article

Family relationships and internet abuse in 25 European countries

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The aim of this article is to understand the link between family relationships and internet abuse (IA) using a sample of 18,709 children in 25 European countries. Our results suggest that family relationships are a significant predictor of IA – even when controlling for other significant individual and country-level factors. According to our results, children in two-parent families were less likely to have IA than children in other types of homes, but their advantage seems to derive from having better family dynamics (manifest in more communicative and less autonomous lifestyles) rather than family structure as such. Moreover, the importance of family structure with respect to IA is mediated by children's relational lifestyles. This suggests that positive parenting characterised by high levels of dialogue may work as a protective factor of IA. We also identified sociodemographic risk factors: IA is more common among older and male children, those with lower levels of self-efficacy, and those living in large cities. The specific components of advantageous relational lifestyles can guide interventions to protect children from IA.

key words family relationships • internet abuse • adolescents • lifestyles • risk factors

The aim of this article is to understand the link between family relationships and internet abuse (IA). New interactive technologies allowed social developments such as more equal access to knowledge and information, but simultaneously created problematic behaviours that are now on the agenda of family studies. In fact, 33% of European adolescents have difficulties in reducing internet usage (Livingstone et al, 2011a). Analysing 11,956 adolescents from ten European countries, Durkee et al, (2012) found that 13.5% reported maladaptive internet use. The inability of young

people to manage online connections is a growing phenomenon in post-industrial countries (Anderson et al, 2017), and IA has damaging consequences, especially for adolescents, such as depression (Morrison and Gore, 2010) and stress (Harwood et al, 2014).

Networked relationships and their side-effects have influenced the attitudes of many policy makers and other stakeholders, which have sometimes focused exclusively on negative unintended consequences of usage of the internet. Accumulating evidence has helped to move initial polarised attitudes to more constructive approaches (Livingstone et al, 2018). Nonetheless, the bulk of interventions and studies continue to focus on individuals, even though sociocultural context likely plays a crucial role in determining whether internet use becomes problematic.

This study conceptualises online risks and opportunities in a multi-level framework (Livingstone et al, 2015, 2018), and is focused on the relevance of relationships, especially family relationships, in influencing adolescents' internet usage. Other studies have investigated the effects of family structure (Li et al, 2014) and family processes (Wong, 2010; Corrado and Freedman, 2011; Anderson et al, 2017) on problematic internet behaviours, but without considering the importance of parent–child communication controlling for structural and individual factors. Because family structure (Garriga and Härkönen, 2009; Bakker et al, 2015), socioeconomics (Treanor, 2016) and processes (Crossley, 2016) have an impact on children's development, protecting adolescents requires understanding of which family conditions facilitate lower risk of IA and how those conditions are formed.

Defining IA

There is no clear consensus regarding how to define problematic internet usage (Anderson et al, 2017). Some authors do not distinguish between addiction and abuse (Šmahel et al, 2009). Others interpret problematic usage as compulsive (Van den Eijnden et al, 2010) or an abuse that is a consequence of a lack of certain type of impulse control related to the usage of connections (Morahan–Martin, 2008).

For this study, we define IA as a generalised maladaptive internet use (Davis, 2001). IA is a set of problematic practices that, influenced by sociocultural and personal factors, result in person's life difficulties and disturbances, but the term does not necessarily imply addictive behaviour (Douglas et al, 2008) or a clinical impairment leading to pathological usage (Durkee et al, 2012).

Predicting IA

Sociocultural contexts, individual characteristics and personal relationships are factors that influence the way children use opportunities and deal with online risks (Gorzig and Olafsson, 2011). Empirical evidence shows that children's development also depends on the activities they perform in their digital ecologies (Livingstone et al, 2015). This means that a large share of the variance in children's online outcomes will depend on factors not explained by socio–psychological conditions, parental practices or country–level mediators. Nonetheless, clarifying the role of family relationships can contribute to effective interventions. Consequently, we control for individual and ecological variables while focusing on family relationships.

IA and the individual

Sociodemographic variables and personal traits influence internet usage. Previous studies show that males have higher rates of pathological internet use (Durkee et al, 2012), and adolescents older than 15 years have a higher rate of internet addiction than younger adolescents (Yen et al, 2009).

Recent research has shown that having several devices to access the internet is associated with IA (Young and Case, 2004). Behavioural problems may be greater among those with more resources because they have more access (Borzekowski and Rickert, 2001). However, a higher status may imply better digital literacy and a richer sociocultural environment too.

