Abstract

This study examined whether children with high levels of bullying or defending rather choose similar or popular peers as friends in late childhood. We expected that friendship preferences of children were based on similarity in bullying and defending behaviors. Moreover, we assumed that children's bullying behavior was associated with the tendency to seek out popular peers as friends. To test these hypotheses, we analyzed data from third- (M_{age} = 9.35 years) and fourth-grade (M_{age} = 10.46 years) students in China (N = 453, 54.79% boys at wave 1; N = 454, 54.35% boys at wave 2; N = 453, 54.05% boys at wave 3). Longitudinal social network analysis revealed that children's level of bullying behavior was associated with their likelihood of choosing popular peers as friends, while defending behavior was related to a tendency to select peers with similar levels of defending as friends. The study sheds light on *whom* children with bullying or defending behaviors select for affiliation within Chinese culture, and has implications for prevention and intervention of school bullying.

Key words： bullying, defending, popularity, friendship, late childhood

Choosing Friends Based on Similarity or Popularity? Friendship Preferences of Children Exhibiting Bullying and Defending in Late Childhood

During late childhood and early adolescence, formation of close friendships with peers becomes increasingly important (Steinberg, 2020). Friendship selection has mainly been studied in terms of *similarity selection* (Veenstra et al., 2013) and *popularity selection* processes (Dijkstra et al., 2013). Similarity of friends serves to promote closeness and minimize conflicts in the relationship, but also increase the probability of receiving rewarding feedback from peers (Veenstra et al., 2013). Having popular friends, on the other hand, might enhance one's own popularity (Dijkstra et al., 2013). During bullying incidents, bullying perpetration and defending victims are two key behaviors that are likely to happen (Salmivalli et al., 1996). Shedding light on the friendship formation process of children engaging in bullying and defending behavior can deepen our understanding of the group dynamics involved in bullying and inform anti-bullying interventions. Using longitudinal social network analysis, the present study examined two types of friendship selection preferences – similarity selection and popularity selection – among children exhibiting bullying or defending in late childhood.

Similarity Selection Associated with Bullying and Defending

Bullying is a subtype of aggressive behavior which is repeatedly targeted at peers who find it difficult to defend themselves (Olweus, 2013). Defending encompasses actions that involve standing up for victims, providing comfort and support, and attempting to stop bullying (Salmivalli et al., 1996). Upon entering adolescence, positive feedback from peers become increasingly important, leading to increases in reward-seeking behaviors (Steinberg, 2020). In this developmental period,

youth who engage in bullying as well as those who defend their victimized peers are likely to seek such confirmation from their friends.

Children often spend time and make friends with peers who have psychological or behavioral characteristics akin to their own (Veenstra & Laninga-Wijnen, 2022). Sharing similarities between friends promotes effective communication, minimizes conflict, increases the stability of the relationship, and ultimately satisfies children's need for affection and belonging (Laninga-Wijnen et al., 2017). Specifically, those exhibiting high levels of bullying behavior can be assumed to select as their friends peers with similar levels of bullying. Bullying behavior often takes place in the presence of peers who reward the behavior by exhibiting pro-bully attitudes or even participating in such actions (Rambaran et al., 2020). Such positive reinforcement helps children who bully establish a dominant position among peers and maintain positive self-views (Murray-Close et al., 2010; Salmivalli, 2010). Similarly, youth engaging in defending behavior are also likely to select their friends on the basis of similarity, i.e., from among peers who have a similar propensity for defending and share the value that bullying is not acceptable (Lambe & Craig, 2022; Sijtsema et al., 2014). Such friends are most likely to provide rewarding feedback for their prosocial behaviors and attitudes. Furthermore, friends with high levels of defending are often empathetic (Peets et al., 2015) and thereby responsive to the emotional needs of their peers, fostering trust and intimacy within the friendship (Miklikowska et al., 2022).

Previous findings regarding the similarity friendship selection associated with bullying and defending are inconsistent. Several studies have reported significant effects of similarity in bullying on friendship formation among early adolescents (Sentse et al., 2014; Sijtsema et al., 2014). However, other studies did not detect any similarity selection effect in late childhood (Shin, 2022) or

in early adolescence (Merrin et al., 2018). Regarding defending behavior, Ruggieri et al. (2013) found that youth tended to select and maintain friendships with those who were similar in defending during early adolescence. In contrast, Lambe and Craig (2022) found no significant selection effects based on similarity in defending behavior in early adolescence. Using two age groups, Sijtsema et al. (2014) found similarity selection in early adolescence but not in late childhood.

