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Linking gamers' competitive spirit and in-game impulse purchase: The need for popularity as a mediator and social competence as a moderator

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ABSTRACT

This study investigated the effects of competitive attitudes on in-game impulse purchase behaviors, focusing on the mediating role of the need for popularity and the moderating effect of social competence. Data collected from 234 participants via broadcasters on Discord and Twitch platforms was analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The findings confirm that the need for popularity fully mediates the relationship between competitive attitudes and in-game impulse purchases. Moreover, social competence was found to moderate this relationship negatively, indicating that individuals with lower social competence are more influenced by their need for popularity when making in-game impulse purchases. These insights highlight the significant impact of social dynamics and individual psychological traits on consumer behavior in gaming environments. Furthermore, these results emphasize the ethical imperative for game developers to implement protective measures to safeguard consumers from the potential negative effects of in-game impulse purchases.

1. Introduction

The video gaming industry's revenue is projected to hit US$282.30 billion by 2024, with a growth rate of 8.76% annually until 2027, and the number of users is expected to exceed 1.47 billion by 2027 (Statista, 2024). The purchase of games is now accompanied by a considerable market for in-game item transactions, reflecting a significant shift in gaming platform economics. Consequently, a large portion of game developers' revenue is arguably due to these in-game purchases (Balakrishnan & Griffiths, 2018). The advancement in online game design technologies has reached a point where gamers are consistently encouraged to purchase in-game items to improve their gameplay experience (Wang et al., 2021). Such in-game items have been recognized as prominent goods within the context of online consumption (Hamari, 2015). The perceived value of these digital assets, particularly characters and items, is a driving factor for their in-game purchases (Zhao et al., 2024). Analysts estimate that spending on in-game purchases will exceed $74 billion by 2025 (Gibson et al., 2023).

Regardless of the rising importance of in-game impulse purchases, most of the research in the literature has focused on general game purchasing behavior and online game purchasing. Interest in in-game impulse purchase has emerged over recent years, but these studies have put most of their focus on factors related to emotional states while playing games, the structure of the game, and perceptions and skills of players. For example, Ghazali et al. (2023) explored enjoyment, skill, challenge, and flow as key drivers of in-game purchase intentions, while Zhao et al. (2024) emphasized the role of cognitive absorption and the moderating effects of autonomy and competence in open-world games. Similarly, Rita et al. (2024) linked performance, hedonic content, social factors, and flow experiences to in-game impulse purchases, and An et al. (2024) found that emotional attachments, such as 'character attachment,' drive impulsive purchases. However, despite this very rapid growth in the number of studies, critical psychological traits of players, such as competitive attitudes, the need for popularity, and social competence, have remained largely unconsidered in the context of in-game impulse purchases.

Impulse purchase conveys a form of purchasing behavior that is unplanned, or better phrased, 'buy now and think later'. Individuals engage in such purchases for pleasure rather than out of actual need. They make these purchases when they feel emotional, and their behaviors are usually triggered by both external and internal stimuli (Lee et al., 2023). The research that focuses on online games indicates that psychological and emotional goals play an important role in determining how involved the players will be (Hemenover & Bowman, 2018), and these are actually among the triggers for impulse purchasing (Zhao et al., 2022). In-game purchases, which often occur when players are

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emotionally immersed in the game, are frequently regarded as impulsive and irrational (An et al., 2024).

In online video games, the need to win and show off in-game items as a display of social status compels players to spend money (Tamás et al., 2024). Research suggests that competitive attitudes directly influence how players measure success and, in turn, affect their likelihood of buying in-game items to demonstrate their accomplishments (Huang et al., 2024). It is also well known that gamers become more engaged and play longer in games when they are presented with competition (Harris et al., 2022), and this could perhaps trigger their buying tendencies (Balakrishnan & Griffiths, 2018; Jiao et al., 2022). However, while competition is known to motivate behaviors that target acquiring in-game items (Ghazali et al., 2023; Liao et al., 2020), psychological drivers for in-game impulse purchases remain largely unexplored and are the main purpose of this paper.

Exploring this gap could show how competitive attitudes and the need for popularity drive in-game impulse purchases, providing a clearer understanding of consumer motivations within digital environments. Accordingly, this study aims to answer the following research question:

RQ How do gamers' psychological factors, such as competitive attitudes, the need for popularity, and social competence, affect in-game impulse purchases?

This study also considers the possibility that other factors may mediate the relationship between competitive attitudes and in-game impulse purchases. Specifically, given the relationship between competitive attitudes and the desire to be liked by others, this study incorporates the need for popularity into the research model as a mediator and social competence as a moderator. While the need for popularity has previously been linked to impulse buying in the context of fashion products (Cengiz, 2017), it has not been examined in relation to video game purchases. Players may be motivated to buy certain in-game content to become or remain popular, and this behavior could vary based on their level of social competence, which reflects their ability to navigate social interactions successfully.

To better understand how competitive attitudes, the need for popularity, and social competence influence in-game impulse purchases, this research draws on two theoretical perspectives: social comparison theory (Festinger, 1954) and self-determination theory (Deci & Ryan, 1985).

Accordingly, this paper is organized as follows: (1) we review the literature and present the hypotheses; (2) we describe the methodology we used to evaluate the measurement and structural models; (3) we discuss our results in light of previous findings; and (4) we provide strategic recommendations for further study and real-world applications in the video game industry.

2. Theoretical background

2.1. Social Comparison Theory

Social Comparison Theory describes how individuals evaluate and measure their social status by comparing themselves with others (Festinger, 1954). According to this theory, social comparison is a cognitive process driven by an innate tendency to make conscious or unconscious comparisons (Keupp et al., 2019). This process involves evaluating one's own information, attributes, or status in comparison to others. Festinger (1954) proposed two directions for the social comparison process: upward comparison and downward comparison. In upward comparison, a person compares themselves to others who are in a better situation. In downward comparison, a person compares themselves to those who are in a worse situation. The outcomes of social comparison can vary based on the perceived level of similarity or difference. Consequently, social comparison influences people's self-perceptions, motivations, behaviors, and emotional responses (Gerber et al., 2018).

Social comparison may be especially prevalent in environments where social interaction is central and success is the primary focus (Esteves et al., 2021; Rita et al., 2024). For example, individuals with high popularity on social platforms are less likely to engage in upward social comparison, whereas those with a greater need for popularity are more likely to do so (Nesi & Prinstein, 2015). This tendency is evident in video game environments, where there are numerous opportunities for interaction and comparison with other gamers. In such contexts, gamers often evaluate their scores, achievements, unique cosmetic items, access to exclusive game areas, and overall success against others.

