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Differences in general and gaming-specific self-esteem and their association with different psychological and gaming-related outcomes

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A B S T R A C T

Self-esteem is commonly conceptualized as a stable general trait. However, growing evidence highlights the importance of domain-specific self-esteem. Focusing on the video game domain, this study examines how differences in general self-esteem and gaming-specific self-esteem relate to socio-demographic, psychological, and gaming-related factors. Using survey data from 14,740 highly engaged gamers, we demonstrated differences among three groups: those with higher gaming self-esteem than general self-esteem, those with no difference between the two constructs, and those with lower gaming self-esteem than general self-esteem. Gamers in the first group reported more psychological distress, spent more time gaming and consuming gaming content, played games for escapism and competence, and preferred multiplayer gaming genres. In contrast, gamers in the last group exhibited more favorable outcomes, including fewer symptoms of gaming disorder, less consumption of gaming-related content, and more positive affect. These findings suggest that higher levels of gaming-related self-esteem may reflect the use of video games to compensate for low general self-esteem and be evidence of underlying psychological vulnerabilities. Recognizing this pattern can help identify gamers at risk and promote healthier engagement with video games.

1. Introduction

1.1. Background

Video games have become a central component of contemporary digital culture and a rapidly growing industry, with billions of players worldwide (Statista Search Department, 2024). The rising prevalence of gaming across various demographics has sparked interest in associated potential risks (Griffiths et al., 2012). Indeed, these concerns have prompted the American Psychiatric Association (2013, 2022) to include Internet Gaming Disorder in the fifth revision of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) as a condition warranting further study. In addition, the World Health Organization (2019, 2022) has recognized gaming disorder in the 11th version of the International Classification of Diseases (ICD-11). Recent estimates suggest that approximately 2% of the global population may be affected by gaming disorder, with males and adolescents exhibiting higher rates (Gjoneska et al., 2024; Stevens, Dorstyn, Delfabbro, & King, 2020). In view of video games' popularity, contemporary research has focused on the psychological processes that shape individual differences in the gaming experience, including factors involving balanced versus problematic engagement with them (Billieux et al., 2019; Brand et al., 2025; Király et al., 2023). Among these factors, the concept of self-esteem has been consistently linked to varying patterns of gaming.

Self-esteem refers to people's overall self-evaluation of their worth, encompassing positive and negative self-appraisals (Rosenberg, 1965). Subsequent theoretical developments have distinguished between global self-esteem, reflecting a general sense of self-worth, and domain-specific self-esteem, which captures self-evaluations within specific contexts such as academics, appearance, or social functioning (Harter, 1985, 1999). These self-evaluations may be structured hierarchically rather than existing solely at the global level (Swann & Bosson, 2010). They reflect how people feel about themselves within a given context (Sowislo & Orth, 2013). Importantly, domain-specific self-esteem differs from related constructs. For example, self-efficacy reflects how individuals judge their capabilities (Chen et al., 2004). Contingent self-worth refers to conditional self-evaluations that depend on one's performance and success in all areas of life (Beard & Wickham, 2016;

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Crocker & Knight, 2005). Thus, domain-specific self-esteem is a distinct construct. Indeed, recent evidence suggests that it is a relatively stable trait-like facet of one's self-evaluation (Dapp & Orth, 2024).

Gaming may serve as a salient domain for investigating the role of self-esteem, both general and domain-specific. Research has demonstrated that players vary in the meaning they ascribe to their engagement with video games (Karhulahti, 2020). Some scholars have suggested that integrating play into daily life as a purposeful, beneficial activity may give gamers social recognition and a sense of belonging (Razum & Huić, 2023). Therefore, it might be useful to examine how gaming-specific self-esteem and general self-esteem relate to one another, rather than examining each in isolation. However, to date, few studies have done so.

Generally, lower levels of self-esteem have been consistently associated with more problematic gaming patterns and gaming disorders (Kavanagh et al., 2023; Király et al., 2023). For example, Beard et al. (2017) reported the early onset of gaming disorder in people who relied heavily on gaming for self-regulation. An influential line of research has interpreted these associations through a compensatory framework. It proposes that video games are used to cope with various psychosocial issues, compensate for different deficiencies, and fulfill unmet needs (Anderson et al., 2017; Kardefelt-Winther, 2014). Indeed, evidence has shown that video games have become central to how some players evaluate themselves by supporting the exploration of their identity, their self-expression, and their access to affirming communities (Di Cesare et al., 2023; Noon et al., 2024). Some researchers report that even brief gameplay may affect self-esteem (Kavanagh et al., 2024).

Others have used the gamer-avatar bond (Szolin et al., 2022) to explain the ease of immersion in gameplay, which offers individuals the opportunity to maintain fulfilling digital lives. Such immersive engagement might also be described as escapism from the real world into the gaming world (Calleja, 2010; Giardina et al., 2023). This behavior is associated with problematic gaming and poorer mental health outcomes (Király et al., 2022a,b, 2023). Interestingly, it is not buffered by high levels of general self-esteem (Kavanagh, 2025). Thus, if gamers become overly psychologically reliant on video games, problematic gaming habits and negative outcomes may arise (Monley et al., 2024).

Although informative, prior research work on gaming and self-esteem is somewhat limited in its scope. Much of the literature has approached self-esteem in gaming primarily through the lens of avatar-related dynamics, focusing on differences between people's actual and ideal selves (Blinka, 2008; Blinka et al., 2023; Mancini et al., 2019). However, particularly when engagement is appearance-focused, such dynamics may overlap with dissociative experiences, including a reduced emotional connection to one's body and diminished awareness of bodily sensations, rather than reflecting self-esteem per se (Casale et al., 2025; Casale et al., 2021).

