



Testing the reciprocal longitudinal association between pro-aggressive bystander behavior and diffusion of responsibility in Swedish upper elementary school students

Robert Thornberg¹ · Björn Sjögren¹ · Gianluca Gini² · Tiziana Pozzoli²

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Abstract

The overall objective of this study was to investigate the longitudinal association between diffusion of responsibility and pro-aggressive bystander behavior across three time points in upper elementary education. This three-wave longitudinal study included 1905 Swedish students who completed a questionnaire in at least one of the three waves: the fourth ($M_{\text{age}} = 10.56$), fifth ($M_{\text{age}} = 11.55$), and/or sixth grades ($M_{\text{age}} = 12.58$). Both traditional and random intercept cross-lagged panel models revealed a reciprocal relationship between pro-aggressive bystander behavior and diffusion of responsibility from the fourth to fifth grades, whereas the only significant cross-lagged path from the fifth to sixth grades was from pro-aggression to diffusion of responsibility in the traditional cross-lagged panel model. Thus, this study provides evidence for bidirectional longitudinal associations between diffusion of responsibility and pro-aggressive bystander behavior but did not support a full cross-lagged bidirectional model.

Keywords Peer victimization · Bullying · Bystander · Diffusion of responsibility · Pro-aggressive bystander behavior · Pro-bullying

1 Introduction

Peer victimization refers to when children are targets of any form (e.g., physical, verbal, and relational) of offensive and harmful behavior perpetrated by other children (Finkelhor et al., 2012; Hawker & Boulton, 2000). These situations seldom

✉ Robert Thornberg
robert.thornberg@liu.se

¹ Department of Behavioural Sciences and Learning, Linköping University, 58183 Linköping, Sweden

² Department of Development and Social Psychology, University of Padua, Padua, Italy

involve only those who victimize and those who are victimized. It is a social phenomenon that occurs in peer groups and social contexts (Hong & Espelage, 2012; Hymel et al., 2015; Mischel & Kitsantas, 2020; Salmivalli, 2010). Other peers are, therefore, usually present as bystanders (Atlas & Pepler, 1998; Hawkins et al., 2001; Jones et al., 2015; Nishina & Bellmore, 2010) and may take the victimizer's side, the victim's side, or remain passive and try to stay outside the situation (Salmivalli, 2010). A *bystander* refers to an observer, viewer, witness, or passerby (Hong & Espelage, 2012), and how bystanders act is likely to influence the prevalence of peer victimization (Denny et al., 2015; Nocentini et al., 2013; Salmivalli et al., 2011). According to a recent study, classrooms where students were less caring tended to have more victims of bullying (D'Urso et al., 2022).

Conceptualizing peer victimization as a social phenomenon elicits new ideas for how it could be counteracted. More specifically, intervention and prevention programs could benefit from targeting the attitudes and behaviors of bystanders (Saarento & Salmivalli, 2015). In fact, programs aimed at increasing pro-victim bystander intervention are already operating, resulting in reduced prevalence rates of peer victimization and bullying (e.g., Fonagy et al., 2009; Kärnä et al., 2011). However, although some programs aimed at increasing bystander pro-victim intervention have proven effective, a meta-analysis revealed small effect sizes for K-8 children (Polanin et al., 2012). Hence, there is a need to learn more about factors that are linked with students' bystander behaviors, and how various bystander behaviors and their associations with social-cognitive processes develop over time. The current study is delimited to the bystander response in which students take the victimizer's side, because it is understudied and, as Troop-Gordon et al. (2019) put it, "little is known regarding its development" (p. 78).

1.1 Pro-aggressive bystander behavior

Pro-aggressive bystander behavior includes acting as an *assistant*, someone who joins the victimizer(s) and starts to victimize the victim too, and acting as a *reinforcer*, someone who supports and provides positive feedback to the victimizer(s), for example by cheering and laughing (Salmivalli, 2010). Although there is a conceptual difference between the assistant and reinforcer roles, both represent taking the victimizer's side, and research findings on the characteristics and correlates of these two roles clearly indicate that they are hardly distinguishable empirically (Demaray et al., 2016; Gini et al., 2021; Pouwels et al., 2016). Therefore, it is often suggested that assistant and reinforcer behavior can be combined into one single category, which has been termed *pro-bullying* (Bjärehed et al., 2021; Nocentini et al., 2013; Troop-Gordon et al., 2019) or *pro-aggressive* bystander behavior (Bjärehed et al., 2020; Orue et al., 2023; Sjögren et al., 2021a).

Previous findings demonstrate the importance of increasing the scientific understanding of why students side with victimizers despite the inhumane and immoral characteristics and harmful consequences of this behavior, and despite the fact that students in general condemn peer victimization (Thornberg, Pozzoli, et al., 2017; Thornberg, Wänström, et al., 2017). Indeed, in addition to inflicting

more harm to the victim by siding with the victimizers, pro-aggressive bystander behaviors communicate social appraisal of, and reinforce, peer victimization. In line with this, previous research has shown that the more common it is for classmates to side with the victimizers, the more prevalent bullying is in these classroom groups (Bjärehed et al., 2021; Kärnä et al., 2010; Nocentini et al., 2013; Salmivalli et al., 2011; Thornberg & Wänström, 2018). The present study aimed to contribute to the understanding of how pro-aggressive bystander behavior develops over two years during upper elementary school, and of the potential role of diffusion of responsibility in this development.

