

ORIGINAL ARTICLE

The Relationship between Undergraduate Students' Online Gaming Motivations, Gaming Addiction, and Online Prosocial Behaviors*

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Main Points

- Social and skill development motivations significantly predicted online prosocial behaviors among university students, while gaming addiction and other motivations (coping/escape, recreation, fantasy, and competition) did not.
- The regression model explained 11% of the variance in online prosocial behavior, with social motivation ($\beta = .243$) being the strongest predictor, followed by skill development motivation ($\beta = .206$).
- These findings suggest that gaming motivation is a stronger indicator of online prosocial behavior than gaming addiction, highlighting the need to consider motivational profiles in psychological and educational interventions.

Abstract

This study examined the role of university students' gaming addictions and online gaming motivations in predicting their online prosocial behaviors. The data collection instruments used in the study were the Personal Information Form, Online Prosocial Behavior Scale for University Students, Motives for Online Gaming Questionnaire, and Digital Game Addiction Scale for University Students. A total of 452 undergraduate students participated in the study. According to the multiple linear regression analysis results, the model variables explained 11% of the variance in online prosocial behavior. However, gaming addiction and coping/escapism, fun, fantasy, and competition motivations were not significant predictors of online prosocial behaviors. The findings were discussed, and recommendations were presented.

Keywords: Gaming addiction, gaming motivation, online gaming, online prosocial behavior

Introduction

In Türkiye, more than 50% of individuals who play video games are under 35, with the majority being in the 18 – 34 age range, accounting for 38% (Ministry of Youth and Sports, 2021). Considering this, most individuals who play video games are university students. The university period is a critical developmental stage during which individuals explore their identities and attempt to understand themselves (Jourdan, 2006). How online games influence individuals' social behaviors and friendships has been emphasized. One of the prominent behaviors among these is prosocial behavior. Prosocial

behaviors are voluntary behaviors intended to help an individual or group without expecting any external reward or benefit (Eisenberg & Mussen, 1997). Prosocial behaviors, which can be described as positive interpersonal relationships, include empathy, cooperation, sharing, altruism, helping, and consoling others for their happiness and benefit, and are referred to as positive social behaviors (Uzmen & Mağden, 2002). Prosocial behaviors are exhibited in different ways throughout every stage of life; however, adolescence and young adulthood periods hold particular importance due to the growing significance of peer communication (Gardner & Steinberg, 2005). Therefore, examining the relationship

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between prosocial behaviors and online gaming behaviors among university students in emerging adulthood is also important for studies aimed at improving the quality of their friendships.

Studies have shown that competitive online games can reduce friendship quality and teamwork, lead to aggression, and lower prosocial behaviors. However, displaying positive social behavior to help others during the game enhances friendship quality after the game (Dowsett & Jackson, 2019; Jerabeck & Ferguson, 2013; Shao & Wang, 2019; Sherry, 2001; Velez et al., 2016; Zhao et al., 2021). Similarly, it has been reported that collaborative online games increase teamwork and cooperative behaviors outside the game (Badatala et al., 2016; Harrington & O'Connell, 2016; Martončík & Loksa, 2016). In online games, it has been observed that players being a leader or a group member and gaining social status in-game have positive effects on the socio-emotional development of individuals (Martončík, 2015). Therefore, the online social behaviors that individuals show to their opponents or teammates during the game may also be reflected in their relationships outside the game. For this reason, revealing the factors influencing online social behaviors is important in supporting the social development of individuals who play games.

Playing online games may be associated with individuals' prosocial behaviors. Studies suggest that online games also affect individuals' social development and contribute to their well-being by increasing peer interaction (Gitter et al., 2013; Masala & Iona, 2018). On the contrary, it has been observed that adolescents who play violent video games exhibit increased violent behaviors in their close friends in measurements taken 1 year later (Verheijen et al., 2018). In addition, the friendship quality of individuals who play competitive games against each other declines. However, the friendship quality of individuals who exhibit prosocial behaviors toward each other in the game may increase (Verheijen et al., 2019). The relationships and interactions established in the game also influence the interactions outside the game. It has been stated that players' social bonds are strengthened when they extend the relationships formed in online games into real-life (Trepte et al., 2012). For this reason, it is important to identify the factors that encourage individuals toward prosocial behaviors rather than aggressive behaviors during online gaming.