In addition, studies examining self-esteem in gaming—especially those relying on the Rosenberg Self-Esteem Scale—have largely treated self-esteem as a unidimensional low-high construct, without further operationalizations (Kavanagh et al., 2024; Koncz et al., 2022; Lemenager et al., 2020; Nie, Griffiths, & Teng, 2024). Finally, work in this area has often been restricted to massively multiplayer online role-playing games (MMORPGs) (Cole et al., 2020; Mancini et al., 2024; Sibilla et al., 2024; Stetina et al., 2011). While this focus is understandable given the robust evidence linking MMORPGs to compensatory game design features and the increased risk for gaming disorder (King et al., 2019), it limits the generalizability of findings to the broader range of gaming experiences.

To address these issues, we conducted a cross-sectional study assessing two research questions. First, is there an association between differences in general and gaming-specific self-esteem and specific socio-demographic characteristics, psychological factors, and gaming-related behaviors among highly engaged gamers? Second, does gaming-specific self-esteem explain additional variance in outcomes beyond general self-esteem?

2. Methods

2.1. Participants and procedure

To conduct our study, we analyzed a subset of data collected as part of a larger project (Király et al., 2022a). Although derived from the same dataset, our investigation addressed distinct research questions and used a novel analytic framework focusing on differences between general and gaming-specific self-esteem. We used a purposive sampling technique, with data collected between March and April 2020 through GameStar.hu, a widely read Hungarian online gaming magazine. The magazine promoted an anonymous online survey administered via Qualtrics. Individuals aged 14 years or older who self-identified as video game players were eligible to participate; parental consent was obtained for participants younger than 18 years of age. The sample comprised 14,740 gamers residing in Hungary and neighboring countries (Romania, Serbia, Slovakia, and Ukraine), representing a broad range of gaming patterns (for more details on the recruitment process, please refer to Király et al. (2022a). The study was conducted in accordance with the Declaration of Helsinki and received ethical approval from the relevant institutional review board.

2.2. Measures

Psychometric properties of all study measures, including reliability estimates, are reported in Supplementary Table 1.

2.2.1. Demographics

Information regarding the participants' age, gender, marital status, education (i.e., number of years completed), and current work and study status was collected.

2.2.2. Psychological measures

2.2.2.1. Self-esteem. Self-esteem was assessed using the original and a gaming-specific adaptation of the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965). Participants responded to the five positively worded (non-reversed) items of the original scale (e.g., "I feel that I am a person of worth, at least on an equal basis with others") and to a parallel gaming-specific version adapted to the video-gaming domain (e.g., "When I play video games, I feel that I am a person of worth, at least on an equal basis with others"). The adaptation involved only the addition of a contextual prefix. Otherwise, the content of the items remained unchanged, thereby preserving the original focus on self-evaluative feelings of worth rather than perceived ability or performance. The positively worded items were selected to reduce the questionnaire's length and the participants' burden. We also chose them because they load on a methodological factor that is highly correlated with the full scale. For both versions, items were rated on a 4-point Likert scale (1 = strongly disagree, 4 = strongly agree). Total scores ranged from 5 to 20, with higher scores indicating higher levels of self-esteem. The internal consistency (Cronbach's alpha) was adequate for both self-esteem dimensions: gaming-specific ($\alpha = .87$) and general ($\alpha = .87$) in the present study.

2.2.2.2. Positive and negative affect. Positive and negative affect were assessed using the 20-item Positive and Negative Affect Schedule (PANAS; Watson et al., 1988). Participants were asked to indicate how they feel on average by responding to 10 items assessing positive affect (e.g., "interested") and 10 items assessing negative affect (e.g., "distressed"). Items were rated on a 5-point Likert scale ranging from 1 (very slightly or not at all) to 5 (extremely). Scores for each subscale ranged from 10 to 50, with higher scores indicating higher levels of positive or

negative affect. The internal consistency (Cronbach's alpha) was α = .87 for the positive affect and α = .86 for the negative affect in the present study.

2.2.2.3. Perceived stress. Perceived stress was assessed using the 4-item Perceived Stress Scale (PSS; Cohen & Williamson, 1988), a short form derived from the original 14-item scale (Cohen, 1986). Participants indicated how often they experienced stress-related feelings during the past month by responding to items such as, "In the last month, how often have you felt that difficulties were piling up so high that you could not overcome them?" Responses were recorded on a 5-point Likert scale ranging from 1 (never) to 5 (very often). Two items were reverse-coded. Item scores were summed to yield total scores ranging from 4 to 20, with higher scores indicating greater perceived stress. The internal consistency (Cronbach's alpha) of the scale was α = .76 in the present study.

2.2.3. Gaming-related measures

2.2.3.1. Time spent gaming. Participants reported the number of hours they typically spent gaming on weekdays and weekend days, respectively. Response options ranged from 0 to 12 h; participants reporting more than 12 h were instructed to select the maximum value. Average weekly gaming time was calculated as (average weekday gaming hours × 5) + (average weekend gaming hours × 2).

2.2.3.2. Time spent watching gaming-related videos/streams. Participants reported the number of hours they typically spent watching gaming-related videos or streams on weekdays and weekend days, respectively. Response options ranged from 0 to 12 h; participants reporting more than 12 h were instructed to select the maximum value. Average weekly time spent watching gaming-related videos or streams was calculated as (average weekday viewing hours × 5) + (average weekend viewing hours × 2).

