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ORIGINAL ARTICLE

Bullying Victimization as an Adverse Experience for Psychosocial Adjustment among Irish Adolescents

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Abstract

This study investigates the long-term effects of victimization from middle adolescence to late adolescence and early adulthood, examining emotional and behavioral problems, peer relationships, and smoking habits and sleeping difficulties. The study also explores how these outcomes can persist into early adulthood, taking into consideration early victimization experiences, gender, cognitive ability, and family social class. The total sample included 7525 participants, spanning the ages of 13, 17, and 20, from the Child Cohort of the Growing Up in Ireland study (48.9% male). The path analysis model suggests that victimization is associated with behavioral problems at age 17, and it is also linked to emotional problems and sleeping difficulties at both ages 17 and 20. Additionally, sleeping difficulties, smoking habits, and indices of emotional and behavioral adjustment exhibit some stability between ages 13 and 17, as well as 17 and 20. Theoretical and practical implications are discussed.

Keywords Victimization · Consequences · Peer relationships · Emotional problems · Behavioral problems · Sleeping difficulties · Smoking habits

Adolescents are victimized when they are repeatedly and consistently exposed to negative actions from one or more overpowering subjects, thus creating an imbalance and abuse of power. In the context of bullying, "traditional victimization" may indeed refer to face-to-face bullying or offline forms of harassment. This can include physical bullying, verbal abuse, social exclusion, or any other harmful actions that occur in person rather than through digital means (Olweus et al., 2019). Victimization is an experience that can occur across the lifespan of many adolescents (Smith et al., 2003). Approximately 10–15% of adolescents are peer victimized (Juvonen & Graham, 2001). Victimization during middle adolescence (i.e., 12–13 years old) is associated with adverse repercussions for relationships (deLara, 2019), behaviors (Ilola et al., 2016), and health (Pellegrini & Long, 2002) in young adulthood (i.e., 18–22 years old). The literature presents a mixed picture of potential consequences in young adulthood resulting from bullying victimization, along with a scarcity of studies investigating the persistence of these consequences. To contribute to this body of research, the current study utilizes large-scale, nationally representative data from Growing Up in Ireland to explore whether victimization at age 13 is associated with negative peer relationships, increased emotional and behavioral problems, and smoking and sleeping difficulties at age 17. This investigation further extends the literature by examining the persistence of these psychosocial difficulties at age 20 in an Irish sample, taking into account the significant role of bullying victimization and its relationship with sociocultural and personal factors, including social class, gender, and cognitive ability. Additionally, as a secondary aim, the study will explore the trajectories of emotional, behavioral, and peer problems across the three stages of life (13 years old, middle adolescence; 17 years old, late

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adolescence; 20 years old, young adulthood[1]), as well as those associated with smoking habits and sleeping difficulties at 17 and 20 years old.

According to Van der Kolk and colleagues' (1996) perspective, bullying victimization may be considered an event associated with and capable of affecting the psychological and social well-being of adolescents and young adults (Idsoe et al., 2021). This aligns with the literature on psychosocial adjustment as an outcome of various risk and protective factors (e.g., Herrenkohl et al., 2012), each potentially carrying different weight. Stressful experiences created by bullying victimization may also result in alterations in emotional internal states and impulses (e.g., emotional problems, smoking habits, and sleeping difficulties), leading to challenges in adjusting emotional responses and behaviors. This, in turn, has a further negative impact on the effective management of personal and social problems (Cross et al., 2015).

Bullying victimization can be considered a detrimental adverse adolescent experience that can have profound and lasting effects on an individual's young adulthood well-being (Arseneault, 2018; Lataster et al., 2006). Bullying victimization, indeed, represents a form of chronic stress and interpersonal trauma (Crandall et al., 2019). The repercussions of such bullying victimization can extend across the developmental stages, influencing emotional, social, and cognitive domains. The repercussions of such bullying victimization can extend across the developmental stages, influencing emotional, social, and cognitive domains. In adolescence, the immediate consequences may include heightened stress responses, impaired self-esteem, and social withdrawal. As individuals progress through adolescence and young adulthood, the effects may manifest as persistent mental health issues, compromised interpersonal relationships, and even increased risk for chronic diseases (D'Urso et al., 2021; Mishna et al., 2016; Vidourek et al., 2016). Adolescents may struggle to manage stress resulting from bullying victimization consistently, as it can instigate deficits in the maturation of bullying victimization response systems (Otgaar et al., 2019).

A plethora of research studies have explored the association between bullying victimization during early adolescence and subsequent mental health problems. Initially, literature has emphasized its links to emotional difficulties, including depression, anxiety, self-harm, and suicidal behavior (Armitage et al., 2021; Hemphill et al., 2011; Moore et al., 2014, 2017). Recent investigations extend this connection to sleep problems alongside suicidal ideation (Hasan et al., 2021). Moreover, cross-sectional studies have highlighted the strongest associations of bullying victimization during middle adolescence with behavioral problems, somatic symptoms, and peer difficulties (Gini, 2008; Ilola et al., 2016; Pace et al., 2020).

