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Digital Encounters and Protection Pathways Across Adolescence: Age- and Gender-Related Patterns in 26,297 European Adolescents Digital encounters and protection pathways

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Abstract

Background

Adolescent digital wellbeing cannot be understood from screen time alone. Young people differ not only in how long they use digital media, but also in the content and interactions they encounter, how they appraise their own use, and how they respond to online challenges. We examined age- and gender-related patterns across these dimensions in a large European sample, with particular attention to reported protection and support pathways.

Methods

We conducted a descriptive secondary analysis of published weighted aggregate youth tabulations from Flash Eurobarometer FL579, including 26,297 adolescents aged 13–18 years across the 27 EU Member States. We examined EU27 estimates and subgroup estimates by gender and age (13–14, 15–16, and 17–18 years) and calculated absolute percentage-point differences. Because respondent-level data were unavailable, individual-level associations, adjusted models, statistical uncertainty for derived contrasts, and causal effects could not be assessed.

Results

Screen time of at least six hours was reported by 46% of adolescents on a typical weekend day and 25% on a school day. Compared with 13–14-year-olds, adolescents aged 17–18 years more often reported prolonged screen time and perceived their screen time (48% vs. 36%) and social-media time (47% vs. 33%) as too high. Difficult-to-recognize AI-generated content (39%) and false or misleading information (35%) were the most frequently reported online encounters. The largest age-group difference in protection strategies concerned talking to a parent, teacher, or another adult (32% among 13–14-year-olds vs. 18% among 17–18-year-olds), whereas reporting harmful content or accounts was more common in the oldest group (30% vs. 21%).

Conclusions

Digital experiences and reported protection pathways differed substantially across adolescent age groups. Older adolescents more often reported several challenging online encounters and independently initiated or platform-based protective actions, whereas younger adolescents more often reported turning to adults. These cross-sectional aggregate patterns cannot establish within-person developmental change or substitution between strategies. They nevertheless highlight a potential tension between increasing digital autonomy and continued access to trusted support. Prevention should strengthen

adolescent agency without transferring responsibility for structurally produced online risks from platforms, institutions, and adults to young people themselves.

Background

Digital services have become a central setting for adolescents' communication, information seeking, entertainment, learning, identity development, and social participation. Research and public debate often begin with the amount of time young people spend on screens. Duration alone, however, cannot capture what adolescents encounter online, how they interact with others, whether they experience their own use as excessive, or how they respond when digital experiences become challenging. Evidence syntheses consistently indicate that associations between digital-media use and wellbeing vary by activity, content, individual characteristics, developmental stage, and outcome. Screen time is therefore better treated as one dimension of a broader digital ecology than as a uniform proxy for risk or harm [1, 2].

A useful framework for understanding this broader ecology is digital resilience. Rather than conceptualizing online safety as simple avoidance of risk, digital resilience emphasizes the capacities to recognize, manage, and recover from online adversity within a wider social and technological context. A systematic review and meta-ethnography by Hammond et al. [3] describes digital resilience as a socio-ecological process spanning the individual, home, community, and societal levels. Empirical work with adolescents similarly suggests that digital literacy, supportive parent–child relationships, and school-based digital-literacy provision may contribute to adaptive coping, whereas protection cannot be reduced to individual self-control alone [4]. This perspective is particularly relevant to the present survey because its protection items include both independently initiated actions and interpersonal help-seeking.

Adolescence adds a developmental dimension to this question. Across adolescence, young people typically gain greater autonomy in social relationships, decision making, identity exploration, and media use, while parents and other adults renegotiate their roles in guidance and monitoring. Recent systematic reviews underline that parental influence on adolescent social-media use is multifaceted: communication, modelling, monitoring, and limit-setting can have different associations with use and risk, and no single mediation strategy is uniformly optimal across adolescents and contexts [5, 6]. Increasing autonomy may therefore alter not only adolescents' exposure to digital environments but also the pathways through which they seek protection and support.