2.2.3.3. Gaming disorder symptoms. Gaming disorder symptoms were assessed using an abbreviated version of the 10-item Internet Gaming Disorder Test (IGDT-10; Király et al., 2017), selected to align with the ICD-11 diagnostic framework for gaming disorder (World Health Organization, 2019). The included items corresponded to the core ICD-11 criteria: impaired control over gaming, increasing priority given to gaming over other activities, continuation or escalation of gaming despite negative consequences, and resulting functional impairment or distress. This abbreviated operationalization has been used in prior research to assess ICD-11–consistent gaming disorder symptoms (e.g., Horváth et al., 2021; Katz et al., 2024) and is conceptually consistent with other validated brief instruments, such as the Gaming Disorder Test (GDT; Pontes et al., 2021). Responses to dichotomized items 4, 5, and 6, as well as a combined indicator derived from items 9 and 10, were coded (0 = never or sometimes, 1 = often). Scores were summed to yield a total gaming disorder symptom score ranging from 0 to 4, with higher scores indicating more severe symptoms of gaming disorder. The internal consistency (composite reliability) of the scale was ω = 0.88 in the present study.

2.2.3.4. Gaming motives. Gaming motives were assessed using five subscales from the Gaming Motivation Inventory (GMI; Király et al., 2022a), selected to provide a theoretically relevant and parsimonious set of motives linked to self-esteem and gaming behavior. We chose the subscales based on prior meta-analytic evidence demonstrating the relevance of these motives to both adaptive and maladaptive gaming outcomes (Bäcklund et al., 2022). The included motives were competence (desire to feel skilled and capable of mastering in-game challenges), escapism (using games to immerse oneself in another world or to distract from real-life problems and negative emotions), introjected regulation (playing due to internal pressures such as guilt, obligation, or avoidance of negative self-evaluation), recreation (playing for fun and relaxation), and social motivation (playing to connect with others and share gaming experiences). Escapism and introjected regulation were included due to their strong and consistent associations with problematic gaming, whereas competence and social motives were selected for their conceptual relevance to self-evaluation. Recreation was included as a comparatively adaptive motive, typically weakly related or unrelated to problematic gaming (Bäcklund et al., 2022). Each motive was assessed using three to five items rated on a 7-point Likert scale ranging from 1 (does not correspond at all) to 7 (corresponds exactly). The internal consistency (Cronbach's alpha) of the five motives in the present study was as follows: Competence (α = .77), Escapism (α = .89), Introjected Regulation (α = .77), Recreation (α = .75), and Social (α = .82).

2.2.3.5. Gaming genres. Participants were asked to allocate 100% of their total gaming across a predefined list of gaming genres. The genres included: (1) shooters (first- and third-person; e.g., Call of Duty), (2) battle royale (e.g., Fortnite), (3) multiplayer online battle arena (MOBA; e.g., League of Legends), (4) auto chess/auto battler (e.g., Battlegrounds), (5) open-world action-adventure (e.g., Grand Theft Auto series), (6) role-playing games (RPG; e.g., The Witcher), (7) massively multiplayer online role-playing games (MMORPG; e.g., World of Warcraft), (8) strategy games (real-time or turn-based; e.g., StarCraft), (9) card games (e.g., Magic: The Gathering Arena), (10) sports games (e.g., FIFA), (11) simulation games (e.g., vehicle, animal, or life simulations such as Euro Truck Simulator, Goat Simulator, or The Sims), and (12) other genres (e.g., puzzle games).

2.3. Statistical analysis

To analyze our data, we first used structural equation modeling (SEM) with robust maximum likelihood. General self-esteem and gaming-specific self-esteem were specified as two correlated latent factors, each indicated by five items from the original and gaming-adapted versions of the Rosenberg Self-Esteem Scales. To account for local item dependencies, residual covariances were specified (a) between corresponding items across the two scales and (b) between items 4 and 5 within each scale, reflecting content and wording similarity. Model fit was evaluated using the comparative fit index (CFI), Tucker–Lewis index (TLI), root mean square error of approximation (RMSEA) with 90% confidence intervals, and standardized root mean square residual (SRMR).

In the structural model, both latent self-esteem factors were included simultaneously as predictors of gaming disorder symptoms, affective outcomes, perceived stress, and gaming motivations, while controlling for age and gender. Unstandardized coefficients (B) with standard errors and standardized coefficients (β; STDYX) are reported. Within the SEM analyses, missing data were handled using full information maximum likelihood (FIML), allowing all available information to contribute to parameter estimation (Muthén & Muthén, 1998).

To examine within-person differences between general and gaming-specific self-esteem, we transformed the scores on the Rosenberg Self-Esteem Scales into a standardized difference score computed as z (gaming-specific self-esteem) − z(general self-esteem). For categorical analyses, participants were classified into three self-esteem groups using a ±1 SD threshold. These groups corresponded to conventional cutoffs for deviations from a sample's distribution. Using them allowed us to identify individuals with comparatively higher or lower levels of gaming-specific self-esteem. Thus, our three groups were: (1) Increased gaming-specific self-esteem, (2) Stable self-esteem, and (3) Decreased gaming-specific self-esteem. Sensitivity analyses using a ±0.5 SD threshold were also conducted to evaluate the robustness of the group classifications relative to a more inclusive classification of smaller deviations.

