The Shaping Mechanism and Governance Path of Bullying Bystander Protective Behavior in School Environments

Authors: Li Huanhuan, Kai Yan, Li Huanhuan

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Abstract

School climate is a critical micro-environment for shaping the social behavior of adolescents and a vital link in the governance of bullying. Previous research has indicated that poor peer relationships are school environmental risk factors that effectively predict bullying or victimization, while bystander protective behavior within the school context is one of the important factors in the termination of bullying phenomena. However, exploring the predictors of bystander protective behavior from a static perspective using linear analysis methods makes it difficult to deeply elucidate the complex psychological mechanisms of "why bystanders react differently in real-world situations." To this end, this study attempts to adopt a dynamic perspective based on situational interaction, focusing on constructing a three-stage psychological decision-making framework in which the interaction of school and classroom climate, interactive relationships, and bystanders' individual psychological characteristics shapes bystander protective behavior. This aims to provide innovative insights for developing a scientific and effective comprehensive model for school bullying governance.

Full Text

Preamble

Shaping Mechanisms and Governance of Bullying Bystander Protective Behavior in School Environments

Li Huanhuan, Yan Kai (Department of Psychology, Renmin University of China, Beijing 100872)

Abstract

School bullying is a pervasive global issue that severely impacts the physical and mental health of adolescents. While traditional interventions have focused primarily on the perpetrators and victims, recent research highlights the critical role of bystanders—the majority of students who witness bullying incidents. This paper explores the psychological and social mechanisms that shape bystander protective behavior, transitioning from passive observation to active intervention. By analyzing individual factors (such as empathy and self-efficacy) and contextual factors (such as school climate and peer influence), we propose a comprehensive governance framework. This framework emphasizes the cultivation of a supportive school environment and the implementation of targeted social-emotional learning programs to empower bystanders, thereby transforming them into active defenders and fostering a safer school culture.

1. Introduction

School bullying remains a significant challenge for educational systems worldwide, characterized by repetitive aggressive behavior involving an imbalance of power. Although direct participants—the bully and the victim—are the primary focus of concern, the vast majority of bullying incidents occur in the presence of peers. These bystanders play a pivotal role in the dynamics of bullying; their reactions can either exacerbate the situation by encouraging the bully or mitigate it by supporting the victim.

Understanding the shaping mechanisms of bystander protective behavior is essential for developing effective anti-bullying strategies. Protective behavior refers to actions taken by bystanders to support the victim, discourage the bully, or report the incident to authorities. Despite the potential for bystanders to stop bullying, many remain passive due to various psychological barriers. This article examines the internal and external factors that influence these behaviors and discusses governance strategies to mobilize the "silent majority" in school settings.

2. Shaping Mechanisms of Bystander Protective Behavior

The transition from witnessing bullying to taking protective action is a complex process governed by multiple levels of influence. These can be broadly categorized into individual psychological traits and environmental factors.

2.1 Individual Psychological Factors Individual characteristics serve as the internal foundation for protective behavior. Key factors include:

- **Empathy:** Affective and cognitive empathy allow bystanders to understand the victim' s distress and feel a sense of shared emotional pain. High levels of empathy are consistently associated with a greater likelihood of intervention.

- **Self-Efficacy:** Even if a student wishes to help, they may not act if they feel incapable of doing so

摘要

School climate serves as a critical micro-environment for shaping the social behavior of adolescents and constitutes a vital component of bullying intervention and prevention. Previous research has demonstrated that maladaptive peer relationships are a school-level environmental risk factor that effectively predicts bullying or victimization. Conversely, bystander defending behavior within the school context is recognized as one of the most significant factors in terminating bullying incidents. However, exploring the predictors of bystander defending behavior from a static perspective using linear analysis methods makes it difficult to provide an in-depth explanation of the complex psychological mechanisms underlying why bystanders react differently in real-world situations.

To address this gap, the present study adopts a dynamic perspective based on situational interaction. It focuses on constructing a three-stage psychological decision-making framework that examines how the interactions between school and classroom climates, interpersonal relationships, and the individual psychological characteristics of bystanders shape defending behavior. This approach aims to provide innovative insights for the development of scientifically effective and comprehensive models for school bullying governance.

关键词

School Bullying and Bystander Protective Behavior: Shaping Mechanisms and Governance Pathways

Abstract

School bullying is a pervasive global issue that severely impacts the physical and mental health of students and undermines the safety of the educational environment. While traditional interventions have focused primarily on the perpetrators and victims, recent research highlights the critical role of bystanders —the majority of students who witness these incidents. Bystander protective behavior, defined as actions taken by witnesses to support the victim or stop the bullying, serves as a powerful natural deterrent. This paper explores the psychological and social mechanisms that shape bystander behavior and proposes comprehensive governance pathways to foster a culture of intervention and support within schools.

1. Introduction

School bullying is characterized by repetitive, intentional aggressive behavior involving an imbalance of power. Beyond the immediate dyad of the bully and the victim, bullying is a group phenomenon where bystanders play a decisive

role in the escalation or de-escalation of the conflict. When bystanders remain passive or reinforce the bully, they inadvertently validate the aggression. Conversely, when bystanders intervene to protect the victim, they can significantly reduce the frequency and severity of bullying incidents. Understanding how to transform passive observers into active protectors is essential for effective school governance.

2. Shaping Mechanisms of Bystander Protective Behavior

The transition from witnessing bullying to taking protective action is influenced by a complex interplay of individual, social, and situational factors.

2.1 Cognitive and Emotional Foundations Protective behavior is often rooted in high levels of empathy and moral sensitivity. Students who can cognitively understand the victim' s distress and emotionally share their pain are more likely to feel a sense of responsibility. Furthermore, the "Bystander Effect" suggests that the presence of others can lead to a diffusion of responsibility; therefore, shaping protective behavior requires strengthening an individual' s internal moral obligation to act regardless of the group size.

2.2 Social-Cognitive Factors and Self-Efficacy A student' s belief in their own ability to intervene effectively—known as self-efficacy—is a primary predictor of protective behavior. Even if a student feels empathy, they may remain passive if they fear retaliation or do not know how to help. Shaping mechanisms must therefore focus on building social skills and providing students with concrete strategies for safe intervention.

2.3 Peer Influence and Group Norms The social climate of the peer group significantly dictates bystander responses. In environments where "standing up for others" is a valued social norm, students are more likely to

1 问题提出

School bullying is a deliberate act of harm repeatedly inflicted by an individual or group on a weaker party within the school environment, encompassing various forms such as physical, verbal, relational, and cyberbullying (Zhang, 2023; Salmivalli & Peets, 2018). Bullying is prevalent among adolescent populations worldwide; approximately one-third of adolescents reported experiencing some form of peer bullying within the past month (UNESCO, 2019). In China, about 15% of middle school students have been involved in bullying incidents (Luo et al., 2022). Bullying not only causes persistent emotional distress and developmental risks for victims—such as depression, anxiety, and self-harm (Guo et al., 2025; Shen & Su, 2024)—but also reinforces aggressive tendencies and problem behaviors in perpetrators (Han et al., 2025), while simultaneously inducing negative emotional experiences and psychological stress in bystanders (Callaghan et al., 2019).

Given the prevalence and multifaceted harms of bullying, constructing a scientifically effective and comprehensive model for school bullying governance to reduce its occurrence and protect the healthy development of adolescents has become a core societal issue.

