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Bullied, anxious and skipping school? the interplay of school bullying, school anxiety and school absenteeism considering gender and grade level

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Introduction: The topics of bullying, school anxiety and school absenteeism are of steady interest for the scientific community in recent decades. However, it seems surprising that investigations into the combination of these constructs are rare, especially considering their interconnectedness. Due to the lack of joint investigation of these factors, it is hardly possible to compare results of these related, yet distinct factors across other studies, let alone the predictive power of specific factors. The goal of the current study is to investigate how bullying, school anxiety and school absenteeism are related, considering the variables gender and grade level.

Methods: For this purpose, $N = 195$ secondary school children in the 7th–9th grades in northern Germany were surveyed *via* self-report questionnaires and additionally collecting their school records. We present complex descriptive analyses with scales and subscales of bullying, anxiety and absenteeism. Further, a structural equation modelling (SEM) approach is utilized to discover the interconnectedness of the constructs.

Results: On the one hand, the descriptive statistics show significant gender and grade level differences regarding bullying and anxiety. On the other hand, the SEM reveals that high values on the bullying victim scale are accompanied by significantly higher school displeasure (anxiety). School displeasure—as well as high bullying offender values—are associated with significantly more days of absence from school.

Discussion: We discuss how school environment improvement through specific interventions such as the cognitive-behavioral approach, could aid to ameliorate this issue.

KEYWORDS

bullying, anxiety, secondary school, gender differences, structural equation modelling, school absenteeism, grade level differences

1. Introduction

Wherever people meet, bullying can occur. Accordingly, bullying can be described for different contexts, for example in familial contexts (bullying between siblings), in children's residential care homes, or in workplaces (Monks et al., 2009). Out of these contexts, the school context is particularly important for children and adolescents, since this is the place where they spend a significant part of the day. School bullying can lead to serious psychological

consequences (Bond et al., 2001; Craig and Pepler, 2003; Aalsma and Brown, 2008), and can be seen as a relevant risk factor for school absenteeism and school dropout (Gubbels et al., 2019). For this reason, it is particularly important to gain essential knowledge from research to be able to prevent the phenomenon.

According to this, numerous studies about bullying, related emotional problems (e.g., anxiety) and absenteeism, considering gender and age have been conducted (Olweus, 1997; Richards and Hadwin, 2011; Ingul and Nordahl, 2013; Modecki et al., 2014; Gubbels et al., 2019; Olweus et al., 2019). The majority of these studies focuses on the three aspects separately or within bivariate analyses, while investigations involving their combination remain rare. It is thus the goal of this study to investigate how school bullying, school anxiety and absenteeism may be connected in the context of gender and grade level, by using descriptive analyses and a structural equation modelling approach. The results of such analyses could reveal relevant information for future investigations and interventions for practitioners, decision makers in school, and for the young people themselves.

1.1. Theoretical background

1.1.1. Bullying

Much research on bullying has been conducted in recent years and decades as being the victim of bullying can be seen as a relatively common adolescent experience (Aalsma and Brown, 2008). Although this field of research is of great interest, it still lacks a unified definition (Aalsma and Brown, 2008). Definitions of bullying diverge and encompass various aspects of it, such as types of bullying behavior (e.g., online and offline, physical and verbal, direct and indirect), which can occur not only separately but also in combination (e.g., the concurrent occurrence of physical and verbal bullying; Olweus, 1997). One mainly used definition of bullying is the description as a type of interpersonal behavior identified by negative physical and/or verbal actions that are typically classified by three main attributes: hostile intent, repetition, and power imbalance (Olweus, 1997; Olweus et al., 2019; Stewart-Tufescu et al., 2021). Accordingly, bullying can be seen as the systematic abuse of power that is characterized by repeated psychological or physical aggression with the intention to cause distress to another person (Scott et al., 2016). To put this in concrete terms, bullying/victimization is the repeatedly and over time exposure of a student to negative actions on the part of one or more other students (Olweus, 1997).

Opportunities for bullying have increased—particularly in the context of social media, which can penetrate all areas of life and gain a persistent presence in people's lives—and thus leading to long-term emotional and social problems for young people (Stewart-Tufescu et al., 2021). Consequently, cyberbullying in particular becomes an increasingly significant topic in research in recent years (Modecki et al., 2014; Pichel et al., 2021). Even though school bullying is much more prevalent than cyberbullying (Pichel et al., 2021), it is still

important not to abandon cyberbullying. As school bullying and cyberbullying are highly correlated with each other and are part of the same construct (Modecki et al., 2014; Pichel et al., 2021), it does not seem to be very beneficial to consider these two separately. For this reason, both school bullying and cyberbullying are integrated into the elaborations of the theoretical background.

Furthermore, there are other differentiations of bullying in research. For example, in some studies, a distinction is also made between pure perpetrators (pure bullies) or pure victims and, on the other side, aggressive victims, the so-called bully-victims (Olweus, 1997; Yang and Salmivalli, 2013). The bully-victims show significantly more physical and verbal bullying as well as more direct cyberbullying than pure bullies (Yang and Salmivalli, 2013). Moreover, traditionally, researchers often differentiate between direct (hitting, kicking or calling names) and indirect (spreading rumors, manipulating or excluding) bullying (Yang and Salmivalli, 2013).

Gender seems to play a relevant role in the context of school bullying (and cyberbullying as well), but the findings regarding gender are inconsistent (Walrave and Heirman, 2011): Some studies have shown that teenage girls are just as likely to (cyber-)bully or being (cyber-)bullied as boys (Ybarra and Mitchell, 2004; Raskauskas and Stoltz, 2007; Williams and Guerra, 2007; Patchin and Hinduja, 2008; Slonje and Smith, 2008); another study, a large-scale survey in the United Kingdom of 120,115 15-year-old adolescents, revealed that girls are more often victims of cyberbullying, emotional and psychological bullying, while boys more often become victims of physical bullying (Health and Social Care Information Centre, 2015). Moreover, more boys are found to be perpetrators (Li, 2006). Stewart-Tufescu et al. (2021) offer a succinct summary by stating that the association between victimization tends to have larger effects among girls, but victimization experiences are still detrimental for boys even if effects are not as large as the effects for girls. Furthermore, there are indications from qualitative research that physical, direct bullying among girls is usually expressed covertly (e.g., by pulling hair), and may not always be noticed by the teacher (Schlesier and Vierbuchen, 2022). Boys, in turn, tend to show aggressive behavior through fights or scuffles (Schlesier and Vierbuchen, 2022).