1.2 A social cognitive framework and diffusion of responsibility

Within the social-cognitive theoretical framework, Bandura (1999, 2016) has proposed the concept of moral disengagement to explain why people can transgress moral standards and act in inhumane ways while still believing that their actions are acceptable and justified. Moral disengagement refers to a set of self-serving cognitive distortions (e.g., moral justification, euphemistic labeling, distorting or ignoring the harmful consequences, dehumanization, and blaming the victim) by which moral self-regulation and moral self-sanctions can be set aside. It facilitates immoral, inhumane, unjust, and uncaring behaviors because people can conduct them without considering that what they are doing is wrong and without feelings of guilt or remorse.

According to the social-cognitive theory (Bandura, 2016), human development, learning and functioning are produced by the interplay of personal influences (i.e., biological endowment and intra-psychological structures and processes), behavioral influences (i.e., behaviors that individuals engage in), and environment influences (i.e., the environments, contexts and situations individuals encounter and act upon). This process is termed 'triadic codetermination'. Thus, in addition to their personal influences, moral disengagement is assumed to be learned through children's social interactions with others, and to gradually develop into habits or dispositions that will differ between individuals (Bandura, 2016; Bussey, 2020; Walters, 2022). In accordance with social cognitive theory (Bandura, 1999, 2016), previous research has shown that students who score higher in moral disengagement are more prone to victimize their peers (for meta-analyses, see Gini et al., 2014; Killer et al., 2019) and engage in pro-aggressive bystander behavior (Gini, 2006; Sjögren et al., 2021b; Troop-Gordon et al., 2019).

However, moral disengagement is a multidimensional construct that consists of several mechanisms (Bandura, 1999, 2016), which may be differentially associated with the development of children's immoral behaviors. Aside from overall moral disengagement, it is therefore worth studying the role played by individual mechanisms, which could also become a target for specific intervention. One of the mechanisms that has been particularly linked to how students at school act as bystanders of peer victimization is *diffusion of responsibility* (Bjärehed et al., 2020; Méndez et al., 2020; Thornberg & Jungert, 2014). Within the field of social psychology and its bystander literature, the concept of diffusion of responsibility has

mostly been adopted in studies aimed at examining why adult bystanders remain passive and unresponsive in emergency situations instead of helping the person in distress (Darley & Latané, 1968; Fischer et al., 2011; Latané & Darley, 1970; Latané & Nida, 1981; Plötner et al., 2015).

Briefly, in their seminal work, Latané and Darley (1970) argue that when there are several bystanders present, “the pressures to intervene do not focus on anyone; instead, the responsibility for intervention is shared among all the onlookers. As a result, each may be less likely to help” (p. 90). In other words, diffusion of responsibility is about diluting personal responsibility due to the presence or involvement of other people (Bandura, 1999). Similarly, Hogg and Vaughan (2018) describe it as the “tendency of an individual to assume that others will take responsibility” (p. 523), which decreases their sense of personal responsibility. Accordingly, previous research has found that greater diffusion of responsibility was associated with less defender behavior (Thornberg & Jungert, 2014; Tolmatcheff et al., 2022) and greater passive bystander behavior (Tolmatcheff et al., 2022) when students were bystanders of school bullying.

Nevertheless, diffusion of responsibility may not only contribute to explaining passive and unresponsive bystander responses in general and less defender behavior in peer victimization among school children. In their cross-sectional study, Bjärehed et al. (2020) found that students who were more inclined to diffuse responsibility were more likely to engage in pro-aggressive bystander behaviors, even when controlling for other mechanisms of moral disengagement. The presence of victimizers who are attacking and harming another student and the presence of bystanders who are laughing and cheering them on may trigger these students to diffuse responsibility and side with them. It reduces their sense of personal responsibility, agency, and outcome monitoring (Bandura, 2016; Beyer et al., 2017), and helps them to avoid feelings of guilt and remorse (Bandura, 1999, 2016). However, there is a lack of longitudinal studies examining the link between diffusion of responsibility and pro-aggressive bystander behavior over time. Such studies would help to answer the question of whether diffusion of responsibility when witnessing peer victimization increases the likelihood of acting as pro-aggressive bystanders, or whether this type of behavior increases students’ tendency to diffuse responsibility over time.

Social cognitive theory (Bandura, 2016) states that children’s development of various cognitive and behavioral patterns (e.g., diffusion of responsibility and pro-aggressive bystander behavior) is a result of the triadic codetermination; in other words, it is produced by a complex and continual interplay between behavioral, personal, and environmental influences. Children’s cognitive propensity to diffuse responsibility as bystanders of peer victimization is something that they may learn when they encounter and interact in peer victimization incidents, and which continues to develop into a more or less stable or trait-like cognitive moral distortion if they repeatedly witness and side with the victimizers in peer victimization situations.

With reference to social cognitive theory (Bandura, 1999, 2016), it would be plausible to assume that the development and change in the propensity to diffuse responsibility and to perform pro-aggressive bystander behavior is a reciprocal

and gradual process over time. In other words, children who begin to act as pro-aggressive bystanders when observing peer victimization may gradually keep away from self-sanctions (i.e., feelings of remorse and guilt) for such behavior through diffusion of responsibility (e.g., “because other students are laughing at and teasing the person, I cannot be blamed for doing that too”), which allows them to continue to engage in pro-aggressive bystander behavior with fewer and fewer feelings of remorse and guilt. In this way, pro-aggressive bystander behavior predicts diffusion of responsibility over time. Simultaneously, and also in line with social cognitive theory (Bandura, 2016), these children may continue to diffuse responsibility to evade self-sanctions, which in turn allows them to increase their pro-aggressive bystander behavior in the future. In this sense, diffusion of responsibility predicts pro-aggressive bystander behavior. Such a development might consist of a vicious cycle between diffusion of responsibility and pro-aggressive bystander behavior as the triadic codetermination operates over time. The present study is designed to examine this possible bidirectional, longitudinal association between diffusion of responsibility and pro-aggressive bystander behavior.

