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DIGITAL TECHNOLOGY USE AND NEGATIVE ONLINE EXPERIENCES AS PREDICTORS OF LIFE SATISFACTION IN CROATIAN PRIMARY SCHOOL CHILDREN

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This research aims to explore the relationship between different domains of life satisfaction (LS), time spent in different activities using digital technology (DT) and negative online experiences in children aged 9 to 12 years in Croatia. Participants were 168 elementary school pupils who filled out a paper questionnaire providing data on LS, different DT activities and negative online experiences. Results point to gender differences for engagement

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in some types of DT activities and negative online experiences. Furthermore, while there are some aspects of DT use that can to some extent be related to lower LS in certain domains (e.g., time spent watching YouTube and using social networks), there are some aspects of this use that can be viewed as beneficial for LS (e.g., time spent corresponding with friends). The suggested model for predicting LS based on different activities using DT and negative online experiences was statistically insignificant.

Key Words: life satisfaction; digital technology activities; negative online experiences; children.

1. INTRODUCTION

The period of transition from late childhood to early adolescence has always been considered a difficult period in life. In every historical epoch there were specific circumstances that affected all humans, and shaped the development of children and youth. At the beginning of 21st century, these circumstances include the widespread use of digital media. Research shows that children and youth use digital media more frequently than previous generations.¹ Studies dealing with outcomes of this use regarding the physical and mental health of children and adolescents identified both benefits and concerns regarding mental health.²

Well-being can be defined as a multidimensional construct comprising of optimal developmental outcomes of children and youth, considering their age, based on a set of objective and subjective indicators. Objective indicators include information about socio-economic status, health, etc., which are obtained from different official records, while subjective indicators are based on individuals' self-reports of their happiness and satisfaction.³ An important component of subjective well-being is life satisfaction – an evaluation of how much a person is satisfied with her/his life quality.⁴ Besides global life satisfaction, life satisfaction can be studied through satisfaction with specific domains such as satisfaction with family life, friends, school experiences, personal satisfaction, satisfaction with the place

¹ OFCOM "Children and Parents: Media Use and Attitudes Report 2018", 2018. Retrieved from: <https://www.ofcom.org.uk/research-and-data/media-literacyresearch/childrens/children-and-parents-media-use-and-attitudes-report-2018>.

² Yolanda Reid CHASSIAKOS, Jenny RADESKY, Dimitri CHRISTAKIS, Megan A. MORENO, Corinn CROSS, "Children and adolescents and digital media", *Pediatrics*, 138(5), 2016., e20162593.

³ Lisa A. NEWLAND, "Supportive family contexts: promoting child well-being and resilience", *Early Child Development and Care*, 184(9-10) 2014.

⁴ William PAVOT, Ed DIENER, C. RANDALL COLVIN, Ed SANDVIK, "Further validation of the Satisfaction with Life Scale: evidence for the cross-method convergence of well-being measures", *Journal of Personality Assessment*, 57(1), 1991, 149-61.

of living and life in general.⁵ As some researchers point out,⁶ it is often thought that young children's answers to questions about their life satisfaction are not reliable as their answers to more objective questions and that children across countries have a different understanding of what it means to be satisfied with their life, or that their assessments of life satisfaction are based on adaptive preferences meaning that if they don't know any better they might give higher assessments of their life satisfaction. But, Ben-Arieh et al.⁷ argue that children as young as eight years can give valuable subjective assessments of their wellbeing, and additional research in Croatia support this claim by showing that seven- and eight-year-old children can participate in research using a simplified questionnaire on subjective well-being.⁸

Regarding digital technology use, the richness and growing availability of different devices, applications, and activities, as well as the rise of multitasking between different devices and activities result in the fact that digital technology serves as an umbrella term for different activities and devices. Some studies focus on broader categories of digital media use, such as screen time or Internet use in relation to well-being, and their findings are inconclusive. For example, McDool et al.⁹ found that internet use is negatively related to different domains of well-being in children aged 10 to 15 years. Cao et al.¹⁰ showed that adolescents with problematic internet use have lower scores on all dimensions of life satisfaction. On the other hand, Kardefelt-Winther et al.¹¹ showed that time children aged 9 to 17 in

⁵ Julie SELIGSON, Scott E. HUEBNER, Robert F. VALOIS, "Preliminary validation of the Brief Multidimensional Students' Life Satisfaction Scale (BMSLSS)", *Social Indicators Research*, 61, 2003., 121–145.

⁶ Jonathan BRADSHAW, Bruno MARTORANO, Luisa NATALI, Chris DE NEUBORG, "Children's Subjective Well-being in Rich Countries", 2013. Available online: <https://www.unicef-irc.org/publications/686>.

⁷ Asher BEN-ARIEH, Ferran CASAS, Ivar FRONES, Jill KORBIN, "Multifaceted concept of child well-being", Ben-Arieh, A., Casas, F., Frønes, I., and Korbin, J. E. (Eds.), *Handbook of child well-being*, Springer, 2014., 1–27.

⁸ Renata FRANC, Ines SUČIĆ, Toni BABAROVIĆ, Andreja BRAJŠA-ŽGANEC, Ljiljana KALITERNA-LIPOVČAN, Ivan DEVIĆ, "How to Develop Well-Being Survey Questions for Young Children: Lessons Learned from Cross-Cultural Cognitive Interviews", Pollock G., Ozan J., Goswami H., Rees G., Stasulane A. (Eds.), *Measuring Youth Well-being*. Cham: Springer International Publishing AG, 2008.

⁹ Emily MCDOOL, Philip POWELL, Jennifer ROBERTS, Karl TAYLOR, "The internet and children's psychological wellbeing", *Journal of Health Economics*, 69, 2020.

