

# E-Risk Study Concept Paper Form

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## 1. Collaborating researchers

**Please note:**

Once approved, a formal data use agreement will be required between King's College London and the university or research organisation that employs any collaborator having access to the data if they are not a member of staff, a student or affiliate of King's College London. This needs to be signed by both universities/organisations before data access can be granted.

For projects carried out by a student (e.g., MSc/MA, MPhil/PhD, clinical doctorate), the lead applicant should be the student's supervisor at the same university, and the student should be named as the student collaborator requiring access to the data.

If you have additional collaborators, please name them below and indicate whether they need to have access to the data. It would be common, for instance, for other researchers to see summary results of analyses and act as co-authors on your paper without having access to the data. You will not be permitted to share the dataset except with those indicated in the table as requiring access.

Applicable?	Category	Name	Email address	University/organisation	Needs access to data for analysis?
	<b>Applicant (lead researcher)</b>	Frédéric Thériault-Couture	frederic.2.t heriault- couture@k cl.ac.uk	King's College London	<input checked="" type="radio"/> Yes <input type="radio"/> No
<input type="radio"/> Applicable <input checked="" type="radio"/> Not applicable	<b>Student collaborator (if data is for their dissertation/thesis)</b>				
<input checked="" type="radio"/> Applicable <input type="radio"/> Not applicable	<b>E-Risk Sponsor (if applicant is not an E-Risk investigator)</b>	Louise Arseneault	louise.arse neault@kcl .ac.uk	King's College London	<input checked="" type="radio"/> Yes <input type="radio"/> No
<b>Are there additional collaborators to add?</b>			<input checked="" type="radio"/> Yes <input type="radio"/> No		
<b>If yes, how many additional collaborators would you like to add?</b>			5 <input type="button" value="v"/>		

Category	Name	Email address	University/organisation	Needs access to data for analysis?
<b>Other collaborator #1</b>	Timothy Matthews	t.matthews@greenwich.ac.uk	University of Greenwich	<input type="radio"/> Yes <input checked="" type="radio"/> No
<b>Other collaborator #2</b>	Candice L. Odgers	codgers@uci.edu	University of California Irvine	<input type="radio"/> Yes <input checked="" type="radio"/> No
<b>Other collaborator #3</b>	Flora Blangis	flora.blangis@kcl.ac.uk	King's College London	<input checked="" type="radio"/> Yes <input type="radio"/> No
<b>Other collaborator #4</b>	Helen L. Fisher	helen.2.fisher@kcl.ac.uk	King's College London	<input type="radio"/> Yes <input checked="" type="radio"/> No
<b>Other collaborator #5</b>	E-Risk co-investigators	N/A	N/A	<input type="radio"/> Yes <input checked="" type="radio"/> No

Applicants: If you would like to continue your application later, please press the "Save and return later" button below. Please copy or write down the Return code provided.

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## 2. The project proposal

**Note:** Please provide sufficient detail to enable the committee to review your proposal. Please be as specific as possible about the project aims and analysis methods as once approved this concept paper will be posted publicly and thus will act as a form of pre-registration of your project. Expand boxes as required.

<b>Title of project</b>	Cybervictimization and mental health problems in young people: Findings from a nationally representative longitudinal cohort
<b>Background and rationale for project</b> <i>(approx. 300 - 1000 words)</i>	Similar to traditional forms of bullying, cybervictimization involves aggressive and abusive behaviours (Dooley et al., 2009; Perren et al., 2012; Smith et al., 2008). However, cybervictimization - often referred to as cyberbullying - differs from offline bullying in several aspects (Barlett et al., 2024; Heyeres et al., 2020). First, the abuse occurs specifically through electronic devices and takes place on widely used media platforms. Second, unlike bullying, which is a form of peer victimization, cybervictimization can occur between individuals from different age groups, and the abuser may remain anonymous. Third, the

repetition of abusive acts can be difficult to determine, especially when comments or pictures are posted once but are widely shared online. Fourth, the power imbalance between the perpetrator and the victim is often unclear. Fifth, a single episode of abuse can result in an experience of victimization that lasts much longer than offline bullying, as posts or pictures can be endlessly shared or circulated.

