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From interest to avoidance: How stress and gaming replace what students care about in homework motivation

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Abstract

As digital technologies continue to transform educational environments, students face increasing challenges in managing academic demands alongside recreational screen time. This study investigates the interrelated effects of perceived stress and computer game addiction on children and adolescents' intrinsic and extrinsic motivation to complete homework. A total of 620 primary and secondary school students (381 females and 239 males) participated in the study. The study examined direct and indirect relationships among the variables through a path analysis. Findings revealed that perceived stress negatively predicted intrinsic motivation and positively predicted extrinsic motivation and computer game addiction. Furthermore, computer game addiction significantly mediated the relationship between perceived stress and both types of motivation. These results suggest that stress-related gaming can push students to complete homework for approval or external rewards rather than personal interest. Findings also indicate that computer game addiction exacerbates the impairing effects of academic stress on intrinsic motivation. Targeted interventions that promote healthy stress coping strategies and digital balance are critical for sustaining meaningful motivation and preventing long-term academic disengagement.

Keywords: motivation, homework, stress, game addiction, children, adolescents

Introduction

High stress levels in early to mid-adolescence are directly associated with a greater risk of computer game addiction, as youths may use gaming to cope with or escape from stress (Rajab et al., 2020; Trautwein et al., 2009). However, reliance on gaming as an emotional escape can further elevate stress levels, especially when neglecting academic responsibilities, creating a self-perpetuating cycle. Longitudinal findings reinforce that

stress often precedes increases in gaming problems, suggesting a causal influence (Düll et al., 2024; Vuorinen et al., 2024). In this interplay between stress and gaming, students' motivation, particularly their ability to stay engaged with academic tasks, becomes critical in maintaining a balanced and healthy lifestyle. Additionally, students in Türkiye face a substantial academic workload both inside and outside the classroom. On average, adolescents spend considerable time on daily homework, and many also attend private after-school tutoring, which has become a widespread practice. Surveys indicate that nearly half of high school students in some regions receive such tutoring support (Özdere, 2021). This combination of formal assignments and additional study obligations points to the significance of homework-related stress in Türkiye.

Stress, particularly academic stress, has been shown to undermine intrinsic motivation and increase extrinsic motivation or a lack of motivation for schoolwork (Yang et al., 2022). While previous studies have examined individual effects of digitalization on stress, gaming addiction, and homework engagement (Akoğlu et al., 2020; Hur, 2024; Volpe et al., 2022), a more integrated understanding of interactions among these variables is still lacking. The present study addresses this gap by investigating the complex relationship between perceived stress, computer game addiction, and intrinsic and extrinsic motivation to complete homework among children and early adolescents through a path model analysis.

Homework and stress

Homework remains a widely used instructional strategy across educational systems, intended to reinforce in-school learning, build academic responsibility, and support long-term achievement (Gilic, 2016; McJames et al., 2024). While effective when meaningfully connected to curricular goals and supported by home environments (Trautwein et al., 2009), homework can also be a significant source of perceived academic stress, particularly for early adolescents transitioning from childhood to more autonomous learning demands. According to the transactional model of stress developed by Lazarus and Folkman (1987), which still retains its popularity, when individuals encounter stressors, they rapidly evaluate both the nature of the stressors and their own resources for coping with them. The level of perceived stress depends on this appraisal. Within this model, when stressors are judged to exceed an individual's available resources, the perceived stress level increases.

When assignments are perceived as excessive, irrelevant, or misaligned with students' developmental capacities, they may generate frustration, avoidance, and emotional distress (Moè et al., 2020; Wang et al., 2025). For young learners still developing executive functioning and self-regulation skills, the psychological burden of homework can be substantial, particularly when parental or teacher support is inconsistent (Wang et al., 2025).

Motivation and gaming

Motivation plays a central role in students' academic success and their willingness to complete tasks such as homework (Estévez et al., 2018; Wang et al., 2025). Drawing on expectancy theory, Porter and Lawler (1968) introduced the concepts of intrinsic and extrinsic motivation. Intrinsic motivation reflects personal interest and satisfaction derived from the activity itself, while extrinsic motivation is driven by external incentives such as praise, grades, or approval (Ryan & Deci, 2000; Deci, 1972). The distinction between intrinsic and extrinsic motivation laid the groundwork for later theories, especially self-determination theory. Ryan and Deci (2017) describe these forms of motivation as interrelated, with intrinsic motivation viewed as more crucial for learning and development. However, in our digital age, the learning environment increasingly relies on rewards and punishments, which promote extrinsic motivation at the expense of intrinsic engagement.

Studies have consistently shown that students with higher levels of intrinsic motivation demonstrate greater engagement, persistence, and academic achievement (Liu et al., 2024; Karataş & Ergin, 2018). In contrast, extrinsically motivated students often approach learning tasks as obligations, reducing their autonomy and potentially increasing stress (Pintrich & Schunk, 2002; Eccles & Wigfield, 2002).

