

Early Maladaptive Schemas, Psychopathological Symptoms, and Behavioral Addictions in Adolescent Population

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Keywords

Early maladaptive schemas · Psychopathology · Gambling · Gaming · Adolescents

Abstract

Introduction: Early maladaptive schemas (EMS) have been identified as key cognitive factors in the development of addictive behaviors, yet their specific relationship with adolescent gambling and gaming remains unclear. The study aimed to (1) explore the relationship between Young's EMS, psychopathological symptoms, gambling, and gaming behavior and (2) examine the mediating role of psychopathological symptoms in the relationship between EMS and both gambling and gaming. **Methods:** The sample comprised 1,189 secondary school students ($M_{\text{age}} = 15.64$; $SD = 1.08$; 52.5% girls). EMS, psychopathological symptoms, gambling, and gaming were assessed using the Young Schemas Questionnaire (YSQ), Symptoms Assessment Questionnaire (SA-45), South Oaks Gambling Screen for Adolescents (SOGS-RA), and Video Game-Related Experiences Questionnaire (CERV), respectively. **Results:** Most EMS were associated with both problematic gaming (r_s between 0.068 and 0.233) and gambling severity (r_s between 0.061 and 0.120) and showed strong associations with psychopathological symptoms (r_s between 0.212 and 0.635). After controlling for gender and age, psychopathological symptoms significantly mediated the associations between all EMS domains and both behavioral outcomes

($p \leq 0.002$). A pattern of full mediation was observed for gambling severity, whereas partial mediation was found for problematic gaming. **Conclusion:** The findings suggest that addressing EMS and psychopathological symptoms may be a key component in prevention and intervention strategies for adolescent problematic gaming and gambling. Overall, this research highlights that addressing both early cognitive vulnerabilities and concurrent psychopathological symptoms is essential to mitigate the impact of behavioral addictions in youth.

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Introduction

Although the phenomenon remains controversial [1–3], behavioral addictions are typically conceptualized as recurrent patterns of behavior marked by compulsive and impulsive elements that give rise to clinically meaningful distress and functional impairment across life domains, including interpersonal relationships, educational or occupational performance, and leisure activities [4]. For adolescents, the consequences of behavioral addictions frequently manifest as declines in academic performance, disrupted family relationships, social withdrawal, and an elevated risk of comorbid internalizing and externalizing disorders [5].

To date, only gambling and gaming have been formally classified as addictive disorders within international

diagnostic systems, the DSM-5-TR and ICD-11 [6, 7]. Prevalence data from the European School Survey Project on Alcohol and Other Drugs (ESPAD) indicate that 22% of 15-year-old students reported gambling in the past year, with 15% meeting criteria for excessive gambling and 5% for problem gambling [8]. Systematic reviews of adolescent and youth gambling report highly variable rates of problem gambling, ranging from 0.2% to 12.3% [9], 1.1%–9.8% [10], and even from 0.77% to 57.5% [11]. Regarding video game use, meta-analyses estimate that between 2.5% and 3.3% of the population meet criteria for gaming disorder [12–15]. Rates are higher in younger age groups, being more prevalent among children and adolescents (between 3.3% and 6.7%) than in adults (1.9%) [12, 13, 15].

It should be noted, however, that adolescence is characterized by increased neurobiological vulnerability, reflected in heightened impulsivity and a stronger preference for immediate rewards, which generally diminishes upon reaching adulthood [16, 17]. Moreover, recent studies indicate that engagement with video games, particularly those incorporating chance-based mechanics such as loot boxes and gacha games, may serve as a precursor to gambling behaviors. These game elements, which simulate gambling experiences, can lead to increased impulsivity and reward sensitivity, traits that are heightened during adolescence and are associated with the development of gambling problems later in life [18].

Given the magnitude of these problems and their potential consequences, understanding the underlying risk factors is essential for the development of effective prevention and intervention strategies. One factor that may play a significant role in both the development and maintenance of behavioral addictions are early maladaptive schemas (EMS). According to schema therapy [19–21], EMS are enduring cognitive-emotional patterns that originate in childhood or adolescence when basic emotional needs (e.g., secure attachment, autonomy, freedom of expression, spontaneity, play, and realistic boundaries) are unmet. Young's theoretical framework identifies 18 specific schemas, which are organized into five primary domains: disconnection and rejection, impaired autonomy and performance, impaired limits, other-directedness, and overvigilance and inhibition. For a comprehensive description of these schemas, their characteristics, and their grouping into domains, see Young et al. [19].

Although they may remain latent, EMS are triggered under stressful circumstances, leading to intense negative affect and maladaptive coping responses. Individuals

generally manage activated schemas through three dysfunctional coping modes: surrender (accept a schema and act accordingly), avoidance (distancing from distressing experiences, often through emotional numbing), and overcompensation (excessively counteracting the schema). From a theoretical standpoint, behavioral addictions may be conceptualized as maladaptive coping strategies driven by the activation of EMS. When adolescents experience intense negative affects due to unmet emotional needs, engaging in gambling or gaming may serve as an avoidant coping mechanism. For instance, immersion in virtual gaming or gambling environments provides a psychological escape from the distress associated with EMS like social isolation or emotional deprivation. Thus, rather than being isolated behavioral problems, gambling and video games could become regulatory tools, even if maladaptive ones, for coping with the emotional distress triggered by the activation of early dysfunctional schemas [22, 23]. Moreover, beyond epidemiological considerations, investigating adolescence is theoretically significant because this developmental phase represents a critical period during which childhood schemas and coping mechanisms consolidate. Should adolescents utilize gaming or gambling to regulate schema-induced distress during this vulnerable stage, such behaviors risk becoming deeply entrenched [24, 25]. Accordingly, elucidating this association presents a pivotal opportunity for early intervention prior to the evolution of these vulnerabilities into chronic adult addictive disorders.

