# Impact of e-Discipline on Children's Screen Time

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## Abstract

With rapid technological advancement, the prevalence and undesirable effects of excess screen time on children have become a mounting issue worldwide. There are many studies investigating the phenomenon's impact on society (e.g., behavioral, academic, health), but studies that uncover the causes and factors that increase the odds of children's excess screen time are limited. To this end, this study introduces the term "e-discipline" to refer to systematic practices that use screen devices as discipline tools. As such, the aim of this study is to investigate the association between e-discipline and children's screen time by gender. Analysis was performed on 3,141 children aged 7–11 years old. Bivariate logistic regression models were used to calculate the odds of exceeding the American Academy of Pediatrics guidelines of 2 hours of screen time per day by boys and girls whose parents practice e-discipline. The results showed that children whose parents used screen devices as discipline tools had significantly more screen time compared to children whose parents did not. Furthermore, no statistically significant gender differences were found in the odds of exceeding the recommended screen time under e-discipline. Recommendations stemming from all the results are discussed.

## Introduction

HE PREVALENCE OF EXCESS SCREEN TIME for children is an escalating concern worldwide. Now more than ever, children from a very young age are allowed unlimited access to a wide variety of screen devices, such as computers (desktops, laptops, and tablets), smartphones, video games consoles (PlayStation, Nintendo DS, Wii, Xbox, iPod, etc.) and television (TV; including video games playing on TV). Because of the side effects of such unlimited access, the American Academy of Pediatrics (AAP) released a set of guidelines for the use of screen media by children to limit screen time for children aged 2 years and older to a maximum of 2 hours of screen time per day.<sup>1</sup> In accordance with this guideline, several studies have addressed the negative effects of children's long exposure to screen devices, particularly video games. For instance, playing a violent video game can prime aggressive thoughts, increase hostile affect, and cause physiological arousal.<sup>2</sup> Behavioral and attitudinal measures relating to Internet use and video games are associated with a measure of violent delinquency and antisocial behaviors,<sup>3</sup> and also with dysfunction at home, increased aggression,<sup>4,5</sup> depression,<sup>6</sup> and psychological well-being.<sup>7,8</sup> Academically, children who spend a lot of time on screen devices may experience failure in school performance.<sup>9,10</sup> Diet habits and physical activity are also negatively affected by sedentary screen time, as some children sit for long hours and eat unhealthy food while playing video games, which may lead to several short- or long-term health problems, especially obesity

and heart disease.<sup>11–13</sup> Another adverse effect of prolonged screen time is the development of addictive behavior.<sup>14–16</sup> This study addresses the indirect role of parents in increasing their children's screen time, and whether a change in parental discipline practices can reduce children's screen time, which may therefore prevent potential developmental, social, physical, and mental health problems in their children.

## e-Discipline

Very few measures are available to assess parents' influence on their children's screen use because this research is still at a very early stage.<sup>17</sup> There is a relationship between parents' and children's TV viewing in sedentary home environments.<sup>18</sup> Children of parents who watch more TV are more likely to watch more TV themselves.<sup>19</sup> Additionally, studies show that associations exist between parental rules, physical activity, and alternative activities and the odds of increasing screen time recommendations. For instance, there is a significant correlation between parental rules for watching TV and using computers, and adolescent screen time.<sup>20</sup> Parenting styles (permissive vs. authoritative) on screen time rules have a positive association with physical activity.<sup>21</sup> Absence of screen-related rules, having a TV in the bedroom, and having family meals fewer than four times a week are positively associated with exceeding 2 hours per day of screen time.<sup>22</sup> Parenting media practices were proposed mainly to include screen time rules, media content, and parental monitoring and supervision.<sup>23</sup>