In analyzing the groups, we used listwise deletions to deal with missing data. Thus, in our analyses we included only those participants for whom we had complete data for the variables of interest. Group differences in demographic variables were examined using Pearson's chi-square tests for categorical variables and one-way analyses of variance (ANOVAs) for continuous variables, with effect sizes reported as Cramér's V and eta squared (η^2), respectively. Post-hoc pairwise comparisons were conducted using the Games–Howell tests. Results are reported as frequencies and percentages or as means and standard deviations. Gaming genre preferences were analyzed using one-way ANOVAs with self-esteem group as the between-subjects factor, followed by post-hoc comparisons. Genre use was operationalized as the mean percentage of use within each group. Given the compositional nature of the genre data (summing to 100% within individuals), results are interpreted descriptively with an emphasis on relative differences between groups.

We then examined group differences in psychological factors and gaming-related measures using one-way ANOVAs. Distributional assumptions were evaluated using skewness, kurtosis, and visual inspection of distributions. Homogeneity of variances was assessed using Levene's test, and Games–Howell post hoc tests with Bonferroni adjustments were conducted. No substantial violations of normality or homogeneity assumptions were observed. Effect sizes are reported as eta squared (η^2). Finally, multinomial logistic regression analyses were conducted to examine predictors of self-esteem group membership, with the Stable self-esteem group serving as the reference category. Results are reported as odds ratios with 95% confidence intervals. In addition, analysis of covariance (ANCOVA) models was conducted with age included as a covariate.

All statistical analyses were conducted using IBM SPSS Statistics (version 29) and Mplus (version 8.10).

3. Results

3.1. Descriptive statistics

Survey data were collected from 14,740 highly engaged gamers (Mage = 24.14 years, SD = 6.95, range 14-75, 89.3% males), with a mean of 13.03 years of education (SD = 2.72). Most gamers were single (N = 7,105, 48.2%), not currently studying (N = 7,809, 53.0%), and employed (N = 9,356, 63.5%).

3.2. General and gaming-specific self-esteem: measurement models

A confirmatory factor analysis supported a two-factor measurement model distinguishing general and gaming-specific self-esteem. The two latent factors emerged as moderately correlated yet distinct constructs ($r = 0.42$, $p < .001$). All items showed substantial standardized loadings on their intended factors, and overall model fit was good. Full CFA results, including standardized factor loadings and fit indices, are provided in Supplementary Table S2.

Based on the supported measurement model, we estimated a structural equation model in which general and gaming-specific self-esteem were specified as simultaneous latent predictors of psychological and gaming-related variables, while controlling for age and gender (see Table 1). All reported effects indicated partial associations, adjusted for the shared variance between the two self-esteem dimensions.

General self-esteem showed a coherent pattern of associations with indicators of psychological well-being and distress, including fewer and less severe symptoms of gaming disorder, perceived stress, and negative affect, and higher levels of positive affect. Additionally, general self-esteem was negatively related to escapism and, to a lesser extent, social gaming motives.

In contrast, gaming-specific self-esteem exhibited a distinct pattern of associations. It was positively, albeit weakly, associated with the severity of gaming disorder symptoms and had negligible associations with perceived stress and affective states. Simultaneously, there was a positive relationship between gaming-specific self-esteem and gaming motivations, such as escapism and social motives.

Table 1
Structural equation model results: general and gaming-specific self-esteem as predictors of psychological factors and gaming measures (controlling for age and gender).

	General self-esteem B (SE)	β [95% CI]	Gaming-specific self-esteem B (SE)	β [95% CI]
Severity of gaming disorder symptoms	−0.273 (0.016)	−0.23 [-0.25, −0.21]	0.107 (0.011)	0.11 [0.09, 0.13]
Perceived stress	−0.816 (0.017)	−0.58 [-0.60, −0.56]	0.040 (0.012)	0.03 [0.01, 0.05]
PANAS Positive affect	0.773 (0.015)	0.59 [0.57, 0.61]	0.033 (0.011)	0.03 [0.01, 0.05]
PANAS Negative affect	−0.574 (0.016)	−0.46 [-0.49, −0.44]	0.060 (0.011)	0.06 [0.04, 0.08]
Escapism motives	−1.456 (0.039)	−0.42 [-0.44, −0.40]	0.619 (0.031)	0.21 [0.19, 0.23]
Social motives	−0.308 (0.031)	−0.11 [-0.13, −0.09]	0.631 (0.025)	0.26 [0.24, 0.28]

Notes. N = 14,740*. Results are based on a structural equation model (SEM) with latent factors for general self-esteem and gaming-specific self-esteem. Unstandardized coefficients (B) with standard errors (SE) and standardized coefficients (β; STDYX) with 95% confidence intervals are reported. All coefficients represent partial effects estimated simultaneously, controlling for age, gender, and the other self-esteem dimensions. All coefficients were statistically significant at $p < .01$. *The SEM model was estimated using robust maximum likelihood (MLR), with missing data handled via full information maximum likelihood (FIML). This approach allowed the inclusion of cases with partially missing data; therefore, effective sample sizes may vary slightly across analyses.

3.3. Self-esteem groups: socio-demographic, psychological, and gaming-related differences

3.3.1. Descriptive characteristics and gaming genre preferences of the self-esteem groups

Based on our analyses of differences in general and gaming-specific self-esteem, we classified the 12,947 participants into three groups. Most gamers exhibited stable self-esteem, showing no difference between gaming-specific and general self-esteem (N = 9119; 70.4%). However, a substantial minority reported either lower gaming-specific self-esteem relative to general self-esteem (N = 1924; 14.9%) or higher gaming-specific self-esteem compared to general self-esteem (N = 1904; 14.7%). Table 2 provides detailed socio-demographic characteristics of the three groups.