Flash Eurobarometer FL579 provides an opportunity to examine these dimensions at EU scale. It includes questions on screen time and adolescents' appraisal of whether their screen and social-media time are excessive. It also asks about a heterogeneous set of potentially challenging online encounters, including difficult-to-recognize AI-generated content, misleading information, commercial promotion, appearance- and body-related pressure, unwanted violent or sexualized content, cyberbullying, and pressure to share intimate images. Finally, adolescents report actions they use to protect their mental wellbeing during social-media use. Together, these domains allow a descriptive mapping of use intensity, subjective appraisal, online encounters, and protection pathways across age and gender groups.

Because the questions are available only as separate aggregate tabulations, however, they cannot be interpreted as an individual causal sequence.

This distinction is also important for child online-safety policy. Fegert and Melchior [7] frame online safety as a joint protection and empowerment task and place primary responsibility for foreseeable digital risks with service providers rather than with children and families alone. Köhler-Dauner et al. [8] similarly argue for developmentally differentiated conditions of digital participation. Within such a framework, taking breaks, limiting notifications, or reporting content can be understood as expressions of adolescent agency, but they should complement rather than substitute for safe-by-design services, transparent and effective reporting systems, age-appropriate safeguards, and accessible support from trusted adults and professionals.

The present analysis therefore asks three questions: (1) How do reported screen time and perceived excessive use differ by age and gender? (2) Which online encounters and pressures are most frequently reported, and how do their profiles differ across these groups? and (3) How do reported strategies for protecting mental wellbeing differ by age and gender? Particular attention is paid to whether interpersonal support and independently initiated protection show different age-related patterns. The analysis complements a companion FL579 manuscript on the reported timing of social-media initiation and first personal smartphone ownership. Whereas that manuscript addresses when entry into digital environments occurred, the present study focuses on the current digital environment and the protection pathways adolescents report using. The study is explicitly descriptive and does not infer individual developmental trajectories from cross-sectional subgroup differences.

Methods

Study design and data source

This descriptive secondary analysis used published aggregate youth tabulations from Flash Eurobarometer FL579, Impact of excessive screen time and social media on young people's mental health. Fieldwork was conducted from 30 March to 16 April 2026 across all 27 EU Member States. The broader survey comprised online interviews with adolescents and parents; the present analysis used only the youth tabulations, covering 26,297 adolescents aged 13–18 years [9, 10].

The published tabulations report weighted percentages for the EU27 and for prespecified age and gender subgroups. Respondent-level records were not available for this analysis. Consequently, responses to different questions could not be linked within the same adolescent, and subgroup contrasts could not be adjusted for individual- or country-level covariates.

Measures

Reported screen time. Questions Q2a and Q2b asked respondents to estimate their average time spent looking at screens on a typical school day and a typical weekend day. The response categories used here were “6 to less than 8 hours,” “8 to less than 10 hours,” “10 to less than 12 hours,” and “12 and more hours.” The ≥ 6-hour threshold comprises all four categories and the ≥ 8-hour threshold the latter three. “Don’t know” and summary rows were excluded from the category sums.

Perceived excessive use. Questions Q4a and Q4b assessed adolescents’ appraisal of their overall screen time and social-media time. We report the percentage selecting “Too much” for each question. These items capture subjective appraisal of use and should not be interpreted as clinical measures of problematic or addictive media use.

Online encounters and pressures. Question Q10 recorded whether respondents had seen or personally experienced the listed content or situations while using social media during the preceding three months. We report 11 substantive categories separately and did not construct a composite score. The item set is heterogeneous and includes observed content, commercial or appearance-related pressures, and experiences that may involve direct interpersonal harm; an affirmative response therefore does not uniformly indicate personal victimization.

Self-protective strategies. Question Q11 asked which actions respondents used to protect their mental wellbeing when using social media. We report the 10 substantive response categories shown in Table 3, including “taking no measures.” Multiple responses were possible. For conceptual interpretation, the strategies can be distinguished as self-regulatory actions, platform-mediated actions, interpersonal or professional support-seeking, and no active measure; these groupings were not used to calculate composite scores. Endorsement does not indicate how frequently a strategy was used, what prompted it, or whether it was effective.