More studies are needed on the relationship between gaming addiction and prosocial behaviors. Studies reveal different results regarding the relationship between gaming addiction and prosocial behaviors (Esparza-Reig et al., 2022). Some studies show that the relationship between gaming addiction and prosocial behaviors is not significant, while some studies show that the relationship is negative (Boxer et al., 2015; Collins & Freeman, 2013; Lemmens et al., 2015; Yaghoobi, 2022). Based on this, since gaming addiction is seen to have a relationship with prosocial behaviors, it was addressed in this study.

Individuals' motivations for playing online games can change the effects of games. Individuals' motivations for online games can affect many situations, such as online game playing time, gaming addiction or disorder, and behavioral problems (Halbrook et al., 2019; Laconi et al., 2017). When the literature was examined, it was seen that different studies mentioned different motivations for playing games. According to one study, gaming motivations are classified into three groups: achievement

and recovery, curiosity and social acceptance, and uncertainty in-game demands (Tekkurşun Demir & Hazar, 2018). Another study categorizes motivations for playing games into five groups: concentration, entertainment, escape, learning, and socialization (Akyıldız Munusturlar & Munusturlar, 2018). Another study classifies the motivations for playing games into six groups: intrinsic motivation, integrated regulation, identified regulation, introjected regulation, external regulation, and amotivation (Lafrenière et al., 2012). In contrast, Evren et al. (2020), divide the motivations for playing games into six main groups: social motivation, which involves making friends through gaming; coping/escape motivation, which focuses on escaping from real-life problems and reducing tension and anger through games; competition motivation, which centers on defeating others; skill development motivation, which is about skill acquisition such as coordination and focusing; fantasy motivation, which involves exploring new identities; and recreation motivation, which is about having a pleasant time. As observed, although there is no consensus in the literature regarding the number of motivations for playing games, it can be said that motivations such as social, recreational, and escape are common. However, when the studies are examined, it is understood that gaming motivations may affect social behaviors. For this reason, the relationship between gaming motivations and online prosocial behaviors was also addressed in this study.

When all these studies are examined, it is seen that the prosocial behaviors of university students are important in the relationships they will establish. For this reason, it is important to reveal the effect of online game playing, which may be related to prosocial behaviors and is becoming increasingly widespread among individuals. From this perspective, this study aims to explore the relationship between university students' online gaming motivations, gaming addiction, and their online prosocial behaviors.

Material and Methods

This study employs a quantitative research design and a relational research model, aiming to examine the predictive power of university students' digital gaming addiction and online gaming motivations on online prosocial behaviors. A convenience sampling method was used to collect data from the study group. In the convenience sampling method, the focus is on reaching participants who are easily accessible (Fraenkel et al., 2012).

Study Group

In the Spring Semester of the 2022 – 2023 academic year, 452 university students from various universities in Türkiye participated in the study. Of the students, 261 were male (57.7%), 185 were female (40.9%), four were non-binary (0.9%), two preferred not to specify their gender (0.4%), and 75 had low socioeconomic status (16.6%), 355 had medium socioeconomic status (78.5%), and 22 had high (4.9%) socioeconomic status. It is seen that 234 students (51.8%) who played games for an average of 0 – 2 hours per day mostly participated in the study, and 296 students (65.5%) who played games with people they knew face-to-face/in real-life participated in the study.

When the participants' education levels were examined, it was found that 403 associate and undergraduate students (89.5%) and 49 graduate students (11.9%) participated in the study. When the

grade levels of associate and undergraduate-level participants were examined, it was seen that 30 preparatory class students (6.7%), 86 first-grade students (19.1%), 89 second-grade students (19.7%), 113 third-grade students (25.1%), 70 fourth-grade students (15.5%), eight fifth-grade students (1.8%), and seven sixth-grade students (1.6%) participated in the study.