Previous research exploring the causes of bullying and intervention strategies has primarily focused on the dyadic relationship between the bully and the victim; however,

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Bullying is essentially a group process, with bystanders present in approximately two-thirds of all bullying incidents (Hamby et al., 2016). In these situations, the behavioral responses of bystanders significantly influence the trajectory of the bullying event. In particular, bystander defending behavior—defined as actions taken by individuals who witness bullying to reduce harm by stopping the bully or supporting the victim (Salmivalli, 2010)—can directly alter the process of bullying interactions in real-world settings and serves as a critical behavioral pathway for curbing school bullying. Research has found that when bystanders defend or support the victim, bullying incidents are more likely to be stopped promptly, and the physical and mental harm to the victim is mitigated (Laninga-Wijnen, van den Berg, et al., 2023). Conversely, if bystanders remain silent or encourage the bullying, they may reinforce bullying norms and exacerbate the harmful consequences. Therefore, compared to traditional intervention pathways focusing on bullies or victims, mobilizing bystander defending behavior is increasingly becoming a vital breakthrough for school bullying governance.

However, in real-world school settings, the incidence of proactive defending behavior among bystanders remains low (Lambe et al., 2019). Although over 58% of adolescents have been involved in bullying as bystanders (González-Cabrera et al., 2019), only about 40% have taken actual intervention actions during a bullying incident (Datta et al., 2016); most bystanders remain passive observers or even assist in the bullying. This phenomenon suggests that whether a bystander takes defending action is not based on a single motive or a simple situational judgment, but is rather a complex decision-making process constrained by multiple factors (Casey et al., 2017; Meter & Card, 2015). On one hand, individual characteristics (such as empathy and self-efficacy) provide an important psychological foundation for bystanders to take defending actions. On the other hand, bystanders exist within complex social networks, and their behavioral choices are embedded in specific social interaction structures, influenced by the characteristics of the roles involved in the bullying, peer relationship networks, classroom norms, and school climate (Garandeau et al., 2022; Zhang et al., 2025). However, existing research mostly starts from a single level or partial relationships and has not yet systematically revealed how multi-level factors work together in dynamic situations to influence the psychological decision-making process of bystanders. Therefore, it is necessary to construct a systematic explanatory framework based on the integration of individual and environmental factors and to further explore context-specific school governance pathways.

2.1 旁观者保护行为的界定

The concept of the "bystander" originated in the field of social psychology and refers to a third-party individual who is not directly involved in the core of an emergency or unjust event but witnesses the occurrence or has knowledge of it (Latané & Nida, 1981). Bystander behavior involves a continuous spectrum ranging from passive observation to active intervention, and the decision-making process is influenced by situational cues, individual traits, and social norms (Fischer et al., 2011). Rather than being neutral observers, bystanders are potential actors capable of altering the course of an event through intervention.

In the context of school bullying, bystanders are peers or students who witness bullying incidents. Although they are not directly bullying others or being

bullied themselves, their presence transforms the bullying incident from a dyadic interaction between the bully and the victim into a group dynamic process. The behavioral responses of bystanders significantly impact the development and consequences of bullying incidents (Salmivalli et al., 1996). Compared to bystanders in general social situations, bullying bystanders are often embedded within relatively stable peer networks and classroom structures, facing more complex peer relationships and social pressures. Bystanders often fear that intervening in a bullying incident will invite retaliation from the bully or damage their interpersonal relationships (Strindberg et al., 2020). The Participant Role Model (Salmivalli et al., 1996) categorizes bystanders into four primary types: defenders, assistants, reinforcers, and outsiders. Among these, defenders actively support the victim and intervene in bullying through direct means (such as stopping or driving away the bully) or indirect means (such as notifying a teacher or comforting the victim). Assistants directly join the bully and provide practical

aid (such as participating in the attack). Reinforcers do not join the bullying directly but indirectly foster a bullying atmosphere through cheering, encouragement, or incitement. Outsiders maintain distance or avoid the situation, choosing not to intervene or pretending not to notice the bullying, sometimes even leaving the scene to avoid involvement. The same bystander may shift from an outsider to a defender across different bullying incidents; whether this transition occurs depends on the bystander' s perceived risk, self-efficacy, and relationship with the victim (Pronk et al., 2013; Tian et al., 2025). Thus, bystanders are not a behaviorally homogeneous group, and their behavioral types are not fixed but are dynamically influenced by situational factors. While the Participant Role Model reveals the diverse behavioral orientations of bystanders in bullying contexts as a whole, this framework primarily remains at the level of role classification and pays insufficient attention to the differences in behavioral patterns within the defender category. In fact, when implementing defensive behaviors, bystanders do not exhibit a uniform prosocial response; instead, they adopt diverse protection strategies within specific contexts. In recent years, researchers have begun to refine the multidimensional structure and typological

characteristics of bystander defense behavior.

First, based on the mode of implementation, bystander defense behavior can be distinguished into two types: direct and indirect defense. Direct defense behavior is primarily targeted at the bully, employing confrontational strategies such as active persuasion, physical intervention, or driving the bully away. Indirect defense behavior is victim-centered and employs non-confrontational strategies, such as comforting the victim, reporting the incident to a teacher, or using other indirect methods to protect the victim (Reijntjes et al., 2016). Second, based on the motivation and nature of the behavior, it can be divided into constructive defense and aggressive defense. The former emphasizes problem-solving and emotional support, which facilitates the victim's emotional recovery and reduces self-blame; the latter involves counter-attacks or negative responses toward the bully.

While aggressive defense may stop bullying in the short term, it can trigger cycles of conflict or tension within group relationships (Jin et al., 2024; Steinvik et al., 2025). Furthermore, bystander defense behavior exhibits cultural heterogeneity. A recent study identified a form of "strategic defense behavior" among Chinese adolescents, referring to bystanders using clever, non-confrontational tactics (such as distracting the bully) to defuse the situation. This reflects a behavioral preference in the Chinese cultural context for using indirect, wise methods to avoid direct conflict while effectively protecting the victim. This suggests that while bystanders in individualistic cultures may focus more on direct intervention and personal moral responsibility, those in collectivist cultures may be more inclined to adopt indirect strategies to

maintain group harmony (Wang et al., 2023).

2.2 旁观者保护行为的影响因素

Whether and how bystanders implement protective behaviors in bullying situations is influenced by individual psychological characteristics, peer interaction dynamics within the bullying context, and school- and classroom-level environmental factors. However, factors at these different levels are often examined in isolation, and the underlying mechanisms and interrelationships between them require further integration.

2.2.1 个体心理特征

The emotional and cognitive characteristics of bystanders serve as the psychological foundation for the occurrence of protective behaviors. Among these, empathy is one of the key variables for predicting bystander intervention. Adolescents with higher levels of empathy are more likely to perceive bullying as an emergency requiring intervention.

Furthermore, these individuals develop an emotional connection with the victim, which triggers a stronger motivation to engage in protective behaviors (Choi &

Park, 2021). Compared to cognitive empathy, affective empathy is a more stable predictor of actual protective behavior; it primarily promotes moral concern and helping tendencies by enhancing the bystander' s ability to resonate with the victim' s suffering (Deng et al., 2021). In contrast to the facilitative role of empathy, bystanders with higher levels of moral disengagement are more likely to rationalize bullying and weaken their moral evaluation of the victim' s situation, thereby reducing the likelihood of intervention. Conversely, adolescents with a higher sense of moral responsibility and a greater internalization of fairness norms tend to view protecting the victim as a moral obligation that ought to be fulfilled (Jiang et al., 2022). Students with high moral disengagement exhibit an amotivated state when facing victims, leading to more pro-bullying behaviors and fewer protective behaviors; meanwhile, students with lower moral disengagement are more likely to possess autonomous motivation, leading to increased protective actions and decreased support for bullying (Thornberg et al., 2023). Additionally, evidence from both cross-sectional and longitudinal studies suggests that self-efficacy is a critical antecedent for bystanders to perform actual protective behaviors. When bystanders believe they have the capability to intervene effectively and safely, they are more likely to take action (Sjögren et al., 2021; Sjögren et al., 2024). Although the aforementioned psychological characteristics are closely associated with bystander protective behavior, they represent relatively stable, static traits. How these traits are activated, inhibited, or transformed into actual action within specific bullying contexts has not yet been fully demonstrated. This limitation, to some extent, constrains our ability to explain the phenomenon where "bystanders possess pro-social motivation yet fail to take intervention measures."

