Contribution of Gaming to Overall Leisure Screen Time in Primary School Children

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INTRODUCTION: This study aimed to (i) analyse the prevalence of gaming in young elementary school-aged children; (ii) assess the effect of gaming frequency on excessive screen use; and (iii) identify sociodemographic variables associated with frequent gaming. **METHODS:** A survey was conducted in April–June 2021 with parents of children attending grades 1–3 in randomly selected elementary schools in Czechia, Slovakia, and Finland. Parents (n = 1871) reported the daily screen time and the weekly gaming frequency of their children during a typical week and provided sociodemographic information. **RESULTS:** Of the sample, 82% of children played digital games at least once a week. The prevalence significantly differed based on country, with the highest prevalence in Finland (94%), followed by Czechia (81%) and Slovakia (75%): χ^2 (2) = 52, p < .001. There was a significant association between an increased frequency of gaming and screen time. Screen time was the highest in daily gamers (constituting 24% of the sample), in which it was as high as 280 minutes per day. Daily gaming was associated with country (χ^2 (2) = 68, p < .001), gender (χ^2 (1) = 12, p < .001, OR = 1.46 [1.18–1.81]), school year (χ^2 (2) = 22.8, p < .001), and position among siblings (χ^2 (2) = 19.8, p < .001). **CONCLUSIONS**: These findings may help to determine the appropriate focus for prevention interventions.

Keywords | Gaming – Screen Use – School-Age Children – Leisure Screen Time – Preadolescents

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1 INTRODUCTION

Children's excessive use of screens concerns parents, scholars, and other professionals, including paediatricians (Council on Communications and Media, 2016), because it negatively affects children's development. Associations between excessive screen use and obesity (Jackson et al., 2009), sleep problems (Cavalli et al., 2021; Hale & Guan, 2015; Lan et al., 2020), emotional distress and depressive symptoms (Pagani et al., 2019), attention problems (Christakis et al., 2004), impaired visual function (Wang et al., 2020), academic performance (Adelantado-Renau et al., 2019) and cognition (Kostyrka-Allchorne et al., 2017) were reported. According to current recommendations, leisure screen time (ST) in elementary school-age children should not exceed 2 hours per day (Council on Communications and Media, 2016). There are indications, compared to the era of television (Coyne et al., 2017), that child leisure ST increases with exposure to a greater variety of screen devices and activities. Digital gaming can be considered a relatively new source of leisure ST, perhaps replacing traditional children's games (Sapsağlam, 2018).

The contribution of gaming time to the total ST is rather unknown, while researchers traditionally emphasize TV watching as the major source of screen time in younger children (Paulus et al., 2018). Gaming is a very popular leisure screen activity across all age groups. In total, there were an estimated 3.2 billion players globally in 2021. The largest representation of players was from Asia (almost 1.48 billion gamers in 2021), followed by Europe, with a gaming audience of 715 million (DFC Intelligence, 2021). Twenty percent of European children aged 6–11 years played video games for more than 5 hours per week (Kovess-Masfety et al., 2016), and more recently 50% of Chinese children aged 6–18 years played for more than 6 hours per week (Hong et al., 2023). In Japan, Yamada et al. (2021) reported the prevalence of internet gaming disorder among elementary school-age children (mean age 10.5 years) to be as high as 5.6%. Thus, gaming participation and frequency are relevant even for young (preadolescent) children.

Studies on gaming in primary school-aged children are scarce, but a few studies are available. Paulus et al. (2018) found that approximately two-thirds of German children aged 4–8 years were playing videogames and approximately 20% of children were frequent videogamers, i.e., gaming daily (4%) or several days in week (16%). Similarly, the prevalence of gaming in a small-scale Turkish study with children aged 6–8 years was found to be 58.1% (Aydin et al., 2021). In contrast, a Saudi Arabian study with a heterogeneous sample of children aged between 4 and 17 found a prevalence of at least occasional gaming in 99.3% of children (Salih et al., 2020). Among Spanish adolescents 12–17-year-olds, 76% played some videogames and the average time spend gaming was found to be 7 hours per week (Mora-Salgueiro et al., 2022).

