

RESEARCH ARTICLE

Does parents' perceived style of setting limits to gaming matter? The interplay between profiles of parental mediation and BIS/BAS sensitivity in problematic gaming and online gambling

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Abstract

Introduction: Parents try to prevent possible negative outcomes associated with gaming by setting rules on their adolescent's gaming behavior (i.e., restrictive mediation). Parents can use either more autonomy-supportive or more controlling styles to communicate those rules. Using a person-centered approach, this study aims to, first, identify profiles of parents' perceived degree of restrictive mediation in gaming and styles of communicating these rules (i.e., autonomy-supportive and controlling); second, to examine how adolescents in different profiles differ in terms of maladaptive gaming outcomes (i.e., problematic gaming, simulated, and online gambling); third, to investigate the moderating role of gaming frequency and adolescents' personality (i.e., behavioral inhibition system [BIS] sensitivity and behavioral activation system [BAS] sensitivity) in the associations between the parental profiles and the outcomes.

Methods: The study used quantitative, cross-sectional survey data from Belgian adolescents ($N = 1651$, mean age = 14.00 years, 51.2% boys), collected between November 2021 and February 2022 in schools.

Results: Cluster analysis yielded four profiles of perceived restrictive mediation: an exclusively controlling one, an autonomy-supportive one, one where parents used a perceived mix of both communication styles, and one where there was an overall perceived lack of restrictive mediation. Adolescents in the controlling profile displayed the most maladaptive outcomes. Some of the associations between the parental profiles and the outcomes were stronger for more frequent gamers and for adolescents scoring higher on both BIS and BAS sensitivity.

Conclusion: Associations between the parental profiles and gaming outcomes were theoretically meaningful, yet small in terms of effect size.

KEYWORDS

BIS/BAS sensitivity, gambling, gaming, parenting, restrictive mediation, self-determination theory

1 | INTRODUCTION

Many adolescents spend a considerable amount of their leisure time on video gaming. Although video gaming can foster the development of cognitive, emotional, and social skills (Granic et al., 2014), can improve adolescents' mood (Ryan et al., 2006), and can facilitate the formation of friendships (Domahidi et al., 2014), gaming behavior can also be problematic. At least some adolescents are unable to stop gaming, thereby experiencing negative spill-over effects from their gaming behavior to other life domains, such as school (Männikkö et al., 2020), or facing negative mental health outcomes from video gaming, such as increased anxiety and depression (González-Bueso et al., 2018). In addition, several video games incorporate

gambling-like elements, such as loot boxes (i.e., in-game packages where the contents are hidden until you open them), blurring the lines between video gaming and gambling. Therefore, some video games may serve as a stepping stone toward (problematic) online gambling behaviors (King & Delfabbro, 2016; King et al., 2014).

Parents can play a direct role in their children's gaming behavior, for example by setting rules and restrictions on their gaming behavior (i.e., restrictive mediation). Although parents typically use such restrictive mediation to prevent or reduce problematic gaming, research shows that the effects of parental mediation are quite limited (Chen & Shi, 2019). Scholars therefore suggested that, apart from the degree of restrictive mediation, the style in which the rules are communicated can play a critical role (Valkenburg et al., 2013). Grounded in self-determination theory (SDT; Ryan & Deci, 2017), a few studies have begun to consider parents' communication style about rules on media use (Fikkers et al., 2017; Van Petegem et al., 2019). However, all of these studies used a variable-centered approach, thereby using parents' degree and styles of mediation as separate predictors of gaming-related outcomes. As such, it has not been examined how the degree and styles of mediation naturally co-occur and how such profiles of parental communication relate to their children's problematic gaming behavior and possibly related gambling behaviors.

1.2 | Parental mediation and styles of mediation

When regulating their adolescent's gaming behavior, parents can use a variety of mediation practices. The most commonly examined types of parental mediation in the realm of video gaming are restrictive mediation, active mediation, and coplaying (Nikken & Jansz, 2014). Restrictive mediation refers to the rules and limits that parents set to regulate their adolescent's gaming behavior. Parents may for example limit the time their adolescents can play video games or decide which (types of) games their adolescent can or cannot play. Active mediation involves parents going into conversations with their adolescent about video gaming and its content. Coplaying refers to parents playing video games together with their adolescent.

Many parents are not familiar with video games themselves (or at least have less gaming literacy and interest than their adolescent; Chuang et al., 2011). As a result, these parents are not inclined to play video games with their adolescent or to go into conversations on gaming. Yet, as socialization figures, parents do still feel a need to set rules on gaming (Symons et al., 2017). Hence, they are confronted with the question how and when they need to set rules for their adolescent's gaming behavior.

Although most parents engage in restrictive mediation with the intention to keep the time adolescents spend gaming within reasonable limits and to safeguard their adolescent against problems associated with gaming, studies showed that restrictive mediation is only minimally related to problematic gaming behaviors. A meta-analysis found that associations between restrictive mediation and media-related risk behaviors were very limited (Chen & Shi, 2019). This finding was particularly true for video games, as the meta-analysis showed that associations between restrictive mediation and harmful gaming behaviors (e.g., problematic gaming and engagement in potentially harmful gaming content) were even positive ($r = .14$, $p < .001$).

Because the effects of restrictive mediation are limited, some researchers argued that the style in which the rules are communicated may be more important than the degree to which parents engage in restrictive mediation per se (Valkenburg et al., 2013). Several studies on the relationship between communication styles and gaming behavior relied on SDT (Ryan & Deci, 2017), a general theory on motivation and social development with many applications in the domain of parenting (Grolnick & Lerner, 2023; Joussemet et al., 2008; Soenens et al., 2017).

In SDT, autonomy-supportive parenting is defined as the degree to which parents promote their adolescent's volitional functioning, thereby enabling a sense of freedom, self-endorsement, and authenticity (Grolnick et al., 1991; Soenens et al., 2017). Autonomy-supportive parents provide choices whenever possible, encourage initiative, give a meaningful rationale when introducing rules, and display interest and curiosity in the adolescent's perspective (even when the adolescent challenges the rules). In contrast, a controlling style involves the use of pressuring and domineering practices (Grolnick & Pomerantz, 2009). Controlling parents pressure adolescents to act, think or feel in a certain way, thereby using practices such as guilt-induction, love withdrawal and threats of punishment (Soenens & Vansteenkiste, 2010). Research showed that autonomy-supportive parenting is generally beneficial for adolescents' well-being and social adjustment (Vasquez et al., 2016). In contrast, controlling parenting increases risk for both internalizing problems and externalizing behaviors (Pinquart, 2017). Based on this framework, researchers posited that a more autonomy-supportive style of communicating about rules around video gaming would be more effective than a controlling style of communication (Valkenburg et al., 2013).

The reason why these communication styles yield different outcomes is because they relate to adolescents' internalization of parental rules in different ways. When rules and limits are conveyed in an autonomy-supportive fashion, adolescents better understand the relevance of the rules for themselves and follow them more wholeheartedly. Instead, with controlling communication adolescents fail to internalize the rules or internalize them only partially, resulting in short-lived compliance at best (Hardy et al., 2010; Rodríguez-Meirinhos et al., 2020; Soenens et al., 2009; Son & Padilla-Walker, 2022; Vansteenkiste et al., 2014). In many cases, a controlling style even goes together with anger and oppositional defiance, with adolescents doing the exact opposite of what parents expect and engaging in more risky behaviors (Van Petegem et al., 2015).

A number of studies began to examine parents' communication styles in the context of restrictive mediation and media use. In a sample of parents of children between 3 and 9 years, controlling restrictive mediation around video gaming was related positively to problematic gaming behavior and defiance toward the given rules. By contrast, autonomy-support was unrelated to these outcomes (Van Petegem et al., 2019). Among early adolescents, Valkenburg et al. (2013) showed that a perceived autonomy supportive style of restrictive mediation was related negatively to family conflict and antisocial behavior whereas a perceived controlling style was related positively to these problematic outcomes. The negative consequences associated with a controlling style of parental mediation were confirmed by Görgülü and Özer (2023), who found that pre- to early adolescents who reported more controlling parental mediation about general media use displayed more problematic gaming. With more controlling mediation, the link between daily gaming time and problematic gaming was also more pronounced. Another study on general media use in early adolescents found that autonomy-supportive restrictive mediation was associated with less media violence exposure and aggression (Fikkers et al., 2017). It should be noted that some of these studies were inconsistent in their statistical treatment of the communication styles, with some studies controlling for the effects of restrictive mediation per se when examining the effects of parental communication styles (Van Petegem et al., 2019) and with others not doing so (e.g., Fikkers et al., 2017).

Although these studies provide initial evidence for the importance of parents' communication styles, the effect sizes observed are still rather small, with standardized regression coefficients typically being below 0.20. Because parents rely in reality on a combination of styles, a person-centered approach may yield higher predictive validity. Indeed, autonomy-supportive and controlling communication styles are not necessarily mutually exclusive (Soenens et al., 2009) and some parents even combine both styles (Morbée et al., 2023; Teuber et al., 2022). Research into these parenting profiles in the field of gaming is, however, lacking. Moreover, it may make a difference whether these styles co-occur with low or high parental engagement in restrictive mediation. For instance, a controlling style may be even more detrimental when it is combined with low restrictive mediation than with high restrictive mediation because it then reflects more unpredictable parental engagement in pressuring communication (see Rodríguez-Meirinhos et al., 2020). Overall then, it is important to go beyond an examination of separate parental dimensions and to identify profiles of parenting behaviors. As a "Gestalt," a combination of parenting variables may relate to outcomes in a way that differs from the sum of its parts. Further, from the applied perspective of prevention and intervention, the identification of these profiles has higher ecological validity. Profiles are more recognizable for parents and practitioners (compared to scores on separate parenting dimensions) and they give important indications about which adolescents are most at risk for gaming-related problems (and most in need of intervention or counseling).

1.3 | The interplay between parental mediation and adolescent variables

Although parenting profiles are expected to have main effects in relation to gaming outcomes, it is possible that adolescent personality characteristics or variables attenuate or strengthen the associations. A number of studies outside the context of video gaming have indeed shown that controlling parenting increases risk for psychopathology and problem behaviors more strongly among adolescents predisposed (in terms of personality) to these problems (Kiff et al., 2011; Mabbe et al., 2016). One of the most commonly studied frameworks to understand context x person interactions in (adolescent) development is the diathesis-stress-model (Monroe & Simons, 1991), according to which a personal predisposition toward maladjustment can get active (thus resorting in more pronounced detrimental effects) when people at the same time are confronted with contextual stressors (such as controlling parental behaviors).

In the context of video gaming, this would mean that personal variables that render adolescents more vulnerable to problematic gaming behavior would also increase adolescents' sensitivity to the detrimental effects of adverse parental involvement in gaming. Although it clearly follows from the diathesis-stress perspective that a combination of personal risk and an adverse context (i.e., a controlling parenting profile) is related to the strongest vulnerability to problems, it is less clear from this perspective whether adolescents at higher personal risk differ in their susceptibility for the beneficial role of supportive contexts, such as an autonomy-supportive communication profile. According to the differential susceptibility hypothesis (Belsky & Pluess, 2009; Belsky et al., 2022), some adolescents are more sensitive to the environment "for better and for worse." On the basis of this hypothesis, it could be expected that adolescents most at risk for gaming-related problems are most vulnerable to a controlling parenting profile but, at the same time, also most sensitive to the benefits associated with an autonomy-supportive parenting style. Because the possibility of differential susceptibility has not yet been examined in the context of parental involvement in gaming, this question will be addressed exploratively in the current study.