Cybervictimization also contrasts with offline victimization in that its impact on mental health is still debated (Zhu et al., 2021) and is of concern to the government (Public Health England, 2017), the academic community (Bansal et al., 2024; Odgers & Jensen, 2020), and is part of a broader debate about establishing adequate management over the use of social media and new technology use to prevent potential harm to users (Abi-Jaoude et al., 2020; Chavalarias, 2024; Office of the Surgeon General [OSG], 2023; UK Parliament, 2019). In the present study, we aim to investigate the extent to which adolescent cybervictimization contributes to mental health problems in early adulthood.

Concerns about potential harm to mental health associated with the use of social media platforms are supported by empirical studies, although some research suggests that the negative impact of digital technology use on young people's mental health is on average relatively small (Orben & Przybylski, 2019; Orben, 2020). Nevertheless, growing evidence has reported that overall, cybervictimization is associated with an increased risk of anxiety, depression, conduct problems, post-traumatic stress symptoms, and psychotic experiences among young people, as well as self-harm, suicidal ideations and suicide attempts (Baldwin et al., 2021; Barlett et al., 2024; Fisher et al., 2016; John et al., 2018; Kowalski et al., 2014; Li et al., 2024; Mehari et al., 2020; Morales-Arjona et al., 2024; Tsitsika et al., 2015; van Geel et al., 2014; Walters, 2024).

Furthermore, research has indicated that the risk of poor mental health associated with cybervictimization is independent of sex, age, and ethnic background (Barlett et al., 2024; Kowalski et al., 2020; Xu et al., 2024). However, these findings are not without limitations, fuelling doubts about the 'true' impact of cybervictimization on mental health and emphasizing the importance of ruling out alternative hypotheses for the previously observed associations. First, longitudinal data on cybervictimization are scarce, and only a few studies have considered prior psychopathology to test the assumption that earlier symptoms of poor mental health could lead to cybervictimization. Additionally, a hypothesis that has not yet been tested is the extent to which mental health conditions among those who experienced cybervictimization can be accounted for by concurrent factors, such as problematic use of technology and loneliness, which have been found to be associated with both victimization and mental health conditions in young people (Blinka et al., 2023; Liu et al., 2021; Matthews et al., 2022). Second, the co-occurrence of other forms of victimization has rarely been considered in previous studies to test the independent contribution of cybervictimization to mental health conditions over and above offline victimization. This is especially important given the high rates of polyvictimization among young people (Finkelhor et al., 2007, 2009; Fisher et al., 2015; Haahr-Pedersen et al., 2021; Lino et al., 2024). Third, past research has shown that the association between cybervictimization and mental health conditions is independent of sex and socio-economic status (Fahy et al., 2016; Przybylski & Bowes, 2017), but very few studies have controlled for other familial factors, such as genetic confounds. Indeed, the genetic influences on mental health have been extensively documented (Andreassen et al., 2023; Hannigan et al., 2017; Zandi et al., 2019) and evidence on the genetics of victimization (Fisher et al., 2015; Pezzoli et al., 2019; Veldkamp et al., 2019) and cybervictimization (Baldwin et al., 2021) is growing, emphasizing genetic factors as a potential explanation for the association between cybervictimization and mental health conditions.

Furthermore, some studies reported that the association between cybervictimization and emotional problems is stronger for women, while the association with behavioural problems is stronger for men (Kim et al., 2018; Mehari et al., 2020). Thus, the moderating effect of sex requires closer investigation. Lastly, not all adolescents who experience cybervictimization develop mental health conditions. Therefore, further research is needed