Age is also important to consider, as children younger than 13 report more bullying than those over the age of 15 (Markkanen et al., 2021). However, there is also no clear consensus on the link between age and bullying (Walrave and Heirman, 2011): some studies find (cyber-)bullying to peak in lower secondary school (Slonje and Smith, 2008), while other studies show higher values of (cyber-)bullying in higher grades of secondary school as in lower secondary school (Ybarra and Mitchell, 2004), or report no significant differences in the frequency of bullying in connection to age or grade level (Smith et al., 2002; Patchin and Hinduja, 2008).

The studies cited show many insufficiencies concerning the understanding of school bullying, both in terms of consistency of the results as well as the relatedness with other factors, anxiety and absenteeism together in one study. It seems highly necessary to investigate the association of bullying with potential predictors including grade and gender, their outcome variables and possible interconnections.

1.1.2. Anxiety

School anxiety among students has many facets including manifest anxiety, test anxiety, or social desirability and school displeasure (Wieczerkowski et al., 2016). From these, test anxiety is

Abbreviations: AIC, Akaike information criterion; BIC, Bayesian information criterion; CFI, Comparative fit index; CILL, Confidence interval, lower limit; CIUL, Confidence interval, upper limit; df, Degrees of freedom; M, Mean; ML, Full information maximum likelihood; N/n, Sample size; RMSEA, Root-mean-square-error of approximation; RQ, Research question; SD, Standard deviation; SRMR, Standardized root mean square individual; TLI, Tucker-Lewis-Index.

the emotion that has been researched the most in the past years (Bodas et al., 2008; Aydın, 2017). Test anxiety—an achievement emotion experienced in performance contexts (Pekrun and Stephens, 2010; Pekrun et al., 2017)—is a multidimensional construct and can be defined as a set of cognitive, physiological, and behavioral responses that is related to concerns about possible failure or a poor performance on a test or a similar evaluative situation (Spielberger and Vagg, 1995; Bodas et al., 2008; Putwain et al., 2013; Lohbeck et al., 2016; Putwain and von der Embse, 2021). Studies in the field of test anxiety have yielded consistent results on gender indicating that girls are more affected by test anxiety than boys (Steinhausen et al., 2008; Aydın, 2017; Raknes et al., 2017). The same significant differences between girls and boys were found in studies on subject-specific test anxiety in mathematics, which is established as a separate research area within the field of test anxiety (Lichtenfeld et al., 2012; Lazarides and Buchholz, 2019; Murphy et al., 2019). However, studies provided divergent results on age differences: For example, Aydın (2017) found that primary school students show higher scores in test anxiety than middle school students; Raknes et al. (2017) found that anxiety in adolescence is more prevalent in higher age groups.

Social desirability and school displeasure can also be considered as part of school anxiety (Wieczerkowski et al., 2016). However, in recent decades, little research has been conducted on these two subdomains in the context of schools. Studies can rarely be found that include students' school displeasure for the grades 7–9; the focus is rather on the positive-valence counterpart—school pleasure (Hempel-Jorgensen et al., 2018; Reedy and De Carvalho, 2021). With regard to social desirability, strong intercorrelations with test anxiety are found, especially in the elementary school setting (Striberg, 1974).

Overall, some unfavorable correlations with anxiety have been known for some time, such as withdrawal in the classroom, disorders, or even suicide ideation (Lahaderne and Jackson, 1970; Miotto and Preti, 2008). Hence, it is very important to contribute research on anxiety that may lead to more information about the geneses and links of anxiety to subsequently generate possibilities to disrupt unfavorable processes. However, connections have not yet been sufficiently investigated; there are only few indications so far. There is, for example, evidence of a significant link between anxiety, absenteeism and bullying, which shows that anxious students who still attend school regularly experience more bullying at school than anxious students who stay away from school (Ingul and Nordahl, 2013); anxiety is furthermore a relevant risk factor for school absenteeism (Richards and Hadwin, 2011; Ingul and Nordahl, 2013). It is also already known that anxiety levels decrease from age 13 to 16, but truancy rates increase during the same age band (Steinhausen et al., 2008).

Due to the existence and prevalence of bullying victims who have become bullies themselves (Dulmus et al., 2006), it would be reasonable to assume that anxiety and bullying are related reciprocally. But—contrary to this assumption—it was demonstrated that experiences of victimization predict emotional problems such as anxiety in adolescents (Craig and Pepler, 2003). Bond et al. (2001) also stated that victimization predicts the onset of emotional problems like experiencing more anxiety. These findings suggest, all in all, that victimization (unidirectionally) leads to anxiety. Nevertheless, further studies are needed to examine this relationship, taking into account other variables to gain a deeper insight into the field.

1.1.3. Absenteeism

The issue of not attending school is a commonly recognized problem all over the world, since truancy has been linked to serious immediate and far-reaching consequences for youth, families, and schools and communities (Maynard et al., 2012). Thus, leading researchers, practitioners, and policy makers to try to understand and to address the problem (Maynard et al., 2012); but even the terminology is not entirely clear yet: The terms *truancy* (associated with externalizing problems), *school refusal* (associated with internalizing problems), and the broader term *school absenteeism* (staying away from school regardless of the reasons) are often used interchangeably and—even when strictly categorized—the categories show considerable overlap (Egger et al., 2003). School refusal implies problems attending school and often results in substantial absence from school, combined with a high level of distress (Heyne and Sauter, 2013). Truancy is more associated with externalizing behavior problems (Maynard et al., 2015). Kearney pointed out three dimensions for absenteeism: attention-seeking, negative reinforcement tangible reinforcement factors.

The consideration of all absent days without taking the reasons into account (absenteeism) goes hand in hand with the disadvantage that it is not clear whether the children/adolescents are absent through no fault of their own (i.e., due to illness or family commitments, etc.), or because they are truanting. However, both excused and unexcused absenteeism are usually associated with an increase in emotional and behavioral problems, relying on the intensity of absenteeism rather than its category (Lenzen et al., 2013). Thus, it seems reasonable to subsume both categories of absenteeism when addressing absence from school and problems in socio-emotional development.

