Children's and Parents' Worries About Online Schooling Associated With Children's Anxiety During Lockdown in Ireland

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The COVID-19 pandemic has persisted as a worrying time for children who have been using technology for online schooling during lockdown and their parents. This study investigates the extent of children's and parents' self-reported worries associated with children's anxiety during lockdown in Ireland. Data for 461 children and 461 parents were analyzed from the Ireland dataset obtained as part of the Kids' Digital Lives in COVID-19 Times (KiDiCoTi) international survey. Children reported worries about keeping up with school activities online, getting poor grades, and completing their schoolwork online. Parents reported worries about

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COVID-19 having a negative influence on their children's education and their children being exposed to more online risks. Children's worries about school explained much of the variance of their anxiety to a significant degree, whereas parents' worries explained that variance to a lesser extent. Implications of these results are discussed in the article.

The COVID-19 pandemic and the associated lockdown has altered health, economic, and overall living conditions globally (World Health Organization, 2020). As such, the pandemic has brought about augmented levels of worry and anxiety into people's lives (Centers for Disease Control and Prevention [CDC], 2021).

The present study seeks to further understand how children's anxiety was influenced by their own and their parents' worries while using technology during lockdown. Specifically, it investigates the extent of children's and parents' worry that contributed to increased children's anxiety while participating in online schooling during the first COVID-19 lockdown in Ireland. This is accomplished by evaluating the predictive technology and psychological factors that influenced children's anxiety levels. These factors include specific COVID-related parents' and children's worries such as: worry about COVID-19 having a negative influence on children's education during lockdown and worry about them being exposed to more online risks (e.g., cyberbullying, sexting, personal information disclosure etc.).

It is important to understand the interplay between technology use and worry in the context of lockdown to optimize evidence-based strategies regarding technology use for the promotion of children's mental health. This study broadly positions technology to encompass Internet digital technologies (e.g., software and hardware used to access and navigate online environments), non-Internet digital technologies (e.g., gaming consoles, television, and mobile devices), which do not necessarily require the Internet to function, and the various affordances (i.e., different ways and uses) that digital technology can offer to complement the actions and uses of human functioning (e.g., for school, work, leisure etc.). This positioning of technology has been applied by scholars in the fields of communication studies, cyberpsychology, and sociology (Earl & Kimport, 2011; Kirwan, 2016), whereby the interactions among technology, society, and human behavior are studied. However, this study also draws on specific concepts, research, and approaches to behavioral aspects of digital technology use often investigated in these disciplines. Research into worry about digital technology use and the various types of digital technologies has been of interest to scholars across these disciplines for some time.

In the subsequent sections of this article, the phenomena of children's worry and anxiety are distinguished, and emerging COVID-19–related research, particularly in the Irish context, is evaluated. Following this, an empirical study is detailed, and the results are discussed.

Worry and Anxiety

It is necessary to distinguish between worry and anxiety because they are often conflated (Wilson, 2021). "Worry" can be defined as a chain of negatively affect-laden and intrusive thoughts and mental

images (Borkovec, Robinson, Pruzinsky, & DePree, 1983). It can be determined as a meta-cognitive action or problem-solving attempt to cope with threat (i.e., what should I do or what can I do?). Outcomes of such an attempt contain the possibility of anxiety (Borkovec et al., 1983). In other words, worry can be explained as a mental process that functions when there is a sense of threat and, as such, can heighten anxiety.

Worry can be considered a cognitive component of anxiety (Fialko, Bolton, & Perrin, 2012). Excessive and uncontrollable worry is typical in adults and children who suffer from anxiety disorders (American Psychiatric Association [APA], 2013). However, anxiety is not always pathological (Beesdo, Knappe, & Pine, 2009) as conceptually it is a physiological and emotional response to a vague sense of danger or threat (Comer & Comer, 2019). It is a known detriment to the well-being of children who suffer from it (Creswell, Waite, & Cooper, 2014).

Children's worries are typical, and, like anxiety, they are not reflective of solely "abnormal" contexts (Flood, 2016). Approximately 70% of all children often report worry (Muris, Merckelbach, Meesters, & Van Den Brand, 2002; Wilson, 2021). There is a wealth of research on the myriad of phenomena that can make up and influence children's worry (for extensive reviews, see Grover, Ginsburg, & Ialongo, 2007; Silverman, La Greca, & Wasserstein, 1995; Songco, Hudson, & Fox, 2020; and Wilson, 2021). Notable factors of worry include gender differences and similarities (Muris et al., 2002; Silverman et al., 1995), having a low socioeconomic status (SES) background (Zhu et al., 2019), ethnicity (Scott, Eng, & Heimberg, 2002), and age (Jovanovic et al., 2014).

