

**The effect of parental stress on bullying and victimization in adolescence and the role of
self-control and gender as a moderator**



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Abstract

Bullying in adolescence is found to play an important role in the increase of suicidal attempts in the Netherlands. Multiple studies have found a positive association between parental stress and bullying/victimization. As far as known the current study is one of the first studies exploring the predictive relationship between parental stress and bullying/victimization over time. Also the influence of self-control and gender on this relationship is explored. It is expected that parental stress at age 11 predicts bullying and victimization at age 14. The effects are expected to be stronger for boys. Higher self-control is expected to weaken the relationship. Data of the longitudinal TRAILS study was used to test the hypotheses (N=2229; 50.7% female; $M_{age} = 11.1$ years). Hierarchical regression analyses revealed that experiencing parental stress at home at age 11 predicted a peer nomination as a bully at age 14. However, parental stress did not have an effect on victimization. Furthermore, self-control and gender did not influence the relationship. In conclusion, future research should carefully take the role of parenting into account when aiming to reduce bullying/victimization in schools.

Samenvatting

Pesten tijdens de adolescentie blijkt een grote rol te spelen in de toename van zelfmoordpogingen in Nederland. Meerdere studies hebben een positief verband gevonden tussen ouderlijke stress en pesten/gepest worden. Voor zover bekend is dit een van de eerste studies die het effect van ouderlijke stress op pesten/gepest worden over tijd onderzoekt. Ook wordt de invloed van zelf-controle en gender op deze relatie onderzocht. Er wordt verwacht dat ouderlijke stress op 11-jarige leeftijd pestgedrag/gepest kan voorspellen op 14-jarige leeftijd. Daarnaast wordt verwacht dat de effecten sterker zijn voor jongens. Hogere zelf-controle zou de relatie kunnen verzwakken. Data van de longitudinale TRAILS studie is gebruikt om de hypothesen te testen (N=2229; 50.7% vrouw; $M_{age} = 11.1$ jaar). Uit een hiërarchische regressie bleek dat het ervaren van ouderlijke stress thuis op 11-jarige leeftijd een nominatie als pester door leeftijdsgenoten voorspelde op 14-jarige leeftijd. Echter, ouderlijke stress had geen effect op gepest worden. Ook bleken zelf-controle en gender geen invloed te hebben op de relatie. Concluderend wordt aanbevolen dat toekomstig onderzoek zorgvuldig de rol van opvoeden in acht neemt wanneer er gepoogd wordt om pestgedrag te verminderen in scholen.

Introduction

Peers become increasingly important during the transition between childhood and adolescence, because of changes in the individual and social context. Adolescents spend more time with peers, often as a result of reduced oversight by adults (Brown & Larson, 2009). Moreover, during adolescence peers are used as primary sources for social comparison and appraisal (Prinstein & Aikins, 2004). Consequently, rejection of peers can have particularly during adolescence, a negative impact on development. Peer rejection in adolescence increases the risk for emotional maladjustment (Beeri & Lev-Wiesel, 2012). In the United States, approximately 20% of the adolescents experiences either bullying or victimization during high school (Li et al., 2020). In contrast, in the Netherlands there is a decreasing trend of adolescents' victims of bullying (De Looze et al., 2020). However, suicide attempts in the Netherlands have increased in 2019 among youth under 20 (Centraal Bureau voor de Statistiek, 2020), and bullying seems to play an important role to this problem in the Netherlands (Mérelle et al., 2020).

Bullying is defined as aggressive behavior characterized by repetition (e.g. a victim is targeted a number of times) and an imbalance of power (Smith & Brain, 2000). Olweus (1994) defined being victimized in school as a situation where adolescents are exposed - repeatedly and over time - to negative actions of one or more students. Bullying perpetration and victimization both positively influence truancy (Gastic, 2008; Zych et al., 2020) and negatively interfere with school performances and the psychological health of adolescents (Kowalski & Limber, 2013). Moreover, evidence suggests a positive relation between bullying victimization and substance use, poor general health, depression, and suicidal behaviors (Moore et al., 2017). Therefore, it is important to research possible determinants of this behavior.