Studies also position bullying victimization as an adverse experience that negatively affects adolescents' emotional skills essential for relationship building and coping with developmental tasks (Craig & Pepler, 2007; Soler et al., 2013; Turner et al., 2017). Bullying victimization may compromise social skills, making interpersonal interactions feel unsafe, potentially leading to maladaptive behaviors like smoking and sleep problems in late adolescence and young adulthood (Jose & Vierling, 2018; Wolke et al., 2001). Furthermore, on the relationship level, bullying victimization impedes the development of intimate relationships, affecting both the quality and quantity of friendships during the young adulthood (deLara, 2019; Hemphill et al., 2011). Victimized individuals may struggle to trust others, impacting their responsiveness and confidence to build connections during the young adulthood. This mistrust can persist into adulthood, inhibiting the establishment of friendships and fostering feelings of inhibition (D'Urso et al., 2023; Isaacs et al., 2008). However, literature on this subject is contentious, with some studies reporting good-quality friendships among victims (Woods et al., 2009), while others suggest limited social connections (Eslea et al., 2004).

In line with a life course perspective (D'Urso et al., 2023), the chronic negative correlates of bullying victimization may diminish over time due to the development of resilience, mitigating negative repercussions on social, relational, and individual well-being (Armitage & Armitage, 2014). A study conducted in Ireland highlighted how bullying victimization can negatively impact competence and confidence in late adolescence, manifesting in stress response, negative self-perception, and emotional states (D'Urso et al., 2021). Similarly, Irish adolescents experiencing significant bullying victimization events at school exhibit elevated levels of emotional and psychological problems in late adolescence and young adulthood (Mc Guckin et al., 2011).

Other Problematic Behaviors

The literature underscores the significance of examining not only bullying victimization but also other behavioral dimensions across pivotal stages of the life course to comprehend the intricacies of young adult identity development (Albdour & Krouse, 2014). By adopting a lifespan perspective, researchers can elucidate how various forms of adversity, including peer interactions, emotional regulation, and behavioral patterns, shape the trajectory of identity formation from adolescence into young adulthood (Arnett, 2000). This holistic approach acknowledges the multifaceted nature of identity development and underscores the importance of considering diverse factors in understanding the complexities

[1] Close friendships, emotional well-being, and reactive aggression are outcomes at 20 years old.

of individual growth and adaptation over time (D'Urso et al., 2021). Indeed, it is important to study the long-term consequences of these problematic behaviors, consistent with the developmental cascade model (Masten & Cicchetti, 2010), which suggests that some long-term consequences may persist and amplify, regardless of previous bullying victimization experiences. In this context, emotional problems have been noted to potentially escalate into young adulthood, leading to lower levels of well-being (e.g., Cleverley et al., 2012; Liu et al., 2019). Similarly, peer problems during middle adolescence might result in a reduction in the number of friendships during this period (e.g., Holmes et al., 2016), with the number and quality of friendships not always changing in young adulthood (e.g., Berndt, 2018; Furman & Rose, 2015). However, some studies have indicated that peer problems in late adolescence may not consistently impact young adulthood in the same way (e.g., Lam et al., 2014). Moreover, literature suggests that behavioral problems during middle adolescence could escalate into young adulthood, potentially evolving into aggressive behaviors (e.g., Liu et al., 2013). Smoking habits developed in late adolescence may continue to pose a risk into young adulthood (Vieno et al., 2011; Goebert et al., 2011; Jones et al., 2019), although the risk may decrease or diminish in some cases (Coomber et al., 2011; Sourander et al., 2007). Finally, sleep problems experienced in late adolescence may persist and even worsen into young adulthood (e.g., Chang et al., 2018).

The Current Study

The current study aims to explore longitudinal psychosocial correlates of bullying victimization in a population representative sample of Irish adolescents. Expanding the literature, the study examines the persistence of psychosocial difficulties for which bullying victimization can be a risk factor. Furthermore, the study also situates this longitudinal process considering (as control variables) children's cognitive ability, family's social class, and gender. Using these variables means that the observed longitudinal associations between study variables in the models are less likely to be attributable to unmeasured factors.

