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Predictors of children's and young people's digital engagement in informational, communication, and entertainment activities: findings from ten European countries

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ABSTRACT

Through a re-analysis of survey data collected with a sample of 9,731 youth aged 11–17 from 10 European countries, the article explores how some of the most popular online activities for children and young people (i.e., informational, social, and entertainment activities) relate to different types of perceived digital skills, as well as individual and social characteristics (such as age, gender, emotional problems, sensation seeking, parental mediation, and family environment). Furthermore, this paper looks at the moderating role of the family environment between enabling parental mediation and online activities. Using multi-group structural equation modeling we found that emotional problems, perceived informational and social digital skills, and enabling parental mediation were associated with informational online activities; sensation seeking, perceived informational digital skills, and enabling and restrictive parental mediation were associated with social online activities; and restrictive parental mediation was associated with entertainment online activities. Implications of these findings for educators, policy-makers, and parents are outlined, as well as limitations and future directions.

IMPACT SUMMARY

Prior State of Knowledge: When going online, children and young people more commonly engage in informational, communication, and social activities. While different online activities may promote different positive outcomes, variables like digital skills, individual and social characteristics make a difference in what they do.

Novel Contributions: We found that perceived informational digital skills was the most consistent predictor of all kinds of online activities, followed by enabling parental mediation positively predicting engagement in informational and social activities and restrictive mediation negatively predicting social and entertainment activities.

Practical Implications: Findings are informative for policy-makers and educators to promote curricula fostering informational digital skills, predicting engagement in all kinds of activities, and parents to adopt an enabling mediation style allowing children to undertake a more diverse range of online activities.

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1. Introduction

With a plethora of activities children and young people can undertake online, research has shown that the ones they more commonly engage in are informational, communication, and social activities (Smahel et al., 2020). Policy discourses consider the breadth and range of digital activities taken up as an important measure of children's and young people's digital inclusion, along with digital skills. Because engaging in a diverse range of activities can foster diverse personal, economic, social, and cultural outcomes (Van Deursen & Helsper, 2018), this paper aims to expand this line of inquiry by examining the role of certain predictors of these activities among a sample of European children and young people to better understand how they can be promoted by educators, policy-makers, and parents.

To this end, building on a reanalysis of EU Kids Online survey data collected with a sample of 9,731 youth aged 11–17 from 10 European countries, the present article aims to analyse the relationships between online activities (i.e., informational, social, and entertainment activities), different types of perceived digital skills (informational and social), as well as individual (age, gender, emotional problems, sensation seeking), and social variables (parental mediation and family environment).

2. Background literature

2.1. Children's and young people's online activities and digital inclusion

Research has shown that digital inclusion is not a matter of a clear-cut divide between those who have access and those who do not (Hargittai, 2004), nor that having access to the internet automatically means benefitting from the full range of opportunities it offers (Correa, 2016). Based on these findings, the debate around digital inclusion has shifted from the first-level digital divide focused on access and motivations, to more nuanced definitions of digital inclusion gradually encompassing skills and usage (the second-level digital divide), and, more recently, tangible outcomes of internet use (the third-level digital divide, see Helsper, 2021).

Focusing on usage and online activities, it has been observed that "different patterns of media usage influence life chances to different degrees depending on the particular activities in which people engage online" (Zillien & Hargittai, 2009, p. 275). However, not all online activities are considered as equally beneficial: in fact, research with the general population has observed how certain activities are more capital-enhancing than others (Pearce & Rice, 2013, 2017; van Deursen & van Dijk, 2014), leading to more positive tangible outcomes of internet use. Hence, if educators, policy-makers, and parents aim to foster online activities to advance children and young people's digital inclusion and balance internet risks, we need, first, to take a step back to better understand what activities are more popular with children and young people, and second, whether and how factors such as digital skills and other individual and social variables predict them.

Given the range of activities children can do online, scholars have developed classifications to group-related ones together. However, the classifications of online activities, and hence of internet use, are diverse. At a more concise level, Song, Larose, Eastin, and Lin (2004, cited in Elhai et al., 2017) differentiate between process use (concerning using the

internet to navigate websites and watching movies) and social use (engaging in instant messaging and social media interactions) of the internet, a classification that has been applied to smartphone use too (Elhai, Hall, Levine, & Dvorak, 2017). In a broader typology of internet uses, Blank and Groselj (2014) distinguish between entertainment, commercial, information seeking, creative, socialising activities, and the like, showing how users variously engage with the internet. As such, when studying children's and young people's different online activities, it is important to recognize that they are "not uniform across youth but instead vary in form and magnitude" (Mannerström, Hietajärvi, Muotka, & Salmela-Aro, 2018, p. 3).