Statistical analysis

We extracted published weighted percentages for the EU27, male and female respondents, and adolescents aged 13–14, 15–16, and 17–18 years. For each indicator, we calculated absolute percentage-point (pp) differences between the oldest and youngest age groups (17–18 minus 13–14 years) and between female and male respondents. Screen-time thresholds were derived by summing the relevant published response categories. Because those percentages are rounded, cumulative values may differ slightly from estimates calculated directly from weighted respondent-level data.

The analysis was intentionally descriptive. The aggregate tabulations did not permit linkage of screen time, perceived excessive use, online encounters, and protective strategies within individuals, nor did they provide the respondent-level information required for adjusted analyses of the derived subgroup contrasts. We therefore did not estimate correlations, regression models, mediation pathways, or causal effects and do not interpret percentage-point differences as inferential tests of population parameters.

Results

Screen time and perceived excessive use

Reported screen time was higher on typical weekend days than on school days. At the EU27 level, 46% of adolescents reported at least six hours of screen time on a weekend day, compared with 25% on a school day. At least eight hours were reported by 27% on weekends and 13% on school days. The age-group gradient was substantial across both day types. On school days, ≥ 6 hours was reported by 37% of 17–18-year-olds and 14% of 13–14-year-olds (23 pp difference); on weekend days, the corresponding percentages were 59% and 36% (23 pp difference).

Age-group differences were also evident in adolescents' subjective appraisal of their use. Nearly half of 17–18-year-olds rated their overall screen time as too high (48%), compared with 36% of 13–14-year-olds. For social-media time, the corresponding percentages were 47% and 33%. Female adolescents more often rated both overall screen time and social-media time as too high than male adolescents, although the gender differences were smaller (4 and 6 pp, respectively). These indicators distinguish reported duration from perceived excessiveness; the aggregate data do not establish whether the same adolescents contributed to both patterns.

Table 1

Reported screen time and perceived excessive use among European adolescents: Weighted EU27 percentages by gender and age group

Indicator	EU27 (%)	Male (%)	Female (%)	13–14 years (%)	15–16 years (%)	17–18 years (%)	Age-group difference (pp)	Gender difference (pp)
Screen time ≥ 6 h, typical school day	25	22	27	14	23	37	+ 23	+ 5
Screen time ≥ 6 h, typical weekend day	46	43	49	36	43	59	+ 23	+ 6
Screen time ≥ 8 h, typical school day	13	12	14	7	13	19	+ 12	+ 2
Screen time ≥ 8 h, typical weekend day	27	24	30	20	24	36	+ 16	+ 6
Total screen time rated as too high	41	39	43	36	39	48	+ 12	+ 4
Social media time rated as too high	39	36	42	33	37	47	+ 14	+ 6

Note. Values are weighted percentages from the published tabulations. Screen-time thresholds sum the relevant rounded Q2a/Q2b response-category percentages and may therefore differ slightly from estimates based on respondent-level weighted data. The two perceived-use rows report the response “Too much” in Q4a/Q4b. Age-group difference = 17–18 minus 13–14 years; gender difference = female minus male respondents. Differences are descriptive absolute percentage-point contrasts.

Online encounters and pressures

The most frequently reported online encounters were difficult-to-recognize AI-generated content (39%) and false or misleading information (35%). Commercial and social pressures were also prominent: 28% reported gambling promotion, 25% hate speech, 25% promotion of unhealthy products, and 24% pressure concerning appearance or consumption. Because Q10 combines content seen with situations personally experienced, these percentages describe reported exposure to heterogeneous online encounters rather than a uniform measure of victimization or harm.

Several encounters were reported more often in the oldest than in the youngest age group. The largest age-group difference concerned difficult-to-recognize AI-generated content (47% among 17–18-year-olds vs. 34% among 13–14-year-olds; +13 pp), followed by unwanted sexualized content (+ 9 pp). Gender differences were most pronounced for appearance- and body-related pressures: female adolescents reported pressure concerning appearance or consumption and pressure to follow body standards eight percentage points more often than male adolescents. Gambling promotion was reported more often by male adolescents (30% vs. 26%), while most remaining gender differences were comparatively small.

