

Supportive communication with parents moderates the negative effects of electronic media use on life satisfaction during adolescence

Meyran Boniel-Nissim · Izabela Tabak · Joanna Mazur · Alberto Borraccino ·
Fiona Brooks · Rob Gommans · Winfried van der Sluijs · Emese Zsiros ·
Wendy Craig · Yossi Harel-Fisch · Emily Finne

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Abstract

Objectives To examine the impact of electronic media (EM) use on teenagers' life satisfaction (LS) and to assess the potential moderating effect of supportive communication with parents (SCP).

Methods Data were drawn from the cross-national Health Behaviour in School-aged Children (HBSC) study (2009/2010) in Canada, England, Germany, Hungary, Italy, Israel, The Netherlands, Poland and Scotland. Sample size: 53,973 students aged 11–15 years.

Results More hours per day spent on the computer were associated with lower LS; more EM communication with friends with higher LS. This relationship became negative

if EM use reached and exceeded a certain threshold. SCP moderated the effect of EM communication with friends, but not computer use for the total sample. SCP seems to be more important than computer use or EM communication with friends for LS and it seems to buffer negative effects of EM use.

Conclusions Communication with parents seems to buffer the negative effects of EM use on LS during adolescence. Higher computer use was related to lower LS, but “optimal” frequency of EM communication with friends was country specific.

Keywords Life satisfaction · Adolescents · Computer use · Supportive communication with parents · Cross-national study

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M. Boniel-Nissim (✉)
Department of Counseling and Human Development, University
of Haifa, Haifa, Israel
e-mail: meyrannbn@gmail.com

M. Boniel-Nissim
Department of Behavioral Sciences, Kinneret College, Kinneret,
Israel

I. Tabak · J. Mazur
Institute of Mother and Child, Kasprzaka 17a, 01-211 Warsaw,
Poland

I. Tabak
e-mail: izabela.tabak@imid.med.pl

J. Mazur
e-mail: joanna.mazur@imid.med.pl

A. Borraccino
Department of Public Health and Paediatrics, University of
Torino, Turin, Italy
e-mail: Alberto.Borraccino@hbcs.org

F. Brooks
CRIPACC, University of Hertfordshire, Hatfield AL10 9AB, UK
e-mail: f.m.brooks@herts.ac.uk

R. Gommans
Centre for Child and Adolescent Studies, Utrecht University,
Heidelberglaan 2, 3584 CS Utrecht, The Netherlands
e-mail: R.Gommans@uu.nl

W. van der Sluijs
University of St Andrews, St Andrews KY16 9TF, UK
e-mail: wpmvds@st-andrews.ac.uk

E. Zsiros
National Institute of Child Health, Diószegi út 64, Budapest
1173, Hungary
e-mail: zsemaap@gmail.com

W. Craig
Psychology Department, Queen's University, Kingston, ON,
Canada
e-mail: wendy.craig@queensu.ca

Introduction

Adolescents' use of electronic media

The current generation of young people entering adolescence, electronic media (EM) is a central part of their lives. Recent data indicate that 95 % of teenagers in the USA aged 12–17 use the internet (Purcell 2013), and they spend up to 7 h a day in screen-based activities (Benson 2011). Data from the EU Kids Online study show that European 9–16-year-olds spend an average of 88 min/day online (Livingstone et al. 2011). Seven in ten UK children aged 5–15 have access to a tablet computer at home, and four in ten children aged 5–15 own a mobile phone, rising to almost eight in ten children aged 12–15 (Ofcom 2014).

EM use can positively influence social aspects of adolescent lives such as easiness to communicate with peers and number of friends (Valkenburg and Peter 2009; Kuntsche et al. 2009), as well as have a positive impact on spatial skills (Uttal et al. 2013), cognitive development, like reading skills (Johnson 2010) and even contribute to the development of resilience (Sweetser and Wyeth 2005). There is also strong evidence, however, that EM use may be related to a variety of problem behaviors in adolescence, such as internet addiction (Adiele and Olatokun 2014), shortened sleep duration, poorer diet quality, lower physical activity levels, weight gain (Jackson et al. 2011; Chahal et al. 2013), poor school performance (Möble et al. 2010), loneliness (Deniz 2010), depression and social anxiety symptoms (Becker et al. 2013), and increased likelihood of physical complaints (Torsheim et al. 2010).

