RADOVI
Zavoda za znanstveni rad
HAZU Varaždin

UDK 621.395.721.5:364.658-053.5
Izvorni znanstveni članak
Original Scientific Paper

VANESA VARGA
Hrvatsko katoličko sveučilište, Zagreb
vanesa.varga@unicath.hr

ANA ŽULEC
Hrvatsko katoličko sveučilište, Zagreb
azulec@unicath.hr

MATEA BODROŽIĆ SELAK
Hrvatsko katoličko sveučilište, Zagreb
matea.selak@unicath.hr

MARINA MERKAŠ
Hrvatsko katoličko sveučilište, Zagreb
marina.merkas@unicath.hr

Primljeno: 23. 09. 2022.
Prihvaćeno: 24. 10. 2022.
DOI: 10.21857/yvjrdcv11y

THE RELATIONSHIP OF CHILDREN'S SMARTPHONE USE WITH WELL-BEING AND SCHOOL ACHIEVEMENT

This work has been supported by Croatian Science Foundation under the project number UIP-2019-04-7547 “Digital technology in the family: patterns of behaviour and effects on the child development”.

The aim of this study was to examine the relationship between some aspects of children’s smartphone use (time and motives for smartphone use), indicators of well-being (life satisfaction, positive and negative affect), and school achievement. Participants were 283 children (59,2% girls) aged from 10 to 15 (median 12) years and one of their parents who agreed to participate in the project “Digital technology in the family: patterns of behaviour and effects on child development”. A new scale for children’s motives for smartphone use was developed and it showed good psychometric properties. Children’s life satisfacti-

on was assessed using the Short multidimensional life-satisfaction scale (Seligson et al., 2003), positive and negative effects were assessed using the PANAS-C scale (Ebesutani et al., 2012), and school achievement was measured according to the Croatian grading scale. Results show that as they grow older, children tend to spend more time using smartphones, and their life satisfaction declines. Girls tend to experience more negative affect, while boys tend to experience more positive affect. Girls are also more prone to use smartphone for communication and their school tasks. More usage of smartphones for entertainment is related to higher levels of negative effect in children, while more usage of smartphones for communication is related to higher positive affect and lower school achievement in children. The obtained results are discussed and represent a direction for future research, pointing to the examination of the content to which children and young people are exposed on smartphones and social media.

Key Words: children; time and motives for smartphone use; well-being; school achievement.

1. INTRODUCTION

In the contemporary world, we can see the scene of a toddler watching cartoons on their parents' smartphones or children sitting next to each other on the playground watching content they find interesting and fun. More and more scientists are starting to question how these situations will affect children's development. This is a question that has led to studies on children's smartphone use.[1] A large body of research in the last few years has focused on children's smartphone overuse, pointing to the fact that children start using them at two years of age.[2] Therefore, the question of the effect of smartphone use on children arises, especially on their school performance and overall well-being.

---

1 Ine BEYENS, J. L. POUWELS, I. I. VAN DRIEL, L. KEIJSERS, & P. M. VALKENBURG, "The effect of social media on wellbeing differs from adolescent to adolescent", *Scientific Reports,* 10(1), 2020., 1–11; Jeong H. PARK, "Smartphone use patterns of smartphone-dependent children", *Child Health Nursing Research,* 26(1), 2020., 47-54; Maya SAMAHA & N. S. HAWI, "Relationships among smartphone addiction, stress, academic performance, and satisfaction with life", *Computers in human behavior,* 57, 2016., 321–325; Jean M. TWENGE & W. K. CAMPBELL, "Associations between screen time and lower psychological well-being among children and adolescents: Evidence from a population-based study", *Preventive medicine reports,* 12, 2018., 271–283.

2 Maria DARDANOU, T. UNSTAD, R. BRITO, P. DIAS, O. FOTAKOPOULOU, Y. SAKATA, & J. O'CONOR, "Use of touchscreen technology by 0–3-year-old children: Parents' practices and perspectives in Norway, Portugal and Japan", *Journal of Early Childhood Literacy,* 20(3), 2020., 551–573; J. M. TWENGE & W. K. CAMPBELL, n. dj. 1.

2. TIME AND MOTIVES OF SMARTPHONE USE IN CHILDREN

The use of smartphones is increasing rapidly worldwide.[3] With their expansion, the younger population started to use them, and now children as young as two years know how to use smartphones and mainly to entertain themselves.[4] This expansion led many researchers into examining how this expansion of usageled many researchers into examining how this usage of smartphones affects the development of children and young people.[5] Most research focuses on the time of smartphone use and different motives for smartphone use as determinants of children's developmental outcomes.[6] Even though many experts and pediatric associations[7] suggest the use of digital devices for a maximum of 2 hours a day, research findings suggest that most children use devices, mainly smartphones, for 3 or more hours a day.[8] Considering the somewhat addictive nature of smartphones and

---

3 EUROSTAT, "Individuals - devices used to access the Internet", 2022. Retrieved from:https://ec.europa.eu/eurostat/databrowser/view/isoc_ci_dev_i/default/line?lang=en (preuzeto: 09.10.2022.).

4 M. DARDANOU, T. UNSTAD, R. BRITO, P. DIAS, O. FOTAKOPOULOU, Y. SAKATA, & J. O'CONOR, n. dj., 2; J. M. TWENGE & W. K. CAMPBELL, n. dj., 1.

5 I. BEYENS, n. dj., 1; J. H. PARK, n. dj., 1; M. SAMAHA & N. S. HAWI, n. dj., 1; J. M. TWENGE & W. K. CAMPBELL, n. dj. 1.

6 Maren J. KATER & A. A. SCHLARB, "Smartphone usage in adolescents – motives and link to sleep disturbances, stress and sleep reactivity", *Somnologie*, 24, 2020., 245–252; Haoran MENG, H. CAO, R. HAO, N. ZHOU, Y. LIANG, L. WU, … & J. ZHANG, "Smartphone use motivation and problematic smartphone use in a national representative sample of Chinese adolescents: The mediating roles of smartphone use time for arious activities", *Journal of Behavioral Addictions,* 9(1), 2020., 163–174; Gila C. ZILKA, "Always with them: smartphone use by children, *adolescents, and young* adults characteristics, habits of use, sharing, and satisfaction of needs", *Universal Access in the Information Society* 19, 2020., 145–155.

7 AMERICAN PSYCHOLOGICAL ASSOCIATION, *Digital guidelines: Promoting healthy technology use for children.* 2019. https://www.apa.org/topics/social-media-internet/technology-use-children (preuzeto: 09.10.2022). Danielle ERKOBONI & J. RADESKY, "The elephant in the examination room: Addressing parent and child mobile device use as a teachable moment", *The Journal of pediatrics,* 198, 2018., 5–6; Sonia LIVINGSTONE, L. HADDON, A. GORZIG & K. ÓLAFSON, *"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, Deliverable D4. EU Kids Online Network, London, UK, 2011.

8 Tobias KLIESENER, C. MEIGEN, W. KIESS & T. POULAIN, "Associations between problematic smartphone use and behavioural difficulties, quality of life, and school performance among children and adolescents", *BMC psychiatry,* 22(1), 2022., 1–12; Eun J. LEE & H. S. KIM, "Gender Differences in Smartphone Addiction Behaviors Associated With Parent-Child Bonding, Parent-Child Communication, and Parental Mediation Among Korean Elementary School Students", J*ournal of Addictions Nursing,* 29(4), 2018., 244–254; Tanja POULAIN, M. VOGEL, T. KLIESNER & W. KIESS, "Associations between changes in behavioral difficulties and levels of problematic smartphone use in adolescents over a 1 year period", *European child & adolescent psychiatry,* 2021.,1–4.

and their content, this higher than the recommended time of smartphone use is one of the predictors of problematic use of smartphones in children, which can, in some cases, lead to smartphone addiction.[9] Exceeded time of smartphone use can lead to some other, mostly negative outcomes.[10] Children who spend 3 or more hours a day on smartphones are more likely to experience emotional instability, attention deficit, aggression, anxiety, poor vision, obesity, etc.[11]

Uses and Gratification Theory explains that people actively choose the media they will use[12] so they could fulfill some of their basic needs – cognitive, affective, personal, social, or tension release. Research findings[13] suggest that smartphone use has three main motivators: a) learning, b) socialization and communication, and c) entertainment or fun. Smartphone use driven by these motivators can lead to both positive and negative outcomes. According to some researchers, using smartphones for learning is positively related to broader general knowledge in children, better school achievement, and higher self-esteem and well-being.[14] On

---

9 Laura MARCIANO & A. L. CAMERINI, "Duration, frequency, and time distortion: Which is the best predictor of problematic smartphone use in adolescents? A trace dana study."PloS one, 17(2), 2022., e0263815; Katarina PERIĆ, V. VARGA, M. KOTRLA TOPIĆ & M. MERKAŠ, "Pregled istraživanja o povezanosti korištenja digitalne tehnologije i razvoja djece *(Review of research on the relationship between digital technology use and child development)", Društvena istraživanja: časopis za opća društvena pitanja,* 31(2), 2020., 343–363; Michelle H. VAN VELTHOVEN, J. POWELL & G. POWELL, "Problematic smartphone use: Digital approaches to an emerging public health problem", *Digital health,* 4, 2018., 1 –19.

10 David S. BICKHAM, S. MOUKALLED, & M. RICH, "Young People's Media Use and Remote Schooling Experiences during the COVID-19 Pandemic", *Technology, Mind, and Behavior, Conference Proceedings,* 2021.; Daniela DAVID, C. GIANNINI, F. CHIARELLI, & A. MOHN, "Text Neck Syndrome in Children and Adolescents", *International Journal of Environmental Research and Public Health,* 18(4), 2021., 1565.; Yui MINESHITA, H. K. KIM, H. CHIJIKI, T. NANBA, T. SHINTO, S. FURUHASHI, …& S. SHIBATA, "Screen time duration and timing: effects on obesity, physical activity,dry eyes, and learning ability in elementary school children", *BMC public health,* 21(1), 2021., 1–11.

11 Evon M. ABU-TAIEH, I. ALHADID, K. KAABNEH, R. S. ALHKWALDEH, S. KHWALDEH, R. MASA'DEH, & A. ALROWWAD, "Predictors of Smartphone Addiction and Social Isolation among Jordanian Children and Adolescents Using SEM and ML", *Big Data and Cognitive Computing,* 6(3), 2022., 92; Raghavan SEETHARAMAN & P. S. RAJESWARI, "Smartphone Usage and the Addiction Behavior Among Children–A Global Study", *Specialusis Ugdymas,* 1(43), 2022., 6309 6316.

12 Elihu KATZ, J. G. BLUMLER & M. GUREVITCH, "Uses and gratifications research". *The public opinion quarterly,* 37(4), 1973., 509–523.

13 M. J. KATER & A. A. SCHLARB, n. dj., 6; H. MENG, H. CAO, R. HAO, N. ZHOU, Y. LIANG, L. WU, …& J. ZHANG, n. dj., 6; J. H. PARK, n. dj., 1.