Table 3 lists the preferred gaming genres of the three groups. Shooter and open-world action–adventure games were the most frequently favored genres in all groups. However, those who had higher gaming-specific self-esteem preferred Multiplayer Online Battle Arena (MOBA) games.

3.3.2. Psychological and gaming-related differences between the self-esteem groups

A one-way ANOVA was conducted to examine group differences in 11 variables (see Table 4). Considering the multitude of predictors, we conducted a post hoc Games-Howell pairwise comparison test with a Bonferroni correction. The results were considered statistically significant only if $p < .002$ (i.e., αaltered = 0.05/25) = 0.002).

Results showed that the three groups differed significantly in all

Table 2
Sample characteristics of self-esteem groups.

	Increased gaming-specific self-esteem N = 1904	Stable self-esteem N = 9119	Decreased gaming-specific self-esteem N = 1924	Test (df), *p*	Effect size
Gender; N (%)					
Males	1595 (83.8)[a]	8153 (89.4)[a]	1734 (90.1)[b]	$\chi2$ (2) = 53.71, <0.001	V = 0.064
Females	308 (16.2)[a]	966 (10.6)[a]	190 (9.9)[b]		
Age (years); M (SD)	21.66 (5.32)[a]	24.30 (6.89)[b]	26.55 (7.82)[c]	F (2) = 245.961, <0.001	η^2 = 0.037
Education (years completed); M (SD)	12.40 (2.56)[a]	13.14 (2.69)[b]	13.69 (2.81)[c]	F (2) = 109.71, <0.001	η^2 = 0.017
Marital status; N (%)					
Single	1198 (62.9)[a]	4287 (47.0)[b]	723 (37.6)[c]	$\chi2$ (8) = 379.04, <0.001	V = 0.121
In a relationship	425 (22.3)[a]	2093 (23.0)[a]	416 (21.6)[a]		
Married	262 (13.8)[a]	2680 (29.4)[b]	764 (39.7)[c]		
Divorced	11 (0.6)[a]	38 (0.4)[b]	19 (1.0)[a,b]		
Widowed	0 (0)[a]	5 (0.1)[a]	0 (0)[a]		
Study status (yes); N (%)	1116 (58.6)[a]	4264 (46.8)[b]	728 (37.8)[c]	$\chi2$ (2) = 168.35, <0.001	V = 0.114
Work status (yes); N (%)	930 (48.8)[a]	5906 (64.8)[b]	1410 (73.2)[c]	$\chi2$ (2) = 262.20, <0.001	V = 0.142

Notes: The sample is different in size than the full sample due to missing values on the two self-esteem variables. SD: standard deviation. Superscript letters indicate post hoc group comparisons. Within each row, groups sharing the same superscript do not differ significantly from each other, whereas groups with different superscripts differ significantly according to the respective post hoc tests. For continuous variables, post hoc comparisons were based on Games–Howell tests. For categorical variables, superscripts indicate pairwise comparisons of column proportions with a Bonferroni adjustment. Effect sizes are reported as η^2 for the ANOVA and Cramér's V for χ^2 tests.

Table 3
Gaming genre preference by % of use in the three self-esteem groups.

	Increased gaming-specific self-esteem N = 1904	Stable self-esteem N = 9119	Decreased gaming-specific self-esteem N = 1924	ANOVA		
	M (SD)	M (SD)	M (SD)	F	*p*	η^2
Shooter games, FPS, TPS	25.43 (24.49)[a]	24.67 (24.08)[a]	24.51 (24.91)[a]	0.89	0.409	0.000
Battle Royale	8.84 (15.96)[a]	9.86 (17.52)[b]	9.68 (18.42)[a,b]	2.67	0.069	0.000
MOBA	10.58 (20.72)[a]	6.67 (16.28)[b]	4.90 (14.55)[c]	60.25	<0.001	0.009
Auto Chess/Auto Battler	2.10 (6.18)[a]	2.31 (7.46)[a]	2.12 (7.37)[a]	1.05	0.349	0.000
Open World Action-Adventure	15.64 (18.78)[a]	17.02 (19.23)[b]	17.61 (20.63)[b]	5.48	0.004	0.001
Role-playing games	12.78 (19.39)[a]	12.19 (18.54)[a]	12.41 (19.12)[a]	0.81	0.444	0.000
MMORPG	6.57 (15.95)[a]	5.64 (14.73)[a]	4.21 (12.96)[b]	12.73	<0.001	0.002
Strategy	3.42 (8.98)[a]	3.78 (10.09)[a,b]	4.39 (10.84)[b]	4.64	0.010	0.001
Card	1.31 (5.36)[a]	1.44 (5.86)[a]	1.31 (5.56)[a]	0.76	0.466	0.000
Sports	6.59 (14.84)[a]	9.30 (17.12)[b]	11.12 (19.53)[c]	34.09	<0.001	0.005
Simulators	3.92 (10.81)[a]	3.81 (10.88)[a]	3.81 (11.15)[a]	0.08	0.918	0.000
Other	2.77 (8.72)[a]	3.25 (10.31)[a,b]	3.87 (11.80)[b]	5.49	0.004	0.001

Notes: Values represent mean percentages (%) of genre use within each group. Different superscript letters (a, b, c) in one row reflect significant ($p < .05$) differences between the group means, while the same superscript letters in one row reflect non-significant differences evident in Games-Howell pairwise comparisons. Effect sizes are reported as eta squared (η^2). M: mean; SD: standard deviation; FPS: first-person shooter; TPS: third-person shooter; MOBA: multiplayer online battle arena; MMORPG: massively multiplayer online role-playing games.

variables except for the recreational gaming motive. Effect sizes (η^2) indicated small to large group differences, with the largest effects observed for perceived stress, negative affect, escapism, and competence motives. The increased gaming-specific self-esteem group reported the highest level of engagement in all gaming behaviors, reflected in weekly gaming time (M = 33.31 h/week, SD = 16.46), time spent watching video game-related content (M = 14.60 h/week, SD = 13.29), more severe gaming disorder symptoms (M = 0.55, SD = 0.91), as well as higher scores on the gaming motives. This group also reported greater psychological distress, characterized by less positive affect (M = 2.95, SD = 0.73), more negative affect (M = 2.32, SD = 0.77), and more perceived stress (M = 2.91, SD = 0.80).

