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Psychosomatic complaints in adolescence: Untangling the relationship between offline and online peer victimization, psychosomatic complaints and social support

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ABSTRACT

Offline peer victimization has been linked to psychosomatic complaints. As peer victimization is no longer limited to adolescents' offline relationships, it is crucial that we investigate whether *online* peer victimization has similar negative consequences. To date, no study systematically investigated the unique contribution of online vs. offline peer victimization on psychosomatic complaints, and the possible protective effect of social support. The current study disentangled offline and online peer victimization by distinguishing four victim types: non-victims, offline, online, and dual victims ($N = 897$, 9-to-18-year-olds). In addition, we assessed perceived social support from teachers, parents, friends and classmates. A main effect was found for victim type on psychosomatic complaints. Victims (offline or dual) reported more psychosomatic complaints than non-victims. Notably, online victims reported similar levels of psychosomatic complaints compared to non-victims. Furthermore, although social support from parents and classmates was related to fewer psychosomatic complaints, only limited support was found for a buffering effect of social support.

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A recent meta-analysis showed that offline peer victimization can trigger psychosomatic complaints (Gini & Pozzoli, 2013). Psychosomatic complaints are those somatic complaints for which physicians are not able to identify a physical cause and are thus attributed to stress and anxiety (Beck, 2008; Bohman et al., 2012; Campo, 2012). Although these complaints can occur in isolation, they often seem to cluster; for example, headaches, abdominal pain and sleep problems were highly related symptoms among adolescents (Luntamo et al.,

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2012). Not only are psychosomatic complaints themselves worrisome, they are also related to concurrent mental health problems (Campo, 2012; Luntamo et al., 2012; Neese, Pittman, & Hunemorder, 2013). Moreover, psychosomatic complaints during adolescence are possible risk factors for the development of problems later in life, including psychiatric disorders and suicidal ideation (Bohman et al., 2012; Terre, Poston, Foreyt, & St Jeor, 2003).

Following the increase of online communication, peer victimization is no longer limited to adolescents' offline relationships. This raised the question whether and to what extent online peer victimization is also related to psychosomatic complaints. As offline and online peer victimization are closely related (Hinduja & Patchin, 2012; Modecki, Minchin, Harbaugh, Guerra, & Runions, 2014; Ybarra, Diener-West, & Leaf, 2007), researchers face the challenge to untangle the relationship between offline and online peer victimization when they want to investigate its consequences. Thus, to understand how peer victimization is related to psychosomatic complaints, we need to carefully disentangle the effects of both offline and online peer victimization. Furthermore, to empower youth to withstand the possible negative effects of peer victimization, we need to understand which factors might actually buffer the relationship between offline and online peer victimization and psychosomatic complaints. Therefore, the aims of this study are to investigate (1) the relationship between both online and offline peer victimization and psychosomatic complaints, and (2) the potential protective role of social support from peers, classmates, teachers, and parents.

Psychosomatic complaints and peer victimization

To date, only few studies investigated the relationship between online peer victimization and psychosomatic complaints (Gini, Pozzoli, Lenzi, & Vieno, 2014; Smithyman, Fireman, & Asher, 2014). In line with a meta-analysis on offline peer victimization and psychosomatic complaints (Gini & Pozzoli, 2013), recent studies provided first evidence that online peer victimization is also related to psychosomatic complaints (Brolin Låftman, Modin, & Östberg, 2013; Gradinger, Strohmeier, & Spiel, 2009; Kowalski & Limber, 2013; Völlink, Bolman, Eppingbroek, & Dehue, 2013). In general, victims of offline peer victimization and victims of online peer victimization reported more complaints than non-victims (Beckman, Hagquist, & Hellström, 2012; Brolin Låftman et al., 2013; Kowalski & Limber, 2013). Moreover, Brolin Låftman et al. (2013) showed that those Swedish adolescents who were victimized both offline and online experienced the highest levels of somatic complaints. However, this exceptional vulnerability due to dual victimization was not observed by Beckman et al. (2012). Thus, it remains unclear whether being victimized in multiple settings is especially harmful for youth.