The rise of digital technologies and screen-based entertainment has introduced new challenges for maintaining academic motivation. In particular, computer game addiction has emerged as a significant factor influencing students' academic behaviors. Gaming addiction is characterized by excessive and compulsive engagement in video games, often accompanied by emotional regulation issues, loss of time awareness, and withdrawal from social or academic activities (Griffiths, 1998; American Psychiatric Association, 2022). Recent studies confirm a growing prevalence of problematic gaming among adolescents, with one report indicating addiction rates as high as 41.5% among high school students in Türkiye (Ayaz-Alkaya & Köse-Kabakcıoğlu, 2025).

Theoretical studies on the causes of digital game addiction remain limited (Jin & Jiang, 2025). One of the few theoretical bases is the emotion regulation approach. According to Gross (1998), in children and adolescents whose emotional regulation has not yet fully developed, this process involves controlling emotions, adapting to emotional changes, and maintaining emotional and physical balance. Within this framework, children and adolescents who cannot effectively regulate emotions related to stress, anxiety, or depression become more vulnerable to technology addiction. Consequently, in the trajectory toward gaming addiction, they may struggle to manage feelings such as craving or withdrawal (Contreras, 2019). Emotion regulation theory thus provides part of the theoretical foundation for the hypothesis in this study, which proposes that perceived stress may contribute to gaming addiction among individuals with insufficient emotional regulation. Self-determination theory, widely used to explain motivation, is also regarded

as a model for understanding behavioral addictions (Jin & Jiang, 2025). According to this theory, individuals have psychological needs related to intrinsic motivation, such as relatedness and autonomy, but these needs are often only partially met in real-life contexts (Ryan & Deci, 2017). A lack of autonomy or limited fulfillment of relational needs may direct children and adolescents toward online environments, where they can experience greater autonomy and build social connections. Ariani et al. (2018) argue that autonomy deficiencies in real-life contexts can push individuals to seek online experiences of autonomy, potentially reducing their motivation to engage in other tasks such as completing homework or studying.

Research shows a clear negative relationship between gaming addiction and academic motivation, particularly intrinsic motivation (Amriza et al., 2024; Shahroudi et al., 2019). Students who frequently engage in gaming are more likely to procrastinate, experience attention difficulties, and avoid academic responsibilities such as homework (Sun et al., 2023; Zhu et al., 2015). Furthermore, as students increasingly rely on digital devices for both learning and leisure, the boundaries between productive and distracting screen time have blurred, making it more challenging to regulate their academic behaviors.

Importantly, gaming appears to be a key link in the relationship between academic stress and motivation. Adolescents experiencing high levels of perceived stress, especially related to school, may turn to games as an emotional escape, which can further reduce their motivation to complete homework (Hur, 2024; Ariani et al., 2018; Jun & Choi, 2015). In their theory of compensatory internet use, Kardefelt-Winther (2014) posits that individuals turn to online activities, such as gaming, to compensate for offline stressors, unmet emotional conflicts, or negative affect. Rather than viewing excessive gaming as solely pathological, this perspective suggests that gaming is a coping strategy, where escapism and mood regulation mediate the relationship between stress and problematic use. Together, these perspectives explain how stress may drive adolescents toward gaming as a form of compensation and avoidance, ultimately shaping their motivational orientation. This cycle of stress, gaming, and reduced motivation can become self-reinforcing: students game to avoid stress, fall behind on homework, experience increased stress, and continue to game as a coping mechanism. In this context, extrinsic motivators (e.g., parental pressure, rewards) may temporarily drive homework completion, but intrinsic engagement often declines.

Current study

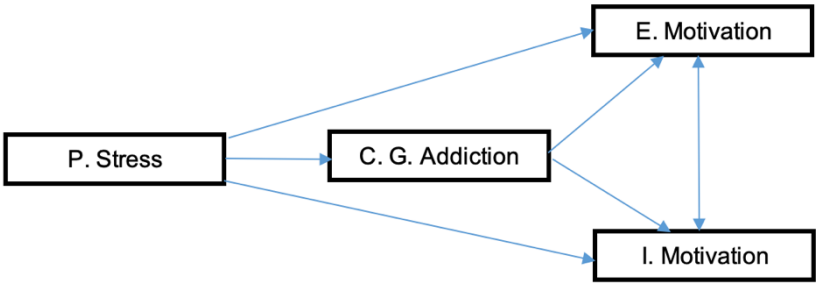
There is limited research on the influence of perceived stress as a source of intrinsic and extrinsic motivation for completing homework among elementary and middle school students. Moreover, no studies in the literature have been found that examine the mediating role of digital game addiction in the relationship between stress and motivation.

Understanding how students' motivation to do homework shifts when the stress they perceive from their environment begins to increase may provide valuable insights for educators. At the same time, knowing whether avoidance strategies such as turning to digital games during stressful times mediate the relationship between stress and intrinsic or extrinsic motivation can offer new perspectives for researchers studying stress, addiction, and motivation.

