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# Adverse childhood experiences and social media use in adulthood. Evidence from a novel EU survey

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#### Abstract

This paper explores whether individuals that grew up in adverse environments are more likely to engage in excessive use of social media later in life. We rely on a novel EU-wide survey that comprises information on social media usage time, patterns, motivations, and potential overuse, together with a rich set of individual-specific socio-economic conditions and childhood experiences. We find that adverse childhood environments, and especially the presence of close relatives with severe drinking and mental health problems, significantly increase the likelihood of social media overuse in adulthood. Moreover, we document interesting differential patterns between types of social media platforms, as well as between active and passive users. Adverse childhood environments have a disproportionate impact on passive overuse of digital social network platforms, resulting in more frequent neglect of work and family responsibilities. Finally, we show that the effect of childhood conditions on some specific aspects of social media use is mediated by loneliness and social connectedness in adulthood. Our findings have significant policy implications because the interplay between the excessive social media use and adverse childhood experiences may jointly undermine individuals' well-being and cognitive development.

Keywords: Adverse childhood conditions, social media overuse, neglect, loneliness, social connectedness

**JEL Classification:** L82, D91, J12, I12, I31

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## Declarations

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### 1 Introduction

In late November 2024, the Australian government has imposed a ban on social media for children under 16, in order to safeguard their mental health and well-being from the detrimental effects of social media, starting from an early age. This comes after two decades of a sharp growth in social media consumption worldwide, expanding from 970 million users in 2010 to approximately 5.17 billion by July 2024. The market has witnessed both quantitative expansion and functional diversification, with key platforms like Facebook (2004), Snapchat (2011), Instagram (2013), and TikTok (2016) emerging during this period (Ortiz-Ospina, 2019). Initially focused on interpersonal text-based interactions, social media platforms now serve multifaceted purposes, including socialisation, entertainment, professional networking, and information dissemination (Aichner and Jacob, 2015). In 2023, more than 83% of European youth were engaged daily in social network platforms (Eurostat, 2024).<sup>1</sup> In the US, about 75% of adults under 30 used at least five of the platforms, which is far higher than the shares of those aged 30 to 49 (53%), 50 to 64 (30%), and those 65 and older, who register only 8% (Pew Research Center, 2024).<sup>2</sup>

While social media can provide some undoubted benefits, excessive use can lead to serious social dysfunction and mental (or emotional) disorders. According to the stimulation hypothesis (Gross, 2004; Valkenburg and Peter, 2007), social media platforms provide opportunities for maintaining contact with friends and family and facilitate the formation of new connections. The displacement hypothesis, on the other hand, emphasises that increased social media use is associated with less face-to-face or direct communication with close friends and relatives, correspondence challenges, and social and/or physical appearance comparisons, which may all lower social skills and overall well-being (Kraut et al., 1998). However, neither of these hypotheses adequately captures the complexities of the relationship between social media, relationship quality, and well-being. The interplay between costs and benefits

<sup>&</sup>lt;sup>1</sup>For more info, see https://ec.europa.eu/eurostat/statistics-explained/index.php?oldid=639272

<sup>&</sup>lt;sup>2</sup>For more info, see https://www.pewresearch.org/internet/wp-content/uploads/sites/9/2024/ 01/PI\_2024.01.31\_Social-Media-use\_report.pdf

of social media consumption may not necessarily result in a linear relationship. This is in line with the digital Goldilocks hypothesis (Przybylski and Weinstein, 2017), which suggests that moderate social media is associated with better psychosocial functioning than lower levels of digital engagement, while excessive use can become harmful.

Even though the empirical assessment of the relationship between social media consumption and well-being is far from being conclusive, several research studies suggest that intensive digital platform use positively correlates with mental health disorders and other emotional dysfunctionalities, such as loneliness and social isolation (Hancock et al., 2022). While most of this research is correlational, suffering therefore from reverse causality and omitted variable problems, some recent contributions have moved forward and relied on experimental and quasi-experimental designs as an attempt to isolate social media consumption's direct effects. Reed et al. (2023) analyse the existing findings on the relationship between social media and well-being in an experimental setting and find that reducing social media activity by 15 min a day translates into a lower social media dependence and improved general health and immune functioning, as well as reduced feelings of loneliness and depression. These results complement the previous findings in the literature on prolonged reduction of social media use (Hunt et al., 2021, 2018). Along similar lines, Allcott et al. (2020) find that deactivating Facebook for the four weeks before the 2018 US midterm election emphasised socialisation within family and friends and increased subjective well-being. To complement these findings, Braghieri et al. (2022) offer quasi-experimental estimates showing that the introduction of Facebook across US colleges in the mid-2000s had a negative effect on student mental health and their academic performance. The authors also emphasise that part of this effect is driven by unfavourable social comparisons, which may be particularly harmful during formative years when identity development is most critical (Crone and Konijn, 2018; Orben et al., 2022).

To add complexity, the potential negative effects of social media use may be more pronounced for individuals with a higher baseline risk of developing mental disorders (Braghieri et al., 2022). Among factors influencing the predisposition of experiencing mental or emotional problems, risky health behaviours, loneliness and social isolation, the adverse conditions experienced during childhood may play a prominent role (Brugiavini et al., 2023; Buia et al., 2019; Hughes et al., 2016; Kovacic et al., 2024; Nelson et al., 2020). Adverse childhood experiences (ACE henceforth) refer to a set of childhood traumatic events such as physical, sexual and emotional abuse, physical and emotional neglect, household substance abuse, household mental illness and parental separation or divorce (Finkelhor et al., 2015). These events may lead individuals to lose trust in the real world and authentic relationships, increasing their social isolation. Moreover, some epidemiological literature have established a significant correlation between adverse childhood experiences and propensity for behavioural addiction disorders (Hao et al., 2024; Mi-Sun and Soo-Young, 2023) with the mechanism operating through diminished self-efficacy, social isolation, heightened anxiety, and maladaptive cognitive patterns (Li et al., 2023). Social media in this context may serve as an optimal coping strategy, leading individuals to spend progressively more time online seeking relief, often requiring increasing amounts of social media engagement to achieve the same comforting effect. This mechanism is theoretically consistent with rational choice models, as the internet presents minimal barriers to entry while maximizing perceived benefits through anonymity and accessibility. The substitution effect becomes particularly salient when individuals seek to minimize exposure to stress and emotional problems, social anxiety and isolation (Wu et al., 2022). While this makes it an attractive short-term solution, people may gradually need to spend more and more time online to get the same feeling of relief, running into a risk of social media overuse or addiction. Individuals with histories of ACE, therefore, may turn to social media not only for its intended purpose of connection and support but also as a way to cope with past trauma and adapt psychologically. However, very little is known about potential relationships between childhood trauma and social media (over) use later in life. The objective of this paper is to fill part of this gap and offer comprehensive evidence on potential impacts of adverse childhood environments on the intensity of social media use, the type of digital platforms engaged with, as well as the main purpose of such activities. In addition, we propose several mechanisms linking ACE to specific patterns of social media consumption. Using data from the European Union Loneliness Survey (EU-LS), a novel survey spanning all 27 EU member states and containing rich information on individual socio-economic characteristics, their backgrounds, social and emotional experiences, as well as a separate module on social media engagement, we focus simultaneously on multiple dimensions of social media consumption, such as how intensively people use instant messaging tools and social networking sites, whether they engage with social media actively or passively, and to what extent social media interferes with their daily activities. As for the underlying mechanisms linking ACE to social media consumption, we explore how loneliness and social connectedness may mediate the relationship between childhood trauma and patterns of social media use in adulthood.

Our main finding is that individuals raised in familial environments with close relatives suffering from drinking problems or mental health issues are significantly more likely to spend more time on social networking sites and, as a result, neglect their work and family duties. Detrimental effects of adverse childhood conditions are less pronounced for instant messaging tools and for active users of social media. We also find some evidence of a stronger impact of specific adverse experiences in childhood on younger individuals, especially in the context of social networking sites passive overuse. Finally, we highlight the importance of loneliness and social isolation as mediating factors between ACE and excessive social media consumption. Loneliness mediates 15% of the effect of mental illnesses in the household during childhood on social networking sites overuse, 25% of its effect on passive social media use, and up to 35% in the case of neglecting work or family duties due to excessive social media consumption. The mediating power of loneliness is contained for instant messaging tools, where the effect of adverse childhood conditions is mainly mediated by social connectedness, especially for active social media users.