Another way of looking at what activities children and young people undertake online, is through the lenses of Ito and Ito et al. (2010) theoretical classification, which distinguishes between friendship-driven and interest-driven activities (Hietajärvi, 2019; Mannerström et al., 2018). The former concern activities such as gaming and social networking, while the latter focuses on information-seeking and content creation. Another classification is provided by the EU Kids Online framework – the one this paper refers to – differentiating between educational/informational, social, and entertainment activities in line with the main motivations for school-aged children to go online (Smahel et al., 2020). Educational/informational activities include using the internet for schoolwork, to seek for news online, etc.; social online activities encompass the use of social networking sites (SNSs) and other online communicative practices (i.e., to keep in touch with friends and family and to make new friends); while entertainment activities include playing video games, watching videos, or listening to music.

Studies show that these activities are quite integrated in children's everyday life. Findings from Global Kids Online (Livingstone et al., 2019), for example, show that up to two in five children use the internet for information seeking at least once a week (such as learning something new, looking for news, health information, etc.); children also frequently engage in at least one or two forms of online social interactions (SNSs or instant messaging); as for entertainment, watching online videos and playing online games are also popular. Data from the US (Rideout & Robb, 2019) equally show that around 3 in 10 tweens and nearly 6 in 10 teens use digital media daily for homework; almost half of tweens and teens use some form of digital gaming daily, and 13% of tweens and 63% of teens use social media every day. Along the same lines, EU Kids Online data (Smahel et al., 2020) offer further support for the notion that some of the most popular activities children engage in are using the internet for schoolwork, communicating with family and friends, using SNSs, watching videos, and playing online games.

Several individual and social variables intersect in differentiating the degree to which children and young people use the internet (Helsper, 2021). Matters such as gender, age, family environment, and parental mediation of internet use, as well as digital skills and psychological wellbeing make in fact a difference not only in terms of access but also with respect to the types of online activities undertaken by children and young people. While preliminary descriptive analyses from the EU Kids Online data looked at associations between individual variables, such as gender, age, and online activities (Smahel et al., 2020), there is still a paucity of literature examining the role and weight of these variables together in predicting children's and young people's engagement in informational, social, and entertainment activities. As such, in this paper we will perform more sophisticated analyses than those already done in the past, adding new variables and going more in

depth than in previous reports informed by the same dataset (Mascheroni, Cino, Mikuška, Lacko, & Šmahel, 2020; Smahel et al., 2020).

2.2. Digital skills and online activities

Digital skills can be defined as the competences that help individuals achieve "beneficial, high-quality outcomes in everyday lives for themselves and others" (International Telecommunication Union (ITU), 2018, p. 23) when using digital technology. When it comes to variables discriminating the way people engage with the internet, empirical evidence supports that they are among the most important explanatory variables of engagement in different online activities (Helsper, van Deursen, & Eynon, 2015).

As the results of a recent systematic evidence review on the antecedents and consequences of digital skills has shown, most studies investigate online activities as a predictor of digital skills: out of the 110 studies included in the review, only seven studies measured online opportunities as an outcome of digital skills (Haddon et al., 2020). The seven studies are consistent in showing a positive association between digital skills and participation in a range of online activities, including information-seeking, communication, schoolwork, and entertainment (such as listening to music). However, the authors of the review emphasise that our knowledge of such a relationship could be further investigated. Research supports that children's digital skills influence their capacity to engage in different digital practices (Mannerström et al., 2018). Users with more skills, in fact, tend to engage in more diverse types of online activities (Hargittai & Hinnant, 2008; Livingstone & Helsper, 2007; Pruulmann-Vengerfeldt & Runnel, 2012). Thus, digital skills and differentiated uses of digital media are correlated themselves (Correa, 2016).

However, as the literature shows, these opportunities, as well as the digital skills conducive to beneficial outcomes, are not equally distributed, since children with less digital skills take on less online opportunities in terms of range of online activities undertaken (Haddon et al., 2020; Livingstone & Helsper, 2010). Considerable variations among children exist, especially in information-navigation skills, communication skills, and content-creation skills (Helsper, 2021). Additionally, empirical evidence defies simplistic understandings of the relationship between digital skills and online activities, which, in fact, is far from linear (Helsper & Eynon, 2013). Thus, "theoretically, it is important to disaggregate different skills because operational, information processing, social and creative skills have different predictive capabilities for different uses of ICTs" (Helsper, 2021, p. 31), and, hence, for different outcomes of ICTs use. In other words, a specific set of skills are variously conducive to distinctive types of internet use for young people. So far, though, research examining the relationship between specific kinds of digital skills and different online activities has been sparse.