Our primary objective was to investigate the association between bullying victimization at the age of 13 and emotional, behavioral, and peer problems, as well as smoking and sleeping difficulties at the age of 17. As a secondary objective, we also examined the connections between emotional, behavioral, and peer problems at the age of 13 and those at the age of 17. The second objective entails investigating the temporal evolution of emotional problems, behavioral issues, peer problems, smoking habits, and sleeping difficulties, considering also the persistence of adjustment difficulties from bullying victimization by looking at certain variables at age 20. Specifically, indeed, we aim to explore whether emotional problems at the age of 13 impact emotional problems at 17, and subsequently emotional well-being at age of 20. Additionally, we aim to determine if behavioral problems at the age of 13 influence behavioral issues at the age of 17, subsequently contributing to reactive aggression at the age of 20. Furthermore, our investigation includes examining whether peer problems at the age of 13 influence the development of close friendships at the age of 17, extending further to the age of 20. We will also assess whether sleeping difficulties at the age of 17 predict the occurrence of sleeping difficulties at the age of 20. Lastly, our objective involves examining if smoking habits at the age of 17 serve as predictors for smoking habits at the age of 20.

Method

Participants

The Growing Up in Ireland (GUI) is a multi-informant, longitudinal nationally representative cohort study that surveyed children, their parents, school principals, and teachers to investigate children's lives and development in Ireland (Cfr. Murray et al., 2011). Data collection for the Child Cohort started between August 2007 and June 2008 (Wave 1, 9 years old) with children born between 1st November 1997 and 31st October 1998. The Child Cohort was interviewed again in the other 4 waves when the participants were 13 (Wave 2), 17 (Wave 3), and 20 years of age (Wave 4). For the current study, waves 2, 3, and 4 of data were included. Below, we report on the sample characteristics at the age of 13. Of the 7.525 participants included in the study at age 13, 48.9% ($n = 3.682$) of participants self-identified their gender as male. Around half of the participants' families were categorized in occupation as professional/managerial, 40% were classed as non-manual/skilled manual, and 13% were classed as semi-skilled/unskilled manual. Regarding family structure, the majority of participants (86.8%) have two parents with one or more siblings, and only 13.2% have one parent with one or more siblings.

Measures[2]

Measures Assessed at 13 Years Old

Gender In the GUI data set provided for secondary analysis, gender was recorded at Wave 1. This variable was coded as female (1) and male (0) for the current analysis.

[2] NB: We used all possible indicators of mental health and psychosocial well-being in the GUI data.

Family Social Class The GUI produces an assessment of the social class of each household based on the occupation of the adults through a 6-point Likert scale from (1) unskilled to professional workers (6).

Cognitive Ability The tool used was the Drumcondra Reasoning Test (DRT), which assesses numerical, verbal, and overall reasoning ability (Educational Research Centre, 1997). The DRT examines a variety of abilities, such as the ability to understand, think and reason with words, and to reason with numbers and manipulate numerical relationships. This contained a subset of questions from the main DRT test; there are 20 items assessing verbal reasoning (e.g., Which word is the odd one out? Terrify; Scare; Frighten; Argue") and 20 items assessing numerical ability (e.g., Which number comes next after 1, 2, 4, 8, 16 …? 10; 20; 24; 32). For the current study, we used the combined total score of verbal and numerical abilities.

Bullying Victimization Child cohort participants were asked at this wave only, "Have you been bullied in the last 3 months?" and responded using a dichotomous scale of yes (1) and no (0). The current study does not include any details on the type of bullying victimization, because these were recorded only for participants responding yes ($N=652$, 8.8%) on the binary victimization item, which would restrict the current study to a much smaller sub-sample.

Measures Assessed at Ages 13 and 17

Peers, Behavioral, and Emotional Problems We used peer problems at age 13 and emotional problems and behavioral problem subscales both at ages 13 and 17 from the Strengths and Difficulties Questionnaire (Goodman, 2001), completed by the Primary Caregiver (PCG)—almost always the mother—in relation to their child. The SDQ is a brief behavioral screening self-report questionnaire for children ages 3–16. Parents are asked to consider the child's behavior over the last 6 months of the current school year. Each subscale comprises five questions with 3-point response scales (1 = "not true" to 3 = "certainly true"): emotional problems (e.g., often unhappy, downhearted), peer problems (e.g., rather solitary, prefers to play alone), behavioral problems (e.g., lies or cheats, fights with other children). A previous study with GUI data suggested a good reliability for these subscales (e.g., Nixon, 2021). Cronbach's alphas suggest a satisfactory reliability for peer problems (0.60), emotional problems (0.70), and behavioral problems (0.60).

Measures Assessed at Ages 17 and 20

Close Friends[3] Participants were asked at these two stages only, "How many friends do you normally hang around with?" and responded using a 4-point Likert scale: 1 = None to two, 2 = between 3 and 5, 3 = between 5 and 10, and 4 = more than 10.

Smoking Participants were asked at these two stages only, "How many cigarettes smoked in a week" and responded using an 8-point Likert scale: 0 = none, 1 = between 1 and 5, 2 = between 6 and 10, 3 = between 11 and 20, 4 = between 21 and 30, 5 = between 31 and 40, 6 = between 41 and 50, and 7 = more than 50.