Additionally, children's anxiety can also be influenced by the worry of their parents (Van Zalk, Tillfors, & Trost, 2018). Barrett, Rapee, Dadds, and Ryan (1996) explained that children could be modeling the behavior of their parents who worry, reinforcing the idea that "the world is a dangerous place." In typical situations, children's perception of their parents' worries can influence their anxiety to some extent (McMurtry, Chambers, McGrath, & Asp, 2010). However, in exceptional situations, such as the COVID-19 global pandemic, there is an evident possibility of exposure to physical danger (e.g., acquiring the virus). The emergency of such exceptional circumstances has been known to be more confirming for children who typically worry (La Greca et al., 2013). It is therefore important to understand which worries influenced children's anxiety during the lockdown and the role of worry about the increasing use of technology.

The COVID-19 Context

It is probably unsurprising that emerging research is signaling that children are reporting increased anxiety while living through the pandemic (Abawi et al., 2020; de Avila et al., 2020; Yeasmin et al., 2020). This increased anxiety has been attributed to: acquiring the virus itself (Taquet, Luciano, Geddes, & Harrison, 2021), being in quarantine (Imran, Aamer, Sharif, Bodla, & Naveed, 2020), increased news coverage about COVID-19 (Bendau et al., 2020), school closures (Lee, 2020), and possibly greater exposure to online risks such as cyberbullying (Milosevic, Laffan, & O'Higgins Norman, 2021).

The COVID-19 pandemic has arguably heightened worry among parents and their children. Children reported worry about their parents' perceptions of the pandemic and their competencies in dealing with the pandemic situation itself (Spinelli, Lionetti, Pastore, & Fasolo, 2020) in addition to worries about their own

well-being (Sarkadi, Sahlin Torp, Pérez-Aronsson, & Warner, 2021). The worry of potentially infecting others with the COVID-19 virus was also reported by children in a study carried out by Larsen, Helland, and Holt (2022). Notably, parents and caregivers reported additional perceived worry and other psychological distress among their children during the pandemic (Morgül, Kallitsoglou, & Essau, 2020). In relation to digital technology, parents also reported worries about their children spending excessively longer periods of time engaging with technology (Ezpeleta, Navarro, de la Osa, Trepat, & Penelo, 2020), exposure to online risks (Vuorikari, Velicu, Chaudron, Cachia, & Di Gioia, 2021), and their own competencies in delivering online education to their children (Garbe, Ogurlu, Logan, & Cook, 2020).

The extent of the affective aspects of technology engagement has been of interest to scholars for some time (Orben & Przybylski, 2019). Recent research suggests that antecedent factors, such as worry about technology use, are likely more attributable to adverse well-being than actual technology use (Orben & Przybylski, 2019; Shaw et al., 2020). Worry about technology use may also be contributing to technology use frequency overestimations in research studies (Sewall, Bear, Merranko, & Rosen, 2020). For these reasons, the role of technology is a factor in determining the influence of children's and parents' worries on children's anxiety. This is likely to particularly implicate the emergency online schooling that parents and children have practiced because of school closures (Mhlanga & Moloi, 2020).

Online Schooling in Ireland During COVID-19

Arguably, adjusting to online schooling during the pandemic was largely disruptive to many families living in Ireland (O'Sullivan et al., 2021). Like children in other countries, children in Ireland reported being bored at home and missing the social aspect of school (Flynn et al., 2021; Götz et al., 2020). Of more concern was that online schooling was identified as a significant stressor in Ireland's households and as a contributor to increased levels of stress and anxiety among children and their parents (O'Sullivan et al., 2021).

There are possible explanations for why online schooling has been so disruptive during lockdown in Ireland. One possibility is that students were not prepared for online schooling. Some school principals have suggested that an effective online learning support platform was in place for only half of Ireland's pupils, and 14% of these pupils reported not having a computer that they could use for schoolwork at home (McKeown, Denner, McAteer, & Shiel, 2019). Another possibility is that children in Ireland did not have the necessary digital skills and motivation to study independently in such exceptional circumstances (Koskela, Pihlainen, Piispa-Hakala, Vornanen, & Hämäläinen, 2020; Lau & Lee, 2020). Most children reported being less motivated about school activities and having received lesser education from online schooling compared with schooling during the pre-lockdown period, with learning being the aspect impacted the most by online schooling (Flynn et al., 2021). A third possibility is that some parents may have felt less confident about supporting their children's online schooling, be it due to their perceived lack of knowledge, digital skills, or time, or because of "having to juggle" between work-from-home and family life (Ferri, Grifoni, & Guzzo, 2020; Flynn et al., 2021; Koskela et al., 2020; Lau & Lee, 2020; Organization for Economic Co-operation and Development [OECD], 2020).

Although these possibilities may explain why online schooling in Ireland has been disruptive, worry may have been a significant antecedent factor that contributed to some of the negative outcomes (e.g., anxiety) associated with online schooling during the pandemic. Parents in Ireland reported worry about their

children's academic achievement, especially if their child was about to take a final exam such as the Leaving Certificate (Flynn et al., 2021), and were concerned about their children's increased levels of stress, depression, and anxiety (O'Sullivan et al., 2021).