Building on previous research linking academic stress, gaming behavior, and motivation, this study examines whether computer game addiction mediates the relationship between perceived stress and both intrinsic and extrinsic motivation to complete homework. Using a path model, the study tests the direct effects of perceived stress on motivation and game addiction, the direct effects of computer game addiction on motivation, and the indirect effects of stress on intrinsic and extrinsic motivation through computer game addiction. As illustrated in Figure 1, the model conceptualizes how emotional (i.e., stress) and behavioral (i.e., computer game addiction) factors jointly shape students' academic engagement in digital learning environments. Thus, the following hypothesis guided the current research study: *Does computer game addiction mediate the relationship between perceived stress and intrinsic/extrinsic motivation to complete homework among children and adolescents in Türkiye?*

Figure 1

The conceptual model



Note: I. Motivation: intrinsic motivation, E. Motivation: extrinsic motivation, P. Stress: perceived stress, C.G. Addiction: computer game addiction

Method

This study employed a correlational survey design to examine the direct and indirect relationships among perceived stress, computer game addiction, and intrinsic and extrinsic motivation to complete homework. A hypothesized path model was developed based on theoretical and empirical literature (Ryan & Deci, 2000; Folkman, 1984; Griffiths, 1998) and tested using path analysis. Path analysis, a subset of structural equation modeling (Bollen, 1989), was used to assess both direct and mediated relationships among the

observed variables, providing estimates of predictive strength and model fit (Bollen, 1989). The analysis was conducted using AMOS statistical software.

Participants

The study was conducted during the 2023–2024 academic year with elementary and middle school students in the city of Kırıkkale, Türkiye. The study sample comprised 620 primary and secondary school students, including 381 females (61.5%) and 239 males (38.5%). Participants ranged in age from 8 to 14 years, with a mean age of 11.92. The grade-level distribution was as follows: 164 third-graders (26.5%), 79 fourth-graders (12.7%), 127 fifth-graders (20.5%), 64 sixth-graders (10.3%), 89 seventh-graders (14.4%), and 97 eighth-graders (15.6%).

Data collection tools

To serve the purpose of this study, three self-report instruments were used to assess children and adolescents' homework motivation, computer game addiction, and perceived stress. These tools were selected based on their theoretical relevance, psychometric adequacy for the target age group, and adaptation process to Turkish society. Additional demographic data, including gender, age, and grade level, were also collected. Each instrument is described in detail below.

Motivation for doing homework

The Motivation for Doing Homework Scale (Katz et al., 2012; Turkish adaptation by Duru & Çöğmen, 2016) was used to assess students' intrinsic and extrinsic motivation related to homework tasks. The scale consists of 12 items rated on a 4-point Likert scale, ranging from Strongly Disagree (1) to Strongly Agree (4), with higher scores indicating stronger levels of the respective motivational type. The scale comprises two factors: (a) intrinsic motivation (6 items) and (b) extrinsic motivation (6 items). The original Turkish adaptation study reported Cronbach's alpha values of .82 for the intrinsic subscale and .62 for the extrinsic subscale. In the current study, internal consistency coefficients were .86 for intrinsic and .79 for extrinsic motivation.

Computer game addiction

The Computer Game Addiction Scale (Horzum et al., 2008) was developed to assess problematic computer game use in primary and secondary school students. The scale includes 21 items distributed across four factors and rated on a 5-point Likert scale from Never (1) to Always (5), with higher scores indicating greater levels of computer game addiction. The four subscales are: (a) Disruption of Daily Functioning, (b) Withdrawal, (c) Tolerance, and (d) Preoccupation. The original study reported a total scale Cronbach's

alpha of .85, while the current study found a Cronbach's alpha of .88, indicating strong internal consistency.

Perceived stress

The Perceived Stress Scale in Children (Snoeren & Hoefnagels, 2014) measured children's stress perceptions over the past week and was later adapted to Turkish society (Oral & Ersan, 2017). The scale includes 12 items and uses a 4-point Likert scale, ranging from Never (1) to Always (4), with higher scores reflecting greater perceived stress. The Turkish adaptation confirmed a unidimensional factor structure with good model fit indices (χ^2/df = 1.58, RMSEA = .039, RMR = .03, GFI = .98, AGFI = .96, CFI = .97). The internal consistency reliability coefficient reported in the Oral and Ersan (2017) was .76, for the current study, Cronbach's alpha was .80.

Procedures

Prior to data collection, ethical approvals were received from the first author's university. All participating primary and secondary school students were informed about the general purpose of the study, the nature of the questionnaires, and the estimated time required for completion (e.g., 15 minutes). To ensure clarity and age-appropriateness, a preliminary pilot application was conducted specifically with a subset of primary school students (n = 20). Pilot participants reported minor wording and item numbering issues, which were consequently fixed before the launch of the main data collection phase.

Preparation of the data for analysis

After entering the data into IBM SPSS, we conducted preliminary screening to prepare the dataset for analysis. We first examined frequency distributions and analyzed Z-scores to identify extreme values. Two cases with Z-scores beyond ±3 were removed. We then calculated Mahalanobis distances to detect multivariate outliers. Five additional cases exceeded the critical chi-square value (based on the number of independent variables at $p < .01$) and were excluded from further analysis.

Next, we assessed the assumptions required for regression and path analysis. We evaluated linearity by examining correlations among variables, using a significance threshold of .05. The data met the linearity assumption, with no violations observed. We also checked for multicollinearity by analyzing bivariate and multivariate correlations. None of the correlation coefficients exceeded the .80 threshold (Büyüköztürk, 2011), indicating no issues with multicollinearity.