Research suggests that family experiences have a major influence on bullying and victimization (Alizadeh Maralani et al., 2019; De Vries et al., 2018; Erel & Burman, 1995; Garaigordobil, & Machimbarrena, 2017; Georgiou & Fanti, 2010; Ladd, 1992; Leraya et al., 2013; Neece et al., 2012; Zhang et al., 2021). Before they enter secondary school, children's experiences in the family environment affect their capacity to adapt and cope at school, and impact their peer relationships (Ladd, 1992). Therefore, it is important to identify how parenting influences adolescent's victimization and bullying behavior.

A specific family factor that can increase adolescents' bullying and victimization behavior is parental stress (Alizadeh Maralani et al., 2019; Garaigordobil & Machimbarrena, 2017; Zhang et al., 2021). Parental stress has been defined as an adverse psychological

response to the demands of parenthood. It often is experienced when there is an imbalance between perceived parenting demands and the available resources that permit parents to succeed in the parenting role (Abidin, 2019). Previous research suggests a positive association between victimization and higher levels of family stress among early adolescents. Moreover, these studies also found higher stress in families of bullying adolescents (Garaigordobil & Machimbarrena, 2017; Zhang et al., 2021).

The general strain theory (GST; Agnew, 1992) offers an explanation for the relationship between parental stress and bullying/victimization. GST emphasizes that strainful circumstances, specifically having negative interactions with others, can pressure individuals into deviant behavior (Agnew, 1992) and bullying (Patchin & Hinduja, 2011). The GST specifically argues that problems in the parent-child relationship increase strain (Agnew, 2000). When problems in the parent-child relationship increase, parental influence over children's behavior tends to weaken (Agnew, 2007). Parental stress can lead to negative interaction styles between parent and child (Garcia et al., 2017) and as such could increase bullying and victimization among adolescents (Georgiou, & Stavrinides, 2013).

When looking at bullying, experiencing strain can increase feelings of anger and frustration in the adolescent. Deviant behavior may be a method to cope with these feelings of strain. Examples of coping with strain are seeking revenge or taking anger/frustration out on others (Agnew, 2000). In line with this reasoning, it is likely that bullying is the method adolescents adopt in order to take this anger out on others (Patchin & Hinduja, 2011). Therefore, it is hypothesized that parental stress predicts bullying in adolescents.

Next to this, this strain the adolescent experiences also increases the risk for victimization. The aggressive behavior they engage in, due to feelings of strain, makes them popular targets for bullying (Schwartz et al., 1993; Schwartz, 1997). Bullies feel rewarded by the overly reactive behavior of the victims. The anger and emotional distress victims express could therefore potentiate and sustain victimization by peers (Schwartz, 1997). Thus, it is hypothesized that parental stress predicts victimization in adolescents.

Studies have shown that low self-control has a direct negative relationship with bullying in particular (Cho, 2018; Chui & Chan, 2013; 2015; Moon & Alarid, 2015). Adolescents who have difficulties with self control tend to be more often bully or victim (e.g. Cho, 2018; Moon & Alarid, 2015; Schwartz, 1997). Moreover, longitudinal studies showed that low self-control predicts both bullying perpetration and victimization (Cho, 2018; Schreck et al., 2006).

Good self control skills can support adolescents in coping with negative interactions and strain as a consequence of parental stress. GST (Agnew, 1992) argues that the effects of strain (parental stress) on bullying/victimization can be affected by the adolescent's level of self-control (Agnew, 1992). An important domain of self-control is being able to control thoughts and emotions (Baumeister et al., 1994). Adolescents' high self-control could limit the harmful effects of parental stress in such a way that those with high self-control can deliberate on their situation and pursue a more constructive response than seeking revenge or taking anger/frustration on others (Agnew et al., 2002; Hay & Meldrum, 2010). Thus, it is hypothesized that the relationship between parental stress and bullying/victimization is weaker for adolescents high in self-control.