¹⁰ Hui CAO, Ying SUN, Yuhui WAN, Jiahu HAO, Fangbiao TAO, "Problematic Internet use in Chinese adolescents and its relation to psychosomatic symptoms and life satisfaction", *BMC Public Health*, 11, 2019., 802.

¹¹ Daniel KARDEFELT-WINTHER, Gwyther REES, Sonia LIVINGSTONE, "Contextualizing the link between adolescents' use of digital technology and their mental health: a multi-country study of time

their life satisfaction. Bruggeman et al.¹² also showed that there are weak relationships between digital media use and subjective well-being in children aged 9 to 12. A meta-analysis of research on Internet use and psychological well-being showed a small detrimental effect of Internet use in general on well-being,¹³ and an overview of research in this area also showed small negative effects of digital technology use on well-being in adolescents.¹⁴ Some studies differ between types of Internet use they focus on. Valkenburg and Peter¹⁵ found that online interaction with real-life friends with the use of social media such as Twitter can strengthen perceptions of friendship and lead to higher levels of emotional well-being among adolescents. In a review of systematic reviews, meta-analyses and key studies on adolescents' digital technology use and well-being, Orben¹⁶ shows that the link between social media use and psychological well-being is negative but very small and that the direction between these variables is still unclear. Dienlin and Johannes¹⁷ also conclude that the effect of digital technology on well-being of adolescents depends on the type of use, with more passive use being linked to more negative effects, and more active use being linked to more positive effects. Regarding the relationship between digital technology use and well-being of children, some researchers point to gender differences. For example, Devine & Lloyd¹⁸ found that the use of social networking sites and online games is related to poorer psychological well-being in girls, but not boys, aged 10 to 11 years. They also found that more experiences of cyberbullying are related to lower well-being in both girls and boys.

Considering somewhat inconsistent finding from previous studies, and the fact that children start to use digital media at younger age than ever and that cumula-

spent online and life satisfaction", *Journal of Child Psychology and Psychiatry*, 61(8), 2020., 875-889.

¹² Helena BRUGGEMAN, Alain VAN HIEL, Guido VAN HAL, Stephan VAN DONGEN, "Does the use of digital media affect psychological well-being? An empirical test among children aged 9 to 12", *Computers in Human Behavior*, 101, 2019., 104-113.

¹³ Chiungjung HUANG, "Internet Use and Psychological Well-being: A Meta-Analysis", *Cyberpsychology, Behavior, and Social Networking*, 13(3), 2010., 241-249.

¹⁴ Tobias DIENLIN, Niklas JOHANNES, "The impact of digital technology use on adolescent well-being", *Dialogues in clinical neuroscience*, 22(2), 2020., 135-142.

¹⁵ Patty M. VALKENBURG, Jochen PETER, "Online communication and adolescent well-being: Testing the stimulation versus the displacement hypothesis", *Journal of Computer-Mediated Communication*, 12, 2007., 1169-1182.

¹⁶ Amy ORBEN, "Teenagers, screens and social media: a narrative review of reviews and key studies", *Social Psychiatry and Psychiatric Epidemiology*, 55, 2020., 407-414.

¹⁷ Tobias DIENLIN, Niklas JOHANNES, n. dj. 5.

¹⁸ Paula DEVINE, Katrina LLOYD, "Internet Use and Psychological Well-being among 10-year-old and 11-year-old Children", *Child Care in Practice*, 18(1), 2012., 5-22.

tive hours of such use are rising, as is simultaneous use of different devices and activities¹⁹ it is important to continue investigating relationship between such use and well-being, especially in younger children. Additionally, research in this area focuses mostly on adolescent populations, with much less data on younger generations, especially primary school children. This research aims to fill that gap by focusing on primary school children and different activities they engage in with the use of digital technology, in the attempt to explore their link to children's well-being.

Another aspect of Internet use that might affect well-being and life satisfaction, besides time spent in different on-line activities, are negative online experiences or online risks for children. Such experiences might be viewed as negative life events and Marum et al.²⁰ showed that such events reduce life satisfaction. Livingstone & Haddon²¹ define four broad categories of online risks which include content risks (e.g., encountering sexual, violent, racist or hate content), contact risks (e.g., being asked for confidential information, being bullied online), commercial risks and privacy risks (e.g., giving out personal information). Studies on children's DT use in Croatia show that parents and children are not aware of the possible commercial risks.²² Negative on-line experiences also include negative subjective experiences after spending time using digital technology. Studies show that exposure to these risks can be linked to different negative developmental outcomes. For example, cybervictimization in adolescence can predict depression three years later,²³ and exposure to violent media content at preschool age can be linked to increased aggression and self-regulation problems.²⁴

¹⁹ David SMAHEL, Hana MACHACKOVA, Giovanna MASCHERONI, Lenka DEDKOVA, Elisabeth STAKSRUD, Kjartan ÓLAFSSON, Sonia LIVINGSTONE, Uwe HASEBRINK, *EU Kids Online 2020: Survey results from 19 countries*. EU Kids Online, 2020.

²⁰ Gunnvor MARUM, Jocelyne CLENCH-AAS, Ragnhild B. NES, Kjærsti Ruth RAANAAS, "The relationship between negative life events, psychological distress and life satisfaction: a population-based study", *Quality of Life Research*, 23, 2014., 601–611.

²¹ Sonia LIVINGSTONE, Leslie HADDON, "Risky experiences for children online: charting European research on children and the Internet", *Children & society*, 22(4), 2008., 314-323.

²² Marina KOTRLA TOPIĆ, Marina PERKOVIĆ KOVAČEVIĆ, "Young children (0-8) and digital technology. A qualitative exploratory study, national report – Croatia". 2016.

²³ Chad A. ROSE, Brendesha M. TYNES, "Longitudinal associations between cybervictimization and mental health among U.S. adolescents", *Journal of Adolescent Health*, 57(3), 2015., 305–312.