To study the interplay between parental profiles of restrictive mediation and adolescent variables, we focus on two factors that entail heightened risk for problematic gaming behaviors, that is, (a) gaming frequency and (b) personality-based individual differences in adolescents' behavioral inhibition system (BIS) sensitivity and behavioral activation system (BAS) sensitivity. Although frequent video gaming is not by definition problematic, previous research has pointed to a moderately strong positive association between the mean hours of video gaming time per day and problematic gaming (King &

Delfabbro, 2017; Paschke et al., 2020, 2021). Previous research also showed a link between time spent gaming and engagement in simulated gambling (Hayer et al., 2018; Zendle et al., 2019). Simulated gambling refers to elements in video games that share similarities with gambling. Loot boxes, for instance, are in-game packages with contents that are hidden until a player opens them. As another example, skin betting involves video gamers using in-game items to bet on the outcome of a video game. Because those simulated gambling activities create blurring lines between gaming and gambling (Zendle et al., 2019), for some frequent gamers there can be an increased risk that gaming can act as a stepping stone to gambling. Indeed, the link between gaming frequency and problem gambling has already been demonstrated in several empirical studies (Hing et al., 2022; Kristiansen & Severin, 2020).

Several personality factors can play a role in the potential development of problematic gaming behavior, with the effects of BIS/BAS sensitivity on several addictive behaviors being well-documented. BIS reflects individuals' sensitivity to punishment cues and innate fear stimuli, rendering them more vulnerable for the development of internalizing behaviors such as anxiety disorders (Bijttebier et al., 2009). BAS reflects individuals' sensitivity to reward cues and creates approach behavior to appetitive stimuli (Gray, 1987), such as some gaming and gambling elements, rendering people more prone to impulsive behavior (Bijttebier et al., 2009).

Whereas BAS sensitivity is a robust risk factor for a wide variety of harmful behaviors, such as problem gambling (Farrell & Walker, 2019) and substance use, including alcohol and other drugs (Franken et al., 2006; Kimbrel et al., 2007; Loxton & Dawe, 2006), BIS sensitivity has been linked to a more limited set of specific addictions such as internet addiction (Ko et al., 2008; Li et al., 2019; Park et al., 2013) and internet gaming disorder (Dong et al., 2022). Ko et al. (2008) suggested that this might be because the virtual world does not involve any direct physical harm and can be quitted at any time. To people scoring high on BIS, the online world might constitute an appealing and relatively safe place that allows them to cope with their symptoms of anxiety or other internalizing problems. Indeed, previous research already showed that emotion-related coping mediated the relationship between BIS sensitivity and internet addiction (Li et al., 2019).

In sum, adolescents who engage in gaming more frequently and who score higher on BIS and/or BAS sensitivity are arguably more vulnerable for problematic gaming and gambling. An important question is whether and how these risk factors interact with the parental communication patterns around gaming, as reflected in the profiles of parental restrictive mediation.

1.4 | The present study

The contribution of the present study is twofold. First, it adopts a person-centered approach to examine how identified profiles of perceived parental mediation relate to gaming-related outcomes. Second, we seek to examine whether gaming frequency and BIS/BAS sensitivity (two adolescent variables that may increase risk for problematic gaming and gambling) alter the strength of the associations between the parenting profiles and the outcomes. Two types of outcomes are included, that is, problematic gaming and (simulated and online) gambling, because there is an intricate link between problematic gaming and online gambling.

The first aim of this study is to find out which profiles can be identified on the basis of parental restrictive mediation and the perceived parental communication styles. Based on previous research (e.g., Morbée et al., 2023; Rodríguez-Meirinhos et al., 2020), it is expected that four profiles can be identified (Hypothesis 1). Restrictive mediation may either be communicated in an autonomy-supportive, in a controlling way, or involving a mixture of both styles, as perceived by the adolescent. The latter, highly involved group of parents would use all possible means to restrict the frequency of gaming. In contrast, a fourth group of adolescents may perceive an overall absence of parental involvement in video games, with parents thus scoring low on both restrictive mediation as such and the perceived communication styles. These parents would adopt a more permissive approach. The second aim of this study is to examine whether the retained parenting profiles relate to differences in problematic gaming, simulated gambling, and online gambling. Profiles characterized by higher levels of perceived autonomy-support and lower perceived controlling communication are expected to relate to less gaming-related problems (Hypothesis 2).

As for the third aim, the study will test, in an explorative manner, whether the associations between the restrictive mediation profiles and the gaming-related outcomes are moderated by gaming frequency (Research Question 1) and/or by BIS/BAS sensitivity (Research Question 2). Based on the diathesis-stress perspective, it is expected that associations between more adverse parental profiles (i.e., profiles characterized by more perceived controlling communication) and gaming-related problems will be more pronounced among frequent gamers and among adolescents scoring high on BIS and/or BAS. According to the differential susceptibility hypothesis, negative associations between the most adaptive profiles (characterized by more autonomy-supportive communication) and gaming-related problems could also be most pronounced among these more vulnerable adolescents.

In this study, we will control for several relevant background variables, including the adolescent's gender, age, and type of education and the parent's gender. Gender is of importance as boys tend to play video games much more often than girls do

and, on average, boys are more at risk for problematic gaming than girls (Fam, 2018). Because previous research demonstrated associations between parent's educational level and parenting (Hoff et al., 2019), between adolescents' age and problematic gaming (Hawi et al., 2018), and between adolescents' type of education and problematic gaming (Esposito et al., 2020), these background factors can also be of importance.

2 | METHODS

2.1 | Participants and procedure

Participants for this study were recruited via 12 secondary schools in Flanders between November 2021 and February 2022. This data collection is part of a larger interdisciplinary project that focuses on the blurring lines between gaming and gambling. We contacted the school principals with a letter containing information about the project and then reached out to them again by telephone or e-mail to ask them if they agreed on their schools' participation. If they did, school principals provided written informed consent. Adolescents' parents or legal representatives also gave passive consent 1 week before the data collection. Before the actual data collection, adolescents from participating schools were provided with detailed information about the goal and the procedure of the study. It was emphasized to them that participation was entirely voluntary and that they could decline or stop participation at any moment, without negative consequences. The procedure received ethical approval (G-2021-3439-R2(AMD)). In 10 schools, the survey was provided to participants in an online format where they completed the survey during a regular class hour on their school computer; in one school participants filled out a paper questionnaire during a regular class hour. In one school, the survey was distributed through a digital school platform. The survey was conducted in Dutch, but for the sake of clarity, we will only provide translations of items in this paper. The median duration of the survey was around 30 min.

From the initial sample, we excluded participants ($n = 166$) who provided the wrong answer on an attention check item (i.e., "Please mark the answer 'Agree' to this question"), resulting in a final sample of 1651 adolescents. As shown in Table 1, not all of the participants completed all the scales used in this study. As such, the sample size fluctuates depending on the variables involved in the analysis. The participants' age ranged from 10 to 19 years, with a mean age of 14 years and a standard deviation of 1.45. 51.2% of the participants identified as male, 47.1% as female, and 1.7% as none of both (indicating "other, namely" or leaving the question open). Because the latter group of participants was too small to consider as a separate category in the main analyses, we performed a preliminary set of analyses comparing their mean scores on the study variables with the male and female participants. The results showed very consistently that participants with a non-binary gender identity did not differ from the male participants, yet did differ from the female participants. Therefore, for statistical purposes we decided to group together the individuals with a nonbinary gender identity with the boys in all further analyses. The participants were predominantly following the academic track in secondary education (74.4%), with the remainder of the participants following a technical or vocational track. In terms of family structure, 73.41% of the participants reported being in an intact family (with parents being married or living together), with the other participants living in a non-intact family (i.e., single parent, divorced, or blended family).

TABLE 1 Descriptive statistics and correlations between study variables.

	<i>M</i>	<i>SD</i>	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Restrictive mediation	2.36	0.94									
2. Perceived controlling style	2.40	0.95	.61***								
3. Perceived autonomy-supportive style	3.13	1.01	.29***	.19***							
4. BIS	2.60	0.65	.10***	.14***	.18***						
5. BAS	2.76	0.50	.09***	.12***	.11***	.10***					
6. Gaming frequency	2.46	2.22	-.07**	-.01	-.03	-.13***	.03				
7. Problematic gaming	0.84	0.66	.04	.11***	-.10***	-.02	.02	.35***			
8. Simulated gambling	1.79	0.87	.03	.09***	-.02	-.15***	.10***	.29***	.39***		
9. Online gambling	1.18	0.66	.01	.05	-.07**	-.06*	.03	.11***	.24***	.47***	
10. Age	14	1.45	-.28***	-.12***	-.14***	.03	-.03	-.05*	-.09***	.02	.00

Abbreviations: BAS, behavioral activation system; BIS, behavioral inhibition system.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

2.2 | Measures

2.2.1 | Parental restrictive mediation and perceived styles of restrictive mediation

Participants filled out a questionnaire developed and validated by Van Petegem et al. (2019), which contains scales for restrictive mediation as such, autonomy-supportive communication, and controlling communication. Participants were first asked to indicate who they talked most to about video gaming—their father or their mother. Mothers were chosen by 43.69% of the participants, with the other participants choosing their father. They were instructed to keep that parent in mind when responding to all parental mediation items. Participants were then given six different parental restrictive rules on gaming, such as “My parent forbids me from playing certain video games,” for which they had to rate how much the parent in question applied those rules using a scale from 1 (*not at all*) to 5 (*very much*). For every given rule, the questionnaire also included an item tapping into a controlling style of communicating the rule (e.g., “If I played this game anyway, he/she would give me a punishment”) and an item tapping into an autonomy-supportive style of communication (e.g., “My mother/father would try to give a meaningful explanation for this rule and ask what I think about it”). Participants rated all items for autonomy-supportive or controlling communication on a scale from 1 (*completely untrue*) to 5 (*completely true*). The reliability of the three scales was adequate: perceived restrictive mediation ($\alpha = .79$), perceived autonomy-supportive style ($\alpha = .80$), and perceived controlling style ($\alpha = .79$).

2.2.2 | BIS/BAS sensitivity

Participants filled out the widely used BIS/BAS sensitivity scale (Carver & White, 1994), adapted for children and adolescents (Muris et al., 2005). The BIS scale consisted of seven items (e.g., “I worry about making mistakes”) and the BAS scale of 13 items (e.g., “I feel energized when I get something I want”). All items were rated on a scale from 1 (*not true for me*) to 4 (*totally true for me*). Both BIS and BAS sensitivity scales showed good reliability ($\alpha = .80$ for BIS, $\alpha = .84$ for BAS).

2.2.3 | Gaming frequency

We assessed mean gaming time per day by asking participants “Over the past few weeks, how much time did you typically spend gaming?,” for both a weekday and a nonschool day. Gaming frequency was computed by taking the mean of the mean gaming time on a weekday and on a day on which there was no school. This variable is expressed in hours.