There is not much known on the moderating effects of gender on the relationship between parental stress and bullying/victimization. However, there is research on behavior problems in general. The relationship between parental stress and behavior problems appears to be stronger for boys (Barroso et al., 2018). Higher levels of parental stress are experienced more often for parents of boys (Vierhaus et al., 2013), possibly due to higher rates of externalizing behavior among boys (Williford et al., 2007). Furthermore, boys are more likely to express overt aggression, which can cause stress among parents (Smith et al., 2019). Possibly due to socially constructed gender roles (Álvarez-García et al., 2015; Atik & Güneri, 2013; Carrera-Fernández et al., 2013; Poteat et al., 2013; Tippett et al., 2013). Masculinity is more often associated with violence and aggression, whereas femininity is more often associated with being empathetic and helpful as part of their gender role (Gini & Pozzoli, 2006; Watson, 2007; Young & Sweeting, 2004). Violent and aggressive behavior may not only trigger feelings of stress in parents, but may also evoke victimization for boys. It is found that high rates of reactively aggressive behavior are associated with frequent victimization by peers (Schwartz et al., 1993). Reactive aggression may therefore lead to negative peer group attitudes (Coie et al., 1991), which can contribute to maltreatment by peers. In sum, it is expected that the relationship between parental stress and bullying/victimization is stronger for boys, compared to girls.

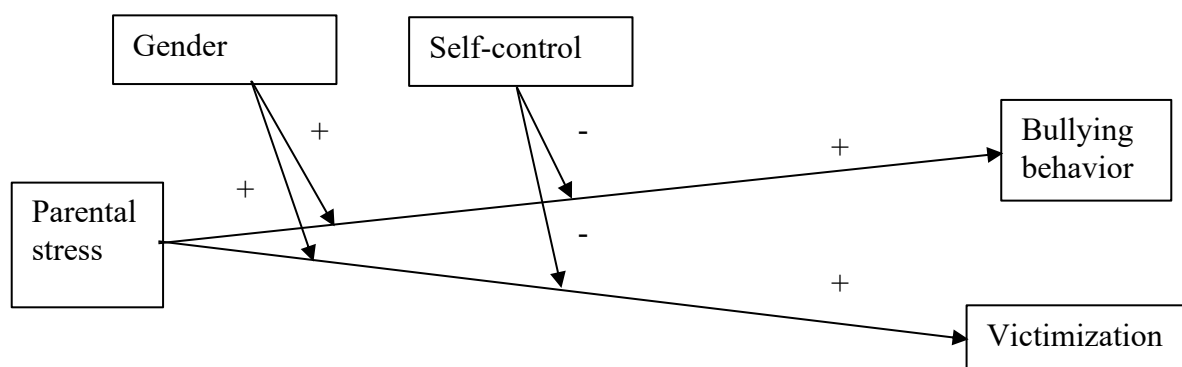
Current Study

Numerous studies have found that family experiences have an effect on bullying and victimization in adolescence (e.g. Alizadeh Maralani et al., 2019; De Vries et al., 2018; Erel & Burman, 1995; Zhang et al., 2021). The current study examines how parental stress contributes to bullying behavior and victimization. It is hypothesized that parental stress at age 11 is a positive predictor of both bullying behavior and victimization at age 14 (H1, H2).

Furthermore, it is predicted that self-control functions as a moderator, since studies have shown that adolescents with higher self-control are better able to cope with parental stress and associated strain and negative interactions (Agnew et al., 2002; Hay & Meldrum, 2010). Therefore, a weaker relationship between parental stress and bullying/victimization for adolescents with higher self-control is expected (H3, H4). Also, gender is predicted to be a moderator in this relationship. The association between parental stress and bullying/victimization behavior is expected to be stronger for boys than for girls (H5, H6), since there is evidence that higher levels of parental stress are experienced for parents of boys (Vierhaus et al., 2013). Lastly, ethnicity and socio-economic status (SES) are considered as control variables, because bullying and victimization behavior appears to differ between level of SES and different ethnicities (Knaappila et al., 2018; Tippett et al., 2013).

Figure 1

Research model with hypothesized relationships



Note. Gender is conceptualized with 0 = female and 1 = male.

Method

Participants

In this study, participants are part of a large longitudinal population study called Tracking Adolescents' Individual Lives Survey (TRAILS; De Winter et al., 2005; Veenstra et al., 2007). The study involves Dutch preadolescents who started participating in this research at the age of 11 and were assessed biennially until they reached 30 years old. The present study involves the first (T1) and second (T2) waves of TRAILS, with T1 starting between March 2001 and July 2002 and T2 in September 2003 until December 2004 (De Winter et al., 2005). Adolescents, living in the North of the Netherlands, were invited by addressing schools. Adolescents were invited via schools. When the schools agreed to participate,

parents/guardians received two brochures with information about TRAILS. Informed consent was obtained of all parents after the nature of the study had been fully explained (De Winter et al., 2005).