The recent COVID-19 pandemic has been found to influence videogame usage in children and adolescents (Han et al., 2022). A small-scale Italian study using data from parents of children aged 3–11 years collected during spring 2020 (in the midst of the COVID-19 pandemic) showed that as much as 94% of boys and 79% of girls engaged in gaming (Donati et al., 2021). Another Italian study conducted in fall 2020 reported that 96.3% of primary school children (8–10 years old) had access to screen-based devices used for gaming (De Pasquale et al., 2021). No studies provided information about how gaming contributes to overall screen time. In addition, all of the above-mentioned studies showed that gaming is more frequent in boys than in girls, but other sociodemographic factors associated with gaming are unclear.

The aim of this study was to (1) establish the prevalence of gaming among primary school-aged children in a multinational sample; (2) examine the association between gaming frequency and screen time; and (3) identify sociodemographic characteristics associated with high gaming frequency (daily gaming).

2 METHODS

2.1 Study design

This study draws on baseline cross-sectional data from a large, prospective survey examining the association between screen use and parenting. The study protocol is available at the following link: https://osf.io/93qx4. The study was conducted in three European countries – Czechia, Slovakia, and Finland. These countries have many similarities such as size, well-functioning social system, similar educational system, but also differences reflected e.g. by human development index (HDI); Finland belongs to the most developed European countries (11th place worldwide, 9th in Europe), while Czechia is around average (22nd in Europe) and Slovakia slightly below the average (29th in Europe) (Conceição et al., 2022). The countries' similarities enabled to unify the study procedures (e.g., participants recruitments and data collection) to ensure the good comparability of data. It was therefore possible to directly compare screen use of children in three countries with differing HDI rankings.

2.2 Participants

Parents/caregivers of children attending grades 1–3 were accessed through cooperating elementary schools that were selected based on stratified random sampling in January 2021 and recruited in February and March 2021. The recruitment of participants as well as data collection was conducted between April and June 2021.

Data were collected via LimeSurvey software for online surveys. Czech schools also had offline (pen-and-paper) options. The pen-and-paper version of survey was introduced alongside with online survey based on the request from some Czech schools, which presumed that pen-and-paper questionnaires would be more convenient for households of their pupils. In total, 28% of Czech participants used pen-and-paper option. Both forms were equivalent in terms of content and the order of items. Both options took up to 25 minutes to complete.

Data from all participants who provided consent to participate (n = 2836) were checked for validity and missing data.

Table 1 | Sociodemographic characteristics of the sample

Variable	The entire sample (n = 1871)
Country	
Czechia	57.1% (n = 1069)
Finland	19.6% (n = 366)
Slovakia	23.3% (n = 436)
Child's sex	
Girls	48.5% (n = 900)
Boys	51.5% (n = 955)
Child's grade (year of study)	
Grade 1	35.6% (n = 666)
Grade 2	34.4% (n = 643)
Grade 3	30.0% (n = 562)
Child's age (mean in months)[1]	101 (SD = 12.4)
Child's position among siblings	
The only child	19.2% (n = 346)
The youngest child	35.7% (n = 644)
The middle child	11.3% (n = 204)
The oldest child	33.9% (n = 611)
Family intactness	78.7% (n = 1467)
Parental gender	
Female	85.4% (n = 1588)
Male	14.6% (n = 272)
Parental age (mean in years)[2]	39.2 (SD = 5.62)
Parental education	
Elementary/Practical	15.0% (n = 278)
High-school	36.4% (n = 674)
University level	48.6% (n = 901)

[1] range 66–192 months
[2] range 22–77 years

Participants with more than 25% missing data (n = 871) were excluded. It should be noted that 664 questionnaire (77%) were completely empty except for the consent page. Also, participants with children outside the target age range (6–11 years) were excluded (n = 7). Participants from Slovakia and Finland who reported not taking part in schooling at the time of the data collection period were also excluded (n = 32), as were participants who did not report whether their children attended school in person (n = 11). Finally, participants who did not report child frequency of gaming were also excluded (n = 44). The final sample consisted of 1871 participants. The characteristics of the participants are shown in *Table 1*.

2.3 Measures

Gaming frequency (GF) was measured as the number of days per week in which the child played games and could range from 0 to 7. Based on the obtained frequency of each response, responses were recoded into four categories: nongamers (0 days per week), low gamers (1 to 3 days per week), moderate gamers (4 to 6 days per week), and daily gamers (7 days per week).