The rest of the paper is organised as follows. Section 2 presents the data and the variables used in the study, Section 3 describes the empirical strategy while Section 4 reports the main results. Section 5 concludes.

### 2 Data and Variables

The European Union Loneliness Survey (EU-LS) represents the first comprehensive study on loneliness across all 27 EU member states.<sup>3</sup> Conducted in late 2022, it gathered data from 25,646 participants aged 16 and above. The survey was administered online across all member states, with approximately 1,000 respondents per country except for Cyprus, Luxembourg and Malta (around 500).<sup>4</sup> Although the survey focuses mainly on different aspects and measurements of loneliness, it also contains a rich amount of information on individuals' health, civic engagement, preferences, and socio-economic conditions. Most importantly, the EU-LS includes a specifically designed module on social media use that examines usage time, patterns, motivations, and potential overuse. In addition to a wide array of measures of loneliness, the survey also includes several indicators of social connectedness, such as the frequency of contact with family and friends, the number of close friends and family members, and participation in social activities, as well as a series of questions about stressful life events and adverse childhood experiences.<sup>5</sup>

#### 2.1 Social Media Use

The survey measures daily time spent on social media, separated into two different categories: social network sites (SNS) and instant messaging tools (IMT). SNS are online digital platforms aimed at creating and sharing personal profiles, such as image-focused (Instagram, TikTok), text-focused (X), or mixed (Facebook) sites. IMT, on the other hand, are web services for private, real-time conversations and are typically text-based (WhatsApp, Facebook Messenger, SnapChat). The EU-LS asks respondents about their daily usage time for both

<sup>&</sup>lt;sup>3</sup>For more information on the survey, see https://joint-research-centre.ec.europa. eu/scientific-activities-z/survey-methods-and-analysis-centre-smac/loneliness/ eu-loneliness-survey\_en

<sup>&</sup>lt;sup>4</sup>Quotas based on the population of each member state were used for sample selection from the online consumer panels to reflect the target population in terms of age, gender, education, and NUTS region of residence. Additionally, the survey collected data on a second sample including only four selected countries, each representing one geographical region of the European Union, namely Sweden, Italy, Poland and France, with the respondents recruited from an existing probability-based panel (KnowledgePanel EU).

<sup>&</sup>lt;sup>5</sup>The full dataset is available on the following link: https://data.jrc.ec.europa.eu/dataset/ 82e60986-9987-4610-ab4a-84f0f5a9193b.

SNS and IMT, with eight response options ranging from "never" to "more than 5 hours".<sup>6</sup> In order to capture the overuse of both social networking sites and instant messaging tools, we've created two separate indicators: one for intense SNS use and another for intense IMT use. Following the digital Goldilocks hypothesis (Przybylski et al., 2020; Przybylski and Weinstein, 2017, 2019), both are defined as 1 if daily usage exceeds 2 hours and 0 otherwise. Despite the increasing overlap in functionalities among communication platforms, we have maintained separate indicators for SNS and IMT for the sake of clarity and because of their different nature.

In addition, the survey allows us to categorise social media users into active and passive ones. Active use generally involves actions enabling immediate interaction with other individuals, including posting content, sharing content, commenting on posts, and chatting in groups or privately. Passive use encompasses non-interactive consumption of content such as scrolling through pictures, watching videos, reading status updates, viewing profiles, and reading news and personal information in profiles and chat groups. The survey records the frequency of passive usage (looking through feeds and viewing videos) and active usage (publishing content and chatting with others). Response options range from "never" to "more than 30 times per day". We define intense passive and active users as those who report using social media 16 times or more per day in their respective modes. Figure 1 shows the distribution of social media users by age and gender.

The EU-LS also examines how social media use affects users' daily responsibilities. Specifically, respondents were asked to indicate how often (ranging from "never" to "several times a day") they neglect their work, school, or family obligations due to time spent on social media. Moreover, they are asked to indicate how often they use social media to improve their mood, with response options ranging from "never" to "several times a day".<sup>7</sup> We create two binary variables that equal 1 if the respondent reports neglecting work, school, or

<sup>&</sup>lt;sup>6</sup>The full range of response options in the survey were: never, less than 10 minutes per day, 10-30 minutes per day, 31-60 minutes per day, 1-2 hours per day, 2-3 hours per day, 4-5 hours per day, and more than 5 hours per day.

<sup>&</sup>lt;sup>7</sup>The full range of response options for both variables were: "several times a week," "once a day," or "several times a day."

family responsibilities, or uses social media to improve his/her mood at least several times per week.



**Figure 1:** Social media use, by gender and age, (%).

**Source**: EU-LS survey, 2022. Number of observations: 23,377. Share of female: 52%, share of male: 48%. Population means: SNS (18.1%), IMT (12.3%), Active (14.0%), Passive (16.4%).

### 2.2 Adverse Childhood Experiences

Within a specifically designated module, the survey participants were asked to recall their childhood relationships with their parents before age 16, rating how emotionally close they felt to their mother and father during that period, as well as whether their relatives had any history of mental health conditions, alcohol problems, or any chronic, severe illnesses, disabilities, or accidents. More in detail, the question about parent-child relationship closeness asks the following: "All in all, how would you describe your relationship with your parents

(mother/father) when you were growing up?" Respondents can rate emotional closeness to each parent on a scale of 1 to 10, where 1 means "not close at all" and 10 means "very close." Following the literature in the field, we categorised the scales into binary variables where 1 represents ratings from 1-5 (indicating lower emotional closeness) and 0 represents ratings from 6-10 (indicating higher emotional closeness).

Regarding the presence of mental health conditions, alcohol abuse, and general chronic illnesses in the household when the respondents were aged 16 or younger, the question is the following: "To your knowledge, when you were growing up, did any of the below apply to someone among your close relatives (parents, brothers, or sisters)?" Respondents had the following answering options: (1) Smoke heavily, (2) Drink heavily, (3) Had chronic, severe illnesses, disabilities, or accidents, (4) Had mental health problems, (5) None of the above. From these responses, we created three binary variables that equal 1 if respondents reported having been raised in the presence of close relatives with mental health problems, drinking problems, or general health conditions (including disabilities or accidents).

We also include additional childhood controls, namely the absence of one or both parents, self-reported health status in childhood, and having a group of close friends that respondents felt comfortable spending time with during school years (when they were 6 to 15 years old).

Figure 2 shows the prevalence of the main adverse childhood experiences in the population, separately for males and females.



**Figure 2:** Adverse childhood experiences, by gender (%).

**Source**: EU-LS survey, 2022. Number of observations: 23,112. Share of female: 52%, share of male: 48%. Population means: Closeness Mother (11.1%), Closeness Father (20.5%), Mental Relatives (11.2%), Illness relatives (12.8%), Drinking Relatives (19.5%).

### 2.3 Loneliness and social connectedness

In line with its main purpose, the EU-LS survey includes various measures of loneliness and social connectedness. As for loneliness, we employ the commonly used indirect measure, namely the University of California Los Angeles Loneliness (UCLA) 3-item UCLA scale (Hughes et al., 2004; Russell, 1996), that does not explicitly refer to loneliness or feeling lonely. Instead, it asks about personal experiences closely related to loneliness, such as having someone to rely on, feeling left out or isolated from others, and having close connections with whom to discuss intimate matters. The main advantage of using this indirect measure is that it does not directly reference loneliness and may provide a more objective picture by

reflecting the core definition of loneliness as a perceived deficiency in social relationships.<sup>8</sup> The exact wording of the items included in the UCLA loneliness scale is the following: "How often do you feel isolated from others?", "How often do you feel you lack companionship?", "How often do you feel left out?". In each case, the available responses are: (1) Hardly ever or never, (2) Some of the time, (3) Often. The option (1) was then assigned a score of 0, option (2) a score of 1, and option (3) was scored 2. A sum score was computed; therefore, the final scale ranges from 0 (not lonely, *i.e.*, those answering (1) to all three items) to 6 (very lonely, *i.e.*, those answering (1) to all three items). Figure 3 shows the distribution of UCLA loneliness scores by age and gender.

