Students' Perception of Efforts by School Staff to Counteract Bullying and Its Association with Students' Psychosomatic Problems: an Ecological Approach

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Abstract
The purpose of this study was to investigate the association between students' perceptions of staff efforts to counteract bullying and students' self-reported psychosomatic problems. Using an ecological framework, the associations were investigated in the light of contextual factors related to the students' family, school, and peer group, as well as their personal characteristics. We used cross-sectional questionnaire data collected in 2009 and 2010 among 2 582 Swedish students aged between 13 and 15 years. Our main finding was that students' perception of efforts by school staff to counteract bullying is an important factor in relation to their self-reported psychosomatic problems. Multinomial logistic regression analysis showed that the odds of having a higher degree of psychosomatic problems compared to lower degree of psychosomatic problems were about 2.5 times higher among students who reported that school staff members do little to counteract bullying. Analysis of interaction effects revealed that the strength of the association between students' perception of staff efforts to counteract bullying and the students' psychosomatic problems was not affected by different types of bullying experienced, nor was the strength of the association modified by the students' personal characteristics or contextual situation. We conclude that social support from school staff is important in relation to students' self-reported psychosomatic problems, irrespective of the students' own experience of bullying. The results underline the importance of promoting a school climate and school culture that support staff members' opportunities, abilities, and willingness to prevent bullying.

Keywords Bullying · Bullying victimization · Anti-bullying interventions · Ecological framework · Psychosomatic problems · Adolescents

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Introduction

Peer victimization is a widespread and recognized social phenomenon among adolescents. It can take the form of psychological, physical or sexual aggression (see, e.g., Longobardi et al., 2017, 2019). Bullying is one form of peer victimization and usually includes three criteria: intent, repetition, and a power imbalance between the perpetrator(s) and the victim (Olweus, 1996). The reported prevalence of bullying will depend on which perspective is taken by researchers. This could relate to the prevalence of different forms, e.g. relational, verbal or physical (Ferrara et al., 2015), or roles, such as bully, victim, or combined bully-victim (Skrzypiec et al., 2018). Furthermore, prevalence rates differ in different countries (Chen & Elklit, 2018). Depending on these factors, the prevalence rate reported in different studies ranged from 3.6 to 69.9% (Chen & Elklit, 2018; Ferrara et al., 2015; Fuentes Chacón et al., 2019; Modecki et al., 2014; Skrzypiec et al., 2018). In addition, bullying can take different forms. Traditional bullying refers to bullying that occurs in the physical environment, while cyberbullying refers to bullying carried out using digital communication technologies, including the internet and mobile phones. Results from a meta-analytic review showed a mean prevalence rate of 35% for traditional bullying and indicated that traditional bullying was twice as common as cyberbullying (Modecki et al., 2014).

There is evidence of several negative social and health-related consequences associated with being a victim of bullying, such as substance use (Arcadepani et al., 2019), alcohol use (Maniglio, 2017), eating disorders (Kaltiala-Heino et al., 2000), body image disorder (Fabris et al., 2021), suicide attempts (Chen & Elklit, 2018), suicide (Gunn & Goldstein, 2017), social phobia (Pontillo et al., 2019), exposure to dating violence (Zych et al., 2021), and displaying violence later in life (Ttofi et al., 2012). Exposure to bullying may also have long-term effects on social functioning. Research reviews have shown that exposure to bullying was a major risk factor for forming lasting relationships, keeping a job and being economically independent (Rossi et al., 2012; Wolke & Lereya, 2015). Adolescents who are victims of bullying also run greater risks of school absenteeism, classroom misconduct, poorer academic performance, lack of motivation and interest in schoolwork, school dropout, and decreased college graduation (Kutsyuruba et al., 2015; Nikolaou, 2022; Okumu et al., 2020; Samara et al., 2021; Wright & Wachs, 2021). Other studies showed that bullying was associated with mental health problems in perpetrators as well as victims, both in younger children (e.g., Fekkes et al., 2004; Gini, 2008) and in adolescents (e.g., Due et al., 2005; Eyuboglu et al., 2021; Gini & Pozzoli, 2009). Some research proposed that the type of mental health problems differs among those who bully others, those who are victimized and bully-victims (e.g., Nansel et al., 2001), whereas others have suggested that various disorders are equally common among bullies and victims (Kaltiala-Heino et al., 2000). A meta-analysis of the association between involvement in bullying and psychosomatic complaints in the school-aged population (7–16 years old) showed that victims, bullies and bully-victims, all had a significantly higher risk of psychosomatic problems compared with peers with no

involvement in bullying (Gini & Pozzoli, 2009). There is also evidence that both bullies and victims suffer long-term adverse effects on mental health (Arseneault, 2017; Lund et al., 2008; Östberg et al., 2018). Furthermore, one study showed that being bullied by peers in childhood generally had more long-term adverse effects on young adults' mental health than child maltreatment by caregivers (Lereya et al., 2015).

In order to prevent bullying, it is important to increase current understanding about factors that are connected to bullying and how they affect young people's mental health problems. Person-in-environment models can be used to explain how different factors in the environment affect an individual, and vice versa. A well-known model of this kind is Bronfenbrenner's ecological model (Bronfenbrenner, 1994). It describes how interactions among personal characteristics, proximal processes, context, and time affect developmental outcomes. We find that it is well suited for analyses of factors related to bullying and its associations with psychosomatic problems in adolescents.