Recent systematic reviews in the behavioral addiction literature have reported positive associations between EMS and addictive behaviors, encompassing both substance and behavioral addictions [24, 26, 27]. These empirical findings are consistent with theoretical formulations that conceptualize addictive behaviors as avoidance strategies, where individuals engage in these activities to attenuate the distress arising from unmet emotional needs and pervasive feelings of emptiness [28, 29].

Empirical research specifically addressing EMS in relation to gambling is scarce; only seven studies to date were found to date have directly examined this association [22, 23, 25, 30–33]. Findings across these investigations are heterogeneous. Correlational estimates reported in the literature are generally small (r between 0.09 and 0.19) [30]. Clinical samples meeting criteria for gambling disorder tend to report elevated EMS scores, particularly within the domains of “impaired autonomy and performance” and “impaired limits” [22, 31]. Other studies, however, have identified higher scores in the

domains of “disconnection and rejection” and “other-directedness” among individuals with gambling disorder [23]. Conversely, other investigations have failed to detect significant associations between EMS and gambling behavior [25, 32]. To date, only one study has evaluated this relationship in an adolescent sample [33]. This study reported that adolescents with higher levels of gambling severity exhibited increased scores on the “disconnection and rejection,” “impaired autonomy,” and “other-directedness” domains.

With respect to gaming, the literature examining associations between EMS and problematic gaming is very limited as, to date, only four studies have addressed this relationship [32–35]. Findings across these investigations are inconsistent. Efrati et al. [33] reported that adolescents with elevated levels of gaming scored higher across all five EMS domains assessed in the study. In contrast, Estévez et al. [32] found no positive correlations between any EMS and gaming severity in their sample. The study by Cudo and Maçik [35] showed a significant relationship with the enmeshment, subjugation, unrelenting standards, and pessimism schemas. Finally, Cudo et al. [34] found gender-specific patterns among men, the schemas of vulnerability to harm or illness, subjugation, and enmeshment were associated with problematic gaming, whereas among women only the dependence/incompetence schema showed a positive association with gaming behavior.

Within the schema therapy framework, it is plausible that associations between EMS and problematic gambling and gaming might be partially shared with, or manifested through, concurrent symptoms of poor mental health. A substantial body of empirical research has reported associations between symptoms of poor mental health and heightened involvement in problematic gaming [36–40] and gambling [41–43]. Similarly, a growing body of research indicates that EMS are implicated in a wide range of mental health problems, including personality disorders [44, 45], depressive disorders [46, 47], anxiety disorders [48], obsessive-compulsive disorder [49], somatization [50], hostility or anger [51, 52], psychotic symptoms [53–55], eating disorders [56], bipolar disorder [57], and suicidal behavior [58, 59], among others.

Empirically, evidence supporting this indirect-association hypothesis remains scarce. To our knowledge, only the study by Cudo et al. [34] has examined whether depression and anxiety accounted for the link between EMS and problematic gaming; however, their results revealed no statistically significant indirect associations via depression or anxiety.

Several limitations in the existing literature on EMS and behavioral addictions warrant further investigation. To date, most research on EMS and addictive behaviors has focused on substance use [24, 26, 27], while comparatively few studies have examined EMS in relation to gaming or gambling. Among the limited number of studies addressing the association with gambling and/or gaming, the majority have been conducted with adult [22, 23, 25, 32, 60] or young adult samples [31, 34, 35], often relying on participants with specific characteristics, such as exclusively female [23, 32], exclusively male [30], or exclusively clinical populations [25, 60]. Furthermore, some investigations have employed categorical classifications rather than continuous measures of addictive behavior [33], which may reduce sensitivity to variations in gambling or gaming severity. In other cases, studies have examined the association of EMS not directly with gambling behavior, but with related constructs such as gambling motives or other correlates [25].

In sum, theoretical frameworks and limited empirical findings suggest that psychopathological symptoms may function as potential mediators of the association between EMS and behavioral addictions. However, empirical evidence directly testing this hypothesis is scarce, particularly in adolescent populations. The present study aims to (1) examine the associations between EMS, psychological symptoms, gaming use, and gambling behavior in adolescents and (2) evaluate whether adolescents' psychopathological symptoms mediate the relationship between EMS and these behavioral addictions.

Methods

Participants

The sample comprised 1,189 adolescents enrolled in secondary education, with ages ranging from 14 to 18 years ($M = 15.64$, $SD = 1.08$). In terms of age distribution, 14-year-olds represented 18.5% ($n = 219$) of the sample, 15-year-olds represented 25.5% ($n = 302$), 16-year-olds represented 31.6% ($n = 374$), 17-year-olds represented 22.3% ($n = 263$), and 18-year-olds represented 2.0% ($n = 24$).

In terms of gender identity, 52.5% of the students identified as female ($n = 623$), 46.2% as male ($n = 548$), and 1.3% as nonbinary ($n = 16$). Regarding academic level, participants were distributed across various stages of secondary education: 25.2% were attending the third year of compulsory education ($n = 298$), 25.1% the fourth year ($n = 297$), 32.8% were in the first year of post-compulsory

secondary education (baccalaureate) ($n = 388$), and 11.8% in the second year ($n = 140$); in addition, 4.8% were enrolled in vocational training programs ($n = 57$). With respect to nationality, the vast majority of participants (93.8%; $n = 1,107$) were Spanish, whereas 6.2% ($n = 76$) were of different national origins.

Instruments

Early Maladaptive Schemas

EMSs were assessed using the Young Schema Questionnaire-Short Form (YSQ-SF-3) [61], adapted to Spanish by Calvete et al. [62]. This instrument demonstrates strong psychometric properties and is widely used in both clinical and nonclinical populations. This questionnaire consists of 90 items that evaluate 18 EMS proposed by Young, grouped into five conceptual domains. Each schema is assessed through 5 items, rated on a 6-point Likert scale ranging from 1 (“completely untrue of me”) to 6 (“describes me perfectly”), yielding scores from 5 to 30 per schema; higher scores indicate increased maladaptive schema activation.