When the universities where the participants studied were analyzed according to the Classification of Statistical Regional Units, the highest number of participants was from the Western Black Sea region, coded TR8, with 152 students (33.6%), and the lowest number of participants was from the Middle Eastern Anatolia region, coded TRB, with eight students (1.8%). When the departments in which the participants were studying were examined, the highest number of students was from the Department of Guidance and Psychological Counseling, with 34 students (7.5%), and Management Information Systems and Elementary Mathematics Education, both with 31 students (6.9%). When the games that the participants played the most were analyzed, it was found that League of Legends (LoL) was the most preferred game, with 98 students (21.7%), followed by Valorant with 73 students (16.2%).

Data Collection Tools

Personal Information Form: The Personal Information Form, developed by the researchers, consists of nine questions. In this form, age, university, and department data are obtained from the participants by the open-ended question method; gender, grade level, socioeconomic level, average daily game playing time, most played game, and the person played with are obtained by the multiple-choice question method.

Motives for Online Gaming Questionnaire: It was developed by Evren et al. (2020). The scale consists of 27 items scored on a 5-point Likert scale and six factors (coping/escape, recreation, fantasy, skill development, social, and competition). A high score from a factor indicates that the relevant motivation is at the forefront of the individual. As a result of the exploratory factor analysis conducted within the scope of the validity study, it was found that the scale consisted of six factors and 27 items. This six-factor structure was tested by confirmatory factor analysis, and the fit indices of the scale ($\chi^2/\text{df} = 710.5/251 = 2.83$; GFI = 0.929, CFI = 0.971, TLI = 0.962, RMSEA = 0.049) were calculated. Within the scope of the scale's reliability studies, the Cronbach's alpha internal consistency coefficient was calculated, and it was found that the coefficients for the scale's dimensions ranged between 0.92 and 0.87.

With the data collected within the scope of this study, the six-factor structure of the scale was tested by confirmatory factor analysis, and the fit indices of the scale ($\chi^2/\text{df} = 819.4/194 = 4.22$; SRMR = 0.073, CFI = 0.914, TLI = 0.897, RMSEA = 0.085) were calculated. It was found that the correlation values of the factors of the scale ranged between 0.65 and 0.41. Within the scope of the reliability studies of the scale, the Cronbach's alpha coefficients of the factors were found to be .92 for the coping/escape sub-dimension, .94 for the fun sub-dimension, .86 for the fantasy sub-dimension, .90 for the skill development sub-dimension, .85 for the social sub-dimension, .87 for the competition sub-dimension, and .97 for the total scale.

Digital Game Addiction Scale for University Students: It was developed by Hazar and Hazar (2019). The scale consists of 21 items scored on a 5-point Likert scale and three factors (hyper-focus and procrastination; conflict, deprivation, and seeking; and emotion change and immersion). The lowest score from the scale is "21," and the highest is "105." In the scale scoring, "1 – 21: Normal group, 22 – 42: Low-risk group, 43 – 63: Risky group, 64 – 84: Dependent group, 85 – 105: Highly dependent group." Exploratory and confirmatory factor analyses were conducted to establish construct validity. The Kaiser – Mayer – Olkin (KMO) coefficient and Bartlett's Test of Sphericity were performed for the suitability of the data for factor analysis, and as a result of the analysis, the KMO value was .91, and Bartlett's Test of Sphericity showed a significance value of $p < .001$. The ability of the items to distinguish between individuals with and without the trait being measured was assessed using an independent t-test on the mean scores of the upper and lower groups, which were determined based on the total scale score. The variance explained by the scale was 59.61%. In the analysis results, it was found that the correlation values of the factors ranged between 0.58 and 0.75. According to the results of the analysis, the fit values of the scale ($\chi^2/\text{sd} = 398/186 = 2.14$, RMSEA = 0.08, GFI = 0.80, AGFI = 0.76, CFI = 0.89, IFI = 0.89, PGFI = 0.65, and PNFI = 0.73) were calculated. Within the scope of the reliability studies of the scale, the Cronbach's alpha coefficients of the factors were .76 for the first sub-factor, .78 for the second sub-factor, .89 for the third sub-factor, and .95 for the total scale.