Popularity Selection Associated with Bullying and Defending

During late childhood, the need for popularity also becomes increasingly important (LaFontana & Cillessen, 2010). Goal-framing theory suggests that individuals are sensitive to opportunities that can facilitate the realization of their goals once they are activated, and make choices accordingly (Lindenberg, 2006). In the process of friendship formation, children might therefore be prone to select friends who can facilitate their goal achievement. To achieve popularity goals, youth are inclined to select high-status, popular peers as friends (i.e., popularity selection) because affiliation with them can elevate their own status (Dijkstra et al., 2013). Studies have revealed a general tendency among youth to select popular peers (e.g., Bravo et al., 2022; Dijkstra et al., 2013). Moreover, Dijkstra et al. (2011) and Palacios et al. (2022) found that children tend to select peers who are at a similar level of popularity.

Bullying behavior is associated with the pursuit of status goals, i.e., with the desire to acquire and maintain power and social standing (Pan et al., 2023; Volk et al., 2017). Children who engage in bullying behavior are therefore especially likely to display a distinct preference for forming friendships with popular peers to enhance their own popularity (Logis et al., 2013). Furthermore, bullies themselves face social risks, including potential retaliation from victims and being challenged by other classmates, which might be damaging for their status (Andrews et al., 2023; Pöyhönen et

al., 2010). By leveraging the power and influence held by their popular friends, bullies can avoid and counteract such risks, induce obedience and feelings of fear in their peers, and in turn solidify or elevate their own status (Huitsing et al., 2014). For these reasons, it is conceivable that bullies would be prone to choose friends based on popularity.

Defending behavior is often driven by individuals' empathic concern and sense of moral responsibility (Gini et al., 2008). In contrast to bullies, youth who defend victimized peers do not score especially high on popularity goals' endorsement. Although one study found that direct defending (such as confronting the bully) was positively associated with agentic goals (e.g., having an impact and being respected, Pronk et al., 2019), other studies found a negative association between prioritizing popularity and defending behavior (Duffy et al., 2017; Pouwels et al., 2019). On the other hand, while popularity does not seem to be as attractive to defenders as it is to bullies (Pouwels et al., 2019), popular friends could potentially discourage bullies from targeting defenders and empower defenders to continue their efforts to protect victimized peers (Laninga-Wijnen et al., 2023). Therefore, defenders might also benefit from having popular friends, but for a different reason than bullies.

Gaps in Current Literature

Although numerous studies have examined the dynamics of friendship selection, they have mainly focused on similarity selection—whether children in late childhood and early adolescence tend to choose friends who share their behavioral characteristics (e.g., aggressive or prosocial behavior) or peer status (popularity) (Dijkstra et al., 2013; Logis et al., 2013; Shin, 2017). These studies are informative, but an important piece of the puzzle is missing: how the behavioral

characteristics of the individual doing the selection (the "ego" in social network terms) are linked to the status of the peers they select (the "alter").

Most studies on friendship selection considered aggressive behaviors generally. However, aggression involves numerous forms, with potentially different effects on friendship selection. Especially when building hypotheses related to aggressive youth's goals, it might be useful to consider goal-directed aggression, such as bullying (Volk et al., 2017). Studies have revealed the need for popularity were more likely to be associated with relational and proactive aggression, rather than physical and reactive aggression among adolescents (Lansu, 2023; Ojanen & Findley-Van Nostrand, 2014). In conclusion, a tenable, yet untested hypothesis derived from goal-framing theory is that bullying in particular (due to its association with status goals) is related to selecting popular peers as friends.

Current Study

We investigated friendship selection processes based on similarity and friendship selection processes based on popularity, related to bullying and defending behaviors, in a sample of Chinese children. We tested three main hypotheses. First, we anticipated that children with bullying or defending behaviors tended to befriend peers with similar levels of bullying or defending behaviors. Due to the importance of receiving validation from peers (Veenstra et al., 2013), we assumed that regardless of their behavioral characteristics, children approaching adolescence sought to fulfill this need by surrounding themselves with friends providing such rewards. Therefore, we formulated a *similarity selection hypothesis for bullying* and a *similarity selection hypothesis for defending*. Moreover, given that youth with high levels of bullying behavior tend to endorse status goals (Huitsing & Veenstra, 2012), we anticipated that they would be likely to select popular peers as

friends (*popularity selection hypothesis for bullying*). Given the inconsistent findings regarding popularity goals and defending, we did not expect such an effect associated with defending.

In addition to selection effects, the influence process plays an important role in friendship dynamics. Children tend to change their behaviors according to their friends' behaviors, due to peer pressure or social learning (Veenstra & Laninga-Wijnen, 2022). Children who have friends who engage in bullying or defending behavior are more likely to exhibit similar level of bullying or defending behaviors. While studies have shown a significant influence effect for bullying in middle childhood (Shin, 2022) and in early adolescence (Sentse et al., 2014) and for defending in early adolescence (Lambe & Craig, 2022), other results have not supported this effect in early adolescence (Merrin et al., 2018; Ruggieri et al., 2013). Therefore, we include two influence effects without formulating specific hypotheses.