The systematic review by Gubbels et al. (2019) shows that anxiety and being bullied—among many other factors—are relevant risk factors for absenteeism. Risk factors for school absenteeism can be ascribed to certain levels, for example to the individual, family, peer, school and community levels (Ingul et al., 2012). These are complexly interrelated and are often described in terms of their push and pull effect (Stearns and Glennie, 2006; Baier, 2016). Pull factors are aspects that 'pull' students out of school because they are apparently considered to be more interesting or relevant than school attendance (Stearns and Glennie, 2006). Push factors are factors that arise in school, such as the school climate, the relationship between students, or student-teacher relationships (Stearns and Glennie, 2006). In unfavorable forms, these factors could 'push' the student out of school and ultimately lead to them dropping out of school entirely (Doll et al., 2013).

In terms of gender, there does not seem to be a consistent picture of school absenteeism. There are no significant gender differences for 1–4 and more than 5 unexcused absences; rather, the type of school seems to be relevant here (Lenzen et al., 2013). Ingul et al. (2012) identified risk factors at the individual level that are powerfully associated with school absenteeism, such as social anxiety, separation anxiety, generalized anxiety, and panic/somatic problems and externalizing problems (Veenstra et al., 2010; Ingul et al., 2012).

1.2. Study aims and research questions

The relationships between bullying, school anxiety and absenteeism/truancy are well researched, but mainly in bivariate

constellations or in terms of risk factors for one of the three variables without considering the interconnectedness of these variables (Bond et al., 2001; Gubbels et al., 2019). Although it can be clearly assumed that social desirability and school displeasure as sub-dimensions of school anxiety play a significant role when considering bullying and school absenteeism together, both have so far been mostly neglected in research. In addition, there are already hints that these three variables develop particularly unfavorably during the middle school years (Ybarra and Mitchell, 2004; Pekrun et al., 2017; Raknes et al., 2017; Pichel et al., 2021). For these reasons, the present study aims to investigate the relationships between school anxiety, school bullying and school absenteeism in grades 7–9. Since school bullying is more prevalent than cyberbullying (Pichel et al., 2021), the focus will be only on school bullying in our analyses. The following research questions (RQ) are addressed:

- RQ1: To what extent do the (sub-)scales of school bullying, school anxiety and school absenteeism are related to each other?
- RQ2: Do the (sub-)scales of school bullying, school anxiety and school absenteeism show group differences regarding grade level and gender?
- RQ3: How is school bullying (victimization and offending) connected to school absenteeism and school anxiety (social desirability and school displeasure), considering grade level and gender?

In the current study, we investigate the interconnectedness of school absenteeism with push factors as bullying that is a problem that arises predominantly in school. On the basis of previous research on correlation between school anxiety and bullying (Bond et al., 2001; Craig and Pepler, 2003; Stewart-Tufescu et al., 2021) and school anxiety and absenteeism (Steinhausen et al., 2008; Richards and Hadwin, 2011; Ingul and Nordahl, 2013), it can be expected that there are significant intercorrelations between the three variables school anxiety, bullying, absenteeism (Ingul and Nordahl, 2013; Gubbels et al., 2019). Furthermore, the divergent findings on gender and age differences in bullying could be guided in one direction with this study. Also, these can be expanded to include direct and indirect bullying in grades 7–9. Additionally, anticipated outcomes might be that being bullied and anxious are risk factors for school absenteeism (Gubbels et al., 2019); high levels of anxiety are expected to be correlated with high rates of school absenteeism (Richards and Hadwin, 2011); and anxious students with regular school attendance behavior report more bullying than anxious students with school absenteeism (Ingul and Nordahl, 2013).

2. Methods

2.1. Study design

In a cross-sectional design, data on bullying, school anxiety and school absenteeism were collected via a questionnaire completed by $N=195$ students in the 7th, 8th and 9th grades in secondary schools in northern Germany. The data were transferred to RStudio and descriptive analyses were performed, along with correlations, Wilcoxon rank-sum tests and Kruskal Wallis tests. Thereafter,

confirmatory factor analysis was conducted and a structural equation model was formulated.

2.2. Data collection

2.2.1. Participants

The sample is an accumulating sample; the recruitment was done through a student teacher and the participants have been compiled by future teacher. A total of $N=195$ (female: $n_f=98$, male: $n_m=97$) students in a secondary school in northern Germany were surveyed. Of these, 55 students were in Grade 7, 58 students in Grade 8, and 82 students in Grade 9. Their ages ranged between 12 and 17 years, with the average age $M=14.26$ years ($SD=1.12$). The majority of the students were born in Germany (91.79%), and 8.21% in a foreign country; 31.79% of the students' parents were born in a foreign country, 68.21% in Germany.

2.2.2. Data collection procedures

The data was collected via school records and self-report questionnaires completed by the students. After the consent of children and parents was obtained, the data was collected in the classrooms at school, as part of a seminar project. The students were informed about confidentiality, anonymity, coding of the questionnaires as well as the time required from them. The seating arrangements were adapted to ensure privacy; and a student teacher (studying for the Master of Education degree) administered the questionnaire. Subsequently, a relaxation exercise was offered to the students to counteract any possible negative emotions that might have been caused by the questions on the bullying scales.

2.2.3. Measures

School bullying was surveyed through the children's version of the German bullying/victimization questionnaire (BVF-K; Von Marées and Petermann, 2010), targeted at children from 8 to 11 years. The BVF-K detects the frequency with which children are affected as victims and/or perpetrators/offenders of direct or indirect aggressive actions (Von Marées and Petermann, 2009). Accordingly, the *victim subscale* includes direct and indirect victimization, and the *offender/perpetrator scale* direct and indirect aggression. The whole bullying scale consists of a total of 18 questions, which are answered with "never" (0), "sometimes" (1), or "often" (2) (Von Marées and Petermann, 2009, p. 247).