Sleep Difficulties Participants were asked at these two stages only, "Do you have any difficulty with sleep?" and responded using a 3-point Likert scale: 0 = no; 1 = yes, some difficulties; and 2 = yes, a lot of difficulties.

Measures Assessed at Age 20

Reactive Aggression (as Indicator of Behavioral Problems) We used the reactive aggression subscale from the reactive-proactive aggression (RPQ; Raine et al., 2006). This questionnaire composed in total by 23-item scale calculates a total aggression score, of which 12 items were to calculate reactive aggression (e.g., yelling at others when they have annoyed you). Each item is rated using a 3-point Likert-type scale (0 = Never, 1 = Sometimes, 2 = Often). Cronbach's alpha suggests a good reliability for this subscale (0.80).

Emotional Well-Being We used the total emotional well-being subscale from the Energy and Vitality Index. The two items originated as part of the RAND 36 - Item Short Form Survey Instrument (Ware Jr. & Sherbourne, 1992). This subscale investigates in the participants' feelings of calm, peaceful, and happiness (e.g., Have you been a happy person?). The answer option for each item is a 6-point frequency scale ranging from all of the time to none of the time. Scores of zero represent the lowest possible score on each scale and scores of 100 represent the highest score. Answering 1 (all of the time) gets a score of 100, 2 (most of the time) scores 80, 3 (a good bit of the time) scores 60, and so on in increments of 20 less. Each answer is then averaged to give a total score for the subscale. Cronbach's alpha for the Energy and Vitality Index has ranged from 0.62 to 0.90 (Cf. Lehtinen et al., 2005).

Descriptive statistics are shown in Table 1.

Analysis Plan

Missing data analyses were conducted because they within waves increased across time. Of the child participants, in Wave 2, 692 had some missing data (9.3%); in Wave 3, 1459

[3] We opted for the available variable that was repeated at the ages of 17 and 20 years (child report) to enhance the reliability of the model.

Table 1 Descriptive statistics

Variable	*M*	*SD*
Cognitive ability (age 13)	58.58	19.83
Emotional problems (age 13)	1.78	1.90
Behavioral problems (age 13)	1.10	1.37
Peer problems (age 13)	1.10	1.44
Sleep difficulties (age 17)	0.34	0.57
Smoking habits (age 17)	2.24	2.28
Close friends (age 17)	2.45	0.77
Emotional problems (age 17)	1.94	2.10
Behavioral problems (age 17)	1.00	1.26
Sleeping difficulties (age 20)	0.44	0.62
Smoking habits (age 20)	2.61	1.14
Close friends (age 20)	3.40	0.78
Emotional well-being (age 20)	65.04	19.46
Reactive aggression (age 20)	4.74	3.33

had some missing data (19.7%); and in Wave 4, 43,379 participants had some missing data (44%). Little's MCAR was significant for the set of Waves 4 variables, $\chi^2(54) = 246.600$, $p = 0.000$, indicating that the data were not missing completely at random.

Subsequently, we conducted a correlation analysis in SPSS version 26 to identify the network of associations between the study variables (Table 2). We conducted path modelling using Mplus version 8.1. In our model, illustrated in Fig. 1 and aligned with our primary objective, we linked bullying victimization and emotional problems at age 13 to emotional problems at age 17, bullying victimization and behavioral problems to behavioral problems at age 17, and peer problems at age 13 to close friendships at age 17. We controlled for gender, social class, and cognitive ability in each of these relationships. Additionally, we associated bullying victimization at age 13 with sleeping difficulties at age 17 and smoking at age 17, again controlling for gender, social class, and cognitive ability in each relationship.

Within the same model, while addressing our secondary objective of examining the longer-term outcomes of bullying victimization, we investigated whether peer problems at age 13 were indeed associated with close friendships at age 17 and whether these friendships at age 17 were in turn linked to close friendships at age 20. We also investigated whether emotional problems at age 13 were associated with emotional problems at age 17 and if the latter were connected to emotional well-being at age 20. Similarly, we explored the relationship between behavioral problems at age 13 and behavioral problems at age 17, with the latter predicting reactive aggression at age 20. Finally, we examined if sleeping difficulties at age 17 were connected to sleeping difficulties at age 20 and if smoking habits at age 17 were linked to smoking habits at age 20. To ensure that the results were statistically representative to the population, we applied the weighting variable from Wave 1 of the GUI in the variable command of Mplus.

Results

Path Analysis Modelling

Model-fit statistics indicated that the model fit the data well, with a root mean square error of approximation (RMSEA) of 0.03 and a comparative fit index (CFI) of 0.90. The chi-square test of model fit was significant, $\chi^2(57) = 531.467$, $p = < 0.001$, likely owing in part to the large sample size. To reduce *type 1 errors*, we described the significant effects only at 0.01 and 0.001 level.