Table 2

Reported online encounters and pressures during social media use in the preceding three months: Weighted EU27 percentages by gender and age group

Encounter	EU27 (%)	Male (%)	Female (%)	13–14 years (%)	15–16 years (%)	17–18 years (%)	Age-group difference (pp)	Gender difference (pp)
AI-generated content difficult to recognize	39	36	42	34	34	47	+ 13	+ 6
False or misleading information	35	33	37	32	33	40	+ 8	+ 4
Gambling promotion	28	30	26	25	26	33	+ 8	−4
Hate speech	25	24	26	23	23	29	+ 6	+ 2
Promotion of unhealthy products	25	24	25	23	24	27	+ 4	+ 1
Pressure concerning appearance or consumption	24	20	28	21	22	29	+ 8	+ 8
Pressure to follow body standards	21	17	25	18	19	26	+ 8	+ 8
Unwanted violent content	19	20	18	17	19	20	+ 3	−2
Unwanted sexualized content	18	17	18	14	16	23	+ 9	+ 1
Cyberbullying or harassment	17	17	18	16	16	20	+ 4	+ 1
Pressure to share intimate images	10	10	10	9	10	11	+ 2	0

Note. The question covers content or situations respondents had seen or personally experienced during social-media use. An affirmative response does not uniformly indicate direct personal victimization or equivalent severity across categories. Age-group difference = 17–18 minus 13–14 years; gender difference = female minus male respondents. Differences are descriptive absolute percentage-point contrasts.

Self-protective strategies

Adolescents reported a mixed repertoire of actions to protect their mental wellbeing. The most common were taking breaks from social media (31%), limiting their own online time (29%), talking to a parent, teacher, or another adult (26%), limiting notifications (26%), and reporting harmful content or accounts (25%). The response profile therefore included self-regulatory actions, use of platform tools, and interpersonal help-seeking rather than a single dominant protection strategy.

The most pronounced age-group difference concerned interpersonal adult support. Talking to a parent, teacher, or another adult was selected by 32% of 13–14-year-olds, 28% of 15–16-year-olds, and 18% of 17–18-year-olds (− 14 pp from youngest to oldest). In contrast, several independently initiated or platform-based actions were reported more often in the oldest group: reporting harmful content or accounts increased from 21% to 30% (+ 9 pp), taking breaks from 28% to 35% (+ 7 pp), and limiting notifications from 23% to 30% (+ 7 pp). Limiting one's own online time differed only modestly by age (+ 3 pp). These parallel group patterns do not show that individual adolescents replace adult support with self-directed strategies.

Table 3

Self-reported strategies to protect mental wellbeing during social media use: Weighted EU27 percentages by gender and age group

Strategy	EU27 (%)	Male (%)	Female (%)	13–14 years (%)	15–16 years (%)	17–18 years (%)	Age-group difference (pp)	Gender difference (pp)
Taking breaks from social media	31	30	32	28	30	35	+ 7	+ 2
Limiting own online time	29	28	30	28	28	31	+ 3	+ 2
Talking to a parent, teacher, or another adult	26	26	26	32	28	18	−14	0
Limiting notifications	26	25	27	23	26	30	+ 7	+ 2
Reporting harmful content or accounts	25	23	27	21	24	30	+ 9	+ 4
Switching off or deleting apps	25	24	27	24	24	27	+ 3	+ 3
Using screen-time tools	19	19	20	18	19	21	+ 3	+ 1
Seeking professional help	14	15	14	12	16	15	+ 3	−1
Taking no measures	10	11	10	11	11	10	−1	−1
Other measures	3	3	3	2	2	4	+ 2	0

Note. Multiple responses were possible. Selecting a strategy does not show that it was used in response to a specific encounter, used frequently, or effective in improving wellbeing. The response categories should therefore not be treated as mutually exclusive pathways. Age-group difference = 17–18 minus 13–14 years; gender difference = female minus male respondents. Differences are descriptive absolute percentage-point contrasts.