The *victim scale* is composed of four questions on direct victimization (e.g., "How often do other children deliberately hurt you?"; Von Marées and Petermann, 2009, p. 69) and four questions on indirect victimization (e.g., "How often do other children not let you play along?"; Von Marées and Petermann, 2009, p. 247). The *offender scale* includes four questions on direct aggression (e.g., "How often do you yell angrily at other children or abuse other children?"; Von Marées and Petermann, 2009, p. 247) and four items on indirect aggression (e.g., "How often do you force another child to do something he or she does not want to do?"; Von Marées and Petermann, 2009, p. 247). The items are all illustrated. According to the questionnaire manual, the internal consistencies are Cronbach's $\alpha=0.76$ (victim scale) and 0.77 (offender scale), while the retest reliability after 4 weeks is $r=0.82$ and 0.87, respectively (ICC,

unadjusted; Von Marées and Petermann, 2009). Information on criterion and construct validity is available for the scale (Von Marées and Petermann, 2009). In the current study, Cronbach's α turned out to be 0.71 (victim scale) and 0.70 (offender scale), with the overall Cronbach's $\alpha=0.78$ (bullying participation).

School anxiety was assessed via the German anxiety questionnaire AFS (Wieczerkowski et al., 2016). The AFS is a multi-factorial questionnaire that measures students' anxious and unpleasant experiences under three aspects: test anxiety, manifest anxiety and school displeasure (Wieczerkowski et al., 2016). It also includes a scale to measure students' tendency to appear adjusted and socially desirable (Wieczerkowski et al., 2016). The advised range of use spans from Grade 4 to 12, or the age range 9–18 years old (Wieczerkowski et al., 2016). All items are answered with the options 'true' (coded as 1) or 'not true' (coded as 0). Thus, high values imply high levels of anxiety. *Test anxiety* comprises 15 items on feelings of anxiety and helplessness in school exams and fear of failure in test situations. *Manifest anxiety* is assessed by 9 items on physical anxiety symptoms as well as on reduced self-confidence (e.g., "I am often afraid that I make a bad impression on others"; Wieczerkowski et al., 2016, p. 17). *School displeasure* is assessed by 10 items on personal rejection of school, as well as reduced desire to go to school (e.g., "It would be nice if I did not have to go to school anymore"; Wieczerkowski et al., 2016, p. 36). *Social desirability* is measured by 10 items which relate to the fear of deviating from social norms.

Data on *school absenteeism* was collected via the class record book of 2018/2019 of the number of school days each student was not at the school. The class record book is kept daily by the teacher, registering absences and other occurrences. No distinction was made between excused or unexcused absenteeism. Internal consistencies are between Cronbach's $\alpha=0.73$ and 0.89 according to the test manual (Wieczerkowski et al., 2016). The retest reliability after 1 month is between $r=0.71$ and 0.76; and after 2 months between $r=0.55$ and 0.71 (Wieczerkowski et al., 2016). For the current data, calculations show Cronbach's $\alpha=0.68$ for school anxiety (test anxiety, manifest anxiety and school displeasure). The questionnaire contained the scales for school anxiety and bullying, as well as questions pertaining to socio-demographic information. Since the children were over 12 years old, sufficient reading ability was assumed.

Gender was asked via the questionnaire. When transferred to the data table, female was transferred as 0, male as 1 and other/no information as missing value. Students were also asked about their *grade level* as well as their age.

2.3. Statistical analyses

All data analyses were performed using RStudio (Version 1.2.5019). The data on school anxiety, bullying, school absenteeism and age were first checked for normal distribution with a Kolmogorov Smirnov test using the *lillie.test()* function in the *nortest* package. Since it turned out that all scales are not normally distributed, appropriate tests were then used, as described below.

For the correlation analyses (RQ1), Kendall's τ were calculated using the *corr.test()* function (method = "kendall") in the *psych* package. For group comparisons (RQ2) of the independent scales,

Mann Whitney U tests (including effect sizes d and r)¹ were used via the *wilcox.test()* function; variance analyses were conducted using Kruskal–Wallis rank sums tests via the *kruskal.test()* in the *stats* package; alleged group differences were revealed using the *describeBy()* function in the *psych* package. The normal distribution of residuals, homoscedasticity, as well as outliers and influencing data points, were checked and evaluated as fulfilled using the *plot* function (residuals vs. fitted diagram, normal-Q-Q-plot, scale location plot and residuals vs. leverage).

To check the *school anxiety* subscales for their fit to the primary scale of school anxiety, a confirmatory factor analysis was calculated using the *cfa()* function in the *lavaan* package, with the same model fit indices as for the structural equation model (s.e.), besides the Akaike information criterion (AIC) and the Bayesian information criterion (BIC). The confirmatory factor analysis models were compared using an analysis of deviance *anova()* function in the *stats* package. Relationships were then specified with a structural equation model (RQ3), estimating the coefficients with the Full Information Maximum Likelihood (ML) method. *School absenteeism* was specified as a criterion variable, since it was assumed that it can be predicted by the variables school anxiety and bullying (Gubbels et al., 2019; see section 2.1.3); the other predictors were simultaneously included in the model. The structural equation model was performed using the *sem()* function in the *lavaan* package.

The following quality criteria were used as model fit indices (for both confirmatory factor analysis and structural equation models): the RMSEA (Root Mean Square Error of Approximation, Badness-of-Fit-Index, good approximative model fit $RMSEA \leq 0.05$ with confidence interval limits, upper limit = CIUL, lower limit = CILL); SRMR (Standardized Root Mean Square Individual, adequate between 0.05 and 0.10); CFI (Comparative Fit Index, Goodness-of-Fit-Index, good approximative model fit $CFI \geq 0.95$); and TLI (Tucker-Lewis Index, Goodness-of-Fit-Index, good approximative model fit $TLI \geq 0.95$). Cronbach's α was calculated as an indicator for internal consistency using the *alpha()* function in the *psych* package. A standard significance threshold of $\alpha=0.05$ was applied to all statistical inferences. Graphical illustrations were created using the *ggpubr* and *semPlot* packages. Post-hoc test power was calculated for small and medium effect sizes, using *G*Power* (Version 3.1.9.4).

3. Results

3.1. Descriptive statistics

The correlation coefficients τ relating to *RQ1* are listed in the correlation table (Table 1), showing that school absenteeism does *not* correlate significantly with any other variable. However, there are significant correlations of manifest school anxiety with the bullying victim scale ($\tau=0.31, p \leq 0.01$) and the bullying offender scale ($\tau=0.14,$

¹ Cohen's d was calculated here (instead of Varghas–Delaney's A), since it is a relatively robust effect size and enables comparability with other studies in the field.