Screen time in children was measured using eight items on time spent with different types of screen-based devices (smartphones, tablets, gaming consoles, personal computers, television) for leisure purposes (not online schooling) during a typical weekday and weekend day. The minutes reported for each type of screen-based device during a typical weekday/weekend day were summed to calculate weekday/weekend day ST. Weekday ST was multiplied by 5, and weekend ST was multiplied by 2. Daily ST was the sum of both divided by 7. The range of daily ST was from 0 (no ST) to 960 minutes (240 or more minutes spent with all types of devices, including combined use of the devices). The amount of reported screen time could be affected by the lockdown of Czech schools during which a part of Czech sample (52%) completed the survey. Therefore, we assessed differences in daily screen time between participants attend-

Table 2 | Associations between gaming frequency and country

		Gaming frequency group			
Country		**Nongamers**	**Low gamers**	**Moderate gamers**	**Daily gamers**
Czechia	Observed	201	370	267	231
	Expected	190.3	365	253.1	261.1
	Ratio	18.80%	34.60%	25.00%	21.60%
Finland	Observed	22	102	93	149
	Expected	65.1	125	86.7	89.4
	Ratio	6.00%	27.90%	25.40%	40.70%
Slovakia	Observed	110	166	83	77
	Expected	77.6	149	103.2	106.5
	Ratio	25.20%	38.10%	19.00%	17.70%

Note. Nongamers = play games 0 days per week, Low gamers = 1 to 3 days per week, Moderate gamers = 4 to 6 days per week, Daily gamers = 7 days per week.

ing the study during lockdown and those attending the study after the lockdown. These two groups differed on average by 18 minutes, which meant a significant difference: $t(1096) = 2.28$, $p = .023$ with a small effect size: Cohen's $d = 0.14$. Attending during or after lockdown was not significantly associated with the gaming frequency of Czech children ($p = .43$). More importantly, the interaction between gaming frequency and lockdown did not significantly affect daily screen time ($p = .30$) as we checked using ANOVA.

Sociodemographic variables consisted of child's sex, age, school year, child's position among siblings, family income, family intactness, and the gender, age, and education of a parent who was completing the questionnaire (mothers in 85% cases).

All variables were reported by a parent.

2.4 Statistical analysis

First, we established the prevalence of GF categories in the entire sample and assessed differences between country subsamples using the χ^2 test of associations.

Second, we examined differences between GF groups in daily ST using Welch ANOVA.

Third, we assessed sociodemographic characteristics as presumed predictors of daily gaming using the χ^2 test of association and binominal logistic regression model. We conducted the analyses both on the merged sample and country subsamples.

2.5 Ethics

The study was approved by the Ethics Committee of the Faculty of Education, Charles University, Czech Republic. All participants provided informed consent for their participation. Informed parental consent was obtained for persons under 18 years of age. Study procedures were carried out in accordance with the Declaration of Helsinki.

3 RESULTS

The prevalence of nongamers in the whole sample was 333 (17.8%), low gamers 638 (34.1%), moderate gamers 443 (23.7%) and daily gamers 457 (24.4%). We found significant differences in proportions of GF categories between countries (χ^2 (6) = 106, $p < .001$). The proportion of daily gamers was the highest in the Finnish sample (40.7%) and the lowest in the Slovak sample (17.7%) *(Table 2)*.

The omnibus differences in daily ST based on GF were significant (F (3; 1831) = 91.14, $p < .001$, $\omega 2 = 0.13$), with higher daily ST in more frequent gamers. In nongamers, the average daily ST was 146 minutes (SE 6.61, 95% CI 133-159); in low gamers, it was 217 minutes (SE 4.23, 95% CI 209-225); in moderate gamers, it was 240 minutes (SE 5.12, 95% CI 230-250); and in daily gamers, it was as high as 280 minutes (SE 5.04, CI 95% 270-290). All post hoc tests were significant but with varying effect sizes *(Table 3)*. In addition, we found a small but significant interaction between GF and gender (F (3; 1831) = 3.103, $p = .026$, $\omega 2 = 0.003$), suggesting that the effect of GF on screen time is different for boys and girls, i.e., nongaming boys showed lower screen time than nongaming girls, but in all other GF groups, boys had higher screen time than girls. However, none of the boy-girl post hoc differences were significant.

