the consequent intentions of reuse and WOM recommendation. The model's overall fit index is 64.61%, and its explanatory power is 44% for continued use intention and 64% for WOM recommendation. **Conclusions:** this study advances the understanding of the dynamics of C2C markets for virtual goods through an empirical analysis of the antecedents of loyalty, including the aesthetic dimension of perceived value. The findings indicate where the platforms can improve, for example, reinforcing the aesthetic value of virtual goods to promote connections with and among users, thus increasing continued use and WOM recommendation.

Data Availability: Barros, Francis; Veiga, Ricardo; Moura, Luiz; Torres Urdan, André; de Matos, Celso Augusto. (2024), "Data for Behavioral Consequences of Perceived Value Among Users in the Steam Community Market, published by BAR - Brazilian Administration Review", Mendeley Data, V1, doi: 10.17632/b5cp8smyfx.1. BAR – Brazilian Administration Review encourages data sharing but, in compliance with ethical principles, it does not demand the disclosure of any means of identifying research subjects.

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INTRODUCTION

This paper addresses consumption behavior on video game platforms, where users engage with electronic games via consoles, computers, or smartphones. In 2023, there were approximately 3.3 billion video game players worldwide, with the industry generating $180 billion in global revenue, projected to reach $207 billion by 2026 (Newzoo, 2023).

There are various business models in the video game industry. In the free-to-play model focused on this paper, usage is free, but players may purchase items, known as virtual goods (VGs), to customize the appearance of characters or objects (Bankov, 2019; Hamari, 2015; Lin & Sun, 2011; Marder et al., 2019). These items are intangible objects — such as clothing, weapons, coins, and other accessories — that modify the appearance of characters without affecting competitiveness (Hamari & Keronen, 2016; Lehdonvirta, 2009b; Yang et al., 2018). Thus, the free-to-play model and VGs emphasize aesthetics within the perspective of perceived value.

This study is grounded in the consumer value theory, articulated by Holbrook (1999) and collaborators, which defines 'perceived value' as the interactive, relative, and experiential evaluation of an object (usually a product) by a subject (usually a consumer). Value is understood as a multidimensional construct that may include, among others, functional, emotional, and social dimensions. Each dimension of perceived value can impact consumer attitudes, which, in turn, influence their intentions and behaviors (Dong & Gao, 2024; Homer & Kahle, 1988). Additionally, the nomological relationships within the theory of planned behavior (TPB) (Ajzen, 1991) are employed as a framework, which has already been applied to video games (Ho et al., 2022; Kahle, 1996; Liu et al., 2024).

Initially, research on VGs in online games focused on the applicability of legislation to regulate them (Lin & Sun, 2011; MacInnes, 2006; Sheldon, 2007) and managerial tools for their administration and distribution (Li & Kuo, 2007; Li & Shi, 2013; Ma et al., 2013; Wu et al., 2013; Yang et al., 2014). Subsequent studies examined motivation and perceived value (Hamari et al., 2017; Hassouneh & Brengman, 2011; Hildebrand & Majchrzak, 2014; Li, 2012; Shelton, 2010; Wang et al., 2013), the impact of socialization on consumption decisions (Hsieh & Tseng, 2018; Kanat et al., 2020; King et al., 2020; Wang et al., 2019; Zhao & Qiu, 2017), and the purchase of items based on chance (loot boxes) (Baeck & Claeys, 2021; Carvalho, 2021; Chen et al., 2020; Ide et al., 2021; Rockloff et al., 2021; Tan & Yang, 2022; Uddin, 2021).

However, the literature has neglected the aesthetic dimension of perceived value, limiting its consideration to more traditional value dimensions (economic, social, and functional) despite VGs being typically designed for aesthetic purposes. Some VGs are more functional, enhancing performance and accelerating player progression (Hamari & Keronen, 2017; Marder et al., 2019; Palmeira, 2021). Nevertheless, aesthetic VGs stand out as a more 'purist' resource, which does not unbalance the potential for success in the game for those who own them relative to their opponents (Marder et al., 2019).

Furthermore, the literature has primarily focused on business-to-consumer (B2C) markets for VGs, needing an understanding of alternative markets. Diverging from B2C, one study explored the acceptance of a VG auction system (Gumussoy, 2016), but this initiative remains purely conceptual. In the consumer-to-consumer (C2C) category of VGs, the Steam Community (https://steamcommunity.com) encompasses more than 100 games (Steam, 2024; Thorhauge & Nielsen, 2021), which serves as the empirical context for this paper.

Given the aforementioned gaps, this paper addresses the following research question: How do the dimensions of perceived value (including aesthetics) and attitude explain the intention for continued use and word-of-mouth recommendation of VGs in community-driven (C2C) markets?

This research question has theoretical relevance. First, it advances the understanding of VG consumption in online games, a relatively recent phenomenon. Second, it addresses C2C markets, highlighting their importance and specificities in VG transactions. Consumers typically do not choose the games they play based on existing VGs but expect game companies to invest in the platforms of their favorite games by offering more virtual goods (Hamari & Keronen, 2017). Third, it introduces the aesthetic dimension of perceived value into explaining this consumption, as aesthetics are fundamental to VGs (Lehdonvirta, 2009a; Marder et al., 2019). These theoretical contributions, in turn, offer several opportunities to improve the management of the substantial business of free-to-play online games and others, particularly in C2C markets.