Most studies regarding friendship selection have been conducted with Western samples. It remains unclear whether these effects can be generalized to Chinese children. Chinese collectivistic culture places significant emphasis on interdependence among peers, highlighting the importance of forming friendships with classmates (Wright et al., 2014). Bullying, as it disrupts group harmony, is highly discouraged by peers (Tseng et al., 2013); yet, Chinese children who bully have been shown to endorse status goals (Pan et al., 2020; 2023). Moreover, a large size is a unique organizational feature of classrooms in China. In larger and more diverse groups, students have a broader pool of potential friends to choose from, giving them more opportunity to select similar friends (Bahns et al., 2012).

Method

Participants and Procedures

The participants were 465 third- and fourth-grade children (grade 3: N = 157, 52.9% boys, M_{age} = 9.35 years, SD = 0.52; grade 4: N = 308, 55.5% boys, M_{age} = 10.46 years, SD =0.54) from 10 classrooms in two Chinese elementary schools. Data collection was conducted annually from 2018 to 2020. Specifically, 453 children were involved at wave 1 (54.79% boys), 454 children at wave 2 (54.35% boys), and 453 children at wave 3 (54.05% boys). The first two waves were administered in the third month of the spring semester (i.e., May of 2018 and 2019). Due to the COVID-19 pandemic, in-person schooling for children started mid-May 2020. Accordingly, the third wave of data was collected late June and early July of 2020. Between the return to school and the data collection period, no COVID-19 case was reported in the schools. Therefore, this study was minimally influenced by COVID-19. The participants were native Mandarin speakers and most of them were Han ethnicity.

Chinese classrooms are large and relatively stable throughout the elementary school. In the current study, the classroom size ranged from 40 to 55 (M= 46.5, SD = 5.13). Students took almost all their lessons with the same classmates. The schedule of courses and other activities was typically identical for all students in the same class. During the data collection, 90.3% of the children attended lessons with the same classmates and in the same classroom across all three time points. Therefore, friendship networks were calculated based on classrooms.

Prior to data collection, the participants' parents and teachers were sent information letters and consent forms. The participants were offered a $1 gift as appreciation. Through these procedures, 98.3% of the children contacted for the study received active parental consent to participate and gave their assent. Participants filled out a battery of peer-nomination questionnaires in the classroom. To ensure confidentiality and anonymity of the participants, everyone received a roster of their

classmates, accompanied by corresponding codes. These codes were used to respond to the peer nomination questions to ensure no names were presented in the questionnaires. Completing the questionnaires took approximately 40 minutes. The research design and procedure were reviewed and approved by the Human Subjects Research Ethics Committee in the department of psychology in Shandong Normal University (approval number: SDNU2018001).

Measures

Demographic Variables. The participants reported their gender, which was coded as 0 = boy and 1 = girl.

Friendship Networks. Students were asked to nominate up to six friends with one item "who are your best friends in your classroom". Self-nominations were not allowed. In each wave, adjacency matrices based on the unilateral nominations were created for each classroom. In these matrices, each friendship nomination is coded as 1 and each friendship non-nomination is coded as 0.

Bullying and Defending Behavior. Bullying and defending behavior were assessed by the Chinese version of the Participant Role Questionnaire (PRQ; Pan et al., 2020; Salmivalli & Voeten, 2004). To begin with, the research assistants presented a definition of bullying, which highlighted its intentionality, repetition and the power imbalance. Then, students were asked to nominate up to three students in their classroom who fit the descriptions of the items of the bully and the defender scales. The bully scale includes three items (e.g., "starts bullying") (α_{wave1} = .98, α_{wave2} = .98, and α_{wave3} = .98). The defender scale also consists of 3 items (e.g., "tells the others to stop bullying") (α_{wave1} = .88, α_{wave2} = .93, and α_{wave3} = .92). A proportion score was calculated for each child by dividing the number of nominations received by the number of nominators within each classroom (classroom size minus one). The scores across the three items of each scale were averaged to calculate bullying and

defending scores respectively. To minimize the impact of non-normal distribution, each child's bullying and defending behavior levels were standardized within their classroom. As the software used for the analyses, RSiena, cannot handle continuous measures (Ripley et al., 2018), the standardized scores of bullying behavior and defending behavior were recoded into discrete ordinal scales (less than 0 = 1; 0-1 = 2; more than 1 = 3).