Counteracting Bullying in Schools

School is one context where bullying can be detected and combatted, and schools usually use both proactive and reactive strategies (Rigby, 2014).

Proactive Strategies: Anti-bullying Interventions

A meta-analysis showed that school anti-bullying interventions were effective in reducing bullying rates and in improving mental health problems in young people (Fraguas et al., 2021). School-based programs have been developed which adopt a whole-school approach, such as the Olweus anti-bullying program (Olweus & Limber, 2009). These programs include multiple components operating at different levels simultaneously. Teachers and other adults working in the school are groups that are usually involved in these anti-bullying initiatives..

Reactive Strategies: School Staff Responses to Bullying Incidents

Several factors influence the responses of teachers and other school staff to bullying incidents. One study found that teachers' moral orientation impacted the kinds of responses to bullying they chose; however, the results showed that the seriousness of the incident was more important (Ellis & Shute, 2007). The type of bullying may also influence the teachers' responses. Several studies have shown that teachers considered physical bullying to be more serious than verbal bullying, which, in turn, was considered more serious than social bullying (Bauman & Del Rio, 2006; Craig et al., 2000; Ellis & Shute, 2007; Williford et al., 2021). Social exclusion is a form of social bullying that can be covert, making it difficult for the teacher to detect it and intervene (Craig et al., 2000). Girls tend to engage in social bullying to a larger extent than boys, and Frånberg (2013) suggested that, since it is harder to detect,

this may not be receiving sufficient attention. Social support for the teacher from school administrators and responses from other teachers were also linked to teacher intervention in bullying incidents (Farley, 2018; Song et al., 2018). An American study (Bauman et al., 2008) investigated intervention strategies among 753 school staff and found that preference for various strategies differed by gender of the school staff, the presence or absence of school anti-bullying policies and programs, previous anti-bullying training and professional training (as school counsellors and teachers).

Students' Perception of School Staff Responses to Bullying Incidents

An Australian study found that 40% of students (mean age 14 years) believed that teachers were not usually interested in taking action to stop bullying (Rigby, 2003). The results also indicated that students who were more often involved in bullying situations, either as bullies or as victims, were more likely than others to rate the conflict resolution skills of teachers as low. In addition, bullies were particularly inclined to judge teachers as unfair in their behavior toward students. Another study (Pepler et al., 2009) showed that 85% of teachers reported that they intervened nearly always or often to stop bullying. In contrast, only 35% of students in that study reported that teachers intervened in bullying incidents. An American study of 15,185 students and 1547 teachers found that 60% of high school students and 67.3% of middle school students felt that their school was doing nothing to prevent bullying, and furthermore, 57% of high school students and 61.5% of middle school students reported believing that school staff made the situation worse when they intervened in bullying incidents (Bradshaw et al., 2007). The results showed that staff at all school levels underestimated the number of students involved in frequent bullying. Upon reporting actual bullying incidents to a member of staff at school, many middle school students (33.6%) and high school students (25.6%) perceived that the staff member did nothing to follow up the reported bullying.

Teachers' Perception of Their Responses to Bullying Incidents

In the survey by Bradshaw et al. (2007), very few staff members in school responded that they would ignore or do nothing when witnessing a bullying incident. Also, a large percentage of staff at all school levels reported that they would intervene in bullying incidents (Bradshaw et al., 2007). However, at times, bullying seems to be ignored or trivialized by teachers (Craig et al., 2000; Ellis & Shute, 2007). How well teachers succeed with their interventions is another question, and the answers from teachers may not match the answers from students. One study showed that students who asked teachers for help about being bullied reported only a moderate level of success in reducing the bullying, whereas a higher level of effectiveness was claimed by the teachers (Rigby, 2014). Espelage and Swearer Napolitano (2003) found that teachers' attitudes and actual behavior in relation to bullying was linked to the occurrence of bullying in schools. Similarly, a Swedish study showed that in

classes where a high proportion of students stated that staff intervene against bullying, fewer students reported having been bullied (Låftman et al., 2017).

Social Support from School Staff in Relation to Students' Mental Health

Several studies have investigated social support from teachers or other school staff in the context of young people's exposure to bullying and their mental health problems. Research showed that lack of social support from teachers and school staff is associated with adolescents' mental health problems, whether for victims of traditional bullying (Duru & Balkis, 2018; Noret et al., 2020) or cyberbullying (Noret et al., 2020). Other studies have investigated social support as a moderator or a mediator between exposure to bullying (both for traditional bullying and cyberbullying) and mental health problems among adolescents, with varying results (Davidson & Demaray, 2007; Hellfeldt et al., 2020; Huang et al., 2018; Ngo et al., 2021; Noret et al., 2020; Stadler et al., 2010). However, these studies used general questions regarding social support from school staff (for example, students' reports of how confident they are about confiding in school staff, whether they receive emotional, appraisal, instrumental or informational support, and their perceptions of teacher's trust, caring, and regard for adolescent perspectives). Few studies have included specific measures of students' perceptions of school staff responses to bullying situations as a type of social support and how this relates to students' mental health problems. One study investigated teachers' perceived self-efficacy in handling bullying and found that students (mean age 12.1 years) who were highly victimized by their peers experienced higher levels of anxiety, but only when their teacher reported lower levels of self-efficacy to handle bullying situations (Guimond et al., 2015). Furthermore, research has shown that among 9 to 12 year olds, the extent to which being bullied is associated with mental health problems partly depends on the children's perception of their teachers' response to bullying situations; however, the nature of these associations was different between girls and boys (Troop-Gordon & Quenette, 2010). For boys, being bullied was predictive of greater internalizing problems only when they perceived their teacher as encouraging victims to engage in independent coping and to respond to aggressive peers with avoidance or assertion. In comparison, although girls similarly evidenced greater internalizing problems when they viewed the teacher as using these strategies, no evidence was found of a buffering effect at low levels of perceiving the teacher as advocating avoidance, assertion, or independent coping. Another study, including children (mean age 9.25 years) found that the association between exposure to bullying and mental health problems was moderated by the teacher's response to bullying incidents, although these associations varied according to the extent of the bullying (Troop-Gordon et al., 2020). It has recently been pointed out that much more research is needed to deepen our understanding of teachers' handling of peer victimization (Erath & Troop-Gordon, 2021).

