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Is there a blast radius of workplace bullying? Ripple effects on witnesses and non-witnesses

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Abstract

Substantial evidence points to detrimental effects of workplace bullying on the health, well-being and job attitudes among those exposed. What is less known is how bullying affects their non-exposed colleagues. In this study, we introduce the concept "blast radius of bullying" and use social information processing theory to investigate how bullying impacts targets, witnesses, and non-witnesses. We suggest three mechanisms to understand the impact bullying may have on non-targets: the working environment mechanism, secondary victimization, and emotional contagion. We hypothesized that non-exposed colleagues in groups where bullying exists would feel some impact of bullying, but that it would be smaller for those further away from the point of impact. We also investigated the association between the severity of mistreatment and outcomes for the above-mentioned categories. We used data (n = 2215) from 195 work groups. The results provided evidence for a blast radius of bullying, however, not as far-reaching as hypothesized as only direct observation of mistreatment was associated with negative outcomes. The severity of mistreatment was not associated with the outcomes, whereas the frequency of observation had some impact for witnesses. The study showed that also witnesses may be regarded as "co-victims".

Keywords Workplace aggression · Bystanders · Health and well-being

Workplace bullying is highly detrimental for those exposed. As shown in numerous primary studies and meta-analyses, targets of bullying suffer grave consequences, including high levels of mental distress, somatic complaints, and sucidal ideation, as well as lower well-being and work ability (Leach et al., 2017; Nielsen & Einarsen, 2012; Nielsen et al., 2016; Verkuil et al., 2015). However, an important unresolved issue within research on workplace bullying is how its occurrence influences those not directly exposed at the workplace. The few studies that exist have mainly been limited to examining colleagues that have witnessed bullying of others directly (e.g., Nielsen et al., 2021; Sprigg et al., 2019; Vartia, 2001), without considering the potential ripple effects on those not knowing that bullying occurs at their workplace or merely have heard rumours about it. Consequently, we do not know whether the occurrence bullying has an impact on the workplace as a whole, or if the consequences are limited to those directly involved as targets, perpetrators, or witnesses. The main objective of the present study is to fill this knowledge gap. We introduce the concept "*blast radius of bullying*" and based on social information processing theory (Salancik & Pfeffer, 1978) we suggest three mechanisms of how this blast radius may be understood. Using group level data, we investigate how the occurrence of bullying in a work group impacts targets, witnesses, and non-witnesses and compare it with employees in work groups free from bullying. Specifically, we determine how the presence of bullying affects creativity, concentration, mental health, sickness absence and sickness presenteeism among targets, witnesses, and non-witnesses.

Workplace bullying has in many cases been treated as a dysfunctional interpersonal process (Fevre et al., 2012; Zapf & Gross, 2001), and to this date, most interventions directed toward bullying has focused on the targets. If bullying also

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has crossover effects on others at the workplace, knowledge about the potential blast radius of bullying is important for the development of more effective measures and interventions that can reduce both the occurrence and consequences of bullying. Knowledge about the ripple effects of bullying will also contribute to our theoretical understanding of the bullying phenomenon.

Is there a blast radius of bullying?

Workplace bullying is defined as systematic, prolonged negative treatment of an employee by co-workers and/or a supervisor (Einarsen et al., 2020). The mistreatment gradually pushes targets to a position where they have an increasing difficulty to ward off or defend themselves against the treatment. It is the combination of systematic mistreatment and perceived inferiority that distinguish bullying from other forms of psychological aggression at the workplace such as incivility and social undermining. Bullying behaviours do not compass a fixed list of behaviours, but most often bullying behaviours can be categorized as being either indirect or direct and targeted at either the personal integrity or the working situation of the bullied (Einarsen & Raknes, 1997). Being exposed to specific harassing behaviours that characterize bullying does not necessarily mean that a person *is* bullied. The duration and the repetetiveness of the behaviour, as well as the power imbalance between the parties, must also be taken into consideration. However, if harassing behaviours occur there is a risk of escalation and the exposure may turn into victimization and disempowerment over time (Einarsen et al., 2020).

It has been argued that since workplace bullying is a dynamic process with negative outcomes for those exposed, it should also have the potential for crossover effects that reach out beyond the immediate protagonists to negatively impact other employees (Lutgen-Sandvik et al., 2007). A crossover, or ripple effect, is a process by which "a psychological strain experienced by one person affects the level of strain of another person in the same social environment" (Westman et al., 2004, p. 769). Yet, as bullying by definition deals with a perpetrator–target relationship, one may intuitively question whether it is likely or even reasonable that the occurrence of bullying should influence those at the workplace that is not directly involved in this relation (Nielsen & Einarsen, 2013). There are previous studies focussing on outcomes for one group of non-targets—witnesses to bullying (e.g., Nielsen et al., 2021; Salin & Notelaers, 2020; Sprigg et al., 2019; Vartia, 2001). In a systematic review and meta-analysis, Nielsen et al. (2023) showed associations between witnessing bullying and, for example, mental health problems and job satisfaction. However, a majority of studies on witness outcomes have not adjusted for the observer's own exposure to bullying; something that is of utmost importance to actually be able to assess any "pure" effects of witnessing bullying of others (Nielsen & Einarsen, 2013). Nielsen et al. (2023) showed that if adjusting for one's own exposure to bullying behaviours the effect size became significantly smaller.

Furthermore, an unresolved issue within research on workplace bullying is how occurrence of workplace bullying affects all employees working in groups infested by bullying, not just targets and witnesses. Previous research on outcomes for non-targets has, in the few studies that exist, treated those who did not report witnessing bullying as employees working in work groups free from bullying (e.g., Vartia, 2001). In a work group where bullying occurs, apart from targets and witnesses, there will also, in most cases, be a majority of employees who are unaware of, or merely have heard rumours about, a co-worker being bullied. However, the findings on possible outcomes for witnesses challenge the conceptualisation of bullying as a purely interpersonal problem affecting only those directly involved and points to a spillover effect that reaches out to potentially impact the broader workplace (Fevre et al., 2012). The present study investigates this extended impact, or *blast radius*, of bullying on those not directly exposed, and how it affects all employees working at workplaces infested by bullying—all non-targets, that is, witnesses and non-witnesses.