Popularity. For popularity, participants received a roster of all classmates who had consented to participate and were asked to indicate "Who are the most popular ones in your classroom". A maximum of three nominations were allowed. Following previous studies (Li et al., 2012), the Chinese term "*shou huan ying*" (受欢迎) was used to refer to popularity in this study. To fulfill Siena computation requirements, the popularity scores were standardized within classes and waves and classified into discrete ordinal scales (less than 0 = 1; 0-1 = 2; more than 1 = 3).

Data Analyses

Analyses were conducted using the stochastic actor-oriented model (SAOM; Snijders et al., 2010) in an iterative simulation of the Markov Chain Monte Carlo (MCMC), which was calculated by Siena (Ripley et al., 2018; Snijders et al., 2010) in RSiena package (version 1.3.14) in R (version 4.2.2). Siena models assume that the individual's behaviors (e.g., bullying, defending, popularity) depend on those of other members of their group and on their structural positions in the group, and vice versa (Snijders et al., 2010). By means of simulation, the likelihood of changes in the friendship network and changes in behavior over time are estimated.

Analyses in RSiena consisted of parameter estimates in terms of both network dynamics (*structural network and friendship selection effects*) and behavior dynamics (*behavior tendencies and friendship influence effects*). The co-evolution of networks and behaviors included bullying

behavior, defending behavior, popularity, friendship dyads and gender. The most common structural network effects were included (Veenstra et al., 2013): *Outdegree* (*Density*) reflects the possibility to nominate peers. *Reciprocity* reflects the possibility that children nominate the ones who also nominate them. For triadic configurations, we used *transitive triplets* concerning the transitive closure of adolescents ("friends of friends become friends"). Moreover, we added the effect *reciprocated transitive triplets,* which captures whether reciprocity is likely in transitive groups (Block, 2015).

To examine friendship selection, *ego* effects, *alter* effects and *ego* × *alter* effects were added to the model. *Ego* effects refer to given nominations, while *alter* effects refer to received nominations. For example, *bullying ego* and *bullying alter* reflect the extent to which bullying affects the number of nominations given and received, respectively. To evaluate the similarity selection hypothesis, *similarity selection processes* were tested using *ego* × *alter* effects for both bullying and defending. This approach examined whether children formed friendships with peers based on similarity in bullying and defending. *Popularity selection processes* were investigated through *bullying ego* × *popularity alter* and the *defending ego* × *popularity alter* effects to determine whether children exhibiting bullying or defending behavior tended to select popular peers as friends, in accordance with the popularity selection hypothesis. Other friendship selection effects, such as *gender ego* × *gender alter* and *popularity ego* × *popularity alter,* were also included.

In the behavior dynamics part of the model, rate functions, shape effects and influence effects were estimated. Behavioral rate parameters refer to the opportunities for change of behavior between each of the two observed points in classrooms. Shape effects, including linear shape and quadratic shape effects, describe the tendencies and dispersions of the behaviors or traits. The *average alter*

effects regarding bullying, defending and popularity were included in the model to measure whether children whose friends had higher bullying (defending, popularity) increased in bullying (defending, popularity) themselves over time.

After computing models for each classroom, we employed the R-package 'metafor' (Viechtbauer, 2010) as a tool to execute the meta-analysis model, facilitating the aggregation of results from the 10 classrooms of our sample.

Results

Descriptive Statistics

Descriptive statistics of friendship networks are presented in Table 1, demonstrating stability of classroom networks across waves. The means and standard deviations of bullying, defending and popularity, along with their correlations, are displayed in Table 2. Boys scored higher than girls in bullying at all waves ($|t|$s $\geq$ 5.86, ps $<$ .001, ds $\geq$ 0.53). Girls scored higher than boys in popularity at Wave 1 ($|t|$ = 2.48, p = .01, d = 0.23). There was no gender difference in popularity at Wave 2 and Wave 3 ($|t|$s $\leqslant$ 1.01, ps $\geq$ .31, ds $\leqslant$ 0.94), or in defending at any wave ($|t|$s $\leqslant$ 1.52, ps $\geq$ .13, ds $\leqslant$ 0.14). There was high stability of bullying (rs = .71 – .79), defending (rs = .53 – .68), and popularity (rs = .68 – .82). At each wave, bullying and popularity had a weak negative correlation (rs = -.06 – -.01), and defending was positively correlated with popularity (rs = .44 – .57).