In upward social comparison, individuals want to be seen as better than other people in their social circle (Chen et al., 2024). This creates a competitive environment (Wolf et al., 2020), which makes "competency-oriented" products more appealing (Chen et al., 2024) and serves as a strong incentive for impulse purchases (Rita et al., 2024). Conversely, in downward comparison, individuals often hold a more positive self-evaluation, feel more competent, as a result, are less likely to make purchases when engaged in the social comparison process (Chen et al., 2024).

2.2. Self-Determination Theory

Self-Determination Theory (SDT) is a meta-theory of human motivation that describes how basic human needs serve as the regulators of individual motivations and influence well-being, pleasure, and satisfaction (Ryan & Deci, 2000). One of the sub-theories of SDT is Basic Psychological Needs Theory, which extends the concept of intrinsic motivation by addressing three innate psychological needs: autonomy, competence, and relatedness (Ryan & Deci, 2000). In this context, competence means the development and mastery of skills within a competitive environment, autonomy relates to the individual's desire to be the actor of his or her actions, while relatedness concerns connectedness with others to meet basic social needs.

These basic needs become intrinsic motivators in encouraging people to engage themselves with video gaming. While participating in a game, one develops and masters skills to achieve the need for competence and relatedness to attain meaningful solutions. Increased competitive behavior will add to the gamer's popularity due to increasing visibility and recognition and hence possibly serve as an extrinsic motivator (Moller et al., 2024; Türkay et al., 2023). With these needs being satisfied through video games, gamers are expected to experience greater enjoyment and satisfaction (Kosa & Uysal, 2022). Teng et al. (2024) provided a framework for understanding the psychological characteristics of gamers that lead to satisfaction in online games by applying self-determination theory to the design of game elements. Similarly, Moller et al. (2024) used Self-Determination Theory (SDT) to examine how the competitive aspects of digital games can either satisfy or frustrate basic psychological needs, ultimately influencing players' motivation and well-being.

Regarding impulse purchases through the lens of Self-Determination Theory (SDT), Zhang et al. (2023) found that autonomy and competence influence the online transaction experience and its continuity. Similarly, Badgaiyan and Verma (2014) demonstrated that an individual's shopping tendency (which can be understood as an expression of autonomy according to SDT) has a significant positive effect on impulse purchases. These studies supported that consumers who shop for pleasure and enjoyment are more likely to engage in impulse purchases (Lee et al., 2021). In light of previous studies, we consider that SDT is an appropriate framework to explain the mechanism underlying gamers' psychological needs and in-game impulse purchases.

These theoretical frameworks can explain how competitive attitudes, the need for popularity, and social competence interact in influencing in-game impulse purchases. More specifically, Social Comparison Theory explains how individuals' competitive attitudes and the need for popularity drive them to buy products to compare themselves favorably with others. On the other hand, Self-Determination Theory can shed

light on the role of social competence in this study using a configurational approach. In sum, this study aims to investigate how these variables jointly affect impulse purchases in gaming environments.

3. Literature review and hypotheses

3.1. In-game impulse purchase

Impulse purchase emerges from a suddenly developed urge that may trigger the need to acquire something right now, mostly for immediate satisfaction (Rook, 1987). Emotional states, psychological traits, self-esteem, self-control, and consumer self-image, are known to trigger impulse purchases (Deng et al., 2023; Gibson et al., 2023). Notably, impulse purchases are impulsive decisions that can disrupt consumers' planned shopping and budgets. This could lead to feelings of dissatisfaction with products and guilt (Iyer et al., 2020; Li et al., 2021; Rook, 1987). Consequently, impulse purchases have generally been regarded as negative and maladaptive consumer behaviors given that they are linked to regret and disquietude afterwards (Ahn & Kwon, 2022).

Impulse purchases have become deeply embedded in the fabric of online commerce. On the vast expanses of the internet, consumers are encouraged to make spontaneous, unplanned, and irrational purchases, referred to as online impulse purchases (Gulfraz et al., 2022). The facilitation of rapid payment and subscription services, epitomized by the common 'one-click buy' feature, has significantly increased the appeal and prevalence of such transactions (Unal & Park, 2023). This behavior resonates as particularly appealing and prevalent among the younger generation, who prioritize immediate pleasure and fulfillment in their purchases while often overlooking the potential negative consequences of their shopping decisions (Mason et al., 2022).

This study focuses on exploring in-game impulse purchases as a behavioral disorder characterized by a lack of control (Gibson et al., 2023; Müller et al., 2019). Research suggests that adolescents turn to video gaming as a way to satisfy their psychological and emotional needs, particularly when these needs are not being met in their offline lives (Allen & Anderson, 2018; Scerri et al., 2019). Consequently, this tendency may result in patterns of behavior resembling addiction in their impulse purchases within games.

In-game purchasing represents a core element of the gaming experience, offering players the chance to purchase various add-ons, including cosmetic items like clothing and skins, as well as game progression boosters and exclusive access items such as battle passes and special characters (Gibson et al., 2023). These purchases are often made on impulse. In addition, visual and auditory cues or pop-up advertising messages within a game can serve as stimuli, amplifying emotional engagement and driving impulse purchases during gameplay (Nuyens et al., 2016). Therefore, it is argued that gamers' quests for status and competitive advantage can predispose them to in-game impulse purchases, allowing them to satisfy their psychological needs by improving their virtual avatars or game capabilities. Additionally, most gaming platforms have streamlined the purchasing process by integrating pre-registered payment methods, simplifying and encouraging the act of buying within the gaming environment.

In a broader sense, the phenomenon of in-game impulse purchases is influenced by hedonic motives, emotional factors, and competitive motivations. Furthermore, it is recognized as maladaptive due to its potential adverse outcomes, including post-purchase regret, underdeveloped personal skills, and financial and psychological consequences.

The literature on in-game purchases has grown significantly in recent years, with most studies focusing on online game purchasing behavior in general. However, relatively few studies have specifically examined in-game impulse purchases. This gap is particularly critical, as in-game impulse purchases represent a unique and increasingly frequent behavior among players. While prior research has provided valuable insights into the general motivations for game purchases, it has not sufficiently addressed the psychological traits associated with in-game impulse purchase behavior. Therefore, the maladaptive nature of in-game impulse purchasing, with its ties to personality traits and potential negative outcomes, needs further investigation.