14 Michael CHAN, "Mobile phones and the good life: Examining the relationships among mobile use, social capital and subjective well-being", New Media & Society, 17(1), 2015., 96–113; ; T. KLI-

the other hand, when smartphone use is motivated by socialization, outcomes can vary. In some cases, this motivation directs smartphone use in a way that leads to better social skills and better relationships with others,[15] while in other cases this motivation is related to fear of missing out ("FoMO").[16] "FoMO" refers to the need to be online to avoid feelings of exclusion when one is absent from rewarding experiences that others may have.[17] When smartphone use is driven by "FoMO", it is related to a longer time of use, more social comparison, and lower well-being.[18] Using a smartphone to entertain oneself might have some negative mental health outcomes. In some cases, smartphone use may lower anxiety and be a tool for escaping some negative events,[19] but at the same time it may lead to an exceeded time of smartphone use, losing connections to other people, and lead to higher anxiety and depression, as well as lower well-being in children.[20]

Literature suggests age and gender differences in the motivation for smartphone use. Research findings[21] suggest that motivation for smartphone use changes with age. Younger children (i.e., preschool children and children in lower grades

---

KLIESENER, C. MEIGEN, W. KIESS, & T. POULAIN, n. dj., 8, H. MENG, H. CAO, R. HAO, N. ZHOU, Y. LIANG, L. WU, …& J. ZHANG, n. dj., 6.

15 Valerie BARKER, "Older adolescents' motivations for social network site use: The influence of gender, group identity, and collective self-esteem", *Cyberpsychology & behavior,* 12(2), 2009., 209–213; Wendy W. GOH, S. BAY & V. H. H. CHEN, "Young school children's use of digital devices and parental rules", *Telematics and Informatics,* 32(4), 2015., 787–795; Heather L. HUNDLEY & L. SHYLES, "US teenagers' perceptions and awareness of digital technology: a focus group approach", *New media & society,* 12(3), 2010., 417–433.

16 H. MENG, H. CAO, R. HAO, N. ZHOU, Y. LIANG, L. WU, …& J. ZHANG, n. dj., 6; Melina A. THROUVALA, M. D. GRIFFITHS, M. RENNOLDSON & D. J. KUSS, "Motivational processes and dysfunctional mechanisms of social media use among adolescents: Aqualitative focus group study", *Computers in Human Behavior,* 93, 2019., 164–175.

17 Andrew K. PRZYBYLSKI, K. MURAYAMA, C. R. DEHAAN & V. GLADWELL, "Motivational, emotional, and behavioral correlates of fear of missing out", *Computers in Human Behavior,* 29(4), 2013., 1841–1848.; M. A. THROUVALA, M. D. GRIFFITHS, M. RENNOLDSON & D. J. KUSS, n. dj., 16

18 H. MENG, H. CAO, R. HAO, N. ZHOU, Y. LIANG, L. WU, …& J. ZHANG, n. dj., 6; M. A. THROUVALA, M. D. GRIFFITHS, M. RENNOLDSON & D. J. KUSS, n. dj., 16; Andrew K. PRZYBYLSKI, K. MURAYAMA, C. R. DEHAAN & V. GLADWELL, n. dj., 17.

19 W. W. GOH, S. BAY & V. H. H. CHEN, n. dj., 15; Kai LUKOFF, C. YU, J. KIENTZ & A. HINIKER, "What Makes Smartphone Use Meaningful or Meaningless?" P*roceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies,*, 2(1), 2018., 1–26.

20 E. M. ABU-TAIEH, I. ALHADID, K. KAABNEH, R. S. ALHKWALDEH, S. KHWALDEH, R. MASA'DEH, & A. ALROWWAD, n. dj., 11; Sharon HORWOOD & J. ANGLIM, "Problematic smartphone usage and subjective and psychological well-being", *Computers in Human Behavior,* 97, 2019., 44–50; R. SEETHARAMAN & P. S. RAJESWARI, n. dj., 11.

21 W. W. GOH, S. BAY & V. H. H. CHEN, n. dj., 15; H. L. HUNDLEY & L. SHYLES, n. dj., 15.

of primary school) tend to use smartphones more for learning and playing, while older children (i.e., preadolescents and adolescents in higher grades of primary school) tend to use smartphones more for socializing and entertainment.[22] It was also shown that girls tend to use devices, specifically smartphones, for socialization and communication, while boys use them for entertainment and playing games.[23] These differences are usually theoretically explained in such a way that girls are more focused on their connections to other people and generally tend to socialize more than boys.

Previous research on smartphone use in children provides the ground for the general hypothesis that both, the time of smartphone use and the motivation for smartphone use are related to children's well-being and their school achievement.

3. SMARTPHONE USE AND WELL-BEING OF CHILDREN

Subjective well-being refers to the way people evaluate and experience their lives.[24] Well-being is usually understood as a concept with three components: a global subjective judgment of one's life in general, referred to as life satisfaction, and the frequency of positive and negative affective experiences.[25] This tripartite conceptualization has generated a significant amount of research examining the characteristics, correlates, predictors, and potential consequences of well-being.[26] Statham and Chase[27] stated that children reported that their well-being includes feelings of happiness and security, having a positive sense of self, etc. When children use devices, including smartphones, they often feel happy, as they are playing games, watching videos, or communicating with their friends.[28] On the ot-

---

22 Isto, 21.

23 M. J. KATER & A. A. SCHLARB, n. dj., 6; E. B. WEISER, n. dj., 6.

24 Ed DIENER, "Subjective well-being", *Psychological Bulletin,* 95, 1984., 542-575.

25 Ed DEINER, E. M. SUH, R. E. LUCAS & H. L. SMITH, "Subjective well-being: Three decades of progress", *Psychological Bulletin,* 125, 1999., 276–302.

26 Michael EID & R. J. LARSEN, *"The science of subjective well-being",* New York, NY: Guilford, 2008.

27 June STATHAM & E. CHASE, "Childhood wellbeing: A brief overview". Loughborough: *Childhood Wellbeing Research Centre,* 2010.

28 Doaa ALMUAIGEL, A. ALANAZI, M. ALMUAIGEL, F. ALSHAMARANI, M. ALSHEIKH, N. ALMUHANA, M. ZEESHAN, M. ALSHUREM, A. ALSHAMMARI, & K. MANSI, "Impact of Technology Use on Behavior and Sleep Scores in Preschool Children in Saudi Arabia", *Frontiers in psychiatry,* 12, 2021., 601; Lee Y. TAY, T. B. AIYOOB, T. B. K. CHUA, K. RAMACHANDRAN & M. Y. H. CHIA, "Pre-schoolers' use of technology and digital media in Singapore: entertainment indulgence and/or learning engagement?", *Educational Media International,* 58(1), 2021., 1–20.

her hand, some research[29] suggests that social media can be hurtful for children's well-being because it gives the opportunity to compare oneself with others, which can lead to lower self-esteem and well-being. Use of social media, as one of the main activities on smartphones,[30] also leads to passive media use, like endless scrolling, which is perceived by the user as a waste of time and feeling like nothing has been done, consequentially lowering well-being.[31]

Even though most of the research has shown that smartphone, as well as social media overuse, can lead to lower well-being,[32] some recent research points out that this may not be the case for everybody all the time. Beyens[33] showed that the association between social media use and affective well-being differs strongly across adolescents. While 44% did not feel better or worse after passive social media use, 46% felt better, and 10% felt worse. Also, some recent meta-analysis[34] showed that the effects of smartphone and social media use differ depending on the duration of the effects. When they examined short-term effects, it was indeed shown that higher time of smartphone and social media use negatively affects well-being. But when long-term effects were examined, it was shown that there is no significant influence of smartphone and social media use on the well-being of children and adolescents.[35]

4. SMARTPHONE USE AND SCHOOL ACHIEVEMENT OF CHILDREN

Smartphones can be very useful to children for information browsing, learning, and doing homework because they make educational processes easy, fun, and interactive.[36] Some researchers state that smartphones enhance learning.[37] Children,

---

29 Tobias DIENLIN & N. JOHANNES, "The impact of digital technology use on adolescent wellbeing", *Dialogues in Clinical Neuroscience,* 22(2), 2020., 135–142; Yu-Ting HU & Q. Q. LIU, "Passive social network site use and adolescent materialism: Upward social comparison as a mediator", *Social Behavior and Personality,* 48(1), 2020., 1–8; M. SAMAHA & N. S. HAWI, n. dj., 1.

30 I. BEYENS, n. dj., 1.

31 H. MENG, H. CAO, R. HAO, N. ZHOU, Y. LIANG, L. WU, …& J. ZHANG, n. dj., 6; S. HORWOOD & J. ANGLIM, n. dj., 20.

32 S. HORWOOD & J. ANGLIM, n. dj., 20; Y.-T. HU & Q. Q. LIU, n. dj., 29; M. SAMAHA & N. S. HAWI, n. dj., 1.

33 I. BEYENS, n. dj., 1.

34 M. CHAN, n. dj., 17; T. DIENLIN & N. JOHANNES, n. dj., 29; Philippe VERDUYN, O. YBARRA, M. RESIBOS, J. JONIDES & E. KROSS, "Do social network sites enhance or undermine subjective well-being? A critical review", *Social Issues and Policy Review,* 11(1), 2017., 274–302.

35 Isto, 34.

36 Shlomit HADAD, H. MEISHAR-TAL, & I. BLAU, "The parents' tale: Why parents resist the educati-

on the other hand, prefer to use smartphones for fun, entertainment, and passing the time.[38] Therefore, recent research also tries to determine whether smartphone use affects children's school achievement in any way.[39] A vast number of research has shown that smartphone overuse leads to lower school achievement.[40] For example, Nehra and Mehrotra[41] aimed to investigate the impact of smartphone overuse on the academic performance of adolescents aged 13 to 19 and showed that smartphone overuse negatively impacts learning and academic performance. If used less, it can increase various skills and cognitive abilities, thereby improving academic performance. Simbolon and Daulay[42] have shown that students who cannot control use of smartphones and use them for too long delay completing their assignments because of smartphone use. They also found a negative effect of smartphone overuse on academic procrastination, which is explained by the lack of self-control. Other studies have shown that nomophobia ("the fear of being out of mobile phone contact") in children is associated with lower school achievement.[43] Park[44] found that a higher level of adaptation to school among ten-year-old children reduces the negative effect of problematic smartphone use on school performance. However, when the level of adjustment is lower and when there is

---

onal use of smartphones at schools?", *Computers & Education,* 157, 2020.; Putri A. SIMBOLON & N. DAULAY, "The Effect of Smartphone Addiction on Students' Academic Proscrastination", *Jurnal Basicedu,* 6(4), 2022., 5580–5688.

37 Ramadan EYYAM & H. S. YAEATAN, "Impact of use of technology in mathematics lessons on student achievement and attitudes". *Social Behavior and Personality: an international journal,* 42(1), 2014., 31S–42S.

38 Sung M. BAE. "The relationships between perceived parenting style, learning motivation, friendship satisfaction, and the addictive use of smartphones with elementary school students of South Korea: Using multivariate latent growth modeling", *School Psychology International,* 36(5), 2015., 513–531; Chris FULLWOOD, S. QUINN, L. K. KAYE, & C. REDDING, "My virtual friend: A qualitative analysis of the attitudes and experiences of Smartphone users: Implications for Smartphone attachment", *Computers in Human Behavior,* 75, 2017., 347–355.