RSiena Results

Results of RSiena analyses on friendship, bullying, defending and popularity, including the estimate, standard error and p-value for each effect, are presented in Table 3. All of the classroom networks exhibited good convergence (ts $\leq$ 0.25) except for one (t = 0.56). Separate analyses conducted using the well-converged classrooms yielded similar results to those obtained with all

participants. In terms of goodness of fit, indegree for friendship networks fitted well ($p = .11$). The lack of fit in the geodesic distance and triad census statistic ($p < .001$) might be due to the limited nomination procedure and the large size of the classrooms. For endogenous effects, the network rate parameters reflected the accelerating rate of evolution. The outdegree effect was significant and negative, suggesting that the network was sparse. The significant positive reciprocity effect indicated that students tended to reciprocate the friendship nominations they received. The positive transitive triplet parameters showed that children tended to nominate the friends of their friends as friends, while negative reciprocated transitive triplet parameters indicated that children were less likely to form reciprocal friendship within transitive groups.

This model included ego and alter effects on bullying, defending, popularity and gender. In terms of bullying, the bullying alter effect was negative and significant, whereas the bullying ego effect was non-significant, indicating that children with high levels of bullying were less likely to receive friendship nominations. Significant defending ego and alter effects were found. Children with high level of defending were less likely to nominate peers as friends, but were more likely to be nominated as friends. Popular children displayed no specific inclination towards selecting many friends in the current model, but they did, however, receive more friendship nominations themselves. In addition, boys were more likely than girls to be selected as friends, whereas there were no gender differences in the tendency to select friends.

For similarity selection effects, children were more likely to select as friends children of the same gender ($b = 1.88$, $SE = 0.12$, $p < .001$) and with similar levels of defending ($b = 0.22$, $SE = 0.07$, $p = .001$) and popularity ($b = 0.17$, $SE = 0.06$, $p = .004$) as themselves. Table 4 showed that the similarity effect was more pronounced among children with a high level of defending behaviors

(0.55) compared to those with a low level (0.04). Additionally, children exhibiting defending behaviors tended to avoid peers with low level of defending behavior (-0.39). Finally, the similarity effect based on bullying was not significant (b = 0.11, SE = 0.05, p = .053).

For the popularity selection effects, children with high level of bullying were more likely to select popular peers as friends (b = 0.11, SE = 0.05, p = .016), but children with high level of defending had no such tendency (b = -0.10, SE = 0.08, p = .182). As presented in Table 4, compared to peers with low level of popularity (j = 1), highly popular peers (j = 3) were overall more likely to be nominated as friends. Further, a higher level of bullying behavior (i = 3) increased the likelihood of children selecting popular peers as friends.

In terms of influence effects, the changing rates of bullying, defending and popularity were significant. The influence effect of bullying was significant, while the influence effects of defending and popularity did not reach significance. In other words, children became more similar over time in bullying, but not in defending or popularity, with the peers they had nominated as friends.

Discussion

Forming friendships becomes increasingly important in late childhood. To better understand the friendship preferences of children exhibiting bullying and defending behavior, it is important to analyze friendship selections based on similarity, as indicated in prior studies (Logis et al., 2013; Ruggieri et al., 2013; Sijtsema et al., 2014), as well as selections based on popularity. In line with the goal-framing approach (Lindenberg, 2006), the current study investigated children's friendship formation process in relation to their levels of bullying and defending behavior in a sample of Chinese third- and fourth-graders with a three-wave longitudinal design. The longitudinal social network analyses revealed that children who engaged in bullying behavior were likely to choose

popular peers as friends, whereas children who defended victims of bullying were inclined to select friends exhibiting similar level of defending.

Similarity Selection

From a developmental perspective, positive feedback from peers become increasingly important in late childhood (Steinberg, 2020; Veenstra et al., 2013). Choosing as friends peers with similar behavioral characteristics can fulfill children's basic need for connection and belonging (Veenstra & Laninga-Wijnen, 2022). Accordingly, we hypothesized a similarity selection effect associated with bullying as well as defending behavior. In line with the hypotheses and prior studies (Ruggieri et al., 2013; Sijtsema et al., 2014), we found that children with high levels of defending behavior displayed a tendency to befriend children who exhibited similar levels of defending victimized peers. This might be because children with defending behavior share antibullying attitudes and moral values (Sijtsema et al., 2014) which are central to children's conceptions of friendship. Through forming friendships with other defenders, who typically exhibit qualities of empathy and responsiveness (Peets et al., 2015), children can establish bonds characterized by trust, affection, and intimacy. Furthermore, when children with defending behavior choose other defenders as friends, they might find it easier to stop bullying together and reduce the potential risk of becoming the next victim.

Surprisingly, children with high levels of defending behaviors were overall less likely than their peers to nominate others as friends (defending ego effect). This finding, which is consistent with Ruggieri et al. (2013), might seem contrary to the idea that defenders endorse affection goals. When combined with the observation that defenders were more likely to avoid peers without defending behaviors (as shown in the selection table), a possible explanation is the prioritization of friendship quality over quantity; that is, children with high levels of defending behaviors tend to develop

supportive and secure relationships with few peers, rather than seeking to establish friendships with many peers.

