Can classroom seating arrangements help establish a safe environment for victims? A randomized controlled trial

Hoekstra N. A.H; Berg Y.H.M van den; , Lansu, T. A.M; , Peetz, H.K; Mainhard, M.T; Cillessen, A.H.N

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RESEARCH ARTICLE

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Can classroom seating arrangements help establish a safe environment for victims? A randomized controlled trial

Nathalie A. H. Hoekstra[1] | Yvonne H. M. van den Berg[1] | Tessa A. M. Lansu[1] | Hannah K. Peetz[1] | M. Tim Mainhard[2] | Antonius H. N. Cillessen[1]

[1]Behavioural Science Institute, Radboud University Nijmegen, Nijmegen, The Netherlands

[2]Educational Sciences, Leiden University, Leiden, The Netherlands

Correspondence

Nathalie A. H. Hoekstra, Behavioural Science Institute, Radboud University, PO Box 9104, 6500 HE Nijmegen, The Netherlands.
Email: nathalie.hoekstra@ru.nl

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Abstract

Students around the globe still experience bullying daily. Teachers play a key role in supporting victimized students and they could do so using their classroom seating arrangement. Common teacher strategies are to separate victims and bullies and to seat victims close to supportive others, but research has not examined whether these strategies support victims' wellbeing. Therefore, the current study tested an intervention in which victims in experimental classrooms were seated far away from their bullies and next to their best friends, whereas a random seating arrangement was implemented in control classrooms. The underlying reasoning was that victims would experience a sense of safety next to their best friend and to limit bullies' opportunities to harass the victim. The outcomes were classroom comfort, internalizing problems, academic engagement, and victimization frequency. We used a sample of 1746 Dutch upper elementary school students (M_{age} = 10.21) of whom 250 students reported to be chronically and frequently victimized (M_{age} = 9.96 years). Ethical and practical reasons rendered the conditions similar regarding victims' distances to their bullies. Consequently, the intervention in the end tested the effect of victims sitting next to their best friend. Several mixed-effects models showed that no support was found for the effectiveness of this intervention. Additional exploratory analyses testing the effect of victims' continuous distances to their bullies on their wellbeing also found no effects. These findings suggest that changing victims', bullies', and best friends' seats do not improve victims' classroom wellbeing. Alternative explanations, directions for future research, and practical implications are discussed.

KEYWORDS

bullying, classroom seating arrangement, classroom well-being, randomized controlled trial, victimization

1 | INTRODUCTION

Bullying is still a world-wide problem in schools (UNESCO, 2019). Every teacher wants to provide support when it comes to their attention that a student is victimized. As the responsible adults in the classroom, teachers are in a unique position to impact peer victimization processes for the better (Troop-Gordon, 2015; Yoon et al., 2020). They can implement anti-bullying interventions, but these require substantial time to be implemented effectively (Olweus & Limber, 2010), while victims' wellbeing is threatened daily. One way to instantly support victimized students could be a strategic seating rearrangement. Common teacher strategies are to seat bullies and victims far away from each other and the victim close to a friend or supportive other once they know what is going on (Hoekstra et al., 2023). This makes sense intuitively, but it has not been systematically tested whether these strategies indeed are effective in improving victims' wellbeing and reducing victimization. Therefore, the current study examined whether teachers can provide a safer social environment for victims by assigning the involved students to specific seats.

1.1 | Victimization in the Classroom

Victimization entails the intentional and repeated targeting of an individual by one or multiple peers who are more powerful than the victim (Olweus, 1994). Studies report varying victimization rates among youth, ranging from 9% to even 36% (OECD, 2019; UNESCO, 2019; World Health Organization, 2020), but there is a clear consensus on the negative effects of being victimized by peers (e.g., Juvonen & Graham, 2014; Olweus, 2013; Schacter, 2021) on mental and physical health in the short and the long term (e.g., Arseneault, 2018; Gini & Pozzoli, 2013). In addition, victimization has far-reaching consequences for society in terms of (mental) health care costs, as the estimated total costs of victimization are over 1.4 million dollars per victimized individual across the lifespan (Wolke & Lereya, 2015).

Although cyberbullying has increased over the past two decades, victimization still mainly occurs live at school (Baldry et al., 2017; Pichel et al., 2021). Hence, teachers play an important role in addressing peer victimization (Troop-Gordon, 2015) and ensuring a safe social climate (Farmer et al., 2011; Yoon et al., 2020). A logical step for teachers is to implement an anti-bullying intervention. They can be effective (Gaffney et al., 2021; Ttofi & Farrington, 2011), but require substantial time, attention, and training (Olweus & Limber, 2010). Thus, there is a need for a simple-to-implement form of instant victim support in addition to long-term and more elaborate anti-bullying interventions. Ideally, because teachers face a high workload, this form of instant support is not time-consuming nor labor-intensive.

1.2 | Seating arrangements to support victims

As seating arrangements are a universally present element in the elementary school classroom, they may be suitable to support victims. Previous studies suggest that teachers already do this. Troop-Gordon and Ladd (2015) investigated 170 grade 6 and 7 teachers' response strategies to peer bullying and victimization and asked them how often they separated aggressors and their victims. They found that teachers on average scored $M = 3.82$ on a scale from 1 to 5, suggesting that the teachers in their sample separated them relatively often. Furthermore, qualitative studies have also shown that separating bullies and victims is common practice in classrooms. Gremmen et al. (2016) found that teachers separate students from whom they expect negative behavior to diminish it and that teachers promote positive behavior by seating students next to a friend for safety. Similarly, Hoekstra et al. (2023) found that teachers seat victims next to someone they feel safe with or who can defend or comfort them to promote wellbeing. Teachers also reported to separate victims from their bullies, especially when they deemed this necessary for the victim's wellbeing.

Moreover, empirical studies have shown associations between seating arrangements and students' social relations and individual outcomes. For example, social status was higher for centrally seated students than students located at the sides (Van den Berg & Cillessen, 2015), classmates sitting near each other increased friendship formation (Faur & Laursen, 2022), and students' distance to friends impacted academic engagement and achievement (Gremmen et al., 2018). Next to concurrent associations, intervention studies found that peer relationships and individual outcomes can even be impacted through seating. For example, when students who initially disliked each other were seated closer together, they liked each other more over time (Van den Berg et al., 2012), although potentially at the cost of the larger classroom climate (Braun et al., 2020).