The goal of the current study was to examine the impact of EM use on young people's subjective life satisfaction.

Life satisfaction and the role of electronic media use

Life satisfaction (LS) is one component of subjective well-being, consisting of the existence of positive affect, the absence of negative affect, and the cognitive judgment of satisfaction with life as a whole (Diener et al. 1985). LS is positively related to mental and physical health as well as health behaviors in adolescents. LS is furthermore associated with material and housing circumstances, and

negatively related to risk behaviors like substance use or violent behaviors (Park 2004; Bradshaw et al. 2011).

Previous analyses of the international HBSC study showed that the total amount of screen-based media use (i.e., television and computer use) was related to lower LS, more health complaints, risk behaviors, and poorer family relationships but with better peer relationships among adolescents from North America and Europe (Iannotti et al. 2009). In other studies, screen time was negatively related to overall quality of life in Australian and German adolescents (Mathers et al. 2009; Lacy et al. 2012; Finne et al. 2013).

Stepanikova et al. (2010) showed that the amount of time spent online (web, instant messaging, chat rooms, newsgroups) was negatively associated with LS and positively associated with loneliness. The amount of electronic media communication (EMC; e-mail, chat, texting and phone use) also was significantly related to more psychological, physical and attentional problems in US adolescents (Rosen et al. 2014). In another study, higher use of different forms of EMC also were related to lower LS (Ferguson et al. 2014), while in a study by Valkenburg and Peter (2007) it seemed to foster friendship quality, which in turn led to higher LS in adolescents.

Life satisfaction and the role of parents

Adolescence brings changes in family relationships, as teenagers become more independent (Steinberg and Morris, 2001). The discrepancy between parents and their children in the use of EM can weaken their relationship (Mesch, 2003). Recent research, however, has identified that quality of communication between adolescents and parents remains of significance and operates as important protective health assets (Brooks et al. 2012).

A Hungarian study found that talking about problems with parents was positively associated with LS, especially in girls (Piko and Hamvai, 2010). In Canadian and Polish studies, better parent–adolescent communication was significantly related to higher LS (Elgar et al. 2013; Tabak et al. 2013). In Dutch youth, social support from parents was more important in preventing emotional problems than peer support (Helsen et al. 2000). In addition to the potential impact of EM use on young people's subjective LS, the current study also examined to what extent supportive communication with parents (SCP) moderated the link between EM use and LS.

The current study

The first goal of the current study was to investigate the association between adolescents' EM use and their LS. The second goal was to investigate how the quality of communication with parents may interact with different forms of EM

Y. Harel-Fisch
Bar Ilan University, Ramat Gan, Israel
e-mail: harelyos@netvision.net.il

E. Finne
WHO Collaborating Centre for Child and Adolescent Health
Promotion, School of Public Health, Bielefeld University,
Universitätsstraße 25, 33615 Bielefeld, Germany
e-mail: emily.finne@uni-bielefeld.de

use to affect teenagers' LS. The third goal of the current study was to examine cross-country differences in these effects.

Method

Study design and sample

Data were drawn from the cross-national (HBSC) study, collected during the 2009/2010 school year in nine regions: Canada, England, Germany, Hungary, Israel, Italy, The Netherlands, Poland and Scotland. There were 53,973 students aged 11, 13, and 15 years (Table 1) who participated in the study.

Data were collected using a school-based survey administered in the classroom by teachers or trained researchers in each participating region. Requirements in terms of sampling, questionnaire items and survey administration were followed according to the standardized research protocol (Currie et al. 2012). Response rates ranged from 40 (England) to 86 % (Germany) with an average of 60 %; each country obtained needed ethical approvals for the survey.

Measures

Life satisfaction (LS)

Participants were asked to rate their LS using a visual analog scale—the “Cantril ladder” with 10 steps (10 = best possible life; 1 = worst possible life). Adolescents indicated where on the ladder they would place their life at present. A score of 6 or more indicated high LS (Currie et al. 2012). The item has been used in previous

work showing good reliability and significant associations with other well-being measures, and perceived and subjective health (Levin and Currie 2013).

Electronic media communication (EMC) with friends

Frequency of EMC was measured by asking how often adolescents talk to friend(s) on the phone, send them text messages or have contact through the Internet. Responses were rated on a 5-point scale (1 = never or rarely; 5 = every day). EMC with friends was dichotomised: low = less than every day; high = daily.

