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Childhood Risk and Protective Factors as Predictors of Adolescent Bullying Roles

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Abstract

This study shows longitudinal predictors of involvement in different bullying roles, including mental health, individual, family, peer and school predictors. The analyses were based on a longitudinal prospective study with 916 students followed up from ages 7 to 17 with 7 waves of data. Participants were selected through random sampling and were enrolled in 56 schools. Predictors were measured from ages 7 to 11 and involvement in bullying roles and trajectories from ages 11 to 17. Predictors of bullying perpetration were gender, substance use, truancy, ADHD, moral neutralization, self-control, parental monitoring, corporal punishment, liking school, and bonding with the teacher and classmates. Predictors of victimization were gender, substance use, truancy, internalizing problems, self-control, ADHD, bonding to classmates, and social activities. Predictors of bully/victims were gender, divorced parents, substance use, internalizing problems, ADHD, sensation seeking, moral neutralization, self-control, corporal punishment, parental monitoring, liking school, bonding to classmates, and social activities. Truancy was a risk factor for perpetration mostly in girls; low self-control was a risk factor for perpetration especially in boys. Truant children with high classmates bonding were at high risk of perpetration. Low parental monitoring was a risk factor for perpetration in children who did not like school. Low social activities with peers were a risk factor for victimization in boys and substance use was a risk factor for victimization especially in children with low self-control. High classmates bonding was protective against victimization in non-truant children and against being a bully/victim in children with high sensation seeking. Early interventions focused on risk and protective factors could possibly protect children from bullying.

Keywords Bullying · Longitudinal study · Childhood risk and protective factors

School bullying is a serious public health problem, defined as long-term, frequent, and intentionally harmful aggressive behavior among students. In bullying situations, perpetrators inflict harm on victims who find it difficult to defend themselves (Smith and Brain 2000). Different bullying roles such as victims, perpetrators, and bully/victims have been described. Victimization (being bullied) is related to long-term health issues such as psychosomatic problems (Gini and Pozzoli 2013; Gini et al. 2014b) and depression later in life (Averdijk et al. 2011; Sourander et al. 2016; Ttofi et al. 2011b). School bullies have a high probability of later offending (Ttofi et al. 2011a) and drug use (Ttofi et al. 2016). Consequences for bully/victims include suicidal thoughts, behavior, and weapon carrying (Zych et al. 2015). Also, involvement in any bullying role is related to suicidal thoughts and behavior (Holt et al. 2015), weapon carrying (Valdebenito et al. 2017), and other adult psychiatric outcomes (Copeland et al. 2013). Thus, understanding and reducing school bullying are urgently needed, and protecting

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children against bullying and its consequences is crucial for their health and well-being.

Bullying is an aggressive behavior that can occur in any age group. There are many studies focusing on bullying variations with age, mostly focused on its manifestations and prevalence rates. Nevertheless, to our knowledge, longitudinal studies focused on the age of onset have not been conducted yet. Although it is difficult to compare bullying rates among different age groups, longitudinal studies showed that bullying victimization rates generally decreased with age (Cross et al. 2015; Kim et al. 2009; Nasaescu et al., 2020; Schafer et al. 2005; Sourander et al. 2000; Swearer and Cary 2003). Perpetration seems to be rather constant if different studies are compared, although with inconsistent findings (Kim et al. 2009; Schafer et al. 2005; Swearer and Cary 2003; Zych et al. 2020).

Although the number of studies on bullying has increased greatly throughout the past decades, most of the research on this topic is cross-sectional and correlational (Zych et al. 2015), and there are only several longitudinal studies about bullying (Zych et al. 2020). Bullying is often analyzed from an ecological perspective (Espelage et al. 2013) that focuses on the interaction of a person with their environment, including different individual and social factors, family, peers, and school climate (Espelage 2014). Thus, bullying is not only an individual behavior but also a result of a dynamic interaction among different factors from an ecological perspective. A recent systematic review of meta-analyses showed that individual, peer, family, school, and community factors are all related to bullying perpetration, victimization, and being a bully/victim (Zych et al. 2019), but most of the studies are cross-sectional and do not make it possible to distinguish predictors from correlates. Moreover, studies usually focus on a few risk or protective factors only, and therefore, it is not possible to discover which factors are the most important and predict bullying after controlling for covariates.