²⁴ Caroline FITZPATRICK, Michael OGHIA, Jad MELKI, Linda PAGANI, "Early childhood exposure to media violence: What parents and policymakers ought to know", *South African Journal of Childhood Education*, 6(1), 2016., a431.

2. THEORETICAL FRAMEWORK

The theoretical framework of this study is based on Bronfenbrenner's bioecological model.²⁵ According to this model four factors (proximal processes, person's characteristics, context, and time) simultaneously and bidirectionally influence human development. Their effects are not additive but rather synergistic because they are a part of an interactive system, and development occurs because of a joint, synergistic relation between individual and context. Proximal processes are interactions between a person and its environment (other persons, objects, symbols) and they can only be effective if they are enduring. The child's environment includes children's microsystems (e.g. family, class), mesosystems (e.g. school), exosystems (e.g. parent's work), macrosystems (e.g. country), and chronosystem (e.g. world economic crises). Johnson and Pupilampu²⁶ proposed refinement to the bioecological model to deal with the pervasive impact of new technologies. This new dimension, the ecological techno-subsystem, is proposed as a part of the microsystem and is supposed to capture both child interaction with living (e.g., friends, family, and teachers) and non-living (e.g., applications, gadgets) elements of communication. In this context, we are interested in investigating how digital technology use is related to life satisfaction in children aged 9 to 12 in Croatia.

This research aims to investigate different domains of life satisfaction and digital media use in children from 9 to 12 years of age in Croatia, with the focus on different activities that children engage in using digital technology and their negative online experiences. We are interested in possible gender differences in these variables, as well as interrelations between different life satisfaction domains and different activities with digital technology. Finally, we aim to explore if life satisfaction can be predicted based on time spent in different activities children engage in using digital technology and the occurrence of different negative online experiences.

²⁵ Urie BRONFENBRENNER, Pamela. A. MORRIS, "The Bioecological Model of Human Development", Lerner, R. M. and Damon, W. (Ed.s.), *Handbook of child psychology: Theoretical models of human development*, John Wiley & Sons Inc., New York, 2006., 793–828.

²⁶ Genevieve M. JOHNSON, Korpla P. PUPLAMPU, "Internet use during childhood and the ecological techno-subsystem", *Canadian Journal of Learning and Technology*, 34(1), 2018., 19–28.

3 MATERIALS AND METHODS

3.1. Participants

Participants were 168 elementary school pupils (92 boys and 76 girls) aged from 9 to 12 years ($M=10.19$, $SD=.868$). They attended third ($N=48$, 28.6%), fourth ($N=61$, 36.3%), or fifth grade ($N=59$, 35.1%) in two towns in Croatia (Osijek and Varaždin).

3.2. Procedure

Data presented in this article are a part of a larger study on the well-being of children in family context, funded by the Croatian Science Foundation (CHILD-WELL). After the Ethical board of the authors' institution, as well as Croatian ministry of Science and Education approved the research, parents of children attending third, fourth, and fifth grade of two elementary schools were invited to participate in the research study. They were explained the purpose of the research and asked to give their approval for their children to participate. Over 90% of parents from children in each grade agreed to participate in the study. After the parents signed the consent form, the children were approached in school during regular classes by trained researchers. After giving their personal consent to participate, they filled out the prepared paper questionnaires. Group administration lasted about 45 minutes. Children who did not participate in the study spent the time in quiet activities while their peers completed the survey.

3.3. Measures

3.3.1. Life satisfaction

Children's life satisfaction was assessed by the Brief Multidimensional Student's Life Satisfaction Scale (BMSLSS).²⁷ Using a seven-point response scale, ranging from 'Very Dissatisfied' to 'Very Satisfied' participants assessed how satisfied they were with six different life domains: their family life, their school experiences, themsel-

²⁷ Julie SELIGSON, Scott E. HUEBNER, Robert F. VALOIS, n. dj., 4.

ves, the place where they live, and their life in general. Apart from individual satisfaction rates regarding each specific domain, the items can be averaged together resulting in a total score, which represents overall life satisfaction. Cronbach Alpha of this scale is .781.

3.3.2. Activities using DT

The participants were asked to rate the frequency of engaging in different activities using digital technology: (1) playing games or using applications for fun on a tablet, smartphone or a computer, (2) searching the Internet for school related information, (3) searching the Internet for information not related to school, (4) watching TV, (5) watching cartoons, films or video clips on YouTube, (6) listening to music using a tablet, smartphone or a computer, (7) taking photos or make videos with a tablet or a smartphone, (8) using social networks (Facebook, Instagram, TikTok etc.), (9) writing to their friends using Viber, WhatsApp, chat, messages, etc. and (10) posting photos, videos or texts on the Internet. They used a four-point scale: 1 "Almost never", 2 "Rarely", 3 "Few times a week", 4 "Almost every day". The items were analysed individually.

3.3.3. Negative experiences during Internet use

To assess the frequency of occurrence of negative experiences on the Internet, using a 3-point scale: 1 "Never", 2 "A few times", 3 "Often", participants rated how often they experienced (1) finding sexual or aggressive content, (2) someone whom they don't know asking for information about their name, address or school, (3) someone teasing or bullying them over the Internet, (4) feeling upset and in a bad mood after using digital technology for a longer time. The items were analyzed individually, and, in each item, the responses were binary recoded to show if the participants had any such negative experiences ("A few times", and "Often") or not ("Never").

4 RESULTS

4.1. Descriptive statistics and gender differences

Our first aim was to investigate the level of life satisfaction, and frequency of time spent in different activities using digital technology and negative online experiences in children aged 9 to 12 years. Results (Table 1) show that our participants are generally very satisfied with their life in all domains. They are the most satisfied with the place where they live (M=6.69) and relatively least satisfied with their school experiences (M=5.98).