39 T. KLIESENER, C. MEIGEN, W. KIESS, & T. POULAIN, n. dj., 8; Lusekelo KIBONA & G. MGAYA, "Smartphones' effects on academic performance of higher learning students", *Journal of Multidisciplinary Engineering Science and Technology,* 2(4), 2015., 777–784.

40 Nikita NEHRA & R. MEHROTRA, "Impact of Smartphone Addiction on Academic Performance of Adolescents in Rajasthan", *Journal of Positive School Psychology,* 2022., 9139–9149. Meehyun YOON & H. YUH, "Relationships between adolescent smartphone usage patterns, achievement goals, and academic achievement", *Asia Pacific Education Review,* 2021., 1–11.

41 NEHRA & R. MEHROTRA, n. dj., 40.

42 S. HADAD, H. MEISHAR-TAL, & I. BLAU, n. dj., 36.

43 Hatice Y. DURAK, "Investigation of nomophobia and smartphone addiction predictors among adolescents in Turkey: Demographic variables and academic performance", *The Social Science Journal,* 56(4), 2019., 492–517.

44 J. H. PARK, n. dj. 1.

a higher level of problematic use of the smartphone, then school achievement is significantly lower. Eoh and colleagues[45] showed that children with high problematic smartphone use have poorer academic performance. However, in children with a high level of adaptation to school life, problematic smartphone use did not affect academic performance. Eoh and colleagues[46] state that school is a primary realm of life for children and their adaptation to school and academic performance affects their degree of happiness. High academic achievement is connected to more positive emotions, lower negative emotions, and higher satisfaction with life.[47] Good school performance is positively correlated to children's well-being.[48]

Research about the relationship between aspects of smartphone use and well-being[49] of children is rare in Croatia, with few exceptions that examined specific aspects of device use and specific aspect of well-being. The contribution of this research to the existing literature is that it considers children's motives for using smartphones in addition to the quantitative indicator of time. Panova and Carbonell[50] claim that problems that arise from smartphone use are likely related to the type of activity, motivation, or gratification with which it is used, rather than the time of smartphone use itself. There is much literature on children's motives for smartphone use in the context of problematic smartphone use,[51] but not in the context of children's well-being and school achievement.

---

45 Yookyung EOH, E. LEE, & S. H. PARK, "The Relationship between Children's School Adaptation, Academic Achievement, Happiness, and Problematic Smartphone Usage: A Multiple Informant Moderated Mediating Model", *Applied Research in Quality of Life,* 2022., 1–15.

46 Isto, 45.

47 Age DISETH, A. G. DANIELSEN, & O. SAMDAL, "A path analysis of basic need support, self-efficacy, achievement goals, life satisfaction and academic achievement level among secondary school students", *Educational Psychology,* 32(3), 2012., 3353–54; Bo LV, H. ZHOU, X. GUO, C. LIU, Z. LIU, & L. LUO, "The relationship between academic achievement and the emotional well-being of elementary school children in China: The moderating role of parent-school communication", *Frontiers in Psychology,* 7, 2016., 948–946.

48 Corinna BISEGGER, B. COLETTA, U. VON BISEGGER, T. ABEL & U. RABENS-SIEBERER, "Health-related quality of life: Gender differences in childhood and adolescence", *Sozial und Präventivmedizin,* 50, 2005., 281–291; M. CHAN, n. dj., 17.

49 Jakov BURIĆ, J. R. GARCIA, & A. ŠTULHOFER, "Is sexting bad for adolescent girls' psychological well-being? A longitudinal assessment in middle to late adolescence", *New Media & Society,* 23(7), 2021., 2052–2071.; Gordana KERESTEŠ & A. ŠTULHOFER, "Adolescents' online social network use and life satisfaction: A latent growth curve modeling approach", *Computers in Human Behavior,* 104, 2020.; Marina KOTRLA TOPIĆ, V. VARGA, & S. JELOVČIĆ, "Digital technology use during the COVID-19 pandemic and its relations to sleep quality and life satisfaction in children and parents", *Društvena istraživanja: časopis za opća društvena istraživanja,* 30(2), 2021., 249–269.

50 Tayana PANOVA & X. CARBONELL, "Is smartphone addiction really an addiction?", *Journal of behavioral addictions,* 7(2), 2018., 2522–59.

51 Eun J. BAE, H. SAGONG, & J. Y. YOON, "Problematic smartphone use and functional somatic symp-

With that in mind, the aim of this paper is to determine how some aspects of smartphone use (time of use and motives of use) are associated with children's well-being (life satisfaction, positive and negative affect) and school achievement.

5. METHOD

Data for this paper are part of an ongoing longitudinal study - Study 2, Wave 1 - of the research project "Digital technology in the family: patterns of behaviour and effects on child development" funded by the Croatian Science Foundation and the Catholic University of Croatia.

6. PARTICIPANTS

Participants were 283 children (59.2% girls) aged 10 to 15 (median 12), and 283 parents (79.8% mothers). Children attend fifth (29.3%), sixth (21.5%), seventh (29.2%) and eight (20.1%) grades of elementary school. Both fathers (58.3%) and mothers (49.1%) mainly finished high school or have a college or a higher level of education (37.3%, 48.4% respectively). Most fathers (91.2%) and mothers (84.8%) are employed, and most families have a monthly income per person between 1.501,00 and 5.500,00 HRK (66.1%), with some families having a monthly income lower than 1.500,00 HRK (1.1%), while some families have monthly income higher than 5.500,00 HRK (32.8%).

7. INSTRUMENTS

Life satisfaction (LS) was measured using the Brief Multidimensional Students' Life Satisfaction Scale (BMSLSS).[52] The scale consists of six items among which five items cover domains of life satisfaction and one item measures general life satisfaction. Children rated how satisfied they are with each domain using a scale from 1 – "completely unsatisfied" to 7 – "completely satisfied". Five items were combi-

toms among adolescents: Mediating roles of depressive symptoms and peer relationships by gender", Archives of Psychiatric Nursing, 40, 2022., 25–31.

52 Julie SELIGSON, E. S. HUEBNER & R. F. VALOIS, "Preliminary validation of the brief multidimensional students' life satisfaction scale (BMSLSS). *Social Indicators Research,* 61(2), 2003., 121–145.

ned into an average score, with higher scores indicating more life satisfaction. The-Cronbach Alpha reliability for five items covering satisfaction with life domains was .807.

Positive (PA) and negative affect (NA) were measured using the Positive and Negative Affect Schedule (PANAS-SF). Children assessed how they felt in the last two weeks on a scale from 1 – "not at all" to 5 – "very much". The Cronbach Alpha coefficient was .776 for the negative affect (5 items) and .824 for the positive affect subscale (5 items). Items were averaged into a total score for each subscale, with higher scores indicating higher positive, or negative affect.

School Achievement (SA) was measured using the Croatian grading scale (1 - Insufficient, 2 - Sufficient, 3 - Good, 4 - Very good, 5 - Excellent).

Children reported their daily time of smartphone use on a timeline designed in the project. Children were asked to mark the average time they spend on smartphones on the time lent. Lent was from 0 hours to 7 hours, with 30 minutes mark between each hour.

Motives for smartphone use were assessed using 18 items scale developed in the project. The scale was constructed based on children's answers in the focus groups from Study 1 (S1) of the project. On a scale from 1 – "never" to 5 – "always", children rated how often they use a smartphone for different purposes (e.g., for doing homework, to have a good rest, to be available, etc.). Factor analysis resulted in three main motives for smartphone use: schoolwork (e.g., for doing homework, searching for information that I need for school), communication (e.g., to stay in touch with my friends, to stay in touch with my parents), and entertainment (e.g., when I am bored, when I don't know what else to do, to relax, because that is my habit, to have rest from school, to laugh). Motive for schoolwork consists of four items (Cronbach alpha .624). Motive for communication is measured through three items (Cronbach alpha .705), while eleven items measured motive for entertainment (Cronbach alpha .880). These three factors explain 44.6% of the variance. Items were averaged into a total score for each subscale, with higher scores indicating a higher frequency of smartphone use for specific purposes (motives). Scale in Croatian and English can be found in the Appendix 1.

---

[53] Andrew MACKINNON, A. F. JORM, H. CHRISTENSEN, A. E. KORTEN, P. A. JACOMB & B. RODGERS, "A short form of the Positive and Negative Affect Schedule: Evaluation of factorial validity and invariance across demographic variables in a community sample", *Personality and Individual differences,* 27(3), 1999., 405–416.

8. PROCEDURE

Participants were recruited from six elementary schools in the City of Zagreb and Zagreb County. Parents and children who decided to participate sent the signed informed consent through teacher in school to the research team. The research team delivered questionnaires to the schools. One was for the one parent to fill out at home, and children had two parts, one to be filled in school, and one to be filled out at home. Later the teachers gathered the questionnaires and the members of the research team collected them from school.

9. RESULTS

The descriptive results for children's time of smartphone use, life satisfaction, positive affect, negative affect, motives for smartphone use, and school achievement are presented in Table 1.

Table 1. Descriptive statistics for children's time of smartphone use, life satisfaction, positive affect, negative affect, motives for smartphone use, and school achievement (N=274)

	Mean	Median	SD	Min	Max
Age	12.23	12	1.20	10	15
Time of smartphone use (in minutes)	174.49	150	88.84	0	420
Life satisfaction	5.77	5.9	1.06	1.40	7
Positive Affect	3.01	3	0.88	1	5
Negative Affect	1.93	1.8	0.84	1	5
School Achievement	4.6	5	0.54	3	5
Motive for schoolwork	3.23	3.25	0.76	1.25	5
Motive for communication	4.04	4	0.81	1	5

Motive for entertainment	3.27	3.27	0.80	1	5

Children's timeline estimates show that children use smartphones for around 3 hours and 15 minutes daily. On average, children estimate a high level of life satisfaction. The result of conducted t-test for testing the difference between experienced positive affect and negative affect indicates that children, on average, experience more positive than negative affect (t=13.039, df=259, p< .001). According to descriptive statistics, the primary motive for most children to use smartphones is communication. Children also claim that they use smartphones to communicate with others rather than to entertain themselves (t=-12.64, df=245, p< .001) or to do schoolwork (t=-15.43, df=263, p< .001). Children reported finishing the previous school year with excellent achievement, on average.

Table 2. Correlations between children's estimations of the time of smartphone use, life satisfaction, positive affect, negative affect, motives for smartphone use, and school achievement (N=274)

		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1	Age	_								
2	Gender	.072	-							
3	Time of smartphone use (in minutes)	.176**	-.115	-						
4	Life Satisfaction	-.206**	.020	-.109	-					
5	Positive Affect	.004	.110	-.029	.160*	-				
6	Negative Affect	.023	-.172**	.238**	-.456**	-.211**	-			
7	Motive for schoolwork	.014	-.163**	.055	.128*	.059	-.035	-		

		1	2	3	4	5	6	7	8	9
8	Motive for communication	.013	-.192**	.188**	.102	.235**	.006	.379**	-	
9	Motive for entertainment	.102	-.043	.346**	-.109	.089	.286**	.136*	.304**	-
10	School Achievement	.048	.109	.016	-.035	-.009	-.044	-.076	-.222**	-.030

Notes: **p< .001; *p< .05
Gender: girls are coded as 1, boys as 2.