Regarding individual factors, a systematic review and meta-analysis by Cook et al. (2010) found that internalizing and externalizing behaviors predicted bullying victimization and perpetration. Another meta-analysis discovered that drug use was related to both bullying victimization and perpetration (Valdebenito et al. 2015). Moral disengagement and impaired morality in general were found to be risk factors for bullying perpetration (Gini et al. 2014a; Romera et al. 2019). Attention deficit and hyperactivity were described as important longitudinal predictors of offending (Young et al. 2015), but research on the relation between ADHD and bullying is still in its early stages. A study with Italian adolescents found that ADHD was related to bullying perpetration in boys and victimization in girls (Bacchini et al. 2008). Unnever and Cornell (2003) studied more than 1300 US adolescents and found that bullying victimization was related to ADHD, and bullying perpetration

was related to low self-control. A study with Greek adolescents found that sensation seeking was related to bullying perpetration (Antoniadou et al. 2016).

Parental factors such as high parental involvement and good supervision were found to be related to less victimization and lower rates of being a bully/victim in a meta-analysis conducted by Lereya et al. (2013). A retrospective study with Japanese, South African, and US young people showed that physical child harm was related to bullying victimization, perpetration, and being a bully/victim (Dussich and Maekoya 2007). Family conflict and divorce are important predictors of antisocial behavior and offending (Farrington et al. 2015), but little is known about their relation to bullying.

Also, according to meta-analytic findings, low quality of peer relationships was found to be related to any bullying role (Cook et al. 2010). According to a systematic review of meta-analyses, prosociality was a protective factor against victimization, and peer status and support were protective against victimization, perpetration, and being a bully/victim (Zych et al. 2019). Nevertheless, a study with Spanish, Colombian, and Irish adolescents reported that victims scored high on prosociality and bullies scored high on social efficacy (Gomez-Ortiz et al. 2019). Thus, findings on peer relations and bullying are inconsistent.

Regarding school factors, a systematic review of meta-analyses showed that high academic performance was related to less bullying perpetration and victimization (Zych et al. 2019) and a study with a nationally representative sample of US adolescents found that bullying victimization was related to truancy (Gastic 2008). A positive school climate includes different dimensions related to teachers, peers, and school in general (Del Rey et al. 2017). Meta-analytic findings showed that a positive school climate was a protective factor against bullying perpetration, victimization, and being a bully/victim (Cook et al. 2010).

Thus, different meta-analyses and cross-sectional studies discovered individual, family, peer, and school factors related to different bullying roles. The ecological approach states that bullying is a result of a dynamic interaction among these factors. Nevertheless, given the cross-sectional designs of these studies, predictors cannot be distinguished from consequences or correlates. On the other hand, there are several prospective longitudinal studies that examined the early predictors of bullying. It was found that internalizing and externalizing problems predicted victimization over time (Brendgen et al. 2016; Reijntjes et al. 2010; Reijntjes et al. 2011). Children who were physically abused by their parents at age 12 tended to be bullied by peers at age 16 (Benedini et al. 2016). A twin study showed that internalizing and externalizing problems, low family support, and high child maltreatment predicted chronic peer victimization across primary and secondary school (Bowes et al. 2013). Impulsivity tended to predict bullying victimization and perpetration 1 year later (Fanti and Kimonis 2013), and low

commitment to school was related to bullying perpetration 2 years later (Hemphill et al. 2012), although this relation was no longer significant after controlling for other variables.

A longitudinal study over 7 years showed that adolescent victims tended to be unpopular and disliked in childhood, whereas bullies tended to be rather popular (Pouwels et al. 2017). All these studies shed light on longitudinal predictors of bullying, but most of them include only a few predictors in a few data waves. Nevertheless, violence should be considered from a comprehensive and multifactorial perspective (Eisner and Malti 2015). At the same time, it is necessary to study bullying from an ecological perspective (Espelage 2014). Thus, new studies are needed to discover long-term risk and protective factors and unique relations between these factors and bullying roles. Longitudinal studies including a broad range of childhood risk and protective factors for adolescent bullying can provide a global vision of the problem, making it possible to distinguish predictors from correlates, and consequences. Moreover, to our knowledge, longitudinal predictors taking into account different ages of onset of bullying have not been studied yet.