3.2. Competitive attitude

A competitive attitude is an inherent desire and psychological need to outdo or overcome competitors in order to achieve attractive goals (Li et al., 2022). Based on research, a competitive attitude is defined as the desire to win in interpersonal situations, which can be extended to the context of video games (Franken & Brown, 1995; Helmreich et al., 1980). Thus, in this study, we considered the competitive attitude based on the concept of the "desire to win," as it makes sense that gamers primarily compete to win in video games (Sepehr & Head, 2018). The win of the virtual gaming world is often accompanied by rewarding systems (Wang & Sun, 2020). Since winning in a game is often measured by achievements and awards, in-game impulse purchases become particularly significant (Rita et al., 2024). Gamers compete to acquire in-game rewards, seeking a competitive advantage that reinforces their self-perceived strength and skill relative to others (Liao et al., 2020; Sharma et al., 2021). Competitive drive is enhanced by the goal-oriented nature of most games, where winning is a primary pursuit (Liao et al., 2020). Under the lens of social comparison theory, competitive behavior emerges as individuals compare their assets and achievements in games with other gamers (Esteves et al., 2021). Therefore, individuals engage in impulsive behaviors to relieve the negative emotions resulting from social comparison (Chen et al., 2024). Similarly, research in other fields has demonstrated that in conditions where individuals experience arousal, this arousal stimulates their competitive attitudes, which in turn leads to impulse purchases (Li et al., 2023; Wu et al., 2021). These findings can be extended to video game environments through the model of competitive arousal. According to this theory, when gamers are exposed to competitive situations within games, they experience heightened arousal. Hence, this research recognizes the possibility of the impact of competitive attitudes on in-game impulse purchases. Researchers in the field of consumer behavior have extensively examined the effects of competitive attitudes on consumption behaviors (Redine et al., 2023; Yucel-Aybat & Kramer, 2018). Similarly, the significance of competition within the realm of gaming has also attracted considerable attention (Rieger et al., 2014; Song et al., 2013). However, the literature largely overlooks the influence of competitive attitudes on in-game impulse purchases.

Thus, this study investigates whether individuals with a competitive attitude engage in in-game impulse purchases to experience a sense of superiority among their peers. Based on these insights, we develop the following hypothesis.

H1. Competitive attitudes positively affect in-game impulse purchases.

3.3. The need for popularity

Popularity, within the scope of this research, is characterized by an individual's pursuit of validation and recognition from others, judgments often grounded in personal traits or their treatment by peers (Bukowski, 2011; Santor et al., 2000). This subjective perception encompasses concepts of prestige, prominence, and reputation among peer groups (Cillessen & Marks, 2011). Based on social comparison theory (Festinger, 1954), individuals evaluate their popularity by comparing themselves with others, either upward or downward. If they perceive their popularity to be lower than others, they may engage in behaviors aimed at satisfying their need for recognition and achieving greater prestige. Conversely, if they perceive their popularity as high, they are less likely to engage in upward social comparisons (Nesi & Prinstein, 2015). The concept of "the need for popularity" has recently been associated with involvement in purchase decisions and impulse buying, especially regarding fashion clothing (Cengiz, 2017).

The concept of the "need for popularity" is relatively new in online game research, compared to the well-established "need for affiliation." The "need for affiliation" refers to an individual's desire to build and maintain positive and meaningful social connections (Baumeister & Leary, 2017) and has been extensively studied in the context of online gaming (Huang et al., 2024; Hussain et al., 2023). It is associated with the pursuit of social interactions that foster emotional closeness and interpersonal bonds, as seen in studies showing that online gaming environments facilitate deep, meaningful relationships (Bhagat et al., 2020; Qin et al., 2021). In contrast, the "need for popularity" focuses on gaining recognition, status, and visibility among peers. While both concepts drive social motivations within gaming, the "need for affiliation" emphasizes altruistic and cooperative behaviors, whereas the "need for popularity" is often linked to competitive dynamics, where players seek social recognition as a marker of their success and superiority in the gaming environment.

Competitiveness captures the individual mindset of desiring to win over or be superior to others in different domains (Swab et al., 2024). With this, every time an individual engages in competitive activities, the need for social validation and recognition rises, which corresponds to an increasing need for popularity. This, in turn, nurtures the view that competitive individuals somewhat look for external approval in that they try to show others their performances (Tamás et al., 2024). Also, prior studies have already supported that highly competitive-driven individuals usually try to improve their social status by recognition from others (Ghazali et al., 2023). Therefore, we argue that competitive attitudes serve as a driving force for the need for popularity, as competition creates a desire for social recognition and validation. Accordingly, we propose the following hypothesis.

H2. Competitive attitudes positively affect the need for popularity.

Research has revealed that individual behaviors are not solely dictated by rationality; factors such as self-assertion or display can also drive individuals toward maladaptive behaviors (Corey, 2012). For instance, Rita et al. (2024) found that emotional factors can have a positive influence on the impulse purchase of in-game items. This study shifted focus from the rational to the irrational factors affecting in-game impulse purchases, assessing whether such behavior is driven by a desire for increased popularity within the gaming community. Consequently, we hypothesize that the need for popularity may lead to in-game impulse purchases. Based on these considerations, we formulated the following hypotheses.

H3. The need for popularity positively affects the in-game impulse purchases.

3.4. The need for popularity as a mediator

Individuals seeking to achieve popularity often put effort into developing and improving their online profiles and attempts to portray a more popular persona (Utz et al., 2012). This could be extended to gaming since the acquisition of in-game items by players may reflect similar motivations. For instance, the popularity of any individual in the gaming community is usually determined by his progress through the levels involved and also by the number of in-game possessions he has. The need for popularity in these communities is especially evident in multiplayer games. In these contexts, social interactions often revolve around in-game items. In-game items are very important since they can enhance a player's perceived status and success within the game environment. Additionally, these phenomena also involve competition, suggesting that the extent of a player's popularity or level progression may reflect their competitive orientation in the gaming community.