The results presented in Table 2 show that as children grow older, they tend to use smartphones more, and their life satisfaction declines. Girls tend to experience more negative affect and use smartphones for communication and school tasks. Children who report spending more time using smartphones experience more negative affect. When it comes to motives for smartphone use, results show that the motive for schoolwork is not correlated with time spent on a smartphone, while the motive for communication and motive for entertainment are positively correlated with the time spent on a smartphone. Children who frequently use a smartphone for doing their schoolwork are more satisfied with their lives. Children who often use smartphones to communicate with others experience more positive affect, while those who claim that they use smartphones for entertainment purposes experience more negative affect. When it comes to school achievement, children who report using smartphones more for communication purposes tend to have lower final grades in school.

To examine the prediction of subjective well-being (life satisfaction, negative and positive affect) and school achievement by age, gender, and some aspects of smartphone use (time of use and motives for smartphone use), four hierarchical regressions were conducted (Table 3, 4, 5 and 6). Children's age and gender were entered in the first step, while time of smartphone use and motives for smartphone use in the second step.

Table 3. Prediction of life satisfaction by age and gender (block 1), time of smartphone use, and motives for smartphone use (block 2) – hierarchical regression (N=274)

	Block 1			Blocks 1 & 2		
	Beta	*t*	*p*	*Beta*	*t*	*p*
Constant		10.84	.000	8.321	.000	
Age	-.199	-2.953**	.003	-.190	-2.826**	.005
Gender	.025	0.379	.705	.060	0.876	.382
Time of smartphone use				-.070	-0.974	.331
Motive for schoolwork				.123	1.693	.092
Motive for communication				.121	1.613	.108
Motive for entertainment				-.091	-1.262	.208
R		.197			.290	
R^2		.039			.084	
delta R2					.045	
F(p)		4.362 (p = .014)			3.215 (p = .001)	

Notes: **p< .001; *p< .05
Gender: girls are coded as 1, boys as 2.

Children's age is a significant negative predictor of life satisfaction, and none of the variables of smartphone use are significant predictors. In total, this model explains 5% of the variance of children's life satisfaction.

Table 4. Prediction of positive affect by age and gender (block 1), time of smartphone use, and motives for smartphone use (block 2) – hierarchical regression (N=274)

	Block 1			Blocks 1 & 2		
	Beta	*t*	*p*	*Beta*	*t*	*p*
Constant		4.415	.000		2.340	.020
Age	-.011	-0.163	.871	-.010	-.155	.877
Gender	.122	1.804	.073	.151	2.235*	.026
Time of smartphone use				-.088	-1.210	.228
Motive for schoolwork				-.014	-0.195	.846
Motive for communication				.229	3.054**	.003
Motive for entertainment				.066	0.924	.357
R		.121			.264	
R^2		.015			.070	
delta R2					.055	
F(p)		1.628 (p = .199)			2.694 (p = .015)	

Notes: **p< .001; *p< .05
Gender: girls are coded as 1, boys as 2.

In the model predicting positive affect in children, the significant positive predictors are child gender and motive for communication. This model accounts for 6% of the variance in children's positive affect.

Table 5. Prediction of negative affect by age and gender (block 1), time of smartphone use, and motives for smartphone use (block 2) – hierarchical regression (N=274)

	Block 1			Blocks 1 & 2		
	Beta	*t*	*p*	*Beta*	*t*	*p*
Constant		3.948	.000		3.453	.001
Age	-.005	-0.68	.946	-.034	0.521	.603
Gender	-.145	-2.176*	.031	-.154	-2.349*	.020
Time of smartphone use				.126	1.792	.075
Motive for schoolwork				-.056	-0.804	.422
Motive for communication				-.126	-1.741	.083
Motive for entertainment				.252	3.620**	.000
R		.146			.264	
R^2		.021			.070	
delta R2					.055	
F(p)		2.404 (p = .093)			4.934 (p = .001)	

Notes: **p< .001; *p< .05
Gender: girls are coded as 1, boys as 2.

In the model predicting negative affect in children, the significant negative predictor is gender, and the significant positive predictor is motive for entertainment. This model accounts for 10% of the variance in children's negative affect.

Table 6. Prediction of school achievement by age and gender (block 1), time of smartphone use, and motives for smartphone use (block 2) – hierarchical regression (N=274)

	Block 1			Blocks 1 & 2		
	Beta	*t*	*P*	*Beta*	*t*	*p*
Constant		-0.697	.486		0.899	.370
Age	.041	0.610	.542	.034	0.511	.610
Gender	.110	1.636	.103	.071	1.043	.298
Time of smartphone use				.071	0.994	.322
Motive for schoolwork				.032	0.445	.657
Motive for communication				-.252	-3.347**	.011
Motive for entertainment				.002	0.028	.978
R		-121			.262	
R^2		.015			.069	
delta R2					.054	
F(p)		1.623 (p = .200)			2.628 (p = .018)	

Notes: **p< .001; *p< .05
Gender: girls are coded as 1, boys as 2.

Motive for communication is a significant negative predictor of school achievement in children. In total, this model explains 6% of the variance of children's school achievement.

The used set of predictors explained 10% of the variance of negative affect, 6% of the variance of positive affect, 6% of the variance of school achievement, and 5% of the variance of children's life satisfaction.

10. DISCUSSION

This study aimed to investigate the relationship between some aspects of children's smartphone use (time and motives for smartphone use), well-being (life satisfaction, positive and negative affect), and school achievement. The results showed that more time spent on smartphone use during a day is associated with higher levels of negative affect and lower life satisfaction. Time spent using a smartphone during a day was not related to school achievement. In addition, older children tend to have lower life satisfaction and boys and children who use smartphones more for communication report more positive affect. Girls and children who use smartphones with the purpose to entertain themselves tend to have higher levels of negative affect, and children who use smartphones to communicate with others tend to have lower school achievement.

Our results about the time of smartphone use are consistent with previous studies, with children in our study estimating time spent on smartphones to be approximately 3 hours and 15 minutes. Smartphone use among children and adolescents is rapidly increasing,[54] while the average age of users is decreasing.[55] In the national report on internet use, Ciboci[56] showed that 95.5% of children in Croatia aged 12 to 14 own a smartphone through which they access internet content. Studies on children's smartphone use report that children aged 10 to 18 use smartphones for more than 3 hours per day.[57] Prolonged time of smartphone use during a day lowers children's time for other activities, e.g., outdoor play or live interactions with friends, or schoolwork at home. Not all time spent with a smartphone is productive and positive. This finding calls for warning children and parents to think about daily activities and smartphone use and find the balance between screen-time and other activities.

Although this study shows that, on average, children estimate high levels of life satisfaction and experience more positive affect than negative affect, children who

---

[54] STATISTA. "Number of smartphone users worldwide from 2014 to 2020 (in billions). 2019". https://www.statista.com/statistics/330695/number-of-smartphone-usersworldwide/. (preuzeto: 09.10.2022).

[55] M. DARDANOU, T. UNSTAD, R. BRITO, P. DIAS, O. FOTAKOPOULOU, Y. SAKATA, & J. O'CONOR, n. dj., 2; J. M. TWENGE & W. K. CAMPBELL, n. dj. 1.

[56] Lana CIBOCI, P. ĆOSIĆ, I. KANIŽAJ, D. POTOČNIK, & D. VINKOVIĆ, *"Nacionalno istraživanje o sigurnosti djece na Internetu",* 2020.

[57] T. KLIESENER, C. MEIGEN, W. KIESS, & T. POULAIN, n. dj., 8.; E. J. LEE & H. S. KIM, n. dj., 8.; T. POULAIN, M. VOGEL, T. KLIESNER & W. KIESS, n. dj., 8.

report spending more time using smartphones reported lower levels of life satisfaction and experience more negative affect. These findings are in line with previous research that also showed that a higher number of hours spent using a smartphone is associated with lower life satisfaction and higher negative affect.[58] Some authors claim that children with excessive smartphone use are more likely to have unhealthy and irregular lifestyle habits, sedentary behaviours, and spend less time engaging in physical activity[59] leading to negative affect and lower satisfaction with life in general.

Our findings are in line with previous research showing that there are three common motives for smartphone use: the motive of entertainment, communication, and doing schoolwork. According to this study, it can be stated that the main motive for smartphone use for most children is communication. The results indicate that children use smartphones to communicate with others more than to entertain themselves or do homework. Furthermore, motive for communication and motive for entertainment are positively correlated with the time of smartphone use. These observations also fit with the empirical findings supporting the Uses and Gratifications Theory of media use, according to which individuals choose media to gratify their unfulfilled needs.[60] One of the basic human needs is communication and interaction with others which is also one of the main motives for using smartphones.[61] In this regard, smartphones may contribute to satisfying needs, and establishing and maintaining social relationships. Along with the motive for communication, our results show that motive for entertainment is one of the most common among children, which is coherent with the literature.[62] Statistical analysis in our study have shown that children tend to use smartphones more to entertain themselves than to do their homework, which is in line with the literature.[63]

---

58 Mark J. BABIC, J. J. SMITH, P. J. MORGAN, N. EATHER, R. C. PLOTNIKOFF, & D. R. LUBANS. "Longitudinal associations between changes in screen-time and mental health outcomes in adolescents", *Mental Health Physical Activity,* 12, 2017., 124–131.; Asaduzzaman KHAN, E. Y. LEE, S. ROSENBAUM, S. R. KHAN & M. S. TREMBLAY, "Dose-dependent and joint associations between screen time, physical activity, and mental wellbeing in adolescents: an international observational study", *The Lancet Child & Adolescent Health,* 5(10), 2021., 729–738.; Lu LI, G. K. LOK, S. L. MEI, X. L. CUI, L. LI, C. H. NG, ... & Y. T. XIANG, "The severity of mobile phone addiction and its relationship with quality of life in Chinese university students", *Peer Journal,* 8, 2020., e8859.

59 A. KHAN, E. Y. LEE, S. ROSENBAUM, S. R. KHAN & M. S. TREMBLAY, n. dj., 58.

60 Jay G. BLUMLER & E. KATZ, "The Uses of Mass Communications: Current Perspectives on Gratifications Research", *Sage Annual Reviews of Communication Research,* 3, 1974.

61 Louis LEUNG & R. WEI, "More than just talk on the move: Uses and gratifications of the cellular phone", *Journalism & mass communication quarterly,* 77(2), 2000., 308–320.

62 Anita WHITING & D. WILLIAMS, "Why people use social media: a uses and gratifications approach", *Qualitative market research: an international journal,* 16(4), 2013., 362–369.