Computer use per day

Frequency of computer use was measured by asking how many hours a day participants usually use the computer for game playing, emailing, internet (on weekdays and at weekend). Responses were rated on a 9-point scale (1 = none at all; 2 = about half an hour a day; 3 = about 1 h a day; 9 = about 7 or more hours a day). Daily frequency of each behavior was weighted by number of days (5 weekdays and 2 weekend days) and summarized. This variable was dichotomised: low = 0–2 h/day; high = more than 2 h/day.

Supportive communication with parents (SCP)

Participants were asked how easy it is for them to talk to their mother/father about things that really bother them. Responses were rated on 4-point scale (1 = very easy; 4 = very difficult). Reported quality of communication

Table 1 Background characteristics of the sample (%)

Variable	Total sample weighted data	Canada (n = 15,919)	England (n = 3,524)	Germany (n = 5,070)	Hungary (n = 4,864)	Israel (n = 4,135)	Italy (n = 4,837)	Netherlands (n = 4,591)	Poland (n = 4,262)	Scotland (n = 6,771)
Gender										
Male	48.0	49.1	43.5	48.5	47.3	46.3	50.1	49.1	48.8	49.3
Female	52.0	50.9	56.5	51.5	52.7	53.7	49.9	50.9	51.2	50.7
Age (years)										
11	32.4	28.6	33.8	34.0	30.8	35.7	32.9	32.8	32.9	30.5
13	33.7	36.8	34.3	32.9	33.0	31.4	34.9	35.0	33.9	31.4
15	33.8	34.6	31.9	33.1	36.2	32.9	32.1	32.2	33.2	38.1
Family structure										
Intact families	71.8	66.2	62.5	73.6	70.7	85.9	81.0	79.2	80.8	64.8
Other	28.2	33.8	37.5	26.4	29.3	14.1	19.0	20.8	19.2	35.2
Family affluence										
Low	12.7	8.2	12.7	7.8	23.4	15.1	12.6	3.9	20.4	9.6
Middle	37.8	34.6	34.4	37.0	44.3	35.2	42.9	32.1	42.9	35.8
High	49.5	57.2	52.9	55.3	32.2	49.7	44.6	64.0	36.7	54.6

with father and mother were dichotomised into two categories: easy (0) and difficult (1), summarized, and again dichotomised: 0 = easy communication with both parents; 1 = difficult communication with at least one parent.

Socio-demographic information

Participants reported their gender and age, family structure (living with both parents or not), and family affluence measured by the family affluence scale, including four items about car and computer ownership, own bedroom and family holidays. Responses were summarized on an 8-point scale (0–1 = low affluence; 4–5 = average affluence; 6–7 = high affluence), in accordance with international guidelines (Boyce and Dallago 2004).

Statistical analyses

Chi-square tests were used to examine the associations between gender, age and country, and categorized independent variables. Mean LS scale scores were compared using univariate ANOVAs. Next, a series of general linear models (GLM) with interaction effects were specified and estimated. Gender, age, family affluence and structure were added as control variables. Computer use, EMC, SCP, and two interaction terms (computer use and EMC by SCP) were added as explanatory variables. Two separate step-wise logistic regression analyses were conducted to further explore the interaction effects on LS (adjusted odds ratios) using a combination of dichotomised SCP and computer use or EMC, respectively, to result in two 4-category variables. The calculations were carried out using SPSS 19. In analyses of the full sample (all countries together), data were weighted by country sample size.

Results

Most adolescents were satisfied with their life and perceived the communication with their parents as easy, especially boys [LS: χ^2 (1, $N = 46,921$) = 162.02; $p < 0.001$; SCP: χ^2 (1, $N = 42,436$) = 794.39; $p < 0.001$] and younger adolescents [accordingly: χ^2 (1, $N = 46,513$) = 157.43; $p < 0.001$; χ^2 (1, $N = 42,084$) = 1,108.83; $p < 0.001$]. Every third teenager spent time on the computer consistent with expert recommendations (no more than 2 h of media time per day, American Academy of Pediatrics 2001). Girls spent less time using the computer than boys [χ^2 (1, $N = 45,863$) = 727.49; $p < 0.001$] and younger adolescents spent more time using the computer than older adolescents [χ^2 (1, $N = 45,480$) = 1,312.55; $p < 0.001$]. Moreover, frequency of EMC with

peers increased with age [χ^2 (1, $N = 46,875$) = 3,287.62; $p < 0.001$].