1.3 The current study

The overall objective of the current study was to investigate the longitudinal association between diffusion of responsibility and pro-aggressive bystander behavior across three time points in upper elementary education. Since this study was designed to fill the gap in the literature, as previous research has not yet examined the longitudinal association between the two variables, we were unable to deduce hypotheses from the existing empirical literature. However, with reference to social cognitive theory, which assumes triadic codetermination and proposes that changes in self-serving cognitive moral distortions (e.g., diffusion of responsibility) and immoral behavior (e.g., pro-aggressive bystander behavior) are gradual, reciprocal processes over time (Bandura, 1999, 2016), we formulated three hypotheses.

First, we hypothesized that diffusion of responsibility would predict later pro-aggressive bystander behavior. Second, we hypothesized that pro-aggressive bystander behavior would predict later diffusion of responsibility. Third, we hypothesized that the longitudinal relationship between diffusion of responsibility and pro-aggressive bystander behavior would be bidirectional.

Therefore, we simultaneously investigated the associations between diffusion of responsibility and pro-aggressive bystander behavior over time, the associations between diffusion of responsibility at T1, T2, and T3, and the associations between pro-aggressive bystander behavior at T1, T2, and T3 (see Fig. 1). Analyzing the relationship between diffusion of responsibility and pro-aggressive bystander behavior by considering their respective stability over time is crucial to understanding the directionality of this association. Moreover, we tested the longitudinal relationships between the study variables at both between- and within-person levels (see section Statistical analyses). While a between-person approach sheds light on how individuals might differ from their peers with respect to the variables and their associations,

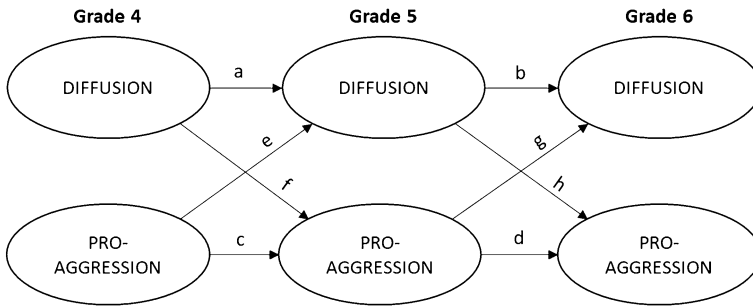


Fig. 1 The autoregressive (paths a–d) and cross-lagged effects (paths e–h) of the cross-lagged panel models

a within-person approach is useful for examining the development at the individual level (see also Hudson et al., 2019; Romera et al., 2021). Gender and immigrant background were included as control variables in the longitudinal analyses to avoid omitted variable bias.

2 Method

2.1 Participants

This study was part of a broader longitudinal project investigating social and moral correlates of peer victimization among Swedish students from fourth to eighth grades. In the current study, we included students from upper elementary school, which they enter in grade 4, the year they turn 10, and end in grade 6. In Sweden, elementary school students are, in general, in the same class all day, have a home classroom where most of their classes take place, and have the same teacher for most school subjects.

Three waves of data were collected, at one-year intervals, in grades 4 to 6. The original sample in the first wave consisted of 2,408 fourth-grade students from 74 schools. However, 782 students (32%) did not participate, either because we did not receive consent from their parents (599 students) or because they were absent or chose not to participate (183 students). In addition, three students were excluded from the analyses because they did not complete the scales used in this study. Thus, 1,623 fourth grade students participated ($M_{\text{age}}=10.56$, $SD=0.35$, girls=52%). Between the fourth and fifth and between the fifth and sixth grades, some students were withdrawn from the study (e.g., they were absent on the day of data gathering or had transferred to another school), while others joined the study. There were 1685 ($M_{\text{age}}=11.55$, $SD=0.33$, girls=53%) and 1485 ($M_{\text{age}}=12.58$, $SD=0.35$, girls=53%) participating students in the fifth and sixth grades, respectively. In total, 1,905 students participated on at least one occasion.

Schools were selected through a strategic sampling technique to obtain a heterogeneous sample. In this way, the studied sample included students from

different socioeconomic backgrounds (from lower to upper-middle socioeconomic status) and socio-geographic locations (from rural areas to medium and large cities). Across the three waves, 18–19%—compared to 22% of the whole population (Swedish National Agency for Education, 2016)—had an immigrant background (i.e., were not born in Sweden or were born in Sweden of foreign-born parents).

2.2 Procedure

First, the study was approved by school principals and teachers. Then, both written informed parental consent and student assent were obtained from all participants. Participating students filled in a web-based questionnaire three times at one-year intervals. The first data collection wave took place in the school year of 2015/2016, when the students were in fourth grade, and the last data collection wave took place in the school year of 2017/2018, when the students were in sixth grade. During the administration of the questionnaire, either a member of the research team or a teacher was present to explain the study procedure and to assist participants who needed help (e.g., clarifying particular items or words in the questionnaire). The average completion time for the questionnaire was approximately 30 min.