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This study introduces the term "e-discipline" to describe the systematic practices that use screen devices as discipline tools. Examples of e-discipline are when parents reward their children's good behavior by allowing them to have more time on screen devices or when parents punish their children by prohibiting the use of screen devices. The purpose of this research is to investigate whether e-discipline is a contributing factor to excess screen time in children. Child discipline is a challenge that is becoming more difficult to address with the presence of a plethora of enticing Internet connected screen devices at home and a multitude of addictive video games. While some parents tend to use screen devices as a reward for their child's good behavior, others tend to prohibit their child from using screen devices as a punishment for bad behavior. Additionally, there are parents who use screen devices as both a reward and a punishment. Furthermore, one study showed that 34.4% of parents use screen devices to keep their children quiet.<sup>24</sup> These traditional parental practices could pose a risk of increasing children's screen time, which could have adverse effects. Furthermore, there is no evidence of the effectiveness in addressing the child's original behavior problem.<sup>25</sup> In child discipline principles, some argue that (a) withholding specific foods from children as punishment can make them seem more desirable, and (b) serving desirable foods for children as a reward can make them seem even more desirable.<sup>26,27</sup> The theory here is that these two principles might be applicable to screen time. It is also expected that children whose parents let them use screen devices to keep them quiet have higher odds of exceeding the recommended screen time compared to children whose parents do not use this practice.

Within the aforementioned framework, this study was conducted to investigate the following hypotheses:

H1: Boys and girls whose parents let them use screen devices to reward them for good behavior are likely to exceed the recommended screen time.

H2: Boys and girls whose parents prohibit them from using screen devices to punish them for bad behavior are likely to exceed the recommended screen time.

H3: Boys and girls whose parents do not have home policies for screen time are likely to exceed the recommended screen time.

H4: Boys and girls whose parents complain about their screen time are likely to exceed the recommended screen time.

H5: Boys and girls whose parents let them play on screen devices so the parents have a break or can continue doing their own work are likely to exceed the recommended screen time.

H6: Boys and girls who tend to continue to use screen devices in the presence of their parents are likely to exceed the recommended screen time.

H7: There are no gender differences under e-discipline.

#### Methods

## Sampling and procedures

The target population encompassed 187,800 Lebanese students.<sup>28</sup> The sample consisted of 3,141 children aged 7–11 years, of which 1,588 were boys (50.6%). This age group is the focus of most research on screen time.<sup>29</sup> The sample's

percentage of girls (49.4%) was slightly higher than that of the target population (47.5%). Participants were recruited from 15 private schools that were randomly selected from regions distributed geographically throughout Lebanon. In April 2013, survey questionnaires were distributed with the schools' administrations' approval in open peel and seal envelopes to students, requesting to have each questionnaire filled out by either a parent or a guardian. The questionnaire achieved a response rate of 66.1%. Some of the questionnaires were excluded from the analysis because of (a) missing values for the dependent variable, screen time; (b) outlier values exceeding a screen time of 12 hours a day;<sup>24</sup> and (c) screen time greater than zero where screen devices were not available.

#### Measures

The following social demographic control variables were included: gender, age, and the respondent's relationship to the child (mother, father, or guardian). Parents were asked to report what screen devices their children use at home (TV, computer, smartphone, video game consoles, or other screen devices). For screen time, parents were asked four separate questions about the average time their children spent (a) watching TV on weekdays, (b) using other screen devices on weekdays, (c) watching TV on weekends, and (d) using other screen devices on weekends. The average daily screen time was calculated as [(TV weekday+"Other Screens" weekday)×5+(TV weekend+"Other Screens" weekend)×]/7. The overall average screen time was categorized into  $\leq 2$  hours per day and >2 hours per day based on the AAP recommended time of a maximum of 2 hours of screen time per day.

Parents were asked if they (a) let their children use screen devices as a reward for achievement or as motivation, (b) prohibit their children from using screen devices for misconduct or bad achievement, (c) their children play on screen devices so that they can have a break or continue doing their own work, and (d) complain to their children about the amount of time spent on screen devices. Answers were on a 3-point Likert scale: yes, sometimes, and no. Parents were also asked two binary questions: (a) whether they have a rule about the amount of time their child can spend on a screen device, and (b) whether their children continue using screen devices in their presence.