In this study, only 11 of the 18 schemas were analyzed; representing four of Young’s proposed domains. The first domain, disconnection and rejection, includes five schemas: (1) emotional deprivation, (2) abandonment, (3) mistrust/abuse, (4) social isolation/alienation, and (5) defectiveness/shame. The second domain, impaired limits, comprises two schemas: (6) entitlement/grandiosity and (7) insufficient self-control/self-discipline. The third domain, other-directedness, consists of two schemas: (8) subjugation and (9) self-sacrifice. Finally, the fourth domain, overvigilance and inhibition, encompasses two schemas: (10) emotional inhibition and (11) unrelenting standards/hypercriticalness. For a more comprehensive description of the EMS and their specific definitions within each domain see online supplementary Table S1 (for all online suppl. material, see <https://doi.org/10.1159/000552306>).

The selection of these 11 EMS was driven by pragmatic considerations, as this research was nested within a large-scale project involving an extensive battery of psychometric tests. To mitigate participant burden, prevent survey fatigue, and reduce dropout rates among the adolescent sample, the EMS assessment was shortened. The 11 selected schemas were prioritized based on their theoretical relevance to the core hypotheses of this study.

Domain scores were calculated by averaging the items of the schemas included in each domain. The internal consistency (Cronbach’s α) for each domain in the current sample was $\alpha = 0.952$ for the disconnection/

rejection domain, $\alpha = 0.895$ for the impaired limits domain, $\alpha = 0.901$ for the other-directedness domain, and $\alpha = 0.882$ for the overvigilance/inhibition domain.

Psychopathological Symptoms

Psychopathological symptoms were measured using the Symptoms Assessment-45 Questionnaire (SA-45) [63], a brief and psychometrically robust self-report instrument derived from the original Symptom Checklist-90-Revised (SCL-90-R) [64]. The Spanish adaptation by Sandín et al. [65] was employed in this study. The SA-45 includes 45 items, each rated on a 5-point Likert-type scale (ranging from 0 = not at all to 4 = extremely).

The scale is structured into nine clinical dimensions, each composed of five items: somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. The internal consistency for the subscales in this sample was adequate to excellent, with Cronbach’s alphas ranging from 0.733 (obsessive-compulsive) to 0.855 (hostility), and 0.967 for the entire scale. In the current study, all nine subscales were subjected to a principal component analysis to derive a composite index of general psychological distress.

Gambling Behavior

Gambling severity was assessed using the South Oaks Gambling Screen – Revised for Adolescents (SOGS-RA) [66], an adaptation of the original SOGS developed by Lesieur and Blume [67], specifically tailored to the adolescent population. In this study, we used the Spanish validated version for adolescents [68, 69]. The SOGS-RA includes 12 items scored in a dichotomous format (yes/no), providing a unidimensional index of gambling severity. The total score ranges from 0 to 12, with higher scores indicating greater severity. Following established guidelines, participants were categorized as non-problematic or recreational gamblers (scores of 0–1 points), at-risk gamblers (2–3 points), or problem gamblers (4 points or more). The instrument has shown good internal consistency in previous studies, and in the current sample, the Cronbach’s α was 0.811.

Gaming Use

The Video Game-Related Experiences Questionnaire (*Cuestionario de Experiencias Relacionadas con los Videojuegos* [CERV]) [70] was used to evaluate the intensity and potential problematic use of video games. This instrument consists of 17 items rated on a 4-point Likert-type scale (1 = never/almost never to 4 = almost always), capturing the frequency of behaviors and

psychological experiences associated with gaming. These include aspects such as preoccupation with gaming, difficulty controlling playtime, escalation of use, emotional escape, and interference with daily functioning. Previous psychometric studies [70, 71] have identified a two-dimensional structure: (1) psychological dependence and evasive use and (2) negative consequences of gaming. The total score ranges from 17 to 68 and facilitates the categorization of participants into three empirically derived groups: non-problematic gamers (17–25), at-risk gamers (26–38), and problematic gamers (39–68). In the present study, the CERV demonstrated excellent internal consistency, with Cronbach's alpha values of 0.863 for the psychological dependence and evasive use subscale, 0.865 for the negative consequences subscale, and 0.927 for the full scale.

Procedure

To recruit participants, a number of secondary schools and vocational training centers from different regions of Spain were invited to collaborate in the study. Each institution received details about the research objectives and methodology. Once permission was granted, data collection was conducted during school hours, with students completing the questionnaires either under the supervision of a member of the research team or their regular classroom teacher. The estimated time required to complete the survey was approximately 25 min.

Data were gathered through a mixed-mode approach: 76.03% of the students ($n = 904$) responded via an online survey platform, whereas 23.97% ($n = 285$) completed the questionnaire in a paper-and-pencil format. Before conducting the analyses, both groups were compared across all study variables to ensure that the administration mode did not influence the outcomes. No significant differences were observed, supporting previous evidence that administration format does not influence outcomes [72].

Prior to participation, students were thoroughly informed about the aims of the study. The study was approved by the Research Ethics Committee of the University of Deusto (ref. ETK-59/23-24) and followed the principles of the Declaration of Helsinki. Participants were assured of the confidentiality and anonymity of their responses and informed that their participation was entirely voluntary. No compensation was provided for participation in this study.

Data Analysis

The reliability of the YSQ-SF-3, SA-45, SOGS-RA, and CERV was evaluated using Cronbach's alpha [73], considering 0.80 as the optimal cutoff value [74]. De-

scriptive statistics (i.e., mean and standard deviation) and frequencies were calculated to explore participants' sociodemographic characteristics and psychological variables. As previously noted, to operationalize the mediator variable, a composite psychopathological symptoms score was derived using principal component analysis on the nine symptom dimensions of the SA-45. The first unrotated principal component, which captured the largest proportion of shared variance, was retained and interpreted as a global index of psychopathological symptoms.