Finally, several studies on problematic internet usage identified some personality traits that would increase online problematic behaviour (Byun et al, 2009). Low self-esteem, neuroticism, depression, anxiety, sensation seeking and stressful life events have been recognised as risk factors for IA (Kayiş et al, 2016). Somewhat counterintuitively, children with high self-efficacy encounter more risks online (Livingstone et al, 2015): in having more skills, they may be overconfident without being completely aware of the risks (Ng and Wiemer–Hastings, 2005).

IA and country-level factors

Some studies show that social inequalities (that is, lack of quality access and digital literacy programmes) would affect usage of interactive technologies since 'a country's socio-economic stratification, regulatory framework, technological infrastructure and educational system all shape children's online risks' (Livingstone et al, 2011b: 3; see also Park, 2013). Access is another factor influencing the amount of time users spend online (Livingstone et al, 2011a). Limited internet access should imply less IA (Chinn and Fairlie, 2007). Finally, we postulate that digital literacy – the degree of literacy regarding interactive devices and services – influences internet consumption: countries with higher levels of digital literacy may have more prevalence of IA.

IA and family

Previous literature has examined the impact of family structure and processes on children's development (Floros and Siomos, 2013). Just as family structure and dynamics influence children's educational and health outcomes (for example, Child Trends, 2014), children in non-intact families are more likely to have pathological internet use (Li et al, 2016). Although researchers have explored the links between the demographic and social factors influencing IA, there is less work on family relationships and outcomes for children (Livingstone et al, 2018).

Family processes may influence how media is consumed (Shin and Huh, 2011). Further, parenting styles seem to moderate the impact of media on adolescents' decisions (Kirsh, 2010). Recent studies show that high–quality parenting and parental monitoring reduce the possibility of adolescents' problematic internet behaviours (Noll et al, 2013). For example, Yen et al (2007) showed that parent–adolescent conflict and low levels of parent monitoring predict internet addiction. Other studies stated that an authoritative parenting style and parent–child involvement in online activities are associated with healthier children's behaviour (Wong, 2010), and that

parental openness to discussion with an adolescent can reduce risky behaviours online (Corrado and Freedman, 2011).

High-quality parenting clearly includes more than supervision: parents can contribute to positive socialisation through dialogue and active mediation practices (Livingstone et al, 2011b). Parent–child dialogue with regard to interactive technologies imply the sharing of relational knowledge acquired through repeated life experiences and the co-creation of symbols and meanings that affect individual attitudes, beliefs and so on (Koerner and Fitzpatrick, 2002). Therefore, adolescents' family relationships may be a key factor influencing their internet consumption and digital decisions.

IA, relationships and lifestyles

Ecological models (Livingstone et al, 2015, 2018) imply that individuals are embedded within social and cultural frames that are influenced by interpersonal relationships. Social structures affect and are shaped by individuals' agency – that is, the capacity of acting and producing a result (Giddens, 1991; Archer, 1996). Actions by individuals occur in the form of manifold relations whereby the acting agent makes decisions that are influenced by context, personal reflexivity, knowledge, experiences and main concerns, and the people with whom the agent is interacting.

Agents' decisions configure a lifestyle: a set of practices that are the consequence of personal internal reflections as well as social ecologies and relationships. The lifestyle concept originally had a sociological meaning in reference to consumption choices (clothes, leisure activities, consumer goods and so on) that defined the distinctive characteristics of different social classes (Bourdieu, 1984) on the basis of distinctive ways of living related to material culture (Simmel, 1989; Sobel, 2013). However, 'within contemporary consumer culture it connotes individuality, self-expression, and a stylistic self-consciousness' (Featherstone, 2007: 81).

Agents' lifestyles are more than economic or social capital. They are a complex and dynamic integrated system of behaviours, orientations, resources and knowledge structures developed through interpersonal exchange experiences that express personal and social identity, including preferences and attitudes (Thirlaway and Upton, 2009). From this perspective, lifestyles are the processes that generate cultural capital. They indicate a 'set of distinctive preferences which express the same expressive intention in the specific logic of each of the symbolic sub-spaces …' (Bourdieu, 1984: 173) that configure a habitus or set of embodied set of dispositions manifest in everyday actions.