Competitive attitudes can significantly influence the need for popularity, as individuals with strong competitive drives often seek popularity to achieve social dominance, validation, and higher status. The pursuit of popularity becomes intertwined with the desire to build a reputation and assert superiority over others in social contexts. As a result, a player's desire to dominate others in a game may overlap with their need for popularity, resulting in a stronger impulse to make in-game purchases. By examining these combinations and overlaps, we aim to provide a more nuanced understanding of how competitive attitudes collectively impact in-game purchasing behavior, rather than treating them as isolated factors. Therefore, we developed the following hypothesis.

H4. The need for popularity positively mediates the relationship between competitive attitudes and in-game impulse purchases.

3.5. Social competence as a moderator

Social competence is a spectrum of different traits and, thus, it is often conceptualized as an individual's ability to interact effectively with others and utilize a diverse set of skills to achieve meaningful goals within social groups (Junge et al., 2020). It includes essential competence such as social skills, communication abilities, and adaptability to different social contexts (Reich, 2017). The perceived level of social competence influences the motivation behind individuals' behavior, as supported by self-determination theory (Liu et al., 2024). According to self-determination theory (SDT) (Ryan & Deci, 2000), individuals' basic needs drive their motivation for satisfaction. This study applied the SDT framework to examine the influence of social competence on impulse purchases within video games.

Individuals with high social competence typically navigate social scenarios successfully, form friendships, gain popularity, and establish a favorable status within social networks (Reich, 2017). When people perceive themselves as having high social competence, they are more likely to fulfill their social communication needs through real-life interactions and are less inclined to engage in video games or exhibit problematic behaviors (Kowert & Oldmeadow, 2013; Pirrone et al., 2024). Previous research has indicated that individuals who have their psychological and emotional needs met in real life are less inclined toward patterns of addiction, such as in-game impulse purchases (Allen & Anderson, 2018; Scerri et al., 2019).

Conversely, when social competence is low, individuals may face difficulties in establishing social interaction, which can lead to feelings of rejection or social exclusion (Zhang et al., 2021b). In response to such experiences, many turn to alternative ways to satisfy their social and psychological needs. This can include establishing social interactions and acquiring popularity among their peers in the virtual world. One common approach is to invest time in video gaming, where players can use games as social platforms to satisfy their need for social interaction and develop their social skills (Kowert & Oldmeadow, 2013; Przybylski et al., 2010). Research indicates that individuals who find social interactions challenging are often more immersed in video game environments (Hygen et al., 2020; Snodgrass et al., 2018). Moreover, as indicated by Pirrone et al. (2024) gamers who perceive themselves as having low social competence are more likely to exhibit problematic behavior when seeking rewards, compared to those with higher perceived social competence. This can manifest as impulse in-game purchases, where gamers attempt to compensate for their low perceived competence through extrinsic rewards. Similarly, Achterbosch et al. (2024) argued that behaviors often viewed as maladaptive on gaming platforms, such as expressing grief, can actually contribute to enhancing social competence. Game developers, acknowledging the value of social engagement, have integrated features into gaming platforms to bolster social connections (Jin et al., 2021). Türkay et al. (2023) suggested that when individuals perceive themselves as having low social competence, they are more likely to engage in less demanding activities, such as video games, to regain their sense of social competence. Following these findings, we came up with H_5.

H5. Social competence negatively moderates the relationship between the need for popularity and in-game impulse purchases.

3.6. The present study

Previous studies examining online impulse purchases have generally focused on linear relationships using certain theoretical approaches such as TAM, TPB, and SOR (e.g., Li et al., 2024; Tan & Chiu, 2024). However, our research investigates the relationship between competitive attitudes and in-game impulse purchases, considering factors such as the need for popularity and social competence. Therefore, we believe that the configurational perspective is more appropriate for our study as it captures the complexity of how psychological and social factors interact to influence impulse purchases in gaming environments. This approach allows us to understand not only the isolated impact of each variable but also how different combinations of these factors together explain in-game impulse purchase behavior more accurately.

In sum, the purpose of the present study is threefold. Initially, we investigate whether gamers' competitive attitudes positively affect in-game impulse purchases. Secondly, we examine whether the need for popularity mediates the relationship between gamers' competitive attitudes and in-game impulse purchases. Lastly, we test whether gamers' social competence negatively moderates the relationship between the need for popularity and in-game impulse purchases. Accordingly, we propose a model based on the hypotheses (see Fig. 1).

4. Materials and method

4.1. Participants and procedures

In January 2023, we conducted an online survey targeting active gamers on Twitch and Discord. We intentionally chose these platforms because of their key role in the gaming community, particularly in promoting live streaming and interactions between gamers, which can stimulate competitive arousal and impulse purchases (Chen & Zhang, 2019; Liu et al., 2023).

We distributed the survey link with the help of popular Twitch streamers. They shared the link with their viewers during live streams focused on Steam games. Similarly, Discord moderators shared the survey in announcement channels during discussions about Steam games. To ensure eligibility, participants confirmed that they had been actively playing games on Steam for at least the past three months and had previously made purchases through the platform. Respondents who did not meet these criteria were excluded.

Out of 313 returned questionnaires, 234 were deemed valid after excluding those who had not been actively engaged in gaming, had not made any in-game purchases, or had provided identical answers throughout. A G-Power analysis indicated a minimum required sample size of 198 to ensure sufficient statistical power (Faul et al., 2009), and we exceeded this with 234 valid responses. The final sample included 54.7% males and 45.3% females participants, as outlined in Table 1.

Table 1
Descriptive Statistics of participants.

	Demographic Characteristics	N = 234	
		N	%
Gender	Female	106	45.3
	Male	128	54.7
Age	16–20	88	37.7
	21–25	76	32.5
	26–30	54	23.0
	31 and above	16	6.8
Education	High school and lower	85	36.3
	Associate degree	38	16.2
	Bachelor	92	39.3
	Master and above	19	8.2
Game Category	Action	92	38.9
	Adventure	19	8.3
	Card games	4	1.4
	Puzzle	5	2.1
	Role-playing games	36	14.6
	Sport game	10	4.2
	Strategy	47	20.1
Average time spent in game per day	Simulation	21	9.0
	Less than 30 min	36	15.3
	30 _ 60 min	31	13.2
	61 _ 90 min	24	10.4
	91 _120 min	42	18.1
	More than 121 min	101	43.1

4.2. Measurements

We adapted our questionnaire from previous studies, making slight modifications in phrasing to enhance clarity, which resulted in a five-section questionnaire. The first section focuses on gathering demographic data, gaming preferences, and time spent gaming. The second section assesses social competence. The third section focuses on the need for popularity. The fourth segment investigates in-game impulse purchases, and the last section focuses on competitive attitudes. Appendix A shows the measurement items and their resources.