	<p>to investigate factors that may exacerbate these effects, such as biological sex, preexisting mental health conditions, and a history of other forms of childhood victimization (including emotional abuse, physical abuse, neglect, sexual abuse, and bullying). Understanding the moderating role of these factors is essential for identifying young people who are particularly vulnerable and at heightened risk of developing poor mental health conditions.</p> <p>In sum, robust evidence is needed to characterize cybervictimization among young people, estimate the risk associated with poor mental health outcomes, and rule out alternative hypotheses for this association, using a longitudinal design and a representative sample with robust measures of a wide range of victimization experiences and mental health conditions.</p>
<p><b>Project aims / objectives</b></p>	<p>Using data from E-Risk, a UK nationally representative longitudinal cohort study, the present study aims to extend prior findings by ruling out alternative hypotheses for the previously observed associations between cybervictimization and poor mental health.</p> <p>We will test a series of research questions to understand the mechanisms underlying the association between cybervictimization in adolescence and mental health problems in young people:</p> <p>1) To what extent does adolescent cybervictimization predict poor mental health outcomes in early adulthood? First, we will report on the association between cybervictimization in adolescence and mental health problems in young people, controlling for confounding factors including sex, SES, and age-5 IQ.</p> <p>2) Do preexisting and concurrent vulnerabilities account for the association between cybervictimization and mental health problems in young people? Second, we will test whether the association remains after accounting for prior mental health problems and other forms of victimization in adolescence, as well as loneliness and problematic digital technology use among young people.</p> <p>3) Does adolescent cybervictimization contribute to poor mental health outcomes because of common genetic and environmental influences? Third, we will use a discordant twin analysis to rule out family-wide influences on the association between cybervictimization and mental health conditions in young people.</p> <p>4) Can cybervictimized adolescents at the highest risk of mental health problems be identified? Fourth, we will explore the moderating role of sex, prior mental health problems in early adolescence and a range of other forms of victimization across childhood (emotional abuse, physical abuse, physical neglect, sexual abuse, and bullying victimization) on the association between cybervictimization and mental health problems in young people.</p>
<p><b>Brief statement of your hypothesis</b></p>	<p>Hypothesis 1 (on cybervictimization predicting poor mental health outcomes in early adulthood): We hypothesize that adolescent cybervictimization will be associated with poor mental health outcomes in early adulthood, even after controlling for confounding factors such as sex, socioeconomic status, and childhood IQ.</p> <p>Hypothesis 2 (on preexisting and concurrent vulnerabilities): We hypothesize that preexisting and concurrent vulnerabilities, such as prior mental health problems, other forms of victimization in adolescence, loneliness, and problematic digital technology use, will partially explain the association between adolescent cybervictimization and mental health conditions in young people, yet expect this association to remain significant over and above these controls.</p> <p>Hypothesis 3 (on genetic and shared environmental influences): We hypothesize that the association between adolescent cybervictimization and mental</p>

health problems will be partially explained by genetic and shared environmental factors, as demonstrated by the discordant twin analysis, yet expect this association to remain significant over and above genetic confounds.

Hypothesis 4 (on identifying adolescents at highest risk):

We hypothesize that adolescents who have prior mental health problems or have experienced other forms of victimization during childhood will be at a higher risk of developing mental health problems following cybervictimization, suggesting a moderating effect of these early experiences. However, no moderating role of biological sex is expected for this association.

**Data analysis methods to be used**

**(approx. 100 - 500 words)**

Objective 1 & 2: To what extent does adolescent cybervictimization predict poor mental health outcomes in early adulthood, and do preexisting and concurrent vulnerabilities account for this association?

We will use a series of logistic regression models (unadjusted and adjusted multivariate models) to examine whether adolescent cybervictimization is associated with poor mental health outcomes in early adulthood and to what extent preexisting and concurrent vulnerabilities in young people account for this association. The independent variable will be a 3-category measure of cybervictimization (none, moderate, severe), with "none" as the reference category. The binary dependent variables will include DSM-IV diagnoses of depression, anxiety, PTSD, conduct disorder, and also any psychotic experiences and self-reported self-harm/suicide attempts.

The regressions will be conducted in the following hierarchical steps:

- Baseline model (unadjusted): Regress each mental health outcome on cybervictimization as the sole predictor.
- Model 1: Adjusted for biological sex, SES, and age-5 IQ.
- Model 2: model 1 adjusted for prior history of mental health problems (measured at age 12).
- Model 3: model 1 adjusted for childhood cybervictimization (item measured at age 12).
- Model 4: model 1 adjusted for problematic digital technology use (measured at age 18).
- Model 5: model 1 adjusted for loneliness (measured at age 18).
- Model 6: model 1 adjusted for other forms of victimization in adolescence (measured at age 18).