There are wider developmental implications of worry in this context. A developmental goal for young people is to build social intimacy and connectedness (Steinberg & Morris, 2001). They build their identity through interactions with their peers, thereby discovering new aspects of themselves and learning how to build and maintain new and meaningful social bonds (Steinberg & Morris, 2001). These important developmental processes may have been compromised by the lockdown restrictions and school closures.

To summarize, the COVID-19 context and subsequent lockdowns persist as a worrying time for parents and children alike. During lockdown in Ireland, the move to online schooling does not appear to have been an optimal experience in many households despite the advantages of technology being known. Although emerging research has identified some explanatory reasons for why online schooling was disruptive in many households, there may have been antecedent factors, particularly worry, that contributed to this disruption and to children's anxiety more generally. Subsequently, an empirical study is outlined to investigate this and draw conclusions derived from a data analytical approach.

The Present Study

In this study, we aim to analyze the European Commission Joint Research Committee (JRC, 2020) Kids' Digital Lives in COVID-19 Times (KiDiCoTi) Ireland dataset to identify children's and parents' worries while living in the same household. We also investigate the effect of these worries on children's anxiety while they were engaged in online schooling during lockdown.

KiDiCoTi is a collaborative research project representing 15 European countries with an overarching aim of investigating the potential changes in the digital lives of children and their parents while living in lockdown during the COVID-19 pandemic. In relation to digital technologies, the JRC asked children and their parents across Europe about their digital technology usage, mostly across leisure, work, social networking, and educational contexts.

KiDiCoTi is among the several data-informed evidence bases consulted by the European Commission to foster an inclusive and comprehensive digital education ecosystem at a Europe-wide level. The project did not set out to investigate the extent of children's and parents' worries specifically. Rather, children and their parents across Europe were asked a variety of questions about their worries, digital skills, online risks, opportunities, online schooling, and demographics while living in lockdown to capture a general sense of their digital lives during the COVID-19 pandemic. Similar to other large-scale project such as EU Kids Online and Global Kids Online, KiDiCoTi researchers envisioned the collected data being used to inform and guide policies using data-driven and evidence-based ways. For this reason, the KiDiCoTi Ireland dataset was analyzed to answer related research questions.

The research questions were:

RQ1:   *What are the worries reported by children and parents who are engaging in online schooling during lockdown?*

RQ2:   *To what extent are children's and parents' worries associated with increased children's anxiety?*

The results were then inferred with the broader narrative of emerging research in this area and discussed as implications for future online schooling policies. This may improve the handling of future online schooling in Ireland, particularly in the event of future lockdowns and school closures involving parents and children schooling from home.

Method

Design and Participants

This study is a statistical analysis of the KiDiCoTi Ireland dataset. The KiDiCoTi Ireland data was acquired by the Ireland partners in collaboration with the European Commission JRC. A research agency assisted the JRC with access to national participant panels. Data were collected through an online survey between July and August 2020 with the assistance of this agency. Participants included dyads of parents and their children, such that for each parent participant there was one child participant. When asked about their child, parents would refer to their child participating in the survey. Before completing the questionnaire, all participants indicated their informed consent and understanding of the study aims. Participants did not have to answer all questions and could complete the survey in their own time. Data was treated in confidence and in compliance with the European Union's General Data Protection Regulation (GDPR) guidelines. Ethical approval was granted by the authors' university research ethics committee.

Data Exclusion Criteria

The dataset comprised of an overall sample of 504 parent participants and 504 children participants as part of a national panel in Ireland. However, there were indicators that warranted some exclusion criteria for the purposes of analysis. The data exclusion criteria were as follows: parents of childbearing age under the age of 25 who would not have a corresponding child to be at least 10 years of age ($n = 5$); parents who did not have their child living in the same household ($n = 5$); children with a reported age of 18 years or more ($n = 28$); and children who reported not currently in attendance of primary or post-primary education in Ireland ($n = 5$).

Participants

Parent participants ($n = 461$) in the analysis included both males ($n = 223$, 48.4%) and females ($n = 238$, 51.6%). The average age of a parent was 43.1 years ($SD = 8.1$, age range = 25–68 years). Parents were married ($n = 339$, 73.5%), living with a partner ($n = 69$, 15%), single ($n = 23$, 5%), or separated/divorced/widowed ($n = 30$, 6.5%). They reported their professional situation as: employed ($n =$

343, 74.4%), homemaker (*n* = 46, 10%), unemployed (*n* = 26, 5.7%), self-employed (*n* = 24, 5.2%), or retired/unable to work/student/other (*n* = 21, 4.5%). The highest education level of parents was reported as: bachelor's degree (*n* = 153, 33.2%), secondary education (*n* = 78, 16.9%), master's degree (*n* = 76, 16.5%), trade/vocational training (*n* = 42, 9.1%), and various others, including associate degrees, doctoral education, and primary school education (*n* = 60, 13%). Parents estimated their SES in terms of overall household income as: average (*n* = 201, 43.6%), higher than average (*n* = 150, 32.5%), and lower than average (*n* = 105, 22.8%).