To assess normality, we examined skewness and kurtosis values. Skewness ranged from -.69 to .87, and kurtosis ranged from -.26 to .94. According to Bai and Ng (2005), values between -3 and +3 indicate no major deviations from normality, while George and Mallery (2019) suggest that coefficients between -1 and +1 reflect a normal distribution. Based on

these criteria, the dataset met the assumption of normality. A summary of the intervariable correlations is presented in Table 1.

Findings

This section presents the results of the study that aimed to predict children and adolescents' intrinsic and extrinsic motivation to complete homework based on perceived stress and computer game addiction. The findings include descriptive statistics, correlation analyses, and the tested conceptual path model results.

As shown in Table 1, students reported moderate to high levels of intrinsic motivation (M = 3.05), extrinsic motivation (M = 2.02), perceived stress (M = 2.06), and computer game addiction (M = 2.23). The correlation analysis revealed several significant relationships. Intrinsic motivation was negatively associated with extrinsic motivation (r = -.38), perceived stress (r = -.48), and computer game addiction (r = -.44). As intrinsic motivation increased, levels of extrinsic motivation, stress, and gaming behavior decreased.

Extrinsic motivation showed positive associations with perceived stress (r = .34) and computer game addiction (r = .42), indicating that higher external motivation was linked to elevated stress and gaming tendencies. A positive correlation between stress and game addiction (r = .27) also emerged, suggesting that as students' stress levels increased, so did their propensity for gaming behavior. These findings demonstrated adequate levels of association to proceed with the proposed path model.

Table 1

Results of the correlation analysis showing the relationships between variables

Variables	M	Ss	1	2	3	4
(1) I. Motivation	3.05	.71	1			
(2) E. Motivation	2.02	.54	-.38**	1		
(3) P. Stress	2.06	.93	-.48**	.34**	1	
(4) C.G. Addiction	2.23	.67	-.44**	.42**	.27**	1

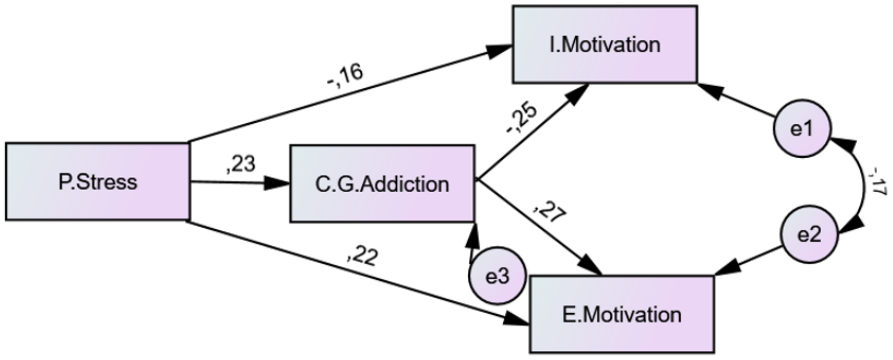
Note. *p<.05, ** p<.01 Note: I. Motivation: intrinsic motivation, E. Motivation: extrinsic Motivation, P. Stress: perceived stress, C.G. Addiction: computer game addiction

Path model results

As shown in Figure 2, the hypothesized model was tested using path analysis in AMOS. The model fit indices indicated an acceptable model fit: $\chi^2/df = 4.89$; RMSEA = .07; SRMR = .05; CFI = .95; GFI= .94, AGFI= .94, NFI = .95; RFI = .91; TLI = .94; IFI= .95. All values met the criteria for a well-fitting model (Bollen, 1989; Şimşek, 2007).

Figure 2

Tested path model



Note: I. Motivation = intrinsic motivation; E. Motivation = extrinsic motivation; P. Stress = perceived stress; C.G. Addiction = computer game addiction.

According to the results presented in Table 2, perceived stress had a direct, negative, and statistically significant effect on students' intrinsic motivation to do homework (β = -.16, t = -4.23, $p < .01$), and a direct, positive, and significant effect on extrinsic motivation (β = .22, t = 5.78, $p < .01$). In addition, computer game addiction significantly predicted intrinsic motivation in a negative direction (β = -.25, t = -6.46, $p < .01$), and extrinsic motivation in a positive direction (β = .27, t = 7.17, $p < .01$). Perceived stress also directly and positively predicted computer game addiction (β = .23, t = 5.96, $p < .01$).

With regard to indirect effects, perceived stress significantly and negatively predicted intrinsic motivation (β = -.10, $p < .05$) and significantly and positively predicted extrinsic motivation (β = .12, $p < .05$) through computer game addiction. The Sobel test confirmed these mediation effects, showing that computer game addiction significantly mediated the relationship between perceived stress and both intrinsic motivation (t = 3.42, $p < .01$) and extrinsic Motivation (t = 4.03, $p < .01$).

Overall, these findings support the mediating role of computer game addiction in the relationship between perceived stress and students' motivation to do homework. That is, higher stress levels not only directly influence motivation but also exert an indirect effect by increasing gaming behavior, which in turn shapes students' academic motivation.