The possible blast radius of bullying may be explained by social information processing theory (Salancik & Pfeffer, 1978). In essence, social information processing theory, also referred to as the social influence model, suggests that individuals gather information from their social environment to understand events, form attitudes, and determine expectations of their behaviour and its implications (Salancik & Pfeffer, 1978). The theory further states that people have a tendency to change their behaviour according to those around them, and that the behaviour of ingroup members has stronger impact than the behaviour of outgroup members. Thus, social information is knowledge acquired from one's social environment or through interactions with or observation of others. Consequently, in a workplace setting, an employee's behaviour, attitudes, and emotions are, at least in part, determined by information about others at the workplace. Building on social information processing theory, we suggest that there are three (related) mechanisms that can explain the ripple or crossover effects of bullying: (a) *the working environment mechanism, (b) secondary victimization, and (c) emotional contagion*. In the upcoming sections, we will explain these in more detail.

The Working Environment Mechanism. Previous research have shown that workplace bullying is strongly associated with the psychosocial working conditions at a

workplace (cf. the work environment hypothesis, Einarsen et al., 1994), including role expectations and the social climate (Van den Brande et al., 2016). Although the causal association between bullying and psychosocial working conditions is unclear, some longitudinal evidence point to the occurrence of bullying as a determinant of a poorer working environment (Hauge et al., 2011; Rosander & Salin, 2023). That is, in addition to having negative effects on the health and well-being of those exposed, bullying may also have detrimental effects on the organization as a whole through harming the working environment. Social information processing theory may be a way to explain how a perception of a negative work climate spreads from tagets, to witnesses and to all others at the workplace. Consequently, because bullied employees, witnesses to bullying, and non-witnesses share the same work environment, it can be argued that occurrence of bullying will have a spillover effect on others at the workplace through the psychosocial working environment and that a more negative work environment thereby will contribute to reduce the health and well-being of non-exposed employees at the workplace.

Secondary Victimization. Secondary victimization is derived from the concept of secondary or vicarious traumatic stress, which shows how traumatic experiences may be transmitted through second-hand exposure to the traumatic events of others as direct witnesses or hearing about their trama histories (Figley, 1995; Zhou et al., 2021). Regarding crossover effects of bullying through secondary victimization, witnesses may be especially affected. As a witness, evaluation of a bullying situation may result in viewing it as a possible threat not only to the target, but also to oneself (Sprigg et al., 2019) and it has been shown that witnesses to bullying has a wide-spread fear that if acting in ways that could be interpreted as support for the target there is a risk of becoming the next target (Baez-Leon et al., 2016). Hence, perceving bullying of others may therefore be regarded as social information processed as an indication as to how any employee might be treated in the organization, thus making bystanders secondary victims. In addition, based on social information processing theory, non-witnesses may further experience consequences through word-of-mouth and interactions with witnesses, or through observing actions and behaviours of the witnesses.

Emotional Contagion. Being grounded in personal empathy, emotional contagion is a phenomenon where the observed behaviour of one individual leads to the reflexive production of the same behaviour by others (Miller et al., 1988). These "copiers" then feel the same emotions of the person who made the original behaviour change. Hence, emotional contagion is a form of crossover at the unconscious level; an individual's emotional state and behavioural attitudes are influenced by another person or group (Barsade, 2002; Barsade et al., 2018). Behaviour can be transferred trough facial expressions, voice, movements, posture, and other instrumental behaviours. Keeping in mind the detrimental effects of bullying on targets, this means that witnesses could contract negative emotional contagion through the social information about bullying and its consequences that they receive from observing and interacting with the targets. In addition, this effect on witnesses can further be spread to non-observers through the interaction between these parties as suggested by social information processing theory.

Taken together, following the social information processing theory and the three mechanisms suggested above, there are strong reasons to believe that there is a blast radius of bullying with targets as the point of impact and where the blast subseqently has detrimental ripple effects on both witnesses and non-witnesses. In support of this claim, research findings show that working in a "high-bullying climate" has an effect on mental health and job satisfaction even for those not a target of bullying (Steele et al., 2022). However, as illustrated in Fig. 1, it is likely that the closer one is to the point of impact, that is, the bullying situation, the stronger the impact will be. Targets of bullying will be more strongly affected than witnesses and non-witnesses. Because witnesses directly observe the exposure and reactions of the targeted victim, their crossover effect will be stronger than of those who did not see the event first-hand. This means that witnesses are more likely to have a greater decrease in health, well-being, and work ability than non-witnesses.

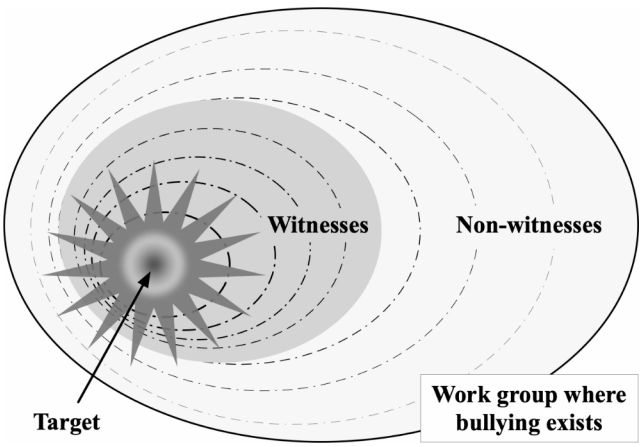

Fig. 1 Theoretical illustration of the blast radius of bullying

Aims and hypotheses

To determine the effects of bullying on non-exposed colleagues, the present study will compare targets, witnessess and non-witnesses of bullying in work groups with at least one target, and also employees from workplaces free from bullying with regard to a range of outcomes that have been

associated with bullying in previous research (Nielsen & Einarsen, 2012), namely job satisfaction, cognitive deficiencies, mental health problems, sick leave and sickness presenteeism. The outcome variables represent both attitudinal and health aspects to get a wide array of possible outcomes that may have a wider effect for others than merely the target, however, the selection was based on what is known about outcomes for targets. *Job satisfaction*, an indicator of workers' contentedness with their job (Spector, 2022), has been negatively associated with exposure to bullying behaviours in several studies (Nielsen & Einarsen, 2012). There is also some evidence pointing to reduced job satisfaction among bystanders to bullying. For instance, Hauge et al. (2007) showed lower levels of job satisfaction as an outcome among employees who had witnessed bullying of others at their workplace. *Cognitive deficiencies* refers in the present study to the lack of creativity and concentration. There is a negative association between exposure to bullying and ability to concentrate on one's work (Yildirim, 2009). Other cognitive outcomes from bullying have also been suggested (Einarsen et al., 2020; Tuckey et al., 2023). *Mental health problems*, as displayed through anxiety and depression, as an outcome of bullying is widely researched and several meta-analyses point in the same direction—bullying leads to mental health problems (Nielsen & Einarsen, 2012; Verkuil et al., 2015). Nielsen et al. (2021) found an association between bystanding and subsequent mental health problems for inactive bystanders. *Sickness absence* as a outcome of workplace bullying has been studied previously (e.g., Nielsen et al., 2020), and meta-analytic evidence show an association between bullying and increased risk of sickness absence (Nielsen et al., 2016). A few studies have focussed on *sickness presenteeism* as a consequence of workplace bullying (e.g., Conway et al., 2016). A meta-analysis on many different causes of presenteeism point to an association between harassment and presenteeism (Miraglia & Johns, 2016), thus suggesting that bullying also could influence presenteeism since bullying is an escalated and extreme form of harassment.