The results show that children who frequently use a smartphone to communicate with others experience more positive affect, while those who report using a smartphone for their entertainment experience more negative affect. In this case, entertainment use refers to escape from real-life problems or monotonous daily routines, in addition to entertainment, relaxation, passing time and obtaining information. Even though entertainment motive in our scale also includes statements about the active use of smartphones (e.g., playing games or obtaining information they do not want to miss), it is mainly focused on relaxation and passing time, aspects of device use that are part of the concept of passive use of devices. Chan[64] explains this by the type of use - communicative use was positively correlated with positive affect, while non-communicative use such as browsing, and scrolling was positively associated with negative affect. Recent literature on this topic distinguishes between active and passive users.[65] Active users typically engage in social activities mediated by digital devices, such as posting, communicating, and commenting, while the main activities of passive users are scrolling and browsing. Studies showed that active social media use has a small positive effect and passive social media use (typically defined as browsing and scrolling) has a small negative effect on well-being.[66] This negative effect on passive users has been explained by the general tendency of social media users to share more positive than negative content, hence leading passive users to more social comparison on social media.[67] dia. According to social comparison theory,[68] people tend to compare themselves with others, and passive social media use often leads to upward social comparison.[69] This positivity bias is thought to reduce well-being.[70]

---

63 E. J. BAE, H. SAGONG, & J.Y. YOON, n. dj., 50.; C. FULLWOOD, S. QUINN, L. K. KAYE, & C. REDDING, n. dj., 38.

64 M. CHAN, n. dj., 17.

65 T. DIENLIN & N. JOHANNES, n. dj., 29; Amy ORBEN, "Teenagers, screens and social media: A narrative review of reviews and key studies", *Social Psychiatry and Psychiatric Epidemiology,* 55(4), 2020., 407–414; Philippe VERDUYN, D. S. LEE, J. PARK, H. SHABLACK, A. ORVELL, J. BAYER, O. YBARRA, J. JONIDES & E. KROSS, "Passive Facebook usage undermines affective well-being: experimental and longitudinal evidence", *Journal of Experimental Psychology: General,* 144(2), 2015., 480–488.

66 Isto, 65.

67 Sophie F. WATERLOO, S. E. BAUMGARTNER, J. PETER & P. M. VALKENBURG, "Norms of online expressions of emotion: Comparing Facebook, Twitter, Instagram, and WhatsApp", *New Media & Society,* 20(5), 2018., 1813–1831.

68 Leon FESTINGER, "A theory of social comparison processes", Human Relations, 7(2), 1954., 117–140.

69 Y.-T. HU & Q. Q. LIU, n. dj., 29.

70 P. VERDUYN, O. YBARRA, M. RESIBOS, J. JONIDES & E. KROSS, n. dj., 34.

This study shows that there is no significant correlation between the average time spent using a smartphone and school achievement in children. Some of the previous research support these findings.[71] Recent research[72] pointed out that the sole time of smartphone use is not affecting children's self-control, performance, and learning skills, but that different activities on smartphones could be the core of the problem. It is possible that is also the case in our study, and we recommend examination of the effects of the specific activities on smartphones (e.g., gaming) on children's school achievement.

The findings of the study show that children's age is a negative significant predictor of their life satisfaction. This finding is in line with previous research.[73] research. The obtained results could be explained from a developmental perspective. Our sample consisted of adolescents who face different challenges during adolescence. Indeed, it is well known that adolescence is a time of significant changes that take place in many domains: physical, psychological, sociocultural, school, interpersonal, and through new social demands and expectations that may vary by gender.[74] All the above changes can negatively affect the overall life satisfaction of adolescents.

The results show that gender is a significant predictor of positive and nega-negative affect, with boys reporting more positive and girls more negative affect.[75] The findings are in line with previous research that has shown how female students are prone to experience more negative affect. Some authors claim that girls engage in higher levels of sedentary behaviour and increased screen time

---

71 N. NEHRA & R. MEHROTRA, n. dj., 40; M. SAMAHA & N. S. HAWI, n. dj., 1.

72 Sarah M. COYNE, A. A. ROGERS, J. D. ZURCHER, L. STOCKDALE, & M. BOOTH, "Does time spent using social media impact mental health? an eight year longitudinal study", *Computers in Human Behavior,* 104, 2020.; S. HORWOOD & J. ANGLIM, n. dj., 20; Ethan KROSS, P. VERDUYN, G. SHEPPES, C.K. COSTELLO, J. JONIDES & O. YBARRA, "Social media and well-being: pitfalls, progress, and next steps", *Trends in Cognitive Sciences,* 25(1), 2020., 55–66.

73 Ferran CASAS, & M. GONZALEZ-CARRASCO, "Subjective well-being decreasing with age: New Research on children over 8", *Child Development,* 90(2), 2019., 375–394; Tamar DINISMAN & A. BENARIEH, "The Characteristics of Children's Subjective Well Being", *Social Indicators Research,* 126(2), 2016., 5555–69; Lisa A. NEWLAND, J. T. GIGER, M. J. LAWLER, S. ROH, B. L. BROCKVELT & A. SCHWINLE, "Multilevel Analisys of Child and Adolescent Subjective Well-Being Acreoss 14 Countries: Child-and Country-Level Predictors". *Child Development,* 90(2), 2018., 395–413.

74 Laura BERK. *"Child development",* Pearson Higher Education AU. 2014.

75 Sara ESTEBAN-GONZALO, J. K. GONZALEZ-PASCUAL, M. CABALLERO-GALILEA, & L. ESTEBAN-GONZALO, "Psychosocial correlates of mental health and well-being during the COVID-19: the Spanish case", *Frontiers in Psychology,* 11, 2020.; Liat HAMAMA & Y. HAMAMA-RAZ, "Meaning in life, self-control, positive and negative affect: Exploring gender differences among adolescents", *Youth & Society,* 53(5), 2021., 699–722.

compared to boys.[76] These behaviours have been linked to negative mental health outcomes.[77] On the other hand, some studies found that boys also report higher levels of intensive physical activities compared to girls, which might confer protection against experiencing negative affect.[78]

Regarding motives, smartphone use for communication purposes proved to be a significant predictor of more positive affect, whereas frequent smartphone use for entertainment purposes was a significant predictor of more negative affect. Studies of children's use of digital devices and activities explain this finding in the context of the "stimulation hypothesis" which posits that online communication may improve the quality of children's friendships and thus their well-being.[79] Valkenburg and Peter[80] emphasize that much of the time adolescents spend alone with computers is typically used to maintain existing friendships. If existing friendships are maintained through social media, digital media is unlikely to negatively affect the quality of those friendships and thus some aspects of children's well-being.[81] On the other hand, the findings of this study show that children who use smartphones for entertainment purposes (relaxation, passing time, and information gathering, including to escape from monotonous daily routines) are prone to experience more negative affect. Previous research showed same trend.[82] In their literature review, Tolsun and colleagues[83] emphasized that

76 Genevive F. DUNTON, B. DO & S. D. WANG, "Early effects of the COVID-19 pandemic on physical activity and sedentary behavior in children living in the US", *BMC Public Health,* 20(1), 2020., 177–187; Wendy E. ELLIS, T. M. DUMAS & L. M. FORBES, "Physically isolated but socially connected: Psychological adjustment and stress among adolescents during the initial COVID-19 crisis", *Canadian Journal of Behavioural Science/Revue Canadienne Des Sciences Du Comportement,* 52(3), 2020.,177–187; Sarah A. MOORE, G. FAULKNER, R. E. RHODES, M. BRUSSONI, T. CHULAK-BOZZER, L. J. FERGUSON, R. MITRA, N. O'REILLY, C. J. SPENCE & L. M. VANDERLOO, "Impact of the COVID-19 virus outbreak on movement and play behaviours of Canadian children and youth: A national survey", *International Journal of Behavioral Nutrition and Physical Activity,* 17(1), 2022., 1–11.

77 Thorhildur HALLDORSDOTTIR, I. E. THORISDOTTIR, C. C. MEYERS, B. B. ASGEIRSDOTTIR, A. L. KRISTJANSSON, H.B. VALDIMARSDOTTIR, … & I. D. SIGFUSDOTTIR, "Adolescent well-being amid the COVID-19 pandemic: Are girls struggling more than boys?", *JCPP advances,* 1(2), 2021., e12027.

78 G. F. DUNTON, B. DO, S. D. WANG, n. dj., 76; Steffen C. SCHMIDT, B. ANNEDA, A. BURCHATZ, A. EICHSTELLER, S. KOLD, C. NIGG, C. NIESSNER, D. ORIWOL, A. WORTH & A. WOLL, "Physical activity and screen time of children and adolescents before and during the COVID-19 lockdown in Germany: A natural experiment", *Scientific Reports,* 10(1), 2020., 21780.

79 Alison J. BRYANT, A. SANDERS-JACKSON, & A. M. SMALLWOOD, "IMing, text messaging, and adolescent social networks", *Journal of Computer-Mediated Communication,* 11(2), 2006., 577–592.

80 Patti M. VALKENBURG & J. PETER, "Online communication and adolescent well-being: Testing the stimulation versus the displacement hypothesis", *Journal of Computer Mediated Communication,* 12(4), 2007., 1169–1182.

81 Isto, 80.

the use of social media further lowered participants' low mood. A possible explanation for this finding could be viewing idealized profiles, pictures, and status updates presented by others.[84] Moreover, intensive smartphone usage for entertainment purposes, as opposed to information seeking or text messaging, also leads to passive media use, such as endless scrolling, which users perceive as a waste of time and a sense of having done nothing, which in turn affects well-being.[85]

As for the model predicting children's school achievement, communication motive was found to be a negative predictor. Kibona and Mgaya[86] found that students are mostly distracted from learning when they receive a text message from a friend and are further distracted by responding to texts or messages. Simbolon and Daulay[87] showed that students who use their smartphones for too long often delay completing their assignments due to smartphone use. It is possible that children in our sample experience the same distractions and delays in completing their assignments because of their need to communicate with others, which then can lead to their lower school achievement.

11. LIMITATIONS

No causal relation can be drawn between the time of smartphone use, the motive for the use, and the well-being of children because of the cross-sectional nature of the study. The relationship between the tested indicators of well-being and smartphone use could be reciprocal, such that low well-being could lead to smartphone use and *vice versa*.[88] Another potential limitation is related to the the self-report method used, which likely resulted in the known biases and unre-

---

82 Leman P. TOLSUN, "Use of Social Networking Sites and Subjective Well-Being", *Current Approaches in Psychiatry/Psikiyatride Guncel Yaklasimlar,* 11(3), 2019., 304–317.
Chia C. YANG & A. ROBINSON, "Not necessarily detrimental: Two social comparison orientations and their associations with social media use and college social adjustment", *Computers in human behavior,* 84, 2018., 49–57.

83 L. P. TOLSUN, n. dj. 82.

84 Tiffany A, PEMPEK, Y. A. YEMOLAYEVA & S. L. CALVERT, "College students' social networking experiences on Facebook", *Journal of applied developmental psychology,* 30(3), 2009., 227–238.

85 S. HORWOOD & J. ANGLIM, n. dj., 20; H. MENG, H. CAO, R. HAO, N. ZHOU, Y. LIANG, L. WU, …& J. ZHANG, n. dj., 6.

86 L. KIBONA & G. MGAYA, n. dj., 39.

87 P. A. SIMBOLON & N. DAULAY, n. dj., 36.

88 S. HORWOOD & J. ANGLIM, n. dj., 20

unreliable estimates of participants' objective smartphone use. In the present study, a relatively small sample using convenience sampling was used, which limits the generalizability of the conclusions.[89] Another potential limitation relates to the relatively limited number of possible motives for smartphone use that were examined. Therefore, we advise the examination of different psychological motives or/and types of use (active vs. passive use) in the future. In particular, we advise the examination of the scale for measuring motivation for smartphone use because the structure of the scale could be different in children of different ages. The motive for entertainment could have more underlying factors or the items could be loaded with new factors (e.g., fear of missing out, boredom) that are not frequently recognized and present in children and early adolescents. It could be that the factor structure of the scale is different regarding the age of children, so the use of the scale is warranted only for early adolescents.