There was significant variation by country on LS and SCP. In The Netherlands and Scotland, about 90 % of young people were satisfied with their life, while in Poland and Hungary it was approximately 80 %. The percentage of adolescents perceiving communication with both parents as easy was highest in The Netherlands and lowest in Italy, Canada and Scotland. Every day EMC with friends was most frequent in Israel and Scotland, and least frequent in The Netherlands and Germany. Almost half of the adolescents in Germany and Italy exceed the maximum recommended frequency of computer use; in Israel and Poland it is only a quarter.

Univariate analysis of life satisfaction determinants

Table 2 presents LS scores with regard to computer use, EMC with friends and SCP. Adolescents' LS depended on the amount of time spent on the computer: Adolescents who reported more hours per day spent on the computer reported lower LS, consistently in all surveyed countries. LS also depended on SCP: Lower LS was associated with difficulties in communication with parents in all participating countries. Additional analyses conducted with ease of communication with mother and father separately showed similar results.

A more complicated association was found between LS and EMC with friends. In the international sample and in most surveyed countries the relationship was curvilinear. In general, more EMC was related to higher LS. However, the relationship between LS and EMC became negative if EMC exceeded a certain threshold. Additional analyses with quasi-continuous variables showed that this threshold varied by country (Germany 1–2 days/week, Canada and Italy 3–4 days, Scotland and Poland 5–6 days). The relationship between EMC and LS also depended on gender and age. For boys and participants aged 11 and 15, highest LS was observed at 5–6 days of EMC per week, while for girls and participants aged 13 the relationship changed from positive to negative at 3–4 days/week.

In contrast to the curvilinear relationship found in the international sample and in most surveyed countries, a linear relationship was found in The Netherlands and in Israel, though in opposite directions. In The Netherlands, more EMC was associated with lower LS, while in Israel more EMC was associated with higher LS.

Multivariate analysis of life satisfaction

A series of alternative general linear models (GLM) were specified and estimated. In the basic model, estimated for the

Table 2 Mean scores (with standard deviations) of life satisfaction (LS) scale by computer use, electronic media communication (EMC) and supportive communication with parents (SCP)

	Total sample weighted data	Canada (<i>n</i> = 15,919)	England (<i>n</i> = 3,524)	Germany (<i>n</i> = 5,070)	Hungary (<i>n</i> = 4,864)	Israel (<i>n</i> = 4,135)	Italy (<i>n</i> = 4,837)	Netherlands (<i>n</i> = 4,591)	Poland (<i>n</i> = 4,262)	Scotland (<i>n</i> = 6,771)
Computer use per day										
0–2 h	7.74 (1.86)	7.65 (1.79)	7.67 (1.74)	7.67 (1.82)	7.47 (1.96)	8.14 (2.03)	7.76 (1.89)	8.16 (1.46)	7.33 (2.05)	7.92 (1.76)
>2 and <6 h	7.51 (1.80)	7.33 (1.83)	7.46 (1.65)	7.30 (1.79)	7.41 (1.78)	7.98 (2.03)	7.42 (1.85)	7.96 (1.42)	7.28 (1.96)	7.65 (1.67)
6 h or more	7.33 (2.09)	7.04 (1.89)	7.16 (1.87)	6.93 (1.98)	7.28 (1.87)	7.85 (2.38)	7.13 (2.16)	7.86 (1.61)	7.04 (2.21)	7.35 (2.00)
<i>F</i>	143.89	102.45	16.90	51.13	3.37	4.91	32.51	13.10	6.25	42.54
<i>p</i>	<0.001	<0.001	<0.001	<0.001	0.035	0.007	<0.001	<0.001	0.002	<0.001
EMC with friends										
0–2 days/ week	7.55 (2.04)	7.29 (2.05)	7.34 (1.98)	7.45 (1.96)	7.32 (2.01)	7.75 (2.51)	7.63 (2.06)	8.18 (1.45)	7.10 (2.22)	7.72 (1.94)
3–6 days	7.62 (1.75)	7.52 (1.74)	7.56 (1.67)	7.47 (1.73)	7.42 (1.77)	7.99 (2.16)	7.61 (1.75)	8.02 (1.34)	7.38 (1.89)	7.82 (1.63)
Everyday	7.49 (1.83)	7.30 (1.90)	7.42 (1.70)	7.28 (1.87)	7.46 (1.81)	8.07 (1.96)	7.42 (1.96)	7.76 (1.59)	7.22 (2.06)	7.54 (1.84)
<i>F</i>	19.47	21.92	3.52	4.96	2.26	7.12	6.52	31.64	5.21	15.8
<i>p</i>	<0.001	<0.001	0.030	0.007	0.104	0.001	0.001	<0.001	0.006	<0.001
SCP										
Difficult with both	6.40 (2.11)	6.41 (2.12)	6.31 (2.02)	6.46 (1.97)	5.86 (2.07)	6.35 (2.40)	6.68 (2.09)	6.37 (2.01)	5.89 (2.37)	6.65 (2.01)
Easy with one	7.06 (1.88)	7.04 (1.82)	6.99 (1.67)	7.01 (1.84)	6.82 (1.88)	7.22 (2.25)	7.18 (1.89)	7.27 (1.57)	6.69 (2.04)	7.37 (1.75)
Easy with both	7.99 (1.66)	7.90 (1.62)	7.87 (1.51)	7.88 (1.60)	7.78 (1.69)	8.29 (2.00)	8.01 (1.73)	8.28 (1.23)	7.69 (1.80)	8.15 (1.50)
<i>F</i>	2,125.86	670.89	172.20	221.33	197.85	126.56	178.42	325.84	173.55	325.39
<i>p</i>	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Bold values indicate statistical significance ($p < 0.05$)