With the data collected within the scope of this study, the three-factor structure of the scale was tested by confirmatory factor analysis, and it was found that the scale had good fit indices ($\chi^2/\text{df} = 1139/186 = 6.12$; SRMR = 0.072, CFI = 0.832, TLI = 0.811, RMSEA = 0.107), and the covariance values of the factors of the scale ranged between 0.89 and 0.75. Within the scope of the reliability studies of the scale, the Cronbach's alpha coefficients of the factors were found to be .90 for the first sub-factor, .89 for the second sub-factor, .79 for the third sub-factor, and .95 for the total scale.

Online Prosocial Behavior Scale (OPBS): It was developed by Erreygers et al. (2018). In the original form of the scale, there are two dimensions (implemented prosocial behavior and experienced prosocial behavior) and a total of twenty items, ten items in each dimension. The scale items are scored on a 5-point Likert scale. According to the results of the exploratory factor analysis conducted in the development study of the original scale, the factor loadings of the items ranged from .51 to .88. Confirmatory factor analysis revealed that the two-factor structure had a good fit ($\chi^2(155) = 1603.92$, $p < .001$; CFI = .973; TLI = .966; RMSEA = .073).

The Turkish adaptation of the OPBS was conducted by Keskinkılıç (2023). Confirmatory factor analysis conducted within the scope of the study indicated that the scale had good fit indices ($\chi^2(169) = 239.858$, $p < .001$; CFI = .993; TLI = .992; RMSEA = .034). The factor loadings of the scale ranged between .52 and .83, and the correlation between the factors was .79. Cronbach's alpha internal consistency coefficient was calculated as .90 for the applied prosocial behavior dimension, .92 for the perceived prosocial behavior dimension, and .94 for the total scale.

Within the scope of the reliability studies of the scale with the data collected within the scope of this study, the Cronbach's alpha internal consistency coefficient of the factors was calculated as .89 for the applied prosocial behavior dimension, .91 for the perceived prosocial behavior dimension, and .94 for the total scale.

Data Analysis

Spearman Rank Difference Correlation analysis was used to examine the relationships between the variables. Additionally, the multiple linear regression analysis method was employed to test whether gaming motivations and gaming addiction predict online prosocial behaviors.

Process Path

After obtaining permission from the authors who developed or adapted the scales used in the study, Ethics Committee of Bartın University (Approval No.: 2022-SBB-0486; Date: 10.11.2022) granted approval. Following the distance education measures implemented after the February 6, 2023, Kahramanmaraş Earthquake in Türkiye, the data collection process was carried out online. The Personal Information Form, Digital Gaming Motivation Scale, Digital Gaming Addiction Scale for University Students, OPBS, and Informed Consent Form used in the study were transferred to an online platform (Google Forms) by the researcher. The online form was then shared with university students via social media and instant messaging applications.

Results

The correlation values between the predicted and the predictor variables are presented in Figure 1.

As observed in Figure 1, the relationship between online prosocial behaviors, the predicted variable of the study, and each motivation to play online games is positive and statistically significant ($p < .05$). The relationship between online prosocial behaviors and gaming addiction is not statistically significant ($p > .05$). When the relationships between all predictor variables are examined, it is found that Spearman's Rank Difference Correlation Coefficients (ρ) vary between $-.02$ and $.27$. The significant and strongest relationships are between online prosocial behaviors and skill development motivation ($\rho = .27$) and social motivation ($\rho = .27$). The lowest and most significant relationship is between online prosocial behaviors and fantasy motivation ($\rho = .11$).

The results of the multiple linear regression analysis, including standardized regression coefficients, unstandardized regression coefficients, and partial correlation values, for predicting online prosocial behaviors based on online game playing motivation and gaming addiction among university students, are provided in Table 1.