The current study includes 2229 participants at T1 (50.74% females) and 2148 participants at T2 (96.37%). The number of participants that filled in peer nominations at T2 is 1007 (51.74% females). This questionnaire is taken in a subsample, because peer nominations were only assessed in classrooms with at least 10 TRAILS-respondents. Furthermore, sociometric data was not collected for adolescents who repeated or skipped a grade and children in special education or in small schools. Victimization is measured by asking ‘By whom are you bullied?’ and bullying is measured by asking ‘Whom do you bully?’ in the questionnaire. There was no maximum of children that could be nominated in response to these questions, nor was it obligated to nominate anyone (Veenstra et al., 2007).

At baseline, mean age is $M = 11.11$; $SD = .56$ (50.74% females). At T2, mean age is $M = 13.57$; $SD = .53$ (50.93% females). Attrition analyses comparing adolescents who dropped out at T2 with adolescents who remained in the study do not significantly differ on self control, gender and parental stress. ($p > .05$). Significant differences are found on ethnicity and SES. Drop-outs are more likely to come from households with a lower SES ($t(2185) = 3.78, p < .01, \text{Cohen's } d = .71$), and are more likely to have a non-western ethnicity ($t(2227) = -4.44, p < .01, \text{Cohen's } d = .34$).

Most of the sample is Dutch (86.50%). The rest of the sample consists of .50% Turkish, .70% Moroccan, 2.10% Surinam, 1.70% Antillean, 1.70% Indonesian or Moluccan and 6.80% other participants. Most of the adolescents reported a middle SES (48.60%), 24.80% reported low SES and 25.20% a high SES.

Procedure

Trained interviewers visited the homes of one of the parents or guardians. The interview consisted of a wide range of topics, including the child’s somatic health, parental psychopathology and parenting skills. Also, the parents needed to fill out self-reports. The children were asked to fill out questionnaires at school within their classroom, under supervision of at least one TRAILS assistant. (De Winter et al., 2005).

Data on peer nominations were collected from TRAILS participants and their classmates in classrooms with at least three TRAILS participants (Dijkstra et al., 2009). The data was collected within classrooms during regular classroom sessions. The students received a nominations questionnaire with all the names of the participating classmates to collect sociometric data.

Instruments

Parental stress (T1)

This independent variable is measured via the Parental Stress Index (NOSI-K) based on the Parenting Stress Index (PSI) questionnaire of Abidin (1983). The questionnaire contains 24 items and includes questions such as: “Lately, I have been finding it difficult to take decisions about my child” and “My child seems more difficult to care for than most children”. Higher scores indicate higher parental stress. The NOSI-K shows good internal consistency (Cronbach $\alpha = .94$).

Bullying behavior and victimization (T2)

The dependent variables ‘bullying behavior’ and ‘victimization’ are measured via peer nominations. Adolescents were asked to nominate classmates who they thought were bully or victim. The nominations are divided by the total number of classmates. Scores are standardized within classrooms to account for classroom size differences. Scores range from 0 to 1 (Sentse et al., 2010). Peer nominations were measured at T1 and T2, and the data of T2 was used. More received nominations indicate that more classmates perceive you as a bully/victim.

Self-control (T1)

Self-control is measured with the Early Adolescent Temperament Questionnaire Revised (EATQ-R; Hartman, 2000; Putnam et al., 2001). The EATQ-R measures fear, shyness, aggression and effortful control. The subscale “Effortful control” is used to measure self-control. Effortful control is a combination of activation control, attention and inhibitory control. This questionnaire consists of 13 items and is measured by questions such as: ‘If someone tells me to stop, I can easily do that.’ Higher scores indicate higher self-control. The variable is based on self-reports of the adolescents. The EATQ-R has a good internal consistency (Cronbach $\alpha = 0.69$).