Helsper and Eynon (2013) tackled the topic arguing that digital skills should be conceived as a multi-layered set of competences – composed of operational, critical, social, and creative – that, in turn, may influence the different types of online activities one undertakes. In their study, the authors have shown that not every type of digital skills are associated with the same activities. For example, while content creation skills are associated with online creative activities, social digital skills were more strongly related to online social interactions, whereas critical skills were negatively related to social and

creative activities (Helsper & Eynon, 2013). Other studies found that informational skills, in turn, are associated with online content creation (Tirado-Morueta, Mendoza-Zambrano, Aguaded-Gómez, & Marín-Gutiérrez, 2017).

It follows that digital skills can help children engage in a more differentiated use of the internet. This of course poses important questions since what children can do online also has important implications for digital and social inequalities. In fact, "the digital divide is generally regarded as a new form of social inequality, in which different patterns of media usage influence life chances to different degrees depending on the particular activities in which people engage online" (Zillien & Hargittai, 2009, p. 275).

Against this background we pose our first research question:

RQ1: How do different dimensions of digital skills (informational, social) relate to different online activities (informational, social, entertainment)?

2.3. Individual characteristics and online activities

When it comes to understanding children's take up of different online activities, both their access and digital skills, as well as their individual characteristics matter (Helsper, 2021; Pruulmann-Vengerfeldt & Runnel, 2012).

The literature supports that digital engagement varies based on age and gender. Studies found that older children who have been using the internet for more years generally engage in a more diverse range of activities than their younger peers (Livingstone & Helsper, 2007; Pruulmann-Vengerfeldt & Runnel, 2012). Older children are more likely than younger children to use the internet for schoolwork, access SNSs, watch videos, or playing video games online (Smahel et al., 2020). Boys also tend to engage in entertainment activities such as gaming more than girls, who conversely are more likely to engage in online social activities – though when it comes to SNSs, the gender difference is indeed small (Brooks, Chester, Smeeton, & Spencer, 2016; Ortega et al., 2010).

Similarly, psychological variables play a role in how children engage with the internet. For example, research shows that children who are more inclined to seek out new and sensational experiences may be more likely to engage in online social interactions and to expand their social contacts; furthermore, children with emotional problems tend to engage more in informational digital activities (Mascheroni et al., 2020).

As such, we pose our second research question:

RQ2: How do individual characteristics (age, gender, emotional problems, sensation seeking) relate to different online activities (informational, social, entertainment)?

2.4 Social characteristics and online activities

As for social characteristics, research has explored the role of socioeconomic status (SES) and parental mediation in children's online experiences. Several studies found that higher SES is associated with more online opportunities for children (Aesaert, van Nijlen, Vanderlinde, & van Braak, 2014; Balea, 2016), since more economically advantaged children are more likely to live in media-rich homes, thus using technology more and engaging in more online activities (Pruulmann-Vengerfeldt & Runnel, 2012). Parental mediation – that is, the diverse strategies adopted by parents to regulate their children's use of digital media – is also relevant. There is in fact strong evidence supporting that

when parents adopt an enabling mediation (that is, using strategies that encourage children's online exploration, offering guidance and support), children engage in a broader range of digital activities, while restrictive mediation (when certain activities or experiences are restricted or banned) hinders these outcomes (Livingstone et al., 2017).

We also know from previous research that the family environment, measured by parental control and parental warmth, can influence children's internet use (Valcke, Bonte, De Wever, & Rots, 2010), even though little is known on how they relate to specific online activities. Family environment also plays a moderating role between individual characteristics and internet usage (Kvardova, Smahel, Machackova, & Subrahmanyam, 2021), and previous research also found a moderating effect on parental mediation and problematic internet usage (Chng, Li, Liau, & Khoo, 2015). In this study, we explore the moderating role of the family environment between enabling parental mediation and children's online activities. We wonder whether warm family relationships might strengthen the relationship between enabling mediation and informational online activities.

On such bases, we pose the following research questions:

RQ3: How do different styles of parental mediation (enabling, restrictive) relate to different online activities (informational, social, entertainment)?

RQ4: How does the family environment relate to different online activities (informational, social, entertainment)?

RQ5: How does the family environment moderate the relationship between enabling parental mediation and online activities (informational, social, entertainment)?

3. Method

The current study uses an international dataset from the EU Kids Online IV project, containing 25,101 participants aged 9–17 from 19 European countries (Smahel et al., 2020). For our analyses, we removed participants younger than 11, because some countries included only children 11 years and older, resulting in 15,416 participants. Subsequently, only countries where interviews took place in schools were incorporated into the analysis, to avoid systematic differences between countries due to different methods of data collection. This resulted in 9,731 participants from 10 countries (Belgium, the Czech Republic, Finland, Malta, Poland, Portugal, Republic of Serbia, Romania, Spain, and Switzerland). Participants' demographics are shown in Table 1.

Sampling and data collection was done through schools with proportional stratified random-cluster sampling. Data were collected between October 2017 and April 2019. Questionnaires were administered by trained administrators in schools. The data collection was approved by relevant ethical bodies in each country, and children's and parents' consent was sought.