Taken together, studies show that teachers already apply seating strategies in educational practice and use them when deciding where to seat victims. There are also several indications in the literature that these strategies may be effective to improve victims' wellbeing.

1.3 | Seating strategies that support victims

Previous intervention studies reduced the distance between students to affect their relationship (e.g., Van den Berg et al., 2012). These were based on the contact hypothesis (Allport, 1954), which states bringing people into contact with each other can decrease negative perceptions. Yet, there is a power imbalance between victims and bullies (Olweus, 1994). Hence, it may not be beneficial to seat them together, as increasing contact may likely not lead to improved quality of contact, but an increase in victimization. Moreover, there are ethical concerns for such a strategy, as it may amplify existing risks for severe and long-term negative consequences for victims.

Therefore, it may be best if a teacher seats a victim far away from their bully. This may simply limit the harassment opportunities (Moon & Alarid, 2015; Popp, 2012). Hoekstra et al. (2023) found that teachers reported a similar line of reasoning when they chose to separate bullies and victims. Research found that when teachers reported using this strategy, classroom levels of peer victimization were lower (Kochenderfer-Ladd & Pelletier, 2008; Troop-Gordon &

Ladd, 2015). In addition, victims may feel less threatened and confronted with negative thoughts about victimization when sitting far away from their bullies.

In addition to reducing victimization, strategically rearranging seats may also strengthen victims' existing peer relationships. Teachers could seat victims next to a supportive peer such as their best friend, as this allows the friend to support the victim in ways that would be harder, if possible, when they would sit farther away. For example, when they are sitting next to the victim, the best friend can more easily offer support during a bullying event (e.g., defend the victim) or after the victim has been harassed (e.g., help the victim recover). The assumed importance of the friend being physically close is in line with the reasoning by Gremmen et al. (2018) in their study on students' proximity to their friends and their achievement and engagement. Being physically close to each other facilitates opportunities for daily interactions and these students are likely to impact each other's classroom experiences. Studies have shown that teachers in educational practice are indeed reported to intentionally place victims next to a classmate with whom they feel safe to enhance wellbeing (Hoekstra et al., 2023). Research focusing on friend support in general (not focusing on classroom proximity) has shown that friend support provides victims with a sense of social safety and alleviates the negative effects of victimization (Adams et al., 2011; Flaspohler et al., 2009; Kendrick et al., 2012).

1.4 | Current study

We ran a randomized controlled trial to investigate whether wellbeing increased after an intervention in which victims in the experimental condition were seated next to their best friend and as far away as possible from their bullies as opposed to a random rearrangement in the control condition. We expected victims in the experimental condition to feel more comfortable in class, experience fewer internalizing problems, would be more academically engaged, and potentially also experience less victimization compared to victims in the control condition.

2 | METHOD

This study is part of research project "Safe at School" (SAS: https://osf.io/57z9a). Before data analysis, the research questions, hypotheses, and analyses were preregistered on the Open Science Framework (OSF: https://osf.io/ncwq7). All procedures and measures were approved by the Institutional Review Board of the Faculty of Social Sciences at Radboud University [ECSW-2020-047].

2.1 | Recruitment and assignment to condition

This study took place in 2020–2021 and 2021–2022. Teachers were recruited via e-mails containing a short project description. Upon expressing interest they received an information package and follow-up call. After agreeing to participate, teachers received an online consent form confirming the participation of their classroom as well as their own. The head of the school also received this form to confirm the participation of their school. The classroom was then randomly assigned to the experimental or control condition. Teachers were informed that the seating arrangement would be changed to promote positive peer relationships but were unaware of which specific strategies. They were kept blind to condition until the end of the project. Parents or guardians also received an online information and consent form in which they could watch information clips and read about the goal and set-up of the study. After that, they were asked for active informed consent for participation of their child(ren), which was obtained for 90.4% of the students.

2.2 | Participants

Teachers and students from 81 grade 4, 5, and 6 (Dutch upper elementary school) classrooms of 35 schools participated (15% in 2020–2021, 85% in 2021–2022), located throughout the Netherlands. The average class had 24 students. Of the total possible sample of 1932 students, 1746 (90.4%) had full consent to participate and 1624 students (M_{age} = 10.21 years, SD = 1.02) completed the T1 questionnaire. Of them, 791 were girls (48.7%), 820 were boys (50.5%), and 11 identified as other (0.7%).

For this study, we identified 250 students who were chronically and frequently victimized (14.3% of the total sample; M_{age} = 9.96 years, SD = 1.00, range 8–13). Of them 136 were girls (54.4%), 110 were boys (44.0%) and 4 identified as other (1.6%). Based on self-reported victimization frequency there were four victims per classroom on average (SD = 2.09, range = 1–12).

2.3 | Measures

All measures at T1 and T2 were obtained in the same manner. We conducted reliability analyses in the full sample of the overarching project (n = 1747) and in the subsample of victims of this study (n = 250). Reliability of the measures in both samples was comparable. We report the reliability of the victim subsample in this paper and the reliability of the full sample on OSF (https://osf.io/e6v9b/).

2.3.1 | Identification of victims

We used the Dutch version of the Olweus Bully/Victim Questionnaire (Olweus, 1996). We provided students with a description of bullying and asked "In the last 3 months, how often were you bullied?" They responded using a 5-point Likert scale (1 = never, 5 = almost every day). Students who indicated being bullied at least once a month over a period of 3 months (score ≥3) at T1 were considered victims (Van der Ploeg et al., 2022).

2.3.2 | Identification of victims' bullies and best friend

Dyadic peer nominations were used to identify victims' bullies and best friends. Victims were asked 'Who bullies you?' (Veenstra et al., 2007) and they could nominate as many bullies as they wanted, both same-sex and other-sex classmates. Furthermore, we asked victims about their single best friend ("Who is your very best friend?"). They could nominate only one best friend, who could be a same-sex or other-sex classmate. In case they did not nominate a best friend, we selected one of their other good friends ("Who are your other good friends?").

2.3.3 | Classroom comfort

We used the 4-item Comfort subscale of the Classroom Peer Context Questionnaire (Boor-Klip et al., 2016). An example is "In this class I can be myself." Students rated how much each statement fit them (1 = not at all true, 5 = very true). We composed an average score for each student (α = .84 at T1 and α = .86 at T2).