## Results

All hypotheses were addressed with a binary logistic regression with screen time as the dependent variable. In accordance with other research<sup>17,24</sup> that requested participation from parents regarding children's screen time, 2,759 questionnaires were filled out by mothers (87.6%). The vast majority of children had TVs, followed by computers, video game consoles, and cell phones in that order, as reported in Table 1.

Table 2 reports average screen time by age and gender. While girls' average screen time was 2.43 hours per day, boys' average screen time was 2.66 hours per day. These averages indicate a gender difference in screen time, similar to other studies.<sup>24,30,31</sup> Indeed, the girls averaged significantly (F=32.351, df=, p<0.0005) less screen time than the boys did. Of girls and boys, 61.8% and 70.0% exceeded the AAP's screen time recommendation, respectively.

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TABLE 1. DISTRIBUTION OF SCREEN DEVICE						
Types by Gender						

Screen device	Girls		Boys		Total	
	Ν	%	Ν	%	Ν	%
Television	1,532	97.0	1,549	95.5	3,081	96.3
Computer	1,452	92.0	1,485	91.5	2,937	91.7
Cell phone	1,096	69.4	1,116	68.8	2,212	69.1
Video game consoles	1,123	71.1	1,375	84.7	2,498	78.0
Other	71	4.5	133	8.2	204	6.4

## Reward and punishment

Table 3 shows that a significant number of parents use screen devices as a discipline tool to reward their children's good behavior and/or prohibit the use of screen devices to punish children's bad behavior. For instance, boys whose parents allowed the use of screen devices to reward their good behavior were more likely to exceed the recommended screen time ("yes" group, OR [odds ratio] = 1.672, p < 0.001; "sometimes" group, OR = 1.298, p < 0.001) compared to boys who were not rewarded with screen devices. This result provides evidence in support of H1. This result is also consistent for girls (see Reward in Table 3), providing evidence in support of H1 and H7. Furthermore, the boys whose parents prohibited the use of screen devices to punish their bad behavior were more likely to exceed the recommended screen time ("yes" group, OR = 1.435, p < 0.01; "sometimes" group, OR = 1.445, p < 0.01) compared to boys who were not punished by not allowing them to use screen devices. This result provides evidence in support of H2. This result is also consistent for girls (see Punishment in Table 3), providing evidence in support of H2 and H7.

The data were also analyzed from parents who used screen devices as a reward and/or punishment. Within this category of parents, all possible frequency combinations (yes, sometimes, and no) are considered (see Reward and punishment in Table 3). It seems that using screen devices as a reward and/ or punishment, whether yes or sometimes, increased the odds of exceeding recommended screen time compared to children, both boys and girls, whose parents do not use screen devices as a reward or a punishment. This finding is consistent with H1 and H2, and is a corollary to them. Furthermore, girls whose parents use screen devices as tools for reward and punishment averaged 30 minutes per day more

TABLE 2. DAILY AVERAGE SCREEN TIMEBY GENDER WITHIN AGE

Age		G	irls	Boys			
	N	М	% >2 hours per day	N	М	% >2 hours per day	
11	240	2.63	66.7	229	2.85	77.3	
10	322	2.52	61.8	309	2.65	69.6	
9	450	2.39	62.9	446	2.62	70.0	
8	338	2.33	59.2	353	2.66	70.0	
7	203	2.38	57.6	251	2.58	64.1	

screen time than girls whose parents did not employ screen devices as a reward or punishment tool.