Discussion

Principal findings

This study provides an EU-wide descriptive account of how multiple dimensions of adolescent digital life differ across age and gender groups. Three findings stand out. First, older adolescents reported substantially longer screen exposure and more often judged their own screen and social-media time to be excessive. Second, several online encounters—including difficult-to-recognize AI-generated content, misleading information, sexualized content, and appearance-related pressures—were more frequently reported in the oldest age group, while the profile of some encounters also differed by gender. Third, protection strategies showed the clearest age-related divergence: reported conversations with adults were markedly less common among older adolescents, whereas several independently initiated or platform-based actions were more common.

The central contribution is therefore not a claim that screen time, online encounters, and coping form a single causal chain. Rather, the findings show that these domains display concurrent age-graded differences within the same European survey. Adolescence is not a homogeneous developmental period, and digital opportunities, exposures, self-appraisals, and support needs should not be assumed to be equivalent at ages 13 and 18. At the same time, the cross-sectional and aggregate design requires precise language: the observed differences may reflect developmental processes, cumulative experience, cohort-related media practices, or combinations of these factors, and they cannot establish within-person change.

Screen time and subjective appraisal

The marked school-day–weekend difference provides context for the broader findings. Weekend days may involve fewer institutional constraints and more discretionary time, allowing individual differences in digital routines to become more visible. The present data cannot determine whether this pattern reflects family schedules, peer communication, leisure opportunities, platform design, or self-regulatory processes. Accordingly, the descriptive thresholds should not be interpreted as clinical cut-offs or as evidence that a specific duration is inherently harmful.

Subjective appraisal adds a distinct dimension. Almost half of adolescents aged 17–18 years described their screen time and social-media time as too high. This does not constitute a diagnosis of problematic use, but it indicates that concern about overuse is not solely imposed by adults or policy debates. Perceived excessiveness may reflect a discrepancy between current media habits and adolescents' own goals or expectations, potentially involving perceived loss of control, competing demands, sleep, schoolwork, relationships, or other priorities. The present survey cannot distinguish among these interpretations.

This distinction is consistent with the broader literature. Associations between screen use and wellbeing are heterogeneous and depend on activity, content, context, and individual characteristics [1, 2]. Problematic social-media use likewise cannot be inferred from duration or dissatisfaction alone and should be assessed in relation to control, motives, functional impairment, and psychosocial context [11]. Future studies should therefore examine whether self-perceived excessive use predicts subsequent attempts to regulate use or later functional impairment beyond objective or reported duration.

Online encounters in a changing information environment

The prominence of difficult-to-recognize AI-generated content is a particularly contemporary finding. It indicates that adolescents increasingly navigate information environments in which the origin, authenticity, and intent of content may be difficult to judge. The item does not establish that respondents were deceived by synthetic material, but it identifies content provenance and authenticity assessment as relevant dimensions of online safety. These demands should not be framed solely as deficits in individual media literacy: recognition also depends on platform transparency, provenance signals, labelling practices, and the design of information environments.

The gender pattern suggests that adolescents may encounter differently configured digital risk environments rather than simply different overall levels of risk. Female adolescents more often reported appearance- and body-related pressures and more often judged their own screen and social-media use as excessive, whereas gambling promotion and unwanted violent content were somewhat more frequently reported by male adolescents. These descriptive differences should not be essentialized or interpreted as fixed gender effects; they instead support examining specific content and commercial environments rather than treating “social media exposure” as a uniform experience.

Commercial exposures also warrant specific attention. Gambling promotion, unhealthy-product advertising, and consumption-related pressure are shaped by platform business models, recommendation systems, advertising practices, and monetization structures. They are therefore not adequately conceptualized as problems that adolescents or families can solve through self-control alone. This distinction aligns with the emphasis on provider accountability in Fegert and Melchior [7] and with age-tiered, developmentally appropriate protection proposed by Köhler-Dauner et al. [8].

