8-2022

Children's Positive Peer Relationships and their Bullying Behaviors: A Latent Profile Analysis

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Children's Positive Peer Relationships and their Bullying Behaviors: A Latent Profile Analysis

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy in Psychology

by

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August 2022
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Abstract

In the current study, I aim to expand upon traditional methods for classifying children based on positive peer nominations and contribute to the field's understanding of high-status bullies who maintain social resources despite bulling behaviors (e.g., van der Ploeg et al., 2020). Both reciprocated and one-sided (i.e., received and sent) positive peer nominations were used to distinguish socially meaningful subgroups. Participants included 659 children from 34 classrooms (*M* Age = 9.31 years, *SD* = .49 years; girls = 50.6%; Hispanic/Latino/a/x = 42.5%, White/European American = 29.9%, Black/African American = 2.3%, Asian/Asian American/Pacific Islander = 11.7%, Native American = 2.3%, Bi/Multiracial = 8.2%, Other or Missing = 4.6%). Results from latent profile analyses (LPA) indicated a 4-class solution best fit the data. Examination of classes and outcomes revealed a class of children with many reciprocated/received and few sent nominations who were more likely to be girls and generally better adjusted (e.g., less depressive symptoms and more prosocial) compared to other classes. A second class was characterized by few reciprocated/received and many sent nominations. Children in this class were less well-adjusted compared to other classes. Also identified was a class high on both reciprocated and sent nominations with few received nominations, and an average class with similar levels of reciprocated, received, and sent nominations. Classes did not differ as a function of self-reported bullying behavior; however, differences did emerge as a function of peer-reported bullying behavior. Results, implications, and future directions are discussed.

Keywords: Peer nominations, one-sided nominations, reciprocated, received, and sent peer nominations, bullying, social behaviors

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Acknowledgements

Thank you to all my professional and personal relationships who have helped support me through this work. Thank you to my teachers, professors, and mentors who have guided me, supported me, and encouraged me. Thanks especially to my dissertation chair, Dr. Tim Cavell, and my committee members, Dr. Lauren Questch and Dr. Doug Behrend. Thanks to my family, who have always surrounded me with the love and support to make pursuing my dreams possible. Thanks especially to my mom and dad and their partners, Herb and Julia, my brother Michael, and my partner Nick. Thanks to my aunts, Paula, Connie, Pam, and Nancy, and my uncles, Ernie, Kevin, Dan, and David. Thanks to my cousins Dave & Tanya, Brandon & Shannon, Shawn, Sebastian, Carson, Mason, Trevor, Dan, Hazel, Lucy, Melissa & Joe, Shay, Julia, and Katie. Also, thanks to my Grandpa and Grandma Stoll and Grandma Mutignani. Thank you to my friends and professional colleagues, especially my cohort and lab mates at the University at Buffalo, here at the University of Arkansas, and at my internship at the University of Mississippi. You have all helped me so much, both personally and professionally, and I am grateful for all your support!

Dedication

To my Uncle Dan and my Grandma Stoll

Children's Positive Peer Relationships and their Bullying Behaviors: A Latent Profile Analysis

Preamble

Research suggests some bullies maintain high-status despite engaging in bullying behaviors (e.g., van der Ploeg et al., 2019). Research on high-status bullies, who can exert considerable influence over the peer group, can inform interventions designed to counter bullying behavior among elementary school children. In this study, I examined children's pattern of reciprocated and non-reciprocated positive peer nominations to advance understanding of high-status bullies. More specifically, I used latent profile analysis (LPA) to identify meaningful subgroups based on three types of positive peer nominations: *sent* (nominations from a focal child but not reciprocated), *received*, (nominations of a focal child but not reciprocated), and *reciprocated* (nominations of a focal child that are reciprocated) nominations. I anticipated finding distinct subgroups that differed on concurrent and prospective measures of social adjustment, including bullying behaviors.

Bullying as a Peer Relations Process

In 2018, the Center for Disease Control and Prevention operationalized bullying as aggressive (i.e., intentionally harmful) behavior between peers that is characterized by a power imbalance (e.g., bully is physically larger, has more friends, etc.) and repetition. Both the perpetration and receipt of bullying behaviors have been linked to a variety of short- and long-term negative outcomes for both victim and bullies. Victims of bullying have increased risk for internalizing problems, such as anxiety and depression, externalizing problems including hyperactivity and impulsivity, and poorer overall general health (Hawker & Boulton, 2000; Rejintes et al., 2010). Alternatively, engaging in bullying behaviors is linked to negative

outcomes including increased risks for anxiety and depression (Wolke & Lereya, 2015) as well as increased substance use at earlier ages, law breaking, and delinquency compared to non-aggressive peers (Radliff et al., 2012).

While bullying can be thought of as a dyadic peer experience, many theories conceptualize bullying as part of a larger peer group process. In fact, Salmivalli (1999) posited the "participant role approach" which theorizes that bullying involves more than just aggression between two peers; rather Salmivalli (1999) highlights the importance of bystanders and other members of the peer group who either sanction the bullying and allow it to continue or intervene and stop the behavior. In line with this, research has found that group-level variables, such popularity and peer group behaviors, are associated with the likelihood children will engage in aggressive or bullying behaviors (e.g., Sijtsema et al., 2009). In other words, bullying can be thought of as an inherently social process that is influenced by the larger peer group as well as by the bullies' own social relationships (Rambaran et al., 2020). Given the social nature of bullying, it is perhaps unsurprising that research has documented links between bullying behaviors and children's peer relationships. For example, bullying has been found to be related, often in complex ways, to children's peer acceptance, liking, and social standing (Salmivalli et al., 2000; Sijtsema et al., 2009). Although a large body of research has been dedicated to understanding bullying as a social behavior related to children's social relationships, recent research has referred to the "puzzle" of high-status bullies (van der Ploeg et al., 2019), a group of children whose bullying behavior co-occurs with positive social constructs such as high status and social competence.