2.2.4 | Problematic gaming

Problematic gaming was assessed by the validated, 9-item GADIS-A scale (Paschke et al., 2020). This scale was found to have a stable internal structure and to display high validity in terms of associations with alternative measures of problematic gaming. Items were rated on a scale from 0 (“*completely disagree*”) to 4 (“*completely agree*”). An example item is: “I often play games more frequently and longer than I planned to or agreed upon with my parents.” The total score for problematic gaming had good reliability in the current study ($\alpha = .80$).

2.2.5 | Simulated and online gambling

Participants were presented with a list of potential simulated gambling behaviors (e.g., “Purchased one or more loot boxes with real money” and “Spun a wheel to win a prize in a game”) and online gambling behaviors (e.g., “Online poker for money” and “Online sports betting”). The online gambling behaviors list was previously used in a study with primary school children and their parents (De Cock et al., 2018), while the simulated gambling activities list was developed specifically for the purpose of this study. Participants had to indicate how frequently in the last 12 months they participated in those activities on a 7-point scale ranging from 1 (“*never*”) to 7 (“*every day*”). We made total scores for simulated gambling and online gambling by calculating the mean across the items for both types of gambling. The simulated gambling scale consisted of 10 items ($\alpha = .82$) and the online gambling scale consisted of six items ($\alpha = .93$). Consistent with other research in adolescent populations on these topics (De Cock et al., 2018; Hing et al., 2022), scores on these scales were generally low (see Table 1).

3 | RESULTS

3.1 | Preliminary analysis

Table 1 displays the correlations, means, and standard deviations for each study variable. Restrictive mediation was related negatively to gaming frequency, yet unrelated to problematic gaming and gambling. Whereas a perceived controlling style of mediation was related positively to problematic gaming and simulated gambling, a perceived autonomy-supportive style was related negatively to problematic gaming and to online gambling. Higher BAS scores were associated with more simulated gambling, whereas higher BIS scores were related to lower gaming frequency and less gambling frequency. There were positive associations between gaming frequency, problematic gaming, simulated gambling, and online gambling. Because the variation inflation factor for every independent variable (i.e., restrictive mediation, perceived autonomy-supportive mediation, perceived controlling mediation, BIS, BAS, and gaming frequency) was smaller than 2, there was no problem with multicollinearity between these variables.

To identify which background variables would need to be controlled for in our primary analyses, we conducted a MANCOVA with adolescents' gender, the reported parent's gender, adolescents' type of education (academic vs. technical/vocational track), and family structure (intact vs. non-intact) as factors and with adolescents' age as a covariate. The dependent variables were all study variables shown in Table 1. Age (Wilks' $\lambda = .878$, $F(9, 1453) = 22.56$, $p < .001$), education type (Wilks' $\lambda = .924$, $F(9, 1453) = 13.36$, $p < .001$), family structure (Wilks' $\lambda = .977$, $F(9, 1453) = 3.70$, $p < .001$), and adolescent gender (Wilks' $\lambda = .688$, $F(9, 1453) = 73.26$, $p < .001$) all displayed significant multivariate effects on the study variables. Therefore, we decided to control for these variables in all main analyses.

As shown in the Supporting Information Materials, boys and adolescents identifying as nonbinary scored higher than girls on perceived restrictive mediation ($b = 0.13$, $p < .01$, $\eta^2 < 0.01$), perceived controlling style of parental mediation ($b = 0.19$, $p < .001$, $\eta^2 = 0.01$), problematic gaming ($b = 0.35$, $p < .001$, $\eta^2 = 0.06$), simulated gambling ($b = 0.72$, $p < .001$, $\eta^2 = 0.17$), online gambling ($b = 0.18$, $p < .001$, $\eta^2 = 0.02$), and gaming frequency ($b = 1.29$, $p < .001$, $\eta^2 = 0.10$), whereas girls reported more perceived autonomy-supportive mediation ($b = -0.11$, $p < .05$, $\eta^2 < 0.01$) and BIS sensitivity ($b = -0.47$, $p < .001$, $\eta^2 = 0.14$). With increasing age, adolescents reported less problematic gaming ($b = -0.05$, $p < .001$, $\eta^2 = 0.01$), less perceived restrictive mediation ($b = -0.18$, $p < .001$, $\eta^2 = 0.08$), lower scores on both a perceived autonomy-supportive ($b = -0.08$, $p < .001$, $\eta^2 = 0.02$) and perceived controlling style ($b = -0.08$, $p < .001$, $\eta^2 = 0.01$) of parental mediation and lower scores on BIS sensitivity ($b = 0.03$, $p < .05$, $\eta^2 < 0.01$) and lower gaming frequency ($b = -0.15$, $p < .001$, $\eta^2 = 0.01$). Adolescents following the academic track reported more autonomy supportive mediation ($b = 0.31$, $p < .001$, $\eta^2 = 0.02$), less problematic gaming ($b = -0.18$, $p < .001$, $\eta^2 = 0.01$), a lower frequency of online gambling behaviors ($b = -0.18$, $p < .001$, $\eta^2 = 0.01$), higher scores on BIS sensitivity ($b = 0.11$, $p < .01$, $\eta^2 = 0.01$), and lower gaming frequency ($b = -1.00$, $p < .001$, $\eta^2 = 0.04$) than adolescents following the technical or vocational track. In terms of family structure, adolescents in non-intact families reported more simulated ($b = -0.13$, $p < .01$, $\eta^2 < 0.01$) and online gambling behaviors ($b = -0.11$, $p < .01$, $\eta^2 = 0.01$), more perceived restrictive mediation ($b = 0.21$, $p < .001$, $\eta^2 = 0.01$) and a perceived controlling parental style ($b = 0.12$, $p < .05$, $\eta^2 < 0.01$) and higher gaming frequency ($b = -0.39$, $p < .01$, $\eta^2 = 0.01$) than adolescents in intact families.

3.2 | Identifying profiles of parental mediation using cluster analysis

To identify the profiles of parental mediation, we relied on hierarchical k-means clustering. This procedure involves two steps: first, a hierarchical clustering procedure is applied in which every comparable participant based on the clustering variables are linked with each other. In a second step, the output of this first step is used for k-means clustering, which involves adapting the clusters to minimize the within-cluster variation and maximizing the between-cluster variation. This approach was preferred over other frequently used person-centered methods such as latent profile analysis (LPA), mainly because we wanted to identify clusters that were clearly distinct from each other. Because LPA assumes that the variances in the variables can differ between the profiles, there can be covariance and thus a less clear distinction between the profiles. Conversely, hierarchical K-means clustering assumes that clusters are statistically independent from each other, which implies that there are less potential problems with multicollinearity between the identified profiles and that profiles generally are more distinct from each other (Waterschoot et al., 2023). In addition, LPA assumes a within-profile normal distribution of variables used to create the profiles (Spurk et al., 2020). By contrast, hierarchical K-means clustering works better for data that are not normally distributed within the profiles (Waterschoot et al., 2023).

The cluster analysis was conducted on three variables: restrictive mediation, perceived autonomy-supportive style, and perceived controlling style. An H-statistic of 0.60 (>0.50) was found, which showed moderate clusterability of the data. Before performing the cluster analysis, the three variables were standardized so that they would be directly comparable. We determined the number of clusters based on several validation techniques. First, we used the Elbow method which proposes that the number of clusters with a minimum of within-cluster variation and a maximum of between-cluster variation is the most suitable (Waterschoot et al., 2023). Second, the average silhouette method was used, with a higher average silhouette score indicating a better quality of a certain cluster solution (Kaufman & Rousseeuw, 1990). Third, the gap statistic method was used (Tibshirani et al., 2001), with a higher gap statistic indicating a cluster solution of higher quality. Fourth, the

“summary of 30 indices” was used (Charrad et al., 2014). This method gives an overview of 30 indicators on which cluster solution is the most fitting to the data, including the Calinski–Harabasz index (Calinski & Harabasz, 1974).

Inspection of the different criteria to determine the number of clusters in Figure 1 showed that the three- and four-cluster solutions were better than any other solution, with the three-cluster solution being slightly more fitting than the four-cluster solution. To further evaluate both solutions, we did an additional analysis examining the stability of the solutions. Specifically, we used a double-split cross-validation procedure for each solution (Breckenridge, 2000). The sample was randomly split into halves and the full two-step procedure was applied to each half. The two solutions were then compared for agreement as follows. The participants of each half of the sample were assigned to new clusters on the basis of their Euclidean distances to the cluster centers of the other half of the sample. These new clusters were then compared for agreement with the original cluster by means of Cohen's kappa (κ). The two resulting kappa's were averaged. Both the three-cluster and the four-cluster solution were shown to be very stable ($\kappa = 0.97$ in both cases). The four-cluster solution did account for substantially more variance in the clustering variables (perceived restrictive mediation: 62%, perceived controlling style: 60%, and perceived autonomy-supportive style: 64%) than the three-cluster solution (perceived restrictive mediation: 54%, perceived controlling style: 55%, and perceived autonomy-supportive style: 55%). Moreover, the four-cluster solution was theoretically better interpretable than the three-cluster solution. Specifically, the three-cluster solution did not yield a profile characterized by high levels of perceived restrictive mediation and controlling communication, a profile that was expected theoretically and was found in other similar studies (Morbée et al., 2023; Rodríguez-Meirinhos et al., 2020). Because the four-cluster solution displayed between 5% and 9% more variance in the clustering variables than the three-cluster solution, was more interpretable, and did not result in a loss of stability compared to the three-cluster solution, we decided to proceed with the four-cluster solution.

The identified clusters are depicted in Figure 2. The first cluster (18.96% of participants) was characterized by rather high levels of perceived restrictive mediation and a perceived exclusively controlling style. The second cluster (23.54%) reflected an overall perceived lack of restrictive mediation (including low scores on the two perceived styles). The third profile (27.48%) consisted of adolescents who perceived their parents as high on restrictive mediation and using a mixed, yet predominantly controlling style. The fourth cluster (30.03%) was characterized mainly by a perceived autonomy-supportive communication style.

3.3 | Mean-level differences between the clusters on the outcomes

The mean scores on problematic gaming, simulated gambling, and online gambling for the adolescents in each of the four clusters can be seen in Table 2. These means were adjusted for adolescents' gender, educational level, age, and family structure. The least significant differences-method was used to determine whether or not the means in every group differed significantly. The analyses revealed that adolescents in the perceived combined styles of mediation cluster gamed significantly less frequently than all other adolescents. As for problematic gaming, adolescents in the exclusively controlling cluster had the highest scores, thereby differing significantly from adolescents in each of the other clusters. Adolescents did not differ significantly between clusters in terms of simulated gambling behaviors. Finally, in terms of online gambling behaviors, adolescents in the autonomy-supportive cluster scored significantly lower compared to adolescents in the perceived lack of restrictive mediation cluster and adolescents in the perceived exclusively controlling mediation cluster.