The present study distinguishes between employees working in groups where bullying exists and groups without bullying. In groups where bullying exists distinct categories are targets, witnesses, and co-workers not aware of the bullying in one's own group or just indirectly aware of such behaviour (non-witnesses). We also investigate whether the outcomes for these categories are affected by the group level bullying, that is, an assessment of the severity of exposure that one or several targets in each group are exposed to. The assumption is that the more systematic and prolonged the negative treatment of an employee is, the greater the spillover effect on non-targets in the same work group, that is, the greater the blast radius can be expected. Previous studies that have examined bullying on a group level have depended on either mean level of exposure in the whole group or on witness reports (e.g., Hauge et al., 2011; Mathisen et al., 2012). Both approaches are problematic in that bullying is a highly skewed phenomenon making mean levels diluted, and witness reports are limited to what is observable and probably lacks precision regarding severity of the mistreatment. In the present study we used a new approach to get an estimate of the group level of bullying in each group. Specifically, we used the most exposed target in each group as an indication of the group level bullying, that is, the perception of exposure of the target in the group is treated as the group level measure. This allowed estimation of occurrence bullying in each work group including all possible negative treatments and not only the observable kinds, and by using this method we also could get a better estimation of the severity of the mistreatment as it is based on the direct experience of the target.

Based on the above reasoning about a blast radius of bullying with a differential impact on workers, and findings from previous research on the outcomes of workplace bullying, we propose the following hypotheses:

Hypothesis *1a.* Targets of bullying will have lower levels of job satisfaction, and higher levels of cognitive deficiencies, anxiety, depression, sick leave and sickness presenteeism compared to non-targets in work groups where bullying exists, and employees in work groups free from bullying.

Hypothesis *1b.* Witnesses of bullying will have lower levels of job satisfaction, and higher levels of cognitive deficiencies, anxiety, depression, sick leave and sickness presenteeism compared to non-witnesses in work groups where bullying exists, and employees in work groups free from bullying.

Hypothesis *1c.* Non-witnesses in work groups where bullying exists will have lower levels of job satisfaction, and higher levels of cognitive deficiencies, anxiety, depression, sick leave and sickness presenteeism compared to employees in work groups free from bullying.

Hypothesis *2a.* There will be significant associations between group level bullying (severity) and job satisfaction, cognitive deficiencies, anxiety, depression, sick leave, and sickness presenteeism for all employees working in groups where bullying exists, but with the strongest associations for targets, less strong for witnesses, and least strong for non-witnesses.

Hypothesis *2b.* The associations between group level exposure to bullying behaviours (severity) and job satisfaction,

cognitive deficiencies, anxiety, depression, sick leave, and sickness presenteeism for witnesses depend on the frequency of observation.

Methods

Sample

Data were gathered from four different organizations representing three different work sectors in Sweden, one government agency, two municipalities, and one private company. Data were collected as part of the organizations' regular work environment surveys (around 200 items, Rosander & Blomberg, 2018) between the years 2015 and 2020 with three separate data collections about 20 months apart. All employees were invited to participate. The current data come from the third data collection as it allowed for the most complete identification of work groups. The response rates were stable around 70% for all three data collections. The third one had a response rate of 72%.

Participants

In total the data consist of answers from 2215 employees in 195 work groups in the four organizations. To be included a group needed to have at least four employees responding. The data used in the study in total comprised 891 men (40%) and 1324 women (60%). The overall gender mix in the 195 groups was 57% women. The mean age was 45.2 years (SD = 11.3) and they had worked at their current workplace for 10.3 years (SD = 9.8).

Measures

Exposure to bullying behaviours was measured using the Negative Acts Questionnaire–Revised (NAQ–R, Einarsen et al., 2009). NAQ–R comprises 22 items covering a wide array of bullying behaviours one may be exposed to at work. It asks for exposure the past six months on a frequency scale from 1 (*never*) to 5 (*daily*). Internal consistency (Cronbach's alpha) was 0.88. To distinguish the bullied from the not bullied we used a cut-off at a sum score of 33 as suggested by Notelaers and Einarsen (2013).

Job satisfaction was measured using a scale taken from the Psychosocial Work Environment Questionnaire (PSYWEQ, Rosander & Blomberg, 2018). It comprises six items covering: (a) being proud of the job one does, (b) liking one's job, (c) having stimulating tasks, (d) see it as fun to go to work, (e) feeling commitment, and (f) giving more than is actually required. Responses are given on a seven-point Likert scale. Cronbach's alpha was 0.86.

Cognitive deficiencies measures three cognitive aspects in relation to one's work, lack of creativity and ability to concentrate, and feeling irresolute. The measure is taken from the Salutogenic Health Indicator Scale (Bringsen et al., 2009). Responses are given on a six-point semantic differential scale. Cronbach's alpha was 0.87.

Anxiety and depression was measured using the Hospital Anxiety and Depression Scale (HADS, Zigmond & Snaith, 1983). The HADS has 14 items measuring anxiety (7 items) and depression symptoms (7 items) experienced the preceding week. It uses a response scale with four alternatives (0–3), for example, for anxiety symptoms, "I feel tense or 'wound up'" with possible responses from *not at all* to *most of the time*. An example item for depression symptoms is "I have lost interest in my appearance". The sum score for each subscale was used. The internal consistency for anxiety symptoms was 0.84, and for depression symptoms 0.82.

Sick leave and *sickness presenteeism* was measured using two questions from the PSYWEQ (Rosander & Blomberg, 2018). For sick leave: *"How many days have you been on sick leave (in the last 12 months)?"*; and for sickness presenteeism: *"How many days have you been at work even though you should not have been working due to illness (in the last 12 months)?"*. Both questions asked for the best estimation based on memory. Possible responses for both questions ranged from *0 days* up to *20 or more days*.