In terms of bullying, the similarity effect was only marginally significant, thereby providing limited evidence for the similarity selection process for those high in bullying. This result was consistent with some previous studies (Shin, 2022; Sijtsema et al., 2014). While one study found that children tended to become friends if they shared the same targets of bullying (Rambaran et al., 2020), bullies affiliated with other bullies primarily when they were rejected by peers (Sentse et al., 2015) and had limited options to gain emotional and practical support (Sijtsema et al., 2010). It seems that popularity, which can enhance both a sense of belonging and the pursuit of status (Dijkstra et al., 2013), matters more than similarity in bullying behavior as such. When given the opportunity, bullies may be more inclined to form friendships with individuals who are popular.

Popularity Selection

Another important shift from childhood to adolescence is the increasing importance of obtaining and maintaining popularity in the peer group (LaFontana & Cillessen, 2010). To acquire higher status in the peer group, children might select popular peers as friends (Dijkstra et al., 2013). Supporting this idea, our results demonstrated that youth tended to select popular peers as friends or to select peers who were at similar levels of popularity as themselves in late childhood, even after controlling for the similarity effects of bullying and defending. These findings were consistent with previous studies (Bravo et al., 2022; Dijkstra et al., 2011; Dijkstra et al., 2013; Palacios et al., 2022), highlighting popularity as a robust selection criterion from middle childhood to early adolescence (Logis et al., 2013).

The current study extended prior literature by showing that children with high levels of bullying behavior were more likely to establish friendships with popular peers. This novel finding, *popularity selection for bullying* can be explained by goal-framing theory (Lindenberg, 2006). Specifically, children who engage in bullying are more likely to prioritize status goals compared to their peers (Pan et al., 2023; Samson et al., 2022). Driven by status goals, they may seek out popular peers to elevate their own status, or avoid losing status. Our findings might imply that children who engage in bullying are strategic in their friendship selection: they may enhance and solidify their status by leveraging their friendship networks.

Although our findings suggest that bullies might select popular peers as friends in order to elevate their status, we found a negative (albeit weak) association between bullying and popularity. This is in contrast with previous studies revealing a positive association between bullying and popularity (see meta-analyses by Wiertsema et al., 2023). This could be attributed to cultural differences. In Chinese culture, bullying is highly discouraged by peers (Li et al., 2012; Tseng et al., 2013), making it difficult for children who engage in such behaviors to gain popularity within their peer groups, especially in late childhood. For example, Tseng et al. (2013) found a negative association between popularity and aggression in a study of fifth-grade Chinese children. Future studies are needed to examine whether having popular friends can actually help bullies elevate their status in the Chinese culture.

For defending, we did not find a popularity selection effect. That is, children who displayed higher defending behavior did not exhibit a stronger preference for forming friendships with popular peers when compared to their classmates. This finding is in line with the idea that children engaging in defending behavior do not prioritize the attainment of popularity (Duffy et al., 2017; Pouwels et

al., 2019). However, it is worth noting that there is heterogeneity in defending behaviors, which can be categorized into direct and indirect forms. Direct defending is associated with both agentic goal and communal goals, while indirect defending is not distinctly related to either (Pronk et al., 2019). Although agentic goals are not identical to status goals, the two types of goals overlap (Ojanen et al., 2005). Future research would benefit from examining the friendship selection process associated with indirect and direct defending behaviors, respectively.

Strengths, Limitations, and Future Directions

The current study made several contributions. Regarding the methodological strengths, the present study used stochastic actor-based modeling with a longitudinal design. This approach allows the simultaneous examination of both similarity and popularity selections for bullying and defending in the formation of friendship networks, as well as ruling out the influence effects. Another notable strength of this study is the use of a Chinese sample while most research on the topic has been conducted with Western samples. This provides a new vision of friendship selection process in the context of vertical-collectivistic cultures and large classroom settings. The hypotheses in this study were drawn upon empirical studies conducted in both Eastern (e.g., Pan et al., 2020; Shin, 2022) and Western cultures (e.g., Pronk et al., 2019; Sijtsema et al., 2014). The findings suggest similarities, rather than differences, in the friendship selection processes in Eastern and Western cultures. However, our novel finding on the popularity selection effect associated with bullying behavior awaits replication in other cultures.