2.3 Measures

2.3.1 Pro-aggressive bystander behavior

A 15-item seven-point scale (1 = *strongly disagree* to 7 = *strongly agree*) measured students' bystander behaviors (Thornberg, Pozzoli, et al., 2017; Thornberg, Wänström, et al., 2017), but was revised to measure bystanding in peer victimization (instead of the more limited context of bullying, as in the original scale). Thus, the scale asked: "Try to remember situations in which you have seen one or more students victimizing another student (for example: teasing, mocking, threatening, physically assaulting, or freezing out). What do you usually do?" Of the 15 items, five depicted pro-aggressive bystander behaviors (e.g., "I also start to hurt the student"; "I encourage those who are hurting the student by laughing and cheering them on"). Students' responses were averaged on these five items at each data collection wave and were used as composite scales for pro-aggressive bystander behaviors (Cronbach's alphas ranging from 0.74 to 0.84 across waves). Three separate confirmatory factor analyses, one for each wave, were run and confirmed the unidimensionality of the scale: CFA wave 1: $\chi^2(5)=8.33$, $p=.14$, CFI=0.979, RMSEA=0.066; 90% CI [0.048, 0.086]; CFA wave 2: $\chi^2(5)=4.26$, $p=0.51$, CFI=0.99, RMSEA=0.054; 90% CI [0.036, 0.074]; CFA wave 3: $\chi^2(5)=8.34$, $p=.14$, CFI=0.985, RMSEA=0.062; 90% CI [0.043, 0.082].

2.3.2 Diffusion of responsibility

An 18-item seven-point scale (1 = *strongly disagree* to 7 = *strongly agree*) was used to measure students' moral disengagement in peer victimization (Bjärehed et al.,

2020). The scale comprised the eight moral disengagement mechanisms outlined by Bandura (1999). For the purpose of this study, we focused on the two items that captured diffusion of responsibility: “If my friends begin to tease a classmate, I can’t be blamed for being with them and teasing that person too” and “If there are several of us who exclude another student, it would not be my fault”. Students’ responses were averaged on these two items at each data collection wave and were used as a composite scale for diffusion of responsibility. As the diffusion of responsibility scale was composed of only two items, the Spearman-Brown reliability coefficient was used instead of Cronbach’s alpha (Eisinga et al., 2013). The Spearman-Brown estimates ranged from 0.59 to 0.63 across waves.

2.4 Statistical analyses

All analyses were performed in R Studio 2022.02.1 using the lavaan package, version 0.6-9 (Rosseel, 2012). Longitudinal associations between pro-aggressive bystander behavior and diffusion of responsibility were tested through both a traditional cross-lagged panel model (T-CLPM) and a random intercept cross-lagged panel model (RI-CLPM). Cross-lagged panel models have been commonly applied to investigate the dynamic interplay of variables. In particular, researchers have used T-CLPM to investigate cross-lagged effects; that is, the effect of a construct on another measured on a later occasion while controlling for the autoregressive effect (i.e., the effect of a construct on itself measured on a later occasion). For instance, a significant positive cross-lagged effect of pro-aggression on diffusion of responsibility between time points 1 and 2 would indicate that students who more often act pro-aggressively as bystanders in the fourth grade will tend to have subsequent higher levels of diffusion of responsibility in the fifth grade.

In recent years, concerns have been raised that the T-CLPM does not separate within-person from between-person variation and, in response to this, the RI-CLPM has been proposed (Grimm et al., 2021; Hamaker et al., 2015). The RI-CLPM is an extension of the traditional cross-lagged panel model that accounts for time-invariant, trait-like stability through the inclusion of random intercepts (Hamaker et al., 2015). In other words, RI-CLPM makes it possible to distinguish between-person effects and within-person effects, thus allowing us to study changes over time on a within-person level for pro-aggressive bystander behavior and diffusion of responsibility. In RI-CLPM, significant autoregressive effects suggest that within-person deviations from expected scores (based on the random intercepts/stable trait levels) of one variable (i.e., pro-aggressive bystander behavior or diffusion of responsibility) predict deviations from expected scores of the same variable in the next wave as well. Significant cross-lagged effects, in turn, suggest that within-person deviations from expected scores of one variable (e.g., pro-aggressive bystander behavior) predict deviations from expected scores of another variable (e.g., diffusion of responsibility) in the next wave.

Although the RI-CLPM has been presented as an enhancement of the T-CLPM (e.g., Hamaker et al., 2015), limitations of the RI-CLPM have also been discussed (Lüdtke & Robitzsch, 2021; Sorjonen et al., 2023). For example, RI-CLPM is

less appropriate for gaining an understanding of how longitudinal associations between variables are linked to or explain differences between individuals (Lüdtke & Robitzsch, 2021). Moreover, it has been proposed that T-CLPM and RI-CLPM should be seen as complementary rather than competing models, that they have their respective advantages and limitations, and that the main question to ask is which model is the most adequate for the research question at hand (Orth et al., 2021).

In the current study, the overall objective was to investigate the longitudinal association between diffusion of responsibility and pro-aggressive bystander behavior. By employing both T-CLPM and RI-CLPM, we sought to capture different aspects of this association and provide a more comprehensive perspective by answering both between-person (e.g., will students who act more pro-aggressively [relative to others] display a subsequent increase in diffusion of responsibility compared to students who act less pro-aggressively?) and within-person (e.g., will students who act more pro-aggressively than usual [relative to their trait level] display a subsequent increase in diffusion of responsibility than usual?) questions (see Orth et al., 2021).