2.2.2 互动关系

In fact, bystander intervention is not merely an isolated decision driven by individual psychological traits, but rather a behavioral consideration embedded within specific peer interaction relationships. The relationships between the parties involved in the bullying and the bystander, as well as the bystander' s own status within the peer group, significantly influence their behavioral responses. When a victim is perceived as vulnerable, helpless, or closely related to the bystander, the bystander is more likely to engage in protective behaviors (Rambaran et al., 2022). Conversely, when the bully holds high social status within the peer group, bystanders often choose to remain silent due to fears of retaliation or social exclusion (Huitsing et al., 2014).

The Moderating Role of Peer Status Relative to the Bully in the Relationship Between Bystander Social Popularity and Proactive Defending Behavior

Introduction

School bullying is a pervasive social phenomenon that significantly impacts the psychological well-being and social development of adolescents. Within the complex ecology of bullying, bystanders play a critical role in determining the outcome and duration of these episodes. Among various bystander responses, proactive defending behavior—where a student actively intervenes to support the victim or stop the bully—is considered the most effective way to mitigate the negative consequences of bullying. However, the decision to intervene is often influenced by the bystander' s own social standing and their relative position within the peer hierarchy compared to the perpetrator.

The Relationship Between Social Popularity and Defending Behavior

Social popularity is a key dimension of peer status in adolescence. Research in machine learning and social network analysis has increasingly been used to map these dynamics. Popular students often possess the social capital and influence necessary to challenge a bully' s behavior without fear of immediate social exclusion. High-status bystanders may feel a greater sense of social responsibility or possess higher social self-efficacy, making them more likely to engage in proactive defending. Conversely, students with lower social popularity may fear that intervening will make them the next target, leading to passive or avoidant behavior.

The Moderating Role of Relative Peer Hierarchy

While absolute popularity is important, the relative hierarchical distance between the bystander and the bully serves as a crucial moderator. Peer groups are often organized into distinct hierarchies, and the power dynamic between the bystander and the bully can either facilitate or inhibit intervention.

When a bystander occupies a higher or equal hierarchical status relative to the bully, their social popularity is more likely to translate into proactive defending. In these instances, the bystander perceives a lower risk of social retaliation. However, if the bystander' s status is significantly lower than that of the bully, even a relatively "popular" student (within their own subgroup) may hesitate to intervene. This suggests that the protective effect of social popularity is contingent upon the bystander' s perceived power relative to the perpetrator.

Theoretical Framework and Hypotheses

Drawing on social cognitive theory and the social dominance perspective, this study examines how the interaction between individual social status and group-level hierarchy influences bystander behavior. We hypothesize that:

1. Social popularity is positively correlated with proactive defending behavior.
2. The relationship between social popularity and defending behavior is moderated by the bystander

plays a moderating role in the relationship between social popularity and intervention intentions. Specifically, when a bystander' s peer status is higher than that of the bully, the positive correlation between the bystander' s social popularity and their intention to intervene becomes significantly more pronounced [**?**, **?**]. A possible explanation for this finding is that bystanders with higher peer status generally possess greater agency and face lower social risks when confronting bullying, making them more likely to engage in protective behaviors.

The aforementioned interactive factors embed the bystander' s decision-making process within a social network, highlighting how peer interactions can either facilitate or inhibit protective behaviors. Compared to relatively static individual psychological traits, research findings regarding these relational dynamics reveal the underlying process of relational trade-offs in bystander intervention. Specifically, bystanders do not simply produce direct behavioral responses based on morality or emotion; rather, they must evaluate the potential risks of their actions within the context of multiple, complex social relationships.

and returns, before making behavioral decisions.

2.2.3 班级与学校环境因素

Individual psychological characteristics and interactive relationships constitute micro-level individual factors, while the classroom and school serve as micro-environmental factors that provide the structural conditions for bystanders to implement protective behaviors. Specifically, classroom bullying norms, teacher attitudes toward bullying, and the overall school climate provide an essential social rule framework for bystanders to interpret and evaluate whether to intervene. During adolescence, youth begin to prioritize enhancing their status within peer groups and are motivated to comply with peer norms to ensure their behavior aligns with group rules and expectations [**?**, **?**]. When explicit anti-bullying norms exist within a classroom, or when peers clearly express support for protective actions, bystanders are more likely to perceive defending the victim as a behavior that is peer-approved and encouraged, thereby reducing perceived social risks [**?**, **?**]. Conversely, in classrooms that tolerate or tacitly accept bullying, even bystanders with high prosocial motivation may choose inaction due to fears of damaging group relationships or undermining their own social standing [**?**, **?**].

As central adult figures in the school environment possessing both authority and social influence, teachers' cognitive attitudes and practical responses to bullying incidents exert a profound impact on students' bullying-related behaviors [**?**, **?**]. Clear, consistent, and fair teacher interventions can significantly enhance

students' sense of efficacy and responsibility regarding bullying intervention. In contrast, passive or ambiguous teacher behavior tends to signal to students that intervention is either ineffective or unsupported by the school [?, ?]. An experimental study involving elementary students in grades four through six found that, compared to scenarios where teachers did not respond to bullying, active teacher intervention not only significantly increased students' inclination to report incidents but also prompted students to exhibit fewer pro-bullying behaviors and more protective behaviors, while simultaneously helping to reduce victimization across the campus [?, ?]. School and classroom climates are also critical contextual factors; the school climate reflects the prevailing social norms and values within the entire school system, while the classroom climate embodies the interpersonal relationships and interaction patterns within a specific class. A positive, warm, and caring school climate is associated with lower levels of school bullying, and such an environment similarly promotes students' prosocial behaviors, including active protection [?, ?].

A study of students in grades four through nine found that those who scored higher across various dimensions of school climate (teacher-student relationships, peer relationships, and school safety) reported fewer pro-bullying behaviors and more protective behaviors [?, ?]. Similarly, by proactively demonstrating respect and a willingness to listen, teachers can shape a safe and trusting classroom environment, thereby enhancing students' sense of psychological safety when choosing to intervene in bullying incidents [?, ?]. A supportive classroom climate can effectively increase students' active protective behaviors while reducing passive or bullying-reinforcing bystander actions [?, ?]. A possible explanation is that positive classroom and school climates convey signals of fairness, care, and respect to students, which subtly reinforces collective anti-bullying norms. These norms lead students to form the perception that protective behavior is socially acceptable and positively evaluated by the group, ultimately significantly increasing their subjective intention to implement such behavior.

However, similar to research on individual psychological characteristics and interactive relationships, current studies on how classroom and school environmental factors shape bystander behavior are largely based on a static perspective. There is a lack of systematic research revealing how bystanders with specific personality traits weigh interactive relationships alongside classroom and school environmental factors within concrete bullying contexts to make choices and decisions regarding protective behavior. Building upon existing foundations, it is necessary to further integrate multi-level key variables and dynamic characteristics to construct a psychological decision-making model that can effectively explain bystander protective behavior.

2.3 旁观者保护行为的决策机制

As previously mentioned, the decision of a bystander to engage in protective behavior is not an instantaneous or intuitive reaction, but rather a complex decision-making process driven by the interplay of multiple factors. Before tak-

ing action, bystanders weigh several critical elements, including the nature of the event, their own available resources and capabilities, and the potential social consequences of their intervention. These psychological processes do not function in isolation; instead, they are dynamically intertwined within specific situational contexts, collectively shaping the individual' s behavioral choices.