2.3.4 | Internalizing problems

Depression

We used the Short Moods and Feelings Questionnaire (Angold et al., 1995). This questionnaire has 13 statements (e.g., Felt miserable or unhappy). Students rated how often they felt that way in the past 2 weeks (1 = not at all, 5 = all the time). We composed an average depression score (α = .94 at T1 and α = .95 at T2).

Social anxiety

We used the Social Anxiety Scale for Children-Revised (La Greca & Stone, 1993). This questionnaire has 18 statements (e.g., I worry about what other children say about me). Students rated how often they felt that way in the current school year (1 = not at all, 5 = all the time). We calculated an average social anxiety score (α = .94 at T1 and α = .95 at T2).

Loneliness

We used the 16-item Children's Loneliness and Social Dissatisfaction Scale (Asher & Wheeler, 1985). An example item is "It's hard for me to make friends at school." Students rated how much each item fit them (1 = not at all true, 5 = very true). Average scores were computed (α = .73 at T1 and α = .75 at T2).

A score for internalizing problems was computed as the average of depression, anxiety, and loneliness. The three scale scores correlated positively with each other (*rs* = 0.39–0.61 at T1; *rs* = 0.34–0.70 at T2). The composite internalizing problems measure was reliable (α = .71 at T1 and α = .75 at T2).

2.3.5 | Academic engagement

We used the behavioral and emotional engagement subscales of the Engagement versus Disaffection with Learning Scale (Skinner et al., 2008) consisting of 10 items (e.g., When I am in class, I participate in class discussions). Students rated how much each statement fit them (1 = not at all true, 5 = very true). We composed an average score for each student (α = .84 at T1 and α = .85 at T2).

2.3.6 | Victimization frequency

The previously described score used to identify victims was also used as measure for victimization frequency.

2.4 | Procedure

We conducted a randomized controlled trial with two measurement occasions. T1 and T2 were 8–12 weeks apart and the intervention took place in between. Classrooms could start at any point in the year, depending on teachers' preferences. At each measurement occasion, researchers visited the classroom. The researchers explained the overarching topic of the study (i.e., creating a safe and comfortable classroom atmosphere for all students) without revealing the true goal of the study (i.e., enhancing victims' wellbeing), provided instructions, and emphasized that all data would be handled confidentially. Then students filled out an online questionnaire which took approximately an hour. Teachers provided their current classroom seating arrangement (Van den Berg & Cillessen, 2015) using an online seating arrangement tool. If a physical visit was not possible (e.g., because of COVID-19 restrictions), the visit took place virtually (i.e., the teacher received login information and an instruction video containing the same instructions as in a live visit to show the students).

2.4.1 | Intervention

The intervention concerned a rearrangement of seats, in which the desk configuration remained the same, yet students were assigned to different seats. First, teachers were asked whether certain students had to sit at specific locations, for instance because of auditory or visual problems. These requests were always taken into account. Next, we used an online tool that a software company built specifically for this project to generate a new seating arrangement, based on an algorithm containing our seating strategies (i.e., victims next to their best friend and far away from their bullies). This tool generated 100 potential seating arrangements for a classroom and presented the best-fitting option.

In the *experimental* classrooms, victims were seated next to their best friend and as far away as possible from their bullies, but the latter differed across classrooms depending on a victim's number of

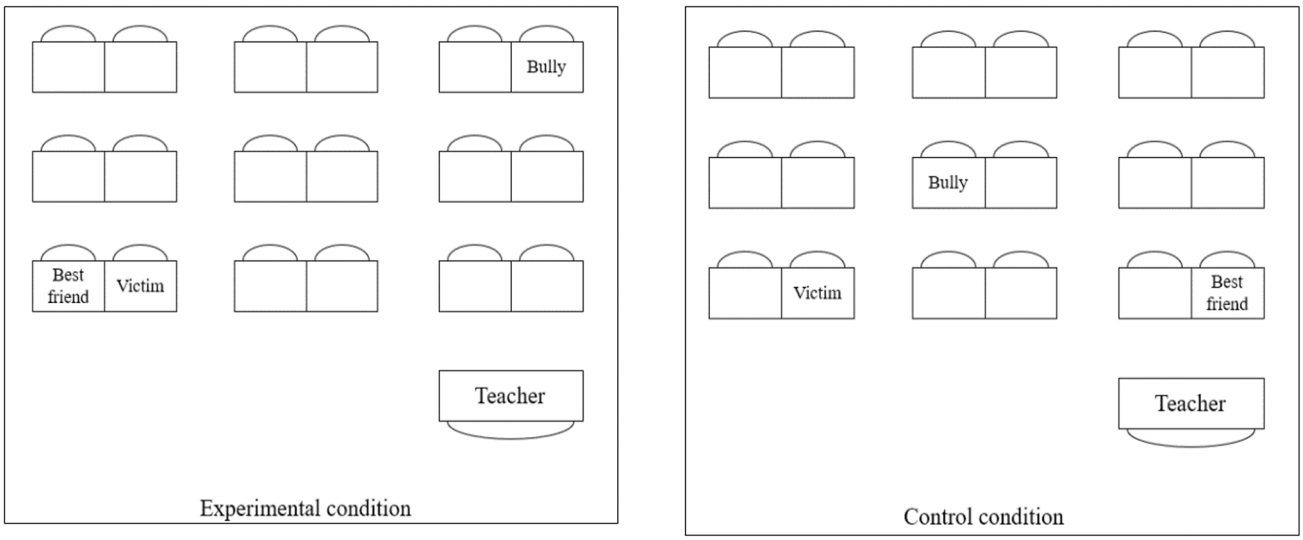

FIGURE 1 Seating intervention principle in experimental and control classrooms.

bullies, the number of victims in the classroom, and the physical size of the classroom. Other students were assigned to seats randomly, yet mixing boys and girls as much as possible, because this is a common teacher strategy (Hoekstra et al., 2023). In the *control* classrooms, all students were assigned to seats randomly, but for ethical reasons we always kept minimally two seats between victims and their bullies. Again, boys and girls were mixed as much as possible. Figure 1 visualizes the intervention principle.

We proposed the new arrangement to the teacher who could request adjustments. For ethical reasons we always accepted these, even if the intervention principle became less optimal.

2.5 | Data analysis

All preregistered analyses were conducted. In addition, a few additional exploratory analyses were run.

2.5.1 | Randomization and manipulation checks

With a χ^2 test and *t*-tests, we checked whether the experimental and control classrooms differed in gender composition, classroom size, percentage of bullies, and outcomes at T1. In addition, we checked whether victims in these conditions differed from in their distance to best friend, distance to bullies, and the changes in these distances from T1 to the intervention.