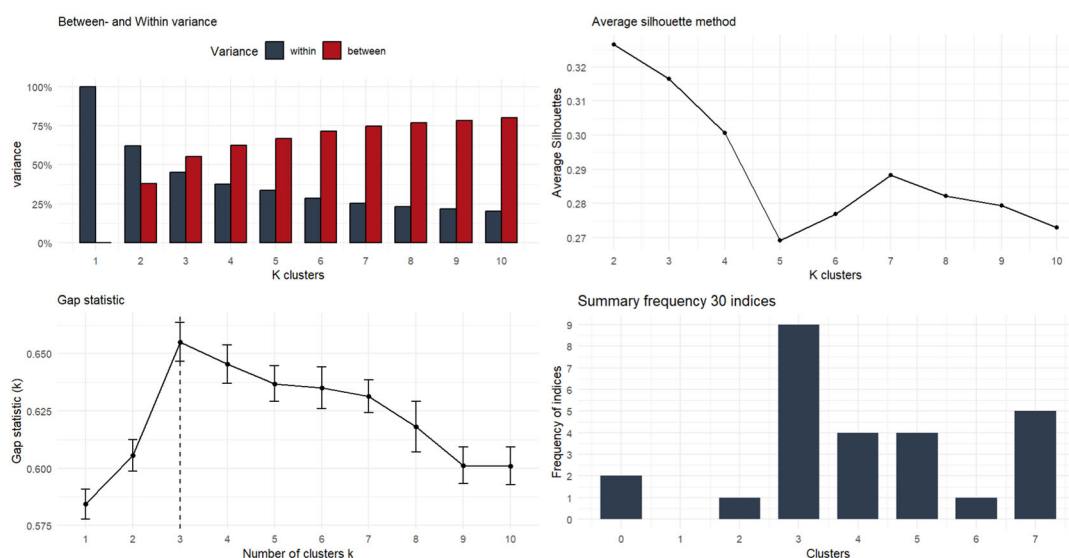


FIGURE 1 Overview of the parameters for the determination of the number of clusters. [Color figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com/doi/10.1002/jad.12271)] [wileyonlinelibrary.com](https://onlinelibrary.wiley.com/doi/10.1002/jad.12271)

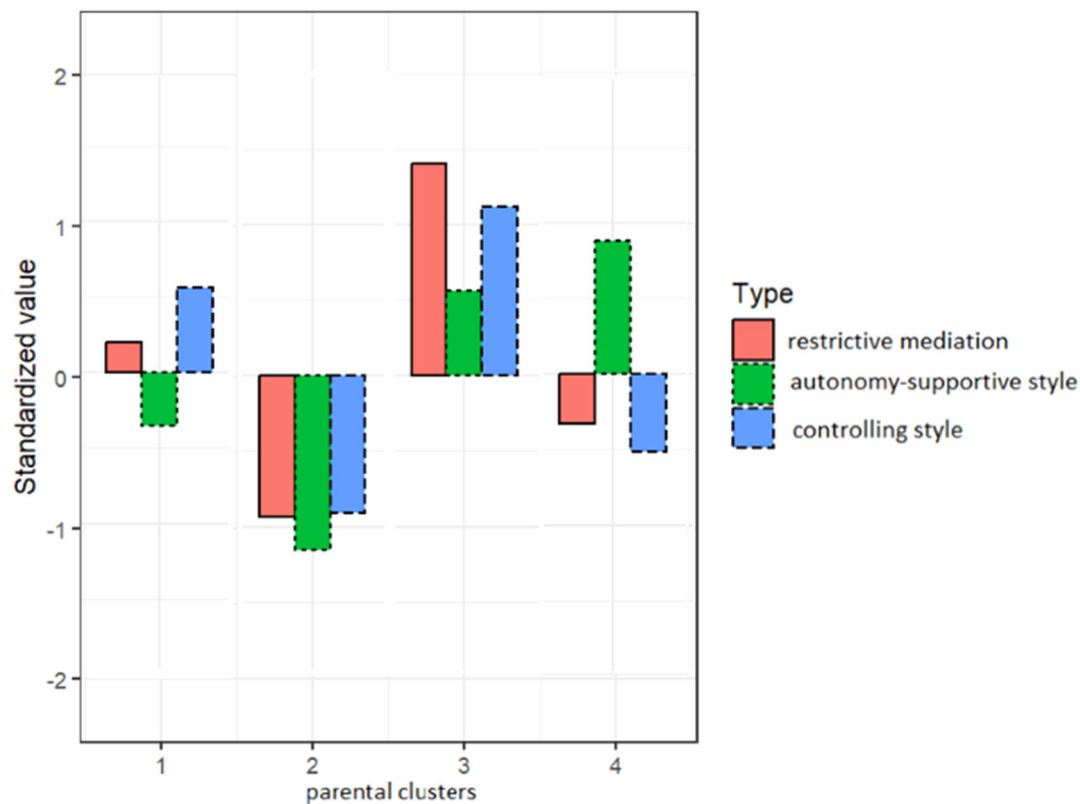


FIGURE 2 Four-cluster solution based on the standardized scores for restrictive mediation, perceived autonomy-supportive style, and perceived controlling style. [Color figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com/doi/10.1002/jad.12271)]

TABLE 2 Mean-level differences in the dependent variables between clusters.

	Perceived exclusively controlling mediation (27.48%)	Perceived lack of restrictive mediation (23.54%)	Perceived combined styles of mediation (18.96%)	Perceived autonomy-supportive mediation (30.03%)	F Value	η^2
Gaming frequency ($n = 1568$)	2.50 _a	2.55 _a	2.12 _b	2.49 _a	2.88*	0.01
Problematic gaming ($n = 1567$)	0.97 _a	0.81 _b	0.80 _b	0.74 _b	10.70***	0.03
Simulated gambling ($n = 1522$)	1.86 _a	1.76 _a	1.79 _a	1.76 _a	1.16	0.01
Online gambling ($n = 1501$)	1.21 _a	1.24 _a	1.18 _{a,b}	1.09 _b	3.71*	0.01

Note: Means with a different subscript differ significantly according to the least significant difference-method ($p < .05$).

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

3.4 | The interplay between cluster membership, gaming frequency, and BIS/BAS

To examine the interactive interplay between cluster membership, adolescents' gaming frequency, and their BIS/BAS scores, hierarchical regression analyses were performed with problematic gaming, simulated gambling, and online gambling as the dependent variables. In the first step, the control variables were added as predictors. In the second step, cluster membership was added as a predictor. To do so, we created three dummy variables based on the original four-category cluster variable. We decided to use the perceived exclusively controlling profile as the reference group, because theoretically we expected this group to be associated the most with the problematic outcomes. This expectation was confirmed in the analysis of mean-level differences between the clusters (see Table 2). The perceived exclusively controlling profile was contrasted with the perceived autonomy-supportive profile (Dummy 1), the perceived lack of restrictive mediation profile (Dummy 2), and the perceived combined styles profile (Dummy 3). Dummies were created by assigning the value 0 to the perceived exclusively controlling profile on all dummy variables. Each of the three other profiles were assigned the value 1 in the dummy contrasting this profile with the exclusively controlling profile and 0 on both other dummy variables. For example, adolescents who were clustered into the perceived autonomy-supportive profile scored 1 on Dummy 1 and 0 on both other dummy variables. In the

third step, BIS and BAS sensitivity and gaming frequency were added as predictors. Finally, the fourth step included the two-way interactions between the cluster dummies, BIS, BAS, and gaming frequency as well as three-way interactions between the cluster dummies and BIS and BAS sensitivity. To avoid problems associated with multicollinearity, all predictors (except the dummy variables) were standardized before calculating the interaction terms (Table 3).

TABLE 3 Regression analyses predicting the standardized dependent variables by cluster membership, gaming frequency, and personality.

	Problematic gaming				Simulated gambling				Online gambling			
	1	2	3	4	1	2	3	4	1	2	3	4
Step 1 (background variables)												
Gender: male & other versus female	0.26***	0.24***	0.19***	0.19***	0.41***	0.40***	0.35***	0.34***	0.13***	0.12***	0.11***	0.11***
Age	−0.11***	−0.12***	−0.10***	−0.10***	−0.02	−0.01	0.01	0.01	−0.03	−0.03	−0.03	−0.02
Type of education: academic versus technical/vocational track	−0.11*	−0.11*	−0.06*	−0.06*	−0.04	−0.05*	−0.02	−0.01	−0.11***	−0.10***	−0.09***	−0.07**
Family structure: married or cohabitant parents versus other family structures	−0.06*	−0.06*	−0.03	−0.03	−0.07**	−0.07**	−0.05*	−0.06*	−0.07**	−0.07**	−0.07**	−0.08**
Step 2 (clusters)												
Contrast 1: Perceived autonomy-supportive versus perceived controlling mediation		−0.34***	−0.35***	−0.16***		−0.10	−0.11	−0.11		−0.17*	−0.18**	−0.17**
Contrast 2: Perceived lack of restrictive mediation versus controlling mediation		−0.26***	−0.23***	−0.10***		−0.11	−0.11	−0.11		0.05	0.05	0.04
Contrast 3: Perceived combined styles versus controlling mediation		−0.27***	−0.24***	−0.11***		−0.08	−0.07	−0.11		−0.04	−0.04	−0.13
Step 3 (adolescent variables)												
Gaming frequency			0.28***	0.29***			0.19***	0.16***			0.05	0.11*
Behavioral inhibition (BIS)			0.10***	0.09			−0.01	−0.06			0	−0.10
Behavioral activation (BAS)			0.02	0.02			0.09***	0.03			0.04	−0.05
Step 4 (interactions)												
BIS x BAS				0.00				−0.02				0.00
Contrast 1 x BIS				0.00				0.08				0.10
Contrast 1 x BAS				−0.02				0.04				0.10
Contrast 1 x BIS x BAS				−0.04				0.00				0.04
Contrast 1 x gaming frequency				0.08				−0.03				−0.17*
Contrast 2 x BIS				−0.03				0.03				0.11
Contrast 2 x BAS				0.01				0.03				0.05
Contrast 2 x BIS x BAS				0.00				0.00				0.09
Contrast 2 x gaming frequency				−0.03				−0.03				0.00
Contrast 3 x BIS				0.05				0.02				0.19*
Contrast 3 x BAS				0.10				0.22**				0.28***
Contrast 3 x BIS x BAS				0.14				0.16*				0.26***
Contrast 3 x gaming frequency				0.03				0.01				−0.10
R ² change	8.89***	1.83***	7.8***	0.95	17.30***	0.20	4.06***	1.23*	3.59***	0.75**	0.4	4.00***

Abbreviations: BAS, behavioral activation system; BIS, behavioral inhibition system.

p* < 0.05; *p* < 0.01; ****p* < 0.001.