LITERATURE REVIEW AND HYPOTHESES

This section outlines hypotheses by reviewing the constructs of the analytical model and integrating their respective literatures. It progresses from perceived value to attitudes toward using the Steam platform and, finally, to their behavioral consequences, namely, the intention for favorable word-of-mouth and continued use of the platform for trading virtual goods (VGs).

As a foundational theoretical framework, this study combines the theory of planned behavior (TPB) (Ajzen, 1991) and the theory of consumption values (TCV) (Sheth et al., 1991). TPB is utilized to predict and explain the intention for continued use and word-of-mouth recommendation. TCV provides insights into the values underpinning consumer choices, in alignment with similar studies in the literature (e.g., Pontes et al., 2024).

Perceived value, attitude, and usage intention

Although studied for decades, perceived value lacks universal conceptualization and measurement, with two primary approaches coexisting (Sánchez-Fernández & Iniesta-Bonillo, 2007; Sánchez-Fernández et al., 2009; Zeithaml et al., 2020). In the unidimensional approach, perceived value is a general utilitarian concept based on cognitive, economic, and ethical foundations, focusing on the relationship between benefits and costs. In the multidimensional approach, perceived value encompasses a broader range of dimensions and attributes (Holbrook, 1999; Sánchez-Fernández & Iniesta-Bonillo, 2007), interpreted as the subjective and interactive evaluation of an object's importance during an experiential preference process. This evaluation is subject to comparisons, varies among individuals, and changes depending on the situation (Holbrook, 1999). One scale for multidimensional perceived value is PERVAL, which includes functional, economic, emotional, and social dimensions (Sweeney & Soutar, 2001).

In the context of VGs, reviews identify perceived value as a precursor to purchase intention (Hamari & Keronen, 2016, 2017). In a meta-analysis, Hamari and Keronen (2017) reported a correlation of 0.42 between perceived value and VG purchase intention (with a cumulative sample of 759 consumers). In this meta-analysis, perceived value was treated from a unidimensional perspective (as the perceived ratio of benefits to prices), but the three studies included used multidimensional scales: (1) emotional, social, and functional value (Kim et al., 2011); (2) hedonic, character competence, visual authority, and monetary value (Park & Lee, 2011); and (3) functional, social, epistemic, and conditional value (Mäntymäki & Salo, 2015). The aggregation of results supports adopting a multidimensional approach to perceived value.

In this paper, perceived value is defined based on functional and economic dimensions, reflecting the video game platform's utilitarian and monetary aspects, respectively. Economic value expresses the reduction of perceived short- and long-term costs, while functional value emerges from the expected and realized practical benefits (Sweeney & Soutar, 2001).

We also examined the aesthetic dimension of perceived value, representing the hedonic consumption aspect that is particularly prominent in VGs. Lehdonvirta (2009a) highlighted the aesthetic value of VGs, though this dimension has played only a secondary role in related studies. This minor importance represents a gap, as VGs are generally designed to focus on pure aesthetics, even though they may also provide functional advantages, such as enhancing player competitiveness (Marder et al., 2019). Thus, the foundation of VG creation lies in their appearance.

The aesthetics of VGs are evaluated based on the emotional pleasure they provide through visual representations on the screen, animations, and sounds. The name and label of a VG, along with any fictional narrative associated with it, also contribute to its aesthetics. If the aesthetic elements of VGs are sufficiently appealing, user interaction with them may evoke pleasure (Lehdonvirta, 2009a). Furthermore, aesthetic value positively influences behavioral intentions to play (Kim et al., 2011; Wang & Hsu, 2019) and to consume virtual goods.

The following construct is the attitude, which refers to an individual's general, favorable, or unfavorable feelings toward a target object that stimulates them (Fishbein & Ajzen, 1975). The relationships between attitude, behavioral intention, and behavior have been studied since the 1970s (Ajzen, 1985; Fishbein & Ajzen, 1975), with evidence showing that attitude precedes behavioral intention, which, in turn, influences actual behavior. This nomological chain has been corroborated in recent studies across various types of attitudes (Alagarsamy et al., 2021; Amalia et al., 2019; Kim et al., 2011; Shin et al., 2019; Zhang & Zhang, 2022;) and specifically, in VG purchases, Hamari and Keronen (2017) also verified a positive correlation between attitude and purchase intention.

The relationship between attitude and continued use intention has been validated in technology contexts (e.g., Apostolou et al., 2017; Chiang, 2013; Cho et al., 2020; Ifinedo, 2017). For example, Chiang (2013) reported that attitude had the strongest direct effect on the intention to continue using social networking sites. Continued use intention is particularly relevant in scenarios where behavior recurrence is expected, as in the case of VGs in free-to-play online games, leading to sustained platform usage among peers.

Maio and Olson (1995) manipulated attitude functions to test hypotheses about their role in influencing the strength of value-attitude relationships, the patterns of these relationships, and the role of values in predicting behavioral intentions. Their results showed that individuals with an expressive value attitude, com-

pared to those with a utilitarian value perception, exhibited significant value-attitude relationships consistent with Schwartz's (1992) value associations model. These values predicted donation intentions even when attitudes, norms, and perceived control were included in the predictive equation.

In other relationships, perceived value influences attitude, which affects behavioral intentions (Alagarsamy et al., 2021; Amalia et al., 2019; Kim et al., 2021; Shin et al., 2019; Zhang & Zhang, 2022). This relationship has been explored in contexts similar to this paper. For instance, Jun et al. (2018) analyzed factors influencing the continued use of mobile payment services, concluding that perceived value positively affects continued use intention. Similarly, Luo and Ye (2019) examined antecedents of continued use intention for international online shopping sites, finding that perceived value positively influences continued use intention, with hedonic value having the most substantial effect. Hamari et al. (2020) identified that perceived value in freemium services is associated with continued use intention, with dimensions such as pleasure, social value, quality, and economic value all having positive effects.