The prevalence of daily gaming was significantly associated with country, child's gender, child's grade (school year), and child's position among siblings *(Table 4)*. In contrast, the associations between daily gaming and parents' education, family income, family place of residence, and family intactness were not significant. As the next step, we performed logistic regression analysis predicting daily gaming by using those sociodemo-

Table 3 | Post hoc comparisons in daily screen time among gaming frequency groups

Comparison									95% Confidence Interval	
Gaming frequency group*			Mean Difference	SE	df	t	p Bonferroni	Cohen's d	Lower	Upper
0	-	1	-0.147	0.0355	1765	-4.14	<.001	-0.313	-0.462	-0.164
	-	2	-0.262	0.0378	1765	-6.92	<.001	-0.558	-0.717	-0.399
	-	3	-0.547	0.0376	1765	-14.55	<.001	-1.166	-1.327	-1.004
1	-	2	-0.115	0.0302	1765	-3.81	<.001	-0.245	-0.371	-0.118
	-	3	-0.4	0.0299	1765	-13.38	<.001	-0.852	-0.98	-0.724
2	-	3	-0.285	0.0326	1765	-8.75	<.001	-0.608	-0.745	-0.47

Note. Comparisons are based on estimated marginal means.
*0 = nongamers (0 days per week), 1 = low gamers (1 to 3 days per week), 2 = moderate gamers (4 to 6 days per week), 3 = daily gamers (7 days per week).

Table 4 | Proportion of daily gamers based on sociodemographic variables

	Proportion test of daily gamers		p
Country		χ^2 (2) = 68.0	<.001
Czechia	21.60%		
Finland	40.70%		
Slovakia	17.70%		
Gender		χ^2 (1) = 12.1*	<.001
Girl	21.00%		
Boy	28.00%		
Grade		χ^2 (2) = 22.8	<.001
First	19.20%		
Second	24.10%		
Third	31.00%		
Position among siblings		χ^2 (3) = 19.8	<.001
The only child	24.90%		
The youngest child	29.70%		
The middle child	22.50%		
The oldest child	19.00%		

*OR = 1.46 (95% CI 1.18-1.81)

graphic variables that were significantly associated with daily gaming in previous analyses. The model with four predictors *(Table 5)* explained only 5.8% of the variance, but all predictors were found to be significant. The most at-risk constellation was being male, attending third grade, and being the youngest child in the family. In contrast, the most protective constellation was being female (OR = 0.69), attending the first grade (OR = 0.53) and being the oldest among their siblings (OR = 0.57). For differences among countries, the lowest prevalence of daily gamers was found in Slovakia (OR = 0.30), and the highest prevalence was found in Finland.

The additional analyses were conducted separately for each country subsample. The results of logistic regression in Czech sample (N = 1069) were slightly different from those observed using the whole sample; namely, from three assessed predictors (child's gender, child' grade, child's position among siblings), gender ceased to be significant (p = .223) and as for the position among siblings, only the difference between the youngest and the oldest child in family was significant (see *Supplementary Table S1*). In Czech children, the highest probability to be a daily gamer was found in boys, who were the youngest in family and were attending the 3rd grade: 39% (95% CI: 31–47%), while the lowest was in girls, who were the oldest in family and were attending the 1st grade: 8% (95% CI: 5–12%). The logistic regression in Slovak sample (N = 436) showed that being boy and being the youngest child in the family were significant predictors of daily gaming *(Table S2).* Unlike in Czechia, the differences between the 1st, 2nd, and 3rd grades were not significant (*Table S2*). In Slovak children, the highest probability

Table 5 | Sociodemographic predictors of daily gaming – the results of logistic regression (N = 1871)