Control variables (T1)

SES is measured via income, occupational status and education of the parents. It is divided in three categories, with higher scores indicating higher SES. Ethnicity is measured by asking the participant’s origins: Dutch, Turkish, Moroccan, Surinamese, Antillean, Indonesian/Moluccan or other. Ethnicity is transformed into a dummy variable, in which 1 = *western* and 2 = *non-western*.

Analyses strategy

For the data-analysis, IBM SPSS Statistics 27 is used. First, descriptive analyses and Pearson and Spearman correlations are carried out to identify the characteristics of the

variables. Furthermore, the relationship between parental stress and victimization/bullying is evaluated using a hierarchical regression. To test the main relationship, parental stress is added as a predictor of bullying and victimization, while controlling for SES and gender. In the second step, the main effects of the interaction variables are analyzed, while controlling for SES. In the last step, the moderation effects for gender and self-control are analyzed in separate regressions, while controlling for the main effects of SES, self-control, gender and parental stress. The hierarchical regression is performed twice; once for bullying and once for victimization.

In order to perform a regression analysis, it is important to check whether the variables are normally distributed. The data for the (in)dependent variables and moderator are non-normally distributed (bullying: $W = .441, p < .001$; victimization: $W = .468, p < 0.001$; self-control: $W = .994, p < .001$; parental stress: $W = .850, p < .001$). However, the histogram of self-control shows otherwise. Also, scatterplots are made to check for linearity of the variables and no linear relationship is found. Lastly, outliers are checked using a Stem-and-Leaf plot. Again, the assumption is violated and outliers are found. However, because the sample is relatively big, these outliers are expected to not have a great influence on the results.

Results

Descriptives

First, in total 1007 adolescents participate in the peer nomination procedure, of which 24,0% is at least one time nominated as a bully ($M = .02; SD = .06$). 22,3% is at least one time nominated as a victim ($M = .02; SD = .06$). Mean scores and standard deviations of the other variables can be found in Table 1. When considering gender differences, girls tend to score significantly higher on self-control, compared to boys $t(2049) = 4.29, p < .01$. Boys score significantly higher on parental stress $t(2045) = -4.91, p < .01$, compared to girls. Also, boys score significantly higher on bullying $t(1005) = -7.28, p < .01$ and victimization $t(1005) = -4.01, p < .01$, compared to girls.

Table 1

Descriptive statistics of variables

	Total	Girls	Boys
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
SES (T1; lowest/highest)	25.3%/25.2%	23.2%/24.3%	27.4%/26.1%
Self-control (T1)	3.58 (.54)	3.63 (.53)	3.53 (.55)

Parental stress (T1)	1.79 (.78)	1.71 (.73)	1.87 (.82)
Bullying (T2)	.02 (.06)	.01 (.03)	.04 (.07)
Victimization (T2)	.02 (.06)	.02 (.04)	.03 (.07)

In order to check whether there is a relationship between parental stress and bullying/victimization, a Pearson correlation was performed. As expected, there was a positive relationship between parental stress and bullying behavior ($r(925) = .13, p < .01$). Parental stress and victimization also revealed a positive relationship, however it was not significant ($r(925) = .05, p = .11$).

The control variable SES was significantly negatively correlated with bullying ($r(988) = -.20, p < .01$), victimization ($r(988) = -.16, p < .01$) and parental stress ($r(2042) = -.07, p < .01$), indicating that having lower SES family background is associated with more parental stress and bullying/victimization nominations by peers. SES was positively correlated to self-control, indicating that adolescents with a higher SES family background had a higher self-control ($r(2008) = .08, p < .01$). Gender and ethnicity are nominal variables and therefore a Spearman correlation was used. As expected, gender had a positive relationship with parental stress ($R_s = .11, p < .01$), bullying behavior ($R_s = .26, p < .01$) and victimization ($R_s = .12, p < .01$), indicating that boys are more likely bully, be a victim and live in families where more parental stress is experienced at home. Ethnicity did not appear to have a relationship with any of the dependent variables tested in this thesis. Therefore, ethnicity was not added in the regression models.

Table 2

Pearson and Spearman correlations between study variables

	1.	2.	3.	4.	5.	6.	7.
1. Gender (T1)							
2. Ethnicity (T1)	-.01						
3. SES (T1)	-.02	-.14**					
4. Self-control (T1)	-.09**	.04	.08**				
5. Parental stress (T1)	.11**	-.01	-.07**	-.18**			
6. Bullying (T2)	.26**	.03	-.20**	-.08*	.13**		
7. Victimization (T2)	.12**	-.02	-.16**	.02	.05	.42**	

Note. Effect is significant at $**p < .01$ and $*p < .05$ (two-tailed). Spearman correlations are pointed out with bold.