This study advances the field of examination of children's smartphone use by further elucidating key correlates and predictors related to well-being and motives for social media use. First, it is important to note that the time of smartphone use as a predictor did not reach statistical significance in predicting the well-being indicators in this study. Several scholars have pointed out that it is not the time spent using smartphones that influences people's subjective well-being, but how people use these media and their individual characteristics. The finding provides direction for future research by focusing on examining the content[90] to which children and adolescents are exposed, rather than the quantity. Second, the research findings demonstrate the importance of awareness of the distracting effect that smartphones may have on children's school performance and how often they experience this negative effect. Indeed, children are often unaware that their performance can be affected when they have a smartphone nearby while doing their homework. Several studies have confirmed this impairing effect of smartphones on school performance.[91]

---

89 Marc H. BORNSTEIN, J. JAGER & D. L. PUTNICK, "Sampling in developmental science: Situations, shortcomings, solutions, and standards", *Developmental review,* 33(4), 2013., 357-370.

90 S. M. COYNE, A. A. ROGERS, J. D. ZURCHER, L. STOCKDALE, & M. BOOTH, n. dj., 72; E. KROSS, P. VERDUYN, G. SHEPPES, C.K. COSTELLO, J. JONIDES & O. YBARRA, n. dj., 72; Jacqueline NESI & M. J. PRINSTEIN, "Using social media for social comparison and feedbackseeking: gender and popularity moderate associations with depressive symptoms", *Journal of Abnormal Child Psychology,* 43, 2015., 1427–1438.; Stefano TARTAGLIA & E. BERGAGNA, "Social networking sites passive use and its effects on sad happy mood". *Psihologija,* 55(2), 2022., 137–147.

91 N. NEHRA & R. MEHROTRA, n. dj., 40; P. A. SIMBOLON & N. DAULAY, n. dj., 36; M. YOON & H. YUH, n. dj., 40.

12. CONCLUSION

The results show that more time spent on smartphones during a day is associated with more negative affect and lower life satisfaction. Time of smartphone use was not significantly related to school achievement. The age of children was significantly and positively related to the time of smartphone use, and negatively and significantly with life satisfaction. Girls reported experiencing more negative affect, while boys reported experiencing more positive affect. More use of smartphones for entertainment is related to more negative affect in children, while more use of smartphones for communication is related to more positive affect and lower school achievement in children.

LITERATURE

1/ Evon M. ABU-TAIEH, I. ALHADID, K. KAABNEH, R. S. ALHKWALDEH, S. KHWALDEH, R. MASA'DEH, & A. ALROWWAD, "Predictors of Smartphone Addiction and Social Isolation among Jordanian Children and Adolescents Using SEM and ML", *Big Data and Cognitive Computing,* 6(3), 2022., 92.

2/ Doaa ALMUAIGEL, A. ALANAZI, M. ALMUAIGEL, F. ALSHAMARANI, M. ALSHEIKH, N. ALMUHANA, M. ZEESHAN, M. ALSHUREM, A. ALSHAMMARI, & K. MANSI, "Impact of Technology Use on Behavior and Sleep Scores in Preschool Children in Saudi Arabia", *Frontiers in psychiatry,* 12, 2021., 601.

3/ 3/ AMERICAN PSYCHOLOGICAL ASSOCIATION, *Digital guidelines: Promoting healthy technology use for children.* 2019. https://www.apa.org/topics/social-media-internet/technology-use-children (preuzeto: 09.10.2022).

4/ Mark J. BABIC, J. J. SMITH, P. J. MORGAN, N. EATHER, R. C. PLOTNIKOFF, & D. R. LUBANS. "Longitudinal associations between changes in screen-time and mental health outcomes in adolescents", *Mental Health Physical Activity,* 12, 2017., 124–131.

5/ Eun J. BAE, H. SAGONG & J. Y. YOON, "Problematic smartphone use and functional somatic symptoms among adolescents: Mediating roles of depressive symptoms and peer relationships by gender", *Archives of Psychiatric Nursing,* 40, 2022., 25–-31.

6/ Valerie BARKER, "Older adolescents' motivations for social network site use: The influence of gender, group identity, and collective self-esteem", *Cyberpsychology & behavior,* 12(2), 2009., 209–213.

7/ Laura BERK. *"Child development",* Pearson Higher Education AU. 2014.

8/ Ine BEYENS, J. L. POUWELS, I. I. VAN DRIEL, L. KEIJSERS, & P. M. VALKENBURG,

"The effect of social media on well-being differs from adolescent to adolescent", Scientific Reports, 10(1), 2020., 1–11.

9/ David S. BICKHAM, S. MOUKALLED, & M. RICH, "Young People's Media Use and Remote Schooling Experiences during the COVID-19 Pandemic", *Technology, Mind, and Behavior, Conference Proceedings,* 2021.

10/ Corinna BISEGGER, B. COLETTA, U. VON BISEGGER, T. ABEL, I U. RABENS-SIEBERER, "Health-related quality of life: Gender differences in childhood and adolescence", *Sozial und Präventivmedizin,* 50, 2005., 281–291.

11/ Jay G. BLUMLER & E. KATZ, "The Uses of Mass Communications: Current Perspectives on Gratifications Research", *Sage Annual Reviews of Communication Research,* 3, 1974.

12/ Marc H. BORNSTEIN, J. JAGER & D. L. PUTNICK, "Sampling in developmental science: Situations, shortcomings, solutions, and standards", *Developmental review,* 33(4), 2013., 357–370.

13/ Alison J. BRYANT, A. SANDERS-JACKSON, & A. M. SMALLWOOD, "IMing, text messaging, and adolescent social networks", *Journal of Computer-Mediated Communication,* 11(2), 2006., 577–-592.

14/ Jakov BURIĆ, J. R. GARCIA, & A. ŠTULHOFER, "Is sexting bad for adolescent girls' psychological well-being? A longitudinal assessment in middle to late adolescence", *New Media & Society,* 23(7), 2021., 2052–2071.

15/ Ferran CASAS, & M. GONZALEZ-CARRASCO, "Subjective well-being decreasing with age: New Research on children over 8", *Child Development,* 90(2), 2019., 375–394.

16/ Michael CHAN, "Mobile phones and the good life: Examining the relationships among mobile use, social capital and subjective well-being", *New Media & Society,* 17(1), 2015., 96–113.

17/ Lana CIBOCI, P. ĆOSIĆ, I. KANIŽAJ, D. POTOČNIK, & D. VINKOVIĆ, "Nacionalno istraživanje o sigurnosti djece na Internetu", 2020.

18/ Sarah M. COYNE, A. A. ROGERS, J. D. ZURCHER, L. STOCKDALE, & M. BOOTH, "Does time spent using social media impact mental health?: an eight year longitudinal study", *Computers in Human Behavior,* 104, 2020.

19/ Maria DARDANOU, T. UNSTAD, R. BRITO, P. DIAS, O. FOTAKOPOULOU, Y. SAKATA & J. O'CONOR, "Use of touchscreen technology by 0–3-year-old children: Parents' practices and perspectives in Norway, Portugal and Japan", *Journal of Early Childhood Literacy,* 20(3), 2020., 551–573.

20/ Daniela DAVID, C. GIANNINI, F. CHIARELLI, & A. MOHN, "Text Neck Syndrome in Children and Adolescents", *International Journal of Environmental Research and Public Health,* 18(4), 2021., 1565.

21/ Ed DIENER, "Subjective well-being", *Psychological Bulletin,* 95, 1984., 542–575.

22/ Ed DEINER, E. M. SUH, R. E. LUCAS & H. L. SMITH, "Subjective well-being: Three decades of progress", *Psychological Bulletin,* 125, 1999., 276–302.
23/ Tobias DIENLIN & N. JOHANNES, "The impact of digital technology use on adolescent wellbeing", Dialogues in Clinical Neuroscience, 22(2), 2020, 135–142.
24/ Tamar DINISMAN & A. BENARIEH, "The Characteristics of Children's Subjective Well Being", *Social Indicators Research,* 126(2), 2016., 555–569.
25/ Age DISETH, A. G. DANIELSEN, & O. SAMDAL, "A path analysis of basic need support, self-efficacy, achievement goals, life satisfaction and academic achievement level among secondary school students", *Educational Psychology,* 32(3), 2012., 3353–54.
26/ Genevive F. DUNTON, B. DO & S. D. WANG, "Early effects of the COVID-19 pandemic on physical activity and sedentary behavior in children living in the US", *BMC Public Health,* 20(1), 2020., 177–187.
27/ Hatice Y. DURAK, "Investigation of nomophobia and smartphone addiction predictors among adolescents in Turkey: Demographic variables and academic performance", *The Social Science Journal,* 56(4), 2019., 492–517.
28/ Michael EID & R. J. LARSEN, *"The science of subjective well-being",* New York, NY: Guilford, 2008.
29/ Wendy E. ELLIS, T. M. DUMAS & L. M. FORBES, "Physically isolated but socially connected: Psychological adjustment and stress among adolescents during the initial COVID-19 crisis", *Canadian Journal of Behavioural Science/Revue Canadienne Des Sciences Du Comportement,* 52(3), 2020.,177–187.
30/ Yookyung EOH, E. LEE, & S. H. PARK, "The Relationship between Children's School Adaptation, Academic Achievement, Happiness, and Problematic Smartphone Usage: A Multiple Informant Moderated Mediating Model", *Applied Research in Quality of Life,* 2022., 1–15.
31/ Danielle ERKOBONI & J. RADESKY, "The elephant in the examination room: Addressing parent and child mobile device use as a teachable moment", *The Journal of pediatrics,* 198, 2018., 5–6.
32/ Sara ESTEBAN-GONZALO, J. K. GONZALEZ-PASCUAL, M. CABALLERO-GALILEA, & L. ESTEBAN-GONZALO, "Psychosocial correlates of mental health and well-being during the COVID-19: the Spanish case", *Frontiers in Psychology,* 11, 2020.
33/ EUROSTAT, "Individuals - devices used to access the Internet", 2022. Retrieved from: https://ec.europa.eu/eurostat/databrowser/view/isoc_ci_dev_i/default/line?lang=en (preuzeto: 09.10.2022.).
34/ Ramadan EYYAM & H. S. YAEATAN, "Impact of use of technology in mathematics lessons on student achievement and attitudes. *Social Behavior and Personality: an international journal,* 42(1), 2014., 31S–42S.