		95% Confidence Interval						95% Confidence Interval	
Predictor	**Estimate**	**Lower**	**Upper**	**SE**	**Z**	**p**	**Odds ratio**	**Lower**	**Upper**
Intercept	0.468	0.143	0.794	0.166	2.82	0.005	1.597	1.154	2.212
Country:									
CZE – FIN	-1.009	-1.275	-0.743	0.136	-7.43	< .001	0.365	0.279	0.476
SVK – FIN	-1.212	-1.548	-0.875	0.172	-7.06	< .001	0.298	0.213	0.417
Gender:									
girl – boy	-0.366	-0.591	-0.141	0.115	-3.19	0.001	0.694	0.554	0.869
Grade:									
1st–3rd	-0.641	-0.918	-0.364	0.141	-4.54	< .001	0.527	0.4	0.695
2nd–3rd	-0.386	-0.655	-0.118	0.137	-2.82	0.005	0.68	0.519	0.889
Position among siblings*:									
the only child	-0.215	-0.522	0.091	0.156	-1.38	0.168	0.806	0.593	1.095
the middle child	-0.435	-0.819	-0.051	0.196	-2.22	0.026	0.647	0.441	0.95
the oldest child	-0.564	-0.836	-0.292	0.139	-4.07	< .001	0.569	0.433	0.747

Note. Estimates represent the log odds of "daily gaming = 1" vs. "daily gaming = 0"
* the youngest child is the referential category

to be a daily gamer had boys, attending the 3rd grade and being the youngest child in the family: 37% (95% CI: 26–50%), and the lowest probability had girls, which were the middle child and attended the 2nd grade: 7% (95% CI: 2–22%), but also girls attending the 1st grade and being either the middle or the oldest in the family showed the low probabilities of daily gaming (< 8%). In Finland, the only significant predictor of daily gaming was being a boy *(Table S3).* Finnish boys' estimated probability to be a daily gamer was 47%, while in Finnish girls it was 35%.

4 DISCUSSION

The prevalence of gaming in children attending the 1st, 2nd and 3rd grades of elementary school was relatively high; in Czechia nongamers constituted 19% of the sample, in Slovakia 25% and in Finland only 6%. Daily gamers constituted 22% in Czechia, 18% in Slovakia and as high as 41% in Finland. The association between gaming frequency (GF) and daily screen time (ST) was confirmed; leisure ST increased with increasing GF and reached as high as 280 minutes in daily gamers. Daily gaming was significantly associated with country (the proportion of daily gamers was highest in Finland and lowest in Slovakia), child's gender (boys displayed the higher proportion of daily gamers), child's grade (there was a higher proportion of daily gamers in the third grade compared to lower grades), and position among siblings (daily gaming was more common among children who have only older sibling(s)).

The prevalence of gaming in our sample (82%) seems to be lower than that identified in a Saudi Arabian broad-aged sample of children, where the proportion of (at least occasional) gamers was 99% (Salih et al., 2020), but greater than that in a German sample of 4- to 8-year-olds, where the proportion of gamers was approximately 67% (Paulus et al., 2018), and a Turkish sample of 6- to 8-year-olds, where the proportion of gamers was 58% (Aydin et al., 2021). For daily gaming, we found an approximately six times higher prevalence (24%) than Paulus et al. (2018). However, it is somewhat problematic to compare the prevalence of gamers in our study with previous research. One reason is that the age range of our sample (8.4 years 1 year) was different than in those cited studies, and it is well established that gaming patterns change with age. The second reason is that our data were collected during the pandemic year 2021, while the abovementioned studies used prepandemic data. It has been argued that children and adolescents reported increased gaming hours as a result of coping with increased stress and social isolation (Han et al., 2022). To the best of our knowledge, only two Italian studies have reported data collected during the COVID-19 pandemic on gaming prevalence in primary school children. Both of these studies reported a higher proportion of gamers among children, but they both had very small and convenient samples (De Pasquale et al., 2021; Donati et al., 2021). It should be mentioned that the prevalence of daily gaming in Finland was more than double the found prevalence in Czechia and Slovakia. This suggested that gaming in children might be largely influenced by cultural norms, access to technology and other individual traits of European countries.

Although watching television remains the major source of children's leisure ST in younger children (Paulus et al., 2018), gaming frequency seems to increase ST substantially. The difference between children who never play videogames and those who play daily was more than 2 hours per day (nongamers had approximately 140 minutes, while it was twofold in daily gamers, i.e., approximately 280 minutes of ST per day). There are estimates that children of primary school age spend 2 hours

per day playing videogames (Aydin et al., 2021; Donati et al., 2021). Nevertheless, current studies do not answer the key question of whether gaming replaces other screen activities (e.g., watching movies) or constitutes an additional screen activity. Our findings supported the latter, i.e., that children who spend time gaming do not give up other screen activities typical for children of this age, mainly watching television.