As presented in Table 1, the seven predictor variables in the model explain 11% of the total variance in online prosocial behaviors. Among the online gaming motivations tested in the model, skill development motivation and social motivation variables are

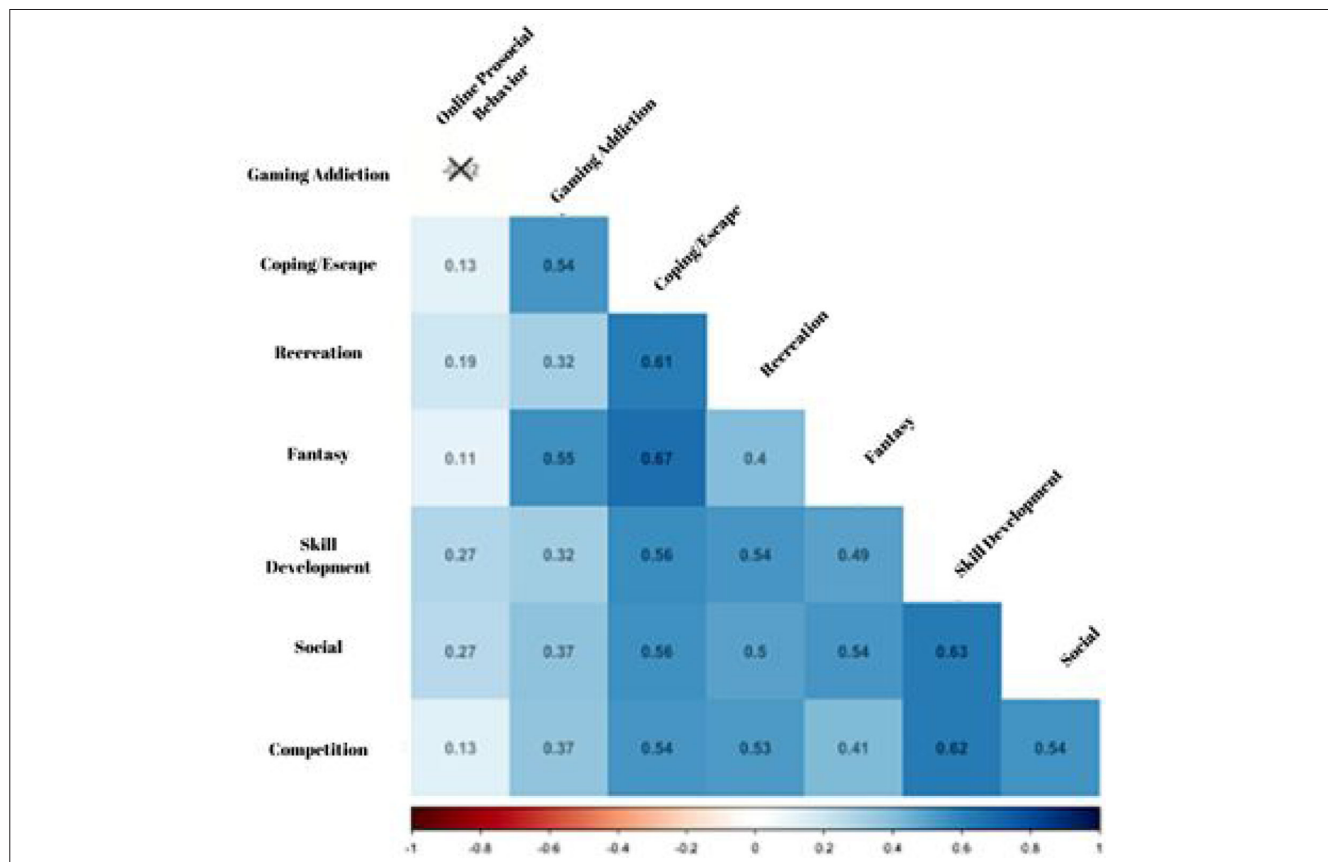


Figure 1. Correlation Values for Online Prosocial Behaviors.