In the hypothesized T-CLPM and RI-CLPM models, the autoregressive (see paths a–d in Fig. 1) and cross-lagged effects (see paths e–h in Fig. 1) between adjacent time points were examined. At time point 1, pro-aggressive bystander behavior and diffusion of responsibility were allowed to covary, and at time points 2 and 3, their residuals were allowed to covary. Moreover, the residual variances among the corresponding indicators were allowed to covary over time. Because χ^2 is sensitive to the sample size, the model was evaluated using the following fit indices: the Comparative Fit Index (CFI), the Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR). A CFI > 0.95, an RMSEA < 0.06, and an SRMR < 0.08 indicate an adequate fit of the model (Hu & Bentler, 1999).

In longitudinal studies, using the same scale does not guarantee that the same construct is being measured over time (Little, 2013). For example, as participants get older or because the nature of the assessment varies across occasions, their interpretations of the scale's items may change. Therefore, measurement invariance across time was examined, following the procedure outlined by Mackinnon et al. (2022). First, a CFA with unconstrained factor loadings and intercept across time points, including both diffusion of responsibility and pro-aggressive bystander, was conducted. In the next step, the unconstrained CFA was compared with a CFA in which the factor loadings were constrained to be equal over time. If the CFI and the RMSEA did not decrease by more than 0.010 and 0.015, respectively, weak/metric invariance was supported (Chen, 2007; Cheung & Rensvold, 2002; Little, 2013). Finally, the CFA with constrained factor loadings was compared to a CFA in which both factor loadings and item intercepts were constrained to be equal over time. If the CFI and the RMSEA did not decrease by more than 0.010 and 0.015, respectively, strong/scalar invariance was supported. Finally, to determine the proportion of variance that could be attributed to stable within-person differences versus within-person fluctuations, we calculated intraclass correlation (ICC) for diffusion of responsibility and pro-aggressive bystander.

Table 1 Means (M), standard deviations (SD), minimum and maximum observations for diffusion of responsibility and pro-aggressive bystanding at each data collection wave

Measure	<i>M</i>	<i>SD</i>	Min	Max
Diffusion of responsibility T1	1.79	1.34	1	7
Diffusion of responsibility T2	1.57	1.21	1	7
Diffusion of responsibility T3	1.49	1.05	1	7
Pro-aggressive bystanding T1	1.15	0.52	1	7
Pro-aggressive bystanding T2	1.15	0.55	1	7
Pro-aggressive bystanding T3	1.14	0.46	1	7

N = 1187; T1–T3 designate the three time points, T1 = grade 4, T2 = grade 5, T3 = grade 6

Table 2 Correlations for diffusion of responsibility and pro-aggressive bystanding behavior

Measure	1	2	3	4	5	6
1. Diffusion of responsibility T1	–					
2. Diffusion of responsibility T2	.24***	–				
3. Diffusion of responsibility T3	.13***	.25***	–			
4. Pro-aggressive bystanding T1	.13***	.24***	.16***	–		
5. Pro-aggressive bystanding T2	.15***	.22***	.22***	.33***	–	
6. Pro-aggressive bystanding T3	.07*	.15***	.32***	.26***	.56***	–

N = 1187; **p* < .05, ****p* < .001; T1–T3 designate the three time points, T1 = grade 4, T2 = grade 5, T3 = grade 6

3 Results

3.1 Preliminary analyses

Table 1 presents means and standard deviations for pro-aggressive bystander behavior and diffusion of responsibility. Mean levels of pro-aggressive bystanding were stable across grades 4 to 6, whereas mean levels of diffusion of responsibility dropped over time, especially from the fourth to the fifth grade. Table 2 presents pairwise correlations within and between grades. All correlations were positive and significant. Thus, diffusion of responsibility and pro-aggressive bystanding were significantly associated with each other, both within and between grades. Associations between adjacent time points (i.e., T1–T2, and T2–T3) were generally stronger compared to the more distant time points.

The intraclass correlations indicated that 55% and 46% of the variance in diffusion of responsibility and pro-aggression, respectively, could be attributed to between-person differences while 45% and 54% could be attributed to within-person fluctuations. Before estimating the cross-lagged panel models, we tested whether the constructs were invariant over time (see “Appendix”). The configural invariance, unconstrained, model showed adequate fit. For each step (i.e., from unconstrained to constrained factor loadings, and from constrained factor loadings to constrained factor loadings and intercepts), CFI and RMSEA did not decrease by more than 0.010 and 0.015, respectively. Thus, strong/scalar invariance was supported.

3.2 Longitudinal associations

To examine whether pro-aggressive bystanding and diffusion of responsibility predicted each other over time, we ran a traditional CLPM and a random intercept CLPM. Both models showed good overall fit: T-CLPM, $\chi^2(146)=208.88$, $p=.001$, CFI=0.980, RMSEA=0.024, 90% CI [0.014, 0.032], SRMR=0.034 and RI-CLPM, $\chi^2(161)=260.27$, $p<.001$, CFI=0.968, RMSEA=0.029, 90% CI [0.021, 0.036], SRMR=0.035. Consequently, we proceeded to investigate the autoregressive and cross-lagged effects of the models. The standardized effects between diffusion of responsibility and pro-aggressive bystanding are illustrated in Fig. 2.

All autoregressive effects were significant and rather strong (β s ranging from 0.33 to .61, see Fig. 2), indicating that both pro-aggressive bystander behavior and diffusion of responsibility show stability over time. Notably, pro-aggressive bystanding was more stable between the fifth and sixth grades ($\beta=0.61$ for the T-CLPM and $\beta=0.56$ for the RI-CLPM) than between the fourth and fifth grades ($\beta=0.42$ for the T-CLPM and $\beta=0.33$ for the RI-CLPM).