35/ Leon FESTINGER, "A theory of social comparison processes", *Human Relations,* 7(2), 1954., 117–140.
36/ Chris FULLWOOD, S. QUINN, L. K. KAYE, & C. REDDING. "My virtual friend: A qualitative analysis of the attitudes and experiences of Smartphone users: Implications for Smartphone attachment", *Computers in Human Behavior,* 75, 2017., 347–355.
37/ Wendy W. GOH, S. BAY & V. H. H. CHEN, "Young school children's use of digital devices and parental rules", *Telematics and Informatics,* 32(4), 2015., 787–795.
38/ Shlomit HADAD, H. MEISHAR-TAL, & I. BLAU, "The parents' tale: Why parents resist the educational use of smartphones at schools?", C*omputers & Education,* 157, 2020.
39/ Thorhildur HALLDORSDOTTIR, I. E. THORISDOTTIR, C. C. MEYERS, B. B. ASGEIRSDOTTIR, A. L. KRISTJANSSON, H.B. VALDIMARSDOTTIR, … & I. D. SIGFUSDOTTIR, "Adolescent well-being amid the COVID-19 pandemic: Are girls struggling more than boys?", *JCPP advances,* 1(2), 2021., e12027.
40/ Liat HAMAMA & Y. HAMAMA-RAZ, "Meaning in life, self-control, positive and negative affect: Exploring gender differences among adolescents", *Youth & Society,* 53(5), 2021., 6997–22.
41/ Sharon HORWOOD & J. ANGLIM, "Problematic smartphone usage and subjective and psychological well-being", *Computers in Human Behavior,* 97, 2019., 44–50.
42/ Yu-Ting HU & Q. Q. LIU, "Passive social network site use and adolescent materialism: Upward social comparison as a mediator", *Social Behavior and Personality,* 48(1), 2020., 18–.
43/ Heather L. HUNDLEY & L. SHYLES, "US teenagers' perceptions and awareness of digital technology: a focus group approach", *New media & society,* 12(3), 2010., 417–433.
44/ Maren J. KATER & A. A. SCHLARB, "Smartphone usage in adolescents – motives and link to sleep disturbances, stress and sleep reactivity", *Somnologie* 24, 2020., 245-252.
45/ Elihu KATZ, J. G. BLUMLER & M. GUREVITCH, "Uses and gratifications research". *The public opinion quarterly,* 37(4), 1973., 509–523.
46/ Gordana KERESTEŠ & A. ŠTULHOFER, "Adolescents' online social network use and life satisfaction: A latent growth curve modeling approach", *Computers in Human Behavior,* 104, 2020.
47/ Asaduzzaman KHAN, E. Y. LEE, S. ROSENBAUM, S. R. KHAN & M. S. TREMBLAY, "Dose-dependent and joint associations between screen time, physical activity, and mental wellbeing in adolescents: an international observational study", *The Lancet Child & Adolescent Health,* 5(10), 2021., 7297–38.

48/ Lusekelo KIBONA & G. MGAYA, "Smartphones' effects on academic performance of higher learning students", *Journal of Multidisciplinary Engineering Science and Technology,* 2(4), 2015., 777–784.
49/ Tobias KLIESENER, C. MEIGEN, W. KIESS, & T. POULAIN, "Associations between problematic smartphone use and behavioural difficulties, quality of life, and school performance among children and adolescents", *BMC psychiatry,* 22(1), 2022., 1–12.
50/ Marina KOTRLA TOPIĆ, V. VARGA, & S. JELOVČIĆ, "Digital technology use during the COVID-19 pandemic and its relations to sleep quality and life satisfaction in children and parents", *Društvena istraživanja: časopis za opća društvena istraživanja,* 30(2), 2021., 249–269.
51/ Ethan KROSS, P. VERDUYN, G. SHEPPES, C.K. COSTELLO, J. JONIDES & O. YBARRA, "Social media and well-being: pitfalls, progress, and next steps", *Trends in Cognitive Sciences,* 25(1), 2020., 55–66.
52/ Eun J. LEE & H. S. KIM, "Gender Differences in Smartphone Addiction Behaviors Associated With Parent-Child Bonding, Parent-Child Communication, and Parental Mediation Among Korean Elementary School Students", *Journal of Addictions Nursing,* 29(4), 2018., 2442–54.
53/ Louis LEUNG & R.WEI, "More than just talk on the move: Uses and gratifications of the cellular phone", *Journalism & mass communication quarterly,* 77(2), 2000., 308–320.
54/ Lu LI, G. K. LOK, S. L. MEI, X. L. CUI, L. LI, C. H. NG, ... & Y. T. XIANG, "The severity of mobile phone addiction and its relationship with quality of life in Chinese university students", *PeerJournal,* 8, 2020., e8859.
55/ Sonia LIVINGSTONE, L. HADDON, A. GORZIG & K. ÓLAFSON, *"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, Deliverable D4. EU Kids Online Network, London, UK, 2011.
56/ Kai LUKOFF, C. YU, J. KIENTZ & A. HINIKER, "What Makes Smartphone Use Meaningful or Meaningless?" *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies,* 2(1), 2018., 1–26.
57/ Bo LV, H. ZHOU, X. GUO, C. LIU, Z. LIU & L. LUO, "The relationship between academic achievement and the emotional well-being of elementary school children in China: The moderating role of parent-school communication", *Frontiers in Psychology,* 7, 2016., 948-946.
58/ Andrew MACKINNON, A. F. JORM, H. CHRISTENSEN, A. E. KORTEN, P. A. JACOMB & B. RODGERS, "A short form of the Positive and Negative Affect Sche-Schedule: Evaluation of factorial validity and invariance across demographic

variables in a community sample", *Personality and Individual differences,* 27(3), 1999., 405–416.

59/ Laura MARCIANO & A. L. CAMERINI, "Duration, frequency, and time distortion: Which is the best predictor of problematic smartphone use in adolescents? A trace data study". *PloS one,* 17(2), 2022., e0263815.

60/ Haoran MENG, H. CAO, R. HAO, N. ZHOU, Y. LIANG, L. WU, …& J. ZHANG, "Smartphone use motivation and problematic smartphone use in a national representative sample of Chinese adolescents: The mediating roles of smartphone use time for various activities", *Journal of Behavioral Addictions,* 9(1), 2020., 163–174.

61/ Yui MINESHITA, H. K. KIM, H. CHIJIKI, T. NANBA, T. SHINTO, S. FURUHASHI, …& S. SHIBATA, "Screen time duration and timing: effects on obesity, physical activity, dry eyes, and learning ability in elementary school children", *BMC public health,* 21(1), 2021., 1–11.

62/ Sarah A. MOORE, G. FAULKNER, R. E. RHODES, M. BRUSSONI, T. CHULAK-BOZZER, L. J. FERGUSON, R. MITRA, N. O'REILLY, C. J. SPENCE & L. M. VANDERLOO, "Impact of the COVID-19 virus outbreak on movement and play behaviours of Canadian children and youth: A national survey", *International Journal of Behavioral Nutrition and Physical Activity,* 17(1), 2022., 1–11.

63/ Nikita NEHRA & R. MEHROTRA, "Impact of Smartphone Addiction on Academic Performance of Adolescents in Rajasthan", *Journal of Positive School Psychology,* 2022., 91399–149.

64/ Jacqueline NESI & M. J. PRINSTEIN, "Using social media for social comparison and feedbackseeking: gender and popularity moderate associations with depressive symptoms", *Journal of Abnormal Child Psychology,* 43, 2015., 1427–1438.

65/ Lisa A. NEWLAND, J. T. GIGER, M. J. LAWLER, S. ROH, B. L. BROCKVELT & A. SCHWINLE, "Multilevel Analisys of Child and Adolescent Subjective Well-Being Acreoss 14 Countries: Child-and Country-Level Predictors". *Child Development,* 90(2), 2018., 395-413.

66/ Amy ORBEN, "Teenagers, screens and social media: A narrative review of reviews and key studies", *Social Psychiatry and Psychiatric Epidemiology,* 55(4), 2020., 407–414.

67/ Tayana PANOVA & X. CARBONELL, "Is smartphone addiction really an addiction?", *Journal of behavioral addictions,* 7(2), 2018., 252–259.

68/ Jeong H. PARK, "Smartphone use patterns of smartphone-dependent children", *Child Health Nursing Research,* 26(1), 2020., 47–54.

69/ Tiffany A, PEMPEK, Y. A. YEMOLAYEVA & S. L. CALVERT, "College students' social networking experiences on Facebook", *Journal of applied developmental psychology,* 30(3), 2009., 227–238.

70/ Katarina PERIĆ, V. VARGA, M. KOTRLA TOPIĆ & M. MERKAŠ, *"Pregled istraživanja o povezanosti korištenja digitalne tehnologije i razvoja djece (Review of research on the relationship between digital technology use and child development)". Društvena istraživanja: časopis za opća društvena pitanja,* 31(2), 2020., 343–363.
71/ Tanja POULAIN, M. VOGEL, T. KLIESNER & W. KIESS, "Associations between changes in behavioral difficulties and levels of problematic smartphone use in adolescents over a 1 year period", *European child & adolescent psychiatry,* 2021.,1–4.
72/ Andrew K. PRZYBYLSKI, K. MURAYAMA, C. R. DEHAAN & V. GLADWELL, "Motivational, emotional, and behavioral correlates of fear of missing out", *Computers in Human Behavior,* 29(4), 2013., 1841–1848.
73/ Maya SAMAHA & N. S. HAWI, "Relationships among smartphone addiction, stress, academic performance, and satisfaction with life", *Computers in human behavior,* 57, 2016., 3213–25.
74/ Steffen C. SCHMIDT, B. ANNEDA, A. BURCHATZ, A. EICHSTELLER, S. KOLD, C. NIGG, C. NIESSNER, D. ORIWOL, A. WORTH & A. WOLL, "Physical activity and screen time of children and adolescents before and during the COVID-19 lockdown in Germany: A natural experiment", *Scientific Reports,* 10(1), 2020., 21780.
75/ Julie SELIGSON, E. S. HUEBNER & R. F. VALOIS, "Preliminary validation of the brief multidimensional students' life satisfaction scale (BMSLSS)". *Social Indicators Research,* 61(2), 2003., 121–145.
76/ Putri A. SIMBOLON & N. DAULAY, "The Effect of Smartphone Addiction on Students' Academic Proscrastination", *Jurnal Basicedu,* 6(4), 2022., 5580–5688.
77/ June STATHAM & E. CHASE, "Childhood wellbeing: A brief overview", *Loughborough: Childhood Wellbeing Research Centre,* 2010.
78/ STATISTA. "Number of smartphone users worldwide from 2014 to 2020 (in billions). 2019". https://www.statista.com/statistics/330695/number-of smartphoneusersworldwide/. (preuzeto: 09.10.2022).
79/ Stefano TARTAGLIA & E. BERGAGNA, "Social networking sites passive use and its effects on sad happy mood". *Psihologija,* 55(2), 2022., 137–147.
80/ Lee Y. TAY, T. B. AIYOOB, T. B. K. CHUA, K. RAMACHANDRAN & M. Y. H. CHIA, "Pre-schoolers' use of technology and digital media in Singapore: entertainment indulgence and/or learning engagement?", *Educational Media International,* 58(1), 2021., 1–20.
81/ Melina A. THROUVALA, M. D. GRIFFITHS, M. RENNOLDSON & D. J. KUSS, "Mo-Motivational processes and dysfunctional mechanisms of social media use

among adolescents: A qualitative focus group study", *Computers in Human Behavior,* 93, 2019., 164–175.

