

From 2D Characters to Digital Companions: Emotional Bonding Mechanism Between Anime Players and Virtual Characters on Continued Participation Intention

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Abstract

This study investigates parasocial relationships between players and virtual characters in anime-style games, exploring their evolution from perceived "two-dimensional figures" to "digital companions". Integrating parasocial relationship theory and self-determination theory, it examines how these evolving relations influence willingness to continue participating through the satisfaction of three basic psychological needs: perceived autonomy, perceived sense of achievement, and perceived sense of belonging, which serve as mediating variables. Based on social role theory, gender is included as a control variable to test potential gender differences. A questionnaire survey collected 220 valid responses. Results show that parasocial relationships positively predict continuous participation intention, with all three psychological needs mediating this effect. Gender does not significantly moderate any mediation paths. These findings enhance theoretical understanding of digital gaming user behavior and offer practical implications for anime-style game developers.

Keywords: *Perceived Autonomy, Perceived Sense of Achievement, Perceived Sense of Belonging, Continuous Participation Intention, Parasocial Relationship Theory, Self-determination Theory*

1. Introduction

The term *nijigen* (two-dimensional) originated in Japanese, initially denoting "two-dimensional," and later extended to refer to the virtual worlds constructed by anime, manga, games, light novels, and their derivative cultures. Anime-style games adopt a Japanese anime aesthetic as their core visual identity and deeply integrate character progression, narrative experience, and social interaction (Chen & Zhang, 2023). In recent years, driven by the increasing performance and portability of mobile devices, anime-style games have witnessed explosive growth. According to a Newzoo (2023) report, anime-style games now account for 18.2% of mobile game market revenue, with an annual growth rate of 22.4%. China, as the world's largest anime-style game market, recorded actual sales revenue of RMB 31.82 billion in 2023–2024, with the user base exceeding 180 million. However, market concentration is extremely high: the top five titles contribute over 60% of market share, and it has become increasingly difficult for new releases to break through (Gamma Data, 2023–2024). Given that virtual characters occupy a central position across various gameplay types in anime-style games, this study focuses on the relationship between players and virtual characters.

Traditional games, primarily delivered via PC and consoles, construct immersive virtual worlds through layers of rules, interaction, and culture (Salen & Zimmerman, 2003), with achievement orientation serving as one of the fundamental motives for player participation (Bartle, 1996; Yee, 2006). Characters are typically treated as functional tools or player avatars (Juul, 2005), and deep emotional identification between players and characters rarely occurs. In contrast, anime-style games follow highly proceduralized Japanese visual aesthetics and character archetype databases, investing substantial resources in character-specific animations, voice acting, backstories, and interactive mechanisms to maximize character appeal and evoke players' desire to collect and form emotional bonds (Zhang & Harwit, 2020). The primary reason players immerse themselves in these games over the long term is not to clear content, but to establish and maintain enduring emotional relationships with virtual characters.

Regarding gender composition, traditional games have long been centered on male players (Kafai, Richard, & Tynes, 2020), whereas the proportion of female players in the anime-style game sector has risen rapidly, reaching 48.3% of China's anime-style game users in 2023–2024 Gamma Data Report. Gender socialization theory suggests that society systematically assigns different interests to different genders (Bussey & Bandura, 1999), but the diverse elements of anime-style games are breaking this pattern. Research indicates significant gender differences in gacha spending behavior: during limited-time high-popularity male character

banners, female players accounted for over 80% of paying users, whereas during female character banners, male players accounted for over 75% (Hsu & Kao, 2021). Female players also spend proportionally more on characters and outfits, while male players spend more on equipment and power-enhancing items (Ratan & Sah, 2015).

In summary, traditional research frameworks centered on gameplay experience and achievement as core drivers have limitations in explaining the emotional bonds and continuance behavior of anime-style game players toward virtual characters. This study integrates parasocial relationship theory (from paper characters to digital companions), self-determination theory, and social role theory to analyze the psychological need satisfaction mechanisms underlying players' continuous participation intention, as well as gender-differentiated effects, from the perspectives of psychology and gendered consumer behavior.

2. Objectives

The objectives of the study should be specified explicitly.

- 1) Verify the positive direct effect of players' parasocial relationships with virtual characters on their continuous participation intention in anime-style games.
- 2) Examine the parallel mediating effects of perceived autonomy, perceived sense of achievement, and perceived sense of belonging in the path between parasocial relationships and continuous participation intention.
- 3) Identify whether gender plays a significant moderating role in each of the three mediation paths above.