Additionally, attitude mediates the relationship between perceived value and usage intention, acting as a bridge that enhances the impact of perceived value on intention. That is, perceived value alone does not lead directly or effectively to intention without a corresponding attitude. This mediating effect has been observed in diverse contexts, such as financial services (Munir & Harimukti, 2024) and durable goods (Pamungkas, 2023). Cognitive, emotional, and social mechanisms support the mediation. For instance, attitude influences cognitive evaluations of an object, leading consumers to form favorable attitudes when perceiving more value, thereby increasing their intention to use it (Pamungkas, 2023). Attitude also impacts emotional responses to the object, stimulating the intention to use it (Ahadzadeh et al., 2023). Finally, social influences (such as norms) can foster a positive (or negative) attitude toward the object, which tends to increase (or decrease) the intention to purchase and use it (Or, 2023; Yazeed et al., 2020).

Based on the above reasoning and using analogy and tentative generalization, attitude is expected to mediate the direct relationships between each dimension of perceived value and the intention to continue using VGs in an online game. Strengthening (or weakening) this attitude should intensify (or reduce) the effect on usage intention compared to the direct effect of perceived value. Despite this evidence, attitude cannot be framed as a universal mediator between perceived value and usage intention; this effect may depend on the specific context, requiring empirical examination (especially regarding the aesthetic value dimension, which remains underexplored in the literature). With these considerations, we propose the following hypotheses:

H1: Attitude mediates the relationship between aesthetic value and continued usage intention.

H2: Attitude mediates the relationship between functional value and continued usage intention.

H3: Attitude mediates the relationship between economic value and continued usage intention.

Perceived value, attitude, and word-of-mouth recommendations

Word-of-mouth (WOM) is a form of direct communication between individuals (Arndt, 1967). This informal exchange involves sharing experiences related to consumption and may include recommendations, warnings, or dissuasion (Westbrook, 1987). Specifically, consumer recommendations have been of interest to marketing professionals for a long time. In the digital market, its impact can be measured through product reviews, customer ratings, interactions on social networks, and other aspects. In this context, behavioral studies are essential for understanding its dynamics (Kundu & Rajan, 2016).

WOM is essential in complex and constantly changing markets, serving as one of the most influential communication channels. Its power stems from its credibility compared to marketing messages, as it is perceived as an unbiased opinion from ordinary people. Although WOM has always been relevant in shaping consumer opinions, its influence has grown with technological advancements and the emergence of new informal communication channels (Allsop et al., 2007).

The concept of electronic or online word-of-mouth (eWOM) is widely used. It refers to the informal exchange of information within online communities about products, services, or brands, where users share their experiences and perceptions (Cheung & Lee, 2012). The literature suggests that eWOM shifts the control of communication messages from companies to consumers. Initially regarded as a threat due to the potential for negative messages (Verhagen et al., 2013), its potential has since been recognized by academics and marketing professionals. With the rise of social networks and e-commerce, eWOM has become a central element in nearly all promotional and marketing activities (Ajina, 2019).

Giantari et al. (2021) investigated students consuming online content during the COVID-19 pandemic.

They found that perceived value had a positive effect on WOM, demonstrating this relationship's applicability on an online platform.

Perceived value contributes to consumer satisfaction, leading to positive WOM, as shown in the case of energy-efficient devices (Le & Nguyen, 2024). Specifically, a positive effect of perceived value on WOM was observed, though mediated by satisfaction.

Utilitarian and hedonic value perceptions positively influence attitude and anticipated satisfaction. This construct impacts engagement in eWOM within the WeChat social networking application. However, the author did not observe a direct influence of attitude on WOM (Pang, 2021).

When treating value perceptions (monetary, convenience, and epistemic) and attitude as antecedents of behavioral intentions (repurchase and WOM) in online shopping, Mosavi and Ghaedi (2012) found positive effects of these antecedents on behavioral intentions, with attitude exerting the stronger impact. Likewise, in the restaurant sector, Foroudi et al. (2021) identified a positive effect of attitude toward establishments (or brands) on revisit intentions and WOM engagement.

Although perceived value is a fundamental concept in consumer behavior, it does not always directly lead to WOM without the mediation of attitude (Hossain et al., 2018; Thavorn et al., 2022). A strong positive attitude tends to amplify perceived value's effects on WOM. In the domain of virtual reality devices, Jo (2023) identified attitude — particularly its emotional and social components — as fundamental in mediating and enhancing the impact on WOM recommendations.

Considering the aforementioned arguments, results, and caveats, as well as the theoretical premise of the theory of planned behavior (Ajzen, 1985) that positive (negative) attitudes positively (negatively) influence corresponding behavioral intentions, we propose the following hypotheses:

H4: Attitude mediates the relationship between aesthetic value and WOM recommendation.

H5: Attitude mediates the relationship between functional value and WOM recommendation.

H6: Attitude mediates the relationship between economic value and WOM recommendation.