Children participants (*n* = 461) included males (*n* = 252, 54.7%), females (*n* = 208, 45.1%), and a participant who chose not to answer (0.2%). The average age of a child participant was 14 years (*SD* = 2, age range = 10–17 years). Children were currently in the following stages in their education: fifth and sixth class primary education (*n* = 132, 28.6%), junior certificate years 1–3 post-primary (*n* = 192, 41.6%), and leaving certificate years 4–6 post-primary (*n* = 137, 29.7%). Children reported the ways in which their schools "moved" online: all their classes used videoconferencing and supplementary materials (*n* = 223, 55.1%), some of their classes used videoconferencing and supplementary materials (*n* = 111, 27.4%), no classes used videoconferencing but sent out supplementary materials (*n* = 60, 14.8%), and no classes used videoconferencing or sent out supplementary materials (*n* = 9, 2.2%). Some children reported receiving some schooling in the school during lockdown (*n* = 2, 0.5%).

Children reported the extent of their schoolwork (school hours and homework) that had changed: less than before the lockdown (*n* = 204, 44.3%), more than before the lockdown (*n* = 107, 23.2%), about the same as before the lockdown (*n* = 86, 18.7%), and no change (*n* = 9, 2%). On whether they participated in online activities (such as an online class or videoconference) while classes had changed due to the COVID-19 pandemic, children replied thus: yes (*n* = 308, 67%), no (*n* = 87, 18.9%), or did not know (*n* = 10, 2.2%).

Measures and Procedure

Anxiety

Children's global anxiety was measured using seven items self-assessed on a 4-point Likert scale ranging from 1 (not very true) to 4 (very true). The anxiety measure appeared to be non-diagnostic and had excellent validity and composite reliability in the current study as demonstrated in Table A.1 (see Appendix). Global anxiety scores were computed by averaging participants' responses across all items. The average overall anxiety score was 17.4, the standard deviation was 6.2, and the range was 4–28.

Psychological Well-Being

Children's psychological well-being was measured using the Rees and Main (2015) multi-item Psychological Well-Being subscale. Participants were asked to state their agreement to six items on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The subscale showed satisfactory validity and composite reliability in the current study as demonstrated in Table A.2 (see Appendix). A psychological well-being score was computed for each participant by averaging participant answers across

all the items. The average overall psychological well-being score was 22.5, the standard deviation was 4.3, and the range was 6–30.

Parent's and Children's Worry Questions

Parents and children were asked a variety of questions about their worries. One worry question asked parents to estimate their worry as less since lockdown, about the same since lockdown, more since lockdown, or not worried in relation to their children being exposed to a variety of online risks during lockdown (displayed in Table 3). These online risks concerned the digital technologies typically used by the parents' children for leisure (e.g., game consoles), social networking (e.g., social networking sites), and for school (e.g., videoconferencing). Parents also answered a single question about worry that the COVID-19 situation will have a negative effect on their children's education, using a 5-point Likert scale ranging from 1 (not worried at all) to 5 (very worried).

Children were asked questions about their worry in relation to their education and in the school context: I worry that it will be difficult for me to participate in online activities; I worry that I will get poor grades because of online activities; and I worry that it will be difficult for me to complete school activities online. Answers were given on a 5-point Likert scale ranging from 1 (not at all true) to 5 (very true).

Procedure and Data Analysis

Data analyses were carried out using IBM Statistical Package for the Social Sciences (SPSS) version 27.0. The seven items to measure children's anxiety and the Rees and Main (2015) Psychological Well-Being scale underwent an exploratory factor analysis (EFA) to identify their psychometric structure as they had not been well validated. The results of EFAs are outlined in Tables A.1 and A.2 (see Appendix). Parents' worry frequencies were reported and tallied as shown in Table 1. Statistical assumptions and a priori power analysis determined the conditions met for the execution of a hierarchical multiple regression to investigate the extent of parent's and children's worry predictors on children's anxiety. The results of the regression are displayed in Table 2. Independent t-tests with effect sizes determined the anxiety differences between children who were worried and children who were not. Chi squares were computed to determine differences in reported worry between different children's demographic groups (gender, SES, and age range). To reduce the possibility of type one error occurrences, significance was determined at the 0.01 level where necessary.