Regression analysis for main effect of parental stress on bullying

Bullying

In line with H1, the main effect of parental stress on bullying, while controlling for SES, was significant, $B(.00) = .01, p < .01$. Also, SES had a direct negative effect on bullying, $B(.00) = .01, p < .01$, indicating that adolescents in families with lower SES were more likely to bully. Moreover, SES remained significant, when the main effect of parental stress was added, $B(.00) = .01, p < .01$. Then, the direct effects of the moderators self-control and gender were analyzed, and gender appeared to have a positive direct effect on bullying, $B(.00) = .02, p < .01$, meaning that boys were more likely to be a bully. No relationship between self-control and bullying was found. Next, the interaction variables were added in separate regressions. Gender appeared to be no significant moderator (rejection of H5). In the last model, the interaction variable of parental stress and self-control was added. Again, no significant moderation was found (rejection of H3).

Victimization

In contrast with H2, the effect of parental stress on victimization, while controlling for SES, was non-significant, $B(.00) = .00, p > .01$. However, a strong direct negative effect was found for SES, $B(.00) = -.01, p < .01$, indicating that adolescents in families with lower SES are more likely to be a victim. Moreover, SES remained significant, when the main effect of parental stress was added, $B(.00) = -.01, p < .01$. Then, the direct effects of the moderators self-control and gender were analyzed. Gender appeared to have a positive direct effect on victimization, $B(.00) = .01, p < .01$, meaning that boys are more likely to be a victim. No hypothesis was formed about this. No relationship between self-control and victimization was found. Next, the interaction variables were added in separate regressions. Gender appeared to be no significant moderator (rejection of H6). In the last model, the interaction variable of parental stress and self-control was added. Self-control appeared not to be a moderator (rejection of H4).

Table 3

Linear Regression Analysis on predicting bullying behavior by parental stress, including interaction by self-control and gender

	Model 1	Model 2	Model 3	Model 4	Model 5
	Bullying (T2) <i>B</i> (SE)	Bullying (T2) <i>B</i> (SE)	Bullying (T2) <i>B</i> (SE)	Bullying (T2) <i>B</i> (SE)	Bullying (T2) <i>B</i> (SE)
SES (T1)	-.01 (.00)**	-.01 (.00)**	-.01 (.00)**	-.01 (.00)**	-.01 (.00)**
Parental stress (T1)		.01 (.00)**	.01 (.0)**	.01 (.00)	.01 (.00)**
Gender (T1)			.02 (.00)**	.02 (.00)**	.02(.00)**
Self-control (T1)			-.00 (.00)	-.00 (.00)	-.00 (.00)
Parental stress x gender				.00 (.01)	
Parental stress x self-control					.01 (.01)
<i>R</i> ²	.04**	.05**	.10**	.10**	

Note. Effect is significant at ** $p < .01$ and * $p < .05$ (two-tailed). Both interaction variables were added separately in two different regressions in model 4.

Table 4

Linear Regression Analysis on predicting victimization by parental stress, including interaction by self-control and gender

	Model 1	Model 2	Model 3	Model 4	Model 5
	Victimization (T2) <i>B</i> (SE)	Victimization (T2) <i>B</i> (SE)	Victimization (T2) <i>B</i> (SE)	Victimization (T2) <i>B</i> (SE)	Victimization (T2) <i>B</i> (SE)
SES (T1)	-.01 (.00)**	-.01 (.00)**	-.01 (.00)**	-.01 (.00)**	-.01 (.00)**

Parental stress (T1)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
Gender (T1)		.01 (.00)**	.01 (.00)**	.01 (.00)**
Self-control (T1)		.01 (.00)	.01 (.00)	.01 (.00)
Parental stress x gender			-.00 (01)	
Parental stress x self-control				.01 (.01)
<i>R</i> ²	.02**	.02**	.04**	.04**

Note. Effect is significant at ** $p < .01$ and * $p < .05$ (two-tailed). Interaction variables were added separately in two regressions.