TABLE 1 Correlation matrix, Kendall's τ .

	Age in years	Grade	Absenteeism	Bullying victim scale	Bullying offender scale	Bullying victim direct	Bullying victim indirect	Bullying offender direct	Bullying offender indirect	Anxiety (manifest)	Anxiety (test)	Social desirability
Age in years	-											
Grade	0.77**	-										
Absenteeism	0.05	0.01	-									
Bullying victim scale	-0.15*	-0.15*	0.05	-								
Bullying offender scale	-0.16*	-0.19**	-0.06	0.44**	-							
Bullying victim direct	-0.17*	-0.17*	0.10	0.82**	0.47**	-						
Bullying victim indirect	-0.07	-0.08	-0.02	0.69**	0.27**	0.40**	-					
Bullying offender direct	-0.13	-0.16*	-0.04	0.43**	0.88**	0.49**	0.22**	-				
Bullying offender indirect	-0.08	-0.11	-0.09	0.30**	0.63**	0.26**	0.30**	0.39**	-			
Anxiety (manifest)	-0.02	-0.06	-0.01	0.31**	0.14*	0.23**	0.36**	0.12	0.09	-		
Anxiety (test)	-0.03	-0.06	0.01	0.18**	0.06	0.11	0.25**	0.03	0.05**	0.53**	-	
Social desirability	0.02	0.02	-0.10	-0.06	-0.11	-0.13	0.05	-0.16*	0.04	0.03	0.09	-
School displeasure	0.03	0.02	0.14	0.19**	0.14	0.17*	0.18**	0.12	0.10	0.20**	0.18**	-0.11

** $p \leq 0.05$, *** $p \leq 0.01$.

$p \leq 0.05$), as well as the respective bullying subscales. Test anxiety and school displeasure correlate highly significantly with the bullying victim scale ($\tau = 0.18$ and 0.19 , $p \leq 0.01$), which can be explained by the correlation with indirect bullying ($\tau = 0.25$, $p \leq 0.01$).

The second question (RQ2) necessitates the estimation of gender and grade level differences according to the (sub-)scales of bullying, school anxiety and school absenteeism. Overall, there are some significant gender differences in the scales. For example, boys show significantly higher values on the bullying offender scale; this effect can be classified as medium to large ($d = 0.53$) and is also evident on both subscales, with the direct subscale in particular showing a high effect size ($d = 0.55$; Table 2). A significant, medium effect can be seen in manifest and test anxiety, with girls showing significantly higher values (Figure 1; Table 2).

Moreover, it was found that bullying, anxiety and absenteeism values predominantly decrease significantly from Grade 7 to 9 (exception: school desirability and school displeasure increase slightly, but these effects are not significant; see Table 3). Bullying offender and victim values are significantly lower in class 9 than in class 7, which can be explained by both their direct subscales (see Figures 2, 3; Table 3).

3.2. Structural equation modelling

Some studies have already emphasized the importance of manifest and test anxiety (see Section 1). The structural equation model investigates in particular the role of *school displeasure* and *social desirability*. Prior to formulating the structural equation model, factor analyses were used to determine to what extent school displeasure and social desirability represent school anxiety.

The comparison of several confirmatory factor analyses shows that school anxiety is most likely composed of the two subscales *school displeasure* and *school desirability* (Model 1), as the corresponding model displays the best fit (RMSEA = 0.06, CFI = 1.0, TLI = 0.97, LogLikelihood = -1913.21, AIC = 3846.14, BIC = 3875.60, $p < 0.01$). Model 1 seems superior to Model 2; in the latter, all subscales are projected onto school anxiety (RMSEA = 0.12, CFI = 0.96, TLI = 0.88, LogLikelihood = -1913.21, AIC = 3849.94, BIC = 3876.12, $p < 0.01$). Model 1 also seems superior to Model 3, in which school anxiety appears to consist of two clusters (school desirability + school displeasure; and manifest anxiety + test anxiety; RMSEA = 0.17, CFI = 0.96, TLI = 0.75, LogLikelihood = -1916.53, AIC = 3851.06, BIC = 3880.52, $p = 0.01$).

In the model comparison, Model 1 is (significantly) better than Model 2 (difference $\chi^2 = 5.78$, $df = 1$, $p = 0.02$) and (not significantly) better than Model 3 (difference $\chi^2 = 0.87$, $df = 1$, $p = 0.35$). Since Model 1 has better fit indices than Model 3, the former is preferred. Consequently, school desirability and school displeasure are included in the structural equation model, which aims to predict school absenteeism via school anxiety, bullying, grade level and gender. Figure 4 displays the results of the structural equation modelling.

The post-hoc test power was calculated for a medium effect size, $\alpha = 0.05$, and total sample size of $N = 195$ ($df = 7$), as $1 - \beta = 0.88$, with a noncentral parameter $\lambda = 17.55$ and a critical $\chi^2 = 14.07$; for smaller effects the test power was calculated as $1 - \beta = 0.49$.

TABLE 2 Gender differences regarding bullying, anxiety and absenteeism.

Variable	Female (n =98)		Male (n =97)		Mann Whitney U tests		Effect sizes	
	M	SD	M	SD	U	p	Cohen's d	r
Absenteeism	7.28	9.53	6.87	6.2	4,436	0.42	0.05	0.03
Bullying victim scale	2.41	2.33	3.05	3.33	4,460	0.45	0.22	0.11
Bullying offender scale	1.19	1.73	2.45	2.90	3,571.5**	0.00	0.53	0.23
Bullying victim direct	1.32	1.58	2.00	2.20	4,023.5*	0.05	0.36	0.18
Bullying victim indirect	1.09	1.12	1.05	1.5	5,198.5	0.23	-1.03	-0.46
Bullying offender direct	0.82	1.26	1.78	2.11	3,553**	0.00	0.55	0.27
Bullying offender indirect	0.38	0.75	0.67	1.14	4,057.5*	0.03	0.30	0.15
Anxiety (manifest)	6.38	4.46	4.58	4.17	5,902.5**	0.00	-0.42	-0.20
Anxiety (test)	7.31	4.26	5.42	3.96	5,979**	0.00	-0.46	-0.22
Social desirability	3.95	2.09	3.92	1.99	4,735	0.96	-0.02	-0.00
School displeasure	4.02	2.50	4.10	2.31	4,647	0.79	0.03	0.02

* $p \leq 0.05$, ** $p \leq 0.01$. Significant effect sizes are in bold.