2.5.2 | Primary analyses

Then, we ran primary analyses to examine the seating intervention effects on classroom comfort, internalizing problems, academic engagement, and victimization frequency. We used the predictors and covariates from T1 and the outcome variables from T2. We ran mixed-effects models in R (R Core Team, 2023) using the lmer function from the lme4 package (Bates et al., 2015). Mixed effects models combine fixed and random effects to account for variability at different levels of hierarchy within the data (Faraway, 2016). In our case, these models accounted for the nesting of timepoints within individual students and of the students within their classrooms. We ran four separate mixed-effects models with fixed effects of condition and time including three levels (i.e., time in individuals in classrooms) for classroom comfort, internalizing problems, and academic engagement. For victimization frequency we included two levels (i.e., time in individuals) because there was <2% variance at the classroom level and the pre-registered criterion was 5%. Individual covariates were gender and age and classroom covariates were the percentage of bullies and the time between T1 and T2. To correct for multiple testing across four outcomes, we applied a Bonferroni correction, $\alpha = .05/4 = 0.0125$. Based on the intention to treat principle, we included all victims, including those without (complete) T2 data.

2.5.3 | Secondary and sensitivity analyses

In the secondary analyses we ran the models with complete cases only (model 2.1; $n = 198$), without the covariates (model 2.2; $n = 250$), and without the victims from classrooms affected by COVID-19 lockdowns or quarantines interrupting the intervention (model 2.3; $n = 206$). Furthermore, we ran sensitivity analyses to determine whether intervention effects varied depending on acceptability and fidelity. Acceptability was defined as the extent to which teachers accepted the intervention principle for each victim (i.e., did the teacher change the victim's seat or those of their bullies or best friend in the proposed new seating arrangement? 0 = no, 1 = yes). We reran the primary analysis with only the victims scoring 1 (model 3.1; $n = 162$) on acceptability. For fidelity, we determined the extent to

which teachers implemented the intervention principle as intended for each victim (i.e., did the teacher keep the victim's seat and those of their bullies and best friend the same during the intervention? 0 = no, 1 = yes). We reran the primary analysis with only the victims who scored 1 (model 3.2; $n = 160$) on fidelity.

3 | RESULTS

3.1 | Descriptive statistics

Descriptive statistics and correlations among the study variables are shown in Table 1. The pattern of correlations is consistent with what one would expect.

3.2 | Randomization and manipulation checks

Our randomization was successful. The manipulation check showed that, as intended, victims in the experimental condition were closer to their best friends during the intervention and had a larger decrease in distance to their best friend between T1 and the intervention arrangement. Contrary to our intentions, victims in the two conditions did not differ in the average distance to their bullies during the intervention, nor in the change in distance to bullies between T1 and the intervention arrangement. This was likely due to the safety measure of minimally two seats between victims and bullies in the control condition. Thus, the intervention primarily included the effect of sitting next to a friend and the results below should be interpreted accordingly. Table 2 shows the results of the randomization and manipulation checks.

3.3 | Primary Analyses (Table 3, Model 1)

3.3.1 | Classroom comfort

There were no significant effects of condition, time, or the interaction between condition and time. Victims in the experimental condition did not report different classroom comfort than victims in the control condition, in general victims did not report more classroom comfort over time, and victims in the experimental condition did not report more classroom comfort over time than victims in the control condition. Gender and number of weeks between T1 and T2 did not predict classroom comfort. Age and percentage of bullies in the classroom were significant predictors. On average, older victims reported lower levels of classroom comfort and victims reported lower levels of classroom comfort if the percentage of bullies in their classroom was higher.

3.3.2 | Internalizing problems

Condition or the condition by time were not significant predictors. Victims did not differ in internalizing problems based on condition

TABLE 1 Descriptive statistics and correlations.

	M	SD	Range	N	1	2	3	4	5	6	7	8	9	10	11
1. Gender			0 – 1	250											
2. Age (years)	9.96	1.00	8–13	250											
3. Percentage of bullies T1	31.06	14.98	3.03– 59.09	250											
4. Classroom size T1	24.18	3.83	16–33	250											
5. Classroom comfort T1	3.66	0.95	1– 5	244	-.16*	-.19**									
6. Internalizing problems T1	2.53	0.68	1– 4.89	224	.12	.06			-.49**						
7. Engagement T1	3.99	0.62	1.4– 5	234	-.06	-.16*			.51**	-.20**					
8. Victimization frequency T1	3.76	0.80	3–5	250	-.03	-.00			-.22**	.18**	.01				
9. Classroom comfort T2	3.75	0.94	1– 5	214	-.10	-.22**			.69**	-.42**	.49**	-.17*			
10. Internalizing problems T2	2.38	0.66	1–5	214	-.14*	.06			-.28**	.66**	-.13	.06	-.46**		
11. Engagement T2	3.98	0.6	2.3–5	210	.02	-.16*			.36**	-.14*	.58**	-.04	.47**	-.30**	
12. Victimization frequency T2	2.57	1.35	1–5	217	-.03	-.06			-.22**	.31**	-.14	.25**	-.32**	.39**	-.09

*$p < .05$; **$p < .01$; ***$p < .001$.

TABLE 2 Randomization and manipulation checks.

	Experimental condition		Control condition		Test statistics	
	M	SD	M	SD	*t*	*p*
Classroom size	23.65	4.27	24.57	3.43	1.83	.06
Percentage of bullies	32.14	17.19	30.27	13.11	−0.98	.33
Classroom comfort	3.62	0.94	3.69	0.95	0.61	.54
Internalizing problems	2.58	0.62	2.49	0.72	−0.96	.34
Academic engagement	4.01	0.58	3.97	0.66	−0.47	.64
Victimization frequency	3.77	0.81	3.75	0.79	−0.23	.82
Distance to closest bully at T1[a]	0.27	0.18	0.25	0.14	−0.97	.33
Average distance to bullies at T1[a]	0.36	0.16	0.35	0.13	−0.85	.40
Distance to best friend during intervention	0.13	0.14	0.37	0.16	11.69	<0.001
Average distance to bullies during intervention	0.44	0.13	0.41	0.13	−1.43	.16
Change in distance to best friend from T1 – intervention	−0.20	0.23	0.05	0.24	7.53	<0.001
Change on average distance to bully/bullies from T1 - intervention	0.07	0.20	0.04	0.36	−0.74	.46
					χ^2	*p*
Gender distribution					0.06	.80

Abbreviation: SD, standard deviation.