Summary and Purpose

Previous research has focused primarily on contextual and personal factors among school staff that affect their responses to bullying incidents, and on the discrepant perceptions of these responses between staff and students. To a lesser extent, studies have focused on the consequences of strategies among school staff to counteract bullying on students' mental health. Our aim was therefore to investigate the association between students' perceptions of efforts by school staff to counteract bullying and students' self-reported psychosomatic problems. Using an ecological framework, the associations were investigated in the light of contextual factors related to the family, school, and peer group, as well as the student's personal characteristics.

The Theoretical Framework Underpinning the Analysis Model

Bronfenbrenner's (bio)ecological systems theory (1986, 1994) is a central theory in human development. This theory is helpful to explain how social factors could lead to mental health problems. It is a theory that was revised and developed by Bronfenbrenner from the 1970s until his death in 2005 (Rosa & Tudge, 2013). In his earliest work, Bronfenbrenner underlined the social nature of human development by describing the importance of ecological contexts. He used the word *ecology* to represent the interplay between the environment and the individuals who are active within it. The change in terminology to *bioecology* was, according to Rosa and Tudge (2013), a strategy to make the importance of the person more explicit in its development.

The most mature form of the theory includes and centers on the concept of *proximal processes* and highlights the influence of personal characteristics on these processes (Bronfenbrenner & Evans, 2000; Rosa & Tudge, 2013; Tudge et al., 2009). This mature form of the theory can be tested using the process–person–context–time (PPCT) model. In order to apply Bronfenbrenner's most mature form of the theory, the study must include the concept of proximal processes and at least two of the other PPCT concepts (Tudge et al., 2009). In the present study, we included the PPCT concepts *process*, *person*, and *context*.

Proximal processes are defined as interactions and activities with important people, symbols and objects, which occur on a regular basis (Bronfenbrenner, 1994). Examples of proximal processes are mother–child engagement, step-parents' disciplinary techniques, educational interventions, and teacher–student relationships. The quality of these processes differs depending on personal characteristics and the spatial and temporal context (Bronfenbrenner & Evans, 2000). Since previous research showed that school staff did not intervene in bullying incidents in accordance with students' desires and needs, we identified students' perceptions of staff intervention in bullying as a proximal process. We proposed that students' perceptions of efforts by school staff to counteract bullying were associated with students' self-reported psychosomatic complaints.

Bronfenbrenner and Morris (2006) described three different personal characteristics: (1) *demand characteristics*, such as age, gender, skin color, and physical appearance; (2) *resource characteristics*, which are mental and emotional aspects, such as experience, skills and intelligence, and social and material resources; and (3) *force characteristics*, such as an individual's temperament, motivation and persistence. Personal characteristics can be either generative or disruptive for a person's development. In this study, we included two demand characteristics: sex of the student and school year as a proxy for age.

The context involves four interrelated systems: the microsystems, mesosystem, exosystem, and macrosystem (Bronfenbrenner, 1994). We included aspects connected to the microsystems, mesosystem and macrosystem.

Microsystems are social environments within which a majority of children's and adolescents' interactions take place. This is, according to Bronfenbrenner (1994), where proximal processes operate. Their ability to affect development depends on the nature and structure of the microsystem. In our study, we included aspects from the family, school and peer group systems. The proximal process operates in the microsystem of school. Previous research showed that many types of bullying were connected to young people's mental health (Hellström et al., 2017) and to teacher intervention in bullying (Bauman & Del Rio, 2006; Craig et al., 2000; Ellis & Shute, 2007). Hence, we investigated how different types of bullying affected students' psychosomatic problems, and whether students' perception of efforts by school staff to counteract bullying was modified by the type of bullying. Another aspect that is linked to the school microsystem is peer relationships. Peer relationships have been highlighted in a review by Hong and Espelage (2012) about factors relevant to bullying; they emphasized negative peer relationships and lack of peer support as significant risk factors for bullying behavior. Much research has been conducted in this area; therefore, we included friendships as a control variable in the analysis.