Social competence was measured using six items adapted from Anderson-Butcher et al. (2008), such as "I ask others if I can be of help." The scale demonstrated acceptable reliability and validity (CR = 0.90; Cronbach's α = 0.877; AVE = 0.619). We measured the need for popularity using a scale from Santor et al. (2000), comprising 12 items. The scale verified reliability and validity (CR = 0.94; Cronbach's α = 0.93; AVE = 0.605). An example item is "I have done things to make me more popular, even when it meant doing something I would not usually do." In-game impulse purchasing tendencies were measured using a scale from Zhang et al., (2021a), comprising 12 items. An example item is "I have a desire to buy things that do not pertain to my specific shopping goal when browsing the Steam website." The scale verified reliability and validity (CR = 0.94; Cronbach's α = 0.93; AVE = 0.569). Competitive attitudes were measured through a subscale addressing the 'desire to win', adapted from the work of Helmreich et al. (1980), and

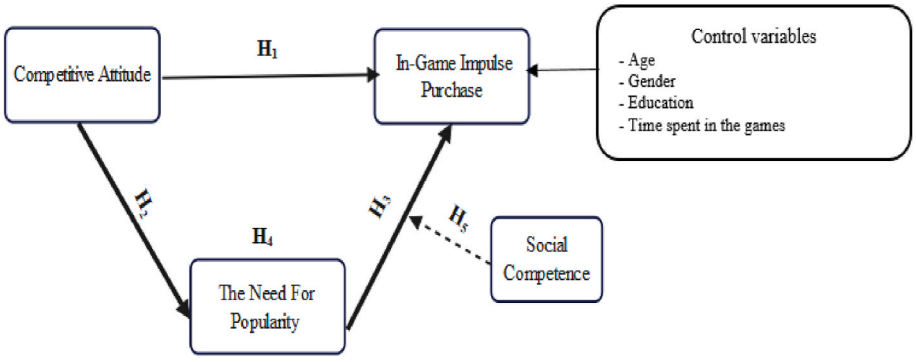

Fig. 1. The hypothesized conceptual model.

including statements like "It is important to me to do better than others on a task." The scale verified reliability and validity (CR = 0.88; Cronbach's α = 0.83; AVE = 0.609). Furthermore, participants rated all items on a 5-point Likert scale, ranging from "1 = strongly disagree" to "5 = strongly agree.".

4.3. Control variables

We added four control variables that could influence in-game impulse purchase behavior. These included time spent in the games, education, age, and gender. As previous research indicated, the amount of time spent playing daily affects purchasing patterns (Jiao et al., 2022). Additionally, demographic factors such as education, age, and gender play a critical role in shaping online impulse purchase behavior (Zhang et al., 2021a). The effects of the control variables on in-game impulse purchase are provided in Table 6.

4.4. Statistics analyses

We chose partial least squares structural equation modeling (PLS-SEM) for this study because it's well-known for handling complex relationships like mediation and moderation (Hair et al., 2019). Furthermore, PLS-SEM can achieve a higher level of statistical power compared to covariance-based structural equation modeling for small sample sizes (Hair et al., 2019). In addition, previous studies on online games have employed PLS-SEM (Tan & Chiu, 2024; Zhang et al., 2024).

In applying the PLS method, we began our analysis by assessing the measurement model to confirm its reliability and validity. This assessment included examining indicators such as Cronbach's alpha (CA), Composite Reliability (CR), Average Variance Extracted (AVE), and factor loadings. To ensure discriminant validity, we employed both the heterotrait-monotrait (HTMT) ratio and the Fornell-Larcker criterion. After assessing the measurement model, we evaluated the structural model. This included assessing the R^2 value to determine the model's explanatory power and the Q^2 value to indicate its predictive relevance. Finally, we calculated the path coefficients (β) and conducted hypothesis testing to verify the proposed relationships within our conceptual framework.

The mediation effect of the need for popularity on the relationship between competitive attitudes and in-game impulse purchases was examined using the bootstrapping method. This technique estimates the significance of the indirect effect by generating 5000 bootstrap samples, providing a robust assessment of the mediating role of the need for popularity. For the moderation analysis, we used the Simple Moderation Analysis tool in SmartPLS 4. This allowed us to incorporate the moderator variable directly into the link between the need for popularity and in-game impulse purchase. Using bootstrapping, we tested the significance of the moderating effect in a more streamlined and efficient manner. SmartPLS 4 was used to perform all analyses in this study.

5. Results

5.1. Test of common-method bias

In this study, measures recommended by Podsakoff et al. (2012) were employed to mitigate the potential common method bias. Initially, two statements (marker variables) were included in the survey: "Fashion clothing holds significant value for me" and "I lack interest in fashion clothes." These statements were chosen because they were theoretically perceived as unrelated to the remaining variables. The investigation revealed that the average correlation coefficients for these two statements were 0.025 and 0.034, respectively. As these were each less than 0.05, we can conclude that common method bias did not significantly impact this study (Rönkkö & Ylitalo, 2011).

5.2. Preliminary analyses

Table 2 presents descriptive statistics, including means, standard deviations, and correlations of the research variables. The results indicate that competitive attitude, the need for popularity, and social competence are all positively associated with in-game impulse purchases, with correlation coefficients of r = 0.417, r = 0.550, and r = 0.505, respectively.

5.3. Assessment of the measurement model

We evaluated the measurement model by examining convergent validity, discriminant validity, and internal consistency. We retained the factor loadings of all items with loadings exceeding 0.60. However, we excluded NFP11 from further analyses as its loading was below this threshold. Subsequently, we evaluated convergent validity using the Average Variance Extracted (AVE), which should exceed 0.50 to establish convergent validity (Hair et al., 2019). Our model surpassed this threshold, with AVE values of 0.605 for the need for popularity, 0.619 for social competence, 0.609 for competitive attitude, and 0.569 for in-game impulse purchase, confirming convergent validity. Furthermore, we established internal consistency reliability through Cronbach's Alpha (CA) and Composite Reliability (CR), both of which should exceed 0.70 (Hair et al., 2019). The results of these evaluations, as indicated in Table 3, confirmed the reliability of the constructs.