3. Materials and Methods

3.1 Research Methodology

This study selects players of Genshin Impact as its target research population. As the leading domestic open-world anime-style game, Genshin Impact boasts over 20 million monthly active players and maintains a relatively balanced gender distribution of 58% male and 42% female players according to Sensor Tower of 2024. It features rich and diversified gameplay systems, including character development, combat challenges, open-world exploration, narrative storylines, and multiplayer cooperative modes, which can simultaneously satisfy multiple psychological needs of players. In addition, the game has fostered mature and highly active player communities across major social platforms. These characteristics effectively prevent sample bias arising from homogeneous player groups or unbalanced gender structure, and fully satisfy the sampling requirements of this research.

This study employs a questionnaire survey method to empirically test the core hypotheses proposed in the theoretical framework. Questionnaire links, accompanied by a formal research description and an informed consent form to guarantee respondents' anonymity and voluntary participation, were distributed across seven major online platforms where Genshin Impact players congregate, including Bilibili, Xiaohongshu, Weibo Super Topics, the NGA Player Community, the Hupu Game Section, Baidu Tieba, and QQ/WeChat game groups. A combination of random sampling and snowball sampling techniques was adopted to cover diverse player subgroups, such as core players, casual players, content creators, and strategy enthusiasts, thus enhancing the representativeness and diversity of the collected sample. The entire data collection period lasted for two weeks.

3.2 Literature Review

Parasocial Relationship Theory proposed by Horton and Wohl (1956), it originally referred to one-sided imagined intimate relationships between audiences and media figures. In anime-style games, through the "action-feedback-emotional attachment" interaction cycle (Klimmt et al., 2006), virtual characters evolve from mere "digital bodies" to "digital companions" with genuine emotional bonds (Cole & Hoagland, 2021).

Self-Determination Theory proposed by Deci and Ryan (2000) that humans have three basic psychological needs: autonomy, sense of achievement, and sense of belonging, whose satisfaction generates enduring intrinsic motivation. In the gaming field, Ryan et al. (2006) confirmed that the satisfaction of these three needs is the core driver of players' continued participation. This study employs it as the mediating mechanism through which parasocial relationships influence continuance intention.

Social Role Theory proposed by Eagly (1987) argued that gender roles assigned by social structures shape differentiated psychological tendencies. In anime-style games, male players tend to obtain autonomy and

sense of achievement satisfaction through characters, while female players prioritize emotional connection and sense of belonging (Chen & Li, 2022; Kong & Li, 2023).

Players' Continuance Intention refers to players' sustained, proactive, and multifaceted behavioral and psychological engagement in games (Khang & Kim, 2016), serving as a core indicator of game user stickiness (Arvidsson & Caliendo, 2016). This study takes it as the core dependent variable to explore the influence mechanisms of parasocial relationships and psychological need satisfaction (Xu et al., 2022).

3.3 Conceptual Framework

This study adopts players' continuous participation intention as the core dependent variable. Unlike traditional management metrics such as purchase intention, loyalty and satisfaction, this variable more comprehensively captures the sustained, proactive and multi-dimensional behavioral and psychological engagement characteristic of anime-style game players. The core independent variable is the parasocial relationship between players and virtual characters, which has evolved from one-way appreciation of "2D characters" to bidirectional emotional bonds resembling "digital companions". According to Attachment Theory (Bowlby, 1979), strongly attached players view virtual characters as emotional safe havens, regulating negative real-world emotions through in-game interactions and consequently engaging in more frequent and longer-duration gameplay.

To elucidate the underlying mechanism linking parasocial relationships to continuous participation intention, this study employs Self-Determination Theory as the primary explanatory framework. This theory identifies three fundamental human psychological needs: autonomy, sense of achievement and sense of belonging. Satisfaction of these needs generates stable, enduring intrinsic motivation, in contrast to extrinsic reward-driven engagement that readily induces burnout (Deci & Ryan, 2000). In anime-style games, parasocial relationships satisfy these needs through three distinct pathways: enhancing players' sense of control and customization over characters (perceived autonomy); fostering self-efficacy through character development, skill mastery and collection achievements (perceived sense of achievement; and providing emotional companionship, resonance and community belonging through shared character preferences (perceived sense of belonging). Collectively, these psychological need satisfactions constitute the mediating mechanism transforming parasocial bonds into sustained game participation.