The mesosystem consists of interrelated microsystems, for example the relationship between home and school, that is, activities and interpersonal roles that occur across the settings of the developing person (Bronfenbrenner, 1994). As mentioned, we investigated whether the association between students' perceptions of efforts by school staff to counteract bullying (the proximal process) and the students' psychosomatic problems was modified by the type of bullying. Given that these school and peer microsystem factors might be influenced by family factors, we included family factors and students' personal characteristics as control variables in these models to account for the mesosystem. In the same way, we included school and peer group factors as control variables to investigate whether the association might be modified by the students' personal characteristics or family-related factors.

The macrosystem describes the all-encompassing pattern of the other systems and is fundamentally different from the other systems (Rosa & Tudge, 2013). It contains institutional systems of culture, such as economic, social, knowledge, legal, and political systems (Bronfenbrenner, 1994). This suggests that there tends to be similarities in experience between people who develop during the same time period, social context, or economic circumstances (Rosa & Tudge, 2013). The macrosystem operates and affects several of the aspects under investigation. Firstly, family residency can be linked to both the economic and social systems in so far as an

adolescent living with a single parent will have different economic circumstances and social life compared to adolescents living with both parents. Secondly, parental unemployment implies lost earnings, which in turn could lead to a decrease in both the quality and quantity of material resources (Mörk et al., 2014). According to Mörk and colleagues (2014), parents could also suffer from loss of status, stress, poor health, or conflicts between parents, which in turn could affect the home environment for the adolescent. Therefore, we included variables about family residency and parental unemployment as part of the macrosystem.

Methods

Material

Data were collected as part of a collaboration project between Karlstad municipality and the Centre for Research on Child and Adolescent Mental Health (CFBUPH) at Karlstad University, which was funded by the Swedish Public Health Institute. Data on social relationships, classroom climate, bullying and mental health were collected. The overall aim of the project was to promote good mental health among children and adolescents.

Data Collection

The data in the present study were collected in 2009 and 2010 among students aged between 13 and 15 years (Swedish school year 7 to 9) in all municipality-run schools in the municipality of Karlstad, Sweden. A research team at CFBUPH carried out the data collection. All students received both written and oral information about the aim of the study, stating that their participation was voluntary and that they had the right to withdraw their participation at any time. For children under the age of 15, written information was given to the parents, and those who did not want their child to participate were asked to notify the class teacher. Hence, informed consent was obtained from all individual participants included in the study. Eight out of nine compulsory schools participated in the data collection in 2009. Since the students could not be identified and linked together between academic years (in other words, a repeated measures design was not possible), retrieved data from 2009 was limited to the students in year 9 in the current study; this was to prevent the same individuals being included twice in the analysis. Table 1 shows the number of participants and non-participants.

The Analysis Model

Given the theoretical framework presented above, our analyses were guided by a model integrating contextual factors related to students' family, school, and peer group with the students' personal characteristics.

Table 1 Frequencies and proportions of participants and non-participants

	Number of students	Number of completed questionnaires	Non-participants, n (%)
Entire sample			
Total	2 973	2 582	391 (13.2)
Boys	1 466	1 250	216 (14.7)
Girls	1 506	1 328	178 (11.8)
School year[a] 7—2010			
Total	707	656	51 (7.2)
Boys	348	322	26 (7.5)
Girls	359	331	28 (7.8)
School year 8—2010			
Total	711	636	75 (10.5)
Boys	349	304	45 (12.9)
Girls	362	328	34 (9.4)
School year 9—2010			
Total	802	712	90 (11.2)
Boys	386	325	61 (15.8)
Girls	416	382	34 (8.2)
School year 9—2009[b]			
Total	753	578	175 (23.2)
Boys	383	297	65 (20.7)
Girls	370	282	73 (24.2)

[a]The Swedish school year 7 starts at 13 years, year 8 at 14 years, and year 9 at 15 years

[b]Retrieved data from 2009 was limited to the students in year 9 to prevent the same individuals being included twice in the analysis

Measures and Variable Construction

Psychosomatic Problems

The instrument used in this study was the Psychosomatic Problems Scale, which has been shown in previous research to be a reliable and valid scale for measuring psychosomatic problems in adolescents (Hagquist, 2008). It is an eight-item scale which consist of the following items: *Had difficulty in concentrating*, *Had difficulty sleeping*, *Suffered from headaches*, *Suffered from stomach aches*, *Felt tense*, *Had little appetite*, *Felt sad*, *Felt giddy*. All of these items are in the form of questions with the response options "Never," "Seldom," "Sometimes," "Often," and "Always," coded 1 to 5. A higher total score implies more psychosomatic problems. The psychometric properties of the scale were analyzed in the present study using Rasch measurement theory (Andrich, 1988; Rasch, 1960). The results indicated four items with differential item functioning (DIF) (Andrich & Hagquist, 2015) for gender, namely, *Had difficulty in concentrating*, *Had difficulty sleeping*, *Suffered from headaches*,

and *Felt sad*. When the sample size was adjusted to 10% of the original size, no DIF was statistically significant. Given that the data fit the Rasch model, linear person estimates are provided that do not depend on the distribution of the persons in the sample. These person estimates are nonlinearly transformed raw scores (logit values) (Andrich, 1988). Despite the DIF evidence, the person estimates generated by the Rasch analysis were used in the statistical analysis in the present study. The logit values ranged from -4.92 to 4.52. In order to make comparisons between distinct groups of students according to their degree of psychosomatic problems, the variable was trichotomized, based on percentile values. Students at or over the 75th percentile were assigned to the category "Higher degree of psychosomatic problems", students above the 25th but below the 75th percentile were assigned to the category "Moderate degree of psychosomatic problems" and students at or below the 25th percentile were assigned to the category "Lower degree of psychosomatic problems." Similar categorizations of psychosomatic problems have been used in previous studies (e.g., Carlerby et al., 2012; Hellström et al., 2017).