[a]Tested as part of the exploratory analyses in the subsample of victims for whom the intervention principle was not changed from T1 to T2 ($N = 160$).

and victims in the experimental condition did not report different levels of internalizing problems over time than victims in the control condition. There was a significant effect of time, indicating that victims in reported fewer internalizing problems over time, regardless of condition. None of the other covariates predicted internalizing problems.

3.3.3 | Academic engagement

Academic engagement was not predicted by condition, time, or condition by time. Victims in the experimental condition did not report different academic engagement than victims in the control condition, victims in general did not change in academic engagement over time, and victims in the experimental condition did not report different levels of academic engagement over time than victims in the control condition. Of the covariates, only age was a significant predictor. Older victims scored lower on academic engagement than younger victims.

3.3.4 | Victimization frequency

There were no significant effects of condition or the interaction between condition and time. Victims in the experimental and control condition did not differ in victimization frequency and victims in the experimental condition did not report a different victimization frequency over time than victims in the control condition. There was a significant effect of time. Victims in general reported a lower victimization frequency over time. None of the covariates were significant predictors.

Although there were no interaction effects for any of the outcomes, we present the means and standard errors for the condition by time cells for all dependent variables in Table 4 to provide more insight in our data.

3.4 | Secondary Analyses (Table 3, Model 2)

Compared to the primary analyses we only found different results in the secondary complete cases-only analysis (model 2.1) and only for classroom comfort. Age was no longer a significant predictor, but gender was, indicating that girl victims on average experienced less classroom comfort than boy victims. For the other secondary analyses (model 2.2 and 2.3) and outcomes the results were the same as in the primary analyses.

3.5 | Sensitivity Analyses (Table 3, Model 3)

Before running the sensitivity analyses, we checked whether victims who were included in those analyses differed from victims who were excluded from these analyses. For acceptability we found that victims whose teachers accepted the intervention seating arrangement that

TABLE 3 Unstandardized regression coefficients and standard errors for primary, secondary, and sensitivity analyses predicting victims' outcomes.

	Model 1		Model 2.1		Model 2.2		Model 2.3		Model 3.1		Model 3.2	
Predictors	**B**	**SE**	**B**	**SE**	**B**	**SE**	**B**	**SE**	**B**	**SE**	**B**	**SE**
Classroom Comfort												
Condition	0.03	0.20	−0.02	0.21	0.10	0.22	−0.02	0.20	−0.08	0.25	0.38	0.23
Time	0.14	0.07	0.14	0.07	0.17	0.08	0.10	0.07	0.13	0.08	0.16	0.07
Time* condition	0.02	0.10	0.03	0.11	0.00	0.11	0.01	0.10	0.16	0.13	−0.13	0.12
Gender	−0.26	0.11	−0.32**	0.11	−0.25	0.12			−0.47***	0.13	−0.28	0.14
Age	−0.19***	0.06	−0.15	0.06	−0.17**	0.06			−0.16	0.07	−0.22***	0.06
Perc. bullies classroom	−0.01**	0.00	−0.01**	0.00	−0.01**	0.00			−0.02***	0.01	−0.02***	0.00
No. of weeks T1-T2	0.02	0.02	0.02	0.02	0.01	0.03			0.04	0.02	−0.02	0.03
Internalizing Problems												
Condition	0.08	0.15	0.08	0.16	0.02	0.16	0.09	0.15	0.17	0.20	−0.24	0.18
Time	−0.16**	0.05	−0.16**	0.06	−0.17**	0.06	−0.15**	0.05	−0.17**	0.06	−0.21***	0.06
Time* condition	−0.01	0.08	−0.00	0.08	−0.01	0.08	−0.01	0.08	−0.12	0.10	0.11	0.10
Gender	0.19	0.08	0.20	0.08	0.21	0.09			0.36***	0.09	0.28**	0.10
Age	0.06	0.04	0.04	0.04	0.03	0.04			0.10	0.05	0.09	0.05
Perc. bullies classroom	0.00	0.00	0.01	0.00	0.00	0.00			0.01	0.00	0.00	0.00
No. of weeks T1-T2	−0.02	0.01	−0.03	0.01	−0.02	0.02			−0.04	0.02	−0.03	0.02
Academic Engagement												
Condition	0.20	0.15	0.21	0.16	0.20	0.16	0.19	0.15	0.16	0.19	0.28	0.18
Time	0.09	0.05	0.12	0.05	0.08	0.06	0.06	0.05	0.12	0.06	0.11	0.06
Time* condition	−0.13	0.08	−0.15	0.08	−0.13	0.08	−0.13	0.08	−0.08	0.10	−0.12	0.10
Gender	−0.04	0.07	−0.04	0.08	−0.03	0.08			−0.13	0.08	−0.03	0.08
Age	−0.13***	0.04	−0.12**	0.04	−0.12**	0.04			−0.15**	0.05	−0.15**	0.05
Perc. bullies classroom	−0.01	0.00	−0.01	0.00	−0.01	0.00			−0.01	0.00	−0.01*	0.00
No. of weeks T1-T2	−0.00	0.01	0.00	0.01	−0.00	0.02			0.01	0.02	0.00	0.02
Victimization												
Condition	−0.13	0.30	−0.24	0.32	-0.02	0.33	-0.09	0.29	−0.15	0.37	−0.23	0.37
Time	−1.24***	0.12	−1.24***	0.13	−1.21***	0.14	−1.24***	0.12	−1.23***	0.14	−1.26***	0.14

TABLE 3 (Continued)

	Model 1		Model 2.1		Model 2.2		Model 2.3		Model 3.1		Model 3.2	
Predictors	**B**	**SE**	**B**	**SE**	**B**	**SE**	**B**	**SE**	**B**	**SE**	**B**	**SE**
Time* condition	0.13	0.19	0.21	0.20	0.06	0.20	0.11	0.18	0.10	0.23	0.22	0.22
Gender	−0.03	0.12	−0.05	0.13	−0.03	0.13			0.03	0.14	−0.02	0.14
Age	−0.01	0.06	−0.02	0.06	−0.03	0.06			0.03	0.07	0.03	0.07
Perc. bullies classroom	0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.01	0.00	0.00
No. of weeks T1-T2	−0.03	0.02	−0.03	0.02	−0.03	0.02			−0.01	0.02	−0.03	0.03

Note: Model 1.1 = Primary analysis: all participants and covariates ($N = 250$). Model 2.1 = Secondary analysis: complete cases only ($N = 198$). Model 2.2 = Secondary analysis: excluding COVID-19 affected classrooms ($N = 206$). Model 2.3 = Secondary analysis: excluding covariates ($N = 250$). Model 3.1 = Sensitivity analysis: acceptability, excluding victims whose teachers did not accept the seating proposal ($N = 162$). Model 3.2 = Sensitivity analysis: fidelity, excluding victims for whom the intervention principle was violated during the intervention ($N = 160$).