The normality of the data was assessed using the Kolmogorov-Smirnov test, which revealed significant deviations from normality for all variables (all p values < 0.001). Therefore, associations between variables were examined using Spearman's rank-order correlations (r_s).

To examine the mediating role of psychopathological symptoms in the relationship between EMS and the severity of video game use and gambling behavior, a series of four mediation analyses were conducted. To test the hypotheses, the 11 schemas were grouped into their four respective theoretical domains. As described in the Instruments section, domain-level mean scores were used as independent variables in the mediation models to provide a more parsimonious analysis. Specifically, each model tested whether psychopathological symptoms (assessed through a composite score derived from the SA-45) mediated the association between each of the four schema domains (i.e., disconnection and rejection, impaired limits, other-directedness, and overvigilance and inhibition) and the two behavioral outcomes (i.e., problematic video game use and gambling severity). To control for potential confounding effects, gender and age were included as covariates in all four mediation models. Gender was dummy-coded (0 = boys, 1 = girls) and age was treated as a continuous variable. Confidence intervals for the indirect effects were estimated using a nonparametric bootstrapping procedure based on 5,000 resamples.

All analyses were carried out using JASP (version 0.18.3). A 95% confidence interval was used to determine the statistical significance of all effects.

Results

Correlations between EMS, Psychopathological Symptoms, Gaming, and Gambling Use

Bivariate correlations were examined between gaming, gambling, EMS, and psychopathological symptoms. With regard to gaming, significant positive correlations, albeit

Table 1. Spearman correlations between gaming and gambling severity, EMS, and psychopathological symptoms

	Gaming	Gambling
EMS		
Disconnection and rejection	0.207**	0.099**
Abandonment	0.068*	0.052
Emotional deprivation	0.213**	0.096**
Mistrust/Abuse	0.190**	0.120**
Social isolation	0.233**	0.076*
Defectiveness/Shame	0.210**	0.095**
Impaired limits	0.174**	0.081**
Entitlement/Grandiosity	0.147**	0.094**
Insufficient self-control	0.173**	0.058
Other-directedness	0.110**	0.032
Self-sacrifice	0.022	0.003
Subjugation	0.199**	0.067*
Overvigilance and inhibition	0.133**	0.063*
Emotional inhibition	0.201**	0.086**
Unrelenting standards	0.050	0.037
Psychopathological symptoms		
Hostility	0.198**	0.146**
Somatization	0.173**	0.072*
Depression	0.122**	0.061*
Obsessive-compulsive	0.187**	0.075*
Anxiety	0.098**	0.009
Interpersonal sensitivity	0.146**	0.050
Phobic anxiety	0.135**	0.018
Paranoid ideation	0.191**	0.086**
Psychoticism	0.193**	0.088**
EMS, early maladaptive schemas. * $p \leq 0.05$; ** $p \leq 0.001$.		

moderate, were observed with all EMS, except for self-sacrifice and unrelenting standards/hypercriticalness. The strongest association emerged for the domain of the disconnection and rejection domain ($r_s = 0.207$, $p < 0.001$), followed by impaired limits ($r_s = 0.174$, $p < 0.001$), overvigilance and inhibition ($r_s = 0.133$, $p < 0.001$), and other-directedness ($r_s = 0.110$, $p = 0.001$). For gambling, significant but weak-to-moderate correlations were found with most EMS, with the exception of abandonment, insufficient self-control/self-discipline, self-sacrifice, and unrelenting standards/hypercriticalness. The highest correlation was again observed for the disconnection and rejection domain ($r_s = 0.099$, $p = 0.001$), followed by impaired limits ($r_s = 0.081$, $p = 0.009$) and overvigilance and inhibition ($r_s = 0.063$, $p = 0.040$). No significant correlation was found with other-directedness domain ($r_s = 0.032$, $p = 0.298$) (see Table 1).

In terms of the associations between behavioral ad-
dictions and psychopathological symptoms, gambling

showed weak positive correlations with hostility, so-
matization, depression, obsessive-compulsive symp-
toms, paranoid ideation, and psychoticism (r_s values
between 0.061 and 0.146, $p \leq 0.037$). By contrast, gaming
was moderately and positively correlated with all nine
psychopathological dimensions (r_s values between 0.098
and 0.198, $p \leq 0.002$) (see Table 1).

Regarding psychopathological symptoms, all nine
psychopathological symptom dimensions were
strongly and positively correlated with the EMS.
Correlations with disconnection and rejection do-
main ranged from $r_s = 0.453$ to 0.635, with impaired
limits from $r_s = 0.377$ to 0.523, with other-
directedness from $r_s = 0.378$ to 0.499, and with
overvigilance and inhibition from $r_s = 0.308$ to 0.439
(all p values < 0.001) (see Table 2).

Mediating Role of Psychopathological Symptoms in the Relationship between EMS, and Gaming and Gambling Use

Four mediation models were tested to examine the role
of psychopathological symptoms in the relationship be-
tween each of the four EMS domains and both gaming and
gambling. Across all domains (i.e., disconnection and re-
jection, impaired limits, other-directedness, and over-
vigilance and inhibition), the a-paths from EMS domains
to psychopathological symptoms were statistically signifi-
cant, ranging from $\beta = 0.074$, $p < 0.001$ (in overvigilance
and inhibition domain) to $\beta = 0.128$, $p < 0.001$ (in dis-
connection and rejection domain), indicating that higher
endorsement of maladaptive schemas was associated with
poorer mental health.