This study further incorporates Social Role Theory to examine the moderating effect of gender differences in these causal pathways. The theory posits that social structures and cultural norms assign individuals to distinct social roles, whose long-term enactment shapes gender-differentiated behavioral patterns and psychological orientations (Eagly, 1987). Existing research demonstrates that male players typically form instrumental relationships with virtual characters, prioritizing functional strength and visual appeal, with need satisfaction primarily centered on autonomy and sense of achievement. Female players, by contrast, tend to develop empathic relationships, emphasizing character narratives and emotional interactions, with need satisfaction predominantly focused on sense of belonging. These gender differences result in parasocial relationships influencing continuous participation intention through divergent mediating paths for male and female players.

3.3.1 Direct Effect Hypothesis

Supported by attachment theory (Bowlby, 1979) and empirical evidence showing that emotional attachment to characters increases game online duration, community participation, and derivative engagement (Banks & Bowman, 2016)

H1: Stronger parasocial relationships between players and virtual characters in anime-style games positively predict players' continuance intention.

3.3.2 Mediating Effect Hypotheses

Based on self-determination theory show autonomy, sense of achievement, sense of belonging as core intrinsic motivation (Deci & Ryan, 2000), these three needs are proposed as parallel mediators between parasocial relationships and continuance intention.

H2: Perceived autonomy is hypothesized to mediate this relationship, given that autonomy experiences are known to enhance intrinsic motivation (Ryan et al., 2006).

H3: Perceived sense of achievement is proposed to mediate this link, insofar as mastering character mechanics and accomplishing in-game goals are expected to bolster self-efficacy (Przybylski et al., 2010).

H4: Perceived sense of belonging is theorized to mediate this link, as virtual characters not only provide companionship but also facilitate access to a social community (Yee, 2006).

3.3.3 Moderating Effect Hypotheses

Based on social role theory show gender roles shape differentiated psychological needs (Eagly, 1987), gender is proposed to moderate the three mediating paths.

H5: The mediating effect of perceived autonomy is anticipated to be stronger for males, owing to their greater emphasis on control and system mastery (Chen & Li, 2022).

H6: The mediating effect of perceived achievement is expected to be more pronounced for males, given their tendency to focus on character performance and goal attainment (Chen & Li, 2022).

H7: The mediating effect of perceived belonging is predicted to be stronger for females, as they tend to prioritize emotional resonance and companionship (Chen & Li, 2022).

3.4 Model Construction

This figure illustrates the parallel mediating model. In this structural model, parasocial relationships between the players and virtual characters (independent variable) directly affect players' continuance participation intention (dependent variable) (H1). Beyond the direct causal pathway, parasocial relationships are further hypothesized to exert indirect effects on continuance intention through three distinct parallel mediating mechanisms: perceived autonomy (H2), perceived sense of achievement (H3), and perceived sense of belonging (H4). Each mediator operates independently to channel the influence of the exogenous variable to the outcome variable, jointly constituting a multi-path indirect transmission system that complements the direct effect in the overall theoretical model.