Discussion

The aim of the current study was to investigate the prospective relationship between parental stress at age 11 and bullying/victimization behavior at age 14 and the role of gender and self-control as moderators. Findings indicated that having parents who experience parental stress increased the likelihood of being nominated as a bully by peers. No relationship between parental stress and victimization was found. Unlike what was expected, no moderating effects for self-control and gender were found on the relationship between parental stress and bullying/victimization. Lastly, a strong SES effect was found, where having lower SES at age 11 makes it more likely to be nominated as a victim and bully at age 14.

In line with the first hypothesis, it was found that there is a predictive relationship between having parents at age 11 who experience parental stress and bullying behavior at age 14. This is in accordance with studies who found a relationship between parental stress and bullying (Alizadeh Maralani et al., 2019; Garaigordobil & Machimbarrena, 2017; Zhang et al., 2021). These studies only found associations by comparing parental stress of adolescents who were involved in bullying/victimization and non-involved adolescents. The current study adds a new perspective by revealing that parental stress can predict bullying over time. It should be noted however that a true direction of the effect can not be established as bullying/victimization was only assessed at T2. Baseline differences could already exist and parental stress could be increased as a response to bullying behavior of their child. Anyhow,

the current study is in line with prior work (De Vries et al., 2018; Lereya et al., 2013) illustrating that negative parenting behaviors can contribute to bullying behavior of the adolescent. The findings support the general strain theory (GST; Agnew, 1992), where it is explained that experiencing strain can increase feelings of anger and frustration in the adolescent. Bullying could therefore be a method adolescents adopt in order to take this anger out on others (Patchin & Hinduja, 2011). The current study supported this assumption by finding that experiencing parental stress at age 11 increased the likelihood of being nominated as a bully by peers at age 14.

In contrast, our second hypothesis, assuming that parental stress at age 11 predicts victimization at age 14, was rejected. This is not in line with previous studies who did find an association between parental stress and victimization among adolescents (Alizadeh Maralani et al., 2019; Garaigordobil & Machimbarrena, 2017; Zhang et al., 2021). Parental stress could still predict victimization, but it is possible that these victims were not visible in this sample and therefore not nominated. It has been found that parental stress is associated with social isolation of the adolescent (Östberg & Hagekull, 2013). According to GST (Agnew, 1992), some individuals may not only experience anger due to strain, but also anxiety. Adolescents experiencing anxiety may be more likely to engage in withdrawn behavior (Jang & Lyons, 2006), such as social isolation. In turn, these socially anxious adolescents are often less accepted by peers and chances of becoming victimized could be higher, because bullies generally choose adolescents who are less popular as victims (Veenstra et al., 2010). It is therefore possible that adolescents in the current study were experiencing victimization, however these socially anxious and isolating adolescents may not have been visible to peers and therefore not been nominated. Thus, future research could further investigate the prospective relationship between parental stress and victimization and whether this may be only the case for socially anxious adolescents.

The third and fourth hypothesis assumed that the effect of parental stress on bullying (H3) and victimization (H4) was weaker for adolescents with higher self-control. No support was found for these two hypotheses and this was in contrast with the general strain theory (Agnew, 1992). This theory argues that adolescents' high self-control could limit the harmful effects of parental stress in such a way that those with high self-control can deliberate on their situation and pursue a more constructive response (Agnew et al., 2002; Hay & Meldrum, 2010). The fact that the current study could not support this theory may be explained by the fact that self-control functioned as a mediator instead of a moderator. According to the general theory of crime (Gottfredson & Hirschi, 1990) it is more difficult to monitor and

punish in a consistent way when there is strain on parental resources of time and energy, in this case due to parental stress. This lack of correct punishment makes it less likely for adolescents to acquire higher self-control (Gottfredson & Hirschi, 1990; Hope et al., 2003). Therefore, it is likely that parental stress could result in adolescents' lower self-control, which in turn leads to bullying/victimization. Thus, it is recommended for future research to explore the mediating role of self control in the relationship between parental stress and bullying/victimization.