Previous research found that the frequency of gaming is associated with gender in that boys are more frequent gamers (Aydin et al., 2021; De Pasquale et al., 2021; Donati et al., 2021; Paulus et al., 2018). A recent study with a large sample of US kindergarten children found effects for ethnicity – Black and Hispanic US children were more prone to play online games daily compared to White and Asian children (Morgan et al., 2021) – and family income, where children from low-income families were more prone to play daily; however, the association was rather weak (Morgan et al., 2021). Our findings supported the evidence on the higher ratio of daily gamers among boys. In our study, we found no significant association between daily gaming and family income, parental education, or family intactness. On the other hand, we found a significantly higher proportion of daily gamers in children attending higher grades (i.e., in those of higher age), which is consistent with previous research showing that gaming frequency increases with age (Ahmed et al., 2022). In Czech and Slovak samples, we found that daily gaming was more prevalent in the youngest children in the family with respect to birth order (i.e., in those having older sibling(s) but not younger sibling(s)). This unexpected finding could be attributed to potentially lower parental surveillance over these children caused by the fact that parents may rely on older children in the family to provide the necessary surveillance/assistance to their younger sibling(s). Parenting has been shown to influence screen use, e.g., restrictive parenting might decrease screen/media time (Fam et al., 2022), and general parental control is negatively associated with adolescents' problematic online media use (Lukavská et al., 2022). However, it is currently unclear whether the intensity of media parenting (parental regulative efforts focused on child screen/media use) is associated with the child's position among siblings. Interestingly, the effect was not found for Finnish participants.

While gaming is a very popular leisure activity with many recognized benefits (Brilliant et al., 2019), it is also one of the sources of screen time that should be limited in primary school children to approximately 2 hours per day to avoid potential negative effects on children's physical and mental health (Council on Communications and Media, 2016). Parents and child caregivers should be aware that engagement in gaming leads to increased screen time in children, which usually does not meet the recommended 2-hour limit as a result. It seems necessary to address this issue by either limiting gaming or limiting other screen activities. It should be noted that watching television seems to be associated with more harm than gaming (Sanders et al., 2019). However, the benefits of gaming were found to be different for different types of videogames (Brilliant et al., 2019), and some videogames might bring specific risks, e.g., loot boxes (Montiel et al., 2022). Finally, it seems that some gamers may develop video gaming disorder even at a relatively young age (Yamada et al., 2021), which is alarming due to the large prevalence of gaming among children. Parents, caregivers, and prevention professionals should be aware of this issue and routinely screen for early signs of video gaming disorder in primary school children. This is especially important in this post pandemic period as screen use among children during the pandemic increased (Han et al., 2022), but the possibilities for prevention professionals to address this issue were limited (Lukavská et al., 2021).

4.1 Strengths and limitations

We used a multinational sample from three European countries to study the contribution of gaming to overall LS time. The study focused on children attending primary school (grades 1-3), an understudied population compared to younger children (attending kindergarten) and adolescents (attending secondary school, high school). Parents/guardians of children were recruited through elementary schools, which could help to decrease self-selection bias. Gaming frequency was reported in the form of the number of days in a week during which the child engaged in gaming. This was relatively simple for parents to report, and at the same time, it was relatively objective (compared to, e.g., rarely/sometimes/often).

The study also had limitations. First, children's screen use and gaming frequency were reported by parents. Nevertheless, it is the most common procedure when investigating young, not yet fully literate children. Second, we did not ask participants to separately report time spent with gaming and with other screen activities; therefore, we could assess the influence of gaming on screen time only indirectly, using the total ST and its variations based on gaming frequency. We decided to do this to minimize bias that could emerge from some parents not knowing for how long his or her child engaged in specific screen activities. Finally, we did not assess the types of games played by children, their content and age appropriateness. As the variety of videogames is large, they are probable to differ in their benefits and risks to children's development. Future studies could benefit from categorizing games based on their content and other characteristics.

5 CONCLUSIONS

Digital gaming is the popular leisure activity among elementary school-aged children. Caregivers should be aware that the daily gaming is associated with the substantially increased screen time which can be marked as excessive in the most daily gamers. Therefore, in frequent gamers, the screen time restrictions - limiting either gaming or other screen-based activities - should be considered to minimize risks related to excessive screen use. Children with older siblings seem to be especially prone to very frequent (daily) gaming.