Recent research highlights the need to distinguish between static and relational cultural capital. Relational capital 'includes cultural resources and activities that are expressed in the relationships between parents and children' (Tramonte and Willms, 2010: 203). Everyday relationships between parents and children activate interests and promote different ways of living that are the foundation for relational lifestyles, 'a dynamic set of decisions transformed into communicative actions integrated by the person's life-project' (Rivera, 2016: 187)

Among the scholars who theorised the role of relational culture on youth identity, Margaret Archer's work dates back to the 1970s. In her multiyear studies, based on surveys and in-depth interviews covering a non-probabilistic sample of young people, she showed that autobiographical accounts express how reflexivity mediates between individual action and social structures. Sociocultural circumstances influence – but do not determine – youth decisions. Analysing the importance of relational culture

on careers paths, she identified four modes of youth lifestyles (Archer, 1996, 2003, 2012): (a) communicative (individuals who count on family values and orientations for decisions); (b) meta-reflexive (altruist youth who do not accept straightforward family orientations); (c) autonomous (they tend to adopt egoistic behaviours); and (d) fractured (isolated young people). Scambler (2013) built on her work and showed that communicative lifestyles are characterised by constant parental guidance, meta-reflexive lifestyles by pro-social behaviours, autonomous lifestyles by new and risky experiences, and fractured lifestyles by social isolation. Those types of relational lifestyles influence behaviours (Garcia Ruiz, 2009), orient social interactions with the community (Archer, 2012), and are linked to problematic digital consumption, with, for example, autonomous and fractured adolescents consuming more pornography (Rivera et al, 2016).

Even though Archer's perspective provided important insights on the dynamics between structure and agency, none of the work validating its relevance for problematic digital consumption considers whether relational lifestyles matter net of other family, individual and country characteristics (Dyke et al, 2012; Burkitt, 2016).

Objective and hypothesis

We aim to clarify how family relationships are linked to IA by testing the relevance of relational lifestyles and family structure. Based on the literature review we develop the following hypotheses:

H1: Being in a two-parent family is associated with decreased likelihood of IA in adolescents.

H2: Positive types of relational lifestyles and high parent–child communication are associated with decreased likelihood of IA among adolescents.

H3: Relational variables significantly predict IA, even when controlling for individual and country characteristics.

Method

Data

We analysed the EU Kids Online survey dataset (Livingstone, 2011). The survey was administered in-home and face-to-face during spring and summer 2010. In total, 25,142 children and adolescents from 25 European countries participated in this study. IA was measured only for students aged between 11 and 16 years (mean = 13.50, SD = 1.69), which reduced the sample to 18,709 children (9,352 male and 9,357 female). The survey (approved by the Research Ethics Committee of the London School of Economics) covered children's and parents' experiences and practices regarding internet usage and interactive technologies. Respondents were selected by random stratified survey sampling. Children and parents were interviewed separately. Countries used either computer-assisted personal interviewing (CAPI) or paper and pencil interviewing (PAPI) administration. High standards of ethical research practices were applied. For example, parents and children were each asked for consent and advised that they could stop the interview at any point or choose not to answer any question if they felt uncomfortable doing so (Livingstone et al, 2015).

Statistical analysis

To examine the influence of family relationships on adolescents' IA we applied a two-level logistic regression model. The first level included individual and relational variables, and the second level included country variables. We first computed a model that does not include the proposed variables (that is, a null model that included only the intercept) to serve as a reference point. We used increments in optimal values of estimated coefficients (Hox, 2002) to see if the models that followed had more explanatory power than the reference model. Our first model included individual-level variables, and the second added relational lifestyles (detailed in the next sections). The third model only included country-level variables. The fourth and final model included all the variables. All the analyses used STATA 12.0.

Individual-level variables

Age: The parents' questionnaire asked 'What is the age of your child?' Parents responded by filling in a blank box. We included age as a continuous variable.

Gender: Parents selected either male (1) or female (2) for the child. A negative coefficient on our gender variable means that females are less likely to abuse the internet.

Socioeconomic status (SES): This was measured using three categories: high (1), medium (2) and low (3). This indicator was calculated from the occupation and education of the main wage earner. High SES was the reference category in the regression.

Rurality: Cities of residence were classified as large (3), medium (2) and small (1). Small cities were the reference category.

Self-efficacy: This study used the Generalised Self-Efficacy scale, (Schwarzer and Jerusalem, 1995). An example item is, 'Thanks to my resourcefulness, I can handle unforeseen situations.' Responses ranged from not at all true (1) to exactly true (4). The internal consistency of the scale for this sample was moderately good (α = .65). We used the respondent's mean score across the ten items comprising the scale, with higher values representing higher perceived self-efficacy.

Skills: We counted the number of skills that adolescents reported in the EU Kids Online questionnaire (for example, comparing different websites to decide whether information is true, changing filter preferences and so on).

Number of devices: We summed all the devices owned by the adolescent (for example, tablet, smartphone and so on).