82/ Leman P. TOLSUN, "Use of Social Networking Sites and Subjective Well-Being", *Current Approaches in Psychiatry/Psikiyatride Guncel Yaklasimlar,* 11(3), 2019., 304–317.

83/ Jean M. TWENGE & W. K. CAMPBELL, "Associations between screen time and lower psychological well-being among children and adolescents: Evidence from a population-based study", *Preventive medicine reports,* 12, 2018., 271–283.

84/ Patti M. VALKENBURG & J. PETER, "Online communication and adolescent well-being: Testing the stimulation versus the displacement hypothesis", *Journal of Computer Mediated Communication,* 12(4), 2007., 1169–1182.

85/ Michelle H. VAN VELTHOVEN, J. POWELL & G. POWELL, "Problematic smartphone use: Digital approaches to an emerging public health problem", *Digital health,* 4, 2018., 1–19.

86/ Philippe VERDUYN, D. S. LEE, J. PARK, H. SHABLACK, A. ORVELL, J. BAYER, O. YBARRA, J. JONIDES & E. KROSS, "Passive facebook usage undermines affective well-being: experimental and longitudinal evidence", *Journal of Experimental Psychology: General,* 144(2), 2015., 4804–88.

87/ Philippe VERDUYN, O. YBARRA, M. RESIBOS, J. JONIDES & E. KROSS, "Do social network sites enhance or undermine subjective well-being? A critical review", *Social Issues and Policy Review,* 11(1), 2017., 274–302.

88/ Sophie F. WATERLOO, S. E. BAUMGARTNER, J. PETER & P. M. VALKENBURG, "Norms of online expressions of emotion: Comparing Facebook, Twitter, Instagram, and WhatsApp", *New Media & Society,* 20(5), 2018., 1813–1831.

89/ Anita WHITING & D. WILLIAMS, "Why people use social media: a uses and gratifications approach", *Qualitative market research: an international journal,* 16(4), 2013., 362–369.

90/ Chia C. YANG & A. ROBINSON, "Not necessarily detrimental: Two social comparison orientations and their associations with social media use and college social adjustment", *Computers in human behavior,* 84, 2018., 49–57.

91/ Meehyun YOON & H. YUH, "Relationships between adolescent smartphone usage patterns, achievement goals, and academic achievement", *Asia Pacific Education Review,* 2021., 1–11.

92/ Gila C. ZILKA, "Always with them: smartphone use by children, adolescents, and young adults characteristics, habits of use, sharing, and satisfaction of needs", *Universal Access in the Information Society* 19, 2020., 145–155.

Appendix 1

Mobitel koristim …	nikad	rijetko	ponekad	često	uvijek
1. kako bih napravio zadaću.	1	2	3	4	5
2. kako bih se dogovorio za susret/igru s prijateljima.	1	2	3	4	5
3. kad mi je dosadno.	1	2	3	4	5
4. kad ne znam što bih drugo radio.	1	2	3	4	5
5. kako bih izradio prezentacije za školu.	1	2	3	4	5
6. kad želim da mi prođe vrijeme.	1	2	3	4	5
7. jer mi je to navika.	1	2	3	4	5
8. da se oraspoložim/razveselim.	1	2	3	4	5
9. zato što me nešto toliko zanima da ne mogu izdržati.	1	2	3	4	5
10. kako bih se odmorio od škole.	1	2	3	4	5
11. da se nasmijem.	1	2	3	4	5
12. kako bih pronašao informacije za školu.	1	2	3	4	5
13. kako bih se čuo/dopisivao s prijateljima.	1	2	3	4	5
14. kako bih pronašao informacije koje me zanimaju.	1	2	3	4	5
15. kako bih bio uvijek dostupan.	1	2	3	4	5
16. kako bih predahnuo.	1	2	3	4	5
17. kako ne bih nešto propustio.	1	2	3	4	5
18. kako bih se čuo/dopisivao s roditeljima.	1	2	3	4	5

I use my mobile phone …	**never**	**rarely**	**sometimes**	**often**	**always**
1. to do my homework.	1	2	3	4	5
2. to arrange to meet/play with friends.	1	2	3	4	5
3. when I am bored.	1	2	3	4	5
4. when I don’t know what else to do.	1	2	3	4	5
5. to make presentations for school.	1	2	3	4	5
6. when I want to pass the time.	1	2	3	4	5
7. because it is my habit.	1	2	3	4	5
8. to cheer up/get happy.	1	2	3	4	5
9. because I am so interested in something that I can't stand not to look.	1	2	3	4	5
10. to take a break from school.	1	2	3	4	5
11. to laugh.	1	2	3	4	5
12. to find information for the school.	1	2	3	4	5
13. to hear/text with friends.	1	2	3	4	5
14. to find the information I am interested in.	1	2	3	4	5
15. to always be available.	1	2	3	4	5
16. to take a break.	1	2	3	4	5
17. so that I don't miss something.	1	2	3	4	5
18. to hear/text with my parents.	1	2	3	4	5

Subscales:

Items 1, 5, 12, 14 – motive for homework
Items 2, 13, 18 – motive for communication
Items 3, 4, 6, 7, 8, 9, 10, 11, 15, 16, 17 – motive for entertainment

SAŽETAK

POVEZANOST NEKIH ASPEKATA KORIŠTENJA PAMETNOG TELEFONA S DOBROBITI I ŠKOLSKIM USPJEHOM KOD DJECE

Cilj ovog istraživanja bio je ispitati povezanost između nekih aspekata dječjeg korištenja pametnog telefona (vrijeme i motivi za korištenje pametnog telefona), pokazatelja dobrobiti (zadovoljstvo životom, pozitivni i negativni afekt) i školskog uspjeha. Istraživanje je dio longitudinalne studije (Studija 2) istraživačkog projekta "Digitalna tehnologija u obitelji: obrasci ponašanja i učinci na razvoj djece" kojeg financiraju Hrvatska zaklada za znanost i Hrvatsko katoličko sveučilište. U istraživanju je sudjelovalo 283 djece (59,2% djevojčica) u dobi od 10 do 15 (medijan 12) godina i 283 roditelja (79,8% majki). Sudionici su bili iz šest zagrebačkih osnovnih škola. Roditelji i djeca koji su odlučili sudjelovati u istraživanju potpisali su informirani pristanak za sudjelovanje. Istraživački tim je školama dostavio upitnike. Jedan upitnik bio je za roditelje koji su ga popunjavali kod kuće. Upitnik za djecu sastojao se od dva dijela. Jedan dio djeca su popunjavala kod kuće, a drugi u školi. Upitnici su, uz pomoć učitelja i stručnih suradnika, prikupljeni i isporučeni istraživačkom timu. Za potrebe ovoga istraživanja razvijena je nova Skala motiva korištenje pametnog telefona za djecu na temelju rezultata iz Studije 1. Dječje zadovoljstvo životom ispitano je Kratkom multidimenzionalnom ljestvicom zadovoljstva životom (Seligson i sur., 2003.), a pozitivni i negativni afekti ispitani su PANAS-C ljestvicom (Ebesutani i sur., 2012.). Školski uspjeh mjeren je prema hrvatskoj ljestvici ocjenjivanja djece u školi.

Procjene dječjeg vremena korištenja pametnog telefona pokazuju da djeca dnevno u prosjeku provedu oko 3 sata i 15 minuta koristeći pametni telefon. Rezultati o vremenu korištenja pametnog telefona su u skladu su s prethodnim istraživanjima koja pokazuju da djeca u dobi od 10 do 18 godina koriste pametne telefone više od 3 sata dnevno (npr. Kliesener et al., 2022; Lee i Kim, 2018; Park, 2020; Poulain et al., 2021; Samahel et al. al., 2020; Twenge i Campbell, 2018). Ovo istraživanje pokazuje da djeca u prosjeku imaju visoku razinu zadovoljstva životom, te da djeca u prosjeku doživljavaju više pozitivnih nego negativnih afekta. Većini djece primarni motiv za korištenje mobitela je komunikacija. Druga dva najčešća motiva za korištenje mobitela među djecom su zabava i pisanje zadaće. Rezultati pokazuju da motiv za pisanje zadaće nije statistički značajno povezan s vremenom provedenim na pametnom telefonu, dok su motiv za komunikacijom i motiv za zabavom statistički značajno pozitivno povezani s vremenom provedenim na pametnom telefonu. Također, djeca su prošlu školsku godinu u prosjeku završila s odličnim uspjehom. Rezultati su pokazali da je više prosječno dnev-

no vrijeme korištenja pametnog telefona povezano s višim razinama negativnog afekta, nižim zadovoljstvom životom, ali ne i s lošijim školskim uspjehom. Nadalje, rezultati pokazuju da, kako odrastaju, djeca provode više vremena koristeći pametne telefone, a njihovo zadovoljstvo životom opada. Prethodna istraživanja također su pokazala da je veći broj sati provedenih u korištenju pametnog telefona povezan s nižim zadovoljstvom životom i češćim negativnim afektima (Babić i sur., 2017; Khan i sur., 2021; Li i sur., 2020). Dječaci i djeca koji koriste pametne telefone uglavnom za komunikaciju češće doživljavaju pozitivne afekte. Djevojčice i djeca koja koriste pametne telefone u svrhu zabave češće doživljavaju negativni afekt, a djeca koja koriste pametne telefone za komunikaciju s drugima imaju lošiji školski uspjeh.

Ovo istraživanje ima određena ograničenja s obzirom na korištenu metodu samoprocjene, koja je vjerojatno rezultirala poznatim pristranostima i nepouzdanim procjenama upotrebe pametnih telefona. Najdalje, zaključci su izvedeni iz relativno malog uzorka. Potencijalno ograničenje odnosi se i na relativno mali broj mogućih motiva za korištenje pametnog telefona koji su ispitani. Također, pri tumačenju ovih rezultata treba uzeti u obzir međuodnos varijabli. Odnos između testiranih pokazatelja dobrobiti i upotrebe pametnog telefona može bi biti recipročan, tako da bi niska razina dobrobiti mogla dovesti do percipirane ili stvarne upotrebe pametnog telefona i obrnuto.

Ovo istraživanje doprinosi unapređenju područja koje se bavi dječjim korištenjem pametnih telefona daljnjim istraživanjem ključnih korelata i prediktora povezanih s psihološkom dobrobiti i motivima za korištenje pametnih telefona. Važno je primijetiti da vrijeme korištenja pametnog telefona kao prediktor nije doseglo statističku značajnost u predviđanju pokazatelja dobrobiti zbog čega rezultati ovog rada daju smjer za buduća istraživanja koja bi se trebala usmjeriti na ispitivanje sadržaja kojima su djeca i adolescenti izloženi, a ne na vrijeme. Također, rezultati istraživanja pokazuju važnost svijesti djece o ometajućem učinku koji pametni telefoni mogu imati na školski uspjeh i koliko često doživljavaju taj negativan učinak. Doista, djeca često nisu svjesna da pametni telefon može imati učinak na njihovu izvedbu.

Ključne riječi: djeca; vrijeme i motivi korištenja mobitela; dobrobit; školski uspjeh.