Although these studies (Brolin Låftman et al., 2013; Chen & Huang, 2015; Kowalski & Limber, 2013; Völlink et al., 2013; Wang, Iannotti, Luk, & Nansel, 2010)

provided preliminary evidence that somatic complaints are related to online peer victimization, each of these studies suffered from at least one of four limitations. First, some studies assessed online peer victimization with only one or two general items (Brolin Låftman et al., 2013; Gradinger et al., 2009; Kowalski & Limber, 2013). Second, few studies controlled for offline peer victimization which makes it impossible to assess the unique contribution of offline vs. online peer victimization to experiencing psychosomatic complaints (Chen & Huang, 2015; Kowalski & Limber, 2013; Völlink et al., 2013). Controlling for offline peer victimization however is important, because for instance Brolin Låftman et al. (2013) showed that after controlling for offline victimization, online victimization remained significantly but less strongly related to health problems. This means that those studies that do not control for offline peer victimization may overestimate the effect of online peer victimization on psychosomatic complaints. Third, some researchers used quite lenient criteria to categorize victims vs. non-victims (e.g., being bullied once or twice in the past month (Beckman et al., 2012)). The use of criteria which are too lenient might result in an artificial distinction between groups of adolescents whose lived experience might actually be very similar. As a result, the relationship between victimization and psychosomatic complaints might be underestimated. Finally, the studies differed in how psychosomatic complaints were assessed. In some instances, items did not reflect psychosomatic complaints, but rather general health or general well-being (Brolin Låftman et al., 2013).

Due to these shortcomings, our understanding of the relationship between peer victimization and psychosomatic complaints is still limited. The current study, therefore, attempts to address these shortcomings by (1) using multiple parallel items to assess offline and online peer victimization, (2) statistically differentiating between offline and online peer victimization, (3) using stringent criteria to categorize victims from non-victims, and (4) assessing psychosomatic complaints with a valid and specific scale.

Does social support buffer the relationship between peer victimization and psychosomatic complaints?

Although it has been consistently shown that peer victimization can impact youth's psychosomatic complaints, the effects are mostly of low to moderate size. One explanation for these small effect sizes is provided by the buffering hypothesis (Cohen & Wills, 1985). The buffering hypothesis argues that 'support "buffers" (protects) persons from the potentially pathogenic influence of stressful events' (Cohen & Wills, 1985). Therefore, due to protective factors in their environment, some young people who experience peer victimization may not or barely be affected by these experiences (Bjereld, Daneback, Gunnarsdóttir, & Petzold, 2015; Davidson & Demaray, 2007; Perren et al., 2012; Van Dyk & Nelson,

2014), whereas others who lack social support are more strongly affected by peer victimization.

However, it seems crucial to distinguish between different sources of support. Pouwelse, Bolman, Lodewijkx, and Spaa (2011) found no moderating effect of general social support for the relationship between peer victimization and depression. In contrast, when *peer* support was assessed specifically, social support led to the expected buffering effect. The importance of peers was also demonstrated by Hodges, Malone, and Perry (1997) who found that especially children who had a very small number of friends suffered more when they were victimized. In addition to parents and peers, teachers also fulfill a buffering role when youth are faced with negative experiences (Chu, Saucier, & Hafner, 2010; Flaspohler, Elfstrom, Vanderzee, Sink, & Birchmeier, 2009). Although these studies demonstrate the necessity to distinguish between different types of support, the relative importance of each source of support remains unclear (Chu et al., 2010).

To date, no study has investigated the buffering role of perceived social support for online victims. To understand whether offline and online victims can benefit from social support, we will test the buffering hypothesis by looking at perceived social support from four groups that are important for youth, i.e., parents, teachers, classmates, and friends (Bokhorst, Sumter, & Westenberg, 2010; Harter, 1985).