## Screen time home policy

The results show that 14.7% of boys' parents and 16.4% of girls' parents reported not having home policies for screen time. These percentages are much less than the 50% reported in other studies.<sup>24</sup> Children whose parents did not establish home policies for screen time were more likely to exceed the recommended screen time compared to those whose parents did have policies for screen time (see Home media use policy in Table 3). This result provides evidence in support of H3. In the United States, the same finding was reported<sup>22</sup> with an exact match of the girls' odds ratio (1.74). Further evidence is provided from the United Kingdom<sup>32</sup> and Australia.<sup>17</sup> These results support the AAP's recent recommendation encouraging parents to establish a family home use plan for all media.<sup>33</sup> Within the gender cohorts, children whose parents had home policies for screen time averaged less screen time (2.40 hours per day for girls and 2.61 hours per day for boys) than children whose parents did not have screen time policies (2.70 hours per day for girls and 2.97 hours per day for boys).

# Complaints

Children whose parents complained about their screen time were more likely to exceed the recommended screen time (H4; see Complaining in Table 3). Furthermore, boys whose parents complained about their screen time averaged 48 minutes per day more screen time than boys whose parents did not complain about time spent.

## Screen devices as distraction tools

Children whose parents always or sometimes let them play on screen devices so parents could have a break or continue doing their own work had significantly higher odds of exceeding recommended screen time compared with children whose parents did not use screen time as a distraction tool (H5; see I need a break in Table 3). Boys whose parents let them play on screen devices as a distraction tool averaged 31 minutes per day more screen time than boys whose parents did not used screen time in this way. Possibly, children's awareness that their parents' self-interest (to have a break) is the motive for permitting them to use screen devices encourages children to maximize screen time in fulfillment of their own self-interest.<sup>25</sup>

## Using screen devices in the presence of parents

Children who tend to continue to use screen devices in the presence of their parents have significantly higher odds of averaging screen time in excess of the 2 hour cutoff (H6; see In my presence in Table 3). Furthermore, boys who tended to continue to use screen devices in the presence of their parents averaged 26 minutes per day of screen time more than boys who did not. This phenomenon is expected to accelerate, as screen devices are becoming ubiquitous in families.

## Discussion

The term "e-discipline" is introduced here to refer to systematic parental practices that use screen devices as

	Girls			Boys		
	%	OR	95% CI	%	OR	95% CI
Reward						
No	50.6	Reference		43.3	Reference	
Sometimes	33.1	1.359**	1.094-1.687	35.8	1.298**	1.029-1.638
Yes	16.3	1.314*	1.005-1.731	21.0	1.672***	1.254-2.229
Punishment						
No	35.4	Reference		24.5	Reference	
Sometimes	31.5	1.599***	1.260-2.030	33.9	1.445**	1.103-1.893
Yes	33.1	1.646***	1.301-2.083	41.6	1.435**	1.108-1.858
Reward and punishment						
Both No	23.4	Reference		14.6	Reference	
No and Sometimes	23.0	1.846***	1.378-2.474	22.1	1.375*	1.010-1.902
Both Sometimes	12.8	1.744**	1.233-2.468	14.1	2.018***	1.365-2.983
Yes and Sometimes	15.9	2.000***	1.440-2.776	19.3	1.659**	1.168-2.357
Yes and No	16.5	1.402*	1.023-1.921	16.5	1.569*	1.092-2.255
Both Yes	8.4	1.551*	1.041-2.312	13.4	2.244***	1.500-3.357
Home media use policy						
Yes	83.6	Reference		85.3	Reference	
No	16.4	1.739***	1.305-2.317	14.7	1.662**	1.203-2.296
Complaining						
No	34.2	Reference		23.0	Reference	
Sometimes	45.7	1.964***	1.573-2.451	46.9	2.438***	1.892-3.142
Yes	20.1	2.707***	2.024-3.620	30.1	2.831***	2.128-3.766
I need a break						
No	62.9	Reference		58.2	Reference	
Sometimes	32.9	1.574***	1.269-1.952	36.5	1.556***	1.272-1.905
Yes	4.2	2.035**	1.187-3.489	5.3	2.207***	1.399-3.481
In my presence						
No	59.7	Reference		56.0	Reference	
Yes	40.3	1.739***	1.418-2.133	44.0	1.911***	1.542-2.369