Family structure: The parent was asked whether she or he considered the household to be a one- or two-parent family. If respondents were unsure (for example, if it was a reconstituted family), they were asked if there was a second adult aged 18+ in a parental/caring role (for example, a step-parent). The data do not allow us to distinguish who the child's caretakers are, simply whether there are two people providing parental care or only one. Having one parent constituted the reference category.

Relational lifestyles of internet use: We measured relational capital construct, which include clusters of variables, following the practice of interpreting the results of a statistical analysis by integrating empirical evidence and the reviewed theory (Thompson and Daniel, 1996). EU Kids Online operationalised its model by scoping children's internet usage, activities, opportunities/risks and benefits/harms. Following Archer's four types classification, based on parent–child interpersonal relationships

Figure 1. Operationalization of Relational Lifestyles of internet use
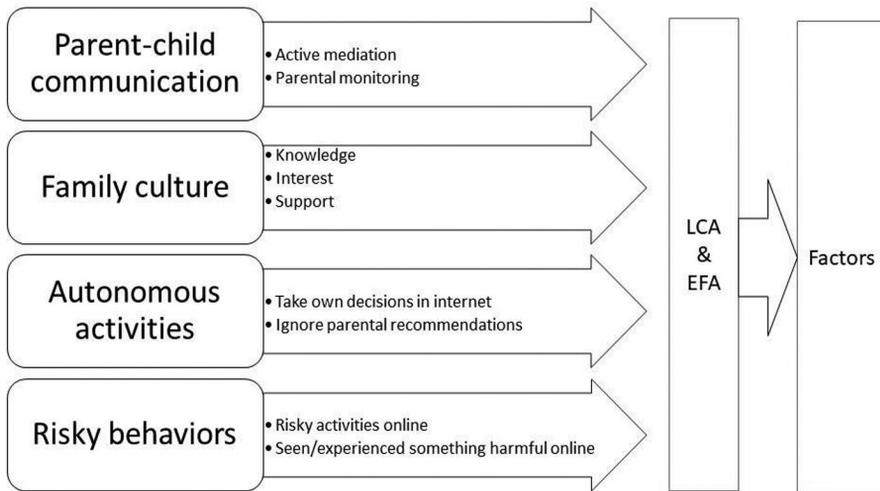
and individuals' orientations, we operationalised the concept of relational lifestyles of internet use by identifying children's autonomous activities (those decided by themselves), risky behaviours, experiences of parent–child communication and social isolation (Figure 1).

In order to measure adolescents' relational lifestyles we used a latent structure analysis of 22 items from the dataset. They were illustrative of the way they interact with their parents, friends and online. Some examples of these items were: 'Overall, would you like your parent(s) to take more or less interest in what you do on the internet, or to stay about the same?', 'Have you ever suggested ways to use the internet safely for your friends?', 'When I am bothered about something that happened on the internet, I talk to my mother or father', 'How true are these of you? I find it easier to be myself on the internet than when I am with people face to face'. Then, we carried out a latent class analysis (LCA) using the statistical software MPlus version 4 (Muthén and Asparouhov, 2002). Following the procedure recommended by Wang and Wang (2012), various models with different number of latent classes were estimated and compared in order to determine the most reliable class solution: the model with four latent classes.

We then ran an exploratory factor analysis (EFA), and coherent with relational lifestyle concept operationalisation, identified four factors. We interpreted and

Table 1. Pairwise comparisons among the four latent classes in the four factor scores corresponding to adolescents' lifestyles and parent–child communication (Cohen's *d*)

	Parental me-diation	Risky behav-iours	Parent–child communication	Social isolation
Autonomous-Meta-reflexive	−0.72	1.41	−0.26	−0.19
Autonomous-Communicative	−0.99	2.35	−0.81	1.46
Autonomous-Fractured	0.98	1.45	0.17	0.08
Meta-reflexive - Communicative	−0.35	0.98	−0.58	2.03
Meta-reflexive- Fractured	2.13	0.16	0.48	0.29
Communicative-Fractured	2.37	−0.69	1.11	−1.39

named the items that share high loadings on the same factor based on theoretical considerations. The first factor included items reflecting negative actions online and off and was named 'risky behaviours'. The second 'parental mediation' joined those factors reflecting active, restrictive and technical mediation of parents of children's internet usage. The 'parent–child communication' factor included variables indicating that family culture is important in adolescents' decisions. Finally, the 'social isolation' factor gathered behaviours that indicate a situation of solitude for the interviewee.