Regarding the outcome variables, the b-paths from
psychopathological symptoms to gambling and
gaming were statistically significant, indicating that
poorer mental health was associated with increased
gaming and gambling severity. The results indicated
that psychopathological symptoms significantly me-
diated the relationship between all four EMS domains
and both behavioral outcomes. Regarding gambling
behavior, significant indirect effects were found for
disconnection and rejection ($\beta = 0.019$, $p = 0.002$),
impaired limits ($\beta = 0.017$, $p < 0.001$), other-
directedness ($\beta = 0.017$, $p < 0.001$), and over-
vigilance and inhibition ($\beta = 0.013$, $p < 0.001$).
Similarly, the indirect effects on problematic gaming
were statistically significant across all domains: dis-
connection and rejection ($\beta = 0.257$, $p < 0.001$),
impaired limits ($\beta = 0.253$, $p < 0.001$), other-
directedness ($\beta = 0.242$, $p < 0.001$), and over-
vigilance and inhibition ($\beta = 0.211$, $p < 0.001$). These

Table 2. Spearman correlations between EMS and psychopathological symptoms

	Hostility	Somatization	Depression	Obsessive-compulsive	Anxiety	Interpersonal sensitivity	Phobic anxiety	Paranoid ideation	Psychoticism
Disconnection and rejection	0.499**	0.487**	0.635**	0.528**	0.551**	0.615**	0.453**	0.611**	0.553**
Abandonment	0.389**	0.413**	0.548**	0.464**	0.498**	0.505**	0.389**	0.502**	0.449**
Emotional deprivation	0.427**	0.386**	0.518**	0.426**	0.432**	0.495**	0.361**	0.482**	0.460**
Mistrust/Abuse	0.475**	0.451**	0.572**	0.480**	0.518**	0.556**	0.408**	0.614**	0.517**
Social isolation	0.387**	0.380**	0.486**	0.406**	0.425**	0.515**	0.357**	0.470**	0.441**
Defectiveness/Shame	0.434**	0.431**	0.512**	0.435**	0.450**	0.515**	0.402**	0.470**	0.489**
Impaired limits	0.463**	0.453**	0.523**	0.505**	0.490**	0.499**	0.377**	0.506**	0.473**
Entitlement/Grandiosity	0.428**	0.392**	0.450**	0.418**	0.432**	0.450**	0.336**	0.471**	0.432**
Insufficient self-control	0.433**	0.452**	0.516**	0.520**	0.472**	0.479**	0.376**	0.471**	0.448**
Other-directedness	0.384**	0.443**	0.533**	0.476**	0.480**	0.499**	0.378**	0.488**	0.460**
Self-sacrifice	0.317**	0.382**	0.450**	0.399**	0.416**	0.401**	0.293**	0.413**	0.378**
Subjugation	0.402**	0.437**	0.534**	0.484**	0.469**	0.527**	0.413**	0.496**	0.464**
Overvigilance and inhibition	0.308**	0.351**	0.439**	0.396**	0.401**	0.426**	0.322**	0.404**	0.381**
Emotional inhibition	0.367**	0.384**	0.453**	0.401**	0.392**	0.436**	0.344**	0.396**	0.388**
Unrelenting standards	0.212**	0.263**	0.347**	0.322**	0.332**	0.343**	0.251**	0.337**	0.308**
EMS, early maladaptive schemas. * $p \leq 0.05$; ** $p \leq 0.001$.									

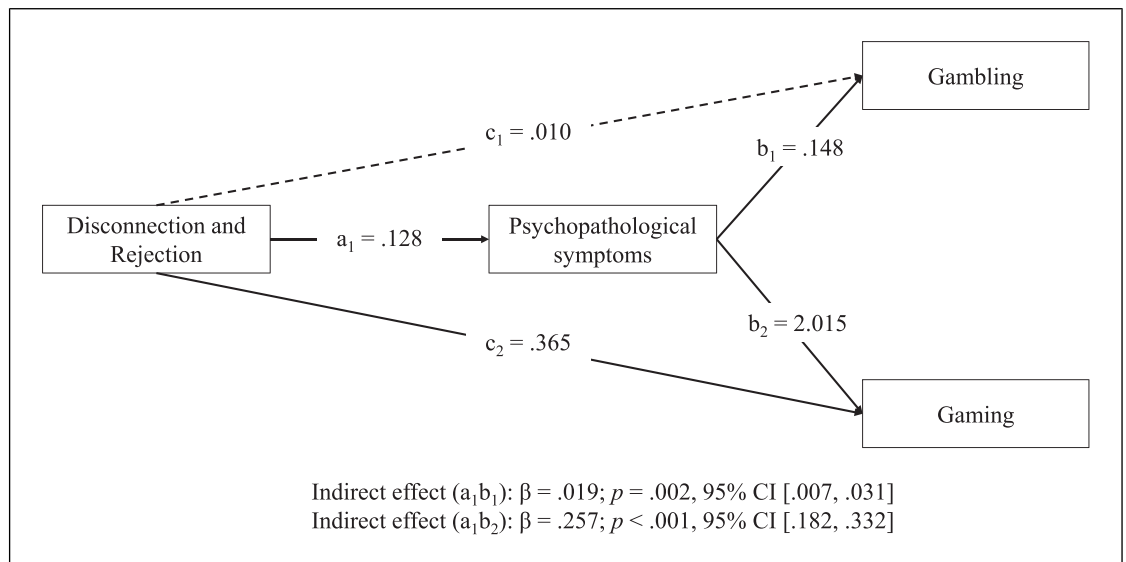


Fig. 1. Mediating role of psychopathological symptoms in the relationship between disconnection and rejection domain and gambling and gaming. Solid lines indicate significant effects at a 95% confidence interval. Dashed lines indicate non-significant effects at a 95% confidence interval. Gender and age were included in the model as covariates.