As shown in Table 3, bullying victimization was associated with emotional problems at age 17 and sleeping difficulties at age 17. Bullying victimization was also linked to behavioral problems at age 17. Peer problems at age 13 were negatively correlated with close friendships at age 17. Emotional problems at age 13 were associated with emotional problems at age 17. Behavioral problems at age 13 were related to behavioral problems at age 17. Being female was associated with fewer close friendships at age 17, emotional problems at age 17, and sleeping difficulties at age 17.

Furthermore, as shown in Table 4, smoking problems at age 20 were predicted by smoking problems at age 17. Sleeping difficulties at age 20 were predicted by bullying victimization and sleeping difficulties at age 17. Emotional well-being at age 20 was predicted by emotional problems. Reactive aggression at age 20 was predicted by behavioral problems at age 17 and cognitive ability. Being female was associated with fewer close friendships at age 20, less reactive aggression at age 20, and sleeping difficulties at age 20. Cognitive ability was negatively related to sleeping difficulties at age 17 and with reactive aggression at age 20.

Discussion

The study examined how the experiences of bullying victimization, peer problems, emotional problems, and behavioral problems at age 13 are associated with social, emotional, and behavioral adjustment in late adolescence (age 17) and the persistence of these adjustment difficulties throughout early adulthood (age 20). This consideration includes the early bullying victimization experience and investigates potential variations by gender, cognitive abilities, and family social class. Using a longitudinal path model to address our primary objective, we found that bullying victimization at age 13 was associated with

Table 2 Correlations among variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Victimization (age 13)	1																
2. Cognitive ability (age 13)	.010	1															
3. Female vs. male	−.011	−.09**	1														
4. Social Class (age 13)	.004	.269***	−.100**	1													
5. Emotional problems (age 13)	.121**	−.023	.100**	−.008	1												
6. Peer problems (age 13)	.212***	−.023	.037*	−.003	.400***	1											
7. Behavioral problems (age 13)	.107***	.001	−.018	−.002	.324**	.244***	1										
8. Sleep difficulties (age 17)	.082**	−.040**	.100**	.005	.114***	.067*	.100**	1									
9. Smoking habits (age 17)	.080**	.011	−.145***	−.080**	.072*	.128***	.169***	.090**	1								
10. Close friends (age 17)	.050**	.020	−.060**	.030*	−.092***	−.140**	−.060**	−.080**	−.050	1							
11. Emotional problems (age 17)	.115***	−.050**	.250***	−.014	.490***	.220***	.217***	.271***	.093**	−.145***	1						
12. Behavioral problems (age 17)	.080**	.014	−.008	−.013	.192***	.138***	.494***	.100**	.216***	−.060**	.305***	1					
13. Sleeping difficulties (age 20)	.084**	−.020	.075**	.012	.110**	.050**	.100**	.420***	.120***	−.052**	.196***	.115**	1				

Table 2 (continued)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
14. Smoking habits (age 20)	.030	−.061	−.029	−.050	−.066	−.050	.123**	.051	.300***	−.080	.044	.072	.061	1			
15. Close friends (age 20)	−.020	.001	−.050**	.011	.020	.020	−.018	.009	−.030	.007	.015	.006	.006	.020	1		
16. Emotional well-being (age 20)	.080**	.025	−.100**	−.002	−.101***	−.061**	−.053**	−.210***	.008	.070**	.204***	−.084**	−.321***	−.083*	−.016	1	
17. Reactive aggression (age 20)	.046**	−0.039	−.146***	−.007	.052**	.021	.148**	.071**	.100**	.006	.061**	.205***	.111**	.090*	.007	−.180**	1

*$p<.05$; **$p<.05$; ***$p<.001$

emotional problems at age 17. Consistent with previous studies (Bowes et al., 2015; Olenik-Shemesh et al., 2012), bullying victimization can induce feelings of asthenia and fatigue because adolescents may lack or have not yet developed adequate emotional resources to manage their condition. Bullying victimization can lead adolescents to feel unable to react and incapable of resilience, possibly due to the challenging emotional experience of this event, which increases emotional frustration across late adolescence (D'Urso et al., 2021).

Bullying victimization, as an adverse experience, also predicts subsequent behavioral problems at the age of 17 suggesting a potentially significant evolutionary perspective (Leenaars et al., 2008). Evolutionarily, indeed, individuals who experienced victimization during adolescence might have developed maladaptive behavioral patterns as a means of self-defense or adaptation to hostile environments. This link could be rooted in an evolutionary strategy aimed at survival, where the development of aggressive conduct serves as a defense mechanism against perceived threats.