Table 3 Socio-demographic, family and electronic media use predictors of adolescents' life satisfaction (LS)—results of general linear models by country

	Total sample weighted data		Canada (<i>n</i> = 15,919)	England (<i>n</i> = 3,524)	Germany (<i>n</i> = 5,070)	Hungary (<i>n</i> = 4,864)	Israel (<i>n</i> = 4,135)	Italy (<i>n</i> = 4,837)	Netherlands (<i>n</i> = 4,591)	Poland (<i>n</i> = 4,262)	Scotland (<i>n</i> = 6,771)	
	<i>df</i>	<i>F</i>	η^2	<i>F</i>	<i>F</i>	<i>F</i>	<i>F</i>	<i>F</i>	<i>F</i>	<i>F</i>	<i>F</i>	
Gender	1	32.91***	0.001	53.97***	17.88***	5.21*	6.10*	3.21	4.99*	19.49***	19.21***	22.78***
Age	1	597.14***	0.018	12.94***	17.35***	5.65*	167.66***	53.51***	143.97***	74.48***	80.49***	110.86***
Family affluence	1	578.44***	0.017	205.38***	15.38***	22.55***	217.75***	41.95***	76.81***	11.52**	29.86***	38.76***
Family structure	1	137.66***	0.004	86.81***	7.55**	100.87***	6.25*	6.33*	22.77***	22.01***	14.56***	44.17***
EMC	2	27.50***	0.002	23.37***	4.20*	8.59	0.28	5.49*	4.34*	8.69***	7.76***	9.61***
Computer use	2	40.14***	0.002	55.64***	3.67*	24.57***	0.19	5.22**	10.93***	0.53	5.38**	22.38***
SCP	2	1,053.72***	0.060	440.93***	74.75***	387.25***	131.24***	81.61***	81.65***	201.83***	88.52***	158.83***
Interaction EMC*SCP	4	3.58**	0.000	3.63**	0.82	3.19	1.89	1.34	1.29	6.24***	2.21	1.37
Interaction computer use*SCP	4	1.77	0.000	7.04***	4.12**	6.39	2.37	2.11	0.74	1.22	2.81 *	0.90
<i>R</i> ²	0.137			0.143	0.152	0.117	0.185	0.139	0.140	0.172	0.137	0.153

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

international sample and for each country separately, four control variables (gender, age, family affluence and structure), three explanatory variables (computer use, EMC, and SCP), and two interactions (computer use by SCP, EMC by SCP) were included (Table 3). In the final model for the international sample, all explanatory variables and one interaction (EMC \times SCP) were significantly associated with LS ($R^2 = 0.137$). Additional GLM models estimated for boys and girls separately revealed a significant computer use by SCP interaction for boys [$F(4, 15588) = 2.81, p < 0.05$]. Models estimated for each age group separately only showed a significant computer use by SCP interaction for the 15-year-old adolescents [$F(4, 11292) = 2.40, p < 0.05$].