To assess discriminant validity in our study, we employed the Fornell-Larcker criterion, which asserts that discriminant validity is confirmed when the Average Variance Extracted (AVE) for each construct exceeds the square of its correlation with any other construct (Fornell & Larcker, 1981), Additionally, we applied the Heterotrait-Monotrait (HTMT) ratio, which should be below the threshold value of 0.90 (Henseler et al., 2016). Results presented in Table 4 indicate that all constructs in our study meet the criteria for discriminant validity.

Furthermore, we assessed the model's explanatory power using R^2 values, following Falk and Miller's (1992) recommendation that these values should equal or exceed 0.10. We also considered Q2 values for measuring the predictive performance of the model, which should be above zero (Falk & Miller, 1992). Based on the data presented in Table 5, our model demonstrates acceptable explanatory power and predictive performance.

5.4. Assessment of the structural model

Table 6 shows the results of the structural model. These results reveal that all path coefficients were significant except Hypothesis 1, indicating that the relationship between competitive attitudes and in-game impulse purchases was not significant; thus, H1 was not supported.

Hypothesis 1 posited that competitive attitudes would positively affect in-game impulse purchases; however, H1 was not supported by our analysis, which revealed a p-value of 0.205, indicating no direct effect (β = 0.099, t = 1.267, p > 0.001). Conversely, Hypothesis 2, which proposed that a competitive attitude would positively affect the need for popularity, was supported (β = 0.573, t = 11.165, p < 0.001). Hypothesis 3, suggesting that the need for popularity would positively influence in-game impulse purchases, was also supported (β = 0.442, t =

Table 2
Descriptive statistics and correlations of the constructs (N = 234).

Variables	M	SD	Correlation coefficients			
			1	2	3	4
1. Competitive attitude	3.21	1.08	_			
2. The need for popularity	2.86	1.20	0.568	_		
3. Social competence	3.94	0.78	0.214	0.118	_	
4. In-game impulse purchase	3.43	1.00	0.417	0.550	0.505	_

Table 3
Construct validity and reliability and factor loadings.

Construct	Items	Factor Loadings	CA	CR	AVE
The need for popularity	NFP1	0.728			
	NFP2	0.686			
	NFP3	0.784			
	NFP4	0.723			
	NFP5	0.805			
	NFP6	0.875	0.93	0.94	0.605
	NFP7	0.810			
	NFP8	0.720			
	NFP9	0.820			
	NFP10	0.807			
	NFP12	0.780			
Social competence	SC1	0.764			
	SC2	0.784			
	SC3	0.755			
	SC4	0.794	0.87	0.90	0.619
	SC5	0.794			
	SC6	0.826			
Competitive attitude	CA1	0.738			
	CA2	0.791			
	CA3	0.799	0.83	0.88	0.609
	CA4	0.763			
	CA5	0.807			
In-game impulse purchase	IP1	0.798			
	IP2	0.734			
	IP3	0.702			
	IP4	0.786			
	IP5	0.810			
	IP6	0.757	0.93	0.94	0.569
	IP7	0.718			
	IP8	0.751			
	IP9	0.723			
	IP10	0.749			
	IP11	0.785			
	IP12	0.729			

Notes:.CA: Cronbach's Alpha, CR: Composite Reliability; AVE: Average Variance Extracted.
Abbreviations: The Need For Popularity (NFP), Social Competence (SC), Competitive Attitude (CA), In-game Impulse Purchase (IP).

Table 4
Discriminant validity Fornell-Larcker criterion and heterotrait-monotrait ratio –HTMT.

	Fornell-Larcker				HTMT Ratio			
	NFP	CA	IP	SC	NFP	CA	IP	SC
NFP	**0.778**				–			
CA	0.568	**0.780**			0.612	–		
IP	0.550	0.417	**0.754**		0.566	0.454	–	
SC	0.118	0.214	0.505	**0.787**	0.165	0.247	0.560	–

Note: Bold values on the diagonal are the square roots of the AVE; AVE values are along the main diagonal.
Abbreviations: Need For Popularity (NFP), Social Competence (SC), Competitive Attitude (CA), In-game Impulse Purchase (IP).

Table 5
Research model R2 and Q2 values.

The dependent variable	R^2	Q^2
NFP	0.323	0.105
IP	0.530	0.239

Abbreviations: Need For Popularity (NFP), Impulse Purchase (IP).

6.390, $p < 0.001$).

Furthermore, our findings showed that the need for popularity acts as a mediator between competitive attitude and in-game impulse purchases ($\beta = 0.253$, $t = 5.541$, $p < 0.001$) (CI [0.171, 0.349]), thus confirming Hypothesis 4.

Results also revealed that social competence negatively moderates the relationship between the need for popularity and in-game impulse purchases in online gaming ($\beta = -0.147$, $t = 3.742$, $p < 0.01$) (CI [−0.230, −0.074]). This implies that individuals with higher social competence are less likely to engage in in-game impulse purchases driven by the need for popularity, thereby supporting Hypothesis 5.

6. Discussion

The results of the present study show that no direct relationship between competitive attitudes and in-game impulse purchases was found. However, the need for popularity fully mediated this relationship. Furthermore, social competence moderated the relationship between the need for popularity and in-game impulse purchases.

This study extends the literature by highlighting the role of the need for popularity as a full mediator, an aspect that has often been neglected within both consumer and gaming studies. Supporting our expectation in H4, this finding reveals that competitive attitudes alone may not be sufficient to drive in-game impulse purchases. Instead, the need for popularity plays a mediating role in this relationship. Moreover, individuals with competitive attitudes pursue popularity as a way to attain prestige, higher social status, visibility, and attractiveness. As Utz et al. (2012) defined individuals' need for popularity motivates them to engage in certain behaviors to appear popular. Their study argued that individuals with a high need for popularity are more likely to participate in social networks. Our study confirms this effect in the context of in-game impulse purchases, where individuals make purchases to enhance their perceived popularity. Our findings align with the study by Cengiz (2017), which demonstrated the positive effect of the need for popularity on impulse purchase behaviors. Our study also extends this insight to the virtual domain, suggesting that when gamers' need for popularity are influenced by competitive attitudes, it can positively impact in-game impulse purchases. This suggests that in-game impulse purchases are intertwined with individuals' need for popularity, as those who aspire to be popular or desire popularity in social interactions tend to make impulse purchases or succumb to such purchases.