The formation of bystander protective behavior is predicated on the cognitive judgment and meaning construction of bullying incidents. According to the Bystander Intervention Model [**?**, **?**], an individual must first notice the event and subsequently define it as "misconduct requiring intervention." This process is influenced by the salience of situational cues, the ambiguity of the event, and social referencing. Such cognitive judgments are not based entirely on objective facts; rather, individuals confirm the reality of the situation by observing the reactions of others.

When peers remain silent or exhibit an indifferent attitude, bystanders often reinterpret the situation, concluding that intervention is unnecessary. This reinterpretation effectively disrupts the subsequent behavioral decision-making process. When bullying manifests in subtle or covert forms, bystanders are more likely to underestimate its severity, which in turn weakens their motivation to intervene. Conversely, when a victim displays clear signs of distress or helplessness, bystanders are more likely to interpret the event as an emergency requiring immediate action (Macaulay et al., 2022). However, the high prevalence of bullying incidents may lead to desensitization among students, making it difficult for them to notice such events or to judge that intervention is required.

After making a fundamental judgment regarding a bullying incident, emotional reactions play a critical driving role in initiating bystander protective behavior. Bullying situations are characterized by high levels of emotional arousal, particularly when a bystander shares an emotional bond or a sense of identification with the victim. In such cases, the bystander is more likely to experience intense empathetic distress or moral outrage, which serves as a psychological catalyst for intervention.

Research indicates that these emotional responses function as a bridge between the cognitive recognition of injustice and the actual execution of supportive actions. When bystanders perceive a power imbalance and subsequent harm, the resulting emotional tension creates a motivational state aimed at alleviating the victim' s suffering or restoring social equity. Consequently, the strength and nature of these emotional reactions are decisive factors in whether a bystander remains passive or transitions into an active defender.

When individuals perceive a high degree of similarity with a victim, they are more likely to experience emotional responses such as sympathy, pity, or anger. According to the "feelings as information" perspective [**?**, **?**], individuals treat their own emotional states as critical cues when deciding whether to take action. Intense negative emotions not only focus a bystander' s attention on the victim' s plight but also amplify their perception of the injustice, thereby increasing

the moral urgency to intervene. Conversely, when bystanders lack emotional involvement, their attention is more likely to be captured by the perceived entertainment value of the bullying. In such cases, they may interpret the bullying as a form of play or a "game," which significantly reduces the likelihood of protective behavior. Furthermore, individuals with low empathy may be insensitive to the harm caused by their own or others' support for bullying; over time, this lack of sensitivity leads to an increase in pro-bullying bystander behaviors [**?**, **?**].

However, emotional arousal alone is insufficient to trigger actual protective behavior. Before reaching a final behavioral decision, bystanders also engage in a process of cognitive evaluation regarding the situation and the potential consequences of their actions.

Risk-benefit assessments are conducted within a social context. Because adolescents place a high value on establishing positive relationships with their peers [**?**, **?**], social status, peer acceptance, and relational risks become highly sensitive factors in their evaluative process. Even when bystanders have already judged a bullying incident as improper and feel sympathy for the victim, their decision to intervene still depends on an assessment of the potential social consequences of such an intervention.

If bullying occurs in a classroom environment where anti-bullying norms are dominant, protective behavior is more likely to receive peer support. This support effectively reduces the social costs of intervening and may even provide the defender with positive social gains, such as an increase in social status and peer attention [**?**, **?**, **?**, **?**]. Through qualitative analysis, [**?**] found that adolescents' willingness to intervene in bullying is jointly influenced by situational cues—such as the severity of the incident, the victim's reaction, and the bully's power status —and cognitive factors, including attitudes, subjective norms, and self-efficacy. Furthermore, the relationship with the bully or the victim, the individual' s own social status, and the school climate also moderate intervention intentions. Consequently, the decision-making mechanism behind bystander protective behavior is not driven by pure altruistic motivation; rather, it is the result of a continuous trade-off between social goals and moral motivations.

It is noteworthy that the cognitive judgments, emotional reactions, and risk-benefit assessments of bystanders in bullying situations do not emerge in a linear, progressive sequence; rather, they interact and regulate one another. On one hand, emotional reactions can reinforce an individual' s cognitive judgment regarding the severity of an incident and increase their willingness to assume responsibility for intervention [**?**, **?**]. On the other hand, the anticipation of potential social risks may inhibit emotion-driven behavioral motivations, leading individuals to choose more indirect or implicit forms of protection, such as comforting the victim after the fact or reporting the incident to a teacher.

This complexity is particularly evident in classroom or school environments where group norms are ambiguous or anti-bullying attitudes are not clearly de-

fined. In such contexts, even bystanders with high protective motivation may abandon protective behaviors due to perceived social costs [**?**, **?**]. The interaction of these multiple factors reveals the inherent complexity and uncertainty of bystander protective behavior within real-world scenarios.

In summary, bystander protective behavior is a complex decision-making process composed of situational cue identification, emotional responses, and risk-benefit trade-offs. Systematically analyzing how this decision-making process operates within real-world bullying contexts not only facilitates a deeper understanding of the dynamic processes through which bystander protection emerges but also helps bridge existing gaps in research regarding mechanistic integration and situational interpretation.

2.4 旁观者保护行为的干预

In recent years, intervention strategies based on bystander protective behavior have gained increasing attention in bullying governance. These strategies primarily encourage active intervention by enhancing bystanders' protective awareness and self-efficacy, while emphasizing the importance of friendship and peer support (Bezerra et al., 2023). For instance, the KiVa program utilizes classroom activities to alter bystander behaviors and attitudes during bullying incidents, thereby preventing and deterring such actions (Kärnä et al., 2011). However, the practical implementation of this program in schools across Finland, Italy, and the United Kingdom has yielded inconsistent results (Nocentini & Menesini, 2016; Yang & Salmivalli, 2014; Axford et al., 2020).

The School-wide Transition to Accountable Culture (STAC) project in the United States teaches students various strategies through lectures and role-playing, providing them with the knowledge, skills, and confidence required to intervene in bullying (Midgett et al., 2018). Similarly, the NoTrap! anti-bullying program engages students in the development of anti-bullying websites to enhance their empathy and problem-solving abilities.

By guiding and strengthening students' sense of participation and responsibility in stopping bullying, these programs encourage bystanders to take initiative and oppose bullying (Palladino et al., 2016). Notably, digital technologies have been progressively integrated into bystander-based anti-bullying interventions (DeSmet et al., 2018). For example, video games are used to present bullying scenarios where players, acting as bystanders, must make behavioral choices. When choosing anti-bullying actions, players receive positive feedback—such as game points or auditory cues—indicating they have made the correct decision (Kolić-Vehovec et al., 2019). Digital intervention technologies create learning opportunities for students to practice action skills and coping strategies within virtual bullying contexts, thereby enhancing their ability and confidence to respond effectively to real-life bullying situations (Calvo-Morata et al., 2020).

Overall, the aforementioned intervention projects can, to a certain extent, guide bystanders toward taking positive action through educational enhancement, role-

playing, and the strengthening of self-efficacy. Although the actual effectiveness of these interventions remains unstable, they provide multidimensional pathways for bullying governance. Consequently, a critical direction for future research lies in integrating systematic findings on the mechanisms that shape bystander protective behavior with the scientific introduction of digital technologies to develop targeted, comprehensive intervention strategies that improve overall effectiveness.