Figure 3: Loneliness (UCLA), by gender and age, average scores.



**Source**: EU-LS survey, 2022. Number of observations: 23,837. Population means: Male (1.84), Female (2.13).

<sup>&</sup>lt;sup>8</sup>Indirect measures are generally preferred because they are not subject to potential reporting bias due to individuals' misunderstanding of loneliness and/or because they may under-report their true feelings of loneliness when asked directly due to stigma. This latter aspect may vary by gender or age group, leading to inaccurate conclusions about the prevalence of loneliness in the population.

The survey also includes a rich set of variables related to the size and quality of social networks. Among these, respondents are asked to report the number of close family members and friends, as well as the frequency of meeting them (ranging from "never" to "daily"). Using this information, we build a composite index for family and friends networks by summing the values of the four variables.<sup>9</sup> The higher the index score, the greater the level of social connectedness. Figure 4 shows the distribution of the index across age groups and gender.

Figure 4: Social Connectedness Index, by gender and age, average scores.



**Source**: EU-LS survey, 2022. Number of observations: 21,994. Population means: Male (0.037), Female (-0.022).

The highest levels of social connectedness are observed among younger individuals, particularly males compared to females. Interestingly, the lowest levels of social connectedness are found among individuals in working age (36 to 65), especially women, whereas an increase is observed among older people. It is worth noting that, when comparing this figure with the previous one on loneliness, the youngest generations report more intense feelings of

<sup>&</sup>lt;sup>9</sup>The variables used are: (i) the number of close family members, (ii) the number of friends, (iii) the frequency of in-person contacts with family members, and (iv) the frequency of in-person contacts with friends. All variables were standardised prior to constructing the index.

loneliness than others, despite having higher levels of in-person connectedness with family and friends. This is not surprising, as loneliness is more about the perception of the quality of social relationships, independent of their quantity and/or size of social networks, which may also be culturally specific (Casabianca and Kovacic, 2024; Heu et al., 2021; Kovacic et al., 2024).

In addition to the core variables described in the previous subsections, we include a set of demographic and socio-economic controls. Specifically, we consider the respondents' age, gender, immigration status (first-generation immigrant or native), educational attainment, employment status, relationship status, household size, sexual orientation, and information related to self-assessed health and risky behaviours (smoking, physical exercise, and diet), all measured at the time of the interview. Table 13 in the appendix presents descriptive statistics on these characteristics.

## 3 Empirical Strategy

In order to explore the relationship between adverse childhood events and social media use, both in terms of its intensity and purposes, we first estimate the following set of models:

$$Y_{it} = \omega_0 + \omega_1 ACE_{i,t-1} + \omega_2 \ X_{it} + \psi_c + \epsilon_{it},\tag{1}$$

where  $Y_i$  represents a set of dummy variables capturing different aspects of social media use: spending more than 2 hours on social network sites or instant messaging tools, being an active or passive social media user, neglecting work and family duties due to excessive use of social media, and using digital devices in order to feel better.  $ACE_{i,t-1}$  is a set of adverse events that occurred during childhood (t-1),  $X_i$  is a vector of individual demographic and/or socio-economic characteristics,  $psi_c$  includes country dummies and  $\epsilon_i$  is the error term. In all regression models, standard errors are clustered at the country of residence level.

In order to analyse the role of loneliness and social connectedness in mediating the effects ACE on social media use, we employ the KHB method originally proposed by Karlson et al. (2012) and empirically validated by Arpino et al. (2018) and Smith et al. (2019), among others. This methodological approach enables a systematic comparison between two models: an unadjusted model that regresses social media outcomes on adverse childhood conditions along with all the other control and explanatory variables, and an adjusted model that additionally incorporates the mediators (loneliness and social connectedness in this case). Through this comparison, the KHB method quantifies the proportion of adverse childhood effect on later-life social media use that operates through these mediating pathways. The method, therefore, allows to decompose mediator contribution to the indirect effect, while capturing the residual influence of early-life trauma (direct effect) in the adjusted model's estimates. The total effect, represented by the unadjusted model's estimates, comprises the sum of both direct and indirect effects.

### 4 Results

This section summarises our main findings. We begin by investigating the relationships between early-life conditions, other demographic and socioeconomic variables, and the frequency with which social network sites and instant messaging tools are used, the differences between types of social media use (active versus passive users), as well as the extent to which frequent social media use interferes with daily functioning and tasks. In addition, we explore whether the observed effects are stronger for vulnerable population groups such as immigrants and LGB+ people. After documenting a significant and differential impact of specific early-life events, the second part of the analysis investigates the existence of potential underlying mechanisms, with a focus on the role of loneliness experiences and social isolation.

#### 4.1 Adverse childhood experiences and social media use

Tables 1 and 2 show the results for the two broad measures of social media use, namely the time spent on social network sites (SNS) and instant messaging tools (IMT). We group adverse childhood experiences in two broad categories: emotional closeness to parents (relationship quality with mother and father) and adverse familial environments (close relatives with mental and chronic illnesses and/or problems with heavy drinking). Other childhood characteristics include the absence of one or both parents and bad health in childhood. The models estimate the probability of spending more than two hours per day on SNS and IMT, respectively, gradually increasing the set of explanatory and control variables. Models 1 and 4 include only early-life conditions along with age and gender, while models 2 and 5 expand the set of controls by including risky health behaviours (smoking, physical inactivity, unhealthy diet), religiosity, relationship status, household size, education, employment status, self-reported health status, and belonging to vulnerable population groups such as immigrants and LGB+. Finally, models 3 and 6 add a battery of variables capturing several aspects of individuals' social networks, such as the number of close friends and relatives, frequency of contact, participation in cultural or sport activities, having had few friends in childhood, and feelings of loneliness in adulthood.

The results reveal some differential patterns between SNS and IMT. While generally emotional closeness to parents does not emerge as a significant predictor of SNS, exposure to relatives with alcohol abuse problems or with mental health issues during childhood shows a robust and statistically significant association with intensive social network site usage in adulthood. On the other hand, parental alcoholism and mental health problems seem not to have a lasting influence on intensive instant messaging tool usage, which is significantly higher among individuals whose parents suffered from chronic severe illnesses or disabilities. Interestingly, individuals reporting lower closeness to mothers are less likely to engage in instant messaging tools, which may indicate generally higher degrees of introversion of these individuals, even after controlling for the size of social networks, frequency of contact with friends and relatives, and feelings of loneliness.

The effects of adverse child environments remain significant even after controlling for social isolation and loneliness, although the size of the coefficients is somewhat reduced. Moreover, lonelier individuals spend more time on digital tools, which is in line with the

**Table 1:** Social Network Sites (SNS), Instant Messaging Tools (IMT) and relationship quality with parents.

	(1)	(2)	(3)	(4)	(5)	(6)
	SNS	SNS	SNS	IMT	IMT	IMT
Closeness mother (chld.)	0.006	0.000	0.003	-0.010*	-0.014**	-0.015**
	(0.007)	(0.007)	(0.009)	(0.005)	(0.006)	(0.006)
Closeness father (chld.)	0.004	-0.001	-0.003	-0.002	-0.004	0.003
	(0.009)	(0.009)	(0.009)	(0.006)	(0.006)	(0.006)
Absent parent (chld.)	$0.010^{*}$	0.004	0.005	$0.011^{**}$	0.010**	0.007
	(0.005)	(0.005)	(0.005)	(0.004)	(0.005)	(0.006)
Bad health (chld.)	$0.042^{***}$	$0.026^{***}$	$0.019^{***}$	$0.012^{**}$	$0.011^{*}$	0.005
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Lesbian or gay		0.028	0.030		$0.038^{**}$	$0.036^{**}$
		(0.019)	(0.019)		(0.015)	(0.016)
Bisexual		0.037***	$0.026^{*}$		0.009	0.006
		(0.014)	(0.014)		(0.010)	(0.011)
Other sexual or.		$0.069^{***}$	$0.065^{***}$		0.013	-0.010
		(0.026)	(0.025)		(0.023)	(0.021)
$\mathrm{DK}/\mathrm{PNS}$		0.002	0.014		$0.044^{***}$	$0.041^{**}$
		(0.015)	(0.018)		(0.014)	(0.017)
Few friends (chld.)			-0.009			-0.013
· · · ·			(0.008)			(0.009)
Loneliness (UCLA)			0.017***			0.009***
			(0.002)			(0.002)
Other controls:						
Age and gender	Yes	Yes	Yes	Yes	Yes	Yes
Socio-economic	No	Yes	Yes	No	Yes	Yes
Network and social act.	No	No	Yes	No	No	Yes
N. Observations	23317	21849	19747	23299	21836	19741