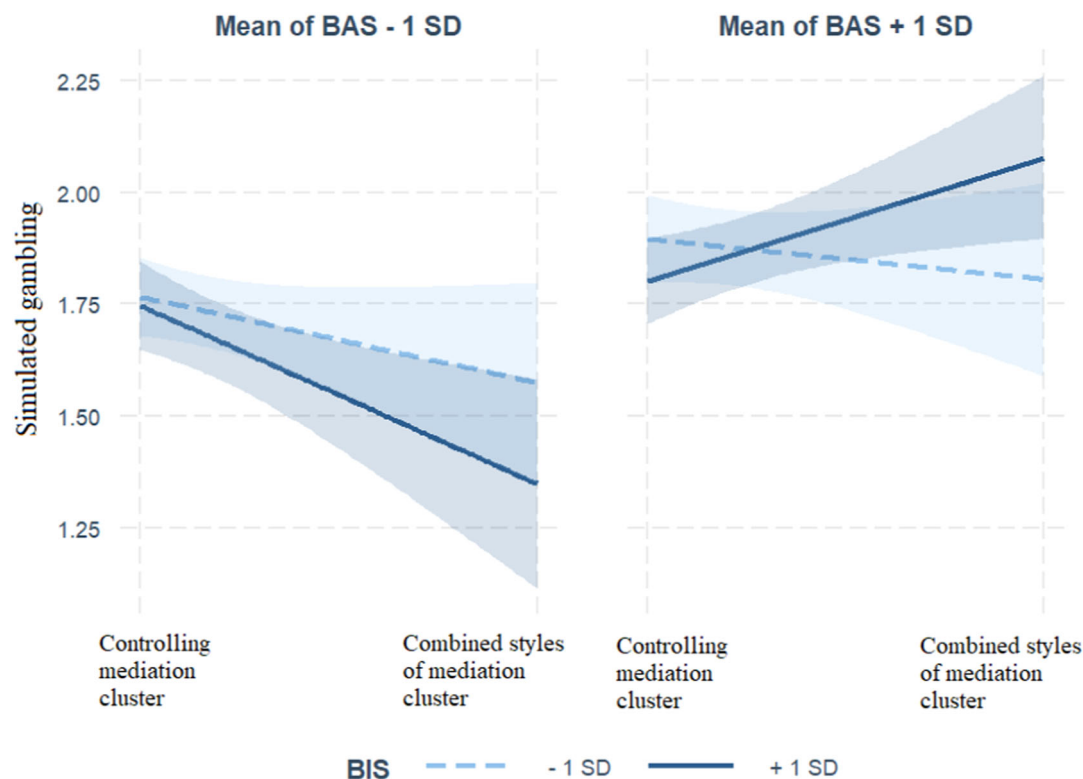


FIGURE 3 Three-way interaction between the perceived combined styles of mediation contrast variable and BIS and BAS sensitivity on simulated gambling frequency. BAS, behavioral activation system; BIS, behavioral inhibition system. [Color figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com/doi/10.1002/jad.12271)]

In relation to problematic gaming, membership of the exclusively controlling profile had a positive main effect (relative to each of the other profiles) even when taking into account the background variables. Adding the interaction terms in the last step did not explain significantly more variance ($\Delta R^2 = 0.95$, $F(1, 13) = 1.36$, $p = .17$), with none of the interaction terms having a significant effect.

In relation to simulated gambling, cluster membership did not have a significant main effect ($\Delta R^2 = 0.20$, $F(1, 3) = 1.29$, $p = .28$). Gaming frequency was related to more simulated gambling ($\Delta R^2 = 4.06$, $F(1, 3) = 26.07$, $p < .001$). Adding the interaction terms in Step 4 led to a significant change in R^2 ($\Delta R^2 = 1.23$, $F(1, 13) = 1.81$, $p < .05$). There was a significant two-way interaction between the dummy contrasting the exclusively controlling profile with the perceived combined styles profile and BAS sensitivity. Moreover, there was a significant three-way interaction between this dummy, BIS sensitivity, and BAS sensitivity. This interaction effect is shown in Figure 3. As can be seen, among adolescents scoring low on BAS but high on BIS (indicating an inhibited-fearful personality), the parenting profile characterized by the perceived combined use of different styles was related to less simulated gambling compared to the controlling profile. By contrast, among adolescents scoring high on BAS and high on BIS (indicating a more impulsive-dysregulated personality), the perceived combined parenting profile was related to more simulated gambling compared to the perceived exclusively controlling profile.

Finally, in relation to online gambling there was a significant main effect of the cluster contrasting the autonomy supportive cluster with the controlling cluster, with adolescents in the autonomy-supportive cluster reporting significantly less gambling. Neither BAS nor BIS sensitivity were significantly related to on online gambling. Adding the interaction terms led to a significant change in the explained variance of the model ($\Delta R^2 = 4.00$, $F(1, 13) = 4.95$, $p < .001$). There was a significant two-way interaction between the dummy contrasting the perceived exclusively controlling profile with the perceived combined styles profile and BIS sensitivity, and between this dummy and BAS sensitivity. This two-way interaction was further qualified by a significant three-way interaction between the perceived combined styles contrast dummy, BIS sensitivity, and BAS sensitivity. This interaction effect is shown in Figure 4 and is very similar compared to the three-way interaction obtained with simulated gambling as the outcome. There was also a two-way interaction between the dummy contrasting the perceived exclusively controlling profile with the perceived autonomy-supportive style profile and gaming frequency, which can be seen in Figure 5. This interaction was consistent with a pattern of differential susceptibility because adolescents with higher gaming frequency were more sensitive to both the advantages associated with autonomy-supportive communication (in terms of lower online gambling) and the risk associated with controlling communication (in terms of higher online gambling) than adolescents with lower gaming frequency.

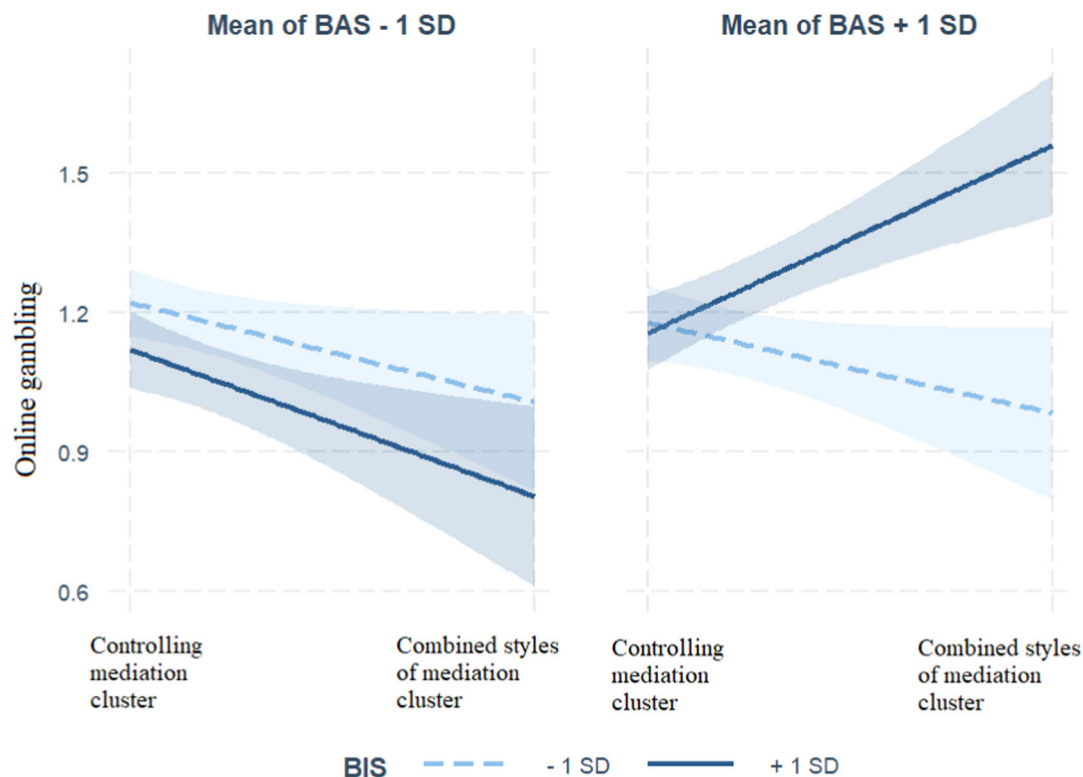


FIGURE 4 Three-way interaction between the perceived combined styles of mediation contrast variable and BIS and BAS sensitivity on online gambling frequency. BAS, behavioral activation system; BIS, behavioral inhibition system. [Color figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com/doi/10.1002/jad.12271)]

4 | DISCUSSION

This study aimed to contribute to the literature on restrictive parental mediation in the domain of gaming in three ways. First, using a person-centered approach we identified profiles of perceived restrictive mediation and two styles of communicating restrictions (i.e., autonomy-supportive and controlling) and second, related these profiles to adolescents' problematic gaming and gambling. Third, adopting a person x context perspective we examined the interplay between the identified profiles and two individual adolescent variables, that is, their gaming frequency and their BIS/BAS sensitivity. We were specifically interested to see whether differences between the parental profiles were more pronounced among adolescents more at risk for problematic gaming and gambling.

4.1 | Profiles of perceived parental restrictive mediation styles

A cluster analysis on parents' perceived degree of restrictive mediation and the two perceived styles of mediation yielded four clusters (Hypothesis 1). First, there was a combined styles cluster in which adolescents experienced their parents as introducing many restrictions, thereby combining high levels of both a controlling and an autonomy-supportive style. Consistent with previous research in other life domains (e.g., Rodríguez-Meirinhos et al., 2020; Soenens et al., 2009; Teuber et al., 2022), this profile shows that controlling and autonomy-supportive parenting are not necessarily mutually exclusive and might cooccur. The parents perceived as both controlling and autonomy-supportive possibly use all means at their disposal to set limits to their adolescent's gaming behavior, thereby sometimes engaging in autonomy-supportive practices and sometimes resorting to more controlling tactics.

A second cluster, labeled perceived lack of restrictive mediation, consisted of parents perceived as doing quite the opposite and using very few restrictive rules on gaming. Because of the overall lack of restrictions, these parents also engaged neither in autonomy-supportive nor in controlling communication on these rules. This lack of involvement in adolescents' gaming may be driven by a variety of reasons. Perhaps some parents deliberately choose not to intervene because they believe that gaming, as a leisure-time activity, is a highly personal issue over which parents have little or no legitimate authority. Particularly, when the adolescent's gaming behavior is perceived by the parent as not problematic or even enriching, parents may possibly decide not to intervene at all. Other parents may perhaps feel unable to intervene because they think they lack