Additional information about exposure to bullying behaviours were obtained through a question about witnessing bullying and an indication as to whom the bully (or bullies) was. The first was used to identify one of the categories of employees to be compared in the study—the witnesses. The latter to ensure that the person exposed to bullying behaviours was exposed by someone in their own work group and not by someone else. A respondent was categorized as a witness if answering at least *now and then* to the question *"Have you witnessed someone being exposed to at least some of the above-mentioned negative acts during the past 6 months at your workplace?"* (using the same frequency scale as the NAQ–R and following directly after the 22 NAQ–R items) and that a target in one's own work group had indicated that they were bullied by someone within the group. This was measured with a question directed to all witnesses and targets where they could indicate that the bully was the supervisor, a colleague(s), someone at other workplaces within the organization, or others not covered by the first three options (multiple responses were allowed). If at least one person in a work group had a NAQ–R sum on or above 33 and indicating to be exposed to bullying behaviours by the supervisor or a co-worker in one's own work group, the group was categorized as having at least

Table 1 Means, standard deviations, and intercorrelations for the main study variables. Correlations at the individual level below the diagonal, and at the group level above the diagonal

Variable	Mean	SD	1.	2.	3.	4.	5.	6.
1. Job satisfaction	5.57	1.10		−0.51	−0.40	−0.44	−.02^{ns}	−.06^{ns}
2. Cognitive deficiencies	4.11	1.23	−0.42		0.68	0.67	.13^{ns}	0.22**
3. Anxiety	5.22	3.86	−0.26	0.60		0.69	0.16*	0.28
4. Depression	3.29	3.00	−0.38	0.61	0.63		0.28	0.30
5. Sick leave	5.34	6.66	−0.07	0.20	0.18	0.22		0.21**
6. Sickness presenteeism	2.61	4.59	−.03^{ns}	0.24	0.29	0.27	0.27	

Note. All correlations significant, $p < .001$ except where indicated. *$p < .05$, **$p < .01$, ^{ns} = not significant

one person exposed to bullying behaviours. Otherwise, the work group was categorized as having no one exposed to bullying behaviours in the group.

We used a group level estimate of exposure to bullying behaviours, created by using the individually highest NAQ–R score in each of the 195 groups. This gives an overall estimate for each work group that allowed for an estimate of severity based on actual experience that includes all possible bullying behaviours and not only observable ones.

Previous experience of exposure to bullying may affect the associations between exposure to bullying behaviours and outcome (Hoprekstad et al., 2021). Although no witnesses in the present study were current targets of bullying behaviours, previous experience may affect the outcome. Hence, we used a measure of previous exposure to bullying as a covariate in the moderation analyses testing hypothesis 2. The question was taken from the PSYWEQ (Rosander & Blomberg, 2018): *"Have you been subjected to bullying in the past (in any context)?"* with yes/no as possible responses.

Data analyses

Statistical analyses were conducted Using IBM SPSS version 29. To test hypothesis 1, we used MANOVA comparing the four different categories—targets, witnesses, and non-witnesses in groups with at least one person exposed to bullying behaviours, and those in groups without anyone exposed to bullying behaviours—on the six outcome variables presented above. We used Tamhane's T2 as post hoc test as it is a conservative test appropriate for unequal variances. Hypothesis 2 was tested using moderation analyses (model 1 in the PROCESS macro, version 4.1, Hayes, 2018). Level of significance was set to $p < .05$.

Results

Means, standard deviations, and intercorrelations for the main study variables are presented in Table 1. The 83 work groups where at least one employee was exposed to bullying behaviours comprised 154 targets, 299 witnesses (not targets themselves), and 674 persons that did not report seeing anyone in the work group being exposed to bullying behaviours. There were also 112 work groups where no one was exposed to bullying behaviours within the group. In these groups there were 22 employees that were exposed to bullying behaviours by someone not in their group. They were excluded from further analyses as targets of bullying no matter who the bully is probably experience more severe outcomes compared to all others in their work group which would have contributed to an incorrect result. This left 1066 employees to be used as comparison to the three different viewpoints of employees in groups with at least one target. A MANOVA investigating differences between (a) targets, (b) witnesses, and (c) non-witnesses in groups with at least one target, and (d) employees in work groups with no targets of bullying behaviours from within the group showed significant differences on the six outcome variables used in the study, Pillai's trace = 0.13, $F(18, 6153) = 15.63$, $p < .001$, $\eta_p^2 = 0.04$. Separate tests for each of the outcome variables showed that all contributed to this difference (see Table 2).

Table 2 Separate univariate tests of the outcome variables used in the MANOVA

Variable	*F*	*p*	η_p^2
Job satisfaction	41.90	< 0.001	0.06
Cognitive deficiencies	30.04	< 0.001	0.04
Anxiety	39.47	< 0.001	0.06
Depression	53.30	< 0.001	0.07
Sick leave	6.84	< 0.001	0.01
Sickness presenteeism	34.28	< 0.001	0.06

Post hoc comparisons (using Tamhane's T2) showed significant differences on all outcome variables for targets compared to all other categories (p's < 0.001) except for sick leave where there were no significant difference compared to witnesses ($p = .888$). The outcomes for witnesses were significantly better compared to targets (except for sick leave), but significantly worse compared to non-witnesses and employees in groups free from bullying for all outcome variables (p's < 0.001 for anxiety and depression, p's < 0.01 for cognitive deficiencies and sickness presenteeism, and p's < 0.05 for job satisfaction and sick leave). This means hypotheses 1a and 1b were supported. There