A meta-analysis on the determinants of purchasing virtual goods (VGs) in online games, virtual worlds, and social networking sites highlighted three key points (Hamari & Keronen, 2017):

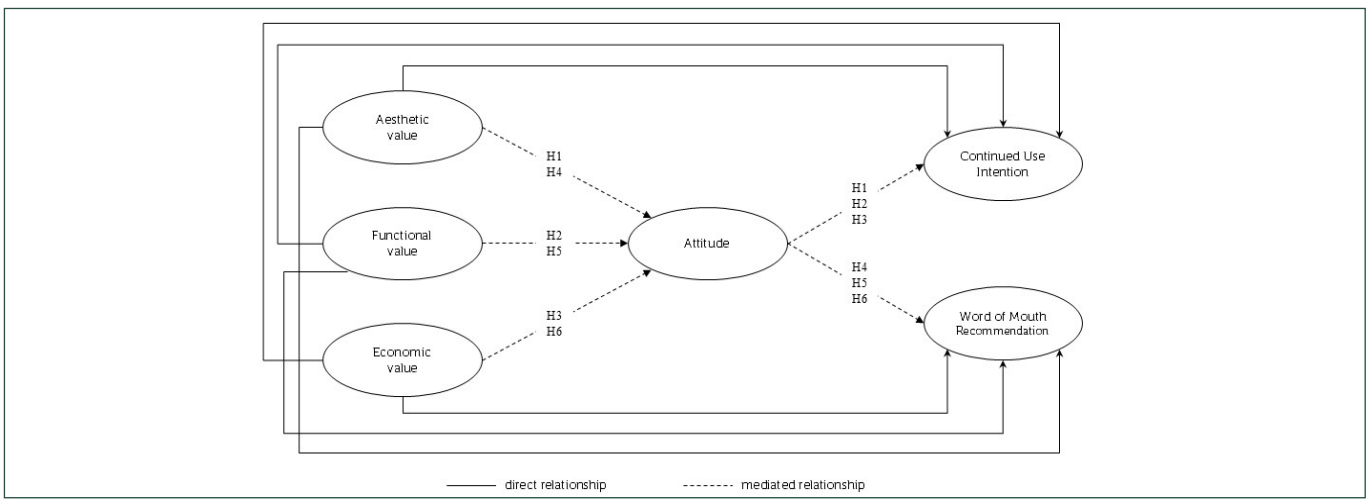
(a) The most studied variable was purchase intention;

(b) Operationalization of intention follows various theories and behavioral models, such as the technology acceptance model, the theory of planned behavior, and the unified theory of acceptance and use of technology;

(c) Among the explanatory variables of intention, attitude is the most influential (correlation of 0.66). These theoretical constructs explain behavioral intention, which precedes and predicts the corresponding actual behavior (Bagozzi et al., 2022).

Conceptual model

Figure 1 outlines this study's conceptual model, which incorporates the hypotheses formulated above. The following section presents the methodology and procedures employed for empirically testing the model.



Source: Developed by the authors.

Figure 1. Research model.

METHODS

A quantitative and descriptive survey-based study with a single cross-sectional design was conducted (Malhotra et al., 2017). The sampling of users from the Steam Community marketplace was non-probabilistic. Created using Google Forms, the questionnaire was distributed in gaming groups on Facebook, such as *Dota 2, Counter-Strike 2, and Don't Starve Together*, and promoted by partner streamers during live broadcasts on twitch.tv. The snowball sampling technique was employed, wherein participants referred the study to their contact networks until the desired number of valid questionnaires was obtained (n = 157).

The questionnaire included indicators for the model's constructs, measured on seven-point Likert scales, and demographic data. The scales were based on previous studies. In cases where no studies analyzing virtual goods were found, approximations were sought in the context of online platforms (whether for shopping or services). The attitude scales were adapted from Chang et al. (2015). The perceived value scales were adapted from Hamari et al. (2020), covering functional and economic value. The aesthetic value scale was adapted from Kim et al. (2011). The continued use intention scale was adapted from Cho et al. (2020). The word-of-mouth recommendation scale was based on Ribeiro's (2018) study, which validated it in Portuguese. All scales were translated and adapted accordingly.

The questionnaire was pre-tested with 17 academics and gamers, and adjustments were made based on feedback regarding clarity. Data collection took place between November 2023 and January 2024. The study was exempted from ethics committee approval as it involved collecting aggregated data without respondent identification.

Data analysis followed these steps: removal of duplicate cases, identification and treatment of univariate and multivariate outliers, and multivariate analyses, as detailed below. Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were used to establish and verify the factor structure of the constructs prior to hypothesis testing, adhering to best practices regarding minimum sample size, extraction methods, factor retention, and rotation procedures (Flora & Flake, 2017).

Structural equation modeling (SEM) was applied to test the model hypotheses and obtain the quality parameters of the theoretical model (Hair et al., 2013). JASP software (version 0.18.3) was used for conducting the exploratory factor analysis (EFA), and the R package plspm (Sanchez, 2013) was used for confirmatory factor analysis (CFA) and SEM, employing the partial least squares (PLS) estimator. This approach is appropriate for exploratory studies with relatively small sample sizes, considering the complexity of the models and the absence of multivariate normal data distribution. One disadvantage of PLS-SEM is the lack of well-established global fit indices to assess the adequacy between the model and samples (Ringle et al., 2014). This limitation was considered secondary due to the model's construction based on theories with extensive empirical support. The bootstrapping technique was applied to validate the path coefficients.

RESULTS AND DISCUSSION

The predominant gender in the sample was male (79%). Regarding age groups, the majority (59.8%) fell between 18 and 29 years old. Concerning household income, there was a higher concentration of individuals in class C (33.8%). Regarding education level, 31.2% of the sample had completed higher education.