Table 2

The effect values of perceived stress and game addiction on intrinsic and extrinsic motivation to do homework

	P. Stress			C.G. Addiction		
	1	2	3	1	2	3
(1) C.G. Addiction	.23	-	.23	-	-	-
(2) I. Motivation	-.16	-.10	-.26	-.25	-	-.25
(3) E. Motivation	.22	.12	.34	.27	-	.27

Note: 1. Direct effects; 2. Indirect effects; 3. Total effects

Discussion and conclusion

This study examined how perceived stress and computer game addiction influence intrinsic and extrinsic motivation to complete homework among children and adolescents. The correlational and path model analysis results revealed several key findings contributing to the growing literature on student motivation to do homework in digitally mediated learning environments.

The first major finding is that perceived stress significantly predicted intrinsic and extrinsic homework motivation but in opposite directions. Specifically, higher levels of perceived stress were associated with lower intrinsic and higher extrinsic motivations. These results align with prior research (Çelik & Yıldırım, 2019; Yang et al., 2022), which suggests that stress often undermines students' enjoyment and internal drive to learn while reinforcing motivation driven by external rewards or pressure. While moderate stress may serve as a motivator by fostering alertness and effort (Eryılmaz, 2009; Yang et al., 2022), excessive or chronic stress appears to shift students' academic engagement toward compliance rather than curiosity. This interpretation is further supported by developmental research showing that during early adolescence, stress regulation is closely tied to biological and cognitive changes. For instance, Gunnar et al. (2009) note that adrenaline secretion increases with the onset of puberty, making stress responses more intense, while Zimmer-Gembeck and Locke (2007) found that adolescents increasingly rely on distractors and avoidance rather than adaptive coping strategies. Such reliance may explain why higher stress contributes to extrinsic rather than intrinsic motivational orientations. Furthermore, the COVID-19 pandemic offers a relevant context to compare these results, in which increased academic demands and inconsistent parental support intensified this shift toward extrinsically motivated academic behaviors (Benneker et al., 2023; Dong et al., 2024; Sun et al., 2023), pushing students to complete homework for approval rather than personal interest. Benneker et al. (2023) provided further evidence that parents' support of a growth mindset and autonomy can be protective factors against adolescents'

declining intrinsic motivation in digital learning environments. The current study provided evidence that the effects of the COVID-19 pandemic's shift to digital learning on intrinsic motivation are persistent, primarily due to the changing nature of learning environments and increased demands for independent academic work.

Similarly, the second key finding highlights the role of computer game addiction as a significant predictor of homework motivation. Students with higher levels of gaming addiction reported lower intrinsic motivation and higher extrinsic motivation. This finding supports previous studies indicating that excessive digital gaming interferes with academic focus, self-regulation, and internalized learning goals (Amriza et al., 2024; Shahroudi et al., 2019; Zhu et al., 2015). As gaming behaviors become more compulsive, students may depend on external structures, such as reminders, adult supervision, or rewards, to complete school tasks. As Wahlstrom et al. (2009) argue, adolescents' developmental tendencies toward novelty-seeking and preference for immediate rewards are shaped by increased dopamine activity. Digital games provide fast, accessible reinforcement compared to delayed rewards gained from completing homework, which may support a reliance on extrinsic motivation over intrinsic enjoyment of learning. Self-determination theory (Ryan & Deci, 2020) further suggests that when rewards dominate, extrinsic motivation expands at the expense of intrinsic motivation. Additionally, Hur (2024) added that students utilize higher computer game addiction as an escape mechanism, which in turn can further weaken their academic skills and internal motivation to learn. Meanwhile, students with lower gaming tendencies may retain a greater capacity for sustained attention, autonomous goal-setting, and academic enjoyment (Ayaz-Alkaya & Köse-Kabakcıoğlu, 2025; Sun et al., 2023). Current findings have shown that adolescents in Türkiye are similarly caught in a cycle where computer game addiction leads to a reduction in intrinsic motivation and an increase in extrinsic motivation.

The third major result is the observed link between stress and computer game addiction. Consistent with previous literature (Ariani et al., 2018; Jun & Choi, 2015; Sun et al., 2023), higher stress levels significantly predicted greater gaming addiction among students. As suggested by Lazarus and Folkman (1984), avoidance-based coping strategies, such as excessive gaming, are commonly used to escape academic or emotional stressors. Gross (1998) emphasizes that emotion regulation skills are not yet fully developed in children and adolescents, and Contreras (2019) suggests that failure to manage stress, anxiety, and depressive feelings increases vulnerability to technology addiction. This study's findings resonate with those perspectives, supporting how perceived stress can foster avoidance strategies like gaming, which then mediate motivational outcomes. Due to increasingly remote learning strategies for adolescents, many adolescents turn to online games for temporary relief from educational and social pressure (Ariani et al., 2018; Hur, 2024). While this behavior may offer short-term emotional regulation, it can also deepen the cycle

of disengagement and academic struggle over time. Significantly, with increased game addiction, accompanying factors such as a lack of physical activity and sleep could negatively exacerbate the effects of computer game addiction on stress.

Finally, the path model confirmed that computer game addiction partially mediated the relationship between stress and motivation. That is, perceived stress not only directly affects intrinsic and extrinsic motivation but also influences motivation indirectly through its impact on gaming behaviors. Although no previous studies had tested this exact model, related research suggests that stress can trigger digital avoidance habits that ultimately reshape how students engage with schoolwork (Rajab et al., 2020). By integrating both self-determination theory and emotion regulation perspectives, the current findings suggest that stress impairs intrinsic motivation while reinforcing extrinsic motivation through pathways of avoidance and immediate reward-seeking. The mediation effect underlines the importance of considering digital behaviors when examining academic motivation in today's screen-saturated learning environments.