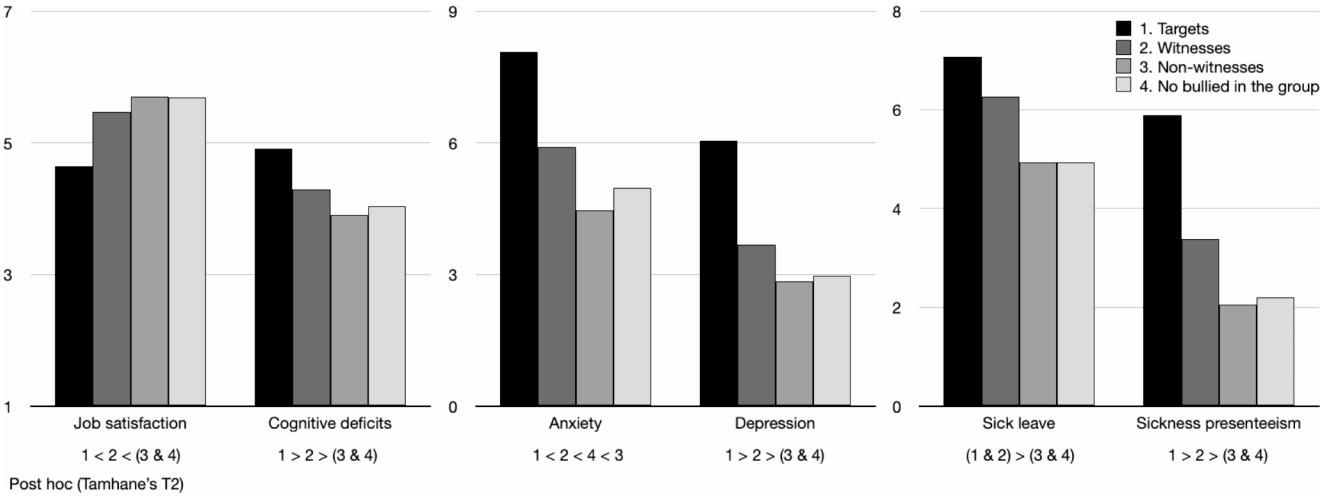

Fig. 2 Result from a MANOVA comparing four categories of employees

Table 3 Means and standard deviations for all variables and groups in Fig. 2

	Bullied in the Group			No Bullied in the Group
	Targets	Witnesses	Not Witnesses	
	(n = 140)	(n = 269)	(n = 587)	(n = 915)
Variable	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Job satisfaction	4.65 (1.29)	5.47 (1.09)	5.70 (1.09)	5.69 (1.00)
Cognitive deficiencies	4.91 (1.35)	4.29 (1.20)	3.90 (1.14)	4.03 (1.20)
Anxiety	8.07 (4.69)	5.90 (3.64)	4.47 (3.45)	4.98 (3.75)
Depression	6.04 (4.11)	3.68 (2.89)	2.84 (2.57)	2.96 (2.79)
Sick leave	7.07 (7.73)	6.26 (6.94)	4.94 (6.54)	4.94 (6.30)
Sickness presenteeism	5.90 (6.67)	3.39 (5.50)	2.06 (3.79)	2.20 (4.03)

were no significant differences in line with hypothesis 1c for any of the outcome variables comparing non-witnesses and employees in groups without bullying except for anxiety, where the non-witnesses actually reported significantly lower level compared to all other categories including those working in groups free from bullying (p = .027). Hypothesis 1c was not supported. The results for all four groups are presented in Fig. 2; Table 3.

To test the second hypothesis (2a) we conducted six moderation analyses, one for each outcome variable. As we used the group level exposure to bullying behaviours, only the groups with at least one target of bullying behaviours were included in the analyses. We tested if the association between group level bullying, that is, the severity of exposure, and each of the outcome variables were different for targets, witnesses, and non-witnesses, that is the interaction between group level bullying and the three categories. In all six analyses we adjusted for previous exposure to bullying (44% of current targets had some previous experience, 39% of witnesses, and 29% of non-witnesses). For *job satisfaction* there were significant interactions comparing targets and witnesses, b = 0.02, 95% CI [0.00, 0.04], p = .031, and comparing targets and non-witnesses, b = 0.02, 95% CI [0.01, 0.04], p = .006. For *cognitive deficiencies* there were significant interactions comparing targets and witnesses, b = -0.02, 95% CI [-0.04, -0.00], p = .029, and comparing targets and non-witnesses, b = -0.03, 95% CI [-0.05, -0.01], p = .004. For *anxiety* there were significant interactions comparing targets and witnesses, b = -0.07, 95% CI [-0.13, -0.01], p = .012, and comparing targets and non-witnesses, b = -0.08, 95% CI [-0.14, -0.03], p = .005. For *depression* there were significant interactions comparing targets and witnesses, b = -0.06, 95% CI [-0.10, -0.01], p = .023, and comparing targets and non-witnesses, b = -0.06, 95% CI [-0.10, -0.01], p = .015. And for *sick leave* there was a significant interaction comparing targets and witnesses, b = -0.16, 95% CI [-0.28, -0.05], p = .004. For *sickness presenteeism* there were no significant interactions. The simple slopes were not significant for any of the outcome variables for witnesses or non-witnesses, only for targets. The interactions are shown in Fig. 3. This means hypothesis 2a only got support in regard to targets. Witnesses and non-witnesses were not affected at all by the severity or level of bullying in the group.

To further test possible effects bullying may have specifically on witnesses we conducted the same six moderation analyses, but only included witnesses (hypothesis 2b). The moderator in these analyses was the frequency of witnessing bullying, from now and then to daily. We tested whether