Results

Parents' Worries

Parents were worried that the COVID-19 situation would have a potential negative impact on their child's education ($n = 267$, 58%), and about their child being at increased exposure to online risks in lockdown ($n = 210$, 46%). They estimated their current worry in lockdown compared with their worry prior to lockdown (less worried, about the same, more worried, or not worried at all) with respect to their children's exposure to specific online risks (shown in Table 1).

Table 1. Parents' Self-Reported Worries About Children's Specific Online Risks During Lockdown.

Online Risks	Estimation of Worry in Lockdown			
	Less	About the Same	More	Not Worried
Excessive use (e.g., spending too much time playing games, watching videos) (*n* = 454)	14 (3%)	148 (33%)	271 (60%)	20 (4%)
Dis- and mis-information (e.g., false information or information intended to mislead, propaganda) (*n* = 454)	16 (3.5%)	197 (43%)	217 (48%)	24 (5%)
Information disclosure (e.g., public sharing or posting of personal data) (*n* = 455)	7 (1.5%)	223 (49%)	200 (44%)	25 (5.5%)
Cyberbullying (e.g., victimization and perpetration of repeated harm inflicted using digital technology) (*n* = 454)	14 (3%)	222 (49%)	197 (43%)	21 (5%)
Sexting (e.g., receiving or sending content with sexually explicit messages, photographs, or images among peers) (*n* = 451)	12 (3%)	203 (45%)	196 (44%)	40 (9%)
Harmful content (e.g., seeing pages about anorexia, bulimia, gory content, self-harm, etc.) (*n* = 451)	11 (2%)	210 (47%)	193 (43%)	37 (8%)
Hate speech online (e.g., messages that spread, incite, promote, or justify racial hatred, xenophobia, antisemitism, etc.) (*n* = 457)	13 (3%)	214 (47%)	195 (43%)	35 (8%)
Total average self-reported worry about children's specific online risks	14 (3%)	206 (45%)	210 (46%)	27 (6%)

Note. Valid percentages reported. Parents had the option of not answering this question.

Parent and Child Worry Predictors of Children's Anxiety

Statistical assumptions and a priori power analysis were considered before conducting a hierarchical multiple regression to estimate the extent to which determining children's school worries and parents' worries predict variances in children's anxiety. Box plots identified five anxiety outlier scores, which were removed, and missing data were coded as missing values.

The dependent variable (children's anxiety) was normally distributed (*Skewness* = 0.14, *Kurtosis* = -0.833). Predictor variables did not highly correlate with each other in a correlation matrix and thus satisfied the assumption of low multicollinearity. G*Power (3.1.9.2 Version) software (Erdfelder, Faul, Buchner, & Lang, 2009) determined a minimum required sample size of 145 with 11 predictors for 95% power estimation in a regression.

Recoded binary categorical dummy variables and continuous variables were input into the model to determine their variances on the anxiety-dependent variable with ENTER. Step 1 included the following control variables into the model: child gender (1 = males), child age (continuous), socioeconomic status (1 = low SES), parent marital status (1 = married), and child psychological well-being (continuous). Step 2 added the child worries: worry about keeping up with schoolwork (1 = worried), worry about getting poor grades (1 = worried), and worry about completing school activities online (1 = worried). Step 3 added the parents' worries: worry that COVID-19 would have a negative effect on their child's schooling (1 = worried) and worry about their child being exposed to more online risks (1 = worried). Table 2 shows the coefficient values and model summaries of the computed hierarchical regression.

Table 2. Hierarchical Regression Results for Children's Anxiety.

Variable	Unstandardized Coefficients		Standardized Coefficients			Model Summary			
	B	SE	β	t	Sig.	R	R^2	ΔR^2	Sig. F Change
Step 1						.26	.07	.07	.000
Constant	21.1	2.89		7.60	.000				
Gender	0.38	0.61	.03	0.62	.536				
Child Age	-0.00	0.16	-.00	-0.01	.989				
SES	-0.68	0.68	-.05	-1.00	.316				
Parent Marital Status	2.36	0.72	.17	3.28	.001				
Child Psychological Well-Being	-0.22	0.07	-.16	-3.16	.002				
Step 2						.57	.32	.25	.000
Constant	20.2	2.50		8.05	.000				
Gender	0.21	0.53	.02	0.40	.687				
Child Age	-0.21	0.14	-.07	-1.57	.118				
SES	-0.42	0.59	-.03	-0.72	.475				
Parent Marital Status	1.95	0.62	.14	3.17	.002				
Child Psychological Well-Being	-0.15	0.06	-.11	-2.46	.014				
Child Worry About Keeping Up With Schoolwork	2.23	0.64	.18	3.47	.001				
Child Worry About Getting Poor Grades	2.61	0.67	.21	3.91	.000				
Child Worry About Completing School Activities	2.92	0.66	.24	4.43	.000				
Step 3						.58	.32	.02	.006
Constant	19.6	2.50		7.83	.000				
Gender	0.22	0.52	.02	0.42	.676				
Child Age	-0.18	0.14	-.06	-1.36	.175				
SES	-0.30	0.58	-.02	-0.52	.603				