Their satisfaction with life in general is also very high (M=6.68).

For the time spent in different activities online, results show that on average participants engage in most of these activities a few times a week, except for playing games which on average happens almost every day (M=3.50) and taking photos or making videos with a tablet or a smartphone or posting such material online, which on average happens rarely (M=1.89). Participants rarely experience different negative experiences during Internet use, and what most often happens is that they feel upset and in a bad mood after using digital technology for a longer time (47% of children).

We found significant gender differences in some of the variables describing activities using digital technology and negative on-line experiences, but not in the life-satisfaction domains. Boys tend to use the Internet more to search for information not related to school (M(SD)boys=2.978(.88), M(SD)girls=2.68(.947), $t=2.110$, $p=.036$), use social networks more often (M(SD)boys=3.04(1.167), M(SD)girls=2.62(1.206), $t=2.263$, $p=.025$), watch more TV (M(SD)boys=3.51(.865), M(SD)girls=2.99(.100), $t=2.223$, $p=.028$), and encounter aggressive and sexual content on-line more often (boys(% of yes) = 42.4%, girls (% of yes) = 23.7% , $\chi^2=5.69$, $p=.017$).

Table 1. Descriptive statistics of the variables in the study

Variable name	Range	M	SD
Life satisfaction – How satisfied are you with...			
... your family life	1 – 7	6.60	.876
... your friends	1 – 7	6.36	1.088
... your school experiences	1 – 7	5.98	1.202
... yourself	1 – 7	6.32	1.130
... the place where you live	1 – 7	6.69	.800
... life in general	1 – 7	6.68	.775

Digital technology use and negative online experiences as predictors of life satisfaction in Croatian...

Activities using digital technology – How often do you...			
... play games or use applications for fun on a tablet, smartphone, or a computer	1 – 4	3.50	.752
... search the Internet for school-related information	1 – 4	2.59	.962
... search the Internet for information not related to school	1 – 4	2.84	.918
... watch TV	1 – 4	3.16	.940
... watch cartoons, films, or video clips on YouTube	1 – 4	3.40	.831
... listen to music using a tablet, smartphone, or a computer	1 – 4	3.10	.983
... take photos or make videos with a tablet or a smartphone	1 – 4	2.35	1.044
... use social networks (Facebook, Instagram, TikTok etc.)	1 – 4	2.86	1.199
... write to their friends using Viber, WhatsApp, chat, messages, etc.	1 – 4	3.27	.934
... post photos, videos, or texts on the Internet	1 – 4	1.89	1.021
Negative experiences during Internet use			
	no	yes	
... finding sexual or aggressive content	111 (66%)	57 (34%)	
... someone whom you don't know asking for information about your name, address, or school	151 (90%)	17 (10%)	
... someone teasing or bullying you over the Internet	130 (77%)	38 (23%)	
... feeling upset and in a bad mood after using digital technology for a longer time.	89 (53%)	79 (47%)	

4.2. Correlations

To investigate the relationship between different domains of life satisfaction and different activities based on digital technology, we run a series of correlation analyses (Table 2). The results show that there are no significant relations between satisfaction with life in general and using digital technology. Some weak positive correlations between specific life domains and using digital technology are found between: time spent corresponding with friends using Viber, WhatsApp, chat, messages, etc. and satisfaction with their friends ($r=.195$, $p=.012$); satisfaction with school experiences and watching cartoons, films or video clips on YouTube ($r=-.202$, $p=.009$) and using social networks ($r=-.187$, $p=.044$); and the amount of time spent watching TV with the satisfaction with the place where participants live ($r=.157$, $p=.044$). The correlations between life satisfaction domains and negative online experiences, were also mostly low and insignificant (Table 2). Few significant correlations were observed between satisfaction with family life and finding aggressive or sexual content online ($r=-.162$; $p=.036$), and experience of someone unknown asking for information about child's name, address or school ($r=-.186$; $p=.016$). Low negative correlations were also observed between satisfaction with "oneself" and feeling upset and in a bad mood after using digital technology for a longer time ($r=-.226$; $p=.004$). Satisfaction with life in general is weakly related to the experience of someone unknown asking for information about a child's name, address or school ($r=-.246$; $p=.001$).

Additionally, we explored relationships between different activities that children spend time using digital technology and negative online experiences (Table 2). Results show that encountering sexual or aggressive content is positively related to playing games ($r=.167$, $p=.031$), listening to music ($r=.170$, $p=.029$), creating photos and videos ($r=.279$, $p=.000$), using social media ($r=.236$, $p=.002$) and posting online content ($r=.251$, $p=.001$). The occurrence of a stranger asking for personal information is positively related to creating photos and videos ($r=.220$, $p=.004$). Being bullied is positively related to watching TV ($r=.164$, $p=.034$), using social networks ($r=.262$, $p=.001$) and posting online content ($r=.201$, $p=.009$). Finally, feeling upset after prolonged use of DT is positively related to communicating with a friend using Viber ($r=.207$, $p=.007$), and posting on-line content ($r=.235$, $p=.002$).

All items of the life satisfaction scale are significantly positively interrelated, with Pearson' coefficients ranging from $r=.237$, $p=.002$ for the correlation between satisfaction with the place where they live and friends, to $r=.687$, $p=.000$ for satisfaction with the family life and life in general. The highest correlations were found between satisfaction with life in general and satisfaction with other life domains

indicating that satisfaction with life in general is the most salient item. Concerning high inter-item correlations of the BMSLSS and acceptable scale reliability ($\alpha=.781$) further analyses were performed at the total composite score as a measure of overall life satisfaction.