**Notes**: The method of estimation is Logit. The reported coefficients are marginal effects. Socio-economic controls: household size, religiosity, immigration status (first-generation immigrant), risky health behaviours (smoking, physical inactivity, poor dietary habits), relationship status, employment status, and self-reported health. Network, social activities and loneliness include: network size (family and friends), frequency of face-to-face contacts with friends and family members, loneliness (UCLA scale). DK/PNS stands for Don't know or prefer not to say answer options to the question on sexual orientation. In all models we control for country fixed effects. Standard errors clustered at the country level are reported in parentheses. Significance levels: \* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01.

**Table 2:** Social Network Sites (SNS), Instant Messaging Tools (IMT) and adverse familial environments.

	(1)	(2)	(3)	(4)	(5)	(6)
	SNS	SNS	SNS	IMT	IMT	IMT
Illness relatives (chld.)	0.020***	0.014*	0.009	0.024***	0.022***	0.016**
	(0.008)	(0.008)	(0.008)	(0.007)	(0.007)	(0.007)
Mental relatives (chld.)	0.034***	0.027***	0.022**	0.012	0.011	0.012
	(0.008)	(0.009)	(0.009)	(0.008)	(0.008)	(0.007)
Drink relatives (chld.)	0.032***	0.028***	0.026***	0.008*	0.003	0.001
	(0.005)	(0.006)	(0.006)	(0.005)	(0.004)	(0.005)
Absent parent (chld.)	0.005	-0.001	0.001	0.005	0.005	0.003
	(0.005)	(0.004)	(0.005)	(0.004)	(0.004)	(0.005)
Bad health (chld.)	0.032***	$0.015^{**}$	0.011	0.005	0.005	0.001
	(0.008)	(0.007)	(0.008)	(0.006)	(0.006)	(0.007)
Lesbian or gay		0.022	0.024		0.033**	$0.031^{**}$
		(0.019)	(0.018)		(0.014)	(0.014)
Bisexual		$0.031^{**}$	0.021		0.005	0.004
		(0.015)	(0.015)		(0.011)	(0.011)
Other sexual or.		$0.065^{**}$	$0.063^{***}$		0.019	-0.002
		(0.025)	(0.024)		(0.022)	(0.021)
$\mathrm{DK}/\mathrm{PNS}$		0.001	0.007		$0.042^{***}$	$0.042^{***}$
		(0.016)	(0.017)		(0.014)	(0.015)
Few friends (chld.)			-0.010			-0.010
			(0.009)			(0.008)
Loneliness scale (UCLA)			$0.016^{***}$			$0.009^{***}$
			(0.002)			(0.002)
Other controls:						
Ago and gondor	Vog	Vog	Voq	Voq	Vog	Voq
Age and gender	res	res	res Vec	res	res	res Voc
Notwork and social act	NO	res	res	NO	res	res
Network and social act.	110	21001	10804	09990	<u> </u>	10707
IN. ODSERVATIONS	25554	21901	19804	23330	21884	19797

**Notes**: The method of estimation is Logit. The reported coefficients are marginal effects. Socio-economic controls: household size, religiosity, immigration status (first-generation immigrant), risky health behaviours (smoking, physical inactivity, poor dietary habits), relationship status, employment status, and self-reported health. Network, social activities and loneliness include: network size (family and friends), frequency of face-to-face contacts with friends and family members, loneliness (UCLA scale). DK/PNS stands for Don't know or prefer not to say answer options to the question on sexual orientation. In all models we control for country fixed effects. Standard errors clustered at the country level are reported in parentheses. Significance levels: \* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01. existing literature (Schnepf et al., 2024). Finally, as demonstrated in some studies (Berlingieri and Kovacic, 2024), sexual minorities are at higher risk of excessive social media use. Bisexual individuals and those declaring sexual orientation other than gay/lesbian or bisexual are more likely to engage for more than two hours per day on social network sites, while gay and lesbian individuals are more inclined towards instant messaging tools compared to their heterosexual counterparts.

The fact that childhood adverse family environments contribute to greater social media consumption in adulthood is particularly salient since balanced engagement with social media platforms is important for healthy psychosocial development. Indeed, according to the digital Goldilocks hypothesis (Przybylski et al., 2020; Przybylski and Weinstein, 2017, 2019), moderate social media use may yield beneficial outcomes while excessive use may be detrimental. Moreover, since the effects of early-life conditions generally decrease over the life course (Kovacic and Orso, 2022), the exposure to some adverse events during childhood that considerably impact the intensity of social media use in adulthood may be particularly problematic for the mental well-being of younger individuals.

In addition to a general overuse of social network sites, early-life exposure to adverse environments is also significantly associated with the qualitative nature of digital media use, potentially predisposing individuals toward more passive forms of engagement in adulthood (Table 4). This evidence is particularly relevant given that passive social media use has been associated with different psychological outcomes compared to active engagement in the existing literature (Evans et al., 2023; Godard and Holtzman, 2024; Yue et al., 2022). More precisely, individuals who experienced familial alcohol abuse during childhood show a higher probability of frequent passive engagement (defined as 16 or more daily instances of scrolling or video watching) with digital platforms. Similar effects emerge for those that experienced bad health in childhood and/or having been raised with close relatives suffering from disabilities or mental health issues, although the latter effects disappear when we account for loneliness in adulthood. This is not surprising evidence since loneliness significantly correlates with adverse childhood conditions (Casabianca and Kovacic, 2024; Kovacic et al., 2024). In contrast, emotional closeness to parents does not appear to play any role (Table 3).

The early-life exposure to within-household alcohol abuse and mental health illness may not only influence the frequency and nature of social media engagement but may also predict more problematic patterns of use that impact daily functioning or utilisation of social media as a coping strategy to overcome some specific psychological issues. Tables 5 and 6 suggest that early-life conditions are positively related to neglect of work, school, or family responsibilities due to social media use and the likelihood of turning to social media in order to improve the general mood and feel better. Having been exposed to alcohol abuse, disability, or mental health problems of close relatives translates into a higher probability of neglecting work and family duties due to excessive social media use. These associations shrink when loneliness and social isolation are taken into account, which suggests that the impact of childhood conditions may be indirect and reflected in contemporary feelings of loneliness. Similarly, accounting for loneliness absorbs the effects of social isolation and bad health in childhood, which are among the factors affecting loneliness (Casabianca and Kovacic, 2024; Kovacic et al., 2024; Schnepf et al., 2024). The effects of mental health illnesses and alcohol abuse within households are even more pronounced in the case of the use of social media as a coping tool to feel better. The marginal effect of using digital tools to improve the mood is double with respect to work and family duties neglect. In addition, this specific purpose of social media use is significantly correlated with lower emotional closeness with parents, especially regarding poorer relationship quality with mothers during childhood (Table 5). This effect, however, vanishes when we account for loneliness and social isolation. This is not surprising since poor relationship quality with parents is strongly correlated with feelings of loneliness in adulthood (Casabianca and Kovacic, 2024; Guthmuller, 2022; Kovacic et al., 2024).