To examine whether group differences remained after accounting for age, we conducted supplementary ANCOVA analyses with age included as a covariate (see Supplementary Table S3). The overall pattern of results remained unchanged, indicating that the observed group differences were not driven by age-related effects.

3.4. Predictors of membership in the self-esteem groups

A multinomial logistic regression was conducted with self-esteem groups as the dependent variable (reference category: stable self-esteem), including 13 predictors (see Table 5). According to the likelihood ratio tests, the independent variables that contributed significantly to the model were age, positive affect, negative affect, perceived stress, competence, escapism, and social motives. The model explained 24.2% of the variance using the Cox and Snell R-squared criteria and 30.1% using Nagelkerke R-squared.

For the increased gaming-specific self-esteem group, age emerged as a significant predictor (OR = 0.94, 95% CI [0.93, 0.95]). Each additional year of age was associated with a 6% decrease in the odds of belonging to this group, suggesting that younger participants were more likely to exhibit higher gaming-specific self-esteem. Positive affect was also negatively associated with group membership (OR = 0.93, 95% CI [0.92, 0.94], $p < .001$). Those who reported more positive affect were less likely to belong to this group. In contrast, negative affect (OR = 1.03, 95% CI [1.02, 1.04], $p < .001$) and perceived stress (OR = 1.13,

Table 4
One-way analysis of variance (ANOVA) by self-esteem groups.

	Increased gaming-specific self-esteem N = 1904	Stable self-esteem N = 9119	Decreased gaming-specific self-esteem N = 1924	ANOVA		
	M (SD)	M(SD)	M (SD)	F	*p*	η^2
Average weekly gaming time (hours/week)	33.31 (16.46)[a]	27.13 (14.36)[b]	22.76 (12.62)[c]	259.35	<0.001	0.039
Average weekly watching gaming videos time (hours/week)	14.60 (13.29)[a]	11.66 (11.71)[b]	8.72 (9.74)[c]	115.98	<0.001	0.018
Severity of gaming disorder symptoms	0.55 (0.91)[a]	0.21 (0.57)[b]	0.14 (0.46)[c]	274.28	<0.001	0.041
Positive affect	2.95 (0.73)[a]	3.46 (0.66)[b]	3.62 (0.65)[c]	560.02	<0.001	0.080
Negative affect	2.32 (0.77)[a]	1.78 (0.60)[b]	1.67 (0.55)[c]	662.71	<0.001	0.093
Perceived stress	2.91 (0.80)[a]	2.23 (0.69)[b]	2.03 (0.67)[c]	877.90	<0.001	0.120
Competence	4.37 (1.56)[a]	3.40 (1.56)[b]	2.51 (1.44)[c]	682.23	<0.001	0.097
Escapism	4.75 (1.80)[a]	3.21 (1.77)[b]	2.61 (1.63)[c]	784.95	<0.001	0.110
Introjected regulation	2.81 (1.52)[a]	2.00 (1.17)[b]	1.63 (0.95)[c]	494.87	<0.001	0.072
Recreation	6.05 (0.99)[a]	6.02 (1.02)[a]	5.96 (1.12)[a]	3.56	0.028	0.001
Social	3.59 (1.59)[a]	3.19 (1.50)[b]	2.54 (1.34)[c]	239.14	<0.001	0.036

Notes: We conducted Games-Howell post hoc tests with a Bonferroni correction (i.e., αaltered = 0.05/25) = 0.002). Different superscript letters (a, b, c) in one row reflect significant ($p < .002$) differences between the groups' means, while the same superscript letters in one row reflect non-significant differences. Effect sizes are reported as eta squared (η^2), reflecting the proportion of variance explained by group membership. M: mean; SD: standard deviation.

95% CI [1.10, 1.15], $p < .001$) were significantly associated with increased odds of membership in this group. Regarding gaming motives, both competence (OR = 1.36, 95% CI [1.30, 1.43], $p < .001$) and escapism (OR = 1.20, 95% CI [1.15, 1.24], $p < .001$) emerged as significant predictors. Those who were more likely to indicate that they played video games to demonstrate their competence or for escapism were more likely to belong to this group.

For the decreased gaming-specific self-esteem group, age was a significant positive predictor (OR = 1.02, 95% CI [1.01, 1.03], $p < .001$). Each additional year of age was associated with a 2% increase in the odds of belonging to this group. Positive affect was also positively associated with membership in this group (OR = 1.05, 95% CI [1.04, 1.06], $p < .001$). In contrast, several gaming-related measures were inversely associated with membership. Those who wanted to demonstrate their competence were substantially less likely to belong to this group (OR = 0.74, 95% CI [0.71, 0.78], $p < .001$), as were those who played video games for social reasons (OR = 0.86, 95% CI [0.82, 0.90], $p < .001$). Specifically, each one-unit increase in competence and social motives was associated with a 26% and 14% reduction in the odds of belonging to the decreased gaming-specific self-esteem group, respectively.