3.1. Measures and variables

Online activities were measured with 15 items (adapted from Helsper et al., 2015). Based on our prior statistical analyses and rational reasoning on two random halves of the sample (with exploratory and confirmatory statistical techniques), the items were dichotomized, five items were omitted and the rest 10 items were divided into thematically

Table 1. Descriptive statistics of participants.

Country	N of participants	Gender (women)	Age M (SD)	SES Me (IQR)
Switzerland	573	288 (52.3%)	13.7 (1.0)	7 (2)
Czech Republic	1848	933 (50.5%)	14.0 (1.4)	6 (2)
Spain	1837	867 (47.2%)	13.5 (1.2)	7 (2)
Finland	788	400 (50.8%)	14.5 (1.2)	7 (2)
Malta	784	470 (59.9%)	13.6 (1.4)	7 (2)
Poland	616	348 (56.5%)	13.6 (1.3)	6 (2)
Portugal	1199	597 (49.8%)	13.8 (1.3)	6 (3)
Romania	547	528 (47.2%)	13.9 (1.6)	7 (2)
Republic of Serbia	675	367 (54.4%	14.2 (1.4)	7 (2)
Belgium	864	449 (51.9%)	14.5 (1.2)	7 (1)
Total	9731	4977 (51.1%)	13.9 (1.3)	7 (2)

Note: N = number, M = mean, SD = standard deviation, SES = socioeconomic status, Me = median, IQR = interquartile interval.

similar clusters: informational online activities (four items; ordinal α were between .569 and .748, M = .666), social online activities (three items; ordinal α were between .441 and .758, M = .615), and entertainment online activities (three items; ordinal α were between .374 and .815, M = .616). The rationale behind this decision is described in detail in Appendix 1.

Emotional problems (Goodman, Meltzer, & Bailey, 1998) were measured with four items (e.g., "*I am often unhappy, sad or tearful*") answered on a 4-point Likert-type scale (1 = not true for me, 4 = very true for me). Scale showed satisfactory internal consistency (McDonald's ω were between .707 and .874, M = .803).

Sensation seeking (Slater, 2003) was assessed with two items (e.g., "*I do dangerous things for fun*") answered on a 4-point Likert-type scale (1 = not true, 4 = very true). Scale showed satisfactory internal consistency (Spearman-Brown ρ were between .810 and .910, M = .853).

Enabling parental mediation was measured with four items (e.g., "[My parent/carer] *suggests ways to use the internet safely*"). On each item, participants are answering on a 5-point Likert-type scale (1 = never, 5 = very often). The scale was newly developed. Scale showed satisfactory internal consistency (McDonald's ω were between .739 and .848, M = .796).

Restrictive parental mediation was measured with three items (e.g., "[My parent/carer allows me to] *download music or films*") answered on a 4-point Likert-type scale (1 = I am allowed to do this anytime, 4 = I am not allowed to do this). The scale was also newly developed. The scale showed average satisfactory internal consistency (McDonald's ω were between .609 and .783, M = .695).

Family environment (WHO, 2016; Zimet, Dahlem, Zimet, & Farley, 1988) was measured with three items (e.g., "*I feel safe at home*") answered on a 4-point Likert-type scale (1 = not true, 4 = very true). Scale showed satisfactory internal consistency (McDonald's ω were between .700 and .868, M = .789).

Perceived digital skills (Helsper et al., 2015) were measured with 11 items. However, we included only two out of five perceived digital skills dimensions, namely perceived social digital skills (two items, e.g., "*I know which information I should and shouldn't share online*") and perceived information digital skills (two items, e.g., "*I find it easy to check if the information I find online is true*") into our analysis; because of the low variability in operational skills, we found across our data, and also due to the fact the literature

does not show benefits associated with operational skills (Livingstone, Mascheroni, & Stoilova, 2021; Mascheroni et al., 2020). On each statement, participants answered on a 5-point Likert-type scale (1 = Not true of me, 5 = Very true of me). The scale showed a rather weaker internal consistency (Spearman-Brown ρ for perceived social digital skills were between .541 and .754, M = .667; and for perceived information digital skills, ρ were between .503 and .798, M = .652).

Besides the mentioned scales, participants also fulfilled questions regarding their socioeconomic status (SES) on a 10-point ladder compared to other people in their countries and time they spent on the internet during a regular school day on a 9-point Likert-type scale (1 = Little or no time, 9 = About 7 hours or more). All item wordings can be found in the EU Kids Online 2020 technical report (see Zlamal et al., 2020).

3.2. Data analysis

We used multi-group structural equation modeling (MG-SEM) because it allows to 1) use variables as indicators of underlying constructs and consequently incorporate them into the measurement model as latent variables (Kline, 2016); 2) model the measurement errors and unexplained variances (Nunkoo & Ramkissoon, 2012); 3) verify and establish the measurement invariance across groups which is crucial, especially in cross-cultural research (Lacko et al., 2022).