The results remain robust even when we consider an aggregate measure of ACE in Table 14 (in the appendix). More precisely, individuals who have experienced three or more adverse childhood conditions are significantly more likely to engage in SNS, be passive social

	(1)	(2)	(3)	(4)	(5)	(6)
	Active	Active	Active	Passive	Passive	Passive
Closeness mother (chld.)	-0.000	-0.002	0.000	0.001	-0.001	-0.002
	(0.008)	(0.009)	(0.008)	(0.007)	(0.007)	(0.008)
Closeness father (chld.)	-0.010	-0.009	0.002	-0.003	-0.006	-0.002
	(0.007)	(0.008)	(0.008)	(0.008)	(0.007)	(0.007)
Absent parent (chld.)	0.012**	$0.015^{**}$	0.013**	0.005	0.006	0.006
	(0.006)	(0.006)	(0.006)	(0.008)	(0.008)	(0.008)
Bad health (chld.)	$0.016^{*}$	0.014	0.011	0.040***	0.028***	0.022***
	(0.009)	(0.009)	(0.009)	(0.008)	(0.008)	(0.008)
Lesbian or gay		$0.035^{**}$	$0.036^{*}$		0.015	0.010
		(0.017)	(0.018)		(0.021)	(0.020)
Bisexual		-0.000	0.000		0.032***	$0.022^{*}$
		(0.010)	(0.010)		(0.013)	(0.012)
Other sexual or.		$0.098^{***}$	$0.079^{***}$		-0.005	-0.008
		(0.029)	(0.028)		(0.021)	(0.021)
DK/PNS		-0.018	-0.009		0.004	0.010
		(0.015)	(0.021)		(0.014)	(0.018)
Few friends (chld.)			-0.007			-0.011
			(0.009)			(0.010)
Loneliness (UCLA)			$0.005^{***}$			0.013***
			(0.002)			(0.002)
Other controls:						
Age and gender	Yes	Yes	Yes	Yes	Yes	Yes
Socio-economic	No	Yes	Yes	No	Yes	Yes
Network and social act.	No	No	Yes	No	No	Yes
N. Observations	23112	21684	19648	23213	21769	19701

Table 3: Active versus Passive SM use, and relationship quality with parents.

**Notes**: The method of estimation is Logit. The reported coefficients are marginal effects. Socio-economic controls: house-hold size, religiosity, immigration status (first-generation immigrant), risky health behaviours (smoking, physical inactivity, poor dietary habits), relationship status, employment status, and self-reported health. Network, social activities and loneliness include: network size (family and friends), frequency of face-to-face contacts with friends and family members, loneliness (UCLA scale). DK/PNS stands for Don't know or prefer not to say answer options to the question on sexual orientation. In all models we control for country fixed effects. Standard errors clustered at the country level are reported in parentheses. Significance levels: \* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01.

	(1)	(2)	(3)	(4)	(5)	(6)
	Active	Active	Active	Passive	Passive	Passive
Illness relatives (chld.)	$0.027^{***}$	0.022***	$0.018^{**}$	$0.023^{***}$	$0.017^{***}$	0.008
	(0.008)	(0.008)	(0.008)	(0.006)	(0.006)	(0.006)
Mental relatives (chld.)	0.005	0.002	0.004	$0.018^{***}$	$0.012^{**}$	0.010
	(0.008)	(0.008)	(0.009)	(0.005)	(0.006)	(0.006)
Drink relatives (chld.)	-0.001	-0.002	-0.002	0.021***	$0.019^{***}$	$0.017^{***}$
	(0.007)	(0.007)	(0.007)	(0.004)	(0.005)	(0.005)
Absent parent (chld.)	0.007	$0.010^{*}$	0.012**	-0.001	0.000	0.001
	(0.006)	(0.006)	(0.006)	(0.008)	(0.007)	(0.007)
Bad health (chld.)	0.011	0.011	0.010	0.029***	0.018**	$0.016^{*}$
	(0.009)	(0.009)	(0.008)	(0.009)	(0.009)	(0.009)
Lesbian or gay		0.040**	0.042**		0.012	0.009
		(0.018)	(0.019)		(0.020)	(0.020)
Bisexual		-0.003	-0.002		$0.025^{**}$	0.016
		(0.011)	(0.010)		(0.013)	(0.012)
Other sexual or.		0.092***	0.081***		-0.006	-0.007
		(0.029)	(0.029)		(0.021)	(0.021)
DK/PNS		-0.007	-0.003		-0.004	0.003
		(0.016)	(0.021)		(0.015)	(0.019)
Few friends (chld.)			-0.005			-0.011
			(0.010)			(0.010)
Loneliness (UCLA)			0.004**			0.013***
			(0.002)			(0.002)
Other controls:	17	V	V	V	V	37
Age and gender $C$	Yes	Yes	Yes	Yes	Yes	Yes
Socio-economic	INO N	Yes	Yes	INO N	Yes	Yes
Network and social act.	No	No	Yes	No	No	Yes
N. Observations	23139	21734	19701	23246	21820	19758

Table 4: Active versus Passive SM use, and adverse familial environments.

**Notes**: The method of estimation is Logit. The reported coefficients are marginal effects. Socio-economic controls: house-hold size, religiosity, immigration status (first-generation immigrant), risky health behaviours (smoking, physical inactivity, poor dietary habits), relationship status, employment status, and self-reported health. Network, social activities and loneliness include: network size (family and friends), frequency of face-to-face contacts with friends and family members, loneliness (UCLA scale). DK/PNS stands for Don't know or prefer not to say answer options to the question on sexual orientation. In all models we control for country fixed effects. Standard errors clustered at the country level are reported in parentheses. Significance levels: \* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01.

media users, and overuse digital platforms in order to feel better. Moreover, Figures 5 and 6 report the coefficients (expressed as percentage point differences) of emotional closeness and adverse childhood environments on social media overuse and the related work and family duties neglect. Having been raised with close relatives affected by mental health issues or alcohol abuse significantly influences the social networking sites overuse by younger individuals (those aged 35 or younger). Familial heavy drinking and the presence of severe chronic illnesses also affect individuals aged 35-50. Younger individuals with experiences of drinking or mental health problems in the household during childhood are also more likely to engage in passive social media use compared to their older counterparts.

Previous evidence offered a first insight into significant associations between adverse childhood environments and social media use later in life. Moreover, the results suggest that loneliness and social isolation reduce the effects of some experiences, such as heavy drinking and mental health illness within households, making the relationship between earlylife adversity and subsequent digital behaviour patterns even more puzzling. In what follows, we explore the existence of possible indirect pathways of ACE operating through mediating factors. For the sake of clarity, we will focus only on adverse familial environments since emotional closeness with parents revealed to be a relatively weaker predictor of social media overuse.

	(1)	(2)	(3)	(4)	(5)	(6)
	(1) Nogloat	(2) Norloct	(J) Nogloat	(4) E bott	(J) E bott	(0) E bott
	Neglect	Neglect	Neglect	r.bett	r.bett	r.Dett
$C_{1}$ $(1,1,1)$	0.002	0.000	0.007	0.001**	0.004***	0.019
Closeness mother (chld.)	0.003	0.006	-0.007	0.021**	0.024	0.013
	(0.009)	(0.008)	(0.009)	(0.009)	(0.009)	(0.008)
Closeness father (chld.)	-0.019**	$-0.019^{**}$	-0.017**	$0.017^{**}$	0.010	0.007
	(0.008)	(0.009)	(0.009)	(0.007)	(0.007)	(0.007)
Absent parents (chld.)	0.011	$0.015^{**}$	0.009	0.001	-0.003	-0.006
	(0.007)	(0.007)	(0.008)	(0.007)	(0.007)	(0.008)
Bad health (chld.)	0.065***	0.048***	0.026***	0.058***	0.045***	0.028***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Lesbian or gay		-0.014	-0.023	~ /	0.007	0.000
		(0.015)	(0.017)		(0.018)	(0.015)
Bisexual		0.006	-0.002		0.019	0.011
		(0.012)	(0.010)		(0.014)	(0.015)
Other sexual or		0.006	0.005		0.009	0.003
e the senaal of		(0, 030)	(0.027)		(0.033)	(0.032)
DK/PNS		(0.050)	(0.021)		(0.033)	(0.052)
DR/1 NS		(0.009)	(0.004)		(0.010)	(0.014)
		(0.023)	(0.021)		(0.018)	(0.019)
Few mends (chid.)			0.005			-0.001
			(0.009)			(0.011)
Loneliness (UCLA)			0.031***			0.031***
			(0.001)			(0.002)
Other controls:						
Age and gender	Yes	Yes	Yes	Yes	Yes	Yes
Socio- $economic$	No	Yes	Yes	No	Yes	Yes
Network and social act.	No	No	Yes	No	No	Yes
N. Observations	23130	21693	19654	23131	21700	19658

 Table 5: Consequences and purposes of social media use and relationship quality with parents.