GLM models estimated in different regions showed many similarities: age and family characteristics were strong and significant predictors of adolescents' LS in all participating countries. EMC and computer use were associated with adolescents' LS in most countries. In some countries, SCP moderated the relationships between LS and EMC (Fig. 1) or computer use (Fig. 2). The inverse relationship between LS and frequent computer use or using EMC daily was the strongest in adolescents who perceived their communication with both parents as difficult. SCP, therefore, seems to be a protective factor for adolescents' LS.

Two stepwise logistic regression models were estimated (with gender, age, family affluence and structure as control variables) to assess adjusted odds ratios for high LS. In Model 1, the variable combining computer use and SCP was used; in Model 2—EMC with friends and SCP. Difficult communication with one or both parents combined with high computer use (>2 h/day) or daily EMC with friends were the reference groups. The probability of high LS increased about threefold when communication with both parents was easy and computer use or EMC was low (Table 4). Estimations of Model 1 in different countries revealed similar results. The probability of high LS increased with SCP and low computer use with odds ratio's varying from 2.36 (Poland) to 5.46 (England).

Estimations of Model 2 in different countries revealed similar results. The probability of high LS increased with SCP and low EMC use with odds ratios varying from 1.90 (Israel) to 3.36 (Germany), except for The Netherlands (OR = 8.05).

Discussion

We analyzed associations of EM use with LS in a large sample of adolescents from nine countries as well as the possible moderating role of supportive communication with parents. Associations between EM use and LS differed between countries, and these associations were generally of lower magnitude than associations between

Fig. 1 Adolescents' life satisfaction—statistically significant interactions between electronic media communication and supportive communication with parents (Canada, The Netherlands, 2009/2010)

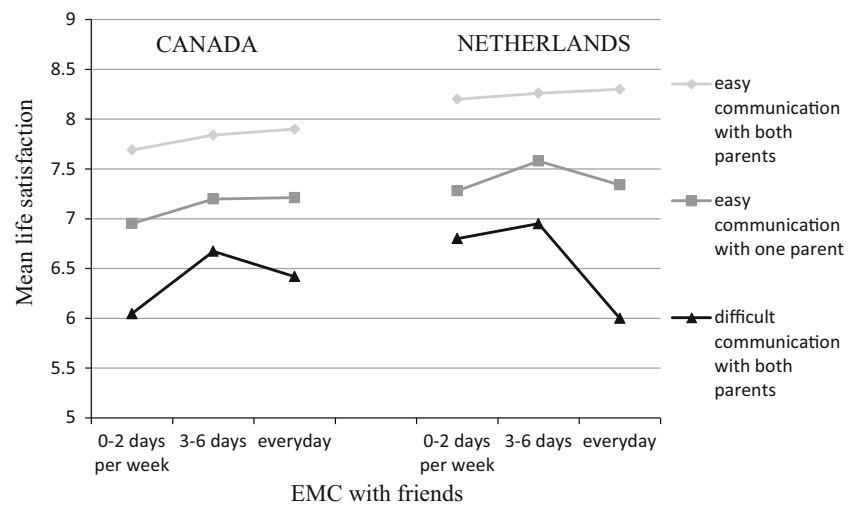
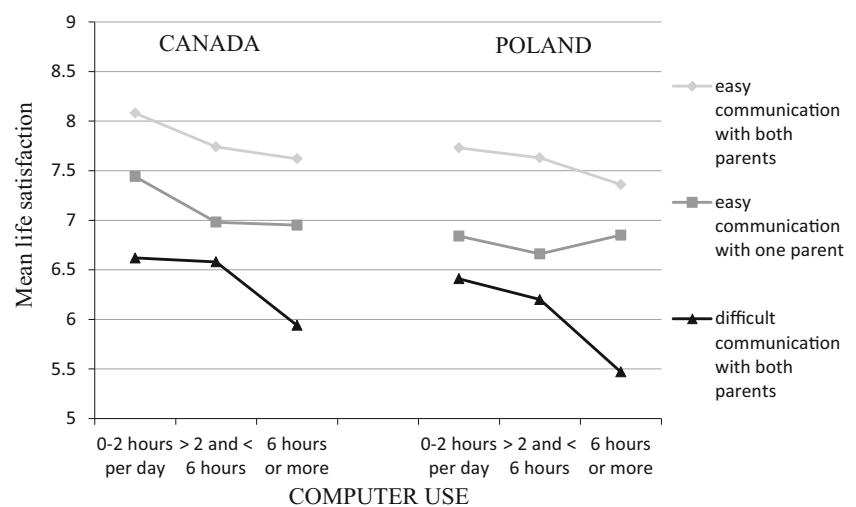