Sensitivity analyses: The internet harassment item reported by close informants at age 18 will be used in sensitivity analyses to examine whether the associations remain after controlling for shared methods variance.

Objective 3: Do genetic and shared environmental factors explain the association between adolescent cybervictimization and mental health outcomes?

We will conduct mixed-effects regression analyses using the XTGEE procedure in Stata statistical software. The first analysis will include all twins in the cohort to examine the family-wide and unique effects of cybervictimization on mental health problems in a representative cohort of children. The second analysis will include only MZ twins to test whether the unique effect of cybervictimization on mental health problems is primarily environmentally mediated by controlling for all genetic relatedness between the MZ twins. The third regression analysis will also include only MZ twins but will control for a prior history of mental health problems at age 12 to examine whether being cybervictimized is an environmentally mediated contributing factor for mental health problems at age 18, above and beyond preexisting problems. The same method will be applied to other preexisting and concurrent vulnerabilities described above (i.e., additionally adjusted for childhood cybervictimization at age 12, problematic digital technology use at age 18, loneliness at age 18, and other forms of victimization in adolescence). All analyses will control for the potential confounding effects of biological sex, SES, and age-5 IQ. For more detailed information on the statistical procedure, see Arseneault et al., 2008.

	<p>Objective 4: Can cybervictimised adolescents at the highest risk of mental health problems be identified?</p> <p>To explore potential moderators of the association between cybervictimization and mental health problems, we will conduct follow-up moderation analyses. Specifically, we will test for interactions between cybervictimization and potential moderators, such as 1) biological sex 2) prior mental health problems in early adolescence; and 3) other forms of victimization experienced across childhood.</p> <p>These moderation analyses will be conducted using interaction terms in regression models. Significant interactions will indicate that certain subgroups of cybervictimised adolescents (e.g., those with a history of mental health problems or prior victimization) are at higher risk of poor mental health outcomes, allowing us to identify adolescents most vulnerable to the negative impact of cybervictimization.</p> <p>Note. For objectives 1, 2, and 4, all analyses will adjust for the non-independence of twin observations using the Huber-White variance estimator.</p>
<p><b>Significance for theory, research methods, or clinical practice</b></p>	<p>For research, this project will be a valuable addition to ongoing studies investigating the association between adolescent cybervictimization and the development of mental health problems in young adulthood. A key strength of this study is its ability to address gaps in the existing literature by controlling for a range of confounding factors that are often overlooked (e.g., other forms of offline victimization, prior mental health problems, and genetic confounds). These factors, if not accounted for, can lead to biased or inflated estimates of the association between cybervictimization and mental health. By unraveling the true impact of cybervictimization on mental health and ruling out alternative hypotheses, the present study aims to contribute to the ongoing debate about how to regulate social media and technology use among young people.</p> <p>For clinical practice, a comprehensive characterisation of the mental health risks associated with cybervictimization is vital to support policymakers, parents, and young people in making informed decisions about their digital engagement and mental well-being. By identifying subgroups of adolescents who are particularly vulnerable-such as those with a history of mental health problems or other forms of victimization-this research can guide more targeted prevention and intervention efforts. It is hoped that this will provide valuable knowledge for health service providers to expand the focus of interventions (e.g., not exclusively on social media and screen use) when addressing poor mental health in victims of online abuse by considering the wider context (e.g., preexisting vulnerabilities and offline victimization experiences).</p>
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**Are there any files you would like to upload to support your concept paper?**

- Yes  
 No

Applicants: If you would like to continue your application later, please press the "Save and return later" button below. Please copy or write down the Return code provided.

To return later, you may click on "Returning?" on the top right of the screen in the E-Risk Concept Paper Form link, which is the same link that was used to access this form: <https://redcap.link/ERiskConceptPaperForm>

### 3. Expected project outcomes

**Please note:**

*The stated end date must be within 24 months of the date when this form is submitted. This end date will form part of the formal data use agreement and on this date you should delete the dataset. Therefore, it must be a realistic date for completion of the project including all analysis, writing a manuscript, review of the manuscript by all collaborators, submission, revisions, and acceptance of a paper for publication.*