Together, these findings suggest that student motivation is not only a function of academic design but also of emotional and behavioral regulation shaped by stress and digital media use. Supporting students' psychological well-being and helping them develop healthier digital habits may be crucial for fostering sustained and meaningful engagement with homework and learning.

Limitations and future research

This study provides valuable insights into the relationships between perceived stress, computer game addiction, and homework motivation in children and adolescents. However, several limitations should be considered.

First, research on homework-specific motivation is limited, with most studies addressing general academic motivation. While this enhances the uniqueness of the current study, it restricts deeper comparison. Future research should continue to explore homework motivation as a distinct construct, incorporating a broader range of psychological and contextual variables. Second, the conceptual overlap between computer game addiction and general technology addiction limited the specificity of some interpretations. Future studies should more clearly differentiate between various forms of digital engagement, such as gaming, social media, and streaming, to isolate their unique impacts on academic behavior. Third, this study did not explore the specific sources of stress. Stress related to schoolwork, family, or financial difficulties may affect students differently. Identifying these sources in future studies would support more targeted interventions. Fourth, further research is needed to better understand how coping strategies differ between children and adolescents, and how these differences are reflected in digital game addiction. For example, if avoidance is a strategy used in both developmental stages, future studies should examine

which specific behaviors (e.g., digital game addiction, academic procrastination) are more frequently employed as avoidance mechanisms by children and adolescents. The results of such research could provide a clearer explanation of the links between digital game addiction, developmental processes, and stress-coping models. Additionally, the cross-sectional design restricts causal conclusions. Longitudinal or experimental research is needed to better understand how stress, gaming, and motivation interact over time.

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Author's contributions
MK and NT conceptualized the research idea. MK and MKY were responsible for data collection and analysis. MA contributed to the data analysis, manuscript development, and led the final writing and preparation of the paper for submission. All authors read and approved the final manuscript.

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Availability of data and materials
All summary outputs of the data are shared within the article. Requests for more detailed information should be directed to the corresponding author.

Declarations

Competing interests
The authors declare no known competing interests.

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References

Akoğlu, G., & Karaaslan, B. T. (2020). COVID-19 ve izolasyon sürecinin çocuklar üzerindeki olası psiko-sosyal etkileri [Possible psychosocial effects of the COVID-19 and isolation process on children]. *İzmir Katip Çelebi University Faculty of Health Science Journal, 5*(2), 99–103.

American Psychiatric Association. (2022). *Diagnostic and statistical manual of mental disorders* (5th ed.). https://doi.org/10.1176/appi.books.9780890425787

Amriza, R. N. S., Husnaini, S. J., & Firmansyah, A. Y. (2024). Correlation among game addiction, achievement emotion, and learning motivation: A study of Indonesian youth in the context of e-learning system. *Research and Practice in Technology Enhanced Learning, 19*, article 027. https://doi.org/10.58459/rptel.2024.19027

Ariani, P., Suryani, S., & Hernawaty, T. (2018). Relationship between academic stress, family and peer attachment with internet addiction in adolescents. *Jurnal Keperawatan Padjadjaran, 6*(3), 215–226. https://doi.org/10.24198/jkp.v6i3.483

Ayaz-Alkaya, S., & Köse-Kabakcıoğlu, N. (2025). Prevalence and predisposing factors of digital game addiction and cyberbullying in adolescents: A cross-sectional study. *Public Health, 241*, 137–143. https://doi.org/10.1016/j.puhe.2025.02.012

Bai, J., & Ng, S. (2005). Tests for skewness, kurtosis, and normality for time series date. *American Statistical Association Journal of Business & Economic Statistics January*, *23*(1), 49–60. https://doi.org/10.1198/073500104000000271.

Benneker, I. M. B., Lee, N. C., & van Atteveldt, N. (2023). Mindset and perceived parental support of autonomy safeguard adolescents' autonomous motivation during COVID-19 home-based learning. *Npj Science of Learning, 8*(1), article 4. https://doi.org/10.1038/s41539-023-00153-2

Bollen, K. A. (1989). *Structural equations with latent variables*. Wiley. https://doi.org/10.1002/9781118619179

Büyüköztürk, Ş. (2011). *Sosyal bilimler için veri analizi el kitabı [Handbook of data social science data analysis]*. Pegem Academy.

Çelik, E., & Yıldırım, S. (2019). Examining test anxiety in terms of academic expectations stress and motivation to study. *Pegem Journal of Education and Instruction, 9*(4), 1139–1158. https://doi.org/10.14527/pegegog.2019.037.

Contreras, C. E. H. (2019). *Emotion regulation strategies on depression through a problematic use of technology: Toward an explanation of the association between depressive symptomatology and Internet addiction* (Doctoral dissertation, Pontificia Universidad Católica de Chile). https://doi.org/10.7764/tesisUC/PSI/23565

Deci, E. L. (1972). Intrinsic motivation, extrinsic reinforcement, and inequity. *Journal of Personality and Social Psychology, 22*(1), 113–120.