Protection pathways, digital resilience, and support

The 14-percentage-point difference in reported conversations with adults is arguably the most consequential age-related finding. It has several plausible interpretations. Lower endorsement among older adolescents may reflect normative increases in autonomy and confidence in managing online situations independently. It may also reflect greater familiarity with platform tools. Alternatively, adults may become less salient, less acceptable, or less accessible as sources of support for digital concerns in later adolescence. The present data cannot distinguish among these possibilities and do not show that older adolescents have weaker relationships or less support available to them.

The simultaneous age-group increase in reporting content, taking breaks, and limiting notifications is compatible with greater self-directed digital agency. Importantly, however, agency and interpersonal support should not be treated as opposing endpoints. Contemporary digital-resilience frameworks describe adaptive navigation of online risk as a socio-ecological process involving recognition, management, recovery, and access to support across individual, family, school, and societal contexts [3, 4]. Systematic reviews of parental mediation likewise indicate that communication, modelling,

monitoring, and rule-setting have context-dependent roles rather than a simple linear relationship with safer use [5, 6].

At the population-subgroup level, the parallel pattern of more frequent reporting of several challenging online encounters and less frequent adult-oriented help-seeking among older adolescents raises the possibility of a digital support gap that warrants individual-level investigation. This is a hypothesis, not a demonstrated mechanism: the aggregate data cannot show that adolescents who encounter more risks are the same adolescents who are less likely to seek adult support. Nevertheless, it points to a relevant prevention question—how families, schools, health services, and platforms can preserve trusted routes to support while respecting increasing autonomy. Recent intervention research similarly suggests that online-safety programmes have focused more consistently on recognizing and managing risk than on recovery and help-seeking, leaving scope for stronger attention to trusted support pathways [12]. Supporting adolescent agency should not become synonymous with transferring responsibility for structurally produced digital risks to adolescents themselves.

Implications for prevention and child online safety policy

The findings support a layered and developmentally differentiated approach to prevention. No single indicator or intervention—including general screen-time limits—addresses the full range of digital experiences identified here. Effective strategies need to combine adolescents' skills and agency with accessible interpersonal and professional support, developmentally appropriate education, usable platform reporting tools, and safer service design. In this sense, the relevant outcome is not only how long adolescents are online, but also what they encounter, whether they can recognize and manage challenges, whether effective help is available when needed, and whether services reduce foreseeable risks by design.

The EU KIDS Act proposal [13] provides a current regulatory context because it envisages graduated conditions of access and autonomy. The present data do not test its proposed age thresholds, account models, supervision arrangements, or safe-by-design obligations and should not be used as evidence that a particular legal threshold will reduce harm. They do, however, suggest that evaluations of age-differentiated regulation should include multiple outcomes beyond screen time: exposure to specific content and pressures, usability and effectiveness of reporting pathways, perceived control, access to trusted support, and mental wellbeing.

Köhler-Dauner et al. [8] similarly locate age assurance within a broader architecture of developmentally appropriate participation and protection. The present findings reinforce the importance of that broader architecture. Age assurance may enable differentiated safeguards, but it cannot itself ensure content quality, prevent commercial exploitation, create effective reporting systems, or provide relational and professional support. A prevention framework that values adolescent agency therefore also requires accountability from the systems in which that agency is exercised.

Relation to the companion manuscript

The companion FL579 manuscript addresses a different question: whether reported timing of first social-media use and first personal smartphone ownership is related to current exposure profiles. The present manuscript instead examines how current use, subjective appraisal, online encounters, and reported protection strategies differ across age and gender groups. Together, the analyses offer complementary perspectives on digital development—one concerning the timing of entry into digital environments and the other concerning the current age-graded configuration of digital experiences and protection pathways. The companion analysis is a separate, currently unpublished manuscript based on the same survey.

The shared data source also requires careful separation of claims. The two analyses cannot be combined to infer that earlier access causes particular online encounters, perceived overuse, or protection strategies. Their contribution is conceptual rather than causal: they illustrate why adolescent digital life should be studied both in relation to the timing of digital access and in relation to current age, autonomy, content environments, and support pathways.