Table 2. Correlations between life satisfaction domains, activities using digital technology and negative experiences during Internet use

	1	2	3	4	5	6	7	8	9	10	11
<i>Life satisfaction</i>											
1. family life											
2. friends	.351**										
3. school experiences	.419**	.370**									
4. yourself	.317**	.362**	.476**								
5. the place you live	.347**	.237**	.305**	.311**							
6. life in general	.687**	.483**	.398**	.404**	.424**						
<i>Activities using digital technology</i>											
7. play games or use applications for fun ...	-.139	-.129	-.207**	-.069	-.141	-.143					
8. search the Internet for school-related information	.046	-.095	-.050	-.009	-.002	.114	.031				
9. search the internet for information not related to school	.004	-.037	-.054	-.029	-.029	.023	.227**	.216**			
10. watch TV	.020	.025	-.051	.059	.157*	.069	.154*	-.027	.173*		
11. watch cartoons, films or video clips on YouTube	-.082	-.066	-.202**	-.030	-.018	.050	.323**	.074	.266**	.221**	
12. listen to music using a tablet, smartphone or a computer	.067	-.042	-.100	-.029	.071	.033	.187*	.138	.224**	-.011	.243**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
13. take photos or make videos with a tablet or a smartphone																			
14. use social networks (Facebook, Instagram, TikTok etc.)	-.010	-.059	-.042	-.058	-.037	-.078	.260**	.166*	.276**	.086	.131	.250**							
15. write to their friends using Viber, WhatsApp, chat, messages...	.072	.103	-.187*	-.121	-.048	-.030	.339**	.141	.331**	.058	.220**	.235**	.446**						
16. post photos, videos or texts on the Internet	.116	.195*	-.006	.024	-.011	.100	.267**	.163*	.273**	.005	.170*	.198*	.208**	.334**					
Negative experiences during Internet use	.039	.076	-.086	-.079	-.030	.055	.235**	.126	.379**	.055	.210**	.097	.412**	.441**	.250**				
17. finding sexual or aggressive content	-.162*	.022	-.113	-.072	-.034	.049	.166*	-.060	.095	.121	.168*	.206**	.233**	.213**	.094	.199**			
18. someone whom you don't know asking for information about your name, address or school	-.186*	-.057	-.112	-.037	-.128	-.246**	.026	.000	.036	.069	-.045	.051	.078	.057	.009	.093	.051		
19. someone teasing or bullying you over internet	-.030	-.140	-.049	-.125	.011	-.055	.036	.024	.077	.013	.029	.095	.071	.076	-.126	.183*	.063	.196*	
20. feeling upset and in a bad mood after using digital technology for a longer time.	-.102	-.011	-.031	-.226**	-.044	-.125	.132	-.007	.109	.159*	.016	.081	.148	.234**	.180*	.099	.181*	.119	.175*

Notes: ** correlation is significant at the 0.01 level (2-tailed); * correlation is significant at the 0.05 level (2-tailed).

4.3. Predicting life satisfaction by using digital technology and negative experiences during Internet use

To predict children's life satisfaction by activities using digital technology and negative experiences during Internet use we performed hierarchical regression analysis. In the analysis, the activities using digital technology formed the first block of predictors, and negative experiences during Internet use made the second block. Table 3 shows the results of the hierarchical regression. The activities using digital technology explained 8.8% of children's life satisfaction, however, the model was not significant ($F_{(10,142)}=1.37, p=.201$). Adding the variables related to negative experiences during Internet use did not improve the prediction of life satisfaction much ($\text{delta } R^2=.043; \text{delta } F_{(4,138)}=1.71; p=.151$), and the total model, explaining 13,1% of variance turned to be insignificant ($F_{(14,138)}=1.49; p=.124$). The single significant predictor in the proposed models was the frequency of play games or use applications for fun on a tablet, smartphone, or computer ($\beta_{M1}=-2.761; p=.007$ and $\beta_{M2}=-2.701; p=.008$) indicating that the frequency of playing games is to some extent negatively related to general life satisfaction.

Table 3. Prediction of life satisfaction by activities using digital technology (block 1) and negative experiences during Internet use (block 2) – hierarchical regression (N = 153)

	Block 1			Blocks 1 & 2		
	Beta	t	p	Beta	t	p
Constant		17.799	.000		16.127	.000
...play games or use applications for fun	-.256	-2.761**	.007	-.248	-2.701**	.008
...search the Internet for school-related information	-.008	-.091	.928	-.016	-.195	.846
...search the Internet for information not related to school	-.049	-.517	.606	-.056	-.593	.554
...watch TV	.133	1.579	.117	.160	1.900	.059

...watch cartoons, films or video clips on YouTube	-.053	-.588	.558	-.064	-.710	.479
...listen to music using a tablet, smartphone or a computer	.010	.116	.908	.037	.424	.672
...take photos or make videos with a tablet or a smartphone	-.062	-.661	.509	-.052	-.551	.583
...use social networks (Facebook, Instagram, TikTok etc.)	.005	.053	.958	.022	.223	.824
...write to their friends using Viber, WhatsApp, chat, messages...	.166	1.860	.065	.168	1.853	.066
...post photos, videos or texts on the Internet	.038	.393	.695	.058	.593	.554
...finding sexual or aggressive content				-.037	-.439	.661
...someone whom you don't know asking for information about your name, address or school				-.156	-1.926	.056

...someone teasing or bullying you over the Internet					-.033	-.388	.699
...feeling upset and in a bad mood after using digital technology for a longer time.					-.105	-1.208	.229
<i>R</i>		.296				.362	
<i>R</i> ²		.088				.131	
<i>delta R</i> ²						.043	

Notes: ** coefficient is significant at the 0.01 level (2-tailed); * coefficient is significant at the 0.05 level (2-tailed).