Thus, the present large-scale study focused on mental health, individual, family, peer, and school variables in childhood (ages 7 to 11) and their relation with different bullying roles in adolescence (ages 11 to 17). Unique associations between these predictors and involvement in bullying as victims, perpetrators, and bully/victims were tested, focusing on early onset, late onset, and persistent involvement in bullying.

Methods

Participants

This study was based on 916 participants at age 7 in 2004 followed up at ages 8, 9, 11, 13, 15, and 17. It is a part of z-proso project, a prospective longitudinal cohort study focused on life development (Ribeaud and Eisner 2010b). The initial target sample consisted of 1675 children who entered the school system in Zurich and whose 56 schools were randomly selected to participate in this study from 90 public schools in Zurich. At age 7, 1361 participated in the first survey wave. Parental consent was obtained in each stage of the study. At age 11, parental consent had to be renewed, which caused some attrition and reduced the sample to 1144 children. After eliminating participants with missing data (see Data Analysis for details), the final sample included 916 children. An analysis of non-response and attrition showed that the current data are relatively representative (Eisner 2019).

Among the participants, 50.0% were boys, and 89.5% were born in Switzerland. Participants had diverse religious, ethnic, and educational backgrounds, with parents born in 80 different countries including Switzerland (41.2%), former

Yugoslavia (13.4%), Sri Lanka (5.7%), Germany (5.3%), Portugal (4.7%), and Turkey (4.3%). Regarding the religious background, 25.2% identified as Roman Catholics, 24.2% as Protestants, 16.6% as Muslims, 7.3% as Christian Orthodox, 4.9% as Hindi, 1.4% of other denominations, and 20.4% identified no religious denomination.

Measures

Bullying perpetration and victimization were measured using the Zurich Brief Bullying Scales (Murray et al. 2019) where students were asked if they had been bullied or had bullied others in the past year (e.g., at school, on the way to school, when outside, at home, or on the Internet), including 4 items on victimization and 4 items on perpetration (social exclusion, verbal, physical, and destroying property) responded on a 6-point Likert scale that ranged from 1 (never) to 6 (almost every day). This questionnaire was responded at ages 11, 13, 15, and 17 and showed good reliability with Cronbach's alphas for victimization ranging from 0.69 to 0.77 and for perpetration from 0.68 to 0.78 in the current sample.

The Social Behavior Questionnaire (SBQ; Tremblay et al. 1991) was adapted to measure child self-reported non-aggressive externalizing behavior at ages 7, 8, and 9 (9 items on opposition, defiance, stealing, lying, vandalizing), internalizing problems at ages 7 and 9 (9 items on anxiety and depression), ADHD (8 items) administered at ages 7 and 9, and prosocial behavior (10 items on helping and empathy) at ages 7, 8, 9, and 11. This instrument was administered using a computer, where children were shown pictures with different behaviors and audio items. The items were responded on a yes/no scale. The questionnaire showed acceptable reliability (Cronbach's alphas ranging from 0.60 to 0.75).

Sensation seeking was measured using a cardboard "travel game" at age 7 (Alsaker et al. 2008). Children were told that they were going on a trip and were asked to move through the board, encountering different risky and non-risky situations. There were 9 items, and Cronbach's alpha was 0.68.

Moral neutralization of aggression (frequently labeled as moral disengagement) was measured using the Unified Moral Neutralization (Ribeaud and Eisner 2010a) paper survey at age 11 ($\alpha = 0.61$). The scale includes 16 items (e.g., it is fine to be mean if others misbehave; it is fine to fight to protect your rights) responded on a 4-point Likert scale ranging from 1 (fully untrue) to 4 (fully true).

Low self-control was measured with an instrument based on the Grasmick scale (Grasmick et al. 1993) at age 11 ($\alpha = 0.75$). This included 10 items (e.g., act without thinking, lose control quickly) responded on a 4-point Likert scale ranging from 1 (fully untrue) to 4 (fully true).