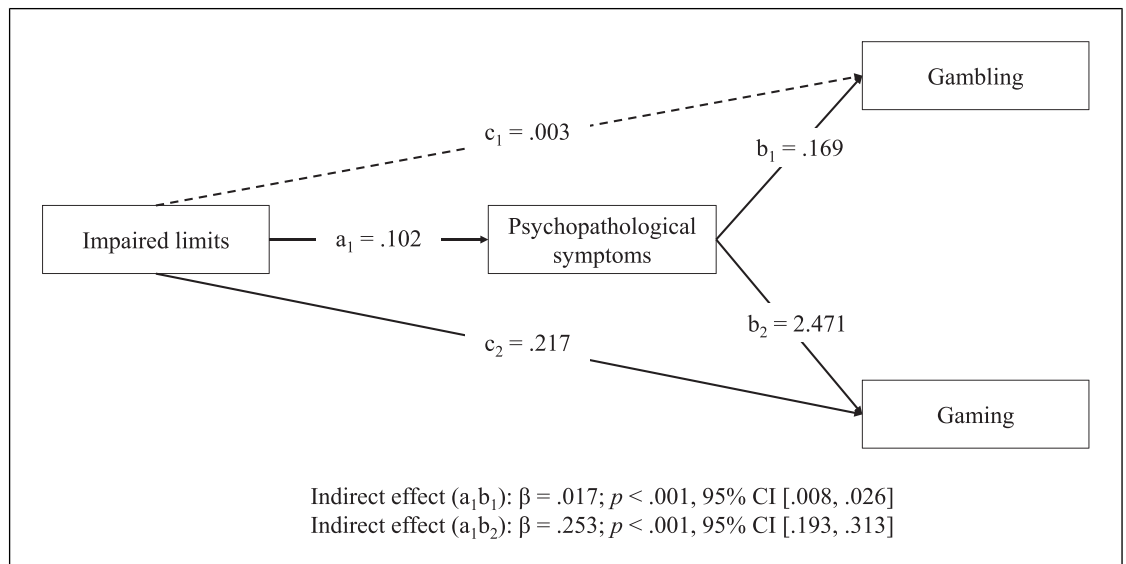


Fig. 2. Mediating role of psychopathological symptoms in the relationship between impaired limits domain and gambling and gaming. Solid lines indicate significant effects at a 95% confidence interval. Dashed lines indicate non-significant effects at a 95% confidence interval. Gender and age were included in the model as covariates.

findings suggest that the associations between EMS and both gambling and gaming behaviors are at least partially accounted for by the presence of psychopathological symptoms. The mediation models are presented in Figures 1–4.

Discussion

The present study aimed to examine the relationship between EMS and behavioral addictions (specifically gambling and gaming) in a large sample of adolescents,

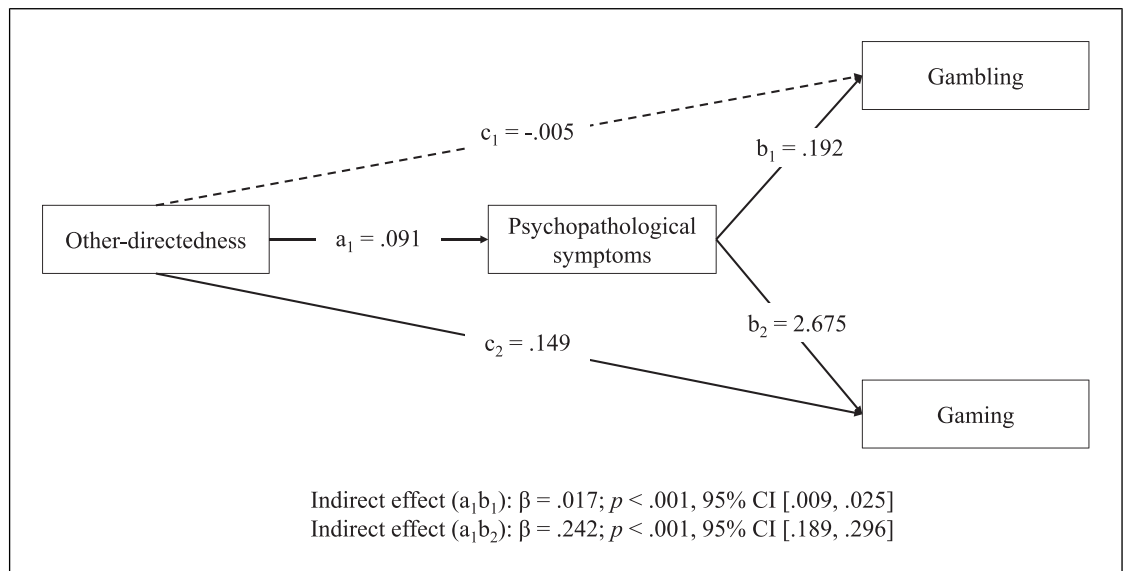


Fig. 3. Mediating symptoms in the relationship between other-directedness domain and gambling and gaming. Solid lines indicate significant effects at a 95% confidence interval. Dashed lines indicate non-significant effects at a 95% confidence interval. Gender and age were included in the model as covariates.