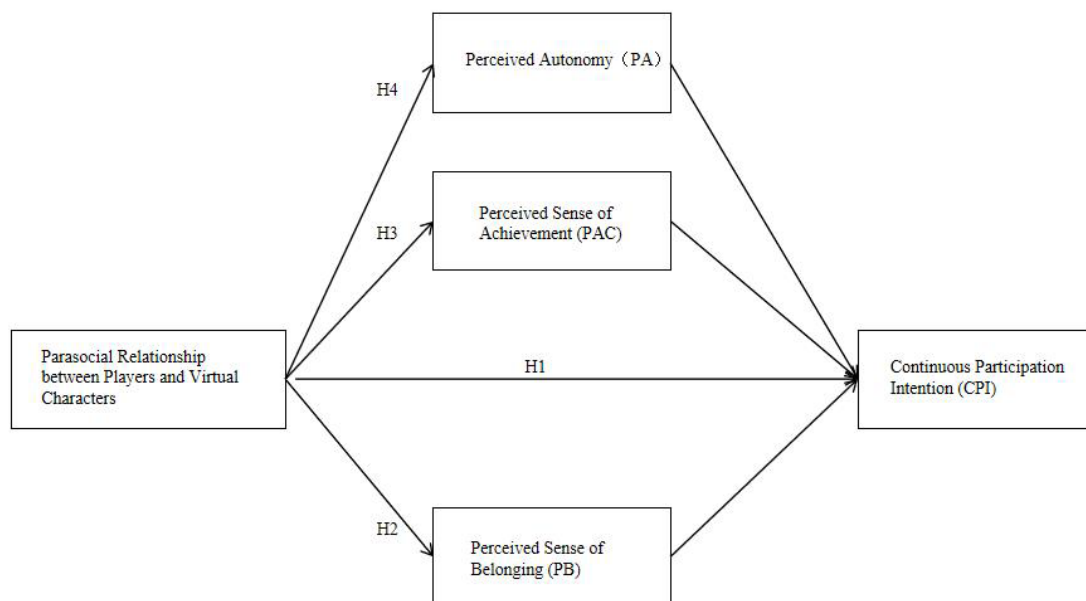


Figure 1 Parasocial relationships and continuance intention diagram

4. Results and Discussion

An online questionnaire survey was administered via the Wenjuanxing platform (www.wjx.com), with a total of 240 questionnaires distributed. After cleaning and screening the collected raw data, 20 invalid responses were eliminated, including those with excessively short completion time and those with consistent ratings of “1” or “7” across the majority of items. Finally, 220 valid questionnaires were retained for formal data analysis, corresponding to an effective response rate of 91.6%. Reliability and validity were tested using SPSS, we completed the assessment of the measurement model using SmartPLS 4.0, a specialized analytical software tool.

Table 1 Sample Demographic Characteristics

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	119	54.09%
	Female	101	45.91%
Age	≤18 years	24	10.91%
	19–22 years	52	23.64%
	23–26 years	52	23.64%
	27–30 years	67	30.45%
	≥31 years	25	11.36%
EDU	High school below	41	18.64%
	Associate degree	56	25.45%
	Bachelor's degree	97	44.09%
	Master's degree and above	26	11.82%
AMS	Rarely or never pay	22	10%
	Below ¥100	51	23.18%
	¥101–¥500	59	26.82%
	Above ¥2000	39	17.73%
ADGT	Less than 1 hour	31	14.09%
	1–2 hours	60	27.27%
	2–4 hours	86	39.09%
	More than 4 hours	43	19.55%

Table 1 presents the demographic and behavioral profiles of the 220 valid samples. The sample had a generally balanced gender structure: 119 males (54.09%) and 101 females (45.91%), consistent with the rising trend of female players in the anime-style game sector. Players aged 18–30 accounted for 77.73% of the total, with the 27–30 age group being the largest (30.45%). As the core user group with strong consumption capacity and activity, they ensure good sample representativeness. For educational attainment, 44.09% held a bachelor's degree, and 81.36% had a college education or above, in line with the typical profile of anime game players.

In terms of monthly in-game spending, moderate spenders (101–500 RMB) took the largest share (26.82%). A total of 90% of respondents had paid for the game, and 66.82% were moderate or heavy spenders, reflecting high consumption willingness. Nearly 70% of players spent 1–4 hours on the game daily, with the 2–4 hours group being the largest (39.09%), indicating a high level of player engagement.

Overall, the sample is representative and can provide reliable data support for subsequent measurement model evaluation.

In this study, five key variables are uniformly defined with fixed abbreviations: parasocial relationship (PSR), perceived autonomy (PA), perceived sense of achievement (PAC), perceived sense of belonging (PB), and continuous participation intention (CPI). Each construct is presented in full with its abbreviation in parentheses at its first mention in the manuscript. After that, the abbreviation is used consistently throughout the main text, tables, and figures without redefinition.

Table 2 Structural Model Results

Path	Indirect Effect	t	p	95%CI	Conclusion
PA → CPI	0.189	3.112	0.002	[0.058, 0.250]	significant
PSR → PA → CPI	0.154	3.122	0.002	[0.058, 0.250]	significant
PSR → PAC → CPI	0.259	4.268	< 0.001	[0.139, 0.379]	significant
PSR → PB → CPI	0.121	2.021	0.043	[0.003, 0.239]	significant

Table 2 summarizes the standardized path coefficients, statistical significance, and 95% bootstrap confidence intervals for both direct and indirect effects in the structural model, all estimated via a bootstrapping procedure with 10,000 resamples.