Supportive parenting (8 items, e.g., talk, help, play), monitoring (5 items, e.g., parents know where you are), and

corporal punishment (3 items, e.g., spank, slap) were based on the Alabama Parenting Questionnaire (Shelton et al. 1996) responded on a 4-point Likert scale ranging from 1 (never) to 4 (always) in a paper survey at age 11. Cronbach's alphas ranged from 0.54 to 0.66.

Truancy (last year) was measured at age 11 with one item (skipped school on purpose) and last year substance use was measured with three items including drinking alcohol, smoking cigarettes, and cannabis use. These items were responded on a yes/no scale.

Social activities with peers were measured through an Unstructured Leisure Scale administered at age 11. The scale used 8 items about activities with peers (e.g., shop with friends, meet with friends, play outside) responded on a 6-point Likert scale ranging from 1 (never) to 6 (every day). Cronbach's alpha was good ($\alpha = 0.79$).

School factors were measured at age 11 by three scales including three items each: liking school (e.g., enjoying going to school; $\alpha = 0.72$), bonding to the teacher (e.g., teacher helps me; $\alpha = 0.78$), and bonding to classmates (e.g., getting along with other kids, $\alpha = 0.77$).

In summary, the risk factors were internalizing and externalizing problems, ADHD, sensation seeking, moral neutralization, low self-control, parental corporal punishment, truancy, substance use, and divorced parents. The protective factors were prosocial behavior, supportive parenting, parental monitoring, social activities with peers, liking school, bonding to the teacher, and bonding to classmates. Although other variables were measured in the project, variables that measure the same or a similar construct as the outcome were not included in this article because it focuses on explanatory risk and protective factors (i.e., factors that measure a construct that is clearly different from the outcome). Most of these instruments are widely used in international research and show good psychometric properties (Ribeaud and Eisner 2010b).

Data Analyses

To classify participants on different bullying roles, items were dichotomized. As suggested by Solberg and Olweus (2003), students who reported no bullying or bullying only once or twice were considered uninvolved. Students who reported bullying three to 10 times a year or more were classified as involved. Participants with missing data on 2 or more of the 4 items at any wave were eliminated and the remaining participants with missing data ($n = 28$) had data imputed.

Bullying roles were formed through latent transition analysis with SAS 9.4 software Proc LTA macro, following the manual by Collins and Lanza (2010). A combination of different statistics (G^2, AIC, BIC, log-likelihood) was used to check how many bullying roles were in the data. Participants were grouped in bullying roles based on their probabilities of affirmative answers to items on bullying perpetration and victimization at each wave (ages 11, 13, 15, and 17) and probabilities of transitions among the bullying roles across these waves were calculated (See Zych et al. 2020 for more details).

After classifying the participants in the bullying roles through LTA, longitudinal patterns were obtained by recoding different combinations of involvement taking into account all the waves. Participants were considered uninvolved if they were not involved in bullying in any wave. Early-onset victims started to be victimized at age 11. Late-onset victims started to be victimized from age 13 onwards. Persistent victims were a subset of victims who were victimized in 3 or 4 waves. The same criteria were applied to perpetrators and bully/victims (perpetrators and victims at the same time). These categories were not mutually exclusive in a sense that the same participant could report being in one bullying role at one time point and a different role at other time points.

Given that most of the variables were not linearly related to bullying, risk and protective factors were dichotomized. This was done with a k-means cluster analysis procedure in PAWS Statistics software. This analysis classifies participants into low-score and high-score groups according to a heuristic algorithm. When a variable was measured only once (e.g., risk-taking measured at age 7), only one variable was clustered into low (0) and high (1). When a variable was measured in several waves (e.g., prosocial behavior was measured at ages 7, 8, 9, and 11), all the waves were entered so that participants were classified as low (0) versus high (1) considering all waves.

Logistic regression analyses with a forward stepwise procedure were performed with risk and protective factors at ages 7 to 11 as explanatory variables and bullying roles at ages 11 to 17 as outcome variables. This procedure enters significant predictors and stops when no more significant predictors are found. Given that hypotheses were directional, odds ratios (OR) with 90% confidence intervals (CI) were calculated. Listwise deletion of the missing data was used in the logistic regression analyses, with percentages of missing data ranging from 10.9 to 12.9%. Interactions between significant predictors were tested by entering both predictors and an interaction term. Interactions were tested with two-tailed significance tests and only for predictors with significant main effects.