Parent Marital Status	1.87	0.61	.13	3.07	.002
Child Psychological Well-Being	-0.18	0.06	-.13	-2.93	.004
Child Worry About Keeping Up With Schoolwork	2.05	0.66	.16	3.12	.002
Child Worry About Getting Poor Grades	2.43	0.67	.20	3.64	.000
Child Worry About Completing School Activities	2.66	0.66	.22	4.05	.000
Parent Worry About Child Exposure to Online Risks	1.71	0.55	.14	3.12	.002
Parent Worry About Child's Education	0.10	0.59	.01	0.17	.868

Note. The dependent variable is children's anxiety.

Worried Children and Anxiety

Children's responses to items about their school worries were recoded as "worried" (true and very true) and "not worried" (not at all true and not true). The school worry items in the dataset were: I worry that it will be difficult for me in online activities (worried = 147, 37%; not worried = 252, 63%); I worry that I will get poor grades because of online activities (worried = 177, 44%; not worried = 229, 56%); and I worry that it will be difficult for me to complete school activities online (worried = 166, 41%; not worried = 240, 59%). Children who responded "not at all true" or "not true" to all three items were considered as "not worried" (n = 164, 41%) about their schooling during lockdown for the purposes of statistical analysis.

Independent t-tests and effect size estimations showed that anxiety scores were significantly higher with a large effect size (t(379) = -9.9, CIs = -7, -4, p < .001, Cohen's d = 0.99), and psychological well-being scores were significantly lower with a smaller effect size (t(401) = 3.49, CIs = 0.7, 2.4, p < .001, Cohen's d = 0.35) among the children who worried compared with those who did not. Table 3 shows the descriptive statistics of the children's scores on the anxiety and psychological well-being measures.

Table 3. Descriptive Statistics for Anxiety and Psychological Well-Being Measures Among Children.

			Anxiety			Psychological Well-Being		
Demographic	*N*	%	*M(SD)*	*Min.*	*Max.*	*M(SD)*	*Min.*	*Max.*
Gender								
Males	249	55	17.5(6.5)	7	28	23(4)	6	30
Females	207	45	17.3(6)	5	28	22.1(4.1)	10	30
Age Range								
10–13	205	45	17.4(6.1)	5	28	22.7(4)	10	30
14–17	252	55	17.5(6.3)	7	28	22.3(4.5)	6	30
SES								
Lower SES	104	23	19.4(6)	7	28	21.6(4.6)	8	30
Higher SES	348	77	17(6.1)	5	28	22.8(4.1)	6	30
School Worry								
Worried	238	59	19.5(5.8)	7	28	21.8(4.5)	7	28
Not Worried	164	41	14.1(5.1)	5	28	23.3(4)	14	30

Children in the 14–17 age range reported significantly more worries compared with those in the 10–13 age-range (X^2(1) = 6.35, p < .012, *Cramer's V* = .125). There were no significant differences between gender (X^2(1) = .442, p > .506) or SES (X^2(1) = 1.0, p > .317) among the children who were worried and those who were not.

Discussion

This study investigated the extent of some of the self-reported children's anxiety and psychological well-being during the first COVID-19 lockdown among a sample of 11- to 17-year-old children and their

parents in Ireland. Specifically, we aimed to determine how the worries reported by children and their parents contributed to children's anxiety.

Children's and Parent's Worries

Many children and parents reported worries that were particularly relevant to their education during lockdown. Although not all children reported worry, most reported at least one of the following worries to some extent: worry about keeping up with online activities, worry about getting poor grades, and worry about completing their schoolwork. The children who reported these worries indicated a significantly higher anxiety score compared with those who did not. This is a finding that is consistent with the numerous psychological studies and reviews demonstrating the adverse influence of children's worry on their anxiety levels (Muris et al., 2002; Spinelli et al., 2020; Wilson, 2021).

Similar to the findings of other age- and worry-related research (e.g., Jovanovic et al., 2014), significantly more worries were reported among children aged between 14 and 17 years compared with those aged between 10 and 13 years. In Ireland, the majority of children in the 14–17-year-old age group are usually attending post-primary education and preparing to undertake the Junior and Leaving Certificate state examinations. Preparing for the state examinations is of considerable importance to many children as these examinations largely function as a pathway to access third-level education and other careers in Ireland. Around the time of data collection for this study, various media reports about how uncertain children, parents, and teachers were about the assessment of these examinations (i.e., predictive grading) were in circulation. This likely explains why this age group reported significantly more worries about their education while in lockdown. It also echoes the findings of Flynn et al. (2021) who also found that major examinations were of concern among young people during the pandemic.