The analyzed platform — the Steam Community Market — is a C2C (consumer-to-consumer) marketplace where users can buy and sell virtual goods related to Steam games. These items include, but are not limited to, collectible cards, badges, skins, and other cosmetic items. Sales made in the market add funds to the seller's Steam wallet, which can be used to purchase games, items, or other content on the platform.

Table 1 presents the results of the descriptive analysis and the exploratory factor analysis.

Table 1. Descriptive analysis and exploratory factor analysis.

Factors, items, and measurement properties	Mean	SD	λ	com.
Word-of-mouth recommendation (F1) (α = 0.944, VE = 22.2%)				
WOM1: I would recommend the Steam Community Market to my friends.	4.898	1.69	0.881	0.932
WOM2: I would say positive things about the Steam Community Market to others.	4.994	1.56	0.783	0.876
WOM3: I would encourage my friends to use the Steam Community Market.	4.764	1.72	0.838	0.846
Functional value (F2) (α = 0.9, VE = 16.8%)				
VFU1: The Steam Community Market has good quality.	5.229	1.432	0.732	0.675
VFU2: [...] is well-made.	5.172	1.507	0.999	0.901
VFU3: [...] works well.	5.280	1.506	0.897	0.783
VFU4: [...] functions as I expect.	5.064	1.73	0.731	0.675

(continue)

Table 1. Descriptive analysis and exploratory factor analysis. (continued)

Factors, items, and measurement properties	Mean	SD	λ	com.
Aesthetic value (F3) (α = 0.909, VE = 13.9%)				
VES1: The skins in the Steam Community Market are visually appealing.	5.306	1.35	0.849	0.801
VES2: [...] are aesthetically attractive.	5.217	1.31	0.876	0.826
VES3: [...] have features that I find appealing.	5.108	1.40	0.918	0.854
Economic value (F4) (α = 0.785, VE = 9.9%)				
VEC1: The skins in the Steam Community Market offer good value for money.	4.268	1.85	0.607	0.724
VEC2: [...] have better prices than skins sold directly by the game(s).	4.592	1.71	0.711	0.654
VEC3: [...] are inexpensive.	3.860	1.72	0.801	0.708
Continued use intention (F5) (α = 0.862, VE = 7.7%)				
INT1: I intend to continue using the Steam Community Market in the future.	5.439	1.46	*	*
INT2: I will try to use the Steam Community Market whenever possible.	4.045	1.86	0.580	0.751
INT3: I will continue to use the Steam Community Market regularly.	4.414	1.84	0.728	0.852
Attitude (F6) (α = 0.861, VE = 7.5%)				
ATI1: I find using the Steam Community Market enjoyable.	4.357	1.56	0.697	0.740
ATI2: I like using the Steam Community Market.	4.822	1.51	0.656	0.866
ATI3: I think using the Steam Community Market is a good idea.	5.331	1.43	*	*

Note. α and VE = Cronbach's alpha and explained variance; λ = factor loading; com. = commonality; SD = standard deviation; * = items excluded from the EFA for not meeting the requirements.

In the descriptive analysis, VEC3, INT2, and VEC1 exhibited the lowest means (3.86, 4.045, and 4.268, respectively). The highest means were observed for the variables INT1 (5.439), ATI3 (5.331), and VES1 (5.306). With two of the three variables in the economic value construct among the lowest means, there are indications of a perceived high price, probably due to the addition of fees to the value of the virtual goods at the time of the transaction. These fees include the maintenance of the marketplace service and payments to the companies behind the games related to the virtual goods being traded.

The variable INT2 had the highest standard deviation (1.858), followed by VEC1 (1.845) and INT3 (1.84). This result indicates that two of the three indicators of continued use intention show higher variability in opinions. The indicators of the aesthetic value construct exhibited the lowest standard deviations, showing greater consistency in the sample's perception of the visual appeal of the items available in the marketplace.

Considering the construct means, aesthetic value (5.21) and functional value (5.19) showed the highest averages, while economic value (4.24) had the lowest mean. Although 'functional' and 'aesthetic' might seem like competing dimensions, it is important to clarify that, in the context of this study, 'functional' refers to the platform's utility features, whereas 'aesthetic' pertains to the appearance of the items offered in the marketplace.

The skewness and kurtosis values were within the acceptable limits defined by Kline (2023), indicating that the distributions of the individual variables do not significantly deviate from a normal distribution. Additionally, no univariate or multivariate outliers were detected. Subsequently, exploratory factor analysis (EFA) was conducted.

Several methodological decisions should be highlighted. The unweighted least squares estimator was used, which is more appropriate for ordinal data (such as Likert scales) and does not assume normality (Esdar et al., 2017). We followed practices recommended by Rogers (2022), who harshly criticizes heuristics in EFA influenced by default settings in commercial software, as these often rely on outdated estimators, extraction methods, and rotation techniques from past computational limitations that have since been theoretically surpassed. Therefore, the EFA was based on polychoric correlations, better suited for ordinal data, and oblique promax rotation was applied instead of orthogonal rotations. The number of factors was fixed at six, based on prior knowledge of the constructs (Hair et al., 2013).

The EFA solution yielded a satisfactory explained variance (EV) value (78%). All variables presented values greater than 0.5 for commonalities and factor loadings, except for variables INT1 (I intend to continue using the Steam Community Market in the future) and ATI3 (I think using the Steam Community Market is a good idea), which exhibited factor loadings below the recommended threshold. As these variables did not meet this requirement, they were removed.