Results

Latent transition analysis showed that the best fitting model classified participants into four roles: bullies, victims, bully/victims, and uninvolved students (two-group model log-likelihood = − 9926.38, $G^2 = 9602.04$, AIC = 9744.04, BIC = 10,086.26; three-group model: log-likelihood = − 9664.38, $G^2 = 9078.04$, AIC = 9310.04, BIC = 9869.16; four-group model: log-likelihood = − 9447.54; $G^2 = 8644.35$; AIC = 8978.35; BIC = 9783.29).

Regarding different roles, 65.7% of the participants reported being non-perpetrators, 15.5% were early-onset perpetrators, and 18.7% were late-onset perpetrators. Regarding victimization, 66.8% of the participants reported being non-victims, 13.8% early-onset victims, and 19.4% late-onset victims. Also, 82.7% of the participants reported not being bully/victims, 10% were early-onset bully/victims, and 7.3% were late-onset bully/victims. Regarding persistence, 25.3% of the participants reported perpetration at one or two time points, and 9% reported perpetration at three to four time points. Victimization at one or two time points was reported by 23.3% of the participants and victimization at three to four time points by 9.9%. Being a bully/victim at one to two time points was reported by 15.5% of the participants and being a bully/victim at three or four time points by 1.8%. These categories were not mutually exclusive and, overall, only 34.6% of the participants reported never having been involved in bullying (any time point, any role).

Logistic regression analyses showed that factors such as self-reported externalizing problems, self-reported prosocial behavior, and supportive parenting did not predict any bullying role. Significant predictors for different bullying roles are shown in Table 1.

Risk factors for bullying perpetration were male gender (late onset OR = 3.45, persistent OR = 3.10), substance use (early onset OR = 2.89, persistent OR = 3.06), truancy (persistent OR = 4.71), ADHD (late onset OR = 1.62), moral neutralization (early onset OR = 1.70, late onset OR = 1.97, persistent OR = 1.94), low self-control (early onset OR = 1.87, persistent OR = 2.40), and high corporal punishment (late onset OR = 2.13). Protective factors against perpetration were good parental monitoring (early onset OR = 0.45, persistent OR = 0.53), liking school (early onset OR = 0.55), bonding with the teacher (late onset OR = 0.32), and bonding with classmates (early onset OR = 0.38).

Risk factors for victimization were being a boy (late onset OR = 1.45), substance use (late onset OR = 2.46, persistent OR = 4.05), truancy (early onset OR = 3.71), internalizing problems (persistent OR = 1.56), low self-control (early onset OR = 1.70, persistent OR = 1.78), and ADHD (late onset OR = 1.71). Bonding to classmates was a protective factor against victimization (early onset OR = 0.21, late onset OR = 0.46, persistent OR = 0.31).

Risk factors for bully/victims were male gender (early onset OR = 10.56, late onset OR = 1.80, persistent all males), divorced parents (late onset OR = 2.46), substance use (early onset OR = 3.42, persistent OR = 5), internalizing problems (early onset OR = 2.43), ADHD (persistent OR = 4.12), sensation seeking (late onset OR = 1.95), moral neutralization (early onset OR = 2.44), low self-control (early onset OR = 3.14, persistent OR = 8.99), and corporal punishment (early onset OR = 4.60). Protective factors against being a bully/victim were parental monitoring (late onset OR = 0.54), liking

school (persistent OR = 0.10), bonding to classmates (early onset OR = 0.16, persistent OR = 0.15), and social activities with peers (early onset OR = 0.49).