In the measurement model, we specified all explanatory variables (emotional problems, sensation seeking, enabling parental mediation, restrictive parental mediation, family environment, social digital skills, and information digital skills) as latent variables. Online activities were incorporated into analysis as manifest variables calculated as a dichotomized sum of each online activity. The latent interaction of enabling parental mediation by the family environment was created with a match-paired approach (Marsh, Wen, & Hau, 2004) with using double-mean centering estimation strategy (Lin, Wen, Marsh, & Lin, 2010), and subsequently incorporating it into the measurement model as a latent variable. In the model, we also specified common-method variance to control a common-method bias and response style of participants (Podsakoff, MacKenzie, & Podsakoff, 2012).

The final estimates (standardized regression coefficients, standard errors, and p-values) were calculated via non-parametric bootstrapping (1,000 iterations). Full info maximum likelihood (FIML) was used to handle missing values. We set the smallest effect size of interest (SESOI) for the interpretation of significant structural regressions to ±.07 meaning that $-.07 < β < .07$ is considered practically insignificant despite its potential statistical significance (on traditional 5% level). We set this criterion ad-hoc and purely arbitrary to avoid interpretations of negligible effects due to the huge statistical power caused by large sample size.

The analyses were conducted in *R* (v4.0.3; R Core Team, 2020), in packages *lavaan* (Rosseel, 2012), *semTools* (Jorgensen, Pornprasertmanit, Schoemann, & Rosseel, 2021), *sjstats* (Lüdecke, 2020), and *psych* (Revelle, 2021). *R* syntax and additional materials are available online (https://osf.io/mbkwq/).

3.3. Analysis assumptions

Henze-Zirkler's tests showed a multivariate non-normality data distribution (all p < .001) and Anderson–Darling tests confirmed the non-normality on a univariate level (all p < .001; some items showed higher skewness than 2). Hence, we used maximum likelihood estimation with robust (Huber-White) standard errors (MLR) for the calculation of model fit indices and measurement invariance despite the ordinal nature of Likert-data because MLR can handle four or five categories relatively effectively (e.g., Rhemtulla, Brosseau-Liard, & Savalei, 2012) and may produce less biased estimates in case of high violation of normality than ordinal WLSMV (Li, 2016).

Before the main analysis, the psychometric properties of the used scales (see Appendix 2 for detailed report) and the measurement invariance of the whole model were verified (see, e.g., Davidov, Meuleman, Cieciuch, Schmidt, & Billiet, 2014; Meredith, 1993). The metric measurement invariance was successfully established and the results also suggested that it is adequate to constrain the regressions to be equal across countries, i.e., that the countries did not differ statistically in the valency and size of regression coefficients (for more details, see Appendix 3).

4. Results

The descriptive statistics of the used variables for each country (arithmetic means with 95% confidence intervals, standard deviations, and medians for explanatory variables and relative frequencies of each category for outcomes) are available in Appendix 4.

The final structural model fit the data well, RMSEA = .045 [.044, .046], SRMR = .063, CFI = .907 and its metric invariance was also established, ΔRMSEA < .001, ΔSRMR = .002, ΔCFI = .009. In this section, we report and interpret only focal predictors considered in the research questions that showed practically significant effects. The comprehensive results of regression analyses based on the bootstrapping are shown in Table 2. The significant paths are also depicted in Figure 1:

Concerning informational online activities, we found that they are positively associated with emotional problems (β = .13), enabling parental mediation (β = .15) and informational digital skills (β = .26), and negatively with social digital skills (β = −.18). Children and young people, who reported higher emotional problems and informational digital skills, reportedly received more enabling parental mediation, and simultaneously scored lower on social digital skills were generally more likely to engage in information-seeking activities.

As for social online activities, they were positively associated with sensation seeking (β = .07), enabling parental mediation (β = .07) and informational digital skills (β = .08), whereas negatively with restrictive parental mediation (β = −.14). Therefore, children and young people, who showed higher scores on sensation seeking scale, received more enabling but lower restrictive parental mediation, and reported more informational digital skills tended to do more online activities related to communication and sociality.

The online activities related to entertainment were positively associated with informational digital skills (β = .07) and negatively with restrictive parental mediation (β = −.08). That means that children and young people with higher informational skills and lower restrictive parental mediation used the internet more for entertainment. Furthermore, the

Table 2. Regression analysis.