Abbreviation: SE, standard error.

**$p < .01$; ***$p < .001$.

TABLE 4 Group means and standard errors for condition by time cells for all outcome variables.

	Condition	Time	Mean	SE
Classroom comfort	Control	1	3.69	0.08
	Control	2	3.75	0.09
	Intervention	1	3.62	0.09
	Intervention	2	3.74	0.10
Academic engagement	Control	1	3.97	0.06
	Control	2	4.01	0.06
	Intervention	1	4.01	0.06
	Intervention	2	3.93	0.06
Internalizing problems	Control	1	2.49	0.06
	Control	2	2.35	0.06
	Intervention	1	2.58	0.06
	Intervention	2	2.42	0.07
Victimization	Control	1	3.75	0.07
	Control	2	2.51	0.12
	Intervention	1	3.77	0.08
	Intervention	2	2.65	0.14

Abbreviation: SE, standard error.

we proposed, did not differ on any of our outcomes from victims whose teachers did not accept it. For fidelity we found that victims for whom the intervention principle was kept active during the intervention scored higher on academic engagement and lower on victimization frequency than victims for whom the intervention principle was violated during the intervention. The sensitivity analysis for fidelity thus included a sample in which academic engagement was somewhat higher and victimization frequency was somewhat lower than in the full sample.

Compared to the primary analysis, age did not predict classroom comfort anymore in the sensitivity analysis for acceptability (model 3.1), but an effect of gender emerged. When including only the victims for whom teachers accepted the intervention principle, girl victims on average experienced lower classroom comfort than boy victims. The sensitivity analysis for fidelity (model 3.2) showed the same results as the primary analyses.

For internalizing problems, gender emerged as an additional predictor in both the acceptability and fidelity analyses (models 3.1 and 3.2) as compared to the primary analysis. When we focus on only the victims for whom their teachers accepted the intervention principle and for whom the intervention principle was kept active throughout the intervention, girl victims experienced more internalizing problems than boy victims.

For academic engagement we found the same results in the acceptability analysis as in the primary analyses. In the fidelity analysis the percentage of bullies in the classroom emerged as an additional predictor, but as the estimate remained the same as in all other

models with this outcome. Due to this inconsistency, we did not interpret this finding.

For victimization frequency both sensitivity analyses yielded the same results as the primary analyses.

3.6 | Exploratory Analyses (Table 5, Model 4)

As the manipulation check indicated that the conditions did not differ with regard to victims' distance to their bullies, the condition variable did not include the effect of victims' distance to bullies as intended. Therefore, we ran exploratory analyses using victims' within-classroom standardized distances to bullies and best friends as predictors. We ran the same models as the primary analyses (i.e., the same covariates and outcomes) with the victims for whom the intervention principle was kept intact during the intervention period (i.e., score of 1 on sensitivity analysis for fidelity). We ran four different models with different predictors each time: victims' average distance to all bullies and the change in their average distance to their bullies (model 4.1.1), the distance to their closest bully and the change in distance to their closest bully (model 4.1.2), victims' distance to their best friend (model 4.2.1), and victims' change in distance to their best friend (model 4.2.2). None of the predictors were significant for any of the outcomes. Regarding the covariates all results but one were the same as in the primary analyses. Gender emerged as a significant predictor for internalizing problems indicating girl victims reported more internalizing problems than boy victims. This makes sense, as the subsample for the exploratory analysis was the same as the subsample for the sensitivity analysis for fidelity where the same effect of gender was found.

4 | DISCUSSION

Teachers use seating arrangements to manage social dynamics and respond to bullying using specific seating strategies (e.g., Hoekstra et al., 2023), but research on their effectiveness is limited. We conducted a randomized controlled trial to test whether teachers' intuitive strategy to separate victims from their bullies and place them close to supportive others is indeed an effective intervention for victims' classroom comfort, internalizing problems, academic engagement, and victimization frequency. Contrary to our hypotheses, yet consistently across all analyses, victims in the intervention and control condition did not differ from each other on any of the outcomes. Analyzing victims' distances to their best friend and bullies separately also did not indicate any effects. This suggests that merely changing victims' seats does not support their wellbeing in class.

4.1 | Impact of seats on victims' outcomes

Although it may intuitively sound like a good idea to seat victims next to their friend and far away from their bully and even though these are common teacher practices (Gremmen et al., 2016; Hoekstra et al., 2023; Troop-Gordon & Ladd, 2015), we could not confirm they are evidently effective. A general explanation could be that victims did feel better in their specific location, but that this increased feeling of safety was not reflected in the more general wellbeing measures we used. For example, the classroom comfort measure included items such as "I feel comfortable in my class," which may tap more into students' general classroom experiences. Future research on the effects of seating arrangements on victimization should directly measure victims' sense of safety from their bully's harassment specifically or their feelings of safety in their specific seating location to test this explanation. In addition, there may be explanations specifically related to the best friend and bully components of the intervention.

4.1.1 | Victims' proximity to their best friend

The lack of an effect of condition suggests that sitting next to their best friend does not help victims to feel better. This may be because victims' friendship nominations did not have to be reciprocated. If the friend did not consider the victim to be a friend, they may have been less supportive than we anticipated. Thus, for future research, it is valuable to know whether a friendship is reciprocated as well as the degree to which a victim feels supported by their friend especially during or immediately after bullying incidents.

Relatedly, we assumed that a friend could defend the victim, but could not test the degree to which this occurred. Research suggests that defending and friendship co-occur (e.g., Chen et al., 2016; Oldenburg et al., 2018), but there could be various reasons for a friend not to defend a victim. For instance, the friend may be afraid of the bully or to be harmed themselves if they intervene. It may be detrimental to a victim's outcomes if the person they considered their best friend did not defend them when they needed them to. It could also be that other, nonfriend classmates defend victims. Therefore, it is important that future research examines whether defending by a friend is more likely when victims' friends are seated nearby and whether it is beneficial for victims to be seated next to someone the victim nominates as a defending classmate.