Many parents in Ireland reported worry about the COVID-19 situation having a negative impact on their child's education. Though this is consistent with other studies (O'Sullivan et al., 2021; Thorell et al., 2021), parents also reported worry about their children being more exposed to online risks such as cyberbullying, excessive technology use, and disclosing personal information online (see Table 1). The identification of these additional parental worries extrapolates the research findings of O'Sullivan et al. (2021) and Ezpeleta et al. (2020) by elaborating on the more specific parental worries identified. The additional parental worries in relation to children's exposure to more online risks show that excessive technology use was not the only technology-related worry as reported by Ezpeleta et al. (2020). The specific worries related to online risks reported by parents arguably reflect a more comprehensive awareness about their children's online behavior, and that parents' worries incorporated digital technologies themselves and the functions of what these technologies offer. Parents' worries about their children's exposure to more online risks is possibly a contributory component of the general family stress associated with emergency online schooling identified by O'Sullivan et al. (2021).

Parents' Worries and Children's Anxiety

Children's and parents' worries were significant predictors of children's increased anxiety during lockdown, as evidenced by the findings of this study. The results of the regression indicated that children's

worries about their schooling predicted the most variance on their anxiety, whereas parents' worries about their children being exposed to more online risks explained an additional but smaller amount of the variance of anxiety scores. In other words, this study argues that children's worries about their schooling were more contributory to their anxiety than the worry of their parents during the pandemic. This finding is congruent with the work of de Avila et al. (2020) who also noted similar influences on children's anxiety during the COVID-19 pandemic.

Furthermore, this finding may provide additional support for Orben and Przybylski (2019) and Shaw et al. (2020) who have previously argued that antecedent factors, such as worry about technology usage, is likely more detrimental to well-being than actual technology use. For these reasons, children's and parents' worries and the important role of technology must be considered in updated emergency online schooling policies.

Implications for Online Schooling

The results of this study and the related emerging research could function as an evidence base for updating online schooling policies in cases of future global pandemics or situations that involve lockdowns and school closures. Some existing policies have recently been updated to include online resources such as eLearning training for parents and tutors. However, the findings in this study arguably highlight a potential urgency to consider instruction on online safety education.

It could be contested as to what format online safety education could take in this context. For example, Finkelhor, Walsh, Jones, Mitchell, & Collier (2021) argued that online safety education should be part of wider programs addressing both online and offline harms interdependently. However, as the COVID-19 context concerns a predominant variety of online environments such as entertainment, online schooling, and social networking, online safety considerations may be more optimally positioned in the specific online contexts addressed in online training. For example, when instructing on how to use videoconferencing for online schooling, it is within this module that the online safety considerations in videoconferencing are addressed.

Aside from online schooling policies, the findings also implicate Irish schools' handling of the move from the classroom to online schooling. The results of this study show that schools in Ireland were inconsistent in the format, delivery, and frequencies of lessons and activities sent to pupils during the lockdown. This is of particular concern for the pupils who were due to take state examinations (e.g., Junior Certificate, Leaving Certificate) during that time. Though it was evident from the literature that other countries reported similar concerns (Thorell et al., 2021), schools and state educational departments in Ireland may benefit from having consistent and regularly updated guidelines that reflect the technology capabilities of the school. As such the school capabilities may implicate the well-being and individual capabilities of schoolteachers, parents, and pupils.

Such improvements to online schooling policies and competence in handling moves to online schooling are likely to help with the alleviation of some of the worries reported by parents and children, and subsequently children's increased anxiety, as was evidenced in this study.

Limitations and Future Directions

Despite notable strengths such as the uniqueness of parent–child dyads in a COVID-19 context and the ambitious possibility that the results may be used to improve online schooling efforts, this research study also had several limitations.

The cross-sectional nature of KiDiCoTi limits causality in a variety of ways. KiDiCoTi is likely to require an additional wave of data collection to better comprehend the extent of different lockdowns on children's technology use, well-being, and schooling. This dataset is a one-time "snapshot" of a certain moment in time, which is often captured in survey research. Furthermore, the self-report component of KiDiCoTi is predominant and may be problematic to get an accurate estimation of technology use (Sewall et al., 2020). Finally, the theoretical and data analysis approach in this study was adopted to suit this premade dataset crafted by a multidisciplinary team and, as such, presents many opportunities for researchers to take alternative approaches and perspectives when investigating the extent of children's and parents' worry further.

Such opportunities may include expanding on the existing knowledge of how specific theoretical frameworks operate in the COVID-19 context. Unlike the present study, the core assumptions of specific theories could be tested using data analytical approaches. For example, drawing on institutionalized individualization theory (Beck & Beck-Gernsheim, 2002), the COVID-19 context may have contributed to the shifting of the onus of risk management responsibility away from institutions and onto parents. Using this as a theoretical underpin, there could be some theoretical links between the shifting of risk management responsibility due to the COVID-19 lockdowns, which then led to increased worry and anxiety among children. Though this remains a possibility, it could be argued that meaningful applications of theory may have been compromised due to the immediate need and opportunity to collect data and report on impending COVID-19 trends by researchers.