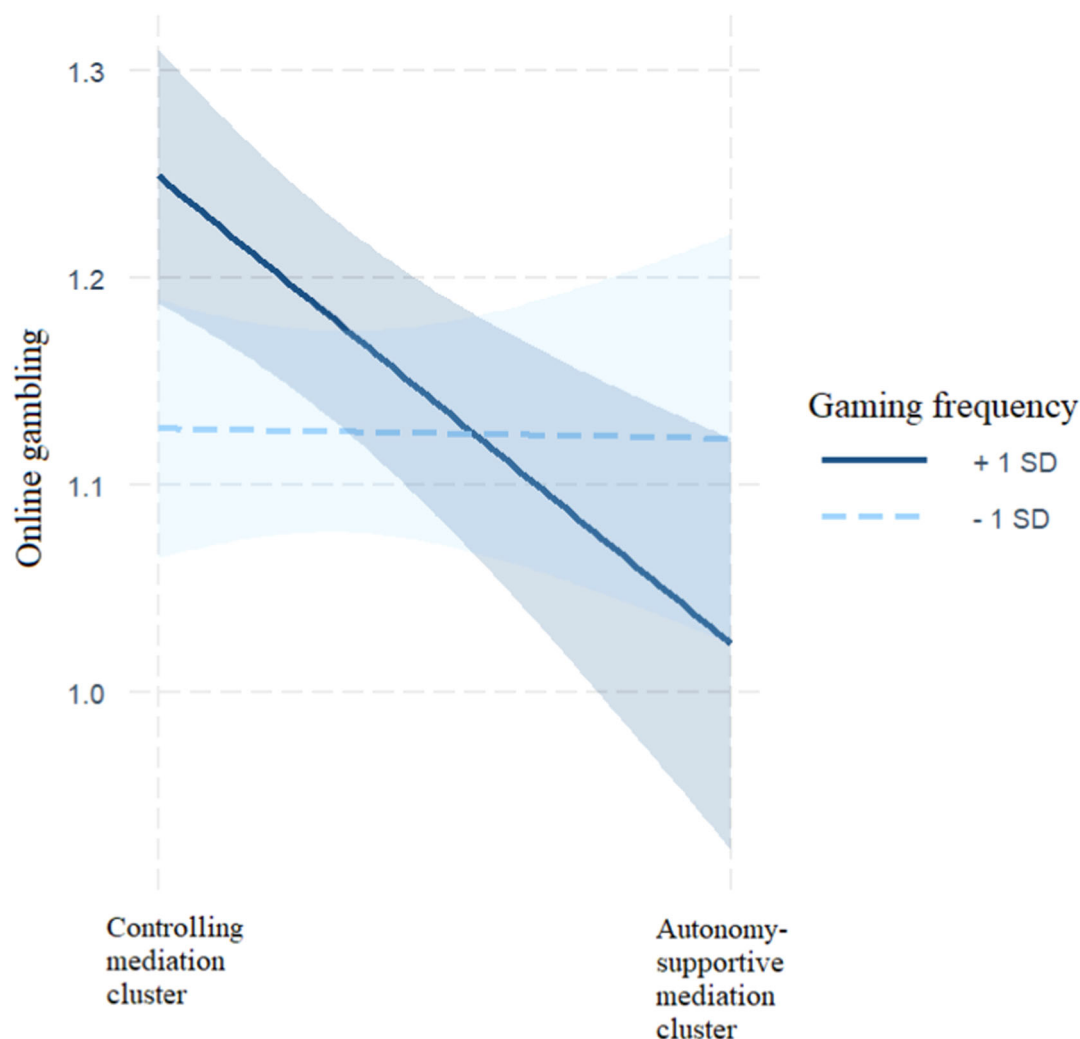


FIGURE 5 Two-way interaction between the perceived autonomy supportive mediation contrast variable and gaming frequency on online gambling frequency. [Color figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com/doi/10.1002/jad.12271)]

the gaming literacy needed to be involved. Another reason why some parents can feel unable to set rules on gaming is because they have given up on regulating their adolescent's behavior. In the past, setting rules may possibly have been ineffective because the adolescent ignored the rules or even responded with anger and antagonism. However, all these interpretations of this cluster remain speculative and therefore need further investigation, using also a qualitative approach.

The third and fourth clusters both included parents who were perceived as setting an average (i.e., neither high nor low) amount of rules. Whereas the third cluster is characterized predominantly by a perceived autonomy-supportive communication style, the fourth cluster involves parents perceived as using a more controlling style in their restrictive mediation. Contrary to previous research outside the video gaming context (Rodríguez-Meirinhos et al., 2020), no cluster was identified combining high levels of limit-setting and a style predominantly perceived as autonomy-supportive. The absence of such a cluster may have to do with the social domain to which gaming belongs (Smetana & Asquith, 1994), with gaming perhaps being perceived as a mainly personal issue by both adolescents and parents. If this would be the case, then an autonomy-supportive style may be difficult to reconcile with high levels of rule-setting in the domain of video gaming. Frequent interventions in this domain would almost automatically be experienced as being intrusive and thwarting an adolescent's need for autonomy.

As for the second aim of the study, when looking at how adolescents in the clusters differ on the gaming- and gambling-related outcomes (Hypothesis 2), we found that the perceived exclusively controlling cluster was associated with the most maladaptive outcomes. Adolescents who perceived their parents as controlling reported higher levels of problematic gaming relative to all other profiles as well as more online gambling relative to adolescents who perceived their parents as autonomy-supportive and uninvolved. This finding is consistent with previous research showing that controlling parenting relates to reactance and lower internalization of rules, such that adolescents do not feel any ownership over the given rules and

therefore do not follow the rules volitionally (Son & Padilla-Walker, 2022; Vansteenkiste et al., 2014). Very likely, these associations are bidirectional in nature, with adolescents' problematic gaming and gambling also raising parental concerns and eliciting more controlling communication in an attempt to provide a quick solution for the problems.

All scores on the problematic outcomes were the lowest among adolescents in the autonomy-supportive cluster. However, this cluster only differed significantly from two of the other clusters (controlling and uninvolved) in terms of online gambling. Somewhat surprisingly, then, the benefits associated with autonomy-supportive communication were limited. The two other profiles (perceived lack of restrictive mediation and perceived combined styles) generally scored in between the controlling and autonomy-supportive profiles on the outcomes. The intermediate position of the perceived lack of restrictive mediation profile may have to do with the different reasons why parents may not be using restrictive mediation around gaming, as discussed before. Future research with more refined measures or perhaps using a mixed-methods approach could shed more light on this possibility. The profile combining high levels of restriction with both autonomy-supportive and controlling communication styles may be a mixed blessing because parents sometimes convey limits in a way that contributes to adolescents' acceptance of the rules but at other moments set limits in a domineering fashion. Possibly, adolescents perceiving their parents as using both styles experience an approach-avoidance conflict in terms of following the parental rules, as they have only partially internalized (i.e., introjected) the rules (Aunola & Nurmi, 2005; Vansteenkiste et al., 2018). That is, they may tend to be reactant at some moments, thereby defying the controllingly introduced rules, but feel guilty for being disobedient and disloyal at other moments, thus being inclined to stick to rules when communicated in an autonomy-supportive way. Such a conflicted motivation may be relatively benign in the short term but more problematic in the long term, a speculative possibility that could be addressed in future longitudinal research.

Overall, the results showed that the perceived degree of restrictive mediation as such was not strongly associated with problematic video gaming and gambling. The style with which parents are perceived to communicate restrictive mediation seems to have stronger associations with these outcomes, with a controlling style being related to more gaming-related problems than an autonomy-supportive style. However, the associations between the parental mediation profiles and the gaming and gambling outcomes were very small in terms of effect sizes. This observation indicates that moderating variables should be taken into account. In this study, we considered the role of adolescents' gaming frequency and their BIS/BAS sensitivity.

4.2 | The interplay between the perceived restrictive mediation profiles and adolescents' variables

As for the third aim, it was tested in a more explorative manner how two adolescent variables interacted with the effects of the perceived restrictive mediation styles profiles. Gaming frequency was considered as a moderator (Research question 1) because previous studies have shown that, on average, more frequent gaming increases risk for problematic gaming outcomes (King & Delfabbro, 2017; Paschke et al., 2020, 2021). In our study we found that gaming frequency was related positively to both problematic gaming and simulated gambling behaviors. There was no direct association, however, between gaming frequency and online gambling behaviors, which perhaps represent a more distal outcome of gaming. More importantly, in the regression analyses there was a significant interaction between the perceived autonomy-supportive profile, in contrast to the controlling profile, and gaming frequency in relation to online gambling behaviors. Among more frequent gamers, the difference between the perceived autonomy-supportive and perceived controlling profiles in terms of online gambling was more pronounced than among less frequent gamers. The shape of this interaction (see Figure 4) was in line with the differential susceptibility hypothesis and suggests that more frequent gamers are simultaneously more sensitive to the advantages associated with an autonomy-supportive parental approach and more sensitive to the adverse consequences associated with a controlling parental style. However, this interaction should be interpreted with caution because its effect size was small and because it did not occur consistently in the prediction of the other outcomes. To examine the moderating role of adolescents' gaming habits in greater detail, it has been suggested by scholars in the video gaming literature (Ballou & Van Rooij, 2021; Granic et al., 2020) that research should look beyond gaming time. Possibly, the game genres adolescents engage in or the platform someone plays video games on are more systematic moderators of the effect of parenting than simply gaming frequency as such.

The second possible moderator considered in this study was adolescents' BIS/BAS sensitivity (Research Question 2). In the regression analyses, BIS sensitivity was associated positively with problematic gaming and BAS sensitivity was associated positively with simulated gambling behaviors. Both findings are in line with previous research indicating that BIS/BAS sensitivity indeed represents a risk factor for problematic gaming and gambling outcomes. In the regression analyses, there was a significant three-way interaction between the parental mediation profiles, BIS, and BAS in relation to both simulated and online gambling behaviors (see Figures 3 and 4). Among adolescents scoring high on both BIS and BAS sensitivity the perceived combined styles of mediation cluster, in contrast with the perceived exclusively controlling cluster, was associated positively with both online and simulated gambling. This could be because adolescents who score high on both personality

traits arguably may already experience a lot of internal conflict as they are highly sensitive to rewards (in this case, those connected to [simulated] gambling elements) while also being anxious to pursue them too intensely. When parents, in addition to this internal struggle, use all possible and contradictory (i.e., both autonomy-supportive and controlling) means to limit gaming behaviors, it may not be clear to adolescents why they should refrain from gambling. In this case, parents who are only moderately involved and solely use a controlling style in the perception of the adolescents, may provide more clarity. The double bind messages provided by parents in the perceived combined styles profile may even relate to reactance among adolescents who already feel torn between approach and avoidance tendencies toward addictive behaviors. In contrast, simulated and online gambling behaviors were less common in the perceived combined styles profile compared to the perceived controlling style profile among adolescents scoring low on BAS and high on BIS. For adolescents with this more fearful personality profile, parents' strong emphasis on the restriction of gaming behaviors may signal the risks associated with gaming, with this risk perception in turn relating to reduced gambling inclinations. Although this three-way interaction was consistent across two outcomes, also this interaction needs to be replicated in future research.

In general, the current findings testify to the complexity of the interplay between parental communication about games and adolescent variables in relation to gaming-related outcomes. If confirmed in future, longitudinal research, these interactions can inform intervention and prevention efforts because they indicate that adolescents with specific personality profiles may need a somewhat tailored parenting approach.