2.5 文献评述

A review and analysis of existing literature reveals that bystander protective behavior is not only a behavioral outcome shaped by the complex interaction of individual psychological traits, interpersonal relationships, and class or school environmental factors, but also a sophisticated decision-making process based on cognitive judgment, emotional response, and risk-benefit assessment within specific contexts. However, several critical issues regarding the formative mechanisms of bystander protective behavior remain to be addressed:

First, previous research has failed to integrate multi-level factors—such as individual psychological characteristics, interactive relationships, school environmental features, and individual decision-making processes—into a unified analytical framework. This lack of integration limits our understanding of how these diverse elements coalesce to influence behavioral outcomes within educational settings.

The existing literature often fails to organically integrate multi-level factors, with different psychological processes frequently discussed in isolation. There is a lack of systematic demonstration regarding the relative importance of various factors and their specific combinations within a unified framework. In particular, the scientific question of how the interaction between school micro-environmental factors and individual factors shapes bystander intervention remains under-explored. This limitation hinders a holistic understanding of the complex operational mechanisms of bystander protection behavior in real-world bullying situations.

Furthermore, current research relies heavily on quantitative methods based on pre-established theoretical assumptions regarding variable relationships. There is a relative scarcity of data-driven and qualitative exploration, which makes it difficult to gain a deep understanding of the internal psychological processes of individuals and limits the discovery of potential underlying pathways.

Accordingly, based on the aforementioned multi-level and multi-dimensional factors, this study first employs machine learning algorithms to identify the key variables influencing bystander intervention. Subsequently, it utilizes Fuzzy-Set Qualitative Comparative Analysis (fsQCA) to explore the multi-variable configurational patterns of bystander protection behavior. This approach aims to construct a comprehensive model of the micro-environmental characteristics associated with bystander intervention.

···a comprehensive explanatory framework for the interaction between interactive relationships and individual psychological characteristics. Furthermore, in-depth interviews were conducted to analyze the internal psychological processes underlying bystanders' behavioral choices in real-world scenarios, providing supplementary validation for the rationality of the aforementioned key variables.

Furthermore, previous research on bystander intervention has often relied on an implicit linear assumption: once a bystander identifies bullying and develops a protective motivation, the intervention behavior will naturally follow. However, in real-world bullying scenarios, intervening may carry significant social risks for the bystander, such as peer rejection, threats to social status, or emotional conflict [**?**, **?**]. During a bullying incident, bystanders are confronted with multiple conflicting pieces of information simultaneously; these social risks and psychological burdens inevitably influence their behavioral decision-making process. Existing studies have not yet fully demonstrated how bystanders weigh and integrate such information to make dynamic decisions in complex contexts. Consequently, this study employs a series of situational experiments to manipulate key factors and examine their dynamic impact on intervention decisions. We aim to construct a three-stage psychological decision-making framework for bystander intervention, providing a scientific basis for understanding how individuals navigate multiple psychological signals to reach a decision.

Finally, current intervention programs for bystander behavior focus primarily on individual behavioral change while relatively neglecting the core role of the school environment. This has led to practical challenges, including low efficiency and poor stability of intervention effects [**?**, **?**]. It is essential to recognize that bullying stems largely from a problematic social ecology (such as a conflictual classroom climate) rather than merely from maladaptive individual motivations [**?**, **?**]. Similarly, individual prosocial behavior is primarily rooted in a favorable social ecology (such as a supportive classroom climate) rather than positive individual motivations alone [**?**, **?**]. In school and classroom environments characterized by high levels of support and healthy peer relationships, students are more likely to reach a consensus and form a collective attitude that supports defenders and opposes bullying, thereby controlling and reducing the occurrence of such incidents [**?**, **?**].

Building on these insights, this study first utilizes digital simulation techniques to examine the effectiveness of intervention models targeting different school environmental factors in promoting bystander intervention. Subsequently, through a quasi-experimental design and field research, we evaluate the practical effects of an optimized intervention scheme focused on key environmental factors. By integrating computational modeling with field interventions, this research seeks to construct a scientific, stable, and feasible intervention framework for addressing school bullying.

3 研究构想

This research focuses on the core scientific problem of the mechanisms shaping bystander protective behavior and its governance pathways within school environments. Adopting a research strategy that combines qualitative exploration with quantitative analysis, and integrates machine learning algorithms suitable for complex model construction with situational experiments for causal exploration, this study attempts to construct a three-stage psychological decision-making framework for bystander protective behavior. The goal is to systematically advance the understanding of the complex causes underlying such behaviors. Study 1 adopts an exploratory orientation and utilizes mixed methods to systematically identify key influencing factors and their configurational patterns across three levels: prediction, understanding, and configuration. This phase serves to define the core variables for subsequent research.

Building upon these findings, Study 2 utilizes a series of situational experiments supplemented by computational modeling to construct and systematically validate the three-stage psychological decision-making framework for bystander protective behavior. This stage focuses on examining the causal relationships between situational cue processing, psychological computational processes, and behavioral choices, as well as the moderating effects of individual psychological characteristics and school environmental factors. Study 3 targets the significant school environmental factors identified in the previous stages as primary intervention points. By combining Agent-Based Modeling (ABM) with field research, this stage constructs a scientifically sound intervention program for bystander protective behavior and evaluates its effectiveness. The overall research framework is illustrated in [Figure 1: see original paper].

3.1 研究 1：旁观者保护行为的关键影响因素与形成模式探索

As the foundation of the overall research framework, Study 1 aims to accurately identify the key factors influencing protective behaviors among bullying bystanders and reveal the multiple pathways of their formation mechanisms. This provides preliminary leads for subsequent mechanism testing and intervention design. By integrating multiple methodologies, Study 1 addresses two core scientific questions: (1) Among various potential influencing factors, which are most critical to bystander protective behavior? (2) Do these factors combine in different ways to form multi-path patterns that shape bystander protective behavior? To this end, Study 1 consists of three interconnected and functionally complementary sub-studies.

Study 1a will utilize large-scale, heterogeneous questionnaire data and employ machine learning methods—including Support Vector Machines (SVM), Random Forest, and XGBoost—alongside SHAP (SHapley Additive exPlanations) value analysis to construct a recognition model for bystander protective behavior and determine the average marginal contribution of each key feature. Included features encompass individual psychological characteristics (such as aggressive

traits, risk expectations, and self-efficacy), interactive relationships

(such as the popularity of involved roles, status differentials, and interpersonal relationships), and class-school environmental factors (such as class bullying norms, teacher support, and school climate). Study 1b will explore the internal psychological processes of bystanders performing protective behaviors through semi-structured interviews. By conducting text coding and thematic analysis, the core considerations of bystanders during actual protective behavior decision-making will be extracted, providing complementary validation for the results of Study 1a. Study 1c will employ an asymmetric method—fuzzy-set Qualitative Comparative Analysis (fsQCA; Ragin, 2009)—to systematically explore the multiple pathways through which different combinations of factors shape bystander protective behavior. Based on configuration theory, this method explores the relationship between condition combinations and outcomes from a set-theoretic perspective [**?**, **?**], revealing whether the effect of a specific variable depends on the presence of other conditions. This study focuses on how individual psychological characteristics, interactive relationships, and school environmental factors work together under different configurations to identify several representative pathways for shaping protective behavior.

Overall, Study 1 integrates machine learning, qualitative interviews, and fsQCA to systematically characterize the key influencing factors and multiple shaping pathways of bystander protective behavior across three levels: prediction, understanding, and configuration. This approach helps overcome the limitations of isolated variables and single pathways prevalent in previous research, providing clear directions and clues for subsequent studies to further examine the internal mechanisms of bystander protective behavior.