**Notes**: The method of estimation is Logit. The reported coefficients are marginal effects. Socio-economic controls: household size, religiosity, immigration status (first-generation immigrant), risky health behaviours (smoking, physical inactivity, poor dietary habits), relationship status, employment status, and self-reported health. Network, social activities and loneliness include: network size (family and friends), frequency of face-to-face contacts with friends and family members, loneliness (UCLA scale). DK/PNS stands for Don't know or prefer not to say answer options to the question on sexual orientation. In all models we control for country fixed effects. Standard errors clustered at the country level are reported in parentheses. Significance levels: \* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01.

	(1)	(2)	(3)	(4)	(5)	(6)
	Neglect	Neglect	Neglect	F.bett	F.bett	F.bett
Illness relatives (chld.)	$0.039^{***}$	$0.030^{***}$	$0.017^{**}$	$0.015^{*}$	0.008	0.000
	(0.008)	(0.007)	(0.007)	(0.009)	(0.009)	(0.009)
Mental relatives (chld.)	$0.029^{***}$	$0.025^{***}$	$0.019^{**}$	$0.055^{***}$	$0.051^{***}$	$0.042^{***}$
	(0.010)	(0.009)	(0.009)	(0.009)	(0.009)	(0.010)
Drink relatives (chld.)	$0.012^{*}$	$0.013^{**}$	0.007	$0.023^{***}$	$0.022^{***}$	$0.019^{***}$
	(0.007)	(0.007)	(0.006)	(0.006)	(0.007)	(0.006)
Absent parents (chld.)	0.002	0.007	0.002	0.000	-0.005	-0.008
	(0.007)	(0.006)	(0.007)	(0.007)	(0.007)	(0.008)
Bad health (chld.)	0.050***	0.036***	0.016*	0.047***	0.037***	0.021***
	(0.009)	(0.008)	(0.009)	(0.009)	(0.009)	(0.008)
Lesbian or gay	. ,	-0.015	-0.023	· · ·	0.001	-0.005
		(0.015)	(0.016)		(0.015)	(0.013)
Bisexual		0.000	-0.006		0.012	0.005
		(0.012)	(0.010)		(0.013)	(0.013)
Other sexual or.		-0.006	-0.002		-0.008	-0.006
		(0.028)	(0.026)		(0.033)	(0.031)
DK/PNS		0.017	0.009		0.007	0.009
,		(0.023)	(0.021)		(0.018)	(0.021)
Few friends (chld.)			0.003		( )	-0.000
			(0.009)			(0.012)
Loneliness (UCLA)			0.029***			0.030***
,			(0.001)			(0.002)
Other controls:			\ /			× /
Age and gender	Yes	Yes	Yes	Yes	Yes	Yes
Socio-economic	No	Yes	Yes	No	Yes	Yes
Network and social act.	No	No	Yes	No	No	Yes
N. Observations	23170	21758	19722	23157	21751	19713

Table 6: Consequences and purposes of social media use and adverse familial environments.

**Notes**: The method of estimation is Logit. The reported coefficients are marginal effects. Socio-economic controls: household size, religiosity, immigration status (first-generation immigrant), risky health behaviours (smoking, physical inactivity, poor dietary habits), relationship status, employment status, and self-reported health. Network, social activities and loneliness include: network size (family and friends), frequency of face-to-face contacts with friends and family members, loneliness (UCLA scale). DK/PNS stands for Don't know or prefer not to say answer options to the question on sexual orientation. In all models we control for country fixed effects. Standard errors clustered at the country level are reported in parentheses. Significance levels: \* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01.

### 4.2 Loneliness and social connectedness as potential mediators

People reporting adverse events in childhood often show increased frequency of social media checking as a basic coping mechanism. One reason for such behaviours may lie in the fact that being exposed to adverse environments in early life can impair cognitive and emotional processes essential for self-regulation, self-esteem, and decision-making (Boullier and Blair, 2018). These disruptions may subsequently reinforce maladaptive coping behaviours and increase the risk of developing addictions (Chaudhary et al., 2024). Feelings like loneliness and social isolation, which are strongly related to emotional processes, may serve as potential mediators that link ACE and social media consumption. Indeed, ACE are often associated with a more frequent reporting of loneliness and social disconnection (Guthmuller, 2022; Kovacic et al., 2024; Tzouvara et al., 2023), feelings that in turn may shape how individuals engage with social media. This mediated pathway might result in compensatory behaviours where people intensively use social media to fill their social gaps. Reliance on online connections, while providing temporary comfort, can lead to a progressive detachment from reality that undermines the development of crucial offline social skills and interpersonal relationships.

Following this line of reasoning, in what follows we show the results of the mediation analysis, where the effects of the most important early-life predictors of intensive social media use evidenced in the previous section, namely being raised in the presence of close relatives with severe drinking problems or mental health issues, are passed through current loneliness experiences and aspects of individuals' social connectedness. More precisely, we report three different effects. The direct effect refers to the coefficient of ACE from the model including the potential mediator (loneliness or social connectedness). This effect quantifies the impact of ACE on social media use, holding constant the influence of the mediator. The total effect, on the other hand, captures the association between ACE and social media without accounting for potential mediators. Finally, the indirect effect represents the difference between the total and direct effects. This latter quantifies the extent to which the relationship between ACE and the outcome is channelled through the mediator.

Tables 7-9 show the results when the mediator is loneliness. In general, statistically significant indirect effects demonstrate that part of the total effect of ACE passes through loneliness. Direct effects, on the other hand, may also be statistically not different from zero, indicating that there is no independent effect of specific adverse conditions considered

	SNS	SNS	IMT	IMT
	(Mental)	(Drink)	(Mental)	(Drink)
Indirect effect	0.004***	0.002***	0.002***	0.001***
	(0.003)	(0.002)	(0.004)	(0.002)
Direct effect	$0.021^{***}$	$0.027^{***}$	0.009	0.005
	(0.035)	(0.027)	(0.048)	(0.030)
Total effect	0.026***	0.029***	0.012	0.006
	(0.035)	(0.027)	(0.048)	(0.030)
% effect mediated	15.3	6.8	16.6	16.6
Other controls:				
Age and gender	Yes	Yes	Yes	Yes
Socio-economic	Yes	Yes	Yes	Yes
Network and social act.	No	No	No	No
N. Observations	21275	21275	21262	21262

Table 7: Mediation Analysis, Loneliness: SNS and IMT intensive use and ACE.

**Notes:** Mediation Analysis. The method of estimation is Logit. The reported coefficients are marginal effects. Socioeconomic controls: household size, religiosity, immigration status (first-generation immigrant), risky health behaviours (smoking, physical inactivity, poor dietary habits), relationship status, employment status, and self-reported health. In all models we control for country fixed effects. Standard errors clustered at the country level are reported in parentheses. Significance levels: \* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01.

on social media use. This, however, does not exclude the possibility of significant indirect effects since the residual part of the total effect may be obscured by other pathways working in opposite directions or by any kind of noise in the relationship between ACE and social media.

The coefficients from Table 7 indicate that 15.3% (6.8%) of the total effect of parental mental illness (heavy drinking) on intensive social network sites use passes through loneliness. The effect on instant messaging, on the other hand, is mediated by 16.6% by loneliness, while adverse childhood environments appear not to have any direct effect. This is in line with the evidence reported in Tables 1 and 2 which highlight the importance of loneliness (model 6) and zero influence of parental mental health and drinking problems (model 5).