4.3 | Limitations and future research

This study has a number of limitations. First, the cross-sectional design of the study precluded an examination of the directionality of the effects. Parents can influence their adolescent's gaming behavior, but adolescents can also elicit particular parental reactions. It is easier for parents to set only a limited number of restrictions to gaming behaviors and to be autonomy-supportive when their adolescent engages in gaming responsibly, thereby maintaining harmony with offline activities such as school. By contrast, problematic and obsessive gaming behavior may provoke moral outrage or concerns in parents, resulting in the use of more controlling practices. Therefore, longitudinal and diary-based studies on this topic are needed. Second, the use of adolescent-reported data alone is another limitation. With this approach, it is unclear whether parents in the different profiles actually behave in the way experienced by the adolescents or whether, instead, these parents are merely perceived to behave like that. Problematic gamers may perceive parental interventions as more controlling, even if their parents' behavior is not inherently controlling. This "perceiver effect" may explain at least partly why teenagers who perceive their parents as exclusively controlling score higher on the maladaptive outcomes. Therefore, a multi-informant approach including both parent and adolescent reports is important for future research. Finally, the measure we used to assess the perceived styles of restrictive mediation, although psychometrically adequate, may be somewhat limited to capture in depth parents' communication styles in the domain of gaming. Further research could include a more fine-grained and comprehensive measure of parental communication styles (e.g., Aelterman et al., 2019) as well as measures on active mediation and cause. Also, it may be important to consider both parents' specific involvement in the domain of parenting and the more general quality of parenting. Because adolescents' gaming behavior affects their behavior in other life domains (e.g., school and friendships), parents' overall interaction quality may explain additional variance in gaming-specific outcomes. General parenting quality may also moderate effects of gaming-specific parental interventions, with adolescents being more receptive for parents' involvement in the domain of gaming when parents are generally supportive (Darling & Steinberg, 1993). Another limitation is that adolescents only reported on the mediating behaviors of the parent with whom they talked mostly about gaming. This approach may also have influenced the results, as the parent they refer to could be particularly interested in gaming, which can, in turn, influence this parent's restrictive mediation behaviors. The results of this study therefore do not necessarily generalize to all parents. Finally, the measure on simulated gambling behaviors used in this study was new and was not yet validated. Future research needs to further validate this measure.

A final recommendation for future research is to include measures of the mediating variables that were assumed to play an important role in associations between parenting and gaming-related outcomes in the current study. For instance, reactance toward rules on gaming could possibly mediate associations between a controlling parenting style and adolescent gaming outcomes. Incorporating these potential mediators into research could help in advancing the understanding of associations between parental mediation and gaming and gambling behavior. In the long term, such future research can inform both practitioners and parents, thereby contributing to more constructive parental involvement in the delicate but important domain of gaming.

ACKNOWLEDGMENTS

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request. The data used in this study are openly available on request.

ETHICS STATEMENT

Ethical approval for this study was obtained from the KU Leuven Social and Societal Ethics Committee (SMEC).

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REFERENCES

- Aelterman, N., Vansteenkiste, M., Haerens, L., Soenens, B., Fontaine, J. R. J., & Reeve, J. (2019). Toward an integrative and fine-grained insight in motivating and demotivating teaching styles: The merits of a circumplex approach. *Journal of Educational Psychology*, 111(3), 497–521. <https://doi.org/10.1037/edu000293.supp>
- Aunola, K., & Nurmi, J. E. (2005). The role of parenting styles in children's problem behavior. *Child Development*, 76(6), 1144–1159.
- Ballou, N., & Van Rooij, A. J. (2021). The relationship between mental well-being and dysregulated gaming: A specification curve analysis of core and peripheral criteria in five gaming disorder scales. *Royal Society Open Science*, 8(5), 201385. <https://doi.org/10.1098/rsos.201385>
- Belsky, J., & Pluess, M. (2009). Beyond diathesis stress: Differential susceptibility to environmental influences. *Psychological Bulletin*, 135(6), 885–908. <https://doi.org/10.1037/a0017376>
- Belsky, J., Zhang, X., & Sayler, K. (2022). Differential susceptibility 2.0: Are the same children affected by different experiences and exposures? *Development and Psychopathology*, 34(3), 1025–1033. <https://doi.org/10.1017/S0954579420002205>
- Bijttebier, P., Beck, I., Claes, L., & Vandereycken, W. (2009). Gray's reinforcement sensitivity theory as a framework for research on personality-psychopathology associations. *Clinical Psychology Review*, 29(5), 421–430. <https://doi.org/10.1016/j.cpr.2009.04.002>
- Breckenridge, J. N. (2000). Validating cluster analysis: Consistent replication and symmetry. *Multivariate Behavioral Research*, 35, 261–285.
- Calinski, T., & Harabasz, J. (1974). A dendrite method for cluster analysis. *Communications in Statistics-Theory and Methods*, 3, 1–27.
- Carver, C. S., & White, T. L. (1994). Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment: The BIS/BAS scales. *Journal of Personality and Social Psychology*, 67(2), 319–333. <https://doi.org/10.1037/0022-3514.67.2.319>
- Charrad, M., Ghazzali, N., Boiteau, V., & Niknafs, A. (2014). NbClust package for determining the best number of clusters. R package version 2.0.3. <https://CRAN.R-project.org/package=NbClust>
- Chen, L., & Shi, J. (2019). Reducing harm from media: A meta-analysis of parental mediation. *Journalism & Mass Communication Quarterly*, 96(1), 173–193. <https://doi.org/10.1177/1077699018754908>
- Chuang, T. Y., Chen, N. S., Chen, M. P., Shen, C. Y., & Tsai, C. M. (2011). Digital game literacy: The difference between parents and their children. In *Proceedings of the 7th European Conference on Management Leadership and Governance: ECGBL 2011* (pp. 106–113). Academic Conferences Limited.
- De Cock, R., Zaman, B., Van Mechelen, M., & Huyghe, J. (2018). Early gambling behavior in online games: Parental perspectives vs. what children report. In G. Mascheroni, C. Ponte, & A. Jorge (Eds.), *Digital parenting: The challenges for families in the digital age* (pp. 125–133). Nordicom.
- Darling, N., & Steinberg, L. (1993). Parenting style as context: An integrative model. *Psychological Bulletin*, 113(3), 487–496. <https://doi.org/10.1037/0033-2909.113.3.487>
- Domahidi, E., Festl, R., & Quandt, T. (2014). To dwell among gamers: Investigating the relationship between social online game use and gaming-related friendships. *Computers in Human Behavior*, 35, 107–115. <https://doi.org/10.1016/j.chb.2014.02.023>
- Dong, H., Zheng, H., Wang, M., Ye, S., & Dong, G. H. (2022). The unbalanced behavioral activation and inhibition system sensitivity in Internet gaming disorder: Evidence from resting-state Granger causal connectivity analysis. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*, 119, 110582. <https://doi.org/10.1016/j.pnpbp.2022.110582>
- Esposito, M. R., Serra, N., Guiliari, A., Simeone, S., Sarracino, F., Continisio, G. I., & Rea, T. (2020). An investigation into video game addiction in pre-adolescents and adolescents: A cross-sectional study. *Medicina*, 56(5), 221. <https://doi.org/10.3390/medicina56050221>
- Fam, J. Y. (2018). Prevalence of internet gaming disorder in adolescents: A meta-analysis across three decades. *Scandinavian Journal of Psychology*, 59(5), 524–531. <https://doi.org/10.1111/sjop.12459>
- Farrell, N., & Walker, B. R. (2019). Reinforcement sensitivity theory and problem gambling in a general population sample. *Journal of Gambling Studies*, 35(4), 1163–1175. <https://doi.org/10.1007/s10899-019-09850-3>
- Fikkers, K. M., Piotrowski, J. T., & Valkenburg, P. M. (2017). A matter of style? Exploring the effects of parental mediation styles on early adolescents' media violence exposure and aggression. *Computers in Human Behavior*, 70, 407–415. <https://doi.org/10.1016/j.chb.2017.01.029>
- Franken, I. H. A., Muris, P., & Georgieva, I. (2006). Gray's model of personality and addiction. *Addictive Behaviors*, 31(3), 399–403. <https://doi.org/10.1016/j.addbeh.2005.05.022>
- González-Bueso, V., Santamaría, J., Fernández, D., Merino, L., Montero, E., & Ribas, J. (2018). Association between Internet gaming disorder or pathological video-game use and comorbid psychopathology: A comprehensive review. *International Journal of Environmental Research and Public Health*, 15(4), 668. <https://doi.org/10.3390/ijerph15040668>
- Görgülü, Z., & Özer, A. (2023). Conditional role of parental controlling mediation on the relationship between escape, daily game time, and gaming disorder. *Current Psychology*. Advance online publication. <https://doi.org/10.1007/s12144-023-04557-6>
- Granic, I., Lobel, A., & Engels, R. C. M. E. (2014). The benefits of playing video games. *American Psychologist*, 69(1), 66–78. <https://doi.org/10.1037/a0034857>
- Granic, I., Morita, H., & Scholten, H. (2020). Beyond screen time: Identity development in the digital age. *Psychological inquiry*, 31(3), 195–223. <https://doi.org/10.1080/1047840X.2020.1820214>
- Gray, J. A. (1987). *The psychology of fear and stress* (2nd ed.). Cambridge University Press.