Next, we conducted four one-way ANOVAs to determine the salient characteristics of the four classes by using each of those four factors in turn as the dependent variable and the latent classes as the independent variables. For each factor, there were statistically significant differences between all latent classes (all pairwise comparisons, $p < .001$). We computed effect sizes (Cohen's d) to determine the magnitude of the difference in this large sample. Following Cohen's guidelines (1992, d values of 0.2 reflects a 'small effect', $d = 0.5$ reflects a 'moderate effect' and $d = 0.8$ reflects a 'large effect'. For example, for parental mediation, the larger effect is found for the difference between communicative and fractured lifestyles, reflecting a significantly higher mean for communicative in parental mediation as compared to fractured adolescents (for all Cohen's d, see Table 1).

The analysis (Table 1 and Figure 1) suggested different relationship lifestyles and parental–mediation practices between the latent classes and were named following the four types identified by Archer (2012). As shown in Figure 2, autonomous adolescents have the highest value for risky behaviours and the second highest value for social isolation. On the other hand, communicative adolescents have the highest value both for parent–child communication and parental mediation. Fractured adolescents have the lowest values on these two indicators of family relationships quality. Finally, meta-reflexive adolescents present the highest value for social isolation among all the lifestyles. The first class was 'autonomous lifestyle' (24.7%) and had the highest value for risks on the internet and the second highest value for internet isolation. The second class was 'meta-reflexive lifestyle' (22.4%) and presents the second highest value in positive relationships but the highest for social isolation. The third class was 'communicative lifestyle' (26.8%). Adolescents in this group have the highest value both for parent–child communication and parental mediation. The fourth was 'fractured

Figure 2. Crosstab between factor scores and latent classes.

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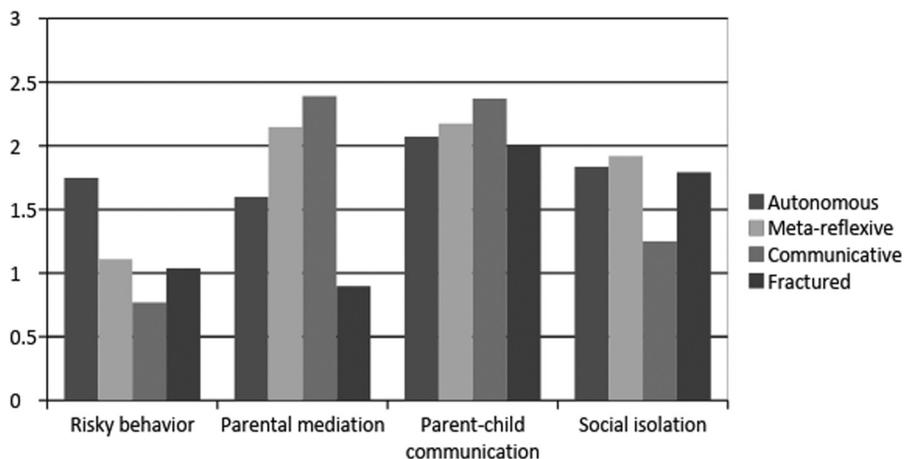
lifestyle' (26.1%), with the lowest values on these two indicators of positive family relationships. Adolescents with autonomous relational lifestyles had highest levels of IA, and we used them as the reference category.

Country-level variables

Income inequality We used the Gini index (OECD, 2010) that ranges from 0 (perfect equality) to 1 (perfect inequality).

    Access to internet We used the Internet World Stats composite (2014).

    Digital literacy The proportion of the population who have used internet for training and education (Eurostat, 2010).

Dependent variable: IA

EU Kids Online used a five-items version of Šmahel et al (2009) adapted for adolescents. The scale had a common introduction: 'In the past 12 months, how often, have these things happened to you?' The specific items were 'I have gone without eating or sleeping because of the internet'; 'I have felt bothered when I cannot be on the internet'; 'I have caught myself surfing when I'm not really interested'; 'I have spent less time than I should with either family, friends or doing schoolwork because of the time I spent on the internet'; and 'I have tried unsuccessfully to spend less time on the internet'. Children chose among four responses: 'Never/almost never' (1), 'Not very often' (2), 'Fairly often' (3), and 'Very often' (4). The five items were highly intercorrelated (α = .77), and were thus averaged to create a composite index of IA.

Results

Table 2 shows descriptive statistics for all the variables. We then conducted several multilevel mixed (hierarchical) models following Hox (2002).

    The null model shows that 16.92% of the variance in IA is at the country level. The first model included only individual-level variables. As shown in Table 3, children have higher levels of IA if they are older children, have low self-efficacy, have more devices, are more skillful, live in one-parent families or live in larger cities ($p < .01$ for all these variables). This model fit was significantly higher compared with the null model (*difference of −2 x log* = −3,424.035, $p < .001$). The variance explained by the first level variables is 6.4% (R^2 = .064).