Dong, J., Manning, K. Q., & Wang, C. H. (2024). The influence of adjustment, mental health and motivation on graduate student learning strategies during COVID-19. *Discover Psychology, 4*, article 195. https://doi.org/10.1007/s44202-024-00314-3

Düll, L., Müller, A., & Steins-Loeber, S. (2024). Negative consequences experienced by individuals with gaming disorder symptoms: A systematic review of available longitudinal studies. *Current Addiction Reports, 11*(4), 528–550. https://doi.org/10.1007/s40429-024-00554-2

Duru, S., & Çöğmen, S. (2016). The psychometric properties of homework motivation scale: a study of reliability and validity. *Turkish Studies, 11*(3), 1049–1064. http://dx.doi.org/10.7827/TurkishStudies.9395

Eccles, J. S., & Wigfield, A. (2002). Motivational beliefs, values, and goals. *Annual Review of Psychology, 53*(1), 109–132. https://doi.org/10.1146/annurev.psych.53.100901.135153

Eryılmaz, A. (2009). Ergenlik döneminde stres ve başa çikma [Stress and coping at adolescence]. *Van Yüzüncü Yıl University Journal of Education, 6*(2), 20–37.

Estévez, I., Regueiro, B., Rodríguez, S., Piñeiro, I., Souto, A., & González-Sanmamed, M. (2018). Why students of secondary education complete more homework. *European Journal of Investigation in Health, Psychology and Education, 8*(1), 15–21. https://www.mdpi.com/2254-9625/8/1/15

Folkman, S. (1984). Personal control and stress and coping processes: A theoretical analysis. *Journal of Personality and Social Psychology, 46*(4). 839–852. https://doi.org/10.1037/0022-3514.46.4.839

George, D., & Mallery, M. (2019). *SPSS for Windows step by step: A simple guide and reference 17.0 update* (15th ed.). Routledge.

Gilic, L. (2016). Increasing homework completion and accuracy rates with parental participation for young children with autism spectrum disorder. *Psychology, Society, & Education, 8*(2), 173–186.

Griffiths, M. D. (1998). Internet addiction: Does it really exist? In J. Gackenbach (Ed.), *Psychology and the Internet: Intrapersonal, interpersonal and transpersonal applications* (pp. 61–75). Academic Press.

Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology, 2*(3), 271–299. https://doi.org/10.1037/1089-2680.2.3.271

Gunnar, M. R., Wewerka, S., Frenn, K., Long, J. D., & Griggs, C. (2009). Developmental changes in hypothalamus–pituitary–adrenal activity over the transition to adolescence: Normative changes and associations with puberty. *Development and Psychopathology, 21*(1), 69–85. https://doi.org/10.1017/S0954579409000054

Horzum, M. B., Ayas, T., & Çakır Balta, Ö. (2008). *Computer game* addiction *scale* for children. *Turkish Psychological Counseling and Guidance Journal*, *3*(30), 76–88.

Hur, Y.-M. (2024). Gene-environment interaction between gaming addiction and perceived stress in late adolescents and young adults: A twin study. *Journal of Behavioral Addictions, 13*(2), 587–595. https://doi.org/10.1556/2006.2024.00029

Jin, Y., & Jiang, S. (2025). Theoretical perspectives on adolescent internet addiction: A comprehensive literature review. *Health & Social Care in the Community, 2025*(1), article 4875332. https://doi.org/10.1155/hsc/4875332

Jun, S., & Choi, E. (2015). Academic stress and internet addiction from general strain theory framework. *Computers in Human Behavior, 49*, 282–287. https://doi.org/10.1016/j.chb.2015.03.001

Karataş, H., & Ergin, A. (2018). Üniversite öğrencilerinin başarı yönelimli motivasyon düzeyleri [Achievement-oriented motivation levels of university students]. *Hacettepe University Journal of Education, 33*(4), 868–887. https://doi.org/10.16986/HUJE.2019051147

Kardefelt-Winther, D. (2014). A conceptual and methodological critique of internet addiction research: Towards a model of compensatory internet use. *Computers in Human Behavior, 31,* 351–354. https://doi.org/10.1016/j.chb.2013.10.059

Katz, I., Buzukashvili, T., & Feingold, L. (2012). Homework stress: Construct validation of a measure. *Journal of Experimental Education, 80*(4), 405–421. https://doi.org/10.1080/00220973.2011.610389

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer.