*If you require an extension to the end date of the project, then you should contact Prof Fisher ([helen.2.fisher@kcl.ac.uk](mailto:helen.2.fisher@kcl.ac.uk)) to discuss this. If you have signed a formal data use agreement, you will need to complete a form to request a licence extension. In some cases, we may also ask you to complete a new concept paper form if there have been substantial changes to the project or a long period of time has elapsed (e.g., greater than a year since the end date of the original project).*

*If the objective of the project is not a journal publication, please suggest an end date within 12 months instead of 24 months, and state a measurable, concrete outcome. If the objective of the project is a student dissertation, then the expected end date should be the deadline for submission of the dissertation; dissertation projects will only be accepted on agreement that they are strictly not for publication.*

<b>Date form submitted</b>	<input type="text" value="01-11-2024"/> D-M-Y DD-MM-YYYY
<b>End date for the project</b>	<input type="text" value="01-11-2025"/> D-M-Y DD-MM-YYYY
<b>Do you expect to publish your results in a journal?</b>	<input checked="" type="radio"/> Yes <input type="radio"/> No
<b>If yes, please provide a provisional list of author names</b>	<b>Frédéric Thériault-Couture, Timothy Matthews, Candice L. Odgers, Flora Blangis, Helen L. Fisher, Louise Arseneault and E-Risk co-investigators.</b>
<b>If yes, please provide a provisional list of journals</b>	<b>Lancet Psychiatry Social Science &amp; Medicine Journal of Child Psychology and Psychiatry Public Health Psychological Medicine</b>

Applicants: If you would like to continue your application later, please press the "Save and return later" button below. Please copy or write down the Return code provided.

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## 4. List of variables required

### Please note:

When specifying variables, please be unambiguous. For each variable, specify the name of the measure, twin age, informant, and if you want specific subscales/derived categories (e.g., Depression from interview with twin at age 18; both number of symptoms and DSM-IV diagnosis). Alternatively, for maximum clarity, give actual variable names (e.g., MDESXE18 - MDE Symptom scale - P18 - Elder; DXMDEE18 - Major depressive episode, dsm4 - P18 - Elder).

By default, the dataset will usually include twin and family IDs, the "random" and "true" twin order variables, the cohort the twin is from (1994 or 1995), twin sex, ethnicity and zygosity variables, and family socioeconomic status at age 5. These routine background variables are listed in the table below. If you require further background variables, please specify them in your list.

Access to some parts of the dataset are restricted, namely identifiable data (e.g., postcodes, video recordings, individual-level genotypic and epigenetic data) which will not be shared outside King's College London, and linked administrative data which is only accessible via the UK Longitudinal Linkage Collaboration's Trusted Research Environment (this requires a separate formal data access agreement).

### Background variables that will be included by default:

Variable name	Description
FAMILYID	Unique family identifier
ATWINID	Twin A ID (ex chkdg)
BTWINID	Twin B ID (ex chkdg)
RORDERP5	Random Twin Order
TORDER	True Twin Order
RISKS	Sample Groups
COHORT	Cohort
SAMPSEX	Sex of Twins
ZYGOSITY	Zygosity
SETHNIC	Ethnicity of Twins
SESWQ35	Social Class Composite