Loneliness appears as an important mediator also for passive users of digital advice. Indeed, 26.6% of the effect of parental mental illness runs through individuals' experiences of loneliness. This mediating effect is significantly lower for parental alcohol abuse (Table 8). At the same time, we do not observe any significant relationship between ACE and active use, which is in line with the results from Tables 3 and 4.

	Active	Active	Passive	Passive
	(Mental)	(Drink)	(Mental)	(Drink)
Indirect effect	0.001	0.000	0.004***	0.002***
	(0.004)	(0.002)	(0.004)	(0.002)
Direct effect	0.002	0.000	$0.011^{*}$	$0.018^{***}$
	(0.043)	(0.034)	(0.027)	(0.024)
Total effect	0.003	0.000	0.015***	0.020***
	(0.044)	(0.035)	(0.028)	(0.023)
% effect mediated			26.6	10
Other controls:				
Age and gender	Yes	Yes	Yes	Yes
Socio-economic	Yes	Yes	Yes	Yes
Network and social act.	No	No	No	No
N. Observations	21130	21130	21195	21195

 Table 8: Mediation Analysis, Loneliness: Active vs Passive SM use and ACE.

Turning to the effects of mental illness and excessive drinking on attitudes toward neglecting work and family duties due to excessive use of social media, loneliness results even more powerful in channelling the effects of ACE. Indeed, 35.7% (29.4%) of the total effect of mental illness (excessive drinking) is mediated by loneliness. These shares are somewhat lower (around 20%) in the case of the use of social media with the purpose of improving the overall mood and satisfaction (Table 9).

Other potentially relevant mediators are given by the indicators of social connectedness, namely the network size (number of close family members and friends) and the frequency of face-to-face contacts with friends and family. Here we employ the index of social connectedness described in Section 2.3 as a proxy for social and familial contacts of respondents. Tables 10-12 show that lower social isolation positively mediates detrimental effects of parental mental illness and alcohol abuse. The benevolent effect of larger and efficient networks is

**Notes**: Mediation Analysis. The method of estimation is Logit. The reported coefficients are marginal effects. Socioeconomic controls: household size, religiosity, immigration status (first-generation immigrant), risky health behaviours (smoking, physical inactivity, poor dietary habits), relationship status, employment status, and self-reported health. In all models we control for country fixed effects. Standard errors clustered at the country level are reported in parentheses. Significance levels: \* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01.

	Neglect	Neglect	F.bett	F.bett
	(Mental)	(Drink)	(Mental)	(Drink)
Indirect effect	0.010***	0.005***	0.010***	0.005***
	(0.006)	(0.004)	(0.005)	(0.004)
Direct effect	$0.017^{**}$	0.012**	$0.039^{***}$	$0.019^{***}$
	(0.041)	(0.026)	(0.039)	(0.029)
Total effect	0.028***	0.017***	0.049***	0.024***
	(0.041)	(0.026)	(0.039)	(0.029)
% effect mediated	35.7	<b>29.4</b>	<b>20.4</b>	20.8
Other controls:				
Age and gender	Yes	Yes	Yes	Yes
Socio-economic	Yes	Yes	Yes	Yes
Network and social act.	No	No	No	No
N. Observations	21148	21148	21147	21147

 Table 9: Mediation Analysis, Loneliness: SM behaviour and ACE.

**Notes:** Mediation Analysis. The method of estimation is Logit. The reported coefficients are marginal effects. Socioeconomic controls: household size, religiosity, immigration status (first-generation immigrant), risky health behaviours (smoking, physical inactivity, poor dietary habits), relationship status, employment status, and self-reported health. In all models we control for country fixed effects. Standard errors clustered at the country level are reported in parentheses. Significance levels: \* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01.

particularly pronounced for instant messaging tools (25%) in the case of parental heavy drinking. As it was the case with loneliness, the direct effect of drinking is not statistically different from zero, which is in line with the results in Tables 1 and 2.

An interesting picture emerges when looking at active versus passive use of social media (Table 11). For active social media use, the effect of ACE appears to be fully mediated by social connectedness. This suggests that parental mental health issues and alcohol abuse indirectly reduce active social media use through the social connectedness index, without significant total or direct residual effects. For passive use, evidence is in line with previous mediation results in Table 8: social connectedness, as loneliness, appears to be an important and significant mediator for mental and drinking behaviours among close relatives, reducing the total effects by 7.6% and 5%, respectively. Regarding social media use and using social media to improve mood), we observe that the social connectedness index is a statistically significant mediator in the relationship between parental mental health issues, drinking problems, and

	SNS	SNS	IMT	IMT
	(Mental)	(Drink)	(Mental)	(Drink)
Indirect effect	-0.001**	-0.001***	-0.001**	-0.001***
	(0.002)	(0.001)	(0.002)	(0.002)
Direct effect	$0.027^{***}$	$0.031^{***}$	$0.014^{*}$	0.005
	(0.037)	(0.027)	(0.048)	(0.029)
Total effect	0.028***	0.030***	0.013	0.004
	(0.037)	(0.028)	(0.047)	(0.029)
% effect mediated	-3.5	-3.3	-7.6	-25
Other controls:				
Demographics controls	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes
N. Observations	20078	20078	20071	20071

Table 10: Mediation Analysis, Social Connectedness: SNS, IMT and ACE.

**Notes:** Mediation Analysis. The method of estimation is Logit. The reported coefficients are marginal effects. Socioeconomic controls: household size, religiosity, immigration status (first-generation immigrant), risky health behaviours (smoking, physical inactivity, poor dietary habits), relationship status, employment status, and self-reported health. In all models we control for country fixed effects. Standard errors clustered at the country level are reported in parentheses. Significance levels: \* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01.

using social media to improve mood. More precisely, about 2.1% and 4% of the total effect of ACE on using social media to feel better is mediated by the social connectedness indicator. Unlike the case where loneliness was the mediator, no significant indirect effect has been found for neglecting work, school, or family tasks (Table 12).

	Active	Active	Passive	Passive
	(Mental)	(Drink)	(Mental)	(Drink)
Indirect effect	-0.002**	-0.001***	-0.001**	-0.001***
	(0.004)	(0.003)	(0.002)	(0.002)
Direct effect	0.004	0.001	$0.014^{**}$	$0.021^{***}$
	(0.047)	(0.038)	(0.033)	(0.024)
Total effect	0.002	0.001	$0.013^{*}$	0.020***
	(0.047)	(0.038)	(0.033)	(0.024)
% effect mediated	-100	-100	-7.6	-5
Other controls:				
Demographics controls	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes
N. Observations	19965	19965	20024	20024

Table 11: Mediation Analysis, Social Connectedness: Active versus Passive, and ACE.

**Notes:** Mediation Analysis. The method of estimation is Logit. The reported coefficients are marginal effects. Socioeconomic controls: household size, religiosity, immigration status (first-generation immigrant), risky health behaviours (smoking, physical inactivity, poor dietary habits), relationship status, employment status, and self-reported health. In all models we control for country fixed effects. Standard errors clustered at the country level are reported in parentheses. Significance levels: \* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01.

Table 12: Mediation Analysis, Social Connectedness: SM behaviours and ACE.

	Neglect	Neglect	F.bett	F.bett
	(Mental)	(Drink)	(Mental)	(Drink)
Indirect effect	-0.001	-0.001	-0.001*	-0.001**
	(0.001)	(0.001)	(0.001)	(0.001)
Direct effect	0.029***	$0.018^{**}$	$0.048^{***}$	0.026***
	(0.041)	(0.031)	(0.042)	(0.028)
Total effect	0.028***	$0.017^{**}$	$0.047^{***}$	$0.025^{***}$
	(0.041)	(0.031)	(0.042)	(0.028)
% effect mediated	-3.5	-5.8	-2.1	-4
Other controls:				
Demographics controls	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes
N. Observations	19984	19984	19982	19982

**Notes:** Mediation Analysis. The method of estimation is Logit. The reported coefficients are marginal effects. Socioeconomic controls: household size, religiosity, immigration status (first-generation immigrant), risky health behaviours (smoking, physical inactivity, poor dietary habits), relationship status, employment status, and self-reported health. In all models we control for country fixed effects. Standard errors clustered at the country level are reported in parentheses. Significance levels: \* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01.