 TABLE 3. ODDS RATIOS AND PERCENTAGES OF CHILDREN EXCEEDING THE AMERICAN ACADEMY

 OF PEDIATRICS' RECOMMENDED SCREEN TIME BY E-DISCIPLINE APPROACH

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

OR, odds ratio; 95% CI, 95% confidence interval; Reward, "I let my child use a screen device as a reward for good behavior"; Punishment, "I prohibit my child from using a screen device for bad behavior"; Home media use policy, "I have a rule about screen time"; Complaining, "I complain to my child about screen time"; I need a break, "I let my child play on a screen device so that I can have a break"; In my presence, "My child continues to use a screen device in my presence."

discipline tools to manage children's behavior. The purpose of this study is to examine the impact of e-discipline on children's screen time. Research shows that interventions to reduce children's screen time have little effect.<sup>29</sup> It is suggested that the minimal effect could be due to parents using e-discipline with their children. The study examined e-discipline's impact on children's screen time by addressing six hypotheses. All the results show that using screen devices as discipline tools increases the odds of exceeding the recommended screen time of 2 hours per day. Regardless of how convenient e-discipline may be for parents and how efficient it may be in shaping children's behavior, it is highly likely to increase screen time. With this evidence, it remains difficult for parents to decide whether to abstain from using screen devices to avoid increasing screen time and its associated side effects or to employ screen devices to regulate children's undesirable behavior, which the side effects of screen time might not outweigh. Some studies have suggested having a fair home policy on screen time<sup>32</sup> from a very early age that restricts content (sexual, violence, foul language, etc.), duration (including all devices), timing (after school, before bedtime, etc.), eating habits, and peers (same age, habits, behaviors, etc.). The fair home policy on screen time duration can be guided by the identified natural phenomenon whereby parents in the current sample complained about screen time for children who exceeded AAP's recommendation of 2 hours per day. In a pre-study conducted to test participants' awareness of the AAP recommendations, it turned out that parents in the target population were unaware of the AAP screen time recommendation. Consequently, many parents intuitively restrict screen time to a maximum of 2 hours per day.

The results should serve as a baseline for researchers to make confirmatory longitudinal studies and cross-cultural comparisons. Further research can expand on the present findings by developing interventions to inform, refine, and provide recommendations for screen device use in family life.

The main limitation of this study is that the 15 participating schools do not necessarily represent the entire target population of students in Lebanon. Hence, the results cannot be generalized to the entire target population. Data were collected in April. Therefore, parents' input on their children's screen time was only captured at one specific time point in the academic year outside of summer break. Thus, results cannot be generalized for the entire calendar year. Obtaining information on screen time from parents might not generate accurate information.<sup>22</sup> More accurate collection tools must be devised, such as unobtrusive direct observations via video recording. However, such a technique is time consuming and costly. An alternative is to help children develop the skills to record their own screen time, similar to some interventions that were intended to increase awareness.<sup>29</sup> However, the accuracy of this process is dubious without parental quality control.

This study investigated the effects of e-discipline on screen time. Several studies have addressed the effects of media content on children. For instance, a meta-analytical review of the effects of games on children showed that video games do affect social outcomes, with violent video games increasing aggressive behaviors and prosocial video games increasing prosocial behaviors.<sup>34</sup> The effects of parental rules related to media content should be investigated.

Further research is needed to find out how much ediscipline children receive. Moreover, whether abstaining from e-discipline can dramatically reduce screen time and consequently eradicate its adverse effect should be investigated. Future research should also investigate whether good behavior is sustained in the long term with children whose parents permit them to use screen devices as a reward. Researchers can categorize families from an e-discipline perspective. There are families who are unaware of e-discipline, those who are aware of it but abstain from its usage, and those who are aware of it and continue to use it. Research should compare these categories and look into the rules and policies parents use to manage their children's screen time.

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