To determine whether pro-aggressive bystander behavior predicted diffusion of responsibility, whether diffusion of responsibility predicted pro-aggressive bystander behavior, or whether there was a reciprocal longitudinal relationship, we examined the cross-lagged effects of the traditional and random intercept cross-lagged panel models. According to both models, diffusion of responsibility in the fourth grade predicted pro-aggressive bystanding in the fifth grade (β s=0.14/0.28, $p<.05$), and pro-aggressive bystanding in the fourth grade predicted diffusion of responsibility in the fifth grade (β s=0.28/0.43, $p<.001$). In other words, there was a reciprocal relationship between diffusion of responsibility and pro-aggressive bystanding from the fourth to fifth grade. By contrast, the models showed little support for a reciprocal relationship between the variables from the fifth to sixth grade. The only significant association was between pro-aggressive bystanding in the fifth grade and diffusion of responsibility in the sixth grade in the T-CLPM ($\beta=0.17$, $p<.05$).

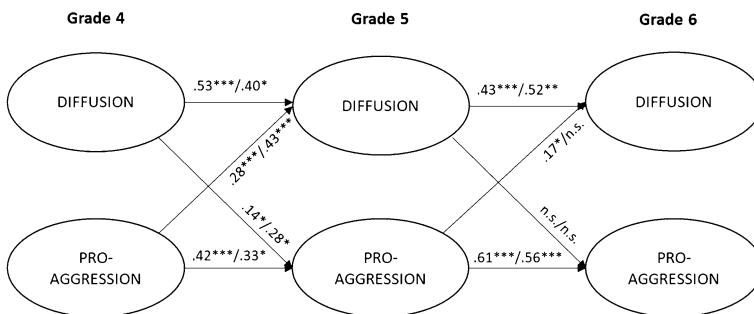


Fig. 2 Standardized path coefficients of the structural part of the traditional and random intercept cross-lagged panel models. Note: * $p<.05$, ** $p<.01$, *** $p<.001$. Path coefficients of the traditional cross-lagged panel model to the left of the slash, and the path coefficients of the random intercept cross-lagged model to the right of the slash

More specifically, the significant bidirectional association of the traditional CLPM suggests that students who more often act pro-aggressively as bystanders in the fourth grade tend to have subsequent higher levels of diffusion of responsibility in the fifth grade, and vice versa. In addition, more pro-aggression predicted higher levels of diffusion of responsibility from the fifth to sixth grade. Moreover, the significant bidirectional association of the random intercept CLPM suggests that students who have higher levels than expected (i.e., students who deviated from their stable trait levels) of diffusion of responsibility in the fourth grade are more likely than expected to act more pro-aggressively as bystanders in the fifth grade, and vice versa. Beyond these within-person effects of the RI-CLPM, there was also a significant between-person effect in that the random intercepts of diffusion of responsibility and pro-aggressive bystanding were positively associated ($\beta=0.16$, $p<.05$), implying that students with higher levels of diffusion of responsibility in general across the waves also reported more pro-aggression in general across the waves.

Regarding the control variables, in both the T-CLPM and RI-CLPM, there was a gender effect for all three waves, indicating that boys were more likely to engage in pro-aggressive bystanding. Furthermore, immigrant background was significantly associated with pro-aggressive bystanding in the first wave, suggesting that immigrant background students were more likely to engage in pro-aggressive bystanding. Neither gender nor immigrant background were significantly associated with diffusion of responsibility (for an overview of all effects of the control variables, see Table 3).

Finally, the explained variance of the endogenous variables (pro-aggression and diffusion of responsibility at T2 and T3) ranged from 25 to 45% in the T-CLPM and from 29 to 50% in the RI-CLPM.

Table 3 Effects of time-invariant control variables on diffusion of responsibility and pro-aggressive bystanding in CLPM and RI-CLPM

	T-CLPM		RI-CLPM	
	Gender	Immigrant	Gender	Immigrant
	β	β	β	β
Diffusion of responsibility T1	0.07	0.08	0.07	0.07
Diffusion of responsibility T2	-0.01	-0.011	-0.02	-0.02
Diffusion of responsibility T3	0.05	0.03	0.03	0.01
Pro-aggressive bystanding T1	0.13***	0.13***	0.13***	0.13**
Pro-aggressive bystanding T2	0.08**	-0.02	0.09**	-0.01
Pro-aggressive bystanding T3	0.09**	-0.01	0.09**	-0.01

** $p < .01$; *** $p < .001$; T1–T3 designate the three time points, T1 = grade 4, T2 = grade 5, T3 = grade 6; Gender: 0 = girls, 1 = boys

4 Discussion

Although diffusion of responsibility has been linked to less defender behavior (Thornberg & Jungert, 2014; Tolmatcheff et al., 2022) and to greater passive bystander behavior (Tolmatcheff et al., 2022) and pro-aggressive bystander behavior (Bjärehed et al., 2020) among school students in peer victimization incidents, these previous studies have been limited to a cross-sectional approach. To the best of our knowledge, this is the first study to have examined the relationship between diffusion of responsibility and pro-aggressive bystander behavior over three time points, and to have tested whether children's diffusion of responsibility predicted their pro-aggressive bystander behavior, whether their pro-aggressive bystander behavior predicted their diffusion of responsibility, and whether this longitudinal association was bidirectional.

In the current three-wave longitudinal study, we found partial evidence for reciprocal influences between diffusion of responsibility and pro-aggressive bystander behavior over time among upper elementary school students. Pro-aggressive bystander behavior in grade 4 resulted in increased levels of diffusion of responsibility in grade 5. Simultaneously, diffusion of responsibility in grade 4 led to increased levels of pro-aggressive bystander behavior in grade 5. This was true in both the traditional CLPM and the RI-CLPM. The latter indicated a bidirectional longitudinal association between diffusion of responsibility and pro-aggressive bystander behavior, even at the within-person level. However, neither the traditional CLPM nor the RI-CLPM confirmed a bidirectional longitudinal relationship between diffusion of responsibility and pro-aggressive bystander behavior from grade 5 to grade 6.