### 5 Conclusions

This paper explores an important topic, namely the potential relationship between adverse childhood conditions and social media use later in life. The existence of such a relationship may be particularly concerning since there is solid evidence that adverse childhood trauma and social media overuse both harm individuals' well-being and cognitive development. Using the rich information from a novel EU-wide survey, we show that these two factors are interconnected. More precisely, individuals whose close relatives suffered from severe drinking or mental health problems are significantly more likely to spend more than 2 hours per day on social networking sites, use social media more passively, and, as a consequence, neglect work and family duties more often compared to their counterparts who spend less time on digital platforms.

We also highlight that the detrimental effect of adverse experiences in early life is mediated through feelings of loneliness and social isolation in adulthood. Loneliness mediates 15% of the effect of mental illnesses in the household during childhood on social networking sites overuse, 25% of its effect on passive social media use, and up to 35% in the case of neglecting work or family duties due to excessive social media consumption. The mediating power of loneliness is contained for instant messaging tools, where the effect of adverse childhood conditions is mainly mediated by social connectedness, especially for active social media users. This result adds to a growing literature showing that loneliness and/or social isolation may be harmful for individuals' mental and physical health conditions.

Finally, our results also suggest that some vulnerable groups are particularly at risk of overusing social media. Among LGB+ individuals, bisexuals are significantly more engaged in passive social networking, while gay and lesbian people are more active and rely more on instant messaging tools.

The evidence reported in this research may have several policy implications. There is a growing interest among policymakers to regulate social media use, especially among younger individuals. The European Digital Act Service, which entered into force in 2023 to protect European users when it comes to privacy, transparency, and removal of harmful or illegal content, and the recent ban imposed by the Australian government for social media use for children below 16 are only some of the initiatives undertaken by governments and regulators. This argument gains additional importance in light of the evidence that negative effects of social media use may be more pronounced for individuals with a higher baseline risk of developing emotional disorders, which, according to a wide medical and epidemiological literature, are also those who were exposed to early-life trauma.

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# Appendix

Variable	Mean	Std. Dev.	Min	Max	Obs
Age	44.475	14.983	16	80	24253
Age (cat.)	2.89	1.37	1	5	24253
Female	0.52	0.5	0	1	24342
Closeness mother (chld.)	0.112	0.315	0	1	23832
Closeness father (chld.)	0.205	0.403	0	1	23714
Absent parent (chld.)	0.204	0.403	0	1	24081
Bad health (chld.)	0.107	0.31	0	1	24342
Few friends (chld.)	0.108	0.31	0	1	24197
Illness relatives (chld.)	0.128	0.334	0	1	23702
Mental relatives (chld.)	0.112	0.315	0	1	23702
Drink relatives (chld.)	0.194	0.396	0	1	23702
ACE index	0.948	1.182	0	6	22968
ACE index $(>=3)$	0.116	0.32	0	1	22968
Household's size	2.235	1.066	1	10	24263
Immigrant	0.082	0.275	0	1	24342
Smoking	0.21	0.407	0	1	24118
Poor diet	0.488	0.5	0	1	24052
Ph. inactivity	0.173	0.378	0	1	23092
Employed	0.655	0.475	0	1	24342
Married (or in rel.)	0.685	0.464	0	1	24235
SAH	0.138	0.345	0	1	24220
Religious	0.259	0.438	0	1	24342
Frequency friends	0.239	0.426	0	1	24074
Frequency family	0.27	0.444	0	1	24095
N. close family members	4.509	3.526	0	25	22863
N. close friends	3.795	3.376	0	25	22622
Cultural/sport events	0.185	0.388	0	1	24125
Loneliness (UCLA)	1.991	1.851	0	6	23837
Heterosexual/straight	0.89	0.313	0	1	24342
Lesbian or gay	0.025	0.155	0	1	24342
Bisexual	0.039	0.193	0	1	24342
Other sexual orientation	0.01	0.098	0	1	24342
DK/PNS	0.037	0.189	0	1	24342

 Table 13:
 Summary statistics

	(1)	( <b>2</b> )	(2)	(4)	(5)	(6)
	(1)	(2)	(5)	(4)	(0)	(0)
	SNS	SNS	SNS	IMT	IMT	IMT
ACE $(>=3)$	$0.043^{***}$	$0.028^{***}$	$0.025^{***}$	$0.015^{***}$	$0.009^{*}$	$0.010^{**}$
	(0.007)	(0.007)	(0.007)	(0.005)	(0.005)	(0.005)
	<b>`</b>	· · · ·	. ,	· · · ·	· · · ·	
N. Observations	22833	21484	19501	22813	21470	19494
	Active	Active	Active	Passive	Passive	Passive
ACE $(>=3)$	0.008	0.008	0.015**	0.023***	$0.015^{*}$	0.011
	(0.006)	(0.006)	(0.006)	(0.007)	(0.008)	(0.007)
	· · · ·	. ,	× ,	· · · ·	· · · ·	
N. Observations	22634	21323	19402	22733	21405	19456
	Neglect	Neglect	Neglect	Feel bett.	Feel bett.	Feel bett.
ACE $(>=3)$	0.017**	0.011	-0.001	0.056***	0.043***	0.030***
	(0.007)	(0.008)	(0.009)	(0.007)	(0.007)	(0.008)
		( )		( )	· · ·	( )
N. Observations	22661	21343	19417	22656	21343	19415
Other controls:						
Age and gender	Yes	Yes	Yes	Yes	Yes	Yes
Socio- $economic$	No	Yes	Yes	No	Yes	Yes
Health in ch.	Yes	Yes	Yes	Yes	Yes	Yes
Network/social act.	No	No	Yes	No	No	Yes
Loneliness/few friends (ch.)	No	No	Yes	No	No	Yes

**Table 14:** Social Network Sites (SNS), Instant Messaging Tools (IMT) and adverse familialenvironments.

**Notes**: The method of estimation is Logit. The reported coefficients are marginal effects. Socio-economic controls: household size, religiosity, immigration status (first-generation immigrant), risky health behaviours (smoking, physical inactivity, poor dietary habits), relationship status, employment status, and self-reported health. Network, social activities and loneliness include: network size (family and friends), frequency of face-to-face contacts with friends and family members, loneliness (UCLA scale). DK/PNS stands for Don't know or prefer not to say answer options to the question on sexual orientation. In all models we control for country fixed effects. Standard errors clustered at the country level are reported in parentheses. Significance levels: \* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01. Figure 5: Heterogeneous effects of adverse childhood conditions on SNS, IMT and active and passive use of social media, by age group



(c) Act. & Pass.: Emotional closeness

(d) Act. & Pass.: Adverse environments

**Source:** EU-LS 2022. The method of estimation is Logit. The figure depicts marginal effects (expressed as a percentage point difference). All models include: household size, immigration status (first-generation immigrant), risky health behaviours (smoking, physical inactivity, poor dietary habits), relationship status, employment status, and self-reported health, network size (family and friends), frequency of face-to-face contacts with friends and family members, loneliness (UCLA scale). In all models we control for country fixed effects. Standard errors clustered at the country level are reported in parentheses.

Figure 6: Heterogeneous effects of adverse childhood conditions on work and family duties neglect and use of social media in order to feel better, by age group



(a) Neglect & F. bett.: Emotional closeness (b) Neglect & F. bett.: Adverse environments

**Source:** EU-LS 2022. The method of estimation is Logit. The figure depicts marginal effects (expressed as a percentage point difference). All models include: household size, immigration status (first-generation immigrant), risky health behaviours (smoking, physical inactivity, poor dietary habits), relationship status, employment status, and self-reported health, network size (family and friends), frequency of face-to-face contacts with friends and family members, loneliness (UCLA scale). In all models we control for country fixed effects. Standard errors clustered at the country level are reported in parentheses.