Current study

The current study will investigate the link between peer victimization and psychosomatic complaints. As peer victimization takes place both offline and online, we adopt statistical approaches that allow us to differentiate between these different experiences, namely partial correlations and categorizing. When categorizing, we distinguish between four different groups of adolescents: (1) youth who are not victimized by their peers (non-victims), (2) youth who are solely victimized offline (offline victims), (3) youth who are victimized only on the internet (online victims), and (4) youth who are victimized in both settings (dual victims). We investigate how these four groups differ in their level of somatic complaints. Overall, we expect that non-victims will report the lowest level of somatic complaints. As research has shown that the relationship between victimization and somatic complaints is driven by youth's offline experiences (Brolin Låftman et al., 2013), it is expected that among the different victims, online victims will report lower levels of somatic complaints compared to youth who have experienced offline victimization, i.e., both offline victims and dual victims. Finally, although some argue that youth who are victimized offline and online suffer the most (e.g., Brolin Låftman et al., 2013), empirical evidence has not always supported this assumption (e.g., Beckman et al., 2012). Therefore, we expect that dual victims experience at least equal levels of somatic complaints as offline victims.

We also aim to understand whether social support can protect youth from the potentially negative effects of peer victimization (Perren et al., 2012). We expect that those victims who perceive high social support from different sources will report less somatic complaints than victims who perceive low social support.

Method

Participants and procedure

We surveyed students who attended either primary or secondary school, US grade levels 4–12. Data came from the second wave of a larger longitudinal study on online peer victimization, because somatic complaints were not assessed in the first wave ($N = 1124$, six schools). The Wave 2 data were collected in spring 2013 which was one year after Wave 1.

The majority of the Wave 2 sample came from the six original participating schools. However, as some students had changed schools, e.g., from a participating primary school to a non-participating secondary school, or changed classes from the first to the second wave, the class composition of the Wave 2 sample was more diverse. Consequently, the current Wave 2 sample reflected 54 classes and the number of students that represented a class varied between 1 and 43. Thus, the Wave 2 sample included 897 students between 9 to 18 years ($M_{\text{age}} = 13.72$, $SD = 2.13$) from schools across the Netherlands. Of these, 444 were male and 453 female. The majority of participants (95%) was born in the Netherlands, came from an intact family with both parents present (73%) or lived with only their birth mother (18%). Some participants did not fill out all questions, as a result information about age was missing for ten respondents and 20 respondents could not be assigned to a victim group. These cases were deleted list wise from the analyses.

The Dutch school year starts in September, hence in the six months prior to the data collection the students saw each other on a daily basis. The study was approved by the ethical committee of the university. A passive parental consent procedure was followed; parents could indicate their objections prior to the study but were also allowed to withdraw consent after the study. This resulted in 27 parents returning the objection-form (less than 3% of the parents); no parents withdrew consent after the study. In addition, active assent was obtained from all participants. Data collection took place using paper-pencil surveys which were distributed in classrooms.

Measures

Peer victimization

Using the Multidimensional Offline and Online Peer Victimization Scale (MOOPV; Sumter, Baumgartner, Van der Hof, Peter, & Valkenburg, 2015), we created four

Table 1. Prevalence rates of each victim type by gender and for the whole sample.