The factors reproduced the expected structure, meaning each factor represented a construct included in the theoretical model. Factors F1, F2, and F3 demon-

strated reliability above 0.9, indicating high consistency among their respective indicators. Factor F4 showed the lowest reliability at 0.785. Despite being the lowest value, it is still considered acceptable. Following this factorial solution, confirmatory factor analysis (CFA) was conducted.

In the CFA, all variables exhibited path coefficients above 0.8, except VEC1 (0.78). Values above 0.6 are considered good (Hair et al., 2013). All coefficients were validated using bootstrapping.

The composite reliability (CR) and average variance extracted (AVE) values were above 0.6, indicating evidence of convergent validity. Discriminant validity was also confirmed using the Fornell and Larcker (1981) criterion, which suggests comparing the square root of the AVEs with the correlations between constructs (Table 2). In this sample, all square root AVE values were higher than the correlations, indicating evidence of discriminant validity.

Table 2. Convergent and discriminant validity.

	AVE, CR, and correlations							
	AVE	CC	1	2	3	4	5	6
1. Functional value	0.768	0.900	**0.876**					
2. Economic value	0.694	0.785	0.336	**0.833**				
3. Aesthetic value	0.846	0.909	0.467	0.452	**0.920**			
4. Attitude	0.878	0.861	0.564	0.472	0.534	**0.937**		
5. Cont. use int.	0.879	0.862	0.373	0.535	0.383	0.589	**0.938**	
6. Recommendation	0.899	0.944	0.591	0.561	0.510	0.729	0.715	**0.948**

Note. AVE = average variance extracted; CR = composite reliability. The values highlighted on the diagonal refer to the square root of the average variance extracted for each construct.

This method of assessing discriminant validity has been criticized, particularly in research with smaller samples or contexts where the theory is not well-established. Therefore, it is recommended that it be supplemented with additional analyses. One such analysis is the examination of cross-loadings.

This verification aims to evaluate whether the items of a construct have stronger loadings on their construct than on others within the model. No critical values were identified in the cross-loading analysis. However, as expected, the indicators of the continued use intention construct showed loadings above 0.6 on the word-of-mouth recommendation construct and vice versa. This result was anticipated since these two constructs often serve as proxies for loyalty and, therefore, share considerable variance, i.e., they are highly correlated.

Structural equation modeling was conducted to test the proposed model. Eight out of the eleven proposed relationships in the model were supported without considering the effects of demographic covariates (Table 3 and the subsequent paragraph). All relationships were validated using bootstrapping at the standard significance level ($p < 0.05$). No significant effects of demographic covariates were found on the outcome variables.

Table 3. Results of the hypothesis tests.

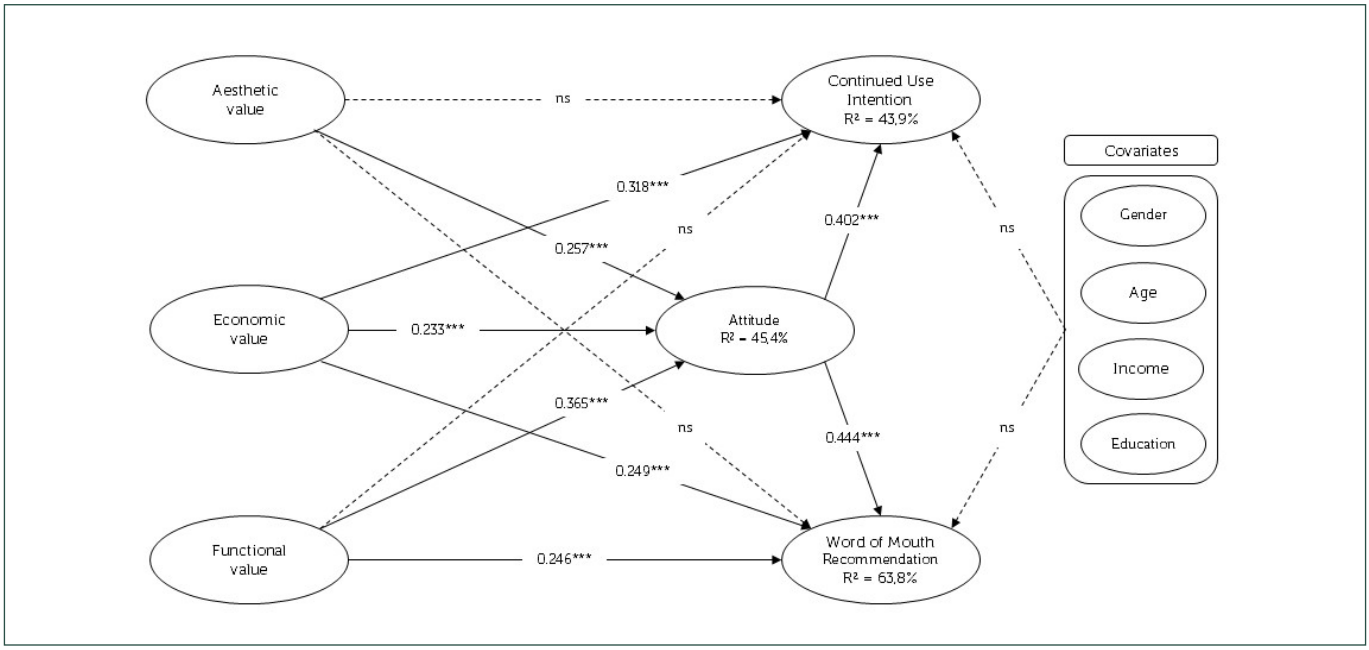
		SEM results		
	Relationship	Standardized coefficient	p-value	Result
Hypotheses	Aesthetic value → Attitude	0.257	0.000	Supported
	Economic value → Attitude	0.233	0.000	Supported
	Functional value → Attitude	0.365	0.000	Supported
	Attitude → Continued use intention	0.402	0.000	Supported
	Attitude → Recommendation	0.444	0.000	Supported
	Gender → Continued use intention	0.031	0.622	ns
	Gender → Recommendation	0.037	0.460	ns
Covariates				
	Age → Continued use intention	0.061	0.371	ns
	Age → Recommendation	0.011	0.830	ns
	Income → Continued use intention	0.041	0.553	ns
	Income → Recommendation	0.059	0.291	ns
	Education → Continued use intention	-0.015	0.831	ns
	Education → Recommendation	0.069	0.239	ns