4. Discussion

By examining within-person differences between general and gaming-specific self-esteem, we identified three distinct groups of gamers. While most gamers exhibited stable self-esteem, a substantial proportion showed either higher or lower gaming-specific self-esteem relative to their general self-esteem. These group-based patterns complement the SEM findings, in which general and gaming-specific self-esteem emerged as empirically distinct yet moderately related constructs. The results indicate that general and gaming-specific self-esteem are partially overlapping concepts rather than independent ones. They also exhibit different associations with psychological functioning and gaming behaviors. The findings support a domain-specific view of self-esteem, aligning with recent literature that challenges traditional, global models of self-esteem and its stability in adulthood (Dapp & Orth, 2024; Raustorp & Fröberg, 2021; von Soest et al., 2016). The findings also accord with recent media portrayals reflecting the growing cultural recognition of gaming as a domain of identity formation (Van Dorn, 2025).

Relative to general self-esteem, those with higher gaming-specific self-esteem were more likely to spend more time gaming and consuming gaming content. They also had more gaming disorder symptoms, a stronger desire to demonstrate their competence as gamers, and higher levels of negative affect. Finally, they were motivated largely by escapism. The characteristics of this group suggest that, for some gamers, having higher gaming-specific self-esteem may co-occur with more intensive and psychologically salient gaming involvement. Nevertheless, given that this subgroup represents a smaller proportion of the sample, these patterns should be interpreted with appropriate caution. In contrast, those with lower gaming-specific self-esteem were less likely to spend excessive amounts of time gaming, had weaker motives for doing so, and exhibited more favorable psychological indicators. These results may reflect a more disengaged gaming pattern, in which gaming is less central to the players' self-evaluation.

Demographically, gamers in the increased gaming-specific self-esteem group were younger, consistent with prior evidence indicating heightened vulnerability to problematic gaming among younger individuals (Király et al., 2023; Wittek et al., 2016). While gaming involvement may decline with age, the harm that gaming inflicts can persist (Derevensky et al., 2019), suggesting that young people's self-evaluations based on their gaming-specific self-esteem may have longer-term implications for their psychological functioning.

In contrast, although the increased gaming-specific self-esteem group included a relatively higher proportion of females, the multivariable analyses did not indicate that gender played a meaningful role in differentiating self-esteem group membership. This result appeared despite previously established gender differences in general and domain-specific self-esteem (Gentile et al., 2009) and problematic gaming outcomes (Chow et al., 2025; Cudo, Dobosz, Griffiths et al., 2024). This pattern points to the importance of gender-balanced research that considers structural and cultural factors within predominantly male-dominated gaming environments. Gender-related differences may be context-dependent and even unfold over time, rather than being uniform or independent effects.

Gaming research has highlighted several factors, particularly gaming motives, through which video game play may become focal to people's self-evaluation. Escapism, for instance, has been conceptualized as an active, psychologically driven mode of engagement through which gaming compensates for unmet needs or distress, often associated with poorer functioning (Giardina et al., 2024; Király et al., 2023). Consistent with this conceptualization, gamers in the increased gaming-specific self-esteem group showed stronger competence and escapism motives, suggesting a potential compensatory pattern rather than purely recreational or practical motivations. Conversely, gamers with decreased gaming-specific self-esteem were less driven by competence and social motives, reflecting the comparatively weak relationship between their self-esteem and playing video games. Taken together, these findings underscore the importance of examining how people's self-evaluations

Table 5
Multinomial logistic regression analysis comparing the increased gaming-specific self-esteem and decreased gaming-specific self-esteem groups to the Stable self-esteem group.

	Increased gaming-specific self-esteem			Decreased gaming-specific self-esteem		
	B	SE	OR (95% CI)	B	SE	OR (95% CI)
Age	−0.06***	0.01	0.94 (0.93, 0.95)	0.02***	<0.01	1.02 (1.01, 1.03)
Gender	−0.12	0.09	0.88 (0.75, 1.05)	0.04	0.09	1.04 (0.87, 1.25)
Average weekly gaming time (hours/week)	0.01***	<0.01	1.01 (1.01, 1.01)	−0.01**	<0.01	0.99 (0.99, 1.00)
Average weekly watching gaming videos time (hours/week)	−0.00	<0.01	1.00 (0.99, 1.00)	−0.01*	<0.01	0.99 (0.99, 1.00)
Severity of gaming disorder symptoms	0.01	0.04	1.01 (0.93, 1.10)	0.15*	0.06	1.16 (1.03, 1.30)
Positive affect	−0.07***	0.01	0.93 (0.92, 0.94)	0.05***	0.01	1.05 (1.04, 1.06)
Negative affect	0.03***	0.01	1.03 (1.02, 1.04)	0.00	0.01	1.00 (0.99, 1.01)
Perceived stress	0.12***	0.01	1.13 (1.10, 1.15)	−0.04**	0.01	0.96 (0.94, 0.99)
Competence	0.31***	0.02	1.36 (1.30, 1.43)	−0.30***	0.02	0.74 (0.71, 0.78)
Escapism	0.18***	0.02	1.20 (1.15, 1.24)	−0.04*	0.02	0.96 (0.92, 1.00)
Introjected regulation	0.00	0.03	1.00 (0.95, 1.05)	0.00	0.03	1.00 (0.94, 1.07)
Recreation	−0.02	0.03	0.98 (0.92, 1.04)	−0.00	0.03	1.00 (0.95, 1.05)
Social	0.01	0.02	1.01 (0.97, 1.06)	−0.16***	0.02	0.86 (0.82, 0.90)

Notes: Stable self-esteem served as the reference group. B: unstandardized regression coefficient; OR: odds ratio; CI: confidence interval; SE: standard error; *: $p < .05$, **: $p < .01$, ***: $p < .001$.

based on their motivations may be associated with potentially destabilizing patterns of engagement. In this context, we must also note that we did not examine adjacent processes directly. For instance, the gamer–avatar bond has been linked to both identity-related processes and problematic gaming (Brown et al., 2024; Fraser et al., 2023; Stavropoulos et al., 2023; Szolin et al., 2022), although it remains subject to ongoing conceptual and methodological limitations concerning genre-specific evidence and generalizability (Infanti et al., 2024).