    Model 2 added relational lifestyles. Autonomous adolescents presented significantly higher levels of IA than meta-reflexive (β = −.197, $p < .001$), fractured (β = −.334, $p < .001$), and communicative (β = −.486, $p < .001$) adolescents. Communicative adolescents reported lower levels of IA compared both with fractured (β = .152, $p < .001$) and meta-reflexive (β = .289, $p < .001$). This model fit was significantly higher compared with model 1 (*difference of −2 x log* = −4,130.913, $p < .001$). The variance explained by the first level variables is 14.8% (R^2 = .148). In model 1, children in one parent families were significantly more likely to abuse the internet, but family structure was no longer significant when relational lifestyles were included in the model (model 2). Regarding this point, we determined whether relational lifestyles mediated the effects of family structure following the procedure recommended by Hayes and Preacher (2013). Family structure was entered as the independent variable,

Table 2. Descriptive statistics for country-level and individual-level predictors of IA among 11- to 16-year-old students in 25 countries, EU Kids Online 2005

	Mean (SD)	%	Range	Kurtosis (SE)	Skewness (SD)
SES high (1)		33.7			
SES medium (2)		41.5			
SES low (3)		19.7			
Rurality small (1)		28.6			
Rurality medium (2)		34.4			
Rurality large (3)		36.6			
Age	13.5 (1.69)		5	−1.26 (.04)	.002 (.02)
Gender male (1)		50			
Gender female (2)		50			
Family structure (1 parent)		25			
Family structure (2 parents)		74.1			
Self-efficacy	2.24 (.45)		2	−.31 (.04)	−.19 (.02)
Number of skills	2.08 (1.40)		4	−1.25 (.04)	−.08 (.02)
Number of devices	2.51 (1.62)		8	−.40 (.03)	.78 (.02)
Autonomous lifestyle (1)		24.7			
Meta-reflexive lifestyle (2)		22.4			
Communicative lifestyle (3)		26.8			
Fractured lifestyle (4)		26.1			
Social inequality	.30 (.04)		.17	.24 (.04)	.73 (.02)
Digital literacy	.38 (14)		.57	−.17 (.04)	.45 (.02)
Internet access	.78 (.14)		.46	−1.20 (.04)	−.18 (.02)
Internet abuse	1.48 (.55)		3	1.92 (.04)	1.40 (.02)

relational lifestyles as the mediator, and IA as the dependent variable while controlling for all the variables. First, we ran a model identifying relational lifestyles as the mediator for the effect of family structure on IA. This indicated that relational lifestyles were significantly related with IA: $B = -.135$, $t(18482) = -39.230$, $p < .001$. Second, family structure was significantly related with relational lifestyles: $B = .074$, $t(17268) = 3.790$, $p < .001$. Third, when both the mediator and family structure were entered as predictors, only the effect of relational lifestyles on IA was statistically significant: $B = -.130$, $t(17268) = 26.583$, $p < .001$. As illustrated in Figure 3, the indirect effect of family structure through relational lifestyles was statistically significant: $B = -.010$, $SE = .003$ [CI 95%: (−.015, −.005)]. The direct effect of family structure on IA was significantly mediated by relational lifestyles.

Model 3 included only variables at country level: societal inequality, access to the internet and digital literacy. These variables did not significantly predict IA. In fact, this model fit was significantly poorer compared with model 2 (*difference of −2 x log* = 2,257.41, $p < .001$) and did not improve the fit of null model (*difference of −2 x log* = -1.63, $p > .05$). The variance explained by the second level variables is 12.3% ($R^2 = .123$).

**Table 3. Fixed and random parameters of the internet abuse models**

	Null model	Model 1	Model 2	Model 3	Model 4
Individual and relational levels					
Constant	1.481 (.022)***	.792 (.048)***	1.351 (.049)***	.998 (.306)**	.957 (.283)**
SES (ref=high)					
SES (medium)		.008 (.010)	.002 (.010)		.002 (.010)
SES (low)		.001 (.013)	-.023 (.012)		-.024 (.012)
Rurality (ref=high)					
Rurality (medium)		.009 (.011)	.008 (.011)		.008 (.011)
Rurality (low)		.041 (.011)***	.034 (.011)***		.034 (.011)**
Age		.044 (.003)***	.026 (.003)***		.026 (.003)***
Female		-.008 (.009)	-.020 (.008)*		-.020 (.008)***
Self-efficacy		-.038 (.010)***	-.037 (.010)***		-.037 (.009)***
Number of skills		.060 (.004)***	.037 (.003)***		.037 (.003)***
Number of devices		.020 (.003)***	.015 (.003)***		.015 (.003)***
Two-parent family		-.022 (.010)*	-.008 (.010)		-.008 (.010)
Relational lifestyles (ref=Autonomous)					
Meta-reflexive lifestyle			-.197 (.012)***		-.191 (.012)***
Communicative lifestyle			-.461 (.012)***		-.461 (.012)***
Fractured lifestyle			-.316 (.012)***		-.317 (.012)***
Country level					
Gini Index				1.157 (.661)	1.317 (.605)*
Digital literacy				-.054 (.222)	.147 (.203)
Access to internet				.202 (.234)	-.074 (.215)