Lazarus, R. S., & Folkman, S. (1987). Transactional theory and research on emotions and coping. *European Journal of Personality, 1*(3), 141–169. https://doi.org/10.1002/per.2410010304

Liu, Y., Ma, S., & Chen, Y. (2024). The impacts of learning motivation, emotional engagement and psychological capital on academic performance in a blended learning university course. *Frontiers in Psychology, 15*, article 1357936. https://doi.org/10.3389/fpsyg.2024.1357936

McJames, N., Parnell, A., & O'Shea, A. (2024). Little and often: Causal inference machine learning demonstrates the benefits of homework for improving achievement in mathematics and science. *Learning and Instruction, 93*, article 101968. https://doi.org/10.1016/j.learninstruc.2024.101968

Moè, A., Katz, I., Cohen, R., & Alesi, M. (2020). Reducing homework stress by increasing adoption of need-supportive practices: Effects of an intervention with parents. *Learning and Individual Differences, 82*, article 101921. https://doi.org/10.1016/j.lindif.2020.101921

Oral, T., & Ersan, C. (2017). Adaptation of the perceived stress scale in children (8-11 years) into Turkish. *SEFAD, 37*, 419–428. https://doi.org/10.21497/sefad.328629

Özdere, M. (2021). The demand for private tutoring in Turkey: An analysis of private tutoring participation and spending. *Journal of Education and Learning, 10*(3), 96–111. https://doi.org/10.5539/jel.v10n3p96

Pintrich, P. R., & Schunk, D. H. (2002). *Motivation in education: Theory, research, and applications* (2nd ed.). Prentice Hall.

Porter, L. W., & Lawler, E. E. (1968). *Managerial attitudes and performance*. R. D. Irwin.

Rajab, A. M., Zaghloul, M. S., Enabi, S., Rajab, T. M., Al-Khani, A. M., Basalah, A., Alchalati, S. W., Enabi, J., Aljundi, S., Billah, S. M. B., Saquib, J., AlMazrou, A., & Saquib, N. (2020). Gaming addiction and perceived stress among Saudi adolescents. *Addictive Behaviors Reports, 11*, article 100261. https://doi.org/10.1016/j.abrep.2020.100261

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*(1), 68–78. https://doi.org/10.1037/0003-066X.55.1.68

Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. New York, NY: Guilford Press.

Ryan, R. M., & Deci, E. L. (2020). Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions. *Contemporary Educational Psychology, 61,* article 101860. https://doi.org/10.1016/j.cedpsych.2020.101860

Shahroudi, S., Soltani, F., Nouri, N., & Rigi, A. (2019). The relationship between cell-phone addiction with academic achievement motivation and academic performance. *Shenakht Journal of Psychology & Psychiatry, 5*(6), 57–70.

Şimşek, Ö. F. (2007). *Yapısal eşitlik modellemesine giriş: Temel ilkeler ve LISREL uygulamaları* [Introduction to structural equation modeling: Basic principles and LISREL applications]. Ekinoks.

Snoeren, F., & Hoefnagels, C. (2014). Measuring perceived social support and perceived stress among primary school children in the Netherlands. *Child Ind Res, 7*(3), 473–486. https://doi.org/10.1007/s12187-013-9200-z

Sun, R.-Q., Sun, G.-F., & Ye, J.-H. (2023). The effects of online game addiction on reduced academic achievement motivation among Chinese college students: The mediating role of learning engagement. *Frontiers in Psychology, 14,* article 1185353. https://doi.org/10.3389/fpsyg.2023.1185353

Trautwein, U., Niggli, A., Schnyder, I., & Lüdtke, O. (2009). Between-teacher differences in homework assignments and student effort. *Journal of Educational Psychology, 101*(1), 176–189. https://doi.org/10.1037/0022-0663.101.1.176

Volpe, U., Orsolini, L., Salvi, V., Albert, U., Carmassi, C., Carrà, G., Cirulli, F., Dell'Osso, B., Luciano, M., Menculini, G., Nanni, M. G., Pompili, M., Sani, G., Sampogna, G., & Fiorillo, A. (2022). COVID-19-related social isolation predisposes to problematic internet and online video gaming use in Italy. *International Journal of Environmental Research and Public Health, 19*(3), article 1539. https://doi.org/10.3390/ijerph19031539

Vuorinen, I., Savolainen, I., Sirola, A., & Oksanen, A. (2024). The impacts of stress and loneliness on gambling and gaming problems: A nationwide longitudinal study. *International Journal of Social Psychiatry, 70*(7), 1325–1332. https://doi.org/10.1177/00207640241264661

Wahlstrom, D., White, T., & Luciana, M. (2009). Neurobehavioral evidence for changes in dopamine system activity during adolescence. *Neuroscience & Biobehavioral Reviews, 34*(5), 631–648. https://doi.org/10.1016/j.neubiorev.2009.12.007

Wang, L., Li, M., Wu, Y., Hu, Y., & Luo, L. (2025). Persistent effectiveness of mathematics homework time from primary school to early middle school: A longitudinal study from China. *Learning and Individual Differences, 118*, article 102642. https://doi.org/10.1016/j.lindif.2025.102642

Yang, M., Viladrich, C., & Cruz, J. (2022). Examining the relationship between academic stress and motivation toward physical education within a semester: A two-wave study with Chinese secondary school students. *Frontiers in Psychology, 13*, article 965690. https://doi.org/10.3389/fpsyg.2022.965690

Zhu, J., Zhang, W., Yu, C., & Bao, Z. (2015). Early adolescent internet game addiction in context: How parents, school, and peers impact youth. *Computers in Human Behavior, 50*, 159–168. https://doi.org/10.1016/j.chb.2015.03.079

Zimmer-Gembeck, M. J., & Locke, E. M. (2007). The socialization of adolescent coping behaviours: Relationships with families and teachers. *Journal of Adolescence, 30*(1), 1–16. https://doi.org/10.1016/j.adolescence.2005.03.001

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