Logistic regression analyses of interaction terms between each pair of significant predictors, entering each effect and the interaction term, showed seven significant interactions (see Fig. 1). Truancy was a risk factor for bullying perpetration mostly in girls ($B = 2.60$, $p = .03$), whereas low self-control was a risk factor for perpetration especially in boys ($B = 0.98$, $p = .01$). Truant children with high classmates bonding were at high risk of bullying perpetration ($B = 2.35$, $p = .02$). Low parental monitoring was a risk factor for perpetration more for children who did not like school than for children who did like school ($B = 0.92$, $p = .047$). For children who were not truant, high classmates bonding was a protective factor against victimization ($B = 2.06$, $p = .04$). High classmates bonding was a protective factor against being a bully/victim for children with high sensation seeking ($B = 1.68$, $p = .01$). Low social activities with peers were a risk factor for victimization in boys ($B = 0.99$, $p = .01$), and substance use was a risk factor for victimization especially in children with low self-control ($B = 1.87$, $p = .03$).

Discussion

Bullying is an aggressive behavior present in children and adolescents that has some very serious consequences. Teachers and schools make an effort to decrease bullying through anti-bullying programs (Farrington and Ttofi 2009). Also, physicians have an important role in identifying children at risk, counseling families, screening for comorbid disorders, and advocating for the prevention of bullying (Lyznicki et al. 2004). Bullying is a challenge in primary care (Klein et al. 2013) and was found to be among the top ten health concerns of parents of children ages 2 to 17 (Shetgiri et al. 2015). Thus, bullying is a very serious public health problem that needs to be addressed by schools, by different health care services, and the society in general.

Understanding, preventing, and intervening in bullying require knowledge about risk and protective factors. Although the number of studies on bullying has increased greatly in the past decades, comprehensive longitudinal research with several waves of data is rare. The present study is based on seven waves of data on 916 children followed up from ages 7 to 17. Several risk and protective factors were discovered, together with interaction effects that showed how protective factors can neutralize risk factors.

The present findings showed that some mental health problems increased the risk of involvement in bullying. Internalizing problems were a risk factor for persistent victimization and for early-onset bully/victims. ADHD was a risk factor for late-onset bullies and persistent bully/victims. Thus,

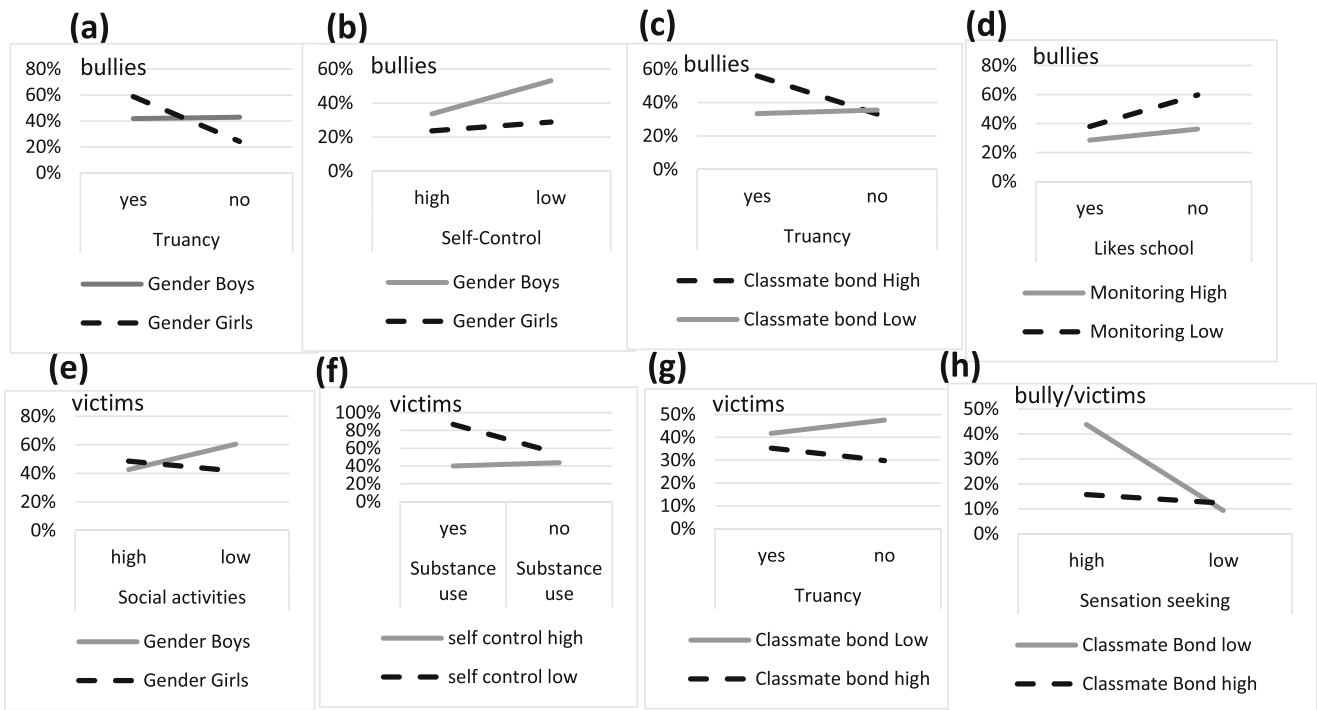**Table 1** Risk and protective factors for different bullying roles