Table 3. Continued

	Null model	Model 1	Model 2	Model 3	Model 4
Log likelihood	−14,695.38	−11,271.345	−10,564.467	−14,693.75	−10,561.441
Δ log likelihood		−3,424.035***	−4,130.913***	−2,257.41***	−4,133.939***
Δ log likelihood (model 2–model 4)					−3.026
Constant (SE)	.012 (.003)	.012 (.003)	.011 (.003)	.010 (.003)	.009 (.003)
Residual (SE)	.286 (.003)	.273 (.003)	.247 (.003)	.286 (.003)	.247 (.003)

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$; †$p < 0.1$

Figure 3. Mediation model between family structure and Internet abuse through relational lifestyles.
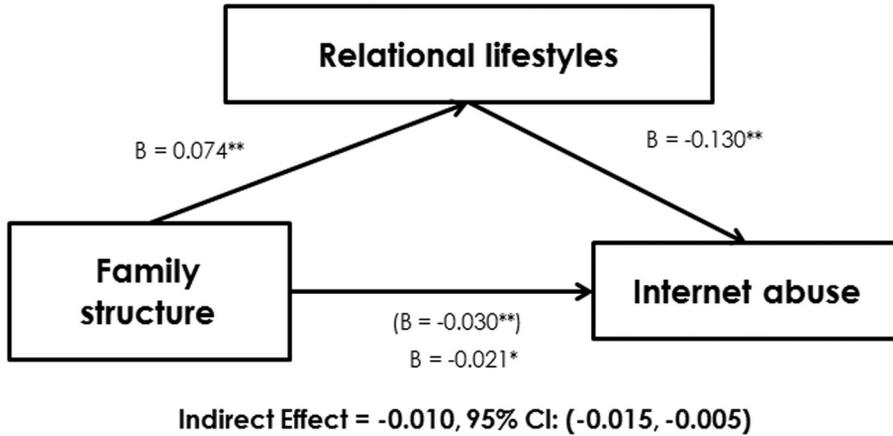
Finally, model 4 included all the variables. In this model, several variables dropped from statistical significance, showing they were not independently important in predicting IA. Overall, male and older adolescents, those having lower levels of self-efficacy, having more devices, being more skillful, having autonomous lifestyles (compared with communicative, fractured and meta-reflexive lifestyles), and those who came from countries characterised by higher social inequality reported higher levels of IA. This model fit was significantly higher compared with model 3 that only included variables at country level (*difference of −2 x log* = −4,133.939, *p* < .001), but it was not significantly higher than model 2 that included only variables at individual level (*difference of −2 x log* = −3.026, *p* > .05). The variance explained by the first-level variables is 15.6% (R^2 = .156) and by the second-level variables is 28.4% (R^2 = .284).

Discussion

Our study clarified the importance of family relationships for IA among adolescents. Even though analysing social behaviours with quantitative data is inherently difficult, the EU Kids Online database allowed us to better identify how families protect and do not protect children from IA.

Children in two-parent families were less likely to have IA than children in other types of homes (H1), but their advantage seems to derive from having better family dynamics (manifest in more communicative and less autonomous lifestyles) rather than family structure as such. Adolescents with authoritative parents are relatively protected from searching for comfort or a sense of autonomy through the internet, even in stressful circumstances. Having a family with high levels of dialogue contributes to the development of relational lifestyles that are protective against IA. These results are in line with previous studies (Li et al, 2014) finding that parent–adolescent communication predicted adolescent pathological or compulsive internet use. When we validate these results while controlling for family structure, we show how much family process as measured by relational lifestyles matters.

The importance of family structure with respect to IA is mediated by children's relational lifestyles. The 'autonomous' group shows fewer positive relationships with their parents and is characterised by risky behaviours. Even when they have parenting

mediation – for example, active co-use of the internet and interaction rules instead of technical restrictions using filters or monitoring software – they tend to decide in solitude and have higher levels of IA. In contrast, the 'communicatives' group was characterised by high parent–child communication and confirmed that positive types of relational lifestyles are associated with lower rates of IA (H2). This suggests that positive parenting characterised by high levels of dialogue may work as a protective factor of IA.