With respect to the direct association, parasocial relationship (PSR) exerts a significant positive direct effect on continuous participation intention (CPI) ($\beta = 0.312$, $p < 0.001$). This finding indicates that, even after controlling for the three psychological need mediators, players' parasocial bonds with virtual characters remain an independent predictor of their willingness to sustain long-term gameplay engagement, thus providing empirical support for H1.

Regarding the underlying indirect mechanisms, all three parallel mediation paths reach statistical significance, as evidenced by bootstrap 95% confidence intervals that do not contain zero. Specifically, the mediating effect of perceived sense of achievement (PAC) is the strongest among the three mediators ($\beta = 0.259$, $p < 0.001$, 95% CI [0.139, 0.379]), followed by the mediating path through perceived autonomy (PA) ($\beta = 0.154$, $p = 0.002$, 95% CI [0.058, 0.250]). Perceived sense of belonging (PB) produces the weakest yet still statistically reliable indirect effect ($\beta = 0.121$, $p = 0.043$, 95% CI [0.003, 0.239]). In addition, the direct link from perceived autonomy to continuous participation intention also achieves statistical significance ($\beta = 0.189$, $p = 0.002$, 95% CI [0.058, 0.250]).

Taken together, the results confirm that perceived autonomy, perceived sense of achievement, and perceived sense of belonging partially mediate the relationship between parasocial relationship and continuous participation intention. H2, H3, and H4 are therefore fully supported by the empirical data.

Table 3 Results of Gender Moderating Effect Test

MP	β	p	IMM	95% CI	Male (p)	Female(p)	valid
PSR →PA →CP	-0.0836	0.2986	-0.0265	[-0.0735, 0.0193]	0.274, $p < 0.05$	0.248, $p < 0.05$	No
PSR →PA C → CPI	-0.0318	0.6650	-0.0125	[-0.0621, 0.0351]	0.364, $p < 0.05$	0.351, $p < 0.05$	No
PSR → PB → CPI	0.0182	0.8215	0.0054	[-0.0387, 0.0543]	0.253, $p < 0.05$	0.259, $p < 0.05$	No

Table 3 further conducted a moderated mediation analysis to examine the regulating effect of gender on the three psychological need mediation pathways (H5, H6, and H7). The empirical results indicate that gender does not exert a significant moderating role on any of the mediating channels. Specifically, the interaction terms for perceived autonomy (PA: $p = 0.2986$, 95% CI [-0.0735, 0.0193]), perceived achievement (PAC: $p = 0.6650$, 95% CI [-0.0621, 0.0351]), and perceived belonging (PB: $p = 0.8215$, 95% CI [-0.0387, 0.0543]) all failed to reach

statistical significance, with all 95% confidence intervals overlapping zero. Consequently, hypotheses H5, H6, and H7 are not supported.

Nevertheless, conditional indirect effect tests reveal that all three mediation pathways remain highly significant within both gender cohorts. The indirect effects for male and female players are closely aligned across PA (Male: 0.2740; Female: 0.2475), PAC (Male: 0.3635; Female: 0.3510), and PB (Male: 0.2534; Female: 0.2588), displaying no statistically significant inter-group variations. Notably, while prior independent samples *t*-tests indicated that male players exhibit a significantly higher mean level of perceived belonging than females, this moderated mediation analysis confirms that gender does not alter the functional mechanism of the "PSR → PB" path. This divergence suggests that the observed mean variance in belongingness stems from exogenous factors—such as gameplay duration or character preferences—rather than structural differences in the psychological mechanics. In sum, the motivational structure through which parasocial relationships drive continuous participation intention demonstrates robust cross-gender invariance.

Table 4 Assumptions Summary

Assumptions	Yes/No
H1: PSR positively affects players' continuous participation intention	yes
H2:PA mediates the relationship between PSR and continuous participation intention	yes
H3:PAC mediates the relationship between PSR and continuous participation intention	yes
H4: PB mediates the relationship between PSR and continuous participation intention	yes
H5: Gender moderates the indirect path of PSR→PA→CPI	no
H6: Gender moderates the indirect path of PSR→PAC→CPI	no
H7: Gender moderates the indirect path of PSR→PB→CPI	no