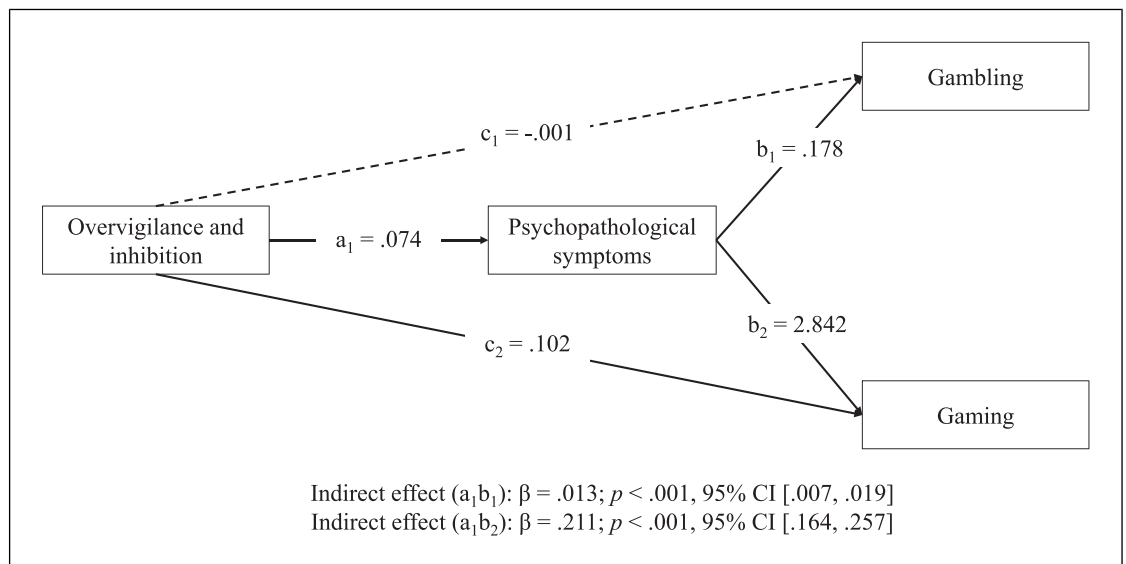


Fig. 4. Mediating role of psychopathological symptoms in the relationship between overvigilance and inhibition domain and gambling and gaming. Solid lines indicate significant effects at a 95% confidence interval. Dashed lines indicate non-significant effects at a 95% confidence interval. Gender and age were included in the model as covariates.

as well as the mediating role of psychopathological symptoms in these associations. Four main findings emerged: (1) EMS were more strongly associated with gaming than with gambling; (2) the disconnection and

rejection domain was the most strongly related to both gaming and gambling scores (although weak-to-moderate); (3) EMS showed strong associations with psychopathological problems, particularly depressive

symptoms; and (4) psychopathological symptoms fully mediated the relationship between EMS domains and gambling severity, whereas a partial mediation was found for the association with problematic gaming.

Our results indicated a moderate association between EMS and gaming among adolescents. These findings are consistent with previous studies [34, 35], which also reported moderate correlations between gaming and several schemas. However, other studies, particularly those focusing on female populations, have failed to identify significant correlations [32], suggesting potential gender-specific effects that warrant further examination. Consistent with our findings, Efrati et al. [33] also reported that adolescents with high levels of gaming disorder scored higher on the disconnection and rejection domain. This pattern suggests that adolescents with problematic gaming may use video games as a strategy to cope with difficulties in building secure attachments and fears of rejection, which may contribute to the maintenance of excessive gaming behaviors.

More specifically, within the disconnection and rejection domain, schemas of social isolation and emotional deprivation exhibited stronger correlations with problematic gaming than the abandonment schema. This distinction is theoretically noteworthy; while abandonment involves the fear of losing significant others, social isolation and emotional deprivation reflect a profound sense of alienation and a lack of emotional support. Consequently, gaming may serve as a targeted compensatory mechanism for these specific vulnerabilities. Online gaming provides a structured digital environment where adolescents can experience a sense of community, forge social connections, and attain the peer validation they feel is missing in their offline lives [75, 76].

In contrast, gambling showed only weak associations with EMS in our sample. In line with previous evidence, Shorey et al. [30], working with a clinical population with alcohol use disorder, reported weak-to-moderate associations between gambling and EMS (ranging from $r_s = 0.09$ to 0.19). Similarly, Estévez et al. [32] found no significant relationships between gambling and EMS among women survivors of sexual abuse. Contrary to other studies [23, 25, 30], our study did not identify significant associations between gambling and specific schemas such as abandonment, insufficient self-control, self-sacrifice, or unrelenting standards. Although the disconnection and rejection domain showed the strongest association with gambling tendencies compared to other domains, the correlation coefficient remains notably low. This finding likely reflects the high statistical

power of the current large sample rather than a robust clinical effect. Nevertheless, our results align with Efrati et al. [33] in suggesting that unmet core emotional needs may represent a subtle but persistent risk factor for behavioral addictions during adolescence.

Along these lines, several theoretical and contextual factors may explain why EMS exhibited substantially weaker direct associations with gambling compared to gaming. First, from a socio-cultural and developmental perspective, video games constitute a normative and universal form of leisure during adolescence [77]. They are deeply integrated into youth culture and daily routines, making them a readily available, immediate psychological refuge for schema-driven distress [24, 35]. In contrast, gambling exhibits a significantly lower prevalence among adolescents compared to video gaming [9], as it is subject to more stringent regulatory frameworks and robust access restrictions (e.g., legal age limits, stricter identity verification, and monetary requirements). These systemic barriers, combined with tighter legal oversight, position gambling as a much less frequent and less accessible activity within the normative boundaries of adolescent socialization. Second, the structural characteristics of the activities differ significantly: online gaming offers profound immersion, avatar identification, and virtual socialization, whereas gambling is frequently driven by thrill-seeking, impulsiveness, or cognitive distortions regarding financial gain [17].

Recent meta-analytical evidence [26] indicates that substance use is primarily associated with EMS within the disconnection and rejection and impaired limits domains, with particular emphasis on the insufficient self-control schema. Although associations between EMS and behavioral addictions tend to be more modest (with no significant differences reported), higher scores in the disconnection and rejection and impaired limits domains have also been consistently observed, consistent with the findings of the present study. Similarly, systematic reviews confirm that these two domains are those most strongly linked to behavioral addictions [24, 27]. This pattern suggests that problematic gamers and gamblers may engage in these activities as a way of coping with psychological distress or avoiding negative emotions [78, 79]. Moreover, the impaired limits domain appears to be particularly relevant to addictive behaviors, as these disorders are characterized by insufficient self-control and difficulties in delaying gratification [80, 81], processes that contribute to the escalation and maintenance of excessive gaming and gambling.