	Boys	Girls	Frequency	Percentage (%)
Non-victim	337	382	719	80.2
Offline victim	59	34	93	10.4
Online victim	15	11	26	2.9
Dual victim	33	25	58	6.5
Total	444	452	896	100.0

groups representing different victim types similar to previous studies (Salmivalli, Sainio, & Hodges, 2013). From the full MOOPV item pool we included ten items that were identical for offline and online peer victimization.¹ Each item was rated on a six point scale ranging from 1 (*never*) to 6 (*every day*), which indicated how often in the past six months respondents had experienced this type of peer victimization. The reliability of each subscale was good; Cronbach's α ranging from .97 to .90. As expected offline and online peer victimization were strongly correlated, $r = .65$, $p < .001$. Based on the cut-off of having experienced this form of victimization at least once a week, respondents were categorized as non-victims, offline victims, online victims, or dual victims. Table 1 shows the number and percentage of respondents that were assigned to each of the four groups for the whole sample and for boys and girls separately. As expected, the majority of respondents were not victimized by their peers. Only a minority were only victimized online.

Psychosomatic complaints

Psychosomatic complaints were measured with the seven highest loading items from the Somatic Complaints List (Jellesma, Rieffe, & Terwogt, 2007). All items were rated on a 5-point Likert scale ranging from 1 (*almost never*) to 5 (*very often*). The items were averaged to create an index of psychosomatic complaints. The items were, 'I feel tired', 'I feel dizzy', 'I have a headache', 'I have a stomach ache', 'I feel shaky', 'I feel nauseous', and 'I feel sick'. The respondents were asked to consider the past six months when completing these questions. The reliability was good (Cronbach's $\alpha = .88$).

Perceived social support

Social support was measured with an adapted version of the Social Support Scale for Children (Harter, 1985), measuring teacher, parent, friend and classmate support. Each source of support was assessed with four items rated on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly disagree*). Taking the average of all four items, higher scores reflected high levels of perceived support. An example item is, 'My parents care about my feelings'. Each subscale showed acceptable reliabilities (Cronbach's α ranging from .68 for classmate support to .94 for friend support).

¹The exact items are included in the Appendix.

Table 2. Bivariate correlations between peer victimization, psychosomatic complaints, social support, gender, and age.

	1	2	3	4	5	6	7
Offline peer victimization	–						
Online peer victimization	.65**	–					
Psychosomatic complaints	.28**	.21**					
Parent support	–.09**	–.08*	–.17**	–			
Teacher support	–.06	–.06	–.07*	.18**	–		
Friend support	–.10**	–.02	.02	.33**	.21**	–	
Classmate support	–.33**	–.21**	–.14**	.24**	.18**	.43**	–
Gender (boy = 0)	.02	.08*	.27**	.01	.01	.21**	.05
Age	–.08*	.04	.002	–.03	–.21**	.08*	.10**

Note: Asterisks indicate the following significance levels.

* $p < .05$; ** $p < .01$.

Results

Preliminary analyses: peer victimization and psychosomatic complaints

An overview of bivariate correlations between the main variables that are included in the current study are presented in Table 2. These analyses showed that both offline and online peer victimization were related to psychosomatic complaints, respectively $r = .28, p < .001$ and $r = .21, p < .001$. To further investigate the relationship between peer victimization and psychosomatic complaints, we conducted partial correlations between offline and online peer victimization and psychosomatic complaints. Partial correlations showed that offline peer victimization remained significant when controlling for online peer victimization, $r = .18, p < .001$. However, when we controlled for offline peer victimization, the correlation between online peer victimization and somatic complaints was no longer significant, $r = .04, p = .21$.

These results were supported by group differences in somatic complaints. An ANCOVA which included age and gender as control variables showed a main effect for victim type on psychosomatic complaints, $F(3, 835) = 13.76, p < .001, \eta_p^2 = .05$ (see Table 3 for descriptive statistics). Respondents who experienced no peer victimization reported the lowest level of psychosomatic complaints. Their levels of psychosomatic complaints differed significantly from offline victims and dual victims, but not from online victims. In addition, levels of psychosomatic complaints did not differ significantly between the three victim groups.² With regard to the control variables, psychosomatic complaints was related to gender, $F(1, 835) = 81.38, p < .001, \eta_p^2 = .09$, but not to age, $F(1, 835) = 0.16, p = .689, \eta_p^2 = .000$. Girls reported more psychosomatic complaints.