5. Discussion and Implications

5.1 Conclusion

Based on parasocial relationship theory and self-determination theory, this study takes players of the open-world anime-style role-playing game Genshin Impact as the research sample and constructs a mediation model: players' parasocial relationships with virtual characters serve as the independent variable; perceived autonomy, perceived achievement, and perceived sense of belonging serve as mediating variables; continuance intention serves as the dependent variable; and gender is included as a moderating variable. The results show that parasocial relationships have a significant direct positive effect on continuance intention ($\beta=0.312$, $p<0.001$), with the total effect reaching 0.846, indicating strong predictive power of the model. All three mediation paths are significant: the indirect effect of perceived achievement is the largest (0.259), followed by perceived autonomy (0.154), and perceived sense of belonging is relatively the weakest but still significant (0.121). This indicates that players' continuance intention is driven by a multidimensional motivational structure jointly shaped by achievement, autonomy, and sense of belonging, rather than by achievement alone. Gender does not significantly moderate any of the mediation paths (all interaction term *p*-values > 0.05). Independent-samples *t*-tests show that male players score slightly higher on the three mediating variables than female players, but there is no substantial difference, suggesting that the intrinsic psychological driving mechanisms of male and female players in such games are highly consistent. This finding deviates from the traditional stereotype that "males value achievement while females value sense of belonging." Possible reasons include the absence of pronounced gender preferences in the game's core gameplay, the conscious effort in character design to dilute gender stereotypes, and the increasingly gender-neutral culture within the player community. This study confirms the applicability of parasocial relationship theory to the context of virtual game characters and reveals a multidimensional psychological driving model centered on achievement with synergistic contributions from

autonomy and sense of belonging, providing a robust theoretical framework for understanding players' continuance intention in anime-style open-world games.

5.2 Theoretical Contributions

This study yields four main contributions. First, it confirms that parasocial relationships drive continuance intention through three parallel mediating paths—perceived achievement, autonomy, and sense of belonging—with achievement exerting the strongest effect, autonomy the next, and sense of belonging the weakest, clarifying their unequal weights. Second, it extends self-determination theory by showing that in open-world anime-style games, the need for achievement predominates over autonomy and sense of belonging, consistent with the situational variability of need importance. Third, it reveals that parasocial bonds with virtual characters can directly satisfy players' sense of belonging needs, partially substituting for community-based belonging. Fourth, it provides counter-evidence to gender-difference assumptions: gender does not significantly moderate any mediating pathway, indicating highly consistent psychological mechanisms across male and female players.

5.3 Practical Implications

Based on the findings, four policy recommendations are proposed:

- 1) Given perceived achievement's strongest mediating effect and highest predictive power, concentrate resources on the character growth system. Amplify achievement through high-impact level-up feedback, ritualized rare-item acquisition, and complete character-specific story quests.
- 2) Given the prominent effects of parasocial relationships, craft richly characterized virtual figures with refined backstories and personality. Interactive mechanisms—birthday storylines, housing interactions, personalized greetings—can deepen emotional investment and retention.
- 3) As gender exerts no moderating effect on any mediating pathway, differentiated content is unnecessary. Instead, direct resources toward a universal, high-quality progression system and immersive narrative that satisfy shared psychological needs, particularly achievement.
- 4) Though weaker than achievement, the mediating effects of autonomy and sense of belonging remain significant. Preserve autonomous space (free team composition, branching choices, open-world exploration) within the structured framework, and strengthen community belonging through official platforms, UGC incentives, and cooperative play.

6. Research limitations and future prospects

Despite validating the mediating mechanisms, this study has several limitations. First, the sample is confined to players of a single open-world anime-style RPG (Genshin Impact), predominantly university students in China ($n=220$), which limits cross-game and cross-cultural generalizability. Second, the cross-sectional design precludes causal inference; the relationship between parasocial bonds and continuance intention may be bidirectional. Third, it lacks fine-grained comparisons across sub-genres within open-world anime RPGs and across other anime game types (e.g., card collection, dating sims), where the relative importance of psychological needs likely shifts. Fourth, only gender was examined as a moderator, leaving other potential moderators (e.g., play time, spending, personality, motivation) unexplored. In conclusion, this study confirms that parasocial relationships positively influence continuance intention through parallel paths of perceived autonomy, achievement, and sense of belonging, with no significant gender moderation. These findings offer theoretical insights for human–virtual character interaction and practical guidance for game development. Future research should employ longitudinal and cross-cultural designs, expand the range of games and moderators, and integrate qualitative methods to further explore the evolving player–character dynamics.

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