Endogenous variable	Exogenous variable	β	95% CI	SE	p
Informational online activities	Emotional problems	.131	.098, .164	.017	< .001
	Sensation seeking	.040	.003, .076	.018	.032
	Enabling parental mediation	.150	.112, .188	.019	< .001
	Restrictive parental mediation	.025	−.007, .058	.017	.130
	Family environment	−.058	−.133, .017	.038	.127
	Informational digital skills	.261	.208, .313	.027	< .001
	Social digital skills	−.180	−.243, −.116	.032	< .001
	Latent interaction: Enabling parental mediation X Family environment	.010	−.046, .065	.028	.736
	Control: Age	.097	.080, .113	.008	< .001
	Control: Gender	−.006	−.049, .038	.022	.789
	Control: SES	.032	.018, .046	.007	< .001
	Control: Time online	.022	.012, .032	.005	< .001
Social online activities	Emotional problems	.041	.017, .065	.012	< .001
	Sensation seeking	.071	.046, .097	.013	< .001
	Enabling parental mediation	.074	.048, .100	.013	< .001
	Restrictive parental mediation	−.135	−.164, −.106	.015	< .001
	Family environment	−.038	−.099, .023	.031	.218
	Informational digital skills	.081	.038, .123	.021	< .001
	Social digital skills	.049	−.006, .103	.028	.079
	Latent interaction: Enabling parental mediation X Family environment	−.042	−.086, .002	.022	.059
	Control: Age	.065	.052, .079	.007	< .001
	Control: Gender	.112	.075, .148	.018	< .001
	Control: SES	.026	.015, .037	.006	< .001
	Control: Time online	.079	.071, .088	.004	< .001
Entertainment online activities	Emotional problems	.025	.001, .050	.012	.043
	Sensation seeking	.064	.036, .093	.015	< .001
	Enabling parental mediation	.010	−.018, .039	.015	.480
	Restrictive parental mediation	−.081	−.112, −.051	.016	< .001
	Family environment	.004	−.071, .078	.038	.926
	Informational digital skills	.066	.020, .111	.023	.005
	Social digital skills	.063	.002, .125	.031	.044
	Latent interaction: Enabling parental mediation X Family environment	.012	−.041, .065	.027	.667
	Control: Age	−.038	−.052, −.024	.007	< .001
	Control: Gender	−.437	−.457, −.400	.019	< .001
	Control: SES	−.006	−.017, .006	.006	.346
	Control: Time online	.110	.101, .119	.005	< .001

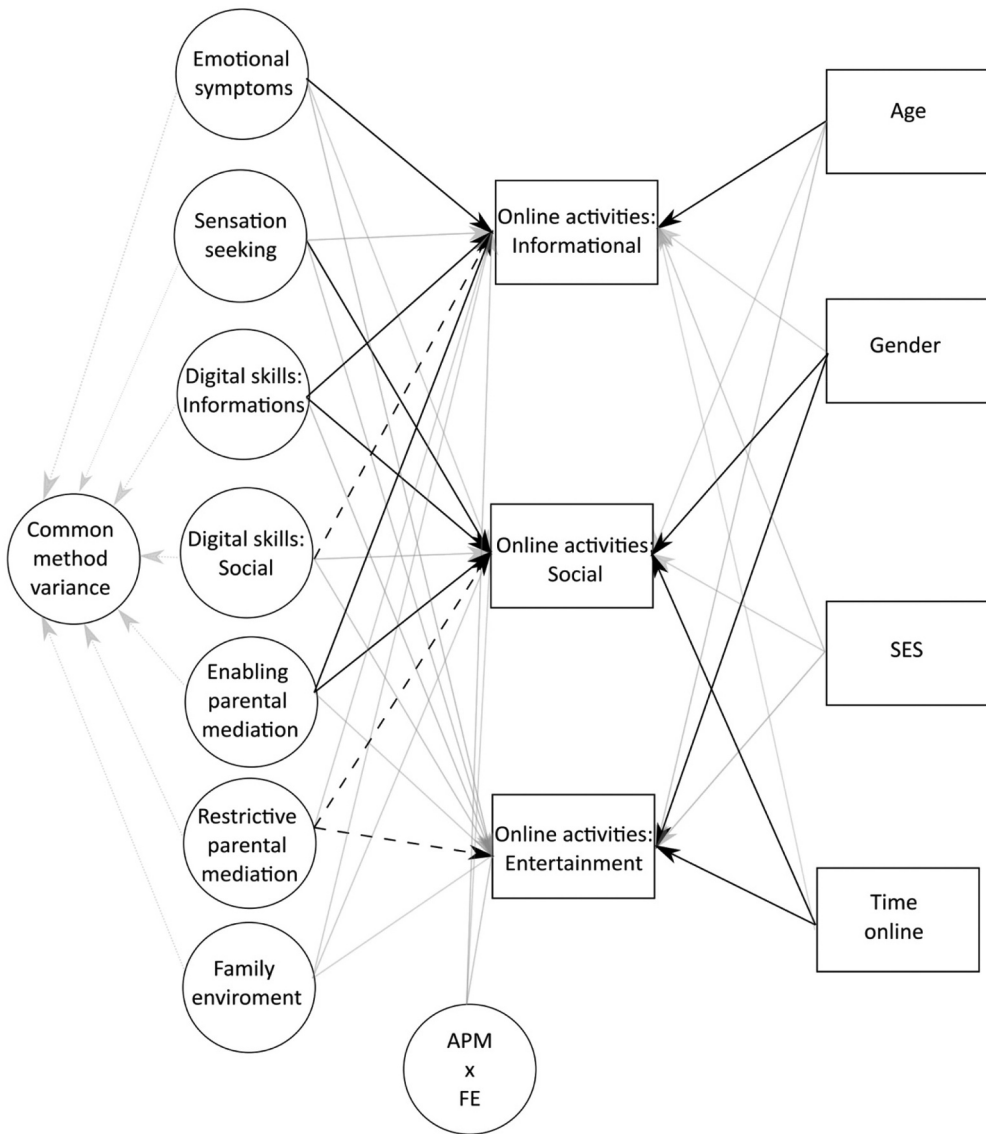Note: β = standardized regression coefficient, CI = confidence intervals, SE = standard errors, p = p-value.