3.2 研究 2：旁观者保护行为三阶段心理决策框架的实验研究

This study attempts to construct a three-stage psychological decision-making framework for bystander protective behavior. It proposes that whether and how bystanders take protective actions stems from their processing of situational cues in bullying scenarios and their weighted calculation of intervention consequences versus personal capabilities. Throughout this process, individual psychological characteristics and school environmental factors influence behavioral decision-making by altering the weights assigned to different information during psychological calculation. By clarifying this staged decision-making process, the study aims to facilitate a comprehensive understanding of bystander protective behavior choices, revealing the diversity and intervenability of bystander actions from the perspective of internal dynamic psychological processes. Building upon traditional experimental paradigms, Study 2 introduces computational modeling methods to treat decision-making information involved in the psychological calculation stage—such as risk, benefit, and self-efficacy—as quantifiable input dimensions. Subsequent research will estimate their relative weights in decision-making, thereby achieving a clear characterization of the psychological calculation process.

Studies 2a and 2b focus on the first stage of the three-stage psychological decision-making framework: the situational cue processing stage. These studies aim to examine how different types of bullying situational cues serve as input information to influence the subsequent psychological calculation process of bystanders. The focus is on how cues such as event severity and diffusion of responsibility affect the bystander' s initial cognitive judgment. Simultaneously, key individual psychological characteristics and school environmental factors identified in Study 1 will be measured to test their potential moderating effects. Study 2a employs a single-factor between-subjects experimental design, with bullying severity (low vs. high) as the independent variable and the necessity of intervention and bystander protective behavior intention as the dependent variables. Study 2a hypothesizes that: (1) compared to low-severity situations, bystanders in high-severity situations will show higher judgments of intervention necessity and stronger protective behavior intentions; (2) participants' individual psychological characteristics (e.g., moral disengagement) moderate the impact of bullying severity on initial cognitive judgments and protective behavior intentions, with this effect being stronger among bystanders with low moral disengagement;

and (3) school environmental factors (e.g., supportive classroom climate) moderate the impact of bullying severity on initial cognitive judgments and protective behavior intentions, with the promoting effect being more significant in classrooms with higher levels of support.

Study 2b employs a 2 (number of bystanders: no other bystanders vs. multiple bystanders) $\times$ 2 (teacher presence: teacher absent vs. teacher present) between-subjects experimental design. The dependent variables include the necessity of intervention and bystander protective behavior intention.

The study also examines whether individual psychological characteristics and school environmental factors exert moderating effects. Study 2b hypothesizes that: (1) compared to situations with no other bystanders, the presence of multiple bystanders will decrease an individual' s judgment of intervention necessity and protective behavior intention; (2) compared to situations where no teacher is present, the presence of a teacher will decrease the bystander's judgment of intervention necessity and protective behavior intention; (3) there is a significant interaction between the number of bystanders and teacher presence, such that intervention necessity judgments and protective behavior intentions will be lowest in situations with multiple bystanders and a teacher present; (4) individual psychological characteristics (e.g., moral disengagement) moderate the effects of bystander numbers and teacher presence on intervention necessity judgments and protective behavior intentions, meaning the diffusion of responsibility effect is weaker in individuals with low moral disengagement; and (5) school environmental factors (e.g., supportive classroom climate) moderate these effects, such that the effects are weaker in classrooms with a more supportive atmosphere.

Study 2c focuses on the role of risk-benefit assessment within the second stage of the three-stage psychological decision-making framework: the psychological

calculation stage. By manipulating situational cues to induce different perceptions of social risks and potential benefits faced when intervening in bullying, the study examines the influence of risk-benefit trade-offs on protective behavior decisions. A 2 (perceived social risk: low vs. high) × 2 (perceived potential benefit: low vs. high) between-subjects experimental design is used, with the dependent variables being the tendencies toward different types of protective behaviors.

The moderating effects of individual psychological characteristics and school environmental factors are also investigated. Study 2c hypothesizes that: (1) perceived social risk and potential benefit exert significant main effects on stable protective behavior intentions and behavioral choices, respectively; specifically, individuals in the high-risk group will have lower protective behavior intentions and be more likely to choose indirect protection or inaction, while those in the high-benefit group will have stronger intentions and be more likely to choose direct protection; (2) there is a significant interaction between perceived social risk and perceived potential benefit, such that in high-benefit situations, the inhibitory effect of risk on protective behavior is weakened, and different risk-benefit combinations will influence the type of behavior chosen;

(3) individual psychological characteristics (e.g., moral disengagement) moderate these relationships, with the risk-inhibition effect strengthening and the benefit-promotion effect weakening among individuals with high moral disengagement; and (5) school environmental factors (e.g., supportive classroom climate) moderate these relationships, such that in more supportive classroom environments, the risk-inhibition effect is weakened and the benefit-promotion effect is enhanced.

Study 2d focuses on the role of self-efficacy assessment in the psychological calculation stage. Using a single-factor between-subjects experimental design, the study manipulates bystanders' perceptions of their own intervention capability (low vs. high) in bullying situations to examine the impact of self-efficacy assessment on protective behavior decision-making. The moderating effects of individual psychological characteristics and school environmental factors are also examined.

Study 2d hypothesizes that: (1) compared to the low self-efficacy condition, individuals in the high self-efficacy condition will exhibit higher levels of protective behavior intention and be more likely to engage in direct protective behavior; (2) participants' individual psychological characteristics (e.g., moral disengagement) moderate the impact of perceived self-efficacy on protective behavior intention, with this positive effect being stronger in individuals with low moral disengagement;

and (3) school environmental factors (e.g., supportive classroom climate) moderate the relationship between perceived self-efficacy and protective behavior intention, such that perceived self-efficacy is more easily translated into protective behavior intention in more supportive classroom environments.

Building on the previous studies, Study 2e further integrates risk-benefit assessment and self-efficacy assessment, focusing on the joint psychological calculation process of multi-source information in the second stage of the decision-making framework. The preceding studies provided the necessary parameter identification basis for integrated computational modeling by deconstructing and testing key decision dimensions individually. Unlike Studies 2c and 2d, which examined the influence of single types of information, Study 2e simultaneously manipulates perceived social risk, perceived potential benefit, and self-efficacy to explore how bystanders comprehensively weigh multiple pieces of decision information when facing bullying. It further tests how this trade-off process jointly influences protective behavior decisions. A 2 (perceived social risk: low vs. high) × 2 (perceived potential benefit: low vs. high) × 2 (self-efficacy: low vs. high) three-factor within-subjects experimental design is employed.

The dependent variables consist of two decision outcomes: (1) protective behavior intention, reflecting the individual' s overall behavioral tendency in bullying situations; and (2) protective behavior choice, reflecting the specific decision-making orientation among various protective strategies. The moderating roles of individual psychological characteristics and school environmental factors continue to be investigated.

Study 2e introduces computational modeling to systematically characterize the multi-information trade-off and calculation process during the psychological calculation stage. Specifically, it is assumed that when facing different bullying situations, individuals calculate the subjective value of various protective behavior options k (e.g., stopping the bully, comforting the victim, reporting to a teacher) based on perceived social risk (R), potential benefit (G), and self-efficacy (E). The function can be expressed as:

$$= \quad + \quad + \quad + \quad (\quad \times \quad) + \quad (\quad \times \quad) + \quad (\quad \times \quad) +$$

In this context, U_i represents the subjective value of behavioral option k for individual i. The parameters ω_r, ω_g, and ω_e denote the weights assigned to risk, gain, and self-efficacy within the decision-making process, respectively. Furthermore, the coefficients of the interaction terms are utilized to characterize the joint effects between these different dimensions of trade-off information.

Building upon this foundation, the probability of an individual choosing between different behavioral options is modeled using a multinomial Logit model (softmax function):

as follows:

$$(\quad =) =$$

$$(\quad)$$

$$\sum \quad (\quad)$$

The model assumes that individuals are more likely to select behavioral options with higher subjective value, thereby mapping the results of psychological

computations onto observable behavioral choice data. For the continuous dependent variable of protective behavioral intention, it is modeled as a function of the value of each protective behavior, specifically expressed as:

$= 0 + 1 + \max$

- $2 +$

Specifically, $\max U_i$ represents the individual' s value assessment of the optimal behavioral option, while $\bar{U}_i$ denotes the average value across all behavioral options, used to characterize the overall behavioral intention.