Table S1 | Sociodemographic predictors of daily gaming – the results of logistic regression in the Czech sample (N = 1069). $R^2 = 0.041$

		95% Confidence Interval						95% Confidence Interval	
Predictor	**Estimate**	**Lower**	**Upper**	**SE**	**Z**	**p**	**Odds ratio**	**Lower**	**Upper**
Intercept	-0.467	-0.807	-0.127	0.173	-2.69	0.007	0.627	0.446	0.88
Gender:									
girl – boy	-0.187	-0.494	0.12	0.157	-1.19	0.233	0.83	0.61	1.128
Grade:									
1st–3rd	-0.966	-1.354	-0.578	0.198	-4.88	< .001	0.381	0.258	0.561
2nd–3rd	-0.5	-0.856	-0.143	0.182	-2.75	0.006	0.607	0.425	0.867
Position among siblings*:									
the only child	-0.104	-0.505	0.297	0.205	-0.51	0.61	0.901	0.603	1.346
the middle child	-0.431	-0.964	0.102	0.272	-1.59	0.113	0.65	0.381	1.107
the oldest child	-0.786	-1.173	-0.4	0.197	-3.99	< .001	0.456	0.31	0.67

Note. Estimates represent the log odds of "gaming_everyday = 1" vs. "gaming_everyday = 0"
* the youngest child is the referential category

Table S2 | Sociodemographic predictors of daily gaming – the results of logistic regression in the Slovak sample (N = 436). $R^2 = 0.055$

		95% Confidence Interval						95% Confidence Interval	
Predictor	**Estimate**	**Lower**	**Upper**	**SE**	**Z**	**p**	**Odds ratio**	**Lower**	**Upper**
Intercept	-0.543	-1.072	-0.0144	0.27	-2.01	0.044	0.581	0.3423	0.986
Gender:									
girl – boy	-0.654	-1.182	-0.1263	0.269	-2.43	0.015	0.52	0.3065	0.881
Grade:									
1st–3rd	-0.235	-0.845	0.375	0.311	-0.76	0.45	0.79	0.4294	1.455
2nd–3rd	-0.283	-0.928	0.3619	0.329	-0.86	0.39	0.753	0.3952	1.436
Position among siblings*:									
the only child	-0.532	-1.2	0.1364	0.341	-1.56	0.119	0.588	0.3012	1.146
the middle child	-1.047	-2.315	0.2214	0.647	-1.62	0.106	0.351	0.0988	1.248
the oldest child	-1.008	-1.624	-0.3916	0.314	-3.21	0.001	0.365	0.1971	0.676

Note. Estimates represent the log odds of "gaming_everyday = 1" vs. "gaming_everyday = 0"
* the youngest child is the referential category

Table S3 | Sociodemographic predictors of daily gaming – the results of logistic regression in the Finnish sample (N = 366). $R^2 = 0.016$

		95% Confidence Interval						95% Confidence Interval	
Predictor	**Estimate**	**Lower**	**Upper**	**SE**	**Z**	**p**	**Odds ratio**	**Lower**	**Upper**
Intercept	0.0407	-0.478	0.5596	0.265	0.15	0.878	1.042	0.62	1.75
Gender:									
girl – boy	-0.5006	-0.935	-0.0658	0.222	-2.26	0.024	0.606	0.392	0.936
Grade:									
1st–3rd	-0.3183	-0.86	0.2233	0.276	-1.15	0.249	0.727	0.423	1.25
2nd–3rd	-0.1601	-0.698	0.378	0.275	-0.58	0.56	0.852	0.497	1.459
Position among siblings*:									
the only child	-0.2154	-0.862	0.431	0.33	-0.65	0.514	0.806	0.422	1.539
the middle child	-9.68e–4	-0.652	0.6504	0.332	0	0.998	0.999	0.521	1.916
the oldest child	0.145	-0.375	0.665	0.265	0.547	0.585	1.156	0.687	1.945

Note. Estimates represent the log odds of "gaming_everyday = 1" vs. "gaming_everyday = 0"
* the youngest child is the referential category

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Research transparency statement: The authors are willing to share their data, analytics methods, and study materials with other researchers. The material will be available upon request.

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