4.4. Discussion

The focus of this study is on the relationship of different activities that children engage in with the use of DT and possible negative online experiences with life satisfaction in children aged from 9 to 12 years of age. This specific age marks the transition for late childhood to early adolescence and is marked by various developmental challenges. Considering widespread use of DT even in children in this age range, and the fact that this age range has often been overseen in studies, this research aimed to investigate if DT use and possible negative consequences of such use can affect children's' wellbeing.

Regarding activities that children from 9 to 12 years engage in using digital technology, our results show that boys are in general a little more active than girls, which is in line with previous research showing that boys engage in more different on-line activities than girls.²⁸ Results from this study show that boys use the Internet for personal and not school related searches, use social networks and watch

²⁸ Sonia LIVINGSTONE, Leslie HADDON, Anke GÖRZIG, Kjartan ÓLAFSSON, "Risks and safety on the internet: the perspective of European children: full findings and policy implications from the EU Kids Online survey of 9-16 year olds and their parents in 25 countries", *EU Kids Online*, London, UK, 2011.

TV more often than girls. In the same line, they have more negative online experiences than girls, namely encountering aggressive and sexual content on-line. Previous research showed that there were no gender differences in the use of social networking sites in children aged 10 to 12²⁹ and these conflicting results suggest that there is a need for further exploration of this relationship.

We found no gender differences in life satisfaction in our study. In a recent meta-analysis of studies on gender differences in life satisfaction in children and adolescents Chen et al.³⁰ highlight that there are still inconsistencies in results on this topic, and even the meta-analyses' results show that there is only a slight difference in life satisfaction in favor of male children and adolescents. Esteban-Gonzalo et al.³¹ showed that when it comes to subjective well-being, gender differences can be observed at the age of 12 and not sooner. This means that participants in our sample are just below the age when more consistent gender changes could be found.

Correlational analyses from this study show different relations of various activities children engage in with the help of digital technology and domains of life satisfaction. Children who spend more time corresponding with friends using Viber, WhatsApp, chat, messages, etc. tend to be a little more satisfied with their friends. This shows that the use of digital technology for maintaining social relationships with friends can be a positive factor in relation to this specific domain of life satisfaction. This finding is in line with Valkenburg and Peter's³² finding of higher emotional well-being resulting from a stronger perception of friendship that is based on online interaction with real-life friends through social media. Also, Subrahmanyam and Smahel³³ showed that for adolescents, online communication with friends is naturally interwoven with the face-to-face communication and that the time spent in online communication does not take away time spent in traditional communication, but it rather offers a chance for communication when face-to-face communication is not available. Results also show that children who spend more time watching cartoons, films or video clips on YouTube and using social networks tend to be a little less satisfied with their school experiences. The correlational analysis

²⁹ Paula DEVINE, Katrina LLOYD, n. dj., 6.

³⁰ Xinjie CHEN, Zhihui CAI, Jinbo HE, Xitao FAN, "Gender Differences in Life Satisfaction Among Children and Adolescents: A Meta-analysis", *Journal of Happiness Studies*, 21, 2020., 2279–2307.

³¹ Sara ESTEBAN-GONZALO, Laura ESTEBAN-GONZALO, Veronica CABANAS-SÁNCHEZ, Marta MIRET, Oscar VEIGA, "The Investigation of Gender Differences in Subjective Wellbeing in Children and Adolescents: The UP&DOWN Study", *International Journal of Environmental Research and Public Health*, 17, 2020., 1-11.

³² Patty M. VALKENBURG, Jochen PETER, n. dj. 5.

³³ Kaveri SUBRAHMANYAM, David SMAHEL, Digital youth. *The role of media in development*, New York: Springer, 2011.

doesn't allow for causal conclusions, but one of the possible explanations could be that time spent in different online activities might be related to children's dissatisfaction with school because it leaves them less time to study. Also, it is possible that because of their low satisfaction with school experiences children engage in more activities on social networks or watch more cartoons and video-clips to get away from school-related activities. These activities are more stimulating and engaging for some children than school related activities. Finally, children who watch more television are a little more satisfied with the place where they live. A possible explanation for this relationship is that our participants predominantly understood this question as being regarding their home, and not their town – what might have been another option, and that those who feel more comfortable in their home, also spend more time relaxing there and watching TV.

While previous research showed that children aged 10 to 12 who experience cyberbullying have poorer well-being,³⁴ and adolescents who experience cyberbullying have a higher risk for a wide range of mental and physical health problems,³⁵ results from this study don't show a significant relationship between being exposed to situations where children are experiencing being teased or bullied over the Internet and life satisfaction in any of the specific domains. The possible explanation is that the slightly younger children in our sample had less opportunity to experience cyberbullying in general and that it was fortunately too rare to produce an effect. In fact, our results show that two-thirds of participant never encountered negative experience of being bullied online. Hasebrink et al.,³⁶ show that only 6% of European children aged from 9 to 16 years report being bullied, but a meta-analysis of 131 studies on cyberbullying showed that most studies estimate the prevalence of cyberbullying among adolescents to between 11% and 48%.³⁷ This is a rather wide span and the study shows that these differences depend on the definition of cyberbullying, demographics, and the defined time frame for reporting episodes of cyberbullying. On the other hand, it is important to note that

³⁴ Paula DEVINE, Katrina LLOYD, n. dj., 5.

³⁵ Madeleine J. GEORGE, Candrice L. ODGERS, "Seven fears and the science of how mobile technologies may be influencing adolescents in the digital age", *Perspectives on Psychological Science*, 10(6), 2015., 832–851.

³⁶ Uwe HASEBRINK, Anke GORZIG, Leslie HADDON, Veronika KALMUS, Sonia LIVINGSTONE, "Patterns of risk and safety online. In-depth analyses from the EU Kids Online survey of 9- to 16-year-olds and their parents in 25 European countries", 2011. Retrieved from: http://eprints.lse.ac.uk/39356/1/Patterns_of_risk_and_safety_online_%28LSERO%29.pdf. Accessed 16 Nov 2012.