With reference to social-cognitive theory (Bandura, 2016), the present findings support the idea that the development of the propensities to diffuse responsibility and to enact pro-aggressive bystander behavior is a gradual, reciprocal process in the earlier period of upper elementary school, while the behavioral pattern becomes more stable in the later period. Both the CLPM and the RI-CLPM in our results show an increased stability of diffusion of responsibility and pro-aggressive bystander behavior over time. In other words, students' levels of diffusion of responsibility in grade 5 no longer mattered for their levels of pro-aggressive bystander behavior in grade 6. While students' levels of pro-aggressive bystander behavior in grade 5 still predicted their levels of pro-aggressive bystander behavior in grade 6 relative to their peers (T-CLPM), this longitudinal link had weakened, and was not statistically significant relative to their trait level (RI-CLPM).

A possible explanation to the increased stability might be that children's social behaviors, including their bystander behaviors, develop into increasingly more habitual patterns with age. This could be interpreted as a part of their social and moral development of identity, personality, and character, defined as dispositional tendencies in behavior (Lapsley et al., 2020). Longitudinal research has found that while differential stability of personality traits is moderate in childhood, it increases during adolescence (Slobodskaya, 2021). This developmental process

of personal factors (cf., Bandura, 2016) might shed some light on the increase of stability of diffusion of responsibility and pro-aggressive bystander behavior among the students during their transition from childhood to early adolescence. Another and complementary explanation would be to take a group developmental perspective (Forsyth, 2006; Wheelan, 2005) applied to the classroom peer context. Group norms, roles, statuses, and relationships become increasingly more established and consistent across the three years of upper elementary school, which, in turn, should increase the stability and predictability of students' social behaviors. In addition, students become increasingly concerned and occupied with their social position or status in their peer landscape as they approach adolescence (Dawes, 2017). This may lead to more stable patterns of how inclined they are to diffuse responsibility and behave in a certain way as bystanders when witnessing peer victimization in order to act in accordance with their social position.

A possible explanation for why students' pro-aggressive bystander behavior continued to predict their diffusion of responsibility in the T-CLPM model might be their continued subsequent psychological need to further develop this moral distortion to avoid moral self-sanctions such as feelings of guilt (Bandura, 2016). Considering that peer victimization takes place in peer groups (e.g., Hymel et al., 2015; Salmivalli, 2010) where other bystanders are present (Atlas & Pepler, 1998; Hawkins et al., 2001; Jones et al., 2015; Nishina & Bellmore, 2010), diffusion of responsibility is a more accessible moral disengagement mechanism to activate and develop. However, note that the link was weaker from grade 5 to grade 6 than from grade 4 to grade 5 in the T-CLPM model, and only significant from grade 4 to grade 5 in the RI-CLPM model. Thus, altogether these findings suggest that the bidirectional longitudinal association between diffusion of responsibility and pro-aggressive bystander behavior declines over time, while each of them become more stable during the upper elementary school.

Previous studies have shown that less perception of personal responsibility is associated with less defender behavior (Jenkins & Nickerson, 2019; Jenkins et al., 2018; Pozzoli & Gini, 2013a, 2013b). According to the bystander intervention model (Latané & Darley, 1970), these earlier results demonstrate that noticing and interpreting that a person is victimized or in distress is not enough for prosocial intervention. Bystanders also need to perceive a personal responsibility for helping that person. In the bystander literature, diffusion of responsibility has been identified as one of the possible mechanisms behind the so-called *bystander effect*, defined as being less likely to help a person in an emergency when other (passive) bystanders are present (Darley & Latané, 1968; Fischer et al., 2011; Latané & Darley, 1970; Latané & Nida, 1981).

The current study adds to the literature by providing evidence that there is a longitudinal link between diffusion of responsibility and pro-aggressive bystander behavior when witnessing peer victimization between the two first grades of upper elementary school. In addition to our structural equation models, we found a positive bivariate correlation between diffusion of responsibility and pro-aggressive bystander behavior at each time point, even though the correlation is considerably small at T1. Thus, students who are more prone to diffuse responsibility as bystanders of peer victimization are not only less likely to intervene and more likely to remain passive or unresponsive bystanders, as demonstrated in previous studies, but

also more likely to side with the victimizers by laughing and cheering or by joining the victimizers and starting to harass the victim too.

In sum, diffusion of responsibility not only inhibits bystanders from defending the victim but also increases the risk that they will begin to assist the victimizers or reinforce peer victimization by laughing and cheering them on. As Bjärehed et al. (2020) conclude, “pro-aggressive bystanders tend to minimize their sense of personal responsibility, and thus their sense of moral agency, by diffusion of responsibility” (p. 47). The present study shows that there was a vicious cycle (i.e., a reciprocal relationship) between diffusion of responsibility and pro-aggressive bystander behavior in the first period of upper elementary school but which then declined, at the same time as they were correlated with each other within all considered grades. Diffusion of responsibility means that the bystanders become a part of the “faceless group” (Bandura, 2016, p. 62) where any harm they do can be attributed to the behavior of others.