Efforts by School Staff to Counteract Bullying

Two questions were used to construct the variable of students' perception of efforts by school staff to counteract bullying. The first question was about reactive behavior: "When a student gets bullied in school, how often do teachers or other adults in school do something to stop it?", with the response options: "They hardly ever do anything," "Occasionally," "Sometimes," "Often," and "They nearly always do something." The second question was about proactive behavior: "In general, how much do you think your mentor/class teacher has done to tackle bullying in your class in the last few months?" with the response options "Little or nothing," "Not much," "A bit," "Quite a lot," and "A lot." The responses to these two questions were recoded into one variable with the following mutually exclusive categories: "The staff members do little to counteract bullying," "Some of the staff members do little to counteract bullying," and "The staff members do a lot to counteract bullying."

Types of Bullying

Frequency of being bullied was measured using a general question as well as specific questions about four different types of bullying: verbal, social, physical, and online. Following the definition of bullying as a repeated action (Olweus, 1996), the variables were dichotomized as "occasionally or never" and "two or more times per month."

Friendships

Friendship status was measured using the statement "I have one or more friends" with the response categories "Not true," "Somewhat true," and "Completely true." The variable was dichotomized as "Not or somewhat true" and "Completely true" and was used as a control variable throughout the analysis.

Sex and Age

Sex (boy or girl) and school year (7, 8, or 9) was included in the statistical analysis. School year was used as a proxy for age (13, 14, and 15 years).

Type of Family Residency

The family residency variable was constructed based on two questions concerning the family situation. The responses to these two questions were recoded into one variable with the following categories: Living with both parents, Living mostly with one parent (either mother or father), Alternating residency (joint or shared physical custody or residency, such as 1 week with one parent, the next with the other parent), and Living with one parent.

Parental Unemployment

Parental unemployment was reported by the students. The variable used in the analysis was whether one, both or neither of the parents were unemployed.

Statistical Analysis

The analyses were conducted using the software program SPSS, version 22. We used multinomial logistic regression in the analysis to examine the associations between students' perception of efforts by school staff to counteract bullying, different types of bullying and the dependent variable psychosomatic problems, focusing both on single main effects (Table 2) and a multivariate main effects model including all independent variables (Tables 3 and 4). For the dependent variable, the highest and lowest degree of psychosomatic problems were included, with the mid category omitted. Associations between the variables were presented in odds ratios (OR) with 95% confidence intervals. Analysis A in Table 3 describes students' perception of efforts by school staff to counteract bullying and its association with students' psychosomatic problems. Analyses B to F describe students' perception of efforts by school staff to counteract bullying and its association with the students' psychosomatic problems when one type of bullying is included in the model: analysis B includes general bullying, analysis C verbal bullying, analysis D social bullying, analysis E physical bullying, and analysis F online bullying. The variables sex, age, family residency, parental unemployment, and friendships were controlled for in all six models.

In order to investigate possible moderating effects of the different types of bullying on the association between students' perception of staff efforts to counteract bullying (SP-SECB) and psychosomatic problems, five different analyses with an interaction term were tested: SP-SECB by general bullying, SP-SECB by verbal bullying, SP-SECB by social bullying, SP-SECB by physical bullying,

Table 2 Frequencies and proportions of independent variables and bivariate logistic regression analysis of the higher versus lower degree of psychosomatic problems. The results for the mid-category are omitted

Independent variable		% (n)	Bivariate analysis OR (CI)
Students' perception of staff efforts to counteract bullying	The staff members do little to counteract bullying	49.2 (1134)	3.22*** (2.38–4.36)
	Some of the staff members do little to counteract bullying	26.3 (607)	1.63* (1.16–2.28)
	The staff members do a lot to counteract bullying	24.5 (564)	1
General bullying	Two or more times/month	12.0 (309)	5.38*** (3.62–7.99)
	Occasionally or never	88.0 (2261)	1
Verbal bullying	Two or more times/month	7.2 (178)	6.01*** (3.63–9.95)
	Occasionally or never	92.8 (2301)	1
Social bullying	Two or more times/month	8.0 (201)	11.40*** (6.36–20.44)
	Occasionally or never	92.0 (2303)	1
Physical bullying	Two or more times/month	4.7 (115)	4.72*** (2.55–8.71)
	Occasionally or never	95.3 (2349)	1
Online bullying	Two or more times/month	2.9 (73)	6.19*** (2.90–13.20)
	Occasionally or never	97.1 (2419)	1
One or more friends	Not or somewhat true	14.2 (356)	1.95*** (1.42–2.69)
	Completely true	85.8 (2150)	1

Table 2 (continued)