Figure 1. Significant paths. Black line represents positive statistically significant effect (with β > .07), dashed line represents negative statistically significant effect (with β < −.07), grey line represents statistically insignificant effect or effect with negligible effect size (−.07 < β < .07), and grey dotted line represents paths to common method variance.

control variable of gender showed a very high negative effect (β = −.44) meaning that boys were far more likely to engage in entertainment activities on the internet.

And finally, the latent interaction of enabling parental mediation by the family environment was not significant for all kinds of online activities, and social digital skills were not associated with social online activities. The remaining associations were insignificant or had negligible effect sizes (−.07 < β < .07). These findings are discussed in more detail below.

5. Discussion

This paper investigated the relationship between children's and young people's perceived digital skills, their individual and social characteristics, and engagement in different sets of online activities (informational, social, and entertainment).

Perceived informational skills appear to be the most consistent explanatory variable of participation in a wider range of online activities since they relate not only to informational activities but also social and entertainment activities. It is not surprising that children and young people who perceive to have higher informational skills also tend to use the internet for information-seeking (related to school or work opportunities, looking for news or health-related information). While this finding is consistent with previous research showing informational digital skills are associated with homework-related information-seeking (Eynon & Malmberg, 2012), why informational skills also relate to social and entertainment activities represents an interesting area for future research.

Surprisingly, perceived social digital skills were only negatively related to informational online activities, while no significant relationship emerged with respect to social and entertainment activities. In past research, contrary to our findings, social skills were positively associated with online social activities, such as instant messaging, chatting, using social networking sites, posting pictures and videos, and the like (Helsper & Eynon, 2013). By contrast, our results only show a negative relation to informational activities, so that children and young people reporting more social skills seem to be less likely to engage in informational activities. Whilst one may assume that children and young people higher in social digital skills may use the internet more for recreative and social purposes rather than informational ones, this interpretation is not supported by our data showing that perceived social digital skills neither relate to social nor entertainment activities. As such, this finding warrants future research.

Age was the most consistent explanatory variable of each type of online activities: older children are in fact more likely to use the internet for information, communication, and entertainment, further supporting that as children grow up they use the internet in a more diversified fashion (Livingstone et al., 2019). Gender, in turn, was positively related to social, but negatively related to entertainment activities, showing that girls engage more than boys in social uses of the internet, and boys more than the former on entertainment uses, suggesting a differentiated pattern of usage echoing previous literature on the matter (Brooks et al., 2016; Ortega et al., 2010). As such, it is important for policy-makers and educators to address this gender gap since these differences in childhood could become a source of inequality later in life (Sey & Hafkin, 2019).

When looking at social and psychological wellbeing, it is remarkable that emotional problems were significantly related to all kinds of activities, with the most significant relationship being with informational activities. Because, among informational questions, participants were also asked whether they look for health information online, we could argue that children and young people who experience higher emotional distress may use the internet to look for health information relating to their conditions and wellbeing. This poses the question in terms of the quality of contents they find online and whether these are age-appropriate (Jiménez-Pernett, de Labry-Lima, Bermúdez-Tamayo,

García-Gutiérrez, & Del Carmen Salcedo-Sánchez, 2010). The same goes for social and entertainment activities: while these can be an opportunity for children and young people to cope with their psychological problems, previous research has shown that emotionally vulnerable children and young people are at higher risk of experiencing harmful situations online (Helsper & Smahel, 2020). Similarly, higher levels of sensation-seeking positively are associated with all types of activities, in line with previous studies (Mascheroni et al., 2020). Unsurprisingly, parental mediation was also a significant explanatory variable in our analysis. More specifically, enabling mediation positively relates to informational and social activities, while restrictive mediation negatively relates to social and entertainment activities. The benefits of enabling mediation have long been documented in the literature, showing it allows children and young people to engage in a broader range of activities online and gain more digital skills. Conversely, restrictive mediation has been demonstrated to hinder both the number and types of activities taken up and the acquisition of digital skills (Livingstone et al., 2017). Our data suggest a normative parenting style showing that parents who adopt restrictive mediation strategies seem to promote informational uses of the internet to the detriment of social and entertainment activities. This means that more restricted children and young people may not benefit from the opportunities of social and entertainment activities. Educators, practitioners, and policy-makers concerned with children, young people, and families, then, should promote an enabling mediation style to maximise children's and young people's opportunities online.