In line with H5, our findings support the negative moderating effect of social competence on impulse purchase behaviors prompted by the need for popularity. This underlines that the higher the level of social competence, the less the likelihood that the need for popularity drives in-game impulse purchases. **Aligning** with this, Deng et al. (2023) argued that consumers who are less inclined toward social interactions in their real lives tend to pursue virtual social interactions and impulse purchases to make up for this deficiency. Our results are aligned with this, highlighting the importance of the need for popularity. Our findings are also supported by previous research on the deficit of social competence (Hygen et al., 2020; Snodgrass et al., 2018). According to these studies, a deficiency in social competence implies that individuals lack social skills, effective interaction with others, and a sense of popularity within social groups. Consequently, they tend to turn to active participation in gaming environments and exhibit addictive and maladaptive behavior to compensate for perceived social shortcomings. Moreover, Lou and Byun (2018) found that individuals facing psychological challenges related to social competence, such as social pressure, social rejection, deficits in social skills, and low self-esteem, are often driven to engage in overconsumption and impulse purchases. These behaviors help them regain a sense of competence within the society with which they interact.

Furthermore, this research highlighted the perception of gaming platforms as environments that fulfill individuals' psychological needs, including competitiveness, popularity, and social competence. This finding is supported by the research of Deng et al. (2023), which highlights that virtual experiences can serve as substitutes for real-life experiences. Therefore, it can be argued that gamers driven by competitive

Table 6
Structural model hypothesis testing.

Hypothesis	Paths	Std. Beta	SE	t-value	p-value	Decision
H1	Competitive attitude → In-game impulse purchases	0.099	0.076	1.267$^{(ns)}$	0.205	Not supported
H2	Competitive attitude → The need for popularity	0.573	0.051	11.165**	0.000	Supported
H3	The need for popularity → In-game impulse purchases	0.442	0.069	6.390**	0.000	Supported
Mediating effect of the need for popularity						
H4	Competitive attitude → The need for popularity → In-game impulse purchases	0.253	0.046	5.541**	0.000	Supported
Moderating effect of the social competence						
H5	Social competence * The need for popularity → In-game impulse purchases	−0.147	0.040	3.742**	0.000	Supported
Control Variables						
	Age → In-game impulse purchases	0.149	0.051	2.936*	0.003	–
	Gender → In-game impulse purchases	−0.031	0.045	0.672	0.502	–
	Education → In-game impulse purchases	−0.043	0.046	0.868	0.385	–
	Time spent in games → In-game impulse purchases	0.005	0.048	0.091	0.927	–

Note. $p < 0.05$**, $p < 0.01$, ns: not significant.

attitudes actively immerse themselves in virtual communities, seeking a sense of involvement similar to real-life social interactions. They view game platforms as environments where popularity can crystallize, and through in-game impulse purchases, they aim to satisfy their needs and achieve success.

7. Theoretical implications

Our findings provide valuable insights into social comparison and self-determination theories and enhance existing knowledge of these theories. The findings revealed that the need for popularity mediates the relationship between competitive attitudes and in-game impulse purchases. This finding can be extended by social comparison theory (Festinger, 1954), which suggests that in the gaming environment, competitive arousal arising from comparing gamers' assets and achievements with those of others can influence impulse purchase behaviors through indirect mechanisms, such as satisfying the need for popularity, envy, or enhancing visibility and appeal. Furthermore, self-determination theory (Ryan & Deci, 2000) suggests that the need for social competence influences individuals' motivations. Within the context of in-game impulse purchases, the theory indicates that gamers with a high perception of competence are less motivated to engage in in-game impulse purchases.

In line with SDT, our findings reveal a positive correlation between social competence and in-game impulse purchases. However, social competence is a negative moderator of the relationship between the need for popularity and in-game impulse buying. This result indicates that though individuals with higher social competence tend to make more in-game impulse purchases, their need for popularity results in fewer such purchases when social competence is higher. This relationship can be understood through the lens of Self-Determination Theory, which posits that individuals with greater competence experience a higher degree of intrinsic motivation and are less reliant on external validation (such as popularity) to fulfill their psychological needs. As a result, they are less likely to engage in impulsive consumption to satisfy social desires.

8. Practical implications

The findings of this research contribute to a deeper understanding of the psychological principles underlying in-game behaviors and offer practical insights for game developers. By considering these factors, developers can create a more engaging and psychologically harmonious game experience that enhances player satisfaction without promoting impulsive or maladaptive consumption behaviors. Understanding the impact of competitive attitudes and social competence on in-game impulse purchases enables developers to design games that encourage healthy competition and positive social interactions. Additionally, by fostering social competence among gamers, developers can potentially reduce the negative aspects of impulse purchasing behaviors.

Game developers and the video game industry should also consider the roles of the need for popularity and the desire to win in driving in-game impulse purchases. For example, they might invest in designing elements that provide players with a sense of superiority and popularity or develop items and outfits that enhance feelings of uniqueness. Similarly, game environments can target gamers' need for popularity by featuring elements that generate feelings of attraction and superiority, which can motivate in-game impulse purchases. However, developers should also prioritize players' social and individual well-being, recognizing that promoting responsible gaming practices is part of their social responsibility. Instead of solely focusing on profit-driven strategies, creating gaming experiences that support positive social interactions and mental health will benefit both players and the broader gaming community in the long run.

Furthermore, the findings of this study have profound implications in the field of consumer psychology and reveal the complex motivations behind in-game purchasing behavior. By understanding these underlying motivations, businesses can better adjust their marketing approaches. Marketing strategies can more effectively attract their target audience by focusing on the driving forces of popularity and competition. Finally, as the game industry continues to advance, developers must consider their social responsibilities and the ethical implications of in-game economies when designing and developing games. For instance, game developers and policymakers can use these insights to design policies and regulations that balance revenue growth with consumer well-being. By understanding the psychological factors that drive in-game impulse purchases, policymakers can encourage responsible gaming practices, potentially integrating features that limit excessive spending and promote more mindful consumption. Strategic decisions can also be made to develop programs that help gamers control social pressures in competitive digital environments. For instance, educational programs focused on digital social knowledge could increase gamers' awareness of social pressures and teach them how to handle such conditions.