Independent variable		% (n)	Bivariate analysis OR (CI)
Sex	Girl	51.8 (1323)	6.61*** (5.18–8.45)
	Boy	48.2 (1233)	1
Age	15	50.0 (1284)	2.88*** (2.18–3.81)
	14	24.5 (629)	1.40* (1.01–1.93)
	13	25.6 (657)	1
Family residency	With one parent	16.6 (415)	3.62*** (2.64–4.95)
	Mostly with one parent	6.5 (163)	1.75* (1.07–2.86)
	Alternating residency	12.2 (306)	1.49* (1.04–2.15)
	With both parents	64.7 (1623)	1
Parental unemployment	One or both parents	12.3 (281)	2.46*** (1.71–3.53)
	Neither parent	87.7 (2005)	1

OR odds ratio, *CI* confidence interval

*p < 0.05, **p < 0.01, ***p < 0.001

Table 3 Multinomial logistic regression of a higher versus lower degree of psychosomatic problems in relation to type of bullying experienced. The results for the mid-category are omitted

	Analysis A OR (CI)	Analysis B OR (CI)	Analysis C OR (CI)	Analysis D OR (CI)	Analysis E OR (CI)	Analysis F OR (CI)
Students' perception of staff efforts to counteract bullying						
The staff members do little to counteract bullying	2.69*** (1.87–3.87)	2.56*** (1.77–3.70)	2.57*** (1.78–3.73)	2.46*** (1.70–3.56)	2.51*** (1.74–3.63)	2.67*** (1.84–3.87)
Some of the staff members do little to counteract bullying	1.57* (1.05–2.34)	1.57* (1.05–2.37)	1.58* (1.05–2.38)	1.54* (1.02–2.31)	1.52* (1.01–2.90)	1.62* (1.08–2.44)
The staff members do a lot to counteract bullying	1	1	1	1	1	1
Type of bullying experienced						
General						
Two or more times/month	-	6.48*** (3.72–11.27)	-	-	-	-
Occasionally or never	-	1	-	-	-	-
Verbal						
Two or more times/month	-	-	6.90*** (3.22–14.78)	-	-	-
Occasionally or never	-	-	1	-	-	-
Social						
Two or more times/month	-	-	-	9.32*** (4.40–19.72)	-	-
Occasionally or never	-	-	-	1	-	-
Physical						
Two or more times/month	-	-	-	-	8.18*** (3.35–19.97)	-
Occasionally or never	-	-	-	-	1	-
Online						
Two or more times/month	-	-	-	-	-	6.10** (2.02–18.45)
Occasionally or never	-	-	-	-	-	1
Model fitting criteria						
− 2 log likelihood (df)	870.46*** (20)	1059.39*** (22)	975.89*** (22)	988.96*** (22)	937.03*** (22)	903.68*** (22)

Table 3 (continued)

		Analysis A OR (CI)	Analysis B OR (CI)	Analysis C OR (CI)	Analysis D OR (CI)	Analysis E OR (CI)	Analysis F OR (CI)
Goodness of fit	Chi-squared value for deviance (df)	387.84 (386)	561.26 (548)	477.95 (498)	503.96 (504)	455.36 (462)	427.90 (432)

The variables sex, age, family residency, parental unemployment, and friendships were controlled for in all analyses

OR odds ratio, *CI* confidence interval

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

Table 4 Multinomial logistic regression of a higher versus lower degree of psychosomatic problems in relation to personal characteristics and contextual factors. The results for the mid-category are omitted

	Analysis A OR (CI)	Analysis B OR (CI)	Analysis C OR (CI)	Analysis D OR (CI)	Analysis E OR (CI)
Students' perception of staff efforts to counteract bullying					
The staff members do little to counteract bullying	2.94*** (2.16–4.01)	3.02*** (2.17–4.20)	2.61*** (1.87–3.65)	2.61*** (1.85–3.68)	2.56*** (1.77–3.70)
Some of the staff members do little to counteract bullying	1.58* (1.12–2.23)	1.63** (1.13–2.35)	1.51* (1.04–2.20)	1.59* (1.08–2.33)	1.57* (1.05–2.37)
The staff members do a lot to counteract bullying	1	1	1	1	1
Sex					
Girl	-	8.71*** (6.56–11.56)	9.10*** (6.82–12.14)	9.49*** (7.05–12.76)	10.61*** (7.73–14.56)
Boy	-	1	1	1	1
Age					
15	-	-	3.26*** (2.33–4.54)	3.11*** (2.21–4.37)	3.39*** (2.36–4.87)
14	-	-	1.51* (1.04–2.20)	1.44 (0.98–2.11)	1.59* (1.07–2.38)
13	-	-	1	1	1
Family residency					
With one parent	-	-	-	2.93*** (2.02–4.26)	2.44*** (1.65–3.61)
Mostly with one parent	-	-	-	1.98* (1.14–3.46)	1.74 (0.98–3.10)
Alternating residency	-	-	-	1.54 (1.00–2.37)	1.41 (0.90–2.24)
With both parents	-	-	-	1	1
Parental unemployment					
One or both parents	-	-	-	-	2.20** (1.38–3.51)
Neither parent	-	-	-	-	1
Model fitting criteria					
−2 log likelihood (df)	113.13*** (8)	194.69*** (10)	431.74*** (14)	903.24*** (20)	1059.39*** (22)

Table 4 (continued)

		Analysis A OR (CI)	Analysis B OR (CI)	Analysis C OR (CI)	Analysis D OR (CI)	Analysis E OR (CI)
Goodness of fit	Chi-squared value for deviance (df)	9.78 (14)	31.26 (36)	121.51 (124)	401.47 (382)	561.26 (548)

The variables friendships and general bullying were controlled for in all models

OR odds ratio, *CI* confidence interval

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

and SP-SECB by online bullying, also controlling for sex, age, family residency, parental unemployment, and friendships.