Table 1.
Multiple Linear Regression Analysis Results for Predicting Online Prosocial Behaviors

Predictors	Estimation	Std. Error	t	p	β
Intersection	29.522	1.379	21.416	<.001	
Gaming addiction	-0.04	0.024	-1.656	.098	-0.093
Coping/Escape motivation	-0.048	0.069	-0.693	.489	-0.052
Recreation motivation	0.100	0.143	0.702	.483	0.045
Fantasy motivation	0.003	0.105	0.029	.977	0.002
Skill development motivation	0.313	0.102	3.077	.002	0.206
Social motivation	0.417	0.108	3.846	<.001	0.243
Competition motivation	-0.135	0.103	-1.318	.188	-0.083

$R = 0.337$; $R^2 = 0.113$; $F = 8.007$; $p < .001$.

statistically significant predictors of online prosocial behavior ($p < .001$). Other online gaming motivations (coping/escape, recreation, fantasy, competition) and gaming addiction variables tested in the model are not statistically significant predictors ($p > .05$).

In this study, which tested the ability of university students' online gaming motivations and gaming addiction to predict online prosocial behaviors, it was found that skill development motivation was the most effective predictor. Specifically, as skill development motivation and social motivation increased, online prosocial behaviors also increased.

Discussion

The study's findings revealed that social and skill development motivations for playing games predicted university students' online prosocial behaviors. However, gaming addiction and coping/escape, recreation, fantasy, and competition motivations were not found to be predictors of online prosocial behaviors.

One of the variables considered as a predictor of online prosocial behaviors within the scope of the research is gaming addiction. As a result of the analyses, it is seen that gaming addiction does not significantly predict online prosocial behaviors. This finding contributes to a body of literature with mixed results; while some studies report no significant relationship, others have found a negative association (Boxer et al., 2015; Collins & Freeman, 2013; Lemmens et al., 2015; Yaghoobi, 2022). The complex and non-significant relationship found in this study may be explained by several contextual factors that were not measured. For instance, the type of game played is a critical moderator. Players in highly competitive games (e.g., LoL, Valorant, which were popular among the participants) may need to engage in cooperative, prosocial behaviors within their teams to succeed, regardless of their level of addiction. Conversely, the isolating nature of addiction might suppress prosocial tendencies in other contexts. Therefore, the relationship between gaming addiction and prosocial behavior is likely not linear but is moderated by in-game social demands, game genre, and whether the prosocial behavior is directed at teammates or opponents. In fact, a recent meta-analysis reinforces this complexity, suggesting that prosocial behaviors in games are predicted by a wide array of factors, including empathy and social norms, rather than simply the absence or presence

of addictive patterns (Li et al., 2023). This supports the finding that gaming addiction, as a standalone variable, may not be a direct predictor of these nuanced social interactions. Therefore, future research should aim to disentangle these effects by analyzing specific game contexts and player roles.

The relationship between prosocial behaviors and gaming addiction is complex. This complexity may stem from the fact that prosocial behaviors center on individuals and human interactions (Erreygers et al., 2018), while addiction itself is a complex phenomenon (Türkiye Yeşilay Cemiyeti, 2023). Therefore, prosocial behaviors and gaming addiction are comprehensive and dimensional concepts, and the relationship between them may vary depending on which dimensions are measured. Further studies are needed on these topics.

In a meta-analysis study, Ferguson (2007) found that online games do not positively or negatively affect individuals' social and emotional characteristics, including prosocial behavior. Accordingly, similar to the results of this study, gaming addiction is not seen as a predictor of prosocial behavior. Considering that the type of game played affects individuals' social behaviors (Dowsett & Jackson, 2019; Jerabeck & Ferguson, 2013), the inclusion of students who played both cooperative and competitive games in this study may have contributed to this finding. Collins and Freeman (2013) argue that individuals who play competitive online games should be in social environments within the game, which may affect their prosocial behaviors. Regardless of whether they are addicted, individuals may need to exhibit prosocial behaviors to achieve various gains in the game. This may explain why gaming addiction was not found to be associated with online prosocial behavior.