Note. ns = non-significant.

Following the structure of the proposed framework, it is observed that attitude is a potential mediator between the perceived value dimensions and the behavioral variables (intention of continued use and word-of-mouth recommendation). The mediation analysis followed established guidelines in the literature (Vieira, 2009). Appendix A, available in Mendeley Data (https://doi.org/10.17632/b5cp8smyfx.1), presents a more robust test to verify the mediating effect of the attitude construct. The test revealed that attitude fully mediates the relationships v. aesthetic → attitude → recommendation and v. functional → attitude → continued use intention and partially mediates the relationships v. economic → attitude → continued use intention, v. economic → attitude → recommendation, and v. functional → attitude → recommendation. In other words, no direct relationship was found between value perceptions and word-of-mouth recommendation intention.

Figure 2 presents the model's standardized path coefficients and explained variance (R^2) values. Its goodness-of-fit (GOF) was 64.61%, and the R^2 values for continued use intention and word-of-mouth recommendation were 43.9% and 63.8%, respectively.

The GOF index is calculated as the geometric mean of the average communality and the model's average R^2 (Henseler & Sarstedt, 2013). This index is commonly used in models employing PLS estimators. It is as a reference in the absence of classical indicators calculated in covariance-based models (CFI, TLI, RMSEA, among others). The GOF represents the overall explanatory power of the model, and a value above 60% is recommended (Sanchez, 2013).



Source: Developed by the authors. *** = p < 0,001.

Figure 2. Main findings of the research model.

Hypotheses H1, H2, and H3 were supported, validating the mediation of attitude between the value dimensions and continued use intention. The same was true for hypotheses H4, H5, and H6. The following paragraphs relate the findings to results from previous studies.

The results concerning the relationship perceived value → attitude are consistent with the findings of Alagarsamy et al. (2021) on environmentally responsible consumer behavior, which also identified that perceived value significantly influences the formation of consumer attitudes. Other results consistent with this study include those from Shin et al. (2019), where hedonic value (β = 0.47; p < 0.05) and utilitarian value (β = 0.42; p < 0.05) significantly influence consumer attitudes toward food trucks. Similarly, Amalia et al. (2019) found that functional, symbolic, and experiential values significantly affect consumers' affective attitudes toward luxury brands. Zhang and Zhang (2022) demonstrated that functional, emotional, and social values significantly influence consumer attitudes toward using digital coupons issued by the Chinese government. Finally, Kim et al. (2021) showed that social, emotional, epistemic, and environmental values influence attitudes toward circular economy products across four sample groups.

Regarding the relationship between attitude → intention of continued use, the study by Alagarsamy et al. (2021) examined two types of attitudes: willingness attitude, which refers to consumers' preference for adopt-

ing a specific behavior, and behavioral consistency attitude, which indicates the alignment between consumers' beliefs and their future behavioral intentions. In both cases, the results align with those of the present study, as willingness attitude (β = 0.340; p = 0.001) and behavioral consistency attitude (β = 0.304; p = 0.002) significantly influence behavioral intention. Other studies also corroborate the relationship between attitude and behavioral intention, such as Shin et al. (2019), reporting β = 0.50, p < 0.001; Amalia et al. (2019), with β = 0.340, p < 0.001; Zhang and Zhang (2022), with β = 0.61, p < 0.001; and Kim et al. (2021), with $\beta \geq 0.730$, p < 0.001, across four samples.

This relationship has also been supported by other investigations (Apostolou et al., 2017; Chiang, 2013; Cho et al., 2020; Ifinedo, 2017), which emphasize the explanatory role of the construct attitude in technology adoption contexts, extending the validity of this relationship to the context of continued use. These findings are consistent with the discussions presented in key action theories.

Concerning the effect of attitude on word-of-mouth recommendation, the study by Kim et al. (2021) also identified that attitude positively influences word-of-mouth recommendations ($\beta \geq 0.707$, p < 0.001). The results presented here represent a significant contribution, as the studied context involves C2C commerce, i.e., consumer-to-consumer transactions, where individuals rely on peer recommendations to assist in their purchasing decisions.

Another aspect to discuss is the mediating role of attitude in the relationships between perceived value and behavioral intentions. In the study by Alagarsamy et al. (2021), the relationships between perceived value, attitude, and behavioral intention are statistically significant, including for both types of attitude (willingness and behavioral consistency). Similarly, according to Shin et al. (2019), the indirect effect of hedonic and utilitarian perceived value on attitude and, subsequently, on behavioral intention is also statistically significant.