In order to investigate whether students' perception of staff efforts to counteract bullying and students' psychosomatic problems were modified by their personal characteristics and contextual factors, four different analyses with an interaction term were tested: SP-SECB by sex, SP-SECB by age, SP-SECB by family residency, and SP-SECB by parental unemployment. The variables friendships and general bullying were controlled for; hence, no specific measure of bullying was included in these analyses. The interactions were analyzed using log likelihood ratio tests, contrasting each main-effects model with each of the models with an interaction term, as listed above.

Results

Table 2 presents descriptive statistics and bivariate multinomial logistic regression analysis for the independent variables concerning students' perception of staff efforts to counteract bullying, type of bullying, personal characteristics and contextual factors, and the dependent variable, psychosomatic problems. The largest proportion of students being bullied two times or more per month was captured with the general bullying question (12.0%). Looking at the specific types of bullying, social bullying was the most common form reported (8.0%). The analysis also showed that almost half of the students (49.2%) reported that school staff members do little to tackle bullying. Table 2 also shows that all personal characteristics and contextual factors from school, family and peer group were associated with psychosomatic problems. The largest odds ratios in the bivariate analysis were associated with three of the specific types of bullying—social, online, and verbal—and with being a girl (OR between 6.0 and 11.4).

Table 3 presents the results from the multinomial logistic regression analysis investigating the associations between students' perceptions of staff efforts to counteract bullying, the type of bullying experienced, and the dependent variable, psychosomatic problems. The results showed that the odds ratio for students' perception of staff efforts to counteract bullying had about the same strength in relation to students' psychosomatic problems, regardless of what type of bullying the students had experienced, controlling for sex, age, family residency, parental unemployment, and friendships. The odds of having a higher degree of psychosomatic problems compared to a lower degree of psychosomatic problems were about 2.5 times higher among students who reported that the school staff do little to counteract bullying. Furthermore, the odds ratio for students' perception of staff efforts to counteract bullying is about the same regardless of whether the models are controlled for bullying or not (analysis A versus analysis B to F).

The interaction analysis (not shown in Table 3) revealed that the strength of the association between students' perception of staff efforts to counteract bullying and students' psychosomatic problems was not moderated by different types of bullying experienced, controlling for all the other independent variables.

Table 4 presents the multinomial logistic regression analysis investigating the associations between students' perception of staff efforts to counteract bullying, personal characteristics and contextual factors, and the dependent variable, students' psychosomatic problems. The analysis showed that the odds ratio for students' perception of staff efforts to counteract bullying decreases by about 0.4 between models A and E; hence, students' personal characteristics and contextual situation had little influence on the association, controlling for friendships and general bullying.

Moreover, the interaction analysis (not shown in Table 4) indicated that the association between students' perception of staff efforts to counteract bullying and the students' self-reported psychosomatic problems is not moderated by the students' demand characteristics and contextual factors, controlling for friendships and general bullying.

Discussion

The purpose of this study was to investigate the association between students' perceptions of efforts by school staff to counteract bullying and students' self-reported psychosomatic problems. Relying on an ecological framework, the associations were investigated in the light of contextual factors related to students' family, school and peer group and the students' personal characteristics.

The bivariate analysis showed that factors related to demand characteristics and the microsystems of family, school and peer group all related to the variable of interest, students' psychosomatic problems. We hypothesized that students' perception of staff efforts to counteract bullying is a proximal process associated with students' psychosomatic problems, and our results confirmed this. Previous studies have shown that social support from teachers and school staff moderates the association between being bullied and adolescents' mental health problems (Duru & Balkis, 2018; Noret et al., 2020). However, these studies have not addressed social support specifically targeting bullying.

In addition, we hypothesized that the association between the proximal process of students' perception of staff efforts to counteract bullying and students' self-reported psychosomatic problems might be moderated by students' demand characteristics and contextual circumstances. However, we did not find any evidence to support this hypothesis. Based on Bronfenbrenner's theory, we expected that family residency and parental unemployment are contextual factors (on the macro level) that would moderate the association between the proximal process and the students' self-reported psychosomatic problems. Based on previous research (Bauman & Del Rio, 2006; Craig et al., 2000; Ellis & Shute, 2007), we also expected that the type of bullying might influence school staff responses, and that boys and girls are different types of bullying, as a consequence receiving different attention in bullying situations (Frånberg, 2013). However, according to our results, the association between students' perception of staff efforts to counteract bullying and students' psychosomatic problems was not moderated by different types of bullying (general, verbal, social, physical, or online), nor by students' personal characteristics (sex and age).

Furthermore, the odds ratio for students' perception of staff efforts to counteract bullying is about the same regardless of whether bullying was controlled for in the analysis or not. This implies that social support from school staff is important in relation to students' self-reported psychosomatic problems, irrespective of the students' exposure to bullying. Almost half of the students (49.2%) in the study reported that the school staff do little to counteract bullying, and this is in line with previous research (Bradshaw et al., 2007; Pepler et al., 2009; Rigby, 2003). The discrepancy showed by previous research (e.g., Pepler et al., 2009) about the difference between school staff and student perceptions of staff efforts to counteract bullying might be explained by the fact that school staff work to counteract bullying in ways that the students do not notice or consider to be related to counteracting bullying. In terms of students' well-being, it is important that all school staff members are involved in counteracting bullying in school. The results from this study show that the odds that students have a higher degree of psychosomatic problems is greater for those who perceive that the school staff do little compared to those who feel that all school staff do a lot to counteract bullying.