²The ANCOVA was re-run with a more lenient cut-off criterion of being victimized once a month rather than once a week. Using this lenient cut-off point does not change the results substantially. Similar to the presented results, the non-victims reported lower levels of psychosomatic complaints than offline and dual victims.



Table 3. Mean differences in psychosomatic complaints and social support between four victim types.

	Means (SD)		Means (SD) social support			
	Psychosomatic complaints		Parent	Teacher	Friend	Classmate
Non-victim	2.24 (0.80) ^a	4.59 (0.65) ^a	3.60 (0.89) ^a	4.41 (0.81) ^a	4.15 (0.63) ^a	
Online victim	2.42 (0.94) ^{a,b}	4.61 (0.44) ^a	3.63 (0.81) ^a	4.28 (0.84) ^a	4.06 (0.65) ^{a,b}	
Offline victim	2.64 (0.89) ^b	4.52 (0.64) ^a	3.49 (1.04) ^a	4.28 (0.92) ^a	3.87 (0.76) ^b	
Dual victim	2.60 (0.86) ^b	4.43 (0.76) ^a	3.39 (1.09) ^a	4.31 (0.89) ^a	3.80 (0.88) ^b	

Note: Means within columns with different superscripts differ from each other at significance level $p < .01$ Bonferroni corrected.

Peer victimization and social support

Differences in social support between the four groups were investigated separately for social support from parents, teachers, friends and classmates. These ANCOVAs included age and gender as covariates. Means and standard deviations are presented in Table 3. A main effect of victim type was observed for classmate support, $F(3, 858) = 8.33, p < .001, \eta_p^2 = .03$. Non-victims reported higher levels of classmate support than offline and dual victims. Notably, online victims reported similar levels of support as non-victims. No significant differences were found for parent support, $F(3, 859) = 1.18, p = .35, \eta_p^2 = .004$, teacher support, $F(3, 859) = 1.41, p = .24, \eta_p^2 = .005$, nor for friend support, $F(3, 859) = 0.37, p = .78, \eta_p^2 = .001$.

Social support as moderator between peer victimization and psychosomatic complaints

Our final aim was to investigate whether social support from parents, teachers, friends or classmates buffers negative effects of victimization. We therefore conducted four hierarchical linear regressions. To account for the hierarchical structure of the data we used robust standard errors (HC3 errors) provided by the SPSS Macro developed by Hayes (Hayes & Cai, 2007). Before looking at the moderating effect of social support, we tested the main effect of social support. Thus, the first hierarchical linear regression included only the four centered measures of social support, age and gender, $R^2 = .12, F(6, 829) = 18.40, p < .001$. This analysis showed a main effect for classmate, $\beta = -.17, SE_{(HC3)} = .05, p < .001$, and parent support, $\beta = -.19, SE_{(HC3)} = .05, p < .001$. Adolescents who reported higher levels of classmate and parent support reported fewer psychosomatic complaints. In addition, a small but negative relationship was observed for friend support and psychosomatic complaints, $\beta = .08, SE_{(HC3)} = .04, p = .0497$.

Second, we investigated the moderating effect of social support. For this we used three sets of dummy variables with either (1) non victims as the reference group, (2) offline victims as the reference group, or (3) online victims as the reference group. These three sets of dummy variables allowed us to compare victims with non-victims, but also to compare the different victim types amongst each other. The three hierarchical linear regression analyses all included age and gender as control variables. The moderating effect was investigated by inspecting the interactions between the dummies and the four types of social support. The results are presented in Table 4.

Overall, the moderating effect of social support appears limited as merely three interactions were significant. In the analysis with offline victims as the reference group a significant interaction was observed (1) between teacher support and the offline vs. online victim dummy, and (2) between teacher support and the offline vs. dual victim dummy. To interpret these significant

Table 4. Results of heteroscedasticity consistent regression analyses (HC method 3) examining the moderating effect of social support on the relationship between peer victimization and psychosomatic complaints (Outcome variable).