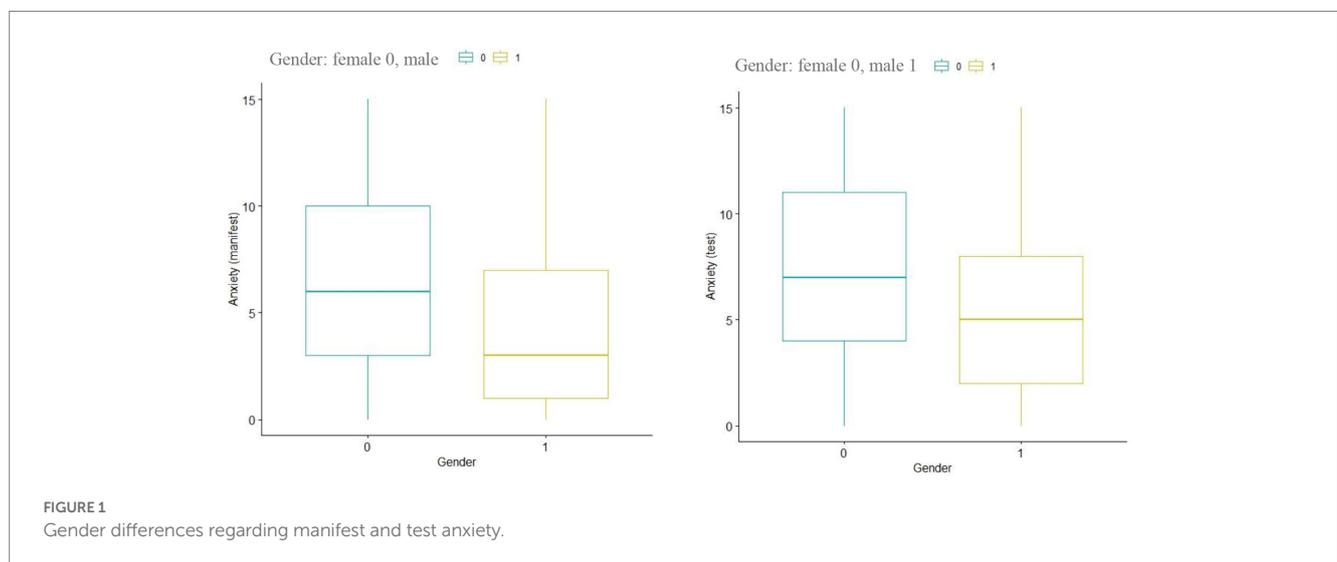


FIGURE 1 Gender differences regarding manifest and test anxiety.

4. Discussion

The current study aimed to investigate the interplay of bullying, school anxiety and school absenteeism in a comprehensive descriptive and impact analysis with a focus on gender and grade level differences. It has shown the extent to which the three scales (including subscales) correlate with each other (RQ1); what group differences exist within grade level and gender (RQ2); and what connections between these components could be discovered (RQ3). In the following sections, theoretical significance, limitations and practical implications are discussed.

4.1. Theoretical significance

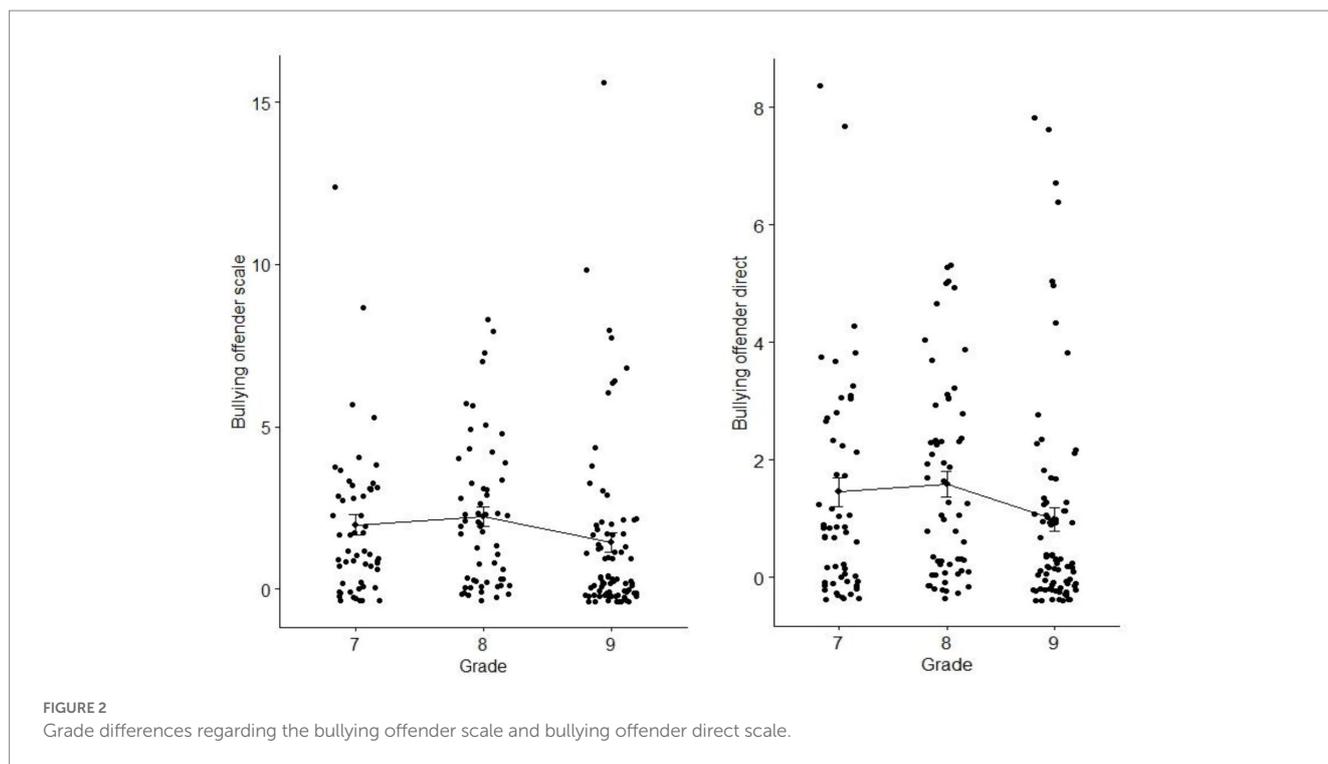
Especially with regard to gender, the present study can provide further evidence. The results presented show similar developments