Additionally, some direct impacts were observed between perceived value dimensions and behavioral variables. An example is the effect of the perception of economic value on the intention of continued use. Another is the relationship between functional value → intention of continued use, which was not supported, suggesting that utilitarian aspects of the platform experience are insufficient to drive continued use. These findings partially corroborate previous studies in which all value dimensions were valid antecedents (Hamari et al., 2020; Jun et al., 2018; Luo & Ye, 2019). On the other hand, Luo and Ye (2019) have already identified that the hedonic dimension of value exerted a higher effect on behavioral intention, which may explain the observed relationship outcome.

Discussion

The literature review culminated in two main concerns, articulated in the research questions and motivated by the observed conservatism among some scholars of virtual goods consumption: the predominant focus on B2C purchase platforms and the disregard for the aesthetic dimension of value, an essential element for understanding virtual goods, whether in terms of design (Lehdonvirta, 2009a) or market dynamics (Marder et al., 2019).

This paper contributes to the literature on virtual goods by proposing an explanatory model for behavioral intentions related to the continued use of the Steam platform for buying and selling virtual goods and engagement in favorable word-of-mouth about the platform. The study explored a novel context (C2C market) and revisited the foundational attribute of virtual goods — the aesthetic value.

The research supports the nomological chain of value → attitude → behavioral consequences by demonstrating that perceptions of aesthetic, functional, and economic value directly influence users' attitudes in the virtual goods marketplace on the Steam platform. These attitudes, in turn, impact the intention to continue trading these goods and to recommend the platform to others. These findings provide valuable insights into understanding this rapidly growing form of consumption.

Additionally, the study contributes to the marketing literature by offering knowledge about emerging consumption patterns, particularly within the C2C context of online gaming platforms. The research demonstrates originality by examining the role of aesthetic value and investigating the dynamics of the C2C market, which must be understood in depth to foster the consumption of virtual goods.

From a managerial perspective, this study contributes to understanding the virtual goods market by examining the value perceptions of the Steam Community Market, which is innovative in establishing a C2C system for buying and selling virtual goods. Previous research on online gaming has primarily focused on the direct sale of items. This study stands out by emphasizing the service associated with the product. The findings highlight the importance of investing in the aesthetic appeal of virtual items available for peer-to-peer trading, as this value dimension is positively associated with attitude toward the platform, indirectly explaining users' loyalty intentions.

CONCLUSIONS

Word-of-mouth (WOM) is a powerful tool in the online gaming industry, significantly influencing user engagement, brand recognition, and competitive positioning (Manuel & Tricahyono, 2018). Positive user experiences and the strategic electronic word-of-mouth (eWOM) analysis can enhance a game's market presence and shape consumer behavior (Su et al., 2016). eWOM is also central to platform economies, spanning industries from news media to the sharing economy (Babić Rosario et al., 2019). Credible social networks and online feedback mechanisms further amplify the effects of WOM, making it a critical factor for game developers and, we add, for platforms like Steam in their marketing and development strategies.

This study analyzed the antecedents of word-of-mouth recommendation and the intention of continued use of community marketplaces for buying and selling virtual goods. The proposed model is grounded in well-established theories of action and empirical findings from studies across various fields, particularly within e-commerce. The complexity of value perceptions was considered, assessing the explanatory significance of distinct value types, with a particular emphasis on aesthetic value, a fundamental attribute of virtual goods. Additionally, the mediating importance of attitude in the relationships between value perception and behavioral intentions, along with its theoretical and managerial implications, was highlighted.

Thus, this paper contributes significantly to the literature on virtual goods by exploring the C2C market and emphasizing the importance of aesthetics in the design of virtual goods. From a managerial perspective, the research reveals the importance of investing in the aesthetic appeal of items, demonstrating how this dimension can positively influence users' intention to reuse and recommend.

The C2C market for virtual goods, developed within digital gaming platforms, reflects the contemporary relevance of digital marketing, which embodies the aestheticization of society (Veiga et al., 2014). Such aestheticization is evident in the digitization of the economy, characterized by the use of distribution channels, communication tools, and marketing strategies driven by user behavior data. This Digital Era transforms consumer culture, steering business efforts toward developing information and communication technologies.

In digital marketing, the Steam Community Market can leverage digital strategies to promote games and virtual goods and reach its target audience. Developers and publishers can utilize content marketing to inform the community of updates. Game pages can be optimized with titles, descriptions, and tags that facilitate discovery through searches.

With access to detailed sales and player behavior data, developers can refine their marketing strategies, capitalizing on promotional events like the Summer Sales to maximize reach and conversions. In this way, digital marketing tools positively impact the visibility and sales success of virtual goods offered by the Steam Community Market.

This study would be complete only if it acknowledged its limitations. As a quantitative study with a non-random cross-sectional sample, the generalizability of the results might be limited. The theoretical boundaries, such as the selection of three specific dimensions of perceived value, also constrain the explanatory power of the models. While the study focused on the C2C market, investigating the effects of aesthetic value in traditional markets still needs to be explored.

Further research on the proposed models and their nested variations, employing probabilistic respondent sampling and covariance-based structural equation modeling (CB-SEM), is recommended to critique, consolidate, and expand the findings. Additional suggestions include securing more institutional support from Steam platform managers and registering the survey form on Amazon Mechanical Turk for international data collection.

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