- Grolnick, W., & Lerner, R. (2023). How parental autonomy support, structure, and involvement help children flourish: Considering interactions, context, and diversity. In R. M. Ryan (Eds.), *The Oxford handbook of self-determination theory* (pp. 491–507). Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780197600047.013.26>
- Grolnick, W. S., & Pomerantz, E. M. (2009). Issues and challenges in studying parental control: Toward a new conceptualization. *Child Development Perspectives*, 3(3), 165–170. <https://doi.org/10.1111/j.1750-8606.2009.00099.x>
- Grolnick, W. S., Ryan, R. M., & Deci, E. L. (1991). Inner resources for school achievement: Motivational mediators of children's perceptions of their parents. *Journal of Educational Psychology*, 83(4), 508–517. <https://doi.org/10.1037/0022-0663.83.4.508>
- Hardy, S. A., Bhattacharjee, A., Reed II, A., & Aquino, K. (2010). Moral identity and psychological distance: The case of adolescent parental socialization. *Journal of Adolescence*, 33(1), 111–123. <https://doi.org/10.1016/j.adolescence.2009.04.008>
- Hawi, N. S., Samaha, M., & Griffiths, M. D. (2018). Internet gaming disorder in Lebanon: Relationships with age, sleep habits, and academic achievement. *Journal of Behavioral Addictions*, 7(1), 70–78. <https://doi.org/10.1556/2006.7.2018.16>
- Hayer, T., Kalke, J., Meyer, G., & Brosowski, T. (2018). Do simulated gambling activities predict gambling with real money during adolescence? Empirical findings from a longitudinal study. *Journal of Gambling Studies*, 34(3), 929–947. <https://doi.org/10.1007/s10899-018-9755-1>
- Hing, N., Rockloff, M., Russell, A., Browne, M., Newall, P., Greer, N., King, D. L., & Thorne, H. (2022). Loot box purchasing is linked to problem gambling in adolescents when controlling for monetary gambling participation. *Journal of Behavioral Addictions*, 11(2), 396–405. <https://doi.org/10.1556/2006.2022.00015>
- Hoff, E., Laursen, B., & Tardif, T. (2019). Socioeconomic status and parenting. In M. H. Bornstein (Ed.), *Handbook of parenting* (pp. 421–447). Routledge.
- Joussemet, M., Landry, R., & Koestner, R. (2008). A self-determination theory perspective on parenting. *Canadian Psychology/Psychologie canadienne*, 49(3), 194–200. <https://doi.org/10.1037/a0012754>
- Kaufman, L., & Rousseeuw, P. J. (1990). *Finding groups in data*. John Wiley & Sons.
- Kiff, C. J., Lengua, L. J., & Zalewski, M. (2011). Nature and nurturing: Parenting in the context of child temperament. *Clinical Child and Family Psychology Review*, 14, 251–301. <https://doi.org/10.1007/s10567-011-0093-4>
- Kimbre, N. A., Nelson-Gray, R. O., & Mitchell, J. T. (2007). Reinforcement sensitivity and maternal style as predictors of psychopathology. *Personality and Individual Differences*, 42, 1139–1149. <https://doi.org/10.1016/j.paid.2006.06.028>
- King, D. L., & Delfabbro, P. H. (2016). Early exposure to digital simulated gambling: A review and conceptual model. *Computers in Human Behavior*, 55, 198–206. <https://doi.org/10.1016/j.chb.2015.09.012>
- King, D. L., & Delfabbro, P. H. (2017). Features of parent-child relationships in adolescents with Internet gaming disorder. *International Journal of Mental Health and Addiction*, 15(6), 1270–1283. <https://doi.org/10.1007/s11469-016-9699-6>
- King, D. L., Delfabbro, P. H., Kaptis, D., & Zwaans, T. (2014). Adolescent simulated gambling via digital and social media: An emerging problem. *Computers in Human Behavior*, 31(1), 305–313. <https://doi.org/10.1016/j.chb.2013.10.048>
- Ko, C. H., Yen, J. Y., Yen, C. F., Chen, C. S., Weng, C. C., & Chen, C. C. (2008). The association between Internet addiction and problematic alcohol use in adolescents: The problem behavior model. *Cyberpsychology & Behavior*, 11(5), 571–576. <https://doi.org/10.1089/cpb.2007.0199>
- Kristiansen, S., & Severin, M. C. (2020). Loot box engagement and problem gambling among adolescent gamers: Findings from a national survey. *Addictive Behaviors*, 103, 106254. <https://doi.org/10.1016/j.addbeh.2019.106254>
- Li, Q., Dai, W., Zhong, Y., Wang, L., Dai, B., & Liu, X. (2019). The mediating role of coping styles on impulsivity, behavioral inhibition/approach system, and Internet addiction in adolescents from a gender perspective. *Frontiers in Psychology*, 10, 2402. <https://doi.org/10.3389/fpsyg.2019.02402>
- Loxton, N. J., & Dawe, S. (2006). Reward and punishment sensitivity in dysfunctional eating and hazardous drinking women: Associations with family risk. *Appetite*, 47(3), 361–371. <https://doi.org/10.1016/j.appet.2006.05.014>
- Mabbe, E., Soenens, B., Vansteenkiste, M., & Van Leeuwen, K. (2016). Do personality traits moderate relations between psychologically controlling parenting and problem behavior in adolescents? *Journal of Personality*, 84(3), 381–392. <https://doi.org/10.1111/jopy.12166>
- Männikkö, N., Ruotsalainen, H., Miettinen, J., Pontes, H. M., & Kärräinen, M. (2020). Problematic gaming behaviour and health-related outcomes: A systematic review and meta-analysis. *Journal of Health Psychology*, 25(1), 67–81. <https://doi.org/10.1177/1359105317740414>
- Monroe, S. M., & Simons, A. D. (1991). Diathesis-stress theories in the context of life stress research: Implications for the depressive disorders. *Psychological Bulletin*, 110, 406–425. <https://doi.org/10.1037/0033-2909.110.3.406>
- Morbée, S., Waterschoot, J., De Muynck, G.-J., Haerens, L., Soenens, B., & Vansteenkiste, M. (2023). Identifying profiles of parental (de)motivating behaviors in youth sports: A multi-informant approach. *Motivation & Emotion*, 47, 990–1006. <https://doi.org/10.1007/s11031-023-10040-3>
- Muris, P., Meesters, C., de Kanter, E., & Timmerman, P. E. (2005). Behavioural inhibition and behavioural activation system scales for children: Relationships with Eysenck's personality traits and psychopathological symptoms. *Personality and Individual Differences*, 38(4), 831–841. <https://doi.org/10.1016/j.paid.2004.06.007>
- Nikken, P., & Jansz, J. (2014). Developing scales to measure parental mediation of young children's Internet use. *Learning, Media and Technology*, 39(2), 250–266. <https://doi.org/10.1080/17439884.2013.782038>
- Park, S. M., Park, Y. A., Lee, H. W., Jung, H. Y., Lee, J. Y., & Choi, J. S. (2013). The effects of behavioral inhibition/approach system as predictors of Internet addiction in adolescents. *Personality and Individual Differences*, 54(1), 7–11. <https://doi.org/10.1016/j.paid.2012.07.033>
- Paschke, K., Austermann, M. I., & Thomasius, R. (2020). Assessing ICD-11 gaming disorder in adolescent gamers: Development and validation of the gaming disorder scale for adolescents (GADIS-A). *Journal of Clinical Medicine*, 9(4), 993. <https://doi.org/10.3390/jcm9040993>
- Paschke, K., Austermann, M. I., & Thomasius, R. (2021). Assessing ICD-11 gaming disorder in adolescent gamers by parental ratings: Development and validation of the gaming disorder scale for parents (GADIS-P). *Journal of Behavioral Addictions*, 10(1), 159–168. <https://doi.org/10.1556/2006.2020.00105>
- Van Petegem, S., de Ferrer, E., Soenens, B., van Rooij, A. J., & Van Looy, J. (2019). Parents' degree and style of restrictive mediation of young children's digital gaming: Associations with parental attitudes and perceived child adjustment. *Journal of Child and Family Studies*, 28(5), 1379–1391. <https://doi.org/10.1007/s10826-019-01368-x>
- Van Petegem, S., Soenens, B., Vansteenkiste, M., & Beyers, W. (2015). Rebels with a cause? Adolescent defiance from the perspective of reactance theory and self-determination theory. *Child Development*, 86(3), 903–918. <https://doi.org/10.1111/cdev.12355>
- Pinquart, M. (2017). Associations of parenting dimensions and styles with externalizing problems of children and adolescents: An updated meta-analysis. *Developmental Psychology*, 53(5), 873–932. <https://doi.org/10.1037/dev0000295>
- Rodríguez-Meirinhos, A., Vansteenkiste, M., Soenens, B., Oliva, A., Brenning, K., & Antolín-Suárez, L. (2020). When is parental monitoring effective? A person-centered analysis of the role of autonomy-supportive and psychologically controlling parenting in referred and non-referred adolescents. *Journal of Youth and Adolescence*, 49, 352–368. <https://doi.org/10.1007/s10964-019-01151-7>

- Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. The Guilford Press. <https://doi.org/10.1521/978.14625/28806>
- Ryan, R. M., Rigby, C. S., & Przybylski, A. (2006). The motivational pull of video games: A self-determination theory approach. *Motivation and Emotion*, 30(4), 344–360. <https://doi.org/10.1007/s11031-006-9051-8>
- Smetana, J. G., & Asquith, P. (1994). Adolescents' and parents' conceptions of parental authority and personal autonomy. *Child Development*, 65(4), 1147–1162. <https://doi.org/10.2307/1131311>
- Soenens, B., Deci, E. L., & Vansteenkiste, M. (2017). How parents contribute to children's psychological health: The critical role of psychological need support. In M. L. Wehmeyer, K. A. Shogren, T. D. Little, & S. J. Lopez (Eds.), *Development of self-determination through the life-course* (pp. 171–187). Springer Science + Business Media. https://doi.org/10.1007/978-94-024-1042-6_13
- Soenens, B., & Vansteenkiste, M. (2010). A theoretical upgrade of the concept of parental psychological control: Proposing new insights on the basis of self-determination theory. *Developmental Review*, 30(1), 74–99. <https://doi.org/10.1016/j.dr.2009.11.001>
- Soenens, B., Vansteenkiste, M., & Sierens, E. (2009). How are parental psychological control and autonomy-support related? A cluster-analytic approach. *Journal of Marriage and Family*, 71(1), 187–202. <https://doi.org/10.1111/j.1741-3737.2008.00589.x>
- Son, D., & Padilla-Walker, L. M. (2022). Longitudinal associations among perceived intrusive parental monitoring, adolescent internalization of values, and adolescent information management. *Journal of Child and Family Studies*, 31, 48–60. <https://doi.org/10.1007/s10826-021-02114-y>
- Spurk, D., Hirschi, A., Wang, M., Valero, D., & Kauffeld, S. (2020). Latent profile analysis: A review and “how to” guide of its application within vocational behavior research. *Journal of Vocational Behavior*, 120, 103445. <https://doi.org/10.1016/j.jvb.2020.103445>
- Symons, K., Ponnet, K., Walrave, M., & Heirman, W. (2017). A qualitative study into parental mediation of adolescents' Internet use. *Computers in Human Behavior*, 73, 423–432. <https://doi.org/10.1016/j.chb.2017.04.004>
- Teuber, Z., Tang, X., Sielemann, L., Otterpohl, N., & Wild, E. (2022). Autonomy-related parenting profiles and their effects on adolescents' academic and psychological development: A longitudinal person-oriented analysis. *Journal of Youth and Adolescence*, 51(7), 1333–1353. <https://doi.org/10.1007/s10964-021-01538-5>
- Tibshirani, R., Walther, G., & Hastie, T. (2001). Estimating the number of clusters in a data set via the gap statistic. *Journal of the Royal Statistical Society Series B: Statistical Methodology*, 63(2), 411–423.
- Valkenburg, P. M., Piotrowski, J. T., Hermanns, J., & de Leeuw, R. (2013). Developing and validating the perceived parental media mediation scale: A self-determination perspective. *Human Communication Research*, 39(4), 445–469. <https://doi.org/10.1111/hcre.12010>
- Vansteenkiste, M., Aelterman, N., De Muynck, G.-J., Haerens, L., Patall, E., & Reeve, J. (2018). Fostering personal meaning and self-relevance: A self-determination theory perspective on internalization. *The Journal of Experimental Education*, 86(1), 30–49. <https://doi.org/10.1080/00220973.2017.1381067>
- Vansteenkiste, M., Soenens, B., Van Petegem, S., & Duriez, B. (2014). Longitudinal associations between adolescent perceived degree and style of parental prohibition and internalization and defiance. *Developmental Psychology*, 50(1), 229–236. <https://doi.org/10.1037/a0032972>
- Vasquez, A. C., Patall, E. A., Fong, C. J., Corrigan, A. S., & Pine, L. (2016). Parent autonomy support, academic achievement, and psychosocial functioning: A meta-analysis of research. *Educational Psychology Review*, 28(3), 605–644. <https://doi.org/10.1007/s10648-015-9329-z>
- Waterschoot, J., Morbée, S., Vermote, B., Brenning, K., Flamant, N., Vansteenkiste, M., & Soenens, B. (2023). Emotion regulation in times of COVID-19: A person-centered approach based on self-determination theory. *Current Psychology*, 42, 20211–20225. <https://doi.org/10.1007/s12144-021-02623-5>
- Zendle, D., Meyer, R., & Over, H. (2019). Adolescents and loot boxes: Links with problem gambling and motivations for purchase. *Royal Society Open Science*, 6(6), 190049.

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Additional supporting information can be found online in the Supporting Information section at the end of this article.

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