Unexpectedly, the fifth and sixth hypothesis which assumed that the effect of parental stress on bullying (H3) and victimization (H4) was stronger for boys, was rejected. This is in contrast with the findings of Borroso et al. (2018), who found that the relationship between parental stress and externalizing behavior among adolescents was stronger for boys. There are a few explanations for not finding the moderating effect of gender. First, Borroso et al. (2018) focused their study on a clinical group (e.g. adolescents with ADD and chronic illness), while the current study did not control for mental health of the adolescents nor included solely adolescents with a clinical diagnosis. Furthermore, although previous studies found a relationship between adolescent gender and parental stress (Georgiou & Fanti, 2010; Vierhaus et al., 2013) a gender moderation effect has not been found between parental stress and bullying/victimization (Georgiou & Fanti, 2010). It is possible that the effect of gender only becomes visible in more severe negative parenting behaviors. A stronger effect for girls or boys only seemed to be found in cases of coercive parenting, spanking, serious parent-child conflict and intrusive demandingness (Finnegan et al., 1998; Rigby, 1994; Turns & Sibley, 2018). Moreover, Finnegan et al. (1998) proposed that parenting behavior can impact boys and girls differently. For boys, the risk of victimization is higher when there is a threat of autonomy and for girls a reduced parent-child connectedness is a risk (Finnegan et al., 1998). Future research could therefore explore the effect of specific parental behaviors resulting from parental stress and whether the negative effect on bullying and victimization differs for boys and girls.

It is important to mention that a very strong direct effect of gender was found. Boys were more likely to be nominated as a bully and as a victim in all the models of the performed regression. This is line with the findings that boys are more likely to express overt aggression (Smith et al., 2019), possibly due to socially constructed gender roles (e.g. Álvarez-García et al., 2015; Atik & Güneri, 2013). Masculinity could be a reason for the fact that boys were more likely to engage in physical and verbal bullying (Neupane, 2014), instead of indirect bullying. It is assumable that physical and verbal bullying is much more

salient in class, which could be a reason why boys are more often nominated as a bully. Moreover, boys are also more frequently victimized in a direct or physical way (e.g. threatened, kicked, pushed; Bevans et al., 2013), which is easier noticeable in class. Thus, boys are possibly therefore more often nominated as victims by peers. Girls are more likely to engage in indirect bullying or are indirectly victimized (e.g. spreading rumours, being excluded; Neupane, 2014). This may not be noticed by school peers. It is therefore recommended for future research to explore the effect of gender in the relationship between parental stress and different types of bullying/victimization.

Strengths and limitations

The current study also had a few strengths and limitations. A strength of this study was that the impact of parenting characteristics was examined in a large population-based sample of preadolescent boys and girls. On the other hand, although the main relationship of this study was measured over time, conclusions about the direction of the effect need to be taken with caution. Bullying and victimization were only assessed at T2. There is a possibility that some of the participants did already bully and consequently affected parents by increasing their stress levels. Indeed, it is found that victimization can increase conflict with parents (which is associated with parental stress; Garcia et al., 2017), suggesting that an adolescent who is bullied at school can transfer these negative experiences to the home context and as a result negatively influence the parent-child relationship (Georgiou & Fanti, 2010). Lastly, all the necessary assumptions to perform the regression analyses, such as normality of the data, were violated. It is therefore important to critically reflect on the findings of the current study.

Conclusions and Implications

The current study gained more insight into the relationship between parental stress and bullying/victimization among adolescents, including the role of gender and self-control. Also, as far as known, this is one of the few studies that researched the relationship between parental stress and bullying/victimization over time, and considering the moderating role of gender.

The results revealed that having parents at age 11 who experience parental stress makes it more likely to be nominated as a bully at age 14. It is therefore important to take the role of parents into account in order to target bullying/victimization in school. Also, the timing of the intervention is of great influence. Apparently, inefficient parenting at a young age may underlie maladaptive behavior in adolescents, such as bullying or being victimized. It is therefore beneficial to already inform parents in primary school about the influences of

parental stress. Moreover, interventions could provide tools to reduce parental stress. As Bloomfield and Kendall (2012) found, increasing the parenting self-efficacy is proven to reduce parental stress. Having higher parental self-efficacy is related to experiencing greater confidence, which in turn reduces the stress. All in all, future research should carefully consider the influence of parenting when aiming to reduce bullying/victimization among adolescents in schools.

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