Based on findings in previous research about different professionals' views and strategies for dealing with bullying (Bauman et al., 2008), one could argue that it would have been better to differentiate the two questions about students' perceptions of efforts by school staff to counteract bullying (the reactive "When a student gets bullied in school, how often do teachers or other adults in school do something to stop it?" and the proactive "In general, how much do you think your mentor/class teacher has done to tackle bullying in your class in the last few months?") It is possible that the students included the mentor and/or class teacher when answering the first question about "teachers and other adults." Moreover, the two questions could be interpreted as capturing somewhat different aspects of the school's efforts: resolving ongoing bullying incidents and carrying out preventive work. Hence, we found it more appropriate to combine the two questions.

Limitations and Future Research Directions

One theoretical limitation of the study is that the aspect of time is not included in the ecological model due to the cross-sectional nature of the data. Time and timing is something that can be connected to both constancy and change within all the aspects of the PPCT model (Rosa & Tudge, 2013). Thus, we could not study the development of students' psychosomatic problems over time, nor how, for example, a change in family residency might influence the phenomena under investigation. Several aspects could be conceptualized in different ways in Bronfenbrenner's ecological model. If one could include the aspect of time in the model, family residency could be considered as part of time in the PPCT model, for example, moving from living with both parents to living with a single parent, and how that would impact the relation between the student's perception of staff efforts to counteract bullying in school and psychosomatic problems. Future research should adopt a longitudinal design in order to include the aspect of time in different ways. Furthermore, we did not include any aspects related to the exosystem, in part due to lack of data.

Nevertheless, Bronfenbrenner ([1986]) has argued in some of his studies that parental unemployment is part of the exosystem—two interrelated systems, one of which does not include the developing person—that is, the relationship between family and the parents' workplace. However, we opted for considering parental unemployment and family residency as factors connected to the macrosystem, since the macrosystem contains institutional systems of culture, such as economic, social, knowledge-related, legal and political systems (Bronfenbrenner, [1994]), and there tend to be similarities in experience between people who develop in the same time period, social context, or economic circumstances (Rosa & Tudge, [2013]).

In addition, the cross-sectional nature of the data does not enable causal inferences; nor is it possible to empirically determine the directions of associations between the variables under investigation. While we model our variables hypothesizing a specific direction, it could be that psychosomatic problems affect students' perception of staff efforts to counteract bullying.

Given the complexity of Bronfenbrenner's theory, and of human development, it is difficult to empirically investigate all potentially relevant influential factors. Our analyses might have benefited from controlling for individual and contextual factors concerning the school staff. An obvious risk, though, is to apply an overfitted model (Babyak, [2004]), a condition where a statistical model begins to describe the random error in the data rather than the relationships between variables. As previous research has shown, there are many individual and contextual factors that may influence efforts by school staff to counteract bullying (Bauman & Del Rio, [2006]; Bauman et al., [2008]; Craig et al., [2000]; Ellis & Shute, [2007]; Espelage & Swearer Napolitano, [2003]; Farley, [2018]; Låftman et al., [2017]; Song et al., [2018]). However, our main purpose was to elaborate previous research by adding the perspective of adolescents.

The data collection took place in 2009 and 2010; hence, the associations between the variables under investigation could vary if examined using more recent data. Furthermore, social media and smartphone use were not as common in society then as they are today. For example, WhatsApp was launched in 2009, Instagram in October 2010 and Snapchat not until 2011. Nonetheless, the different means of cyberbullying described in the survey can be considered as contemporary (e.g., online bullying by text messages, chat rooms, or Messenger). Future research could replicate our investigation using contemporary data. For many adolescents today, social interactions and social life take place on the internet due to being constantly online via smartphones (Espelage & Hong, [2017]). Hence, their digital social life could be considered as another important microsystem in adolescents' lives, which may affect their development, and could be explored further in future research.

Conclusions

Our study adds to previous research by demonstrating that students' perception of efforts by school staff to counteract bullying is an important factor in relation to their self-reported psychosomatic problems. In the current study, students' sex, age, parental unemployment and family residency did not moderate the association

between their perception of staff efforts to counteract bullying and their psychosomatic problems. Nor did being victimized through different types of bullying. In other words, the proximal process affected psychosomatic problems, but the proximal process was not influenced by the students' own experiences of being bullied, personal characteristics or contextual circumstances. This implies that all students stand to benefit from staff efforts to counteract bullying, when it comes to their mental health. Hence, it is important to promote a school climate and school culture that support staff members' opportunities, abilities, and willingness to prevent bullying.

Data Availability The data that support the findings of this study are available from the corresponding author upon request.

Declarations

Ethics Approval The principles guiding the data collection were reviewed by the ethical committee at Karlstad University and no objections were raised. The procedures used in this study adhere to the tenets of the Declaration of Helsinki.

Consent to Participate Informed consent was obtained from all individual participants included in the study.

Conflict of Interest The authors declare no competing interests.

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