4.1.2 | Victims' proximity to their bully/bullies

Victims' distance to bullies was not associated with wellbeing. The safety measure of minimally two seats between victims and bullies could be an explanation. Perhaps not sitting in adjacent seats is already enough for victims to feel safe and the extra distance does not add to feeling better. Testing the effect of sitting close/next to bullies versus far(ther) away in an experimental manipulation yields too many ethical concerns, but future research could use existing datasets focused on other topics than victimization in which victims were coincidentally seated close to their bullies. Such studies could try to identify a critical minimum distance that should be between a victim and their bully. For example, sitting within earshot of bullies

TABLE 5 Unstandardized regression coefficients and standard errors for exploratory analyses predicting victims' outcomes.

	Model 4.1.1		Model 4.1.2		Model 4.2.1		Model 4.2.2	
Predictors	***B***	***SE***	***B***	***SE***	***B***	***SE***	***B***	***SE***
Classroom comfort								
Average distance bullies	−0.25	0.56						
Change average distance bullies	0.00	0.01						
Distance closest bully			0.81	0.62				
Change distance closest bully			−0.73	0.50				
Distance best friend					0.08	0.56		
Change distance best friend							−0.28	0.23
Gender	−0.23	0.14	−0.23	0.14	−0.26	0.17	−0.20	0.13
Age	−0.17	0.07	−0.15	0.07	−0.19	0.08	−0.16**	0.06
Perc. of bullies classroom	−0.01**	0.01	−0.01**	0.01	−0.02	0.01	−0.02***	0.00
No. of weeks T1–T2	0.01	0.02	0.02	0.03	0.03	0.03	0.01	0.02
Internalizing problems								
Average distance bullies	0.41	0.37						
Change average distance bullies	−0.01	0.01						
Distance closest bully			0.42	0.41				
Change distance closest bully			0.02	0.33				
Distance best friend					0.10	0.42		
Change distance best friend							0.12	0.18
Gender	0.27**	0.09	0.26**	0.10	0.30	0.13	0.24	0.10
Age	0.06	0.05	0.06	−.05	0.06	0.06	0.06	0.05
Perc. of bullies classroom	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
No. of weeks T1–T2	−0.03	0.02	−0.02	0.02	−0.02	0.02	−0.02	0.02
Academic engagement								
Average distance bullies	−0.59	0.35						
Change average distance bullies	0.01	0.01						
Distance closest bully			0.26	0.40				
Change distance closest bully			−0.41	0.32				
Distance best friend					−0.17	0.39		
Change distance best friend							−0.20	0.16
Gender	0.05	0.09	0.03	0.09	0.02	0.12	0.06	0.09
Age	−0.14**	0.05	−0.13**	0.05	−0.15**	0.05	−0.12**	0.04
Perc. of bullies classroom	−0.01	0.00	−0.01	0.00	−0.01	0.00	−0.01	0.00
No. of weeks T1–T2	0.00	0.02	0.00	0.02	−0.00	0.02	0.00	0.02
Victimization								
Average distance bullies	0.34	0.58						
Change average distance bullies	0.01	0.01						
Distance closest bully			−0.88	0.64				
Change distance closest bully			0.84	0.52				
Distance best friend					0.17	0.64		

(Continues)

TABLE 5 (Continued)

Predictors	Model 4.1.1		Model 4.1.2		Model 4.2.1		Model 4.2.2	
	B	*SE*	*B*	*SE*	*B*	*SE*	*B*	*SE*
Change distance best friend							0.00	0.27
Gender	0.07	0.15	0.05	0.15	0.04	0.19	−0.01	0.15
Age	−0.02	0.08	−0.01	0.08	0.00	0.09	−0.04	0.07
Perc. of bullies classroom	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01
No. of weeks T1–T2	−0.04	0.03	−0.04	0.03	−0.04	0.03	−0.04	0.03

Note: Model 4.1.1 = Victims' average distance to their bullies and victims' change in average distance to their bullies as predictors ($N = 160$). Model 4.1.2 = Victims' distance to their closest bully and victims' change in distance to their closest bully as predictors ($N = 160$). Model 4.2.1 = Victims' distance to their best friend as predictor (only control condition victims, $N = 101$). Model 4.2.2 = Victims' change in their distance to their best friend as predictor ($N = 160$).

Abbreviation: SE, standard error.

$^{**}p < .01$; $^{***}p < .001$.

may still contribute to negative experiences for a victim, whereas sitting beyond that threshold may be helpful. Nevertheless, this study yielded the highly relevant information that separating victims from bullies does not seem to support victims and that teachers need to provide additional forms of support, but our results do not rule out that a minimum distance between them may still be required.

Another explanation is that being in the same room might already be stressful and detrimental to victims' wellbeing. The classroom is a closed space and students cannot leave. Whereas closer proximity may provide more opportunities (Moon & Alarid, 2015; Popp, 2012), bullying by gestures or comments can still take place from a distance. Research has shown that victims are more sensitive to stress (Knack et al., 2011) and are more occupied with threat (Idsoe et al., 2021). Seeing bullies may already evoke stress and be traumatic, irrespective of how far away they sit. Future research could thus examine whether victims' perceptions of bullies as stressors play a role in the association between a victim's distance to bullies and their wellbeing.

Moreover, students also move through the classroom, which means that bullies can approach victims to harass them, for example on their way to the bathroom. In such cases, sitting farther away does not enhance victims' wellbeing. Future research could employ movement tracking technology to identify victims' and bullies' movements through the classroom. Studies could examine whether bullies indeed actively approach victims or whether victims' movement patterns show that they avoid bullies when moving through the classroom.

Our study took a first step in examining the role of seating arrangements in supporting victims. The fact that we did not detect overall intervention effects on victims' average wellbeing does not mean it did not work for any individual and it also does not disregard that teachers need to carefully think about seating victims, their friends, and their bullies. It could be that the intervention only works for certain victims under certain circumstances. For example, the current strategies may be only effective for victims who are harassed on a daily basis, by bullies who do not target specific victims but any victim who is within their reach, who have best friends who are defenders, in classrooms where bullying norms are low. As such, an important next step is to examine for whom it may still work and under which conditions. This is in line with studies arguing that research should focus on examining the role of moderators and obtain more insight into for whom specifically anti-bullying interventions work (Hensums et al., 2022; Salmivalli et al., 2021). In the case of using seats to support victims' wellbeing, it is important that research identifies individual and classroom characteristics that may drive intervention effects.