regarding bullying across gender and grade levels as those of [Markkanen et al. \(2021\)](#). Our reported results are an extension, as they present bullying in the context of three grade levels (7, 8 and 9), instead of leaving out the age of 14 (8th grade). This is a very meaningful addition, because in our data, in Grade 8 there is a significant peak within the bullying (sub-)scales (see [Figures 2, 3](#)). Moreover, focusing on bullying and gender, findings reveal significant bullying differences between boys and girls, with boys reporting higher levels on both the offender and the victim scales. This says the opposite of the studies which could show that especially teenage girls are affected by (cyber-)bullying ([Raskauskas and Stoltz, 2007](#); [Patchin and Hinduja, 2008](#); [Slonje and Smith, 2008](#); [Markkanen et al., 2021](#)). This could be due to missing differences between direct and indirect bullying, between bullying and cyberbullying, or differences in specific types of schools, which were not included here because the available data were only collected at one school. Accordingly, further studies should include comprehensive investigations of the different aspects.

TABLE 3 Grade differences regarding bullying, anxiety and absenteeism.

Variable	Grade 7 (n = 55)		Grade 8 (n = 58)		Grade 9 (n = 82)		Kruskal Wallis tests		Effect sizes (t ₁ –t ₃)	
	M ₇	SD ₇	M ₈	SD ₈	M ₉	SD ₉	χ ² (df)	p	Cohen's d	r
Absenteeism	6.89	7.31	8.05	10.77	6.50	6.00	0.05 (2)	0.97	–0.06	–0.03
Bullying victim scale	3.11	2.52	2.88	2.94	2.37	3.06	6.38* (2)	0.04	–0.26	–0.13
Bullying offender scale	1.98	2.26	2.22	2.26	1.43	2.69	13.10** (2)	0.00	–0.22	–0.11
Bullying victim direct	1.96	1.78	1.81	1.96	1.34	2.00	9.26** (2)	0.01	–0.33	–0.16
Bullying victim indirect	1.15	1.11	1.07	1.37	1.02	1.41	1.87 (2)	0.39	–0.10	–0.05
Bullying offender direct	1.45	1.83	1.59	1.69	0.99	1.82	9.26** (2)	0.00	–0.25	–0.13
Bullying offender indirect	0.53	0.86	0.64	0.87	0.44	1.11	5.09 (2)	0.08	–0.09	–0.05
Anxiety (manifest)	6.05	4.79	5.41	4.07	5.15	4.37	1.16 (2)	0.56	–0.20	–0.10
Anxiety (test)	6.89	4.32	6.10	3.92	6.21	4.36	1.36 (2)	0.51	–0.16	–0.08
Social desirability	3.89	2.26	3.86	2.00	4.01	1.92	0.17 (2)	0.92	0.06	0.03
School displeasure	3.93	2.38	4.21	2.48	4.05	2.38	0.37 (2)	0.83	0.05	0.03

* $p \leq 0.05$, ** $p \leq 0.01$. Significant effect sizes are in bold.



The results for anxiety show that girls have significantly more test anxiety than boys (with a middle effect size), which supports previous research findings (Aydin, 2017). In that study, younger students reported more anxiety than older students; in the current analysis, a trend in the same direction is evident, but it turns out to be not significant.

A completely new aspect has been revealed by the structural equation model regarding the relevance of school displeasure, which has hardly been investigated in research so far. Higher victim scale values are associated with significantly more school displeasure, which in turn are related to significantly more absenteeism. Furthermore, our analyses demonstrate that an increase in victim values is

significantly related to an increase in offender values, which in turn is directly associated with significantly more school absenteeism and significantly more prevalent in boys than in girls (see Figure 4).

4.2. Implications and future directions

This research is an important piece in the puzzle in the larger context of school life, and how children and young people can successfully attend and participate in school without being 'pushed out', or where a more precise focus may be required if development problems emerge. For the successful management and development

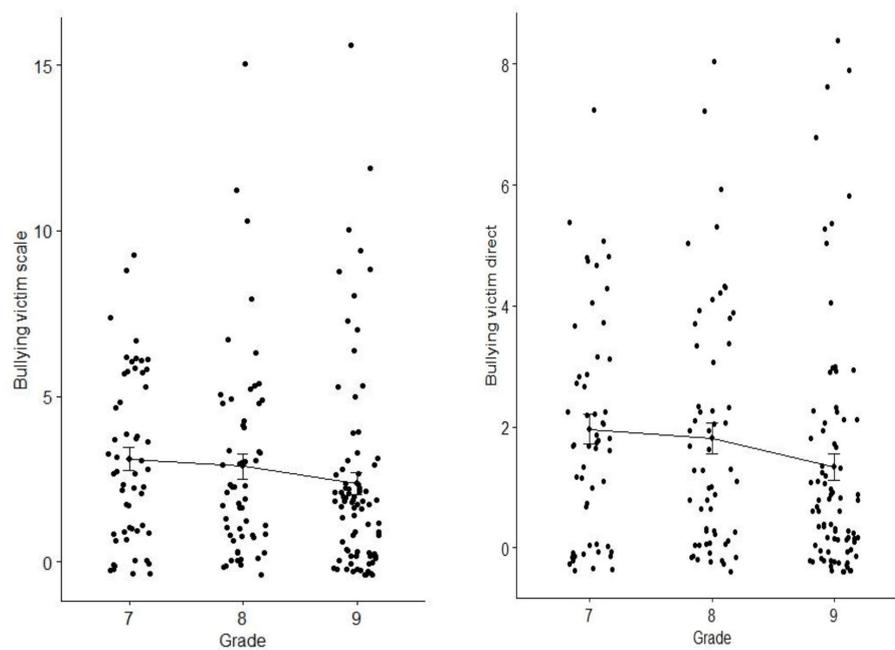


FIGURE 3
Grade differences regarding the bullying victim scale and bullying victim direct scale.