Fig. 2 Adolescents' life satisfaction—selected statistically significant interactions between computer use and supportive communication with parents (Canada, Poland, 2009/2010)



SCP and LS. Parent communication moderated the effect of EMC with friends on LS but not the effect of computer use on LS for the total sample. Interaction effects also strongly differed between countries. Overall, supportive parenting seems to be more important than computer use or EMC with friends for LS and it seems to buffer the negative effects of EM use.

Electronic media and life satisfaction

Regarding EM use and LS, our results revealed that in all included countries a higher amount of computer use was consistently associated with lower LS. This is in line with previous studies showing that higher use of screen media is related to lower LS in adolescence (Iannotti et al. 2009; Racine et al. 2011; Lacy et al. 2012) and that higher computer use is associated with psychological problems in children or teenagers (Mathers et al. 2009; Page et al. 2010; Rosen et al. 2014).

The results demonstrated greater variation for EMC with friends. This difference between computer use in general and EMC with friends may be explained by the type of applications used, for example, communication versus non-communication applications. As Valkenburg and Peter (2011) emphasize, the effects of online communication with friends (positive) differ from the effects of gaming, surfing or chatting with strangers (negative). Computer use and EMC should, therefore, be considered separately in terms of their relation with LS.

Although EMC with friends is generally thought to have positive effects on intimacy and well-being (Valkenburg and Peter 2009; Manago et al. 2012) some studies also found the amount of EMC to be related to psychological problems and lower LS (Stepanikova et al. 2010; Ferguson et al. 2014; Rosen et al. 2014). In our study, we found a curvilinear relation. With the exception of Israel and The Netherlands, adolescents reporting very low or very high EMC with friends had the lowest LS, while the frequency

Table 4 Results of logistic regression models (gender, age, family affluence and structure as control variables)—adjusted odds ratios for the prediction of high life satisfaction (LS)

Variable	Analyzed group	Reference group	<i>p</i>	OR	95 % IS
Computer use (Model 1)		Low SCP with one or both parents and computer use more than 2 h/day			
	High SCP with both parents and computer use 0–2 h/day;		<0.001	3.43	3.12–3.77
	High SCP with both parents and computer use more than 2 h/day		<0.001	2.86	2.65–3.07
	Low SCP with one or both parents and computer use 0–2 h/day		<0.001	1.18	1.08–1.30
EMC with friends (Model 2)		Low SCP with one or both parents and everyday EMC with friends			
	High SCP with both parents and EMC with friends less than everyday		<0.001	2.73	2.51–2.98
	High SCP with both parents and everyday EMC with friends		<0.001	3.03	2.65–3.07
	Low SCP with one or both parents and EMC with friends less than everyday		0.781	0.99	0.91–1.07

of EMC that was associated with the highest LS differed by country, gender and age group. Our findings, therefore, suggest that there is a (country-specific) optimal frequency of EMC with friends.

This perspective supports the view that using EM to communicate with friends is normative among adolescents and not complying with this norm may compromise quality of social interactions, as excessive EMC does. Analyses, however, also revealed that the ‘optimal’ frequency of EMC seemed to be higher in boys than in girls, while girls in general use EMC more frequently.

An alternative explanation would be that EMC with friends mirrors non-virtual friendships and that those with few contacts, therefore, use EM less for communication. Other research in fact showed that EMC with friends was positively related to number of close friends and face-to-face contacts (Kuntsche et al. 2009). Youth with exceedingly frequent EMC also may have more but less intimate friendships and, therefore, report a lower LS. Furthermore, especially frequent EMC could be a sign of a compulsive use in some adolescents.

The optimal frequency of EMC with friends varied in line with the average country frequency. In countries where every day EMC was less frequent, the optimal frequency tended to be lower (Germany, The Netherlands) while in countries with the highest frequency of daily EMC (Israel, Scotland) higher frequencies seemed optimal. This finding supports the assumption that the optimal level of EMC in adolescents corresponds to the norm.