The study underscores how bullying victimization predicts sleeping difficulties at ages 17 and 20. Consistent with the literature (Hasan et al., 2021), this finding highlights bullying victimization as a predisposing factor to sleeping problems during both phases of the life cycle. Bullying victimization may induce negative feelings that hinder adolescents from adapting normally. This data suggests that individuals may lack sufficient resilience to cope with the experienced bullying victimization, possibly leading to states of tension and anguish during the night (Mysliwiec et al., 2018). In Irish school contexts, bullying victimization can be considered a risk factor for social and emotional development (D'Urso et al., 2021). However, the literature emphasizes, in a more holistic and developmental perspective, that bullying victimization can negatively impact emotional (D'Urso et al., 2021; Mc Guckin et al., 2011) and behavioral aspects (D'Urso et al., 2023). Although studies conducted in other socio-cultural contexts have found victimization to influence relational adjustment and mental health (e.g., deLara, 2019; Pellegrini & Long, 2002), bullying victimization in the Irish context also emerges as a hindrance to later emotional and social well-being.

To address our secondary objective, the findings indicate a connection between sleeping difficulties at age 17 and sleeping difficulties at age 20. The cyclical pattern of sleeping difficulties persists throughout the developmental stages from middle adolescence into young adulthood (Chang et al., 2018). Furthermore, the study highlights how behavioral problems at age 13 predict, along with bullying victimization, behavioral problems at age 17, which in turn predict reactive aggression at age 20. These results suggest that behavioral problems can be stable over time, being however moderately affected by experiencing bullying

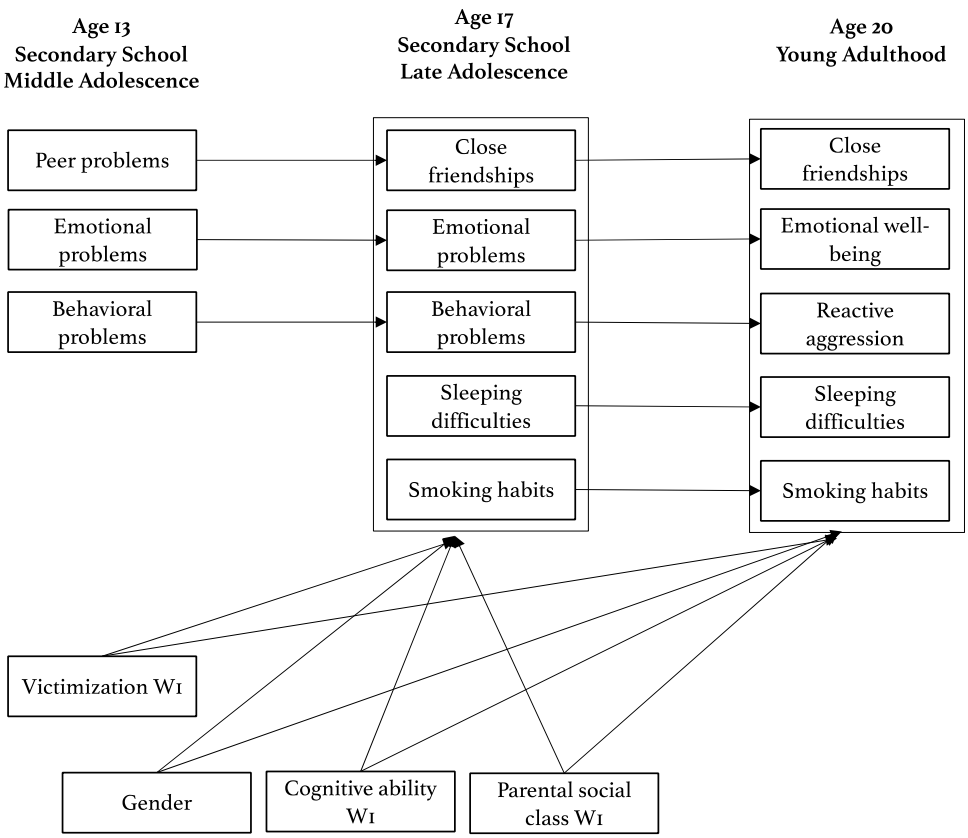

Fig. 1 Model representation

victimization between ages of 13 and 17. This means that behavioral problems in these adolescents can represent a risk factor towards aggression in young adulthood. In this direction, indeed, the literature indicates that bullying victimization is not always linked to behavioral problems or aggression which, on the contrary, may continue over time (Smith & Hung, 2012). Aligned with the findings in the literature (Fanti, 2013), the developmental trajectories in this context consistently demonstrate a sustained presence of relational difficulties with peers and antisocial tendencies from middle to late adolescence. This pattern persists without affording adolescents the opportunity to cultivate resilience and enhance social-emotional skills to address these challenges (Lou et al., 2018).