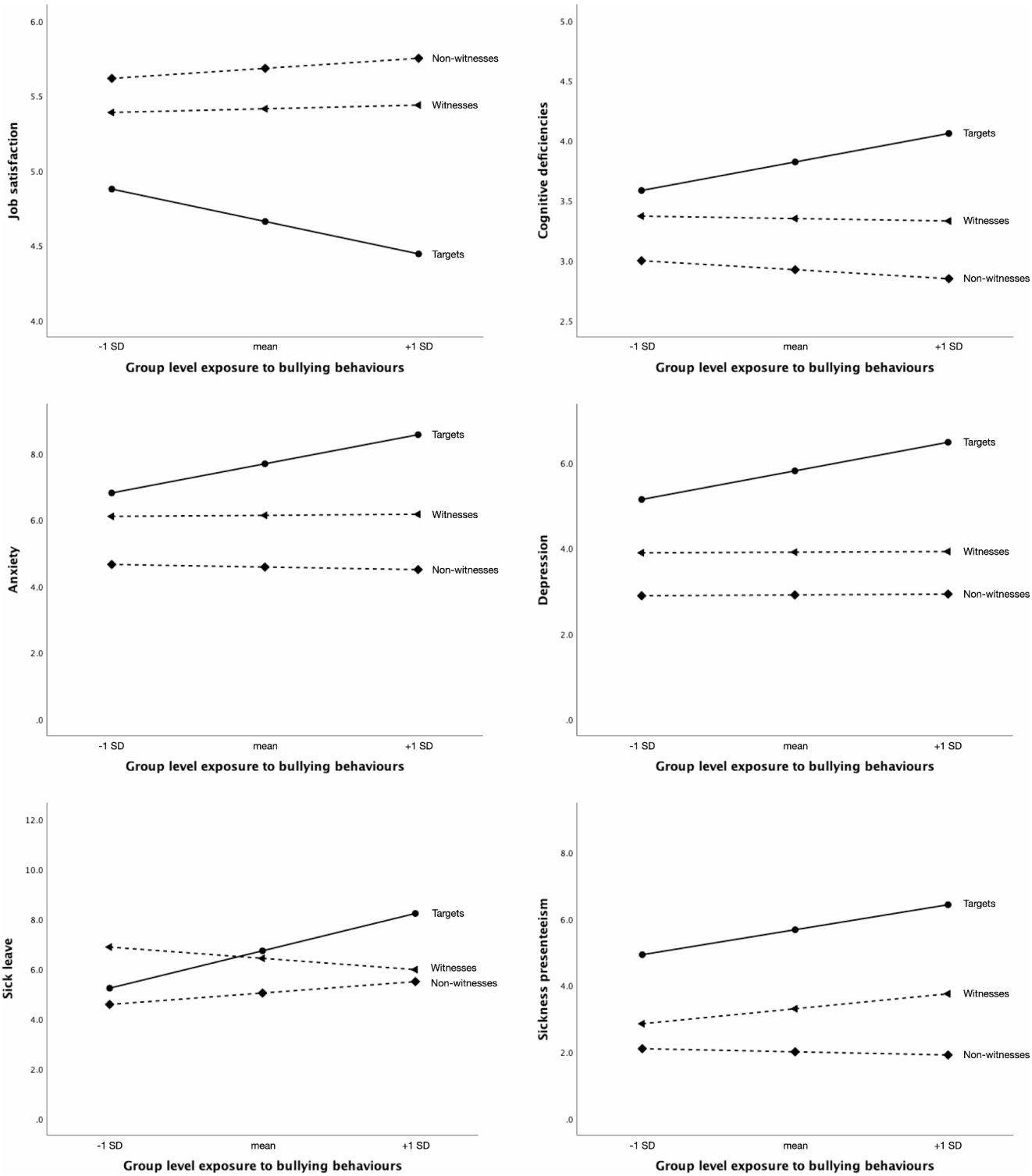

Fig. 3 Interactions between group level bullying and targets, witnesses, and non-witnesses in regard to job satisfaction, cognitive deficiencies, anxiety, depression, sick leave, and sickness presenteeism respectively. The interaction for sickness presenteeism was not significant

there were interactions between frequency of observation and severity of the bullying. The results showed no significant interactions for any of the outcome variables. Thus, hypothesis 2b did not get support. However, there were direct effects of frequency of observation on the outcomes regardless of the severity of the witnessed bullying for job satisfaction, b = -0.31, 95% CI [-0.53, -0.09], p = .005, for cognitive deficiencies, b = -0.36, 95% CI [-0.60, -0.12],

p = .003, and for depression symptoms, b = 0.09, 95% CI [0.01, 0.18], p = .032, that is, worse outcome with increasing frequency of observation. Frequency of observation had no direct effect on anxiety symptoms, sick leave or sickness presenteeism for the witnesses.

Discussion

The main focus of the present study was on non-targets of workplace bullying. From previous research it is apparent that the targets of bullying behaviours suffer consequences (Boudrias et al., 2021) and that was also something that we clearly could show in the present study (hypothesis 1a). The targets reported the lowest levels of job satisfaction, and experiences the highest levels of cognitive deficiencies compared to witnesses, non-witnesses and employees in groups free from bullying. Targets also reported significantly higher levels of mental health problems, sick leave, and sickness presenteeism. Although witnesses reported better levels for all outcome variables in the study compared to targets (except for sick leave), they also differed significantly compared to non-witnesses and employees in groups free from bullying (hypothesis 1b). That the level of sick leave was equal for targets and witnesses seems reasonable considering that previous research on targets of bullying have shown a weaker association between sickness absenteeism and exposure to bullying compared to other outcomes (Glaveli et al., 2023; Nielsen & Einarsen, 2012). Consequently, as exposure to bullying has a limited impact on sickness absence one cannot expect large differences between targets and witnessess.

While both hypothesis 1a and 1b were supported, we found no support for Hypothesis 1c, which focussed on non-witnesses, that is, employees unaware or just indirectly aware of the exposure that takes place in their own work group. The hypothesis stated that non-witnesses in a work group where bullying occurs would experience worse outcomes compared to those working in groups free from bullying. The rationale for this was (a) the work environment mechanism based on the work environment hypothesis stating that occurrence of bullying is connected to deficiencies in the work environment (Einarsen et al., 1994; Ågotnes et al., 2021), and that non-witnesses thereby should be indirectly affected by bullying through a poorer working environment; (b) secondary victimization in which word of mouth would contribute to second-hand exposure to the traumatic stress of the target (Figley, 1995; Zhou et al., 2021); and/or (c) emotional contagion in which negative emotions are spread from target to witnesses, and to non-witnesses (Barsade, 2002; Barsade et al., 2018; Valentine et al., 2022). However, in contrast to expectation, the non-witnesses did not report a more negative outcome for any of the variables in the study compared to employees working in groups free from bullying. A toxic working environment is associated with negative outcomes for employee well-being (Rasool et al., 2021). This type of negative working environment could stem from any number of reasons in groups where bullying exists and in those who are free from bullying alike. The question is if occurrence of bullying creates an even worse working environment. There are some studies pointing in that direction (Hauge, Skogstad et al., 2011; Rosander & Salin, 2023), but that does not rule out that the groups free from bullying had a negative working environment for other reasons levelling out the differences between the non-witnesses and employees in groups free from bullying. For one of the outcome variables, anxiety, the non-witnesses actually reported lower levels than those in groups free from bullying.

We also investigated the associations between the group level exposure to bullying behaviours, that is, the severity of bullying in each group, and the outcome variables included in the study. That the level of exposure is important for the outcome for targets has been shown in previous research (e.g., Rosander & Blomberg, 2019). In the present study we wanted to investigate if the severity also mattered for non-targets. There have been attempts to capture exposure on a group level in previous research, such as the mean level of exposure in a group (Mathisen et al., 2012), the percentage of co-workers reporting witnessing bullying (Hauge et al., 2011), or specific inventories asking if one sees bullying as a problem (e.g., the Bergen Bullying Index, Einarsen et al., 1994). However, using the group mean is problematic because workplace bullying is a highly skewed phenomena watering down the variance considerably. Using others' perception may also be biased as the level depends on what is observable, and it does not necessarily distinguish severity of what is observed. And an estimate if one perceives bullying to be a problem requires awareness, so in a similar vein this measure is most likely an underestimation of the actual problem. We used the individually highest level of exposure to bullying behaviours in each group as the group level assessment. This measure considers all kinds of negative behaviours a target may experience and not just the observable ones and rather that diluting the estimate by using the mean of all employees it pinpoints the perceived exposure as reported by the target in each group (the severity of exposure for the target worst off if more than one target). The results from testing the second hypothesis are interesting.