There are, however, several caveats to bear in mind. First, the measurement in this study relied on a limited nomination procedure. This method may fail to capture the full range of bullying, defending, and popularity. Among the participants, 66.59%–80.91% gave the maximum number of

nominations allowed on friendship items. These percentages were 35.57% to 57.27% for the bullying items, 54.88% to 75.05% for the defending items, and 61.61% to 79.83% for the popularity items. These figures may indicate an underestimation of prevalence, potentially leading to attenuated effect sizes and parameter estimates. However, comparisons between limited and unlimited peer nomination procedures suggest that they generally yield comparable results (Gommans & Cillessen, 2015). To address potential biases, future research could examine these questions using unlimited nominations. Second, although children's social goals affect their friendship choices, we did not measure these goals directly. Incorporating measures of social goals, social behaviors, and friendship networks in future studies may give better insights into how social goals affect children's behaviors and decisions when choosing their friends (Ojanen et al., 2013). Third, this study examined friendship selection processes over a three-year period with one-year intervals, which contrasted with previous studies that used three- or six-month intervals (Merrin et al., 2018; Palacios et al., 2022; Shin, 2022). Considering the rapid changes in peer dynamics during late childhood (Huitsing & Veenstra, 2012), it would be beneficial to replicate the findings of the current study using a short-term interval design.

Moreover, several important issues need to be considered in future research. First, to capture developmental changes in friendship dynamics, future studies should consider replicating these results with adolescent samples. For example, adolescent bullies might tend to choose both similar and popular peers as their friends (Huitsing & Veenstra, 2012). Second, due to the differential associations of social goals with direct and indirect defending (Pronk et al., 2019), future studies could benefit from separately examining the friendship preferences of children who engage direct versus indirect defending. Lastly, our measures of bullying and defending behaviors were assessed

using behavior-based peer nominations. Future research incorporating network-based measurements (e.g., who bullies or defends whom) could expand our understanding of these selection processes.

The findings of this study have implications for anti-bullying programs where peers have formal and informal roles in preventing and stopping bullying (Gaffney et al., 2021). A successful peer-led intervention relies on the development of strong relationship between peer leaders and their classmates (Veenstra & Laninga-Wijnen, 2022). The current findings regarding the friendship preferences of bullies and defenders shed light on the specific processes that should be emphasized in peer-led interventions. Specifically, this study suggested that bullies tend to select popular peers as friends. Moreover, previous studies highlighted the important role of high-status peers in the socialization of children's prosocial behaviors (Choukas-Bradley et al., 2015). Therefore, promoting the prosocial behavior of popular children may reduce bullying behavior in the classroom. Indeed, the Roots Intervention has successfully reduced prevalence of bullying in the US through encouraging popular students to take a public stance against bullying and conflict (Paluck et al., 2016). Moreover, to support children exhibiting defending behavior, teachers can facilitate more friendship opportunities for them. This can be accomplished by fostering an environment that encourages and increases the overall level of defending behavior within the classroom. Teachers can reinforce students' understanding of the vital role that defenders play in addressing bullying incidents, nurture their empathy towards victims, and teach them effective strategies to support the victimized peers (Salmivalli, 2010).

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Table 1

Descriptive Statistics among Friendship Networks (N = 465)

	Ranges	Wave 1	Wave 2	Wave 3
		M(*SD*)	*M*(*SD*)	*M*(*SD*)
density	0 – 1	0.16(0.01)	0.11(0.01)	0.11(0.01)
reciprocity	0 – 1	0.44(0.04)	0.50(0.03)	0.50(0.06)
transitivity	0 – 1	0.33(0.04)	0.34(0.04)	0.38(0.04)
number of ties (directed)	0 – 2970	240.20(29.33)	228.30(30.84)	222.00(25.86)
Moran's *I* for bullying	-1 – 1	0.10	0.11	0.10
Moran's *I* for defending	-1 – 1	0.06	0.10	0.10
Moran's *I* for popularity	-1 – 1	0.14	0.07	0.04
Change		Wave 1 – Wave 2	Wave 2 – Wave 3	
Friendship indicators				
Jaccard index		0.32	0.37	
Hamming distance (change per student)		5.50	4.77	
Average number of ties dissolved		123.40	105.20	
Average number of ties emerged		111.30	101.00	
Average number of ties maintained		108.00	116.70	
Changes in bullying				
Percent increased		7.10%	6.24%	
Percent decreased		7.53%	7.74%	
Changes in defending				
Percent increased		13.55%	10.75%	
Percent decreased		20.86%	12.47%	
Changes in popularity				
Percent increased		5.16%	6.67%	
Percent decreased		8.17%	6.24%	

Table 2

Descriptive Statistics and Correlations (N = 465)

	M(*SD*)	1	2	3	4	5	6	7	8
1. Wave 1 bullying	1.31(0.63)	—							
2. Wave 2 bullying	1.30(0.64)	.79***	—						
3. Wave 3 bullying	1.29(0.60)	.71***	.79***	—					
4. Wave 1 defending	1.47(0.67)	-.01	-.05	-.06	—				
5. Wave 2 defending	1.39(0.64)	-.04	-.05	-.04	.53***	—			
6. Wave 3 defending	1.38(0.64)	-.06	-.06	-.08	.55***	.68***	—		
7. Wave 1 popularity	1.30(0.61)	-.06	-.05	-.05	.44***	.45***	.41***	—	
8. Wave 2 popularity	1.27(0.62)	-.05	-.04	-.03	.42***	.57***	.51***	.77***	—
9. Wave 3 popularity	1.28(0.60)	-.04	-.03	-.01	.40***	.54***	.50***	.68***	.82***

Note. $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$. The scores for bullying, defending and popularity range between 1 to 3.