Cross-country differences in the associations of EM and LS might be explained by differences in the functions EM serves for adolescents from different countries or different types of EM that are predominately used for

communication with friends. We cannot, however, identify these possibilities because different types and functions were not assessed. Moreover, there are cultural differences in average LS as well as differences in relevance of different life domains for LS that may also influence the strength of the associations (Park 2004). Another explanation for the between-country variation in associations might be that countries differ in the number of opportunities youths have to contact friends in person versus virtually using EMC (for example due to different school schedules and spatial spread of housing spaces). In countries where there are less opportunities to meet face-to-face, EMC may be a more common alternative, but more frequent EMC may also be necessary to maintain close relationships and well-being.

Between-country variation in EM effects may explain some of the inconsistent results relating to the associations of EM use and LS reported in the literature. Nevertheless, previous studies also differ markedly in the specific technologies and functions that were studied in relation to LS and mental health. Further cross-national studies with more differentiated measures of technologies used, norms, motives and functions could help to explain country-specific effects. Associations between EM use and LS, however, were generally small, compared to effects of socio-demographic variables and parental communication.

Supportive communication with parents

Multiple parental factors are assumed to be an important protective resource for adolescents’ LS and other health-related outcomes (Park 2004; Antonogeorgos et al. 2013) with ease of family communication being seen as an

important determinant of adolescent health. Concerning the positive associations between SCP and LS, our study supports this assertion. Furthermore, our results are in line with other research findings demonstrating that supportive parent–adolescent communication is an important resource for LS during adolescence (Moreno et al. 2009; Levin and Currie 2010; Piko and Hamvai 2010; Elgar et al. 2013).

In our study, SCP seemed to be more important for LS than EMC with friends. This finding is consistent with other research showing that parental support or communication quality has a more significant effect on psychological well-being than peer relations (Helsen et al. 2000; Moreno et al. 2009). Positive effects of parent relations are thought to evolve particularly through a buffering effect on stress, specifically, as a resource for coping with potential stressors (Levin and Currie 2010). Our result that SCP moderated the associations between EM use and LS confirms this view, since in general negative media effects were smaller—especially concerning EMC—when communication with parents was rated as easy.

An explanation for between-country differences in the moderator effects could lie in the measure itself, as we asked for talking about “things that really bother you” without specifying topics. It might be that there are cultural differences in communication style. However, associations of SCP and LS were consistently found cross nationally.

Concerning health promotion and prevention, our results indicate that prevention strategies regarding excessive media use in adolescence should differentiate between EMC with friends versus other activities. In terms of EMC, programs should not rely on ‘one size fits all’ recommendations on maximum use, but have to take into account the country-specific patterns of use in this age group. More research is needed to disentangle the factors that determine under which conditions a certain amount of EMC may become detrimental to well-being and why. Parents and teachers should be aware that EMC with friends nowadays is a normative way of communication but not per se a sign of less intimate friendships or loneliness. Furthermore, instead of demonizing use of EMC, parents should be aware of the outstanding role their own relationship with their children has for youths’ well-being.

Strengths and limitations

A major advantage of the HBSC study is that it allows for cross-national comparisons based on a standardized research protocol and uniform measurements. Since EM measures markedly differ between studies, international comparisons are rare. Furthermore, the study uses large, nationally representative samples and all included measures are validated. We found no other study that examined

the moderating role of SCP on the associations between EM and LS.

A main limitation of the study is its cross-sectional design that does not allow for causal inferences. Moreover, all measures are based on self-reports, and this may overestimate associations. Because the HBSC study assesses a wide range of health-relevant variables, measurements have to be short and often comprise of one-item-measures. Such a situation occurred with the SCP measure, where only information about easiness of communication was assessed. However, many previous studies validated this question as a good measure of the respondent’s relationship with parents (Currie et al. 2012). Different forms of EMC with friends (i.e., texting, phone calls, e-mailing or using social network sites) or different functions of computer use were not distinguished. Further research is required to study more specific effects and to learn how these effects may interact with SCP.

Conclusion

Our study confirms the important role of communication with parents for adolescents from different countries, and implies a buffering of negative effects of EM use on LS in early adolescents. While higher computer use in general was related to lower LS, there seems to be an optimal frequency of EMC with friends that seems to relate to the typical country-specific frequency of use. Nevertheless, compared to ease of parent–adolescent communication and socio-demographic characteristics the effect sizes of EM were rather small.

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