	OR	90% CI		OR	90% CI		OR	90% CI		OR	90% CI	
	Bullies, $n = 253$			Early-onset bullies, $n = 115$			Late-onset bullies, $n = 143$			Persistent bullies, $n = 68$		
Gender (boys)	2.43	1.77	3.33	ns			3.45	2.35	5.06	3.10	1.83	5.23
Substance use	ns			2.89	1.32	6.32	ns			3.06	1.31	7.12
Truancy	2.31	1.01	5.31	ns			ns			4.71	1.69	13.11
ADHD	ns			ns			1.62	1.07	2.44	ns		
Moral neutralization	1.68	1.15	2.43	1.70	1.07	2.71	1.97	1.30	2.98	1.94	1.10	3.42
Low self-control	1.65	1.17	2.34	1.87	1.20	2.91	ns			2.40	1.37	4.21
Parental monitoring	0.53	0.36	0.77	0.45	0.28	0.71	ns			0.53	0.30	0.93
Corporal punishment	ns			ns			2.13	1.01	4.49	ns		
Liking school	ns			0.55	0.35	.87	ns			ns		
Teacher bonding	0.50	0.29	0.86	ns			0.32	0.18	0.59	ns		
Classmates bonding	0.47	0.29	0.75	0.38	0.21	0.66	ns			ns		
Nagelkerke R^2	.20			.22			.21			.28		
	Victims, $n = 254$			Early-onset victims, $n = 102$			Late-onset victims, $n = 152$			Persistent victims, $n = 72$		
Gender (boys)				ns			1.45	1.02	2.06			
Substance use	2.43	1.22	4.83	ns			2.46	1.17	5.14	4.05	1.67	9.79
Truancy	ns			3.71	1.44	9.55	ns			ns		
Internalizing problems	ns			ns			ns			1.56	.98	2.48
Low self-control	1.42	1.03	1.96	1.70	1.11	2.58	ns			1.78	1.09	2.91
ADHD	1.50	1.07	2.10	ns			1.71	1.17	2.49	ns		
Classmates bonding	0.32	0.21	0.50	0.21	0.13	0.34	0.46	0.28	0.76	0.31	0.17	0.56
Social activities	ns			ns			ns			0.53	0.30	0.94
Nagelkerke R^2	.09			.18			.07			.12		
	Bully/victims, $n = 127$			Early-onset BV, $n = 74$			Late-onset BV, $n = 53$			Persistent BV, $n = 15$		
Gender (boys)	4.05	2.61	6.27	10.56	5.14	21.70	1.80	1.05	3.11	All males		
Divorced parents	1.83	1.13	2.96	ns			2.46	1.39	4.35	ns		
Substance use	ns			3.42	1.34	8.74	ns			5	0.76	33.03
Internalizing problems	ns			2.43	1.32	4.46	ns			ns		
ADHD	2.04	1.31	3.18	ns			ns			4.12	1.01	16.89
Sensation seeking	ns			ns			1.95	1.07	3.55	ns		
Moral neutralization	1.69	1.05	2.73	2.44	1.31	4.56	ns			ns		
Low self-control	1.95	1.24	3.07	3.14	1.68	5.84	ns			8.99	2	40.63
Corporal punishment	2.61	1.24	5.48	4.60	1.87	11.30	ns			ns		
Parental monitoring	ns			ns			0.54	0.30	0.98	ns		
Liking school	ns			ns			ns			0.10	0.02	0.42
Classmates bonding	0.26	0.15	0.45	0.16	0.08	0.31	ns			0.15	0.03	0.67
Social activities	ns			0.49	0.26	0.93	ns			ns		
Nagelkerke R^2	.33			.50			.12			.67		