4.2 | Strengths, limitations, and future directions

This study had several strengths. First, we ran a randomized controlled trial with a large sample in which we were able to keep teachers blind to condition to measure the effectiveness of our intervention. Second, we preregistered the research questions, hypotheses, and analytic strategy on OSF and made relevant information regarding this study available. Third, we ran secondary, sensitivity, and exploratory analyses to test the robustness of effects and to test alternative explanations and nuances. Fourth, by asking victims to identify their bullies, we exactly knew who bullied them. Peer report on who bullies others in general would not have yielded this highly relevant information. Fifth, all measures were highly reliable, and all constructs were correlated as expected based on previous research. Even though the data were collected during COVID-19 times in which classroom social dynamics may have been affected, our measures turned out as expected and the absence of an effect of the intervention is unlikely to be fully attributable to measures issues. Still, some limitations should be taken into account when interpreting our findings and several directions for future research can be provided.

First, although the intervention principle consisted of two components (i.e., proximity to best friend and to bullies) and even though we ran the intervention completely as intended, the safety measure rendered the intervention and control conditions similar. Because in intervention classrooms we could not always seat victims as far away as possible from their bullies, they ended up sitting at similar

distances in both conditions. Therefore, victims' distance to bullies ended up not being a component of the intervention, contrary to what we intended. We addressed this by running exploratory analyses on victims' distance to bullies separately.

Second, teachers' preferences and students' needs always had to be taken into account. This sometimes interfered with the intervention principle. For instance, when bullies had to sit in the front due to auditory problems, they could not always be placed as far away as possible from the victim. Whereas these limitations would also be present in daily practice, it does interfere with a perfect experimental research principle. Finding a balance between scientific, ethical, and practical interests always remains a challenge when running field studies.

Third, we did not take into account the role of eye contact and sight lines. It could be that not necessarily being close but being able to see or have eye contact with bullies is stressful for victims, as victimization is a form of interpersonal trauma (Idsoe et al., 2021). It may also be stressful for a victim if bullies can see them, but they cannot see the bullies (e.g., if bullies are seated behind the victim). Although it may be very challenging in terms of feasibility, it would be valuable to know more about the role of these factors in seating arrangement strategies for victims.

Fourth, we now only focused on students' status as a victim and did not consider their academic characteristics, but teachers commonly balance academic and social-emotional needs for each student and pick their seating strategies accordingly (Hoekstra et al., 2023). It could have been that in our study, victims who were normally seated close to the teacher because of academic reasons were seated in the back where they may have felt less supported by their teacher. The lack of inclusion of academic seating considerations may have affected victims' wellbeing as well. Future research should therefore take into account both other social-emotional strategies and combinations with academic strategies when aiming to support victims' wellbeing.

4.3 | Practical implications

When teachers become aware that a student is being victimized they should quickly start up additional anti-bullying interventions as this seating intervention alone did not improve victims' wellbeing. The current intervention may be helpful as an add-on to other anti-bullying efforts but teachers should not expect that merely using victims' placement in the seating arrangement will be sufficient to solve the problems.

Moreover, the null results of the current intervention yield the though-provoking idea that perhaps the key to improving victims' wellbeing lies in decreasing their distance to their bullies rather than increasing it. In line with the theory of mere exposure (Zajonc, 1968), victims may benefit from sitting closer to their bully, because then they see their bully engage in non-hurtful and friendly behaviors as well. Similarly, reducing this distance allows for more interpersonal contact between victims and bullies, which is an effective way to reduce negative peer perceptions, according to interpersonal contact theory and Allport's (1954) contact hypothesis. We recognize that teachers, school leaders, policy makers, or parents may feel hesitant or even resistant to do so, but we believe that exploring this option is important.

If teachers would decrease victims' distance to their bully from, for example, eight seats to four seats it may already help. Allport formulated four conditions under which intergroup contact is most likely to occur and these could apply to victim-bully dyads in the classroom as well. There should be equal group status within the situation, a common goal, cooperation, and support from authorities. In practice, teachers could bring victims and bullies closer by seating them in the same row for example (but leave several seats between them). The teacher could then give the whole class an assignment (e.g., tidying up their desks) with an incentive for the best row. In such an assignment, the contributions of all members are important (i.e., equal group status), all members have the same goal (i.e., tidying up better than other rows), they can help each other when they have finished their own desk (i.e., cooperation), and the teacher can closely monitor the process (i.e., support from authorities). Even though this is just a small example, the underlying idea is that bringing victims and bullies somewhat closer allows them to have more positive contact and see each other in a different light, which may in turn lead to a reduction of victimization. Of course, it remains highly important that teachers judge for which victims, bullies, and in which situations reducing the distance between them is a suitable strategy, but the results of this study and previous findings from the literature seem to encourage exploring the options in this area. This would by no means entail that teachers should seat victims and bullies very close or next to each other. From this study we can merely conclude that sitting somewhat away or far away from bullies does not make a difference for victims, but we cannot ensure the absence of negative effects when seating them very close or next to their bully.

4.4 | Conclusion

The current study identified the need for a short-term, instant way to support victims of bullying. We proposed that teachers use their classroom seating arrangement to enhance victims' wellbeing. Therefore, we examined the effects of a seating intervention on victims' classroom comfort, internalizing problems, academic engagement, and victimization frequency. In this study, we found no evidence that sitting next to their best friend and away from their bullies increased victims' wellbeing. This still does not mean that teachers should start seating victims very close or next to their bullies because our study cannot ensure this is not harmful. Moreover, the current study also does not rule out the potential effectiveness of more complete separation practices, but we could not confirm that sitting next to their best friend and far away from their bullies was on average helpful for victims' wellbeing. Therefore, further research should examine what works, for whom, and when and identify which strategies are beneficial for victims because students spend a lot of time in the classroom and teachers face the challenge of addressing bullying and victimization on a daily basis.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are openly available in the Open Science Framework at https://osf.io/e6v9b/.

ORCID

Nathalie A. H. Hoekstra http://orcid.org/0000-0003-3635-0953

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