9. Limitations and future research directions

This study offers significant and valuable insights but includes limitations that should be addressed in future research. Data collection from platforms such as Twitch and Discord may represent only a segment of the broader online gaming population. Users of these platforms often share unique interests or motivations, which potentially limit the generalizability of the findings. Expanding participant recruitment to a wider range of gaming environments, including mobile and console gamers, could enhance the validity and applicability of the findings. Additionally, future research could focus on comparing age, gender groups, and socio-economic factors within the context of this study. Examining different levels of gaming experience, such as regular versus professional gamers or mobile versus console gamers, could offer a more specialized understanding of how demographic factors influence in-

game impulse purchase behaviors.

Our analysis specifically focused on in-game items, but other aspects of gaming expenditures, such as the direct purchase of games, game subscriptions, and derivative products, remain unexplored. Future research could investigate other types of gaming expenditures to provide a more comprehensive understanding of impulsivity spending behaviors within gaming. Furthermore, future research could focus specifically on the effects of different categories of in-game items. This approach could offer specific insights into which types of items, such as cosmetic or functional, are more influenced by competitive attitudes and the need for popularity, ultimately driving impulse purchase behavior.

This study investigated the effect of competitive attitudes on in-game impulse purchases. Future research could explore the impact of performance goal orientation or mastery goal orientation on in-game impulse purchases within the context of this study. Additionally, while this study examines the interplay between competitive attitudes, the need for popularity, and social competence, other psychological constructs that were not explored may also significantly influence in-game impulse purchases. It is crucial for future research to take a broader approach, which investigates a wider range of psychological variables to gain a deeper understanding of the factors driving in-game impulse purchasing behavior. Specifically, future research could explore other in-game purchase configurations by incorporating variables such as addiction tendencies and cognitive load.

This study is limited to a cross-sectional design. Future research could consider conducting longitudinal studies to examine how gamers' impulse purchase behavior develops in response to changes in competitive attitudes, the need for popularity, and social competence over time. This approach would provide clearer insights into the dynamics of these factors and their long-term impact on in-game purchasing behavior.

Lastly, our focus has been predominantly on the personal psychological foundations of in-game impulse purchasing behaviors. However, another important consideration is that the architectural design of games themselves may have a significant effec on purchasing tendencies. Future research could explore the role of game design elements, such as the appeal of popular in-game items, and how these factors may influence or encourage gamers' impulse purchasing behaviors and preferences. By focusing on these areas, future studies could provide a more in-depth and comprehensive understanding of the complex dynamics within the digital gaming marketplace, ultimately enhancing our knowledge of consumer behavior in virtual economies.

CRediT authorship contribution statement

Hakan Cengiz: Writing – review & editing, Supervision, Methodology, Formal analysis, Conceptualization. **Arezoo Pouyan:** Writing – review & editing, Writing – original draft. **Hasan Azdemir:** Investigation, Data curation.

Ethics approval

The Institutional Review Board of Karabuk University approved all procedures performed in our study. All procedures were in accordance with the ethical standards of the 1964 Helsinki Declaration and its later amendments.

Data availability

The dataset is available from the corresponding author upon reasonable request.

Conflict of interest

The authors declare that they have no conflict of interest.

Statement

During the preparation of this work the author(s) used ChatGPT to improve the readability and language of the manuscript. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the published article.

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Appendix A

Social Competence (Anderson-Butcher et al., 2008)	
1	I am good at making friends.
2	I help other people.
3	I share what I have with others.
4	I ask others if I can be of help.
5	I get along well with others.
6	I do nice things for people.
The need for popularity (Santor et al., 2000)	
1	I have done things to make me more popular, even when it meant doing something I would not usually do.
2	I've neglected some friends because of what other people might think.
3	At times, I've ignored some people in order to be more popular with others.
4	I'd do almost anything to avoid being seen as a "loser."
5	It's important that people think I'm popular.
6	At times, I've gone out with people, just because they were popular.
7	I've bought things, because they were the "in" things to have.
8	At times, I've changed the way I dress in order to be more popular.
9	I've been friends with some people, just because others liked them.
10	I've gone to parties, just to be part of the crowd.
11	I often do things just to be popular with people.
12	At times, I've hung out with some people, so others wouldn't think I was unpopular.
In-game impulse purchase (Zhang et al., 2021a.)	
1	I feel tempted to purchase items outside my specific shopping goal when browsing Steam.
2	I have a desire to buy things that do not pertain to my specific shopping goal when I browse Steam.

(*continued on next page*)

(*continued*)

3	I have the inclination to purchase products outside my specific shopping goal when browsing Steam.
4	As I browse the Steam website, I have the urge to purchase products other than or in addition to my specific shopping goal.
5	I have a desire to buy product items when the content from Steam reminds me of the products that could arouse my interest.
6	I have the urge to purchase product items when the commercial advertising on Steam reminds me of the products that could arouse my interest.
7	I have a desire to purchase product items when the detailed information from Steam reminds me of the products that could arouse my interest.
8	I have the urge to buy the product items if it provides good quality when I browse a product on Steam for the first time.
9	When I browse a product from Steam for the first time, I would be easily attracted to buy the product based on its visual features.
10	Although I enter Steam platform with some specific purchases in mind, I have the inclination to buy other product items which provide a discount or better offer.
11	Although I enter Steam platform with some specific purchases in mind, I have the urge to buy other product items with sales promotion.
12	Although I enter Steam platform with some specific purchases in mind, I have a desire to purchase other more popular games.
Competitive attitude (Helmreich et al., 1980)	
1	To be a real success feel I must do better than everyone I come up against.
2	It is important to me to do better than others on a task.
3	I feel that winning is important in both work and games.
4	I judge my performance on whether I do better than others rather than on just getting good results.
5	It annoys me when other people perform better than I do.

Appendix B

Definitions of Key Variables Within the Scope of Our Research		Sources
Competitive attitudes	A competitive attitude refers an inherent desire and psychological need to outdo or overcome competitors in order to achieve attractive goals.	(Li et al., 2022)
The need for popularity	The need for popularity refers an individual's need for recognition, validation, prestige, attractiveness, fame, and prominence.	(Bukowski, 2011; Santor et al., 2000)
Social competence	Social competence refers to an individual's social skills, adaptability to various social contexts, and ability to interact effectively with others.	(Junge et al., 2020)
In-game impulse purchase	In-game impulse purchase refers to the sudden and unplanned decision to purchase items offered in the game without thoughtful consideration.	(Gulfraz et al., 2022; Rook, 1987)

Data availability

Data will be made available on request.

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