Socioeconomic status (SES) was a significant and positive explanatory variable of informational and social activities, and a negative one of entertainment activities, showing a differentiated use of the internet for children and young people, where those from a higher socioeconomic status use the internet more for informational and social purposes and less for entertainment and playful reasons. In line with a normative discourse on internet use in terms of what children are supposed to do online, we may argue that parents guided their children's and young people's technology use following what Pugh (2009) has defined as symbolic indulgence or deprivation, where lower SES parents may be more inclined to allow their children to use technology for fun, while higher SES parents may tend to deprive their children of these experiences and invite them to use the internet for more beneficial activities, which are seemingly conducive to more beneficial tangible outcomes – including better school performances, higher social or economic capital, and so on. This may mean that children and young people from lower SES could miss out on "capital-enhancing" online opportunities (Zillien & Hargittai, 2009) if they only engage in certain types of activities.

Finally, social well-being as measured by the family environment does not intervene in moulding the relationship between digital skills and online activities.

Overall, our findings carry important theoretical and policy implications. Theoretically, these results align our work with recent advancements in the understanding of socio-digital inequalities, acknowledging that the relation between social and digital inequalities is bi-directional: while traditional social inequalities shape the path from access to and use of ICTs to digital engagement through digital skills, digital inequalities feed back into pre-existing social exclusion (Helsper, 2021). Moreover, this line of investigation has addressed the risk, typical of much digital inclusion debate, of overlooking individual characteristics like psychological traits and overall wellbeing. Thus, socio-digital inequalities are framed as

both structural and systematic, and simultaneously, compound, and intersectional. Also, although we focused on how perceived digital skills influence online activities, it is important to remember that influence is reciprocal, since spending more time doing certain online activities can implement skills in that domain (Smahel et al., 2020).

In terms of policy-making, the fact that perceived information navigation skills are associated with the engagement in more and diverse online activities is consistent with prior studies but challenges current interventions to promote digital inclusion. In fact, it has already been argued that while differences in technical skills will become less of an issue in the future, conversely informational, social, and creative skills will become increasingly more important in the age of pervasive and ubiquitous internet (van Deursen & Mossberger, 2018). Currently, socio-digital inequalities among children and young people are addressed through programmes aimed at providing access to ICTs and narrowly technical and operational training. Yet, alleviating inequalities in informational, social, creation skills require broader and more inclusive digital literacy targets.

In conclusion, this work presents limitations that warrant for improvement in future inquiry. First, the cross-sectional nature of our data does not allow us to deduce any causal relationship between our variables. For example, the relationship between parental mediation, online activities, and digital skills should be better investigated to explore whether more restrictions lead to less digital skills and thus a lower number of online activities taken up, or if children and young people who are less skilled are more restricted precisely because they are less skilled. Second, online activities that were inserted into the model as endogenous observed variables (i.e., sums calculated from dichotomized frequencies of various activities) were created ad-hoc based on a data-driven approach and subsequent critical theoretical evaluation of exploratory factor structure. In the future, application of confirmatory- and theoretically based measurement of online activities with clear a priori anchoring within reflective or formative constructs is desirable.

Another source of limitation is that we only focused on two types of skills, with two items each. Future research should then opt for different approaches allowing to better analytically differentiate more digital skills dimensions in terms of types of skills and diversity of indicators to measure them. The measurement used in this study was also based on the self-report methods and not objective assessment of children' digital skills. It has been shown that adults tend to overreport their ITC skills in self-report questionnaires in comparison to the their real level of ITC skills measured by objective methods (Palczyńska & Rynko, 2021). Future research could, therefore, verify our findings with objective assessment of digital skills.

While we cannot explain why children and young people who reported higher information skills also benefit more from social and entertainment activities, both researchers and practitioners should keep this in mind to better understand this relationship and promote digital curricula teaching these skills.

In spite of their limitations, this paper broadens the existing literature on the relationship between children's and young people's digital skills and online activities, giving us insights on what skills educational interventions should focus on, but also inviting parents to adopt enabling mediation, and possibly argue for the importance of all online activities beyond normative and neoliberal accounts that only focus on "productive" uses of the internet.

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