³⁷ Robin M. KOWALSKI, Susan LIMBER, "Psychological, physical, and academic correlates of cyberbullying and traditional bullying", *Journal of Adolescent Health*, 53(1), 2013., 13–20.

one-third of our participants did encounter negative on-line experiences in form of being bullied online (7.1 % of them on more than one occasion) and that it is wise to monitor the possible effect of such experiences to gain more insight into its relationship with life satisfaction at this specific age. The same can be said for children's exposure to sexual and aggressive content. Some researchers point that a lot of material that children encounter online is classified as inappropriate, and many contain pornographic content.³⁸ Results from this study show that participants who are less satisfied with their family life show a slight tendency to encounter more sexual or aggressive content on-line and to be contacted by strangers more often. Participants who are less satisfied with life in general also report a tendency to be contacted by strangers somewhat more often. Wolak et al.³⁹ showed that children of this age rarely show a deeper interest in meeting in person someone they met on-line because to engage in something like that the child needs to feel trust and confidence in the unknown person and that is something that takes time and is based on a more profound interest in communication, which is more characteristic of the adolescent population. They also show that the main risk factor for meeting an unknown person is related to how willing the child is to communicate with this person after the first contact. The exact nature of contact with a stranger asking for personal information in this research was not elaborated in more detail and this prevents us from making deeper analyses, but it might be that children who are less satisfied with their family life and life in general are more willing to engage in online activities which enable them to get in contact with unknown persons in the first place. The same reason might explain why these participants encounter sexual or aggressive content more often.

Finally, our results show that the suggested model for predicting life satisfaction in children aged 9 to 12 based on how often they engage in different activities using digital technology and occurrence of negative on-line experiences, is in fact insignificant. The only potentially significant negative predictor in the model is time spent playing games and using applications for fun, which suggest that children who spend more time using digital technology simply for fun, tend to be less satisfied with their life. Previous research again shows conflicting findings regarding the use of digital technology and mental health, with studies showing that

³⁸ Elena MARTELLOZZO, Andrew MONAGHAN, Joanna R. ADLER, Julia DAVIDSON, Rodolfo LEYVA, Miranda A. HORVATH, "*I wasn't sure it was normal to watch it*", London: NSPCC, 2016. Retrieved from: <https://learning.nspcc.org.uk/media/1187/mdx-nspcc-occ-pornography-report.pdf>.

³⁹ Janis J. WOLAK, David FINKELHOR, Kimberly J. MITCHELL, Michele L. YBARRA, "Online "predators" and their victims. Myths, realities, and implications for prevention and treatment", *The American Psychologist*, 63(2), 2008., 111–128.

time spent using digital technology may negatively influence the mental health of adolescents, especially those who already have mental health problems,⁴⁰ but also showing no relationship between mental health and time spent using digital technology, even for adolescents with a higher risk for mental health problems.⁴¹ Since data on younger children are scarce, results from this study point to the importance of further research on this topic.

As mentioned earlier, Johnson and Pupilampu⁴² proposed a new subsystem to be added to Bronfenbrenner's bioecological model.⁴² The purpose of this ecological techno-subsystem is to capture child interactions with living and non-living elements of communication. Results from this study regarding the importance of considering the living elements, such as communication with friends using digital technology for children's life satisfaction in the domain of friendship, but also the non-living elements, such as the use of YouTube application or social networks in relation to life satisfaction are inconclusive and call for further investigation.

The main contribution of this study is its focus on exploring the relationships of different domains of life satisfaction with specific activities that children engage in using digital technology, rather than a general measure of screen-time and with possible negative online experiences. Additionally, the research focuses on children aged from 9 to 12 years, which is an age range that is often overlooked in similar research. What our results show is that while there are some aspects of digital technology use that can be related to lower life satisfaction in certain domains in children aged from 9 to 12 years, such as watching YouTube and using social networks, there are aspects of this use that can be viewed as beneficial for life satisfaction in these developmental years, such as using digital technology to communicate with friends. Furthermore, when it comes to predicting life satisfaction in children aged from 9 to 12 years of age, the results from this study indicate that children's activities with DT and their negative on-line experiences have in fact no effect. Some studies show that life satisfaction is a stable construct, and that when it comes to well-being in adolescence, digital technology has less effect on life-satisfaction, and more effect on short-term markers of well-being such as positive and negative affect.⁴⁴

⁴⁰ Madeleine J. GEORGE, Michael A. RUSSELL, M. A., Joy R. PIONTAK, Candice L. ODGERS, "Concurrent and subsequent associations between daily digital technology Use and High-Risk Adolescents' Mental Health Symptoms", *Child development*, 89(1), 2018., 78–88.

⁴¹ Michaeline JENSEN, Madeleine GEORGE, Michael RUSSELL, Candice ODGERS, "Young Adolescents' Digital Technology Use and Mental Health Symptoms: Little Evidence of Longitudinal or Daily Linkages", *Clinical Psychological Science*, 7(6), 2019., 1416-1433.

⁴² Genevieve M. JOHNSON, Korpla P. PUPLAMPU, n. dj., 7.

⁴³ Urie BRONFENBRENNER, Pamela. A. MORRIS, n. dj., 7.