As expected, for targets there were significant associations between the group level exposure to bullying behaviours (for most targets this equals their individual level of exposure) and the outcome variables. The hypothesis (2a) stated that there would be significant associations also for

witnesses and non-witnesses. The results, however, showed that neither witnesses nor non-witnesses were affected at all by the severity of bullying in their group. That witnesses suffer consequences has been shown in a recent meta-analysis (Nielsen et al., 2023), but according to our results, it seems to be enough for witnesses to merely witness a target being exposed to bullying behaviours, no matter the severity, for them to be affected in terms of their reported levels of job satisfaction, creativity and concentration, mental health, sick leave, and sickness presenteeism. The levels for non-witnesses were on par with employees working in groups free from bullying, so they were not even affected by the poorer work environment that may foster occurrence of bullying (Einarsen et al., 2020). Thus, hypothesis 2a only got partial support.

Finally, we investigated witnesses separately. Hypothesis 2b stated that there would be an interaction between the severity of bullying as reported by targets' and witnesses' frequency of observation. The results showed no interactions at all for any of the outcome variables meaning that hypothesis 2b did not get supported. However, the frequency of observation did have a direct effect on job satisfaction, cognitive deficiencies, and depression symptoms for the witnesses.

Theoretical implications

Theoretically, the present study contributes important new knowledge about how workplace bullying affects non-targets. We introduced the concept of blast radius of bullying, and we suggested three possible mechanisms explaining this ripple or spillover effect of bullying. The results showed that there is a blast radius of workplace bullying, however, not as far-reaching as expected as only witnesses seem be victims of collateral damage to workplace bullying. The three mechanisms we presented were the working environment mechanism, secondary victimization, and emotional contagion.

The working environment mechanism presupposes that the occurrence of workplace bullying will have a negative effect on the working environment, something that a few studies have pointed to (e.g., Hauge et al., 2011; Rosander & Salin, 2023). A poor working environment can also be an antecedent to workplace bullying in line with the work environment hypotheses (Einarsen et al., 1994). The working environment mechanism is also based on the notion that a poor working environment will have a negative impact on the health and well-being of those working there (Nappo, 2019). As targets, witnesses, and non-witnesses all share the same working environment, and if bullying would have had a profound impact on the working environment in general also the health and well-being, and work attitudes of the non-witnesses should have been affected. They were not. For none of the outcome variables in the study the non-witnesses in groups where bullying existed were significantly worse off compared to those working in groups free from bullying. That is, our results did not support the working environment mechanism as an explanation to the blast radius hypothesis.

In a wider perspective the results also highlight a question about the relationship between bullying and the working environment. Investigations of risk factors in the working environment and of bullying as a determinant of a poorer subsequent working environment typically do not investigate the actual working environment, just individual perceptions of it (see e.g., Hauge et al., 2011; Rosander & Salin, 2023). This is an important ditinction to make as the perceptions may differ considerably comparing targets, witnesses and non-witnesses working in the same group (Rosander & Nielsen, in press). Rosander and Nielsen suggested that the associations between risk factors in the working environment and occurrence of bullying may be overestimations. However, when it comes to possible negative outcomes of deficiencies in the working environment, the individual perception is what makes one individual suffer whereas another employee is unaffected by it. Witnessing bullying may make certain deficiencies more visible, or at least one's perception of them, and is followed by more negative outcomes compared to the non-witnesses although they all work in the same working environment.

The second mechanism, secondary victimization, is based on the concept of vicarious traumatic stress (Figley, 1995). To witness a colleague being treated badly may trigger a stress response in the witness. However, in terms of the notion of vicarious traumatic stress it may be enough to merely hear about the victim's trauma (Zhou et al., 2021). When individuals repeatedly hear about or witness traumatic events, it can be emotionally overwhelming and lead to a sense of helplessness or despair. It can also lead to a feeling of personal responsibility for the trauma, particularly if one feels one could have done more to prevent it. Nielsen et al. (2021) showed that the outcome in terms of mental health problems only was there for witnesses who did not try to intervene. The secondary victimization may come out of a perceived inability to help a colleague in need, or at least be more pronounced in such situations. The ripple effect may be fuelled by the experienced dissonance between one's self-image as a responsible and benevolent person and inability to help with resulting feelings of guilt and injured moral conscience (Molendijk, 2018). The concept of moral injury (Litz et al., 2009) is central in this—a concept that not only include perpetration, but also "failing to prevent, bearing witness to, or learning about acts that transgress deeply held moral beliefs and expectations" (p. 700) and the shame

and guilt associated with this. To help a victim in a bullying situation is not always an easy thing to do. There is a widespread fear of becoming the next target (Baez-Leon et al., 2016) which also may contribute to a stress reaction and poor health and well-being. Although a recent study showed that the risk of becoming the next target only exists if not trying to intervene (Rosander & Nielsen, 2023), the fear is probably very real for a witness. The strategies one use to overcome this may be to look the other way or to rationalized what one sees or hears about by cognitively reorganize the event in terms of moral disengagement (Bandura, 2016). The results point to a secondary victimization only for witnesses. It seems first-hand social information is what it takes for the blast radius of bullying to have an impact on others than the target. That is, the results indicate that it is the direct social information on the social environment gathered and processed by the witnesses that help form their attitudes and expectations in terms of the social information processing theory (Salancik & Pfeffer, 1978), not the second-hand information of non-targets.

Finally, the third mechanism, emotional contagion refers to an affective process in which others than the actual target experience an emotional response similar to that of the target (Miller et al., 1988). In terms of the social information processing theory (Salancik & Pfeffer, 1978), people are influenced by others' attitudes and behaviour, so negative emotions stirred by a negative treatment of a colleague may affect also others at the workplace—possibly stronger for the witnesses, but they may also send signals of distress and reduced well-being also to others in the work group. Potentially, this mechanism means that a person does not need to know the origin of the negative emotions. A ripple effect is possible merely from observing others exhibiting negative emotions as an echo of the original cause. The strength of the ripple effect in this case was lower than expected as only witnesses were affected by it.