Regarding parameter estimation, this study first employs multinomial logistic regression to fit the behavioral choice data, estimating the influence of each information dimension on different options. Building upon this, a hierarchical modeling approach is introduced to incorporate individual difference variables and model the weight parameters. Taking perceived risk as an example:

$$w_{r,i} = \beta_{r0} + \beta_{r1} P_i + \beta_{r2} S_i + \mu_{r,i}$$

where P_i represents individual factors and S_i represents school-level factors. Similarly, the weight coefficients for perceived potential benefits and self-efficacy are modeled to examine how factors at different levels influence the decision-making process by altering information weights. Through this modeling strategy, Study 2e can not only test the main and interaction effects of risk, benefit, and self-efficacy on bystander protective behavior but also further quantify the relative weights of different information types in the decision-making process and reveal how individual and school factors act upon the psychological computation process.

Study 2e hypothesizes that: (1) the weight parameter for perceived social risk w_r is greater than 0, and the weight parameters for perceived potential benefits w_g and self-efficacy w_e are both greater than 0; (2) there is a significant interaction weight w_{rg} between risk and benefit, such that under high-benefit conditions, the negative weight of risk is attenuated; (3) self-efficacy moderates the effects of risk and benefit through the interaction terms w_{re} and w_{ge}. Specifically, under conditions of high self-efficacy, individuals exhibit decreased sensitivity to risk and increased sensitivity to benefits; (4) behavioral intention for protection is lowest under high-risk, low-benefit, and low-efficacy conditions, where individuals are more likely to choose indirect protection or passive bystander behavior; conversely, intention is highest under low-risk, high-benefit, and high-efficacy conditions, where individuals are more likely to choose direct protective behavior; (5) individual and school factors influence protective behavioral intentions and choices by altering weight parameters (e.g., increasing or decreasing the weights of risk, benefit, and efficacy).

3.3 研究 3：促进旁观者保护行为的干预路径的模拟与验证

Study 3 focuses on a two-stage intervention involving computational modeling and field research, consisting of two sub-studies. Study 3a employs an Agent-Based Modeling (ABM) approach to characterize the dynamic interaction processes between individuals within a realistic school campus context.

In this model, each student is treated as a heterogeneous decision-making agent whose behavior is jointly determined by individual psychological characteristics and situational factors. Individual-level variables are assigned as parameters (e.g., empathy levels), while school environmental variables are represented as shared contextual parameters (e.g., class climate). During the simulation, bystander behavioral decisions are triggered by constructing virtual classroom scenarios and randomly generating bullying incidents. Specifically, bystander behavior is not generated randomly but follows preset behavioral decision rules: first, individuals perform psychological calculations on potential behaviors based on situational information, synthesizing potential benefits, risks, and self-efficacy to form subjective utility evaluations for different behavioral options; second, the utility values corresponding to different behavioral options are transformed into behavioral choice probabilities via a probability mapping function, allowing for a selection among various protective behavior strategies. Based on this decision mechanism, all bystanders independently make behavioral choices in each simulation round, which are then aggregated into group-level protective behavior performance.

By systematically manipulating individual-level and environmental-level variables, Study 3a compares changes in protective behavior levels under different intervention pathways. This allows for the evaluation of the potential effectiveness of various intervention strategies and the screening of intervention paths that are theoretically most promising with controllable risks. This provides a basis for subsequent field interventions and reduces the costs associated with real-world trial and error.

Study 3b will employ a quasi-experimental longitudinal design to conduct field research in schools, testing the practical effectiveness of the optimized intervention schemes derived from the simulations. Using classes or schools as the intervention units, control and intervention groups will be established, with a focus on the feasibility of intervention schemes aimed at optimizing school environmental characteristics. Intervention effects will be evaluated through multi-source data, including student self-reports, peer nominations, and teacher nominations of bystander protective behaviors and overall class bullying levels. Simultaneously, key variables identified in Study 1 and Study 2 will be assessed to verify whether the intervention operates through the intended psychological pathways.

4 理论建构

School bullying is a unique and complex form of interpersonal aggression that occurs within specific social contexts. Rather than being a simple dyadic interaction between a bully and a victim, it should be understood as a group phenomenon (Olweus, 2001; Salmivalli, 2001).

In this process, bystanders constitute a large group with diverse behavioral choices; their reactions largely determine whether bullying persists, escalates, or is timely suppressed. Consequently, constructing an integrated explanatory framework for the variations in bystander behavioral choices within bullying contexts is a critical component of bullying intervention. Such a framework provides innovative insights for promoting protective behaviors among bystanders and warrants significant attention from researchers.

This research focuses on bystander protective behavior, constructing an innovative three-stage psychological decision-making framework for bystander intervention (see [Figure 2: see original paper]). This framework is grounded in the Bystander Intervention Model [**?**], the Theory of Planned Behavior [**?**], and Goal-Framing Theory [**?**].

The framework emphasizes three core propositions: First, situational cues do not directly determine behavior; rather, they serve as input information for psychological computation. Second, the assessment of risk-benefit trade-offs and self-efficacy constitutes the core computational module of bystander decision-making. Third, individual psychological characteristics and school environmental factors do not directly trigger protective behavior; instead, they function as distal factors that influence the decision-making process by modulating the bystander' s internal psychological states and cognitive evaluations.

Instead, it regulates behavioral decision-making pathways by altering the weights assigned to different pieces of information within mental computation.

Situational Cue Processing Stage

The starting point of the three-stage psychological decision-making framework is the bystander' s cognitive processing of the bullying situation, centered on the core question: "Am I facing an event that requires intervention?" This stage aligns with the classic bystander intervention model [**?**, **?**], which posits that an individual' s sense of responsibility and behavioral intentions are only activated after they have noticed the event and defined it as an emergency or inappropriate situation. This study further suggests that situational cues do not directly trigger protective behavior; instead, they influence the bystander' s judgment regarding the necessity of intervention. This judgment then induces a primary intention for protective behavior based on intuition and normative assessments, providing the prerequisite conditions for subsequent psychological weighing.

In other words, the core function of this stage is to complete a rapid assessment

of whether one should intervene, thereby determining whether the individual enters a deeper level of decision-making processing. In the context of school bullying, this situational cue processing is particularly critical. Compared to sudden, explicit acts of violence, bystanders of school bullying often tend to underestimate the severity of the incident or rationalize it as "joking" or minor "horseplay." Therefore, whether an individual proceeds to subsequent decision-making stages depends first on the bystander' s perception of the necessity for intervention. The preliminary protective tendency generated on this basis constitutes the essential premise and foundation for all following decision-making processes.

Psychological Calculation Stage

Following the preliminary assessment of a bullying situation, a bystander enters the psychological calculation stage only if they perceive intervention as necessary and have formed a primary protective intention. During this stage, whether a bystander ultimately engages in protective behavior depends on their psychological evaluation of the costs, benefits, and feasibility of such actions. The Theory of Planned Behavior emphasizes that an individual' s behavioral intention is jointly determined by three types of judgments: attitude toward the behavior, subjective norms, and perceived behavioral control [**?**, **?**]. Building upon this framework, the present study further distinguishes between the primary behavioral intention—formed through rapid situational assessment—and the stable behavioral intention, which is developed through multiple trade-offs. We propose that the critical function of the psychological calculation stage is to revise, inhibit, or reinforce the primary behavioral intention generated in the preceding stage, thereby influencing the formation of a stable behavioral intention that leads to actual behavior.