Our findings further indicate that other gaming-specific factors, despite being emphasized in prior gaming and well-being research (Hartanto et al., 2021), did not contribute uniformly to differences in self-esteem. Gaming genre preferences varied modestly across self-esteem groups. While MOBA was the most prevalent genre preference among gamers with increased gaming-specific self-esteem, all the groups favored shooter and open-world action–adventure genres. These results indicate substantial overlap in the choice of genres. Thus, we caution against narrowly focused genre-based interpretations (Saini & Hodgins, 2023). These comparatively small differences contrast with the stronger and more consistent associations we observed with the motivational and affective factors, indicating that they may be more central to how self-esteem is patterned.

Additionally, the amount of time spent gaming did not predict self-esteem group membership. This finding aligns with recent critiques of time-based metrics as indicators of psychological risk (Cheng et al., 2025; Katz et al., 2024; Zendle et al., 2023). Likewise, although we found a positive association between the severity of gaming disorder symptoms and gaming-specific self-esteem in the structural equation model, it had limited explanatory value in the multivariable analyses, supporting concerns regarding the specificity of such measures (King et al., 2025; Király et al., 2022a,b). These findings add to ongoing debates regarding the extent to which certain gaming-specific factors might be understood as problematic (Vuorre et al., 2022).

In summary, using a contextualized adaptation of the Rosenberg Self-Esteem Scale allowed us to conduct a direct comparison between general and gaming-specific self-esteem, providing insights into domain-specific self-evaluation. Our large sample size also supports the stability of the patterns we found. The findings indicate that gaming-specific self-esteem represents a distinct, domain-relevant form of self-evaluation. In addition, the differences between general and gaming-specific self-esteem are systematically associated with specific socio-demographic, psychological, and gaming-related variables. These differences capture variations that are not reflected in either construct alone. They underscore the importance of considering domain-specific self-evaluations in research and clinical frameworks, particularly when a given domain is of major personal significance to an individual.

5. Limitations

Several limitations should be considered when interpreting our findings. First, the cross-sectional design precludes causal inferences. Hence, we could not establish the directionality between general and gaming-specific self-esteem. Furthermore, the use of difference scores for general and gaming-specific self-esteem may also raise issues related to reliability and interpretation. We used these scores to make group-based comparisons. Therefore, they should be interpreted as complementary to the latent-variable analyses, rather than as a replacement for them.

Second, all our measures relied on self-reports, which may introduce recall and shared method biases. Additionally, our measures referred to different temporal frames such as current self-evaluations vs. recent affect and behavior, which may introduce additional measurement noise when interpreting their associations. Relatedly, using the brief, five-item version of the Rosenberg Self-Esteem Scale, as well as its contextualized adaptation to the gaming domain, may have limited our ability to consider other factors. Furthermore, it may have affected our conclusions regarding the construct validity and comparability with the original scale. Replication using the full item set is thus warranted. Similarly, we used abbreviated forms of other scales, which may have reduced the precision of our measures and limited the ability to compare our results with studies utilizing the full-length versions of these instruments. Finally, our gaming genre variables were compositional (summing to 100%), meaning that increases in one category necessarily reflect decreases in others. Accordingly, the results should be interpreted as relative differences rather than independent effects.

Third, data collection occurred during the COVID-19 pandemic, a period marked by higher levels of stress, social isolation, and changes in gaming behavior; accordingly, the observed associations may reflect such dynamics. Finally, the sample was predominantly male and consisted of highly engaged gamers, limiting the generalizability of our results to female and more gender-diverse gamers as well as to the

broader population of video game players. That said, our focus on frequent players aligns with established practices in gaming disorder research, where low-engagement groups serve as natural controls rather than primary targets. Additionally, our sample provides robust statistical power for female subgroup (N = 1581) analyses, which exceeds sample sizes in most comparable gaming disorder studies in the field. Therefore, both our purposive sampling approach and the gender composition of our study strengthen its internal validity for accomplishing our key research aims without compromising the study's core contributions.

CRediT authorship contribution statement

Dana Katz: Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Conceptualization. **Róbert Urbán:** Investigation, Formal analysis. **Jeffrey Derevensky:** Writing – review & editing, Conceptualization. **Patrik Koncz:** Writing – review & editing, Conceptualization. **Zsolt Horváth:** Methodology. **Zsolt Demetrovics:** Writing – review & editing, Writing – original draft, Supervision, Conceptualization. **Orsolya Király:** Writing – review & editing, Writing – original draft, Supervision, Funding acquisition, Conceptualization.

Ethical statement

The present study was approved by the Institutional Review Board (Research Ethics Committee, KEB) of ELTE Eötvös Loránd University (approval number: 2020/53, March 6), and was conducted in accordance with the principles outlined in the Declaration of Helsinki.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.chbr.2026.101131.

Data availability

Data will be made available on request.

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