Table 3 Consequences of victimization at age 17

Predictor	Close friends (age 17) *B (SE)*	Behavioral problems (age 17) *B (SE)*	Emotional problems (age 17) *B (SE)*	Sleeping difficulties (age 17) *B (SE)*	Smoking habits (age 17) *B (SE)*
Gender	−0.091 (0.02)***	−0.00 (0.02)	0.212 (0.05)***	0.095 (0.02)***	−0.095 (0.05)
Social class (age 13)	0.040 (0.02)	−0.033 (0.02)	−0.025 (0.03)	−0.004 (0.02)	−0.070 (0.05)
Cognitive ability (age 13)	−0.026 (0.03)	0.020 (0.02)	−0.020 (0.04)	−0.046 (0.02)**	−0.050 (0.05)
Victimization (age 13)	−0.026 (0.06)	0.043 (0.03)**	0.088 (0.03)**	0.083 (0.03)**	0.034 (0.05)
Peer problems (age 13)	−0.146 (0.02)***				
Behavioral problems (age 13)		0.523 (0.02)***			
Emotional problems (age 13)			0.491 (0.02)***		
R^2	0.10	0.30	0.33	0.17	0.02

Gender, social class, and cognitive ability are control variables

**p<.01; ***p<.001

Table 4 Persistence of social, emotional, and behavioral adjustment difficulties at age 20

Predictor	Close friends (age 20) *B (SE)*	Reactive aggression (age 20) *B (SE)*	Emotional well-being (age 20) *B (SE)*	Smoking habits (age 20) *B (SE)*	Sleeping difficulties (age 20) *B (SE)*
Gender	−0.086 (0.03)**	−0.133 (0.02)***	−0.060 (0.02)	0.040 (0.06)	0.060 (0.02)**
Social class (age 13)	0.020 (0.02)	0.005 (0.02)	−0.022 (0.03)	−0.011 (0.06)	−0.007 (0.02)
Cognitive ability (age 13)	−0.03 (0.02)	−0.057 (0.02)**	0.020 (0.02)	−0.053 (0.06)	−0.006 (0.02)
Victimization (age 13)	−0.020 (0.02)	0.013 (0.02)	−0.064 (0.03)	−0.048 (0.06)	0.100 (0.03)***
Close friends (age 17)	0.030 (0.02)				
Behavioral problems (age 17)		0.215 (0.03)***			
Emotional problems (age 17)			−0.130 (0.02)***		
Smoking habits (age 17)				0.310 (0.09)**	
Sleeping difficulties (age 17)					0.374 (0.02)***
R^2	0.02	0.10	0.05	0.11	0.20

Gender, social class, cognitive ability, and victimization are control variables

**$p<.01$; ***$p<.001$

The study concurrently indicated that emotional problems at age 17 negatively predict emotional well-being at age 20 (Ellis et al., 2016). Possibly, during these two developmental stages, adolescents, lacking sufficient protective factors to adequately address their evolving needs, find themselves caught in this detrimental cycle. Consequently, the persistence of maladaptive emotional outcomes over time may be an adaptive response to the developmental needs of adolescents. The data also revealed that peer problems at age 13 were related to fewer close friendships at age 17. This result reflects the notion that, at the age of thirteen, social experiences serve as protective factors for subsequent significant social relationships. During middle adolescence, these experiences foster the development of emotional, cognitive, and social regulatory skills, thereby contributing to a holistic enhancement of peer-related self-efficacy feelings. In the Growing Up in Ireland study, 13-year-old participants valued friends as the second most significant group of people to turn to for support and advice, after their mothers (Economic and Social Research Institute, 2012). Creating ways and opportunities for friends to support each other during the school day and outside of school, by providing safe places for peer socialization, is another way by which educators can promote positive psychosocial adjustment.

Moreover, the model suggested how smoking habits predict smoking habits at age 20. In line with the literature regarding Irish populations (Burns et al., 2017), this result highlights how smoking-related problems can become persistent problems over time among adolescents. This finding suggests that individual smoking cessation support is the type of intervention needed to prevent addiction in adulthood. Furthermore, in this study, impaired cognitive abilities predicted reactive aggression at age 20. This finding may indicate that adolescents' cognitive resources do not contribute to modulating their aggressive behaviors. In fact, cognitive skills may make adolescents more vulnerable, as they likely have not yet developed an adequate social and cognitive structure that allows them to manage their emotional states adequately (e.g., Jenkins et al., 2017).

The results underscored that being female was correlated with elevated emotional problems at age 17 and sleeping difficulties at ages 17 and 20. It is plausible that, due to heightened sensitivity, females may be more susceptible to being overwhelmed by negative feelings and experiencing asthenia compared to boys (Aradilla-Herrero et al., 2014). Furthermore, girls, who typically ruminate more than boys, may be more prone to developing sleeping problems (van Geel et al., 2016). On the contrary, being male was associated with cultivating more close friendships than girls at ages 17 and 20. However, it was also linked to encountering smoking issues at age 17 and displaying reactive aggression at age 20 (e.g., Borowski & Rose, 2021). These findings about friendship may be due to differences in the ways males and females interpret closeness in friendship in adolescence and young adulthood. Females may attribute higher emotional intimacy to close friendship relationships than males, thus reporting a lower number of close friends. At the same time, being male can be associated with a higher risk of aggressive behavior (Björkqvist, 2018) because male adolescents may show less self-control than females and may be consequently more prone to socially deviant behavior (Sagar et al., 2011).