Predictors	Reference group					
	Non Victims B (SE)		Offline Victims B (SE)		Online Victims B (SE)	
Constant	2.11	0.19	2.54	0.21	2.31	0.25
Age	-0.01	0.01	-0.01	0.01	-0.01	0.01
Gender	0.47	0.06***	0.47	0.06***	0.47	0.06***
Non victims (NV)	N/A		-0.43	0.10***	-0.21	0.18
Offline victims (OfV)	0.43	0.10***	N/A		0.23	0.20
Online victims (OnV)	0.21	0.18	-0.23	0.20	N/A	
Dual victims (DV)	0.27	0.11*	-0.16	0.15	0.06	0.21
Classmate support (CS)	-0.10	0.05 [†]	-0.15	0.16	0.19	0.35
Friend support (FS)	0.08	0.05 [†]	0.10	0.10	-0.26	0.23
Parent support (PS)	-0.15	0.06**	-0.16	0.15	-0.44	0.37
Teacher support (TS)	-0.03	0.04	-0.19	0.10*	0.46	0.28
Interaction terms						
NV × CS	N/A		0.05	0.17	-0.28	0.35
NV × FS	N/A		-0.02	0.11	0.34	0.24
NV × PS	N/A		0.01	0.16	0.28	0.38
NV × TS	N/A		0.16	0.10	-0.50	0.28
OfV × CS	-0.05	0.17	N/A		-0.34	0.38
OfV × FS	0.02	0.11	N/A		0.36	0.25
OfV × PS	-0.01	0.16	N/A		0.28	0.40
OfV × TS	-0.16	0.10	N/A		-0.66	0.29*
OnV × CS	0.28	0.35	0.34	0.38	N/A	
OnV × FS	-0.34	0.24	-0.36	0.25	N/A	
OnV × PS	-0.28	0.38	-0.28	0.40	N/A	
OnV × TS	0.50	0.28 [†]	0.66	0.29*	N/A	
DV × CS	-0.21	0.15	-0.15	0.21	-0.49	0.37
DV × FS	-0.06	0.14	-0.09	0.17	0.27	0.27
DV × PS	-0.32	0.16 [†]	-0.31	0.21	-0.04	0.40
DV × TS	0.13	0.09	0.29	0.13*	-0.37	0.29
Adjusted R ²	0.18		0.18		0.18	

* $p < .05$; ** $p < .01$; *** $p < .001$; [†] $p < .10$.

interaction effects, they were followed-up with simple slope analyses (Dawson & Richter, 2006). An inspection of the plots showed that teacher support had a protective effect among offline victims; offline victims with higher levels of teacher support reported lower levels of psychosomatic complaints than offline victims with lower levels of teacher support. This moderating effect was much less pronounced for online victims and dual victims.

Discussion

The current study confirmed that among today's youngsters offline and online peer victimization are entangled (Modecki et al., 2014). Most youngsters who were victimized on the internet were also victimized offline. However, there are still some adolescents who were either only victimized offline or only victimized online. We investigated how these unique groups differed in their levels of psychosomatic complaints and the role of social support as a protective factor.

The number of youth who were victimized only online or both offline and online, was slightly higher in the present study than prevalence rates observed in earlier research (Salmivalli et al., 2013). It should be noted that the cut-off criteria were not identical across studies. For example, whereas Salmivalli et al. used 2 to 3 times a month as a cut-off, we used a more stringent cut-off of at least once a week. Thus, our more recent figures show that although the number of children who are victimized online is slightly higher than earlier studies suggest, overall online peer victimization still occurs less frequently than offline peer victimization, and only few children are solely victimized online.