Note: Bullying roles were compared with that of uninvolved students ($n = 263$). *ns* non-significant, BV = Bully/victims

early detection and treatment of these mental health problems could potentially decrease bullying.

Individual factors, such as high moral neutralization and low self-control, increased the risk of involvement in different bullying roles. Low self-control predicted an early onset of victimization, perpetration, and being a bully/victim, and it was a risk factor for perpetration for boys more than for girls and a risk factor for victimization, especially for children who reported substance use. Thus, it could be desirable to address these risk and protective factors in anti-bullying programs that are conducted in schools around the world (Gaffney et al. 2019), preferably already in childhood. These factors are often included in social and emotional learning programs (Durlak et al. 2011), and therefore, it would be desirable to increase

Fig. 1 Significant interactions between risk and protective factors for different bullying roles. **a** $B = 2.60$, SE = 1.17, $p = .03$; **b** $B = 0.98$, SE = 0.36, $p = .01$; **c** $B = 2.35$, SE = 1.02, $p = .02$; **d** $B = 0.92$, SE = 0.47, $p = .047$; **e** $B = 0.99$, SE = 0.38, $p = .01$; **f** $B = 1.87$, SE = 0.86, $p = .03$; **g** $B = 2.06$, SE = 1.01, $p = .04$; **h** $B = 1.68$, SE = 0.65, $p = .01$

funding for research and practice focused on social and emotional learning and anti-bullying programs, so that they could be empirically validated and conducted in all schools.

Parental monitoring was found to be a protective factor against perpetration (early onset and persistent), whereas corporal punishment was a risk factor for late-onset perpetration and being an early-onset bully/victim. Having divorced parents was also a risk factor for being a late-onset bully/victim. For perpetration, high parental monitoring was especially protective for children who did not like school. These findings could be useful to improve parenting practice (Baldry and Farrington 2000; Gomez-Ortiz et al. 2014), by recommending good parental monitoring and decreasing corporal punishment.

Classmates bonding was found to be protective against involvement in different bullying roles including early-onset perpetration, any pattern of victimization, and early-onset and persistent bully/victims. Social activities with peers were protective against victimization, especially for boys. Thus, it is desirable to foster social competencies and social bonding, as also suggested by previous studies (Gómez-Ortiz et al. 2017; Ortega et al. 2004). In bully/victims, there was a significant interaction effect that showed that high bonding to classmates was especially protective in children with high sensation seeking. Truancy was a risk factor for perpetration for girls. The relation between truancy and bonding to classmates was especially interesting. High bonding to classmates in truant children was a risk factor for perpetration, possibly because antisocial children might show a high bonding to antisocial

classmates. High bonding to classmates was protective against victimization in non-truant children. These findings suggest targeting truancy and bonding to classmates within a comprehensive approach.

To our knowledge, this is the first study that included a great variety of early predictors of adolescent bullying, measured in childhood. Nevertheless, this study also has some limitations. Our analyses make it possible to discover predictors, but they do not allow establishing causal relations that could be studied in the future if within-individual changes in these predictors are compared with within-individual changes in bullying. Randomized controlled trials focused on decreasing some risk factors and promoting some protective factors could shed some light on the causes of bullying. Also, the current results were obtained with self-reports that can include some response bias such as social desirability, so other reports could also be useful to confirm the results. Thus, this research fills some gaps in knowledge and also opens up new horizons for future studies.

There are several early risk and protective factors that can be addressed in children to protect them from being involved in bullying in adolescence. Knowledge about these factors and interactions among them can be very useful for public health and school policy and practice. It can be used especially by teachers, primary care, and mental health professionals who can help to address mental health problems, individual factors, parenting practices, peer relationships, and school factors discovered in this study.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

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