Researchers interested in the COVID-19 context may also be more advantaged by considering more logged data alongside predominantly acquired self-report data. Sewall et al. (2020) noted sizable differences between logged and self-report data in relation to technology-use frequencies. Such a distinction in the context of children's and parents' worry may be especially useful as confirming emerging COVID-19 research trends.

Conclusion

Arguably, it remains difficult to assess how life in a post–COVID-19 world might look while the COVID-19 pandemic remains ongoing. For this reason, it is essential to acknowledge the role of children's and parents' worries for post-lockdown mental health interventions and aftercare. Although the benefits of technology may have been of great convenience while undertaking online schooling in lockdown, it is reasonable to assert that the pandemic persists as an overarching worrying time for children and parents who could be greatly advantaged by future evidence-based improvement supports.

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Appendix

Scale Validation

Anxiety

Based on a Principal Axis Factoring (PAF) with Promax Oblique Rotation method, an exploratory factor analysis (EFA) of the seven items self-assessing children's anxiety was conducted. The inter-item correlation matrix showed no value exceeding .80, that is, there was no redundant item or perfect correlation between any pair of items (Pett, Lackey, & Sullivan, 2011). The Kaiser-Meyer Olkin (KMO) score was .94 with a significant Bartlett test score ($p < .001$), which verified the sampling adequacy for the analysis. Only one common factor had eigenvalues over Kaiser's criterion of 1, and it explained 68.4% of the total variance. Table A.1 displays the seven items and the rotated factor loadings all above .32 (Tabachnick & Fidell, 2013).

Table A.1. Results of Exploratory Factor Analysis of Items Self-Assessing Children's Anxiety.

Item	Factor 1
1. I feel fearful	.88
2. I feel faint, dizzy, or weak, have headaches	.87
3. I feel nervous	.85
4. I feel my heart pounding or racing	.85
5. I feel tense	.83
6. I feel restless, like I can't sit still	.77
7. Generally, I feel worried	.71
Eigenvalue	4.79
% of Variance	68.4
Convergent Validity	.82
Composite Reliability	.94

Note. N = 424. The extraction method was Principal Axis Factoring with Promax Oblique Rotation with Kaiser normalization. All factor loadings were well above .32. Convergent validity was estimated via Average Variance Extracted (AVE = the sum of the squared loadings divided by the number of indicators).

A Composite Reliability (CR) analysis with a value of .94, well above the criteria > .70 (Hair, Hult, Ringle, & Sarstedt, 2014), indicated an excellent internal consistency of the seven children's anxiety scale items. Given that the scale is measuring a single unidimensional factor (i.e., Anxiety), its construct validity in terms of only convergent validity (i.e., the extent to which measures of a theoretical construct share common variance) can be estimated via the Average Variance Extracted (Hair et al., 2014). The AVE for the Anxiety factor was .82, which is greater than .50 and therefore satisfying the criterion for construct validity in terms of convergent validity (Hair et al., 2014).

Psychological Well-Being

Likewise, reliability and convergent validity of the Psychological Well-Being Scale with six items were estimated based on EFA with a PAF with Promax Oblique Rotation method. The inter-item correlation matrix showed no value exceeding .80 indicating that there was no redundant item to remove (Pett et al., 2011). The KMO measure of .85 along with significant Bartlett test score ($p < .001$) verified the sampling adequacy for the analysis. The single factor solution had eigenvalues over Kaiser's criterion of 1 and explained 45.2% of the total variance. A factor with the eigenvalues > 1 is acceptable when it explains the total variance as little as 40% (Kline, 2014). Table A.2 displays the six items along with corresponding rotated factor loadings all above .32 (Tabachnick & Fidell, 2013). Composite Reliability value (*CR* = .83 greater than .70) and the convergent validity (AVE = .68 greater than .50) satisfied the criterion for reliability and construct validity (Hair et al., 2014).

Table A.2. Results of Exploratory Factor Analysis of the Rees and Main (2015) Psychological Well-Being Scale.

Item	Factor 1
1. I like being the way I am	.75
2. I am good at managing my daily responsibilities	.66
3. People are generally friendly toward me	.54
4. I have enough choice about how I spend my time	.57
5. I feel that I am learning a lot at the moment	.66
6. I feel positive about my future	.80
Eigenvalue	3.23
% of Variance	45.2
Convergent Validity	.66
Composite Reliability	.83

Note. N = 424. The extraction method was Principal Axis Factoring with Promax Oblique Rotation with Kaiser normalization. All factor loadings were well above .32. Convergent validity was estimated via Average Variance Extracted (AVE = the sum of the squared loadings divided by the number of indicators).