The distinction between the three victim types allowed us to investigate the role of online victimization in more detail. Many studies on online victimization have not assessed the unique effects of online victimization, and therefore tend to overestimate the negative effects of online victimization. In the current study those adolescents who were victimized only online reported similar levels of psychosomatic complaints to non-victims, whereas offline and dual victims reported higher levels of psychosomatic complaints than non-victim. Thus, in contrast to previous concerns about the potential deleterious effects of online victimization, it seemed that when online peer victimization occurs in isolation it may be less problematic than anticipated. Furthermore, the partial correlations showed that especially offline peer victimization was related to psychosomatic complaints. These findings are in line with Salmivalli et al. (2013), and seem to suggest that in particular offline peer victimization is related to negative consequences. Recently, Mitchell, Jones, Turner, Shattuck, and Wolak (2016) showed that young people, who only experienced harassment incidents on the internet, like name calling and exclusion on the internet reported few emotional consequences. In their study, dual victims reported the strongest emotional impact; they felt most upset, embarrassed and afraid. This latter finding was not replicated in the current study because no differences in somatic complaints between the three victim types were found.

Who supports the victims and does it help?

To formulate guidelines to help victims, we need to know why some children are better equipped to deal with negative peer experiences than others. This susceptibility to the harmful effects of peer victimization can be related to personality and resilience, but also to differences in children's social surroundings, including the level of social support they receive. In the current study, the different groups, thus victims and non-victims, reported almost identical levels of social support from their teachers, parents and friends. Offline and dual victims, however, did report lower levels of classmate support in comparison to non-victims.

Our findings demonstrated that perceived support from parents and classmates is beneficial to all adolescents, as both forms of social support were negatively related to psychosomatic complaints. The positive influence of feeling

supported by classmates is in line with earlier research, and clearly underlines the importance of positive class climates (e.g., Torsheim & Wold, 2001). Although adolescence is known as a period in which peers start to play a bigger role and youth strive for autonomy (e.g., Crone & Dahl, 2012; Nelson, Leibenluft, McClure, & Pine, 2005), these findings also underscore the important role that parents play in their children's lives during adolescence.

In contrast to our expectations, friend support had a small negative relationship with psychosomatic complaints. This counterintuitive relationship between feeling supported by friends and psychosomatic complaints does find support in the literature. Previous research has shown that when girls seek support from other girls who are also experiencing personal problems, they run the risk to co-ruminate which actually exacerbates rather than alleviates their problems (Rose, Carlson, & Waller, 2007). Thus, to fully understand under which circumstances friend support has a beneficial effect requires a more detailed assessment of the type of support that is exchanged between adolescents.

Although we expected social support to buffer potential effects of peer victimization on psychosomatic complaints (Cohen & Wills, 1985), our findings provided only very limited support for this expectation. The only buffering effect was found for teacher support. Teacher support was related to fewer psychosomatic complaints for offline victims. In contrast, online victims who felt supported by their teachers seemed to show slightly more psychosomatic complaints. However, these conclusions should be treated with care. It is important to keep in mind the cross-sectional nature of the current study. Future research might investigate under which circumstance teacher support is sought out or offered. It might be that teachers are better equipped to deal with offline peer victimization experiences than online peer victimization experiences.

Similar to the findings of the present study, at least one previous study showed that social support actually has a limited buffering effect on the relationship between stressful experiences and psychosomatic complaints (Torsheim & Wold, 2001). These authors argued that the majority of students will experience adequate levels of support, and only in the most extreme cases of lacking support or exceptionally high support would support have a buffering effect. Thus, future research in larger samples might look at identifying the minimal levels of support that adolescents need to thrive.

Moreover, future research may benefit from including measures of *online* social support. Online friendships and interactions may play an important role in adolescents' well-being (e.g., Valkenburg & Peter, 2009). Online social support might be especially beneficial for specific risk groups of adolescents, for example, adolescent who have poor *offline* peer relationships. For instance, Indian and Grieve (2014) showed that socially anxious individuals benefited from the support they received through Facebook friends.