Specifically, during the psychological calculation phase, bystanders conduct a comprehensive assessment of the potential consequences of intervening in bullying. When faced with a bullying situation, bystanders simultaneously consider the positive outcomes that protective behavior may bring—such as upholding fairness, reducing harm to others, and enhancing their own status—against the potential costs, such as social exclusion or retaliation from the bully. This trade-off is not an expression of moral indifference but rather a universal adaptive judgment mechanism within social contexts.

As suggested by Goal-Framing Theory, individuals in specific situations are often driven by multiple goals simultaneously. Among these, normative goals (doing the right thing) may coexist or compete with hedonic or gain-oriented goals (avoiding personal loss) [**?**, **?**]. Therefore, this study posits that a bystander' s intention to protect depends on their subjective weighting of benefits and risks within a given context. When normative or moral goals predominate, protective behavior is more likely to be viewed as the appropriate choice; conversely, when self-protection or risk avoidance goals take precedence, the bystander may opt for inaction.

When risk aversion objectives become more prominent, protection intentions and behaviors are more likely to be inhibited. Furthermore, self-efficacy assessment constitutes another core computational dimension of this stage. In evaluating their own capabilities, individuals may overestimate or underestimate their proficiency [**?**, **?**], which subsequently exerts a direct influence on their behavioral intentions and ultimate choices.

If an individual' s intervention self-efficacy is low, they may find it difficult to translate their recognition of the legitimacy of intervening into actual behavior, even when they acknowledge that action is justified [**?**, **?**]. This study further proposes that self-efficacy not only influences whether an individual chooses to intervene in bullying but also affects the specific pathways of protective behavior chosen by bystanders. By exploring these dynamics, this research extends the functional boundaries of self-efficacy within the context of bystander intervention strategies.

This study further indicates that the two primary modules—risk-benefit assessment and self-efficacy assessment—do not function in isolation. Instead, they are integrated by the individual using different weights during the decision-making process, thereby forming a variety of possible psychological computational pathways. In certain contexts, the bystander' s weight allocation for potential risks and benefits may dominate the process; even if self-efficacy is low, a strong intention to engage in protective behavior may still form as long as the individual perceives the moral or normative benefits of intervention to be significantly higher than the potential risks.

Conversely, in other situations, the self-efficacy assessment may emerge as the more decisive factor. The relative weights of the components within this system can shift significantly depending on the individual and the specific context, leading to markedly different behavioral intentions even when situational judgments are identical. Consequently, this framework does not assume the existence of a single, fixed decision-making path. Rather, it emphasizes that the formation of a bystander' s protective behavioral intention stems from the dynamic integration of risk-benefit and self-efficacy judgments under specific weight configurations.

It is important to emphasize that the psychological computation stage does not necessarily reinforce the primary protective behavioral intention. The outcome of this stage may stabilize and strengthen the intention, but it may also inhibit or revise the primary intention. This mechanism provides an explanation for the "intention-behavior gap" —the common phenomenon in real-world settings where an individual "desires to protect but fails to act."

Behavior Selection and Implementation Phase

Following the processing of situational cues and psychological weighing, bystanders enter the final stage of behavior selection. At this point, the stable behavioral intentions formed through psychological calculations are further transformed into specific behavioral strategy selection and implementation. Directly

intervening to stop bullying typically requires high levels of self-efficacy and low risk perception. In contrast, seeking adult assistance or providing post-incident comfort to the victim is often viewed as an alternative path with relatively lower risk (Pronk et al., 2013). Conversely, if the bystander···

If bystanders fail to develop a stable behavioral intention during the preceding stage, they may exhibit passive observational behavior. This study posits that this stage serves as a natural extension of the decision-making outcomes from the two previous phases. When preparing to intervene, bystander behavior involves evaluating various feasible protective actions; specifically, based on established psychological assessments, bystanders select the mode of protective behavior they perceive to be the most viable, safe, and appropriate for their specific circumstances.

The Role of Individual Psychological Characteristics and School Environmental Factors Across Decision-Making Stages

Individual psychological characteristics and school environmental factors play critical roles across the three stages of bystander decision-making, systematically influencing the trajectory of behavioral choices. This study proposes that psychological traits—such as empathy, levels of moral disengagement, and aggression—affect how bystanders process information and make judgments at multiple stages, thereby altering the weight structure of their risk-benefit assessments. Furthermore, the school and classroom environments constitute the broader context in which these decisions occur.

The critical contextual conditions of bystander protective behavior decision-making reshape the subjective weight allocation of risks, benefits, and self-efficacy within the psychological calculation process. Consequently, individual psychological characteristics and the school environment do not function in isolation; rather, they engage in continuous interaction throughout the three-stage decision-making process. Together, these factors collectively shape both the probability of occurrence and the specific manifestations of bystander protective behavior.

In summary, the theoretical and practical contributions of this study are as follows:

First, this research proposes a three-stage psychological decision-making framework for bystander intervention, theoretically shifting the study of bullying bystander behavior from a simple exploration of influencing factors toward a process-oriented explanation. By explicitly defining bystander intervention as a context-based, dynamic, and plastic psychological decision-making outcome, this framework provides an innovative perspective for explaining the variability and situational dependence of bystander behavior.

Second, by distinguishing between decision-making stages and boundary condi-

tions, this study clarifies the specific pathways and interaction patterns through which individual psychological traits and school environmental factors influence bystander choices. This approach overcomes the limitations of previous research that often simplified these complex variables as direct predictors, offering a more nuanced understanding of how personal and environmental factors intersect.

Finally, this study provides new insights for the development and refinement of school bullying governance models. On one hand, traditional intervention pathways that focus solely on individual attitudes, behavioral correction, or empathy training may be insufficient to consistently promote bystander intervention. In contrast, interventions aimed at optimizing school environmental factors—such as clarifying anti-bullying norms, enhancing supportive teacher feedback for protective actions, and reducing the perceived risks for bystanders—are more likely to produce sustained promotional effects at the group level. On the other hand, utilizing Agent-Based Modeling (ABM) as a tool for intervention simulation and optimization offers a paradigm that balances theoretical precision with practical feasibility. This approach helps reduce the trial-and-error costs of real-world interventions and improves the efficiency of resource allocation.

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Shaping mechanisms and evidence-based governance pathways of bystander defending behaviors in school bullying

LI Huanhuan, YAN Kai (Department of Psychology, Renmin University of China, Beijing 100872, China)

Abstract

The school climate serves as a pivotal microenvironment for the development of adolescents' social behaviors and constitutes a critical component of school bullying intervention and governance. Previous research has indicated that adverse peer relationships are a key school environmental risk factor for predicting bullying and victimization, whereas bystander defending behaviors constitute one of the critical school environmental protective factors in terminating bullying events. However, traditional studies have mostly adopted a static perspective to focus on the predictive effects of a limited number of variables on bystander defending behaviors, thus failing to address the scientific question regarding the complex psychological mechanisms underlying why bystanders make divergent behavioral choices in real-world contexts. Furthermore, theoreticallydriven variable selection and linear analytic approaches have also constrained the discovery of potential pathways, failing to illuminate the intrinsic psychological processes underlying the bystanders' behavioral decision-making. To address these gaps, the present study attempts to adopt a dynamic perspective of situational interactions, focusing on constructing a three-stage psychological decision-making framework that illustrates how school climate, interpersonal interactions, and bystanders' personal traits shape bystander defending behaviors through the psychological processes of event identification, emotional experience, and risk-benefit trade offs.

These results may provide innovative insights for developing a scientifically sound and comprehensive model of school bullying governance.

Keywords

school bullying, bystander defending behavior, shaping mechanisms, governance pathways

Note: Figure translations are in progress. See original paper for figures.