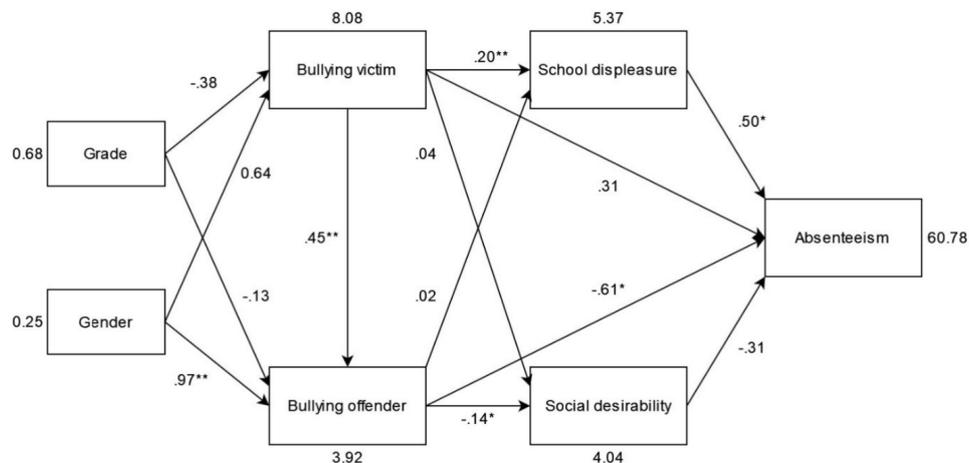


FIGURE 4
Structural equation model with β -estimates and variances Grades: 7–9, sex: female=0, male=1. $*p \leq 0.05$, $**p \leq 0.01$. $N=195$, $\chi^2(7)=4.26$, $p > 0.05$, $RMSEA > 0.01$ (CILL=0.00, CIUL=0.06), $SRMR=0.03$, $CFI=1.00$, $TLI=1.08$.

of teaching and learning in schools, it is enormously important to understand the interrelationships between meaningful factors as bullying, school anxiety and school absenteeism and associations with gender and grade level.

Thus, it is interesting that boys have higher values for being offenders and victims of bullying, even if the effect becomes significant only for being the offender. This has important implications for prevention and intervention in schools. Even though at first glance it appears that boys should be the focus of bullying prevention interventions, it is short-sighted to work only

with high values in bullying, since girls may suffer more from bullying due to their higher anxiety values. Here, a much more complex mechanism must be considered and, above all, the focus should be placed on the systematic development of competencies in the emotional and social domains, for both boys and girls. Since there is an apparent peak in bullying (in the 8th grade) and in anxiety (in the 7th grade), it seems that it would be advantageous to schedule interventions in those grades. This could be achieved by a cognitive-behavioral intervention on the basis of social information processing (Crick and Dodge, 1994; Lemerise and

Arsenio, 2000; Vierbuchen, 2015; Hagen et al., 2016; Schlesier et al., 2019). With cognitive-behavioral interventions, students may learn how they can concretely handle challenging situations (i.e., situations with a bullying experience, or anxiety) as the social information processing model offers a concrete pattern of steps that students have to follow (encoding of cues, interpretation of cues, clarification of goals, response access, response decision and behavioral enactment; Crick and Dodge, 1994). These procedures could be taught to students by teachers and school psychologists, for example, as part of social or civic lessons.

The goal of all analyses and interventions should always be to strengthen the resilience and prosocial behavior of individual children and adolescents, and to positively shape the school and classroom climates. This need has again become clear in this study.

4.3. Limitations

The current study exhibits limitations in various aspects. With nearly 200 participants, the test power was calculated as adequate (0.88) for medium effect sizes, and relatively low (0.49) for small effect sizes. This means that it is possible that small and extremely small effects remain undetected in the current analysis. Furthermore (and this is probably also due to the sample size), the Chi-squared test for the structural equation model (regarding the baseline restricted model) is not significant; but since the more important fit indices produced excellent values, the model fits could be evaluated and compare well with each other. However, a longitudinal study design would not only improve the test power in a sample with the size we have here, but also strengthen the predictive power of individual predictors in the structural equation model.

Another limitation is the investigation of school absenteeism. School absenteeism is a heterogeneous construct (see Section 2.1.3) and in this study the number of days absent from school was included without integrating the status of the absence (excused vs. not excused) or the reason for the absence (illness or truancy). Moreover, only whole days of absence were counted, not individual hours. Thus, the measurement of absenteeism could have been more specific. However, as mentioned before, every single day of absence from school counts as a risk factor for the further cognitive and socio-emotional development of students.

It is important to note that the structural equation model presented in the current study is not proposed as an exhaustive perspective on any of its components. Other outcome variables could also be included in a structural equation model (such as achievement), or other influencing factors (such as teacher–student relationships or achievement goal orientation). It is important that, in sum, the findings from the current study support the theory of school absenteeism, and in particular, the effect of push factors that push students away from school (Stearns and Glennie, 2006).

5. Conclusion

Despite the limitations described, this study can enrich the current state of research in the focused areas of absenteeism, bullying and anxiety, while also adding important insights to help clarify relevant structures and associations; the effects of gender and grade

could be worked out transparently. The present study complements the previous state of investigation, notably in the contextualization of bullying, school anxiety and school absenteeism regarding gender and grade level, which had previously not been investigated in this context and involving these variables. Thus, the study succeeds in providing important indications for practice regarding the prevention of, and interventions into absenteeism, bullying and anxiety in secondary schools.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

Author contributions

JS was responsible for data collection, analyzed it, and wrote most of the parts of the manuscript (theoretical background, methods including data analysis, results and parts of the discussion etc.). M-CV worked on the research questions, formulated preliminary assumptions, and wrote parts of the theoretical background. MM assisted with data analysis, contributed to the interpretation, and proofread, and corrected the entire manuscript. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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