Why did not the blast radius reach the non-witnesses? There is probably a need for a third party to at least know about the mistreatment of a colleague at work for it to have a noticeable effect on their health and well-being. As we do not know whether the non-witnesses actually knew about it, it is hard to rule out the idea of a wider blast radius than shown in the present study. Also, workplace bullying is not always visible or observable to a third party as bullying behaviours many times may be ambiguous (Einarsen et al., 2020) and sometimes the full impact is only felt by repetition—something that may go unnoticed by others who only get snapshots of an ongoing process. In the non-witness group there were also probably some responses from perpetrators and bystanders going along with the bully which may result in other reactions. Especially for person-related bullying behaviours and bullying with a predatory nature (Einarsen, 1999), the act of bullying may have a compensatory effect on, for example, anxiety by knowing someone else is the target. In groups with a strong group identity the act of bullying may be something that reinforce the feelings of togetherness in the group—at the expence of the targets and also the witnesses it seems (cf. "the black sheep effect", Marques & Paez, 1994).

An interesting finding was that the mere instance of being a witness to something one perceives as a harmful treatment of a colleague seems to be enough for a negative outcome for the witness. The severity of the mistreatment was completely unrelated to a witness' own level of the health and well-being outcome and work attitude. Witnessing bullying, in most cases, only involves observing snapshots of an ongoing bullying process, the force of which is unknown to them (Einarsen et al., 2020). The full impact for the target will probably not be noticed by merely observing singular acts. However, the results showed that the more frequent a witness observes mistreatment of a co-worker, the greater the impact. For witnesses, the frequency of observation seems to be more important than the severity of the treatment, at least with regard to one's own health and well-being. The blast radius for witnesses takes the frequency route, not the severity route.

Practical implications

While there may be only one or two targets of bullying in a work group, there may be multiple witnesses. In a probability sample of all people working in Sweden, Rosander and Nielsen (2023) found that as many as 27% of all employees had witnessed others being bullied at least now and then over the past six months without being a target themselves. As the findings of the present study show that employees who observe bullying of others in their work group can be considered as "co-victims" of bullying, this means that measures and interventions towards bullying also needs to focus on the role of bystanders. On an organizational as well as a national level, interventions need to be implemented that raise awareness of bullying, its effects on targets (and bystanders) and the role and consequences of passive and colluding bystander behaviour.

Bystanders can play an important role in shaping the development of workplace bullying. As noted by Ng et al. (2019), interventions that work on shaping group norms around the acceptability of bullying type behaviours, might be particularly effective in influencing bystanders' appraisals of bullying behaviours. This may be especially true for the more ambiguous, lower-level transgressions, which may be more prevalent early in the bullying process and therefore increasing the chances of active and constructive behaviours to challenge bullying at an early stage. And

when a target is perceived to be non-prototypical in relation to the group, anti-bullying norms seem to have a reducing effect on the risk of bullying (Glambek et al., 2020). Furthermore, empowering employees to act when they observe bullying may lead to improving health and well-being outcomes associated with being a bystander, as well as the health and well-being of the targets (Nielsen et al., 2021). Over time, this may contribute to developing a psychosocial climate in the organization where individual attitudes and social norms foster constructive bystander behaviours, while also enhancing the employees' perceived behaviour control as bystanders, something that is likely to be crucial in combating workplace bullying in organizations.

Limitations

All measures were self-report measures susceptible to subjective factors such as social desirability and common method variance. A limitation of the study is that we do not know if a non-witness had heard about the mistreatment or if they were completely unaware of it. Also, we do not know how witnesses interpreted the seriousness of the negative acts nor what type of negative acts they observed. In all work groups where bullying was reported there were also perpetrators. In the present study, we do not know who they were and consequently we do not know how they were categorized in the study. Previous studies have shown that the outcome is dependent on how a witness acts in relation to the observed bullying (Nielsen et al., 2021). In the present study, we do not know if a witness did not act at all, acted to help the target, or acted in support of the perpetrator. Although the response rate was rather high (72%) which is a strength of the present study, there is a risk that some victims of bullying refrained from participating and that some of the groups "free from bullying" actually contained targets and therefore were categorized wrongly. However, this did not contribute to an overestimation of the results, but rather the opposite—we know that all groups with at least one bullied were correctly categorized no matter if some bullying victims chose not to participate.

Future research directions

To better understand the blast radius of bullying, a more detailed account of witnesses and non-witnesses experiences is needed. For non-witnesses it would be interesting to know whether they have heard about others being bullied at their workplace. For witnesses it would be interesting to know about their own perception of the seriousness of the bullying they witness. Both pieces of information would help to better understand the blast radius hypothesis and to see if the ripples actually reach further than the present study was able to show. It would also be of importance to know which members in each work group were the bully or bullies. Although not that much is known about the reactions and outcomes from being a bully, the outcome may be very different compared to witnesses and uninvolved non-witnesses. Finally, it would be interesting to know more about the actions of witnesses and their relation to the target to better understand the outcomes.

The study was conducted in Sweden, a country with relatively strict regulations regarding the social working environment. In order to see how the blast radius hypothesis holds up in other parts of the world, replication of the study in other contexts is important. In such a study also other outcome variables may be added to give a fuller picture of the effects of the blast radius of bullying. In the present study we limited the impact to the workplace, however, it should be emphazised that the blast radius of bullying is likely to also have crossover effects to non-work life areas, including family and friends (Choudhary et al., 2022). Investigation of this crossover effect may be important for the understanding of the impact of workplace bullying.

Conclusions

This research add to current understanding of the effects of workplace bullying on employees by establishing a theoretical model of the potential blast radius of bullying, and then providing a first empirical test of the validity of the model. Building on social information processing theory, we extend previous research on targets of bullying by arguing that systematic mistreatment of employees may have substantial ripple effects on others in the work group. Although the blast radius was not as far-reaching as hypothesized, it reached far enough to negatively affect the health and well-being and job attitudes of those who witnessed bullying of others. This means that it is not only the targets that are victims of bullying, but that the witnesses also could be regarded as co-victims. Bystanders have an important role when combating workplace bullying (Rosander & Nielsen, 2023). Hence, the fact that witnesses may be victims of this kind of collateral damage should be taken into account when developing and implementig measures and interventions aiming at reducing bullying.

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Data Availability The data that support the findings of this study are

available from the corresponding author upon reasonable request.

Declarations

Competing interests The authors have no competing interests to declare that are relevant to the content of this article.

Ethics approval The study was approved by the Regional Ethical Review Board at Linköping University. Protocol number: 2014/282-31.

Informed consent All participants gave their informed consent prior to inclusion in the study.

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