4.5. Study limitations

The main limitation of this study is the small sample size which prevents conducting more elaborate data analyses and making more generalizations in our conclusions. Some limitations regarding measures used in the study also need to be mentioned. Although previous studies show that children can give valuable assessments of their life satisfaction, it might be that some children in this age range had difficulties giving their answers on a 7-point scale. Additionally, the research was conducted on the eve of the pandemic of COVID-19, and the conclusions that we make apply for the time in which the use of digital technology was at what would now be described as a baseline level. Many studies show that during the pandemic and especially during lockdown periods, children, as well as adults, increased the time of digital technology use for all kinds of activities. We are uncertain how this increase, in these specific circumstances, might affect their life satisfaction. Finally, for a more in-depth investigation of the relationship between digital technology use and life satisfaction in children, especially in the context of Bronfenbrenner's theory, we need to consider additional factors which are not covered in this study, such as personality on the individual level and family circumstances on a more general level. Also, to investigate how digital technology use is related to children's wellbeing, other measures of well-being, such as positive and negative affect should be included.

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SAŽETAK

UPOTREBA DIGITALNE TEHNOLOGIJE I NEGATIVNA *ON-LINE* ISKUSTVA KAO PREDIKTORI ZADOVOLJSTVA ŽIVOTOM KOD HRVATSKIH OSNOVNOŠKOLACA

Cilj provedenog istraživanja je istražiti odnos različitih domena zadovoljstva životom te upotrebe digitalnih medija kod djece u dobi od 9 do 12 godina. Pri tome se usmjeravamo na različite aktivnosti u koje se djeca uključuju uz pomoć digitalne tehnologije te moguća negativna iskustva koja su povezana uz upotrebu digitalne tehnologije. Uz ispitivanje postojanja spolnih razlika u navedenim varijablama, cilj je istražiti njihovu međusobnu povezanost te mogućnost predviđanja zadovoljstva životom na temelju vremena kojeg djeca provedu u različitim aktivnostima uz digitalnu tehnologiju i mogućih negativnih iskustava prilikom korištenja digitalne tehnologije za pristupanje internetu.

Sudionici su 168 djece osnovnoškolske dobi (96 dječaka i 76 djevojčica), u dobi od 9 do 12 ($M=10.19$, $SD=.868$). Učenici su u trenutku testiranja pohađali treći ($N=48$, 28.6%), četvrti ($N=61$, 36.3%), ili peti razred ($N=59$, 35.1%) osnovne škole u jednoj od škola u Osijeku ili Varaždinu. Sudionici su za vrijeme jednog školskog sata ispunili upitnik s mjerama zadovoljstva životom, aktivnostima uz digitalnu tehnologiju te negativnim online iskustvima.

Zadovoljstvo životom mjereno je Kratkim multidimenzionalnom skalom zadovoljstva životom za djecu (Seligson i sur., 2003). Na skali od sedam stupnjeva (1 – "Jako nezadovoljan", 7 – "Jako zadovoljan") učenici su procjenjivali koliko su zadovoljni sa šest različitih domena: obiteljskim životom, svojim prijateljima, svojim školskim iskustvima, samim sobom, mjestom gdje žive te svojim životom. Učenici su također procjenjivali koliko vremena provedu u različitim aktivnostima uz korištenje digitalne tehnologije: igranje igrica, pretraživanju Interneta jer trebaju nešto za školu, pretraživanju Interneta jer ih nešto zanima, a nema veze sa školom, gledanju TV-a, gledanju crtića, gledanju filmića ili videa, slušanju glazbe, fotografiranju i snimanju videa ili glazbe, korištenju društvenih mreža, slanju poruka prijateljima ili članovima obitelji te objavljivanju stvari na Internetu. Vrijeme provedeno u navedenim aktivnostima procjenjivali su pomoću skale od 4 stupnja (1 – "Gotovo nikada", 2 – "Rijetko", 3 – „Par puta tjedno“, 4 – "Skoro svaki dan"). Čestice su analizirane individualno. Za procjenu negativnih iskustava na Internetu učenici su uz pomoć skale od tri stupanja (1 – "Nikada", 2 – "Nekoliko puta", 3 – "Često") procjenjivali koliko im se često dogodilo da su na Internetu naišli na seksualni ili agresivni sadržaj, da im se javio netko koga ne poznaju i tražio podatke o imenu, adresi ili školi, da ih je netko preko Interneta zadirkivao, ismijavao ili vrijeđao te da su se nakon duljeg

korištenja uređaja osjećali neraspoločeno ili uznemireno. Čestice su analizirane individualno nakon što su odgovori rekodirani u binarne odgovore ovisno o tome jesu li ikada ili nikada iskusili nešto od navedenoga.

Rezultati pokazuju značajne spolne razlike u učestalosti određenih aktivnosti uz pomoć digitalne tehnologije te negativnih on-line iskustava. Dječaci nešto češće koriste Internet za pretraživanje informacija koje nisu vezane uz školu, češće koriste društvene mreže i gledaju TV. Također, nešto češće nego djevojčice susreću na Internetu seksualni i agresivni sadržaj. Nisu pronađene spolne razlike u mjerama zadovoljstva životom. Nadalje, nisu pronađene povezanosti između aktivnosti u kojima dijete sudjeluje korištenjem digitalne tehnologije i općeg zadovoljstva životom. Postoje međutim određene povezanost sa specifičnim domenama zadovoljstva životom, no dok su neki aspekti upotrebe digitalne tehnologije u određenoj mjeri povezani s nižim zadovoljstvom životom u pojedinim od tih domena (npr. vrijeme koje djeca provedu gledajući YouTube ili koristeći društvene mreže), neki aspekti upotrebe digitalne tehnologije povezani su s višim zadovoljstvom životom (npr. vrijeme provedeno u dopisivanju s prijateljima). Predloženi model predviđanja zadovoljstva životom na temelju upotrebe digitalne tehnologije i negativnih on-line iskustava nije se pokazao značajnim.

Ključne riječi: zadovoljstvo životom; aktivnosti uz digitalnu tehnologiju; negativna on-line iskustva; djeca.