Our study showed that relational lifestyles significantly predict IA, even when controlling for contextual variables (H3). Context matters: in all the empirical models, a relevant percentage of variance is explained by factors at country level, and social inequality was positively related to IA in our final model. Other macro-level factors influencing IA should be explored using other data sets.

Our results have some practical and theoretical implications. Some projects are promoting only parental supervision or mediation practices. Although we recognise the relevance of those strategies to tackle the problem of IA (Livingstone and Helsper, 2010), by highlighting the importance of children's relational lifestyles our study invites policy makers and practitioners to apply bottom-up and peer-to-peer policies and programmes. Such policies and programmes that focus on the improvement of children's and adolescents' dialogical and evaluative skills have the potential to reduce IA by supplementing (not replacing) parental contributions to adolescents' relational lifestyles. Building strong evaluative skills and ability for interpersonal dialogue creates the capacity to search the best information source and make choices based on rational thinking, and also forms a set of dispositions that lead to positive interpersonal relationships, which, in consequence, will facilitate making good decisions. Our study highlights the importance of empowering adolescents' decision making and relational abilities, not only by new knowledge and attitudes, but by promoting practical wisdom (Kristjánsson, 2005), conversational abilities (Turkle, 2015), and positive interpersonal exchanges like those generated by service learning and volunteering activities. Our work also underlines the importance of adopting a character-based theory for dealing with online issues through character development and service-learning programmes (Harrison, 2016).

All youth face difficulties with involving adults in their daily decisions due the generation gap and other factors such as family transitions. Although children with two caregivers are more likely to have the relational lifestyles that help protect them from IA, the prevention of IA in all family types might need to focus on developing healthier relational lifestyles to enhance parent–child communications (Knox et al, 2011), especially with boys. Today, we can find specific programmes for helping parents to improve their communication skills with children to encourage them to avoid drinking, smoking or drug problems. However, we are witnessing a new reality among adolescents with harmful consequences for them that deserves special attention: IA. Time-strapped single parents face particular challenges (Parker and Wang, 2013), but parenting efforts could be guided by knowing that time invested in relationship skills may protect against IA more effectively than time spent regulating and monitoring.

Limitations and future research

Exploring social behaviours such as internet consumption involves many methodological challenges. For example, cut points for identifying problematic

behaviours are sometimes arbitrary and depend upon the number and type of measures available (for example, Durkee et al, (2012). Consequently, we are more confident in our ability to identify the risk factors for IA than in our measurement of the prevalence of IA.

A key limitation is that the EU Kids Online survey sample counted any homes where two individuals functioned in parental or caretaking roles as two-parent homes. However, children who live with both biological parents may be even more advantaged than those who live in a stepfamily or other types of non-intact families (Shek and Leung, 2013). We could neither differentiate among two-parent homes nor analyse the influence of family transitions. Future research could also benefit from taking into account the role of co-parenting or shared parenting as either an individual or a country-level variable.

Other limitations are related to the theoretical perspective we followed in the classification of relational lifestyles and the process of operationalising the concept. First of all, there have been criticisms of the empirical design of Archer's studies, which have been subjected to discussion and critique (Brownlie, 2014). Besides the fact she worked with non-representative samples, main critiques to Archer's classification highlight the lack of consideration of the role of emotions in reflexivity as well as the relevance of including everyday relationships in the analysis (Brownlie, 2014: 23–5). Regarding this last criticism, our study would be a limited attempt to improve Archer's classification. The main limitation was the lack of measures of adolescents' emotions.

In the process of operationalising the relational lifestyle concept, we have to admit the compromises that a research on secondary data has to do by making the best use of the available variables in a survey which cannot fully map onto a complex concept such as this one. Although we carefully studied the survey's technical report and other EU Kids Online publications for guidance, there was still a degree of simplification involved. Finally, the survey's recruitment process may not have reached the most vulnerable or marginalised children despite repeated return visits to sampled households (Livingstone et al, 2015).

Nonetheless, we contribute to the understanding of the growing phenomenon of IA by including adolescents' relational lifestyles and point to practical pathways based on quantitative evidence. Further research should consider the analysis of family transitions, the influence of peer-group dynamics, personal experiences of solidarity on relational lifestyles and parent–children communications. This will require applying qualitative methodologies such as ethnographies and in-depth interviews.

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The authors declare that they have no conflict of interest. The views expressed in this article are those of the authors. The original data creators, depositors or

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Note
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