4.1 Limitations

This study has several strengths, including a three-wave longitudinal design, a large sample, and testing the longitudinal associations across the study variables with both traditional CLPM and random intercept CLPM. However, some limitations should also be noted. First, it was based on self-reported data, which may inflate the size of associations of constructs across time. Furthermore, self-reported data may be vulnerable to social desirability, and to recall and perception biases. There is, for example, a risk that some participants underreported their diffusion of responsibility and/or pro-aggressive bystander behavior due to social norms and standards. To decrease the risk of underreporting, we informed the participants about their confidentiality and assured them before each data collection session that no one at their school or at home would get any information about their individual answers. With reference to their confidentiality, we asked them to be as honest as possible.

A second limitation, particularly from the social-cognitive framework and its assumption of the triadic codetermination, was the reliance on individual-level data in our findings. Contextual variables representing the environmental influences, such as classroom climate, peer network, and group processes data, would have helped us to examine the individual variables (personal and behavioral influences) nested in peer groups and classrooms (environmental influences) to analyze the interplay between these factors over time. Future studies could therefore expand the current findings by adopting a multilevel approach and including contextual variables when examining the longitudinal association between diffusion of responsibility and pro-aggressive bystander behavior.

A third limitation is the lower reliability coefficients of the diffusion of responsibility scores. This means that some caution is warranted when interpreting the results. On the other hand, despite the fact that many researchers follow a rule-of-thumb that reliability coefficients should reach 0.70 for a scale to be considered as sufficient or acceptable, this cut-off value is somewhat arbitrary. Reliability coefficients should be interpreted in the context of the particular study and the total number of items included in the scale (Taber, 2018). Very few items in a scale lead to lower reliability coefficient scores (Vaske et al., 2017), which should always be interpreted with caution.

In line with Taber's (2018) recommendation, we have therefore presented the items included in the scale for the readers so they can make their own judgements of what Taber terms *face equivalence*; in other words, "to what extent items within a particular scale or instrument seem to be targeted at the same underlying construct" (p. 1294). In addition, we were unable to identify a CFA model for this scale due to under-identification as a result of the use of only two items. Thus, future studies aimed at replicating the current findings should measure diffusion of responsibility with a higher number of items, not only to be able to calculate a more accurate estimate of internal reliability but also to address the factorial and content validity of the scale.

A fourth limitation is the sample and its vulnerability to selection bias and limited generalizability. We did not adopt a randomized sampling technique, and we had a significant nonresponse rate. We also did not control for socioeconomic background or ethnicity. Nevertheless, we selected participating schools based on a strategic sampling procedure to gain a heterogeneous sample, including students from different socioeconomic backgrounds and socio-geographic locations. Finally, because the study is based on a non-probability sampling procedure from specific areas in Sweden, we want to emphasize that the findings are partial estimations and approximations, and that generalization should be considered with caution. Future studies should replicate the present findings with other samples of students of different ages and from different cultural backgrounds, including socioeconomic and ethnicity data in the analyses.

4.2 Implications

Despite these limitations, the findings of this study have both theoretical and practical implications. As stated by Darley and Latané (1968) in their seminal work, knowing the situational forces that influence behavior may lead people to better overcome them. Being aware of the processes that are linked to pro-aggressive behavior, both acting as driving forces or as subsequent justifications, is therefore of paramount importance to decrease undesirable behavior. However, diffusion of responsibility and other mechanisms of moral disengagement are not necessarily conscious processes. For this reason, it would be relevant for educators to explicitly consider the diffusion of responsibility processes in prevention and intervention programs and in their curricular activities, encouraging students to reflect on the power of this disengaging excuse for behaving aggressively and to discuss the relevance of each student's sense of responsibility to change aggressive dynamics among peers. This could lead children to become more able to recognize this process in their own and other students' daily lives, and to consider it an unacceptable moral justification. Moreover, given the influence of pro-aggressive behavior in enhancing the use of diffusion of responsibility over time, the findings of this study restate the importance of a firm condemnation of all forms of aggressive behavior in the school context, even when they are not directly enacted, as happens with supporters or assistants of the victimizer. Teachers and educators should also be trained to recognize more subtle forms of aggression and to intervene immediately, giving a clear message to all students about the unacceptability of these behaviors.

Appendix

See Table 4.

Table 4 Model fit statistics for tests of invariance across time

Model tested	χ^2	df	CFI	Δ CFI	RMSEA	Δ RMSEA	Model comparison
1. Unconstrained	148	102	.986		.024		
2. Constrained factor loadings	160	110	.982	.004	.026	.002	1 versus 2
3. Constrained factor loadings and intercepts	203	122	.972	.010	.031	.005	2 versus 3

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Declarations

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Robert Thornberg is professor of Education at the Department of Behavioural Sciences and Learning (Linköping University, Sweden). His main research interests focus on moral and social psychological processes associated with school bullying and various bystander behaviors in bullying and peer victimization.

Björn Sjögren is a postdoctoral researcher at the Department of Behavioural Sciences and Learning (Linköping University, Sweden). His research interests include cognitive and social processes related to children's social interactions with a specific focus on bullying, peer victimization, and bystander behaviors.

Gianluca Gini is professor of Developmental and Educational Psychology at the School of Psychology (University of Padua, Italy). His major research interests include the interplay of individual and group processes associated with different roles of participation in bullying, the health and psychosocial consequences of peer victimization, and the development of adolescents' relationships with peers on social media.

Tiziana Pozzoli is Ph.D. in Developmental Psychology. She is currently associate professor in the Department of Developmental and Social Psychology (University of Padova, Italy). Her research interests concern individual and contextual variables associated with different behavior during bullying episodes, focusing especially on bystanders' behavior.