<p><b>Please select the variables that will be requested</b></p>	<input checked="" type="checkbox"/> Age 5 variables <input type="checkbox"/> Age 7 variables <input type="checkbox"/> Age 10 variables <input checked="" type="checkbox"/> Age 12 variables <input checked="" type="checkbox"/> Age 18 variables <input type="checkbox"/> Age 26 variables <input type="checkbox"/> Age 30* variables
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<b>Age 5 variables</b>	<b>iqe5 Pro-rated IQ score - Elder</b>
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<b>Age 12 variables</b>	<b>cdicate12 - Clinically significant depression elder</b> <b>cdicaty12 - Clinically significant depression younger</b> <b>masccate12 - Extreme anxiety elder</b> <b>masccaty12 - Extreme anxiety younger</b> <b>sharmsuice12 - Self-Harm/Suicidal Behaviour elder</b>
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sharmsuicy12 - Self-Harm/Suicidal Behaviour younger  
 dxCD\_esr12 - Diagnosis of conduct disorder self-report elder  
 dxCD\_ysr12 - Diagnosis of conduct disorder self-report younger  
 psysymp01e12 - Psychosis Symptom Count (Verified Coding) - P12 - Elder  
 psysymp01y12 - Psychosis Symptom Count (Verified Coding) - P12 - Younger  
 bu1e12 - Have you ever been bullied by another person?  
 bu6e12 - Did they do this using emails or text messages?  
 eanseve12 - Severity of Emotional abuse/neglect of Elder twin, thru age 12, 2014  
 eansevy12 - Severity of Emotional abuse/neglect of Younger twin, thru age 12, 2014  
 pabsevtye12 - Physical abuse by 12, severity, Elder  
 pabsevtyy12 - Physical abuse by 12, severity, Younger  
 pnseveritye12 - Physical neglect by 12, severity, Elder  
 pnseverityy12 - Physical neglect by 12, severity, Younger  
 sasevtye12 - Sexual abuse by 12, severity, Elder  
 sasevtyy12 - Sexual abuse by 12, severity, Younger  
 bullseve12 - Bullying victim to Age 12 - Elder  
 bullsevy12 - Bullying victim to Age 12 - Younger

Age 18  
variables

vctzintce18 - Internet victimisation severity (3 cat) - P18 - Elder  
 vctzintcy18 - Internet victimisation severity (3 cat) - P18 - Younger  
 vctzconce18 - Conventional victimisation severity (3 cat) - P18 - Elder  
 vctzconcy18 - Conventional victimisation severity (3 cat) - P18 - Younger  
 vctzperce18 - Peer victimisation severity (3 cat) - P18 - Elder  
 vctzpercy18 - Peer victimisation severity (3 cat) - P18 - Younger  
 vctzfamce18 - Family victimisation severity (3 cat) - P18 - Elder  
 vctzfamcy18 - Family victimisation severity (3 cat) - P18 - Younger  
 vctzmalce18 - Maltreatment victimisation severity (3 cat) - P18 - Elder  
 vctzmalcy18 - Maltreatment victimisation severity (3 cat) - P18 - Younger  
 vctzsexce18 - Sexual victimisation severity (3 cat) - P18 - Elder  
 vctzsexcy18 - Sexual victimisation severity (3 cat) - P18 - Younger  
 vctznegce18 - Neglect victimisation severity (3 cat) - P18 - Elder  
 vctznegcy18 - Neglect victimisation severity (3 cat) - P18 - Younger  
 polyvctzce18 - Poly-victimisation 4 cat (0,1,2,3+) - P18 - Elder  
 polyvctzcy18 - Poly-victimisation 4 cat (0,1,2,3+) - P18 - Younger  
 dxmdee18 - Major depressive episode, dsm4 - P18 - Elder  
 dxmdey18 - Major depressive episode, dsm4 - P18 - Younger  
 dxgade18 - Gen Anxiety Disorder, dsm4\_based - P18 - Elder  
 dxgady18 - Gen Anxiety Disorder, dsm4\_based - P18 - Younger  
 sharme18 - Self-harm - P18 - Elder  
 sharmy18 - Self-harm - P18 - Younger  
 suicate18 - Suicide attempted - P18 - Elder  
 suicaty18 - Suicide attempted - P18 - Younger  
 dxptsd4lfe18 - PTSD Lifetime dx, dsm4 - P18 - Elder  
 dxptsd4lfy18 - PTSD Lifetime dx, dsm4 - P18 - Younger  
 cdmode18 - Moderate conduct disorder (>=5 count) - P18 - Elder  
 cdmody18 - Moderate conduct disorder (>=5 count) - P18 - Younger  
 psysymp01e18 - Psychotic symptoms categorical elder  
 psysymp01y18 - Psychotic symptoms categorical younger  
 psyexpce18 - Psychotic experiences categorical elder  
 psyexpcy18 - Psychotic experiences categorical younger  
 co1inf79e18 - Co-informant1- Internet harassment  
 co2inf79e18 - Co-informant2 - Internet harassment  
 teche18 - Technology use - P18 - Elder  
 techy18 - Technology use - P18 - Younger  
 lonelye18 - Loneliness scale - P18 - Elder  
 lonelyy18 - Loneliness scale - P18 - Younger