The Traditional Bully: Dysregulated Aggression

Bullying behaviors have traditionally been conceptualized as aggressive and impulsive acts and research does support this notion, finding links between bullying behaviors and hyperactive, reactive, and impulsive youth (e.g., Espelage et al., 2001). This conceptualization of bullying draws its roots from the social-cognitive deficit perspective on bullying which theorizes that children engaging in aggressive and bullying behaviors are dysregulated and hot-tempered (Haynie et al., 2001; Olweus, 1978; 1995). These children may lack more sophisticated social and emotion regulation skills and resort to aggression and bullying to release frustration or in reaction to a perceived threat. Empirical support for this perspective is found in research linking bullying to peer rejection, a hostile attributional style, and decreased peer acceptance (e.g., Boulton, 1999; O'Brennan et al., 2009). However, this conceptualization does not encompass all bullies; indeed, empirical evidence supports the existence of a subgroup of children who are bullying as part of a goal-directed social strategy (Sijtsema et al., 2009). These children use aggression or bullying as a tool to make themselves socially central or dominant in the peer group where they are able to maintain their high social standing over time (Reijntjes et al., 2013).

High-Status Bullies: Bullying as a Social Strategy

For high-status bullies, aggressive behaviors appear to be part of a goal-oriented and proactive social strategy (Sijtsema et al., 2009; van der Ploeg, et al., 2019). These children use bullying to attain resources and high social dominance within the peer group. Indeed, recent research highlights bullying is associated with and predictive of high-status within the peer group (de Bruyn et al., 2010; Vaillancourt et al., 2003). Research also demonstrates that some bullies have social competence skills (Vaillancourt et al., 2003) and can retain support from their peers despite bullying behavior (Demaray & Malecki, 2003). This perspective on bullying is consistent with a social dominance view in which children use bullying behavior to advance their own

social standing in a group (Hawley, 1999). Importantly, status and peer attitudes towards high-status bullies are complex. Some empirical evidence documents a strong negative link between facets of peer acceptance and bullying such that children who bully frequently tend to have lower social preference scores (e.g., Sijtsema et al., 2009). However, Samillivali and colleagues (2000) found that increased indirect bullying (e.g., covert or relational bullying) contributed to *higher* peer acceptance scores for children, particularly for boys. Similarly, research also finds that perceived popularity and other attributes of status, such as dominance (e.g., de Bruyn et al., 2010), tend to be correlated positively with bullying, suggesting again that some bullies are dominant, popular, and accepted within the peer group.

The complicated relation between bullying and peer relationships has made it difficult for clinical prevention and intervention programs looking to reduce harmful effects of bullying for both victims and bullies. In particular, the existence of "high-status bullies" have provided unique challenges to researchers seeking to intervene on bullying behaviors. These challenges often arise because some bullying interventions seek to change positive norms and contingencies surrounding bullying and high-status peers often set norms for the peer group (Kärnä et al., 2010; Swearer et al., 2010). For instance, after 1 year in the KiVa anti-bullying program, Garandeau and colleagues (2014) found reductions in peer reported bullying behavior only for low and medium status bullies but not for high status bullies. In the long-term, if bullying interventions are to successfully change norms and contingencies surrounding bullying, researchers must learn to combat the influence of central high-status bullies on the peer group ecology. In this study, I aim to add to the field's knowledge of high-status bullies through consideration of children's positive peer nominations including one-sided or non-reciprocated social ties, which scant empirical work has examined, as part of a child's social world.

Peer Nominations and Classifying Children into Meaningful Social Groups

Researchers have long used peer nominations to classify distinct subgroups of children who are thought to differ in their level of psychosocial functioning and risk trajectory (Coie et al., 1982). Peer nomination procedures involve asking children in a given class (or grade) to identify those classmates they like the most or like the least or which classmates fit various descriptors or social roles (e.g., victims of school bullying, liked by the teacher). Researchers use peer nominations to form indices that represent the degree to which children are accepted by peers, fit various social roles, or have classmates who are friends (e.g., Cillessen & Marks, 2017). For example, positive (liked most) and negative (liked least) peer nominations can be used to form both social preference (i.e., positive minus negative nominations) and social impact (i.e., positive plus negative nominations) scores (Coie et al., 1982). Coie and colleagues found strong empirical support for a method to classify children into distinct sociometric status groups (e.g., popular, rejected) based on these scores. Children's level of social preference is thought to be distinct from their level of perceived popularity, which is typically derived from asking children to identify those classmates considered popular (Parkhurst & Hopmeyer, 1998). Peer nominations have also been used to index children's friendship patterns in a classroom, in particular the number of classmates with whom they share reciprocated positive peer nominations. Less common is for researchers to classify children based on their pattern of non-reciprocated positive peer nominations. However, there is evidence that suggests non-reciprocated (i.e., one-sided peer) nominations carry important information about children's social ties (e.g., Scholte et al., 2009). This study extends that work by using LPA to identify meaningful social subgroups of children based on their pattern of both reciprocated and non-reciprocated positive peer nominations (i.e., received and sent).

Reciprocated, Received, and Sent Positive Peer Nominations

Research examining reciprocated dyads conceptualize them as a positive social resource for children and a protective factor that provides a buffer from negative social outcomes. Indeed, empirical evidence consistently suggests that having reciprocated friends is an important contributor to children's adaptive