Limitations and implications

Although the current study was able to address several gaps in the existing literature, several limitations should be taken into consideration. First, our study design relied solely on self-reports. Self-reports may be subject to social desirability issues and recall errors. Therefore, exact estimations of the amount of peer victimization, for example, should be interpreted with care. However, due to the sensitive topic of peer victimization and psychosomatic complaints, and because we were interested in the subjective experiences of youth, self-reports may still be a valid way to assess these constructs. Second, the present data is cross-sectional. To fully understand the entangled role of social support, victimization and psychosomatic complaints several waves of data would be desirable. These longitudinal studies should investigate not only how much social support is perceived, but also when social support is requested by young people. Third, the effect sizes found in this study were small. This implies that to fully understand psychosomatic complaints during adolescence other factors than peer victimization need to be taken into account. Moreover, research on the consequences of peer victimization may need to look at additional indicators of mental well-being. Fourth, although the current sample was large, youth who are victimized only online are such a minority that they were expectedly underrepresented in our group. In line with research among clinical samples of youth, it may be worthwhile to oversample young people who are victimized online only to better understand the consequences of this specific type of peer victimization. Moreover a larger sample size would also allow us to look at the possible moderating effect of age. The role of parents and teachers is likely to be different for children compared to adolescents. Teacher and parents support might be more important and/or more effective at an earlier age.

Finally, it is important to take the distinction between psychosomatic complaints and somatic complaints into consideration. The crucial distinction is that the same complaints can either have an organic cause or a cause that is medically unidentified. In the current study, no information was included about the medical history of the respondents, therefore it is impossible to rule out an organic cause to the reported symptoms. However, previous research has shown that these types of somatic complaints are highest among adolescents who suffer emotional problems (Ottova et al., 2012; Taylor, Szatmari, Boyle, & Offord, 1996). Future research, however, might benefit from including a clinical sample of adolescents for which physicians have been able to rule out an organic cause.

Conclusion

The current study was one of the first to identify the unique relationship between offline and online peer victimization and psychosomatic complaints. The findings demonstrated that it is crucial to distinguish between different

victim types, as being victimized only online does not seem to have negative consequences per se. This has clear implications for research and practice. For research it means that future studies need to control for offline peer victimization if they want to fully understand the consequences of online peer victimization. For practitioners, it means that when adolescents are referred to them following incidents of online peer victimization, they should look at the full scope of peer victimization experiences. Because for the majority of online victims their negative experiences with peers is not limited to the internet, and in those cases adolescents actually do suffer from their experiences. Finally, as the buffering hypothesis was only partially supported, it will be important to explore which other factors—apart from social support - might protect victimized youth. A solid understanding of factors that can lessen the harmful consequences of these negative experiences is crucial because it will facilitate the development and optimization of programs that assist adolescent victims.

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Appendix. Instructions and items to assess offline and online peer victimization

We used parallel items to assess offline and online peer victimization, each set of items was preceded by specific instructions. Offline peer victimization items were introduced as follows: The following questions are about your experiences with peers. We are interested in your experiences with peers and not with adults. How often have the following things happened to you in the past six months? Online peer victimization included the following definition of the Internet: The Internet refers to Internet via a computer, laptop and Internet via your mobile. The following questions are about your experiences with peers on the Internet.

The following ten items were included:

- (1) Another child/teen called me names
- (2) Another child/teen insulted me
- (3) Another child/teen made a fool of me
- (4) Another child/teen threatened to beat me up
- (5) Another child/teen spread my secrets
- (6) Another child/teen excluded me
- (7) Another child/teen did not let me participate
- (8) Another child/teen did not let me join a conversation
- (9) Another child/teen acted like I did not exist
- (10) Another child/teen gossiped about me

Response options:

Never, once in the past six months, 2–3 times in the past six months, about once a month, about once a week, and almost every day.