Another variable that was considered a predictor of online prosocial behaviors within the scope of the study was online gaming motivations. The analysis of this study indicates that social motivation and skill development motivation, which are among the motivations for playing online games, significantly predict online prosocial behaviors. This finding is in line with the studies in literature (Halbrook et al., 2019). Considering that social motivation means motivation to chat with other players and make friends (Evren et al., 2020; Yee, 2006a, 2006b), it can be said that students who play games with this motivation will pay more attention to their social skills and may be more prone to

show prosocial behavior. This finding aligns with recent studies indicating that motivations centered on social interaction are significantly linked to greater perceptions of social support and well-being within online gaming communities (Wüthrich et al., 2024). Skill development motivation is the development of coordination, concentration, and other skills (Evren et al., 2020). Since students who play games with this motivation tend to focus on themselves rather than others and aim to enhance their social skills, skill development motivation may be associated with online prosocial behaviors.

Limitations and Future Directions

Several limitations of this study should be acknowledged, which also provide avenues for future research. First, the use of a convenience sampling method limits the generalizability of the findings to the broader population of university students in Türkiye. The demographic profile of this sample, primarily from the Western Black Sea region, may not be representative of all student gamers in the country. Future studies should employ stratified or random sampling techniques to obtain a more diverse and representative sample.

Second, the regression model explained 11% of the variance in online prosocial behavior. While these findings identify gaming motivations as significant predictors, this modest R^2 value indicates that other factors not included in this model play a substantial role. Future research could explore other variables such as personality traits (e.g., agreeableness, empathy), moral identity, and specific in-game social network dynamics to build a more comprehensive predictive model.

Third, this study utilized a cross-sectional design, which captures data at a single point in time. Consequently, it is not possible to infer causality from these results. The relationships identified are correlational, and one cannot determine whether motivations lead to prosocial behaviors or if engaging in prosocial behaviors enhances certain gaming motivations. Longitudinal studies are needed to track these variables over time and establish the directionality of these relationships.

Finally, while this study provides valuable insights, it did not deeply analyze the cultural context. Gaming habits and the importance of social connections can vary across cultures. Future studies could conduct cross-cultural comparisons to investigate how the relationship between gaming motivations and prosocial behaviors differs, particularly considering the collectivist aspects of Turkish culture that might place a higher value on in-group social harmony, even in competitive online environments.

When the findings obtained in line with the study's objectives are examined, it is found that the variables explain 11% of the total variance in online prosocial behaviors in the model. Among the motivations for playing online games, skill development motivation and social motivation significantly predict online prosocial behaviors, while other motivations for playing online games (coping/escape, recreation, fantasy, competition) and gaming addiction do not significantly predict online prosocial behaviors. It is observed that social motivation is the strongest predictor of university students' online prosocial behaviors.

Based on the results, several recommendations can be made for researchers and practitioners. More studies are needed to

examine the multifaceted relationship between prosocial behavior, gaming addiction, and game motivations. Future research should also expand to different age demographics, such as middle and late adulthood, to understand the lifelong impact of gaming, and incorporate diverse cultural groups to enhance the applicability of findings.

From a practical standpoint, the current findings suggest that a player's underlying motivation is more indicative of their social behavior than their level of addiction. This has important implications for interventions. For instance, university counselors and mental health professionals could use motivational profiles to identify students who play games to fulfill social needs and guide them toward positive in-game communities. Furthermore, educational programs could be designed to leverage the skill development motivation by framing cooperative gameplay as a method for improving valuable soft skills like communication, teamwork, and strategic thinking. Game developers could also use these insights to design features that reward and encourage prosocial interactions, thereby fostering healthier and more supportive online environments.

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author.

Ethics Committee Approval: Ethical committee approval was received from the Ethics Committee of Bartın University (Approval No.: 2022-SBB-0486; Date: 10.11.2022).

Informed Consent: Written informed consent was obtained from the participants who agreed to take part in the study.

Peer-review: Externally peer-reviewed.

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