Cognitive ability was negatively correlated with sleeping difficulties at age 17 and with reactive aggression at age

20, suggesting a nuanced interplay between cognitive function and emotional regulation. Higher cognitive ability may potentially act as a protective factor, influencing the effective management of emotional states and reducing susceptibility to both sleep-related issues and reactive aggression during early adulthood. This underscores the importance of considering cognitive factors in understanding vulnerability and adaptive strategies associated with emotional well-being in this developmental context (Werner, 2000).

Finally, contrary to expectations (Manstead, 2018), the absence of a significant impact of social class on relational and emotional outcomes, as well as negative habits like smoking and sleep problems, may be attributed to the complex interplay of various factors. Individual differences in coping mechanisms, resilience, and access to support networks may supersede the influence of social class, highlighting the intricate nature of psychosocial determinants. Additionally, diverse pathways and coping strategies employed across different social strata could contribute to the observed variations in relational and behavioral outcomes, mitigating the direct association with social class.

Limitations

Despite the strengths of the current study, some limitations should be considered when interpreting the results: the use of self-report questionnaires is subjected to social desirability effects. Future studies could investigate the same research questions using peer nominations to get more accurate information on bullying victimization (Almeida et al., 2021). It is also possible that the effects of variables on outcomes are overestimated or underestimated. This risk is created through measurement decisions and contextual factors related to implementation, meaning that replicas of the same study with different measures, informants, and participants could achieve slightly different results. This is a different type of risk from modelling inaccuracy that generates a causal error. Another limitation regards measuring bullying victimization with a non-specific questionnaire but with the tool provided by Growing up in Ireland, and it not being measured at age 17 as well as other measures that are not present in the other waves of the survey and not measured all with the same questionnaires per construct. Indeed, the tool also has a limitation as it does not precisely align with the bullying victimization threshold proposed by Solberg and Olweus (2003). According to their criteria, aggressive acts are classified as bullying only if they occur at least two or three times per month.

In this line, the utilized threshold (occurring at least once in the past 3 months) might have encompassed a greater number of participants, leading to the hypothesis that individuals who experience bullying only once within a 3-month period could potentially face a reduced risk of negative outcomes compared to those subjected to bullying 2 or 3 times per month (Holt & Espelage, 2007).

Models generated using secondary data are always subject to the limitation of using available data, rather than being able to plan at the outset how variables will be measured. Having different measures, shorter or single measures is typical, because nationally representative longitudinal studies such as Growing Up in Ireland (e.g., Growing Up in Scotland and the Millennium Cohort Study) are generated to evaluate the highest number of factors for scientific and social-political purposes. The use of brief measures is often preferred over longer measures, to create the maximum possible value of the cohort study for policy and research stakeholders. When using secondary data analysis, researchers should evaluate these measurement limitations against the strengths of using large-scale, nationally representative data sets for identifying robust patterns of child functioning within populations. Future studies could also consider (where possible and available) information from double informants, so that some level of cross-tabulation could be conducted to verify consistency across different reporters.

Conclusions

The study emphasizes the potential long-term effects of bullying victimization extending into early adulthood and underscores the need for adolescent-focused interventions. These interventions should encompass a range of strategies, including anti-bullying measures, promotion of pro-social behavior, prevention of atypical behaviors, and effective emotion management within the school environment, aimed at disrupting dysfunctional conduct and preventing long-term emotional health consequences. Additionally, the study recommends further considerations for future policymaking and interventions to tackle the adverse psychosocial impacts of bullying victimization in Ireland. Schools, indeed, play a crucial role in shaping adolescents' peer relationships and readiness for adulthood, thus fostering resilience against developmental challenges and interrupting cycles of atypical behavior. Monitoring adolescents' mental health is essential for nurturing emotionally resilient adults. These findings hold significance not only for government agencies involved in education, children, and youth but also for health authorities. Practitioners should be attentive to the nuanced implications of bullying victimization and prioritize proactive interventions and comprehensive support systems to address the multifaceted challenges faced by adolescents transitioning into adulthood.

Author Contribution GDU structured and drafted the entire work in all its parts, including conducting the analysis. He is the coordinator of the research. JS contributed by providing new insights during the discussions and analysis. SCC contributed by providing new insights in the interpretation and, consequently, discussion of the results.

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Data Availability Data can be requested directly to Growing Up in Ireland team.

Declarations

Ethical Approval All procedures which involved human participants were performed by Growing Up in Ireland in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed Consent An informed consent was obtained for all participants by Growing Up in Ireland team.

Conflict of Interest The first author is a ME of IJBP.

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