Strengths and limitations

This study draws on a large EU-wide survey and, importantly, on adolescents' own reports across several dimensions of digital life. The analysis distinguishes use intensity, subjective appraisal, specific online encounters, and multiple forms of protective action rather than reducing digital wellbeing to screen time or a single composite risk score. Presenting absolute subgroup differences also makes the descriptive magnitude and direction of age- and gender-related patterns transparent.

Several limitations constrain interpretation. First, the data are cross-sectional and self-reported; age-group differences cannot establish developmental trajectories and may partly reflect cohort-related media practices or differential cumulative exposure. Second, the public tabulations are aggregate. Linking exposures, appraisals, and strategies across the same respondents would risk an ecological fallacy, and the analysis cannot adjust for socioeconomic position, family context, country, platform use, pre-existing mental health, or other potential confounders. Third, Q10 combines content that adolescents saw with situations they personally experienced, so categories differ in proximity and likely severity. Fourth, Q11 measures strategy endorsement but not frequency, trigger, perceived usefulness, implementation quality, or effectiveness. Finally, cumulative screen-time thresholds were derived from rounded published percentages and should be recalculated from respondent-level weighted data if such data become available before final submission.

The appropriate next step is therefore individual-level and longitudinal. Future studies should test how exposure to specific content, subjective control over media use, help-seeking, platform-based coping, family communication, and mental wellbeing develop together over time and whether patterns differ by age, gender, socioeconomic context, or country. Research should also examine whether independently initiated strategies and interpersonal support are complementary, substitutive, or activated under different circumstances. Policy and intervention evaluations should assess not only whether young people know how to respond to online risk but also whether reporting systems work, trusted adults

remain approachable, professional help is accessible, and platform changes reduce exposure to foreseeable harms.

Conclusions

Digital life in adolescence is not captured by screen time alone. Across the FL579 age groups, older adolescents reported longer screen exposure, more frequent perceptions that their use was excessive, and higher percentages for several challenging online encounters. The clearest difference in protection pathways was the lower endorsement of conversations with adults among 17–18-year-olds, alongside higher endorsement of several independently initiated and platform-based actions.

These findings do not establish within-person developmental change, causal relationships, or the effectiveness of particular protection strategies. They do identify a central challenge for adolescent online safety: increasing autonomy should be accompanied by sustained access to trusted support rather than by a transfer of responsibility to young people alone. A developmentally responsive approach should combine digital literacy and adolescent agency with supportive relationships, accessible professional help, effective reporting systems, safer digital-service design, and platform accountability.

Declarations

Ethics approval and consent to participate

This study was based on a secondary analysis of publicly available, anonymized aggregate data from Flash Eurobarometer 579, commissioned by the European Commission. No new data were collected, and the researchers had no direct contact with participants or access to identifiable individual-level information. As the present analysis exclusively used previously published aggregate survey data, no additional ethical approval or informed consent was sought for this secondary analysis.

Consent for publication

Not applicable. The manuscript contains no identifiable individual-level information or images.

Competing interests

The authors declare that they have no competing interests.

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Author Contribution

L.P. and F.K.D. contributed to the conceptualization and methodology of the study. L.P. contributed to formal analysis, data curation, visualization, and drafting the original manuscript. E.L. contributed to formal analysis, data curation, validation, and critical revision of the manuscript. F.K.D. provided scientific supervision, coordinated the project, and critically revised the manuscript. J.M.F. contributed to the conceptualization of the study, provided scientific supervision, and critically revised the manuscript. All authors reviewed and approved the final manuscript and agreed to be accountable for their contributions.

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Data Availability

The data underlying this study are available from GESIS – Leibniz Institute for the Social Sciences as Flash Eurobarometer 579 (ZA9166, Version 1.0.0) at https://doi.org/10.4232/1.14818. Access to respondent-level data is subject to the repository's registration and data-use conditions. The present study is based on publicly available weighted aggregate subgroup tabulations from the youth survey. No new primary data were collected.

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