The strong associations observed between EMS and psychopathological symptoms are consistent with a substantial body of prior research, which has highlighted the role of EMS in a wide range of disorders, including depressive disorders [46, 47], anxiety disorders [48], obsessive-compulsive disorder [49], somatization [50], hostility or anger [51, 52], and psychotic symptoms [53–55]. A particularly striking finding in our study was the role of the mistrust/abuse schema, which emerged as the strongest correlate across almost all psychopathological dimensions (except for somatization and obsessive-compulsive symptoms). This result aligns with schema theory [19], which posits that Mistrust/Abuse underpins basic human security and safe attachment. Adolescents who chronically expect others to intentionally hurt, lie to, or manipulate them are likely to live in a state of constant interpersonal hypervigilance. This perception of threat not only fuels chronic anxiety, interpersonal sensitivity, and paranoid ideation, but also severely depletes emotional resources, ultimately leading to depressive symptoms and hostility [82]. In this sense, the profound lack of safety inherent to the mistrust/abuse schema appears to act as a generalized risk factor for severe psychological distress. Notably, our findings highlighted a particularly strong relationship with depressive symptoms. From a preventive and therapeutic perspective, identifying adolescents with elevated EMSs might help identify individuals who are at a higher risk for concurrent mental health difficulties [83, 84].

The mediation analyses further revealed that psychopathological symptoms bridged the relationship between EMS and both gambling and gaming behaviors. Specifically, these symptoms fully mediated the association between EMS and gambling severity, while a partial mediation was found for problematic gaming. That is, adolescents with higher EMS activation appear more vulnerable to psychopathological problems, which in turn is associated with an increased risk of engaging in both types of behavioral addictions. These findings differ from those of Cudo et al. [34], who reported that depression and anxiety did not mediate the association between EMS and gaming. Several factors may account for these discrepancies: first, the study by Cudo et al. [34] was conducted with young adults aged 18–35 years, whereas our research focused on adolescents; second, their sample comprised regular gamers, while ours was the general adolescent population; third, their analyses considered only depression and anxiety, whereas we used a broader measure of psychopathological symptoms; and finally, their analyses stratified results by gender, a factor which may be particularly relevant in understanding the role of EMS in addictive behaviors.

Taken together, these findings carry several implications. From a research perspective, they highlight the heterogeneity of results in this field and underscore the need for further studies examining EMS in relation to behavioral addictions across different developmental stages, genders, and cultural contexts [26]. From a clinical perspective, our results emphasize the importance of addressing both EMS and mental health problems when designing prevention and intervention programs for behavioral addictions [85]. Interventions targeting EMS may help adolescents develop healthier coping mechanisms, while addressing comorbid psychopathology could buffer the indirect pathway linking EMS to gaming and gambling. Finally, from a theoretical perspective, our findings provide further support for integrating schema theory into models of behavioral addictions, demonstrating that cognitive-emotional vulnerabilities influence addictive behaviors largely through their association with general psychological distress. Understanding these mediating mechanisms may advance theoretical models that conceptualize behavioral addictions as specific maladaptive coping strategies (e.g., using gaming or gambling for emotional avoidance or emotional regulation) triggered by EMS activation. Furthermore, this knowledge can inform targeted prevention and treatment protocols. At the preventive level, school-based interventions should prioritize fostering in-person social connectivity and teaching healthy emotional regulation skills to directly mitigate the vulnerabilities associated with the disconnection and rejection domain. Clinically, interventions should integrate adolescent-adapted schema therapy to heal the root cognitive vulnerabilities (i.e., EMS) [86], while concurrently treating the mediating psychopathological symptoms (such as depression or anxiety) in order to break the pathway leading to addiction.

Several limitations of this study should be acknowledged. First, its cross-sectional design precludes any causal inferences regarding the relationships among EMS, psychopathological symptoms, and behavioral addictions. Longitudinal research is needed to clarify the temporal and potentially bidirectional nature of these associations. Second, the sample consisted of students, which limits the generalizability of the findings to the broader adolescent population, particularly those not engaged in formal education. Third, the study was conducted in Spain, a specific cultural context where social norms and regulations concerning gaming and gambling may differ from those in other countries. Fourth, the prevalence rates of problematic gaming and gambling were relatively low in our sample, which may have reduced the statistical power to detect stronger associations. Finally,

the present study did not differentiate between male and female participants, despite evidence suggesting that gender may play an important role in both the development of EMS and the manifestation of behavioral addictions [34].

Conclusion

This study contributes to the understanding of EMS in adolescent behavioral addictions by showing that EMS are related to gambling and, more strongly, to gaming, with both behaviors particularly linked to the disconnection and rejection domain. Moreover, the results indicate that the association between EMS and gaming operates indirectly through psychopathological symptoms, whereas full mediation was observed for gambling. These findings highlight the importance of considering both cognitive-emotional vulnerabilities and general psychological symptoms when examining the development of behavioral addictions in adolescence. This evidence may help refine theoretical models and inform preventive and clinical strategies aimed at early detection and intervention among at-risk youth.

Statement of Ethics

This study was performed in accordance with the Declaration of Helsinki. This human study was approved by the University of Deusto (ref. ETK-59/23-24). All parents, guardians or next of kin provided written informed consent for the minors to participate in this study. All adult participants provided written informed consent to participate in this study. We ensured the participants the confidentiality and anonymity of their responses and their

voluntary participation. No compensation was provided for participation in this study. Written informed consent was obtained, emphasizing the voluntary nature of participation and ensuring that students were aware they could withdraw at any point without any academic or personal consequences.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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Author Contributions

Laura Macía: conceptualization, investigation, supervision, writing – review and editing. Gema Aonso-Diego: conceptualization, formal analysis, methodology, writing – original draft. Ana Estévez: funding acquisition, project administration, supervision, writing – review and editing. All authors approved the final manuscript.

Data Availability Statement

The data that support the findings of this study are not publicly available due to confidentiality and privacy consideration but are available from the corresponding author upon reasonable request.

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