Table 3

RSiena Estimates for Friend Selection and Influence Effects for Bullying, Defending, and Popularity (N = 465)

	Estimates	*SE*	*95% confidence intervals*	*p*
Network Effects				
Constant friend rate (period 1)	11.30	0.61	[10.12, 12.49]	< .001
Constant friend rate (period 2)	9.20	0.55	[8.13, 10.28]	< .001
Outdegree	-1.95	0.03	[-2.01, -1.89]	< .001
Reciprocity	1.25	0.06	[1.14, 1.36]	< .001
Transitive triplets	0.19	0.02	[0.16, 0.23]	< .001
Reciprocated transitive triplets	-0.07	0.03	[-0.13, -0.02]	.011
Selection Dynamics				
Gender alter	-0.14	0.07	[-0.27, -0.01]	.030
Gender ego	-0.12	0.07	[-0.25, 0.01]	.060
Gender ego x gender alter	1.88	0.12	[1.65, 2.11]	< .001
Bullying alter	-0.24	0.04	[-0.32, -0.16]	< .001
Bullying ego	0.01	0.03	[-0.05, 0.06]	.870
Bullying ego x bullying alter (bullying similarity)	0.11	0.05	[-0.00, 0.21]	.053
Defending alter	0.11	0.04	[0.04, 0.19]	.004
Defending ego	-0.12	0.04	[-0.20, -0.04]	.003
Defending ego x defending alter (defending similarity)	0.22	0.07	[0.09, 0.36]	.001
Popularity alter	0.18	0.03	[0.12, 0.25]	<.001
Popularity ego	-0.05	0.04	[-0.12, 0.02]	.149
Popularity ego x popularity alter (popularity similarity)	0.17	0.06	[0.06, 0.28]	.004
Defending ego x popularity alter	-0.10	0.08	[-0.25, 0.05]	.182
Bullying ego x popularity alter	0.11	0.05	[0.02, 0.20]	.016
Influence Dynamics				

Rate bullying (period 1)	0.56	0.16	[0.24, 0.88]	.001
Rate bullying (period 2)	0.53	0.12	[0.30, 0.76]	< .001
Bullying linear shape	-2.56	0.43	[-3.41, -1.71]	< .001
Bullying quadratic shape	1.39	0.27	[0.86, 1.92]	< .001
Bullying average alter	1.78	0.78	[0.26, 3.30]	.022
Rate defending (period 1)	1.58	0.24	[1.10, 2.05]	< .001
Rate defending (period 2)	0.82	0.12	[0.58, 1.06]	< .001
Defending linear shape	-1.54	0.21	[-1.96, -1.13]	< .001
Defending quadratic shape	0.72	0.16	[0.40, 1.03]	< .001
Defending average alter	0.48	0.40	[-0.30, 1.25]	.227
Rate popularity (period 1)	0.67	0.13	[0.42, 0.92]	< .001
Rate popularity (period 2)	0.96	0.19	[0.59, 1.34]	< .001
Popularity linear shape	-3.17	0.33	[-3.82, -2.52]	< .001
Popularity quadratic shape	1.83	0.24	[1.37, 2.30]	< .001
Popularity average alter	0.45	0.61	[-0.76, 1.65]	.467

Note. For gender, 0=boy, 1=girl. The effects in period 1 and 2 were the change opportunities from wave 1 to wave 2 and wave 2 to wave 3, respectively.

Table 4

Selection Table for Friendship with Respect to Bullying and Defending (N = 465)

Children's bullying	Friends' popularity		
	1	2	3
1	0.05	0.26	0.47
2	0.09	0.41	0.73
3	0.13	0.55	0.98
Children's defending	Friends' defending		
	Low defending	Medium defending	High defending
1	0.04	0.06	0.08
2	-0.17	0.07	0.32
3	-0.39	0.08	0.55

Note: the numbers "1", "2", and "3" in the table represent the discrete ordinal codes of standardized scores of bullying, defending, and popularity. Standardized scores less than 0 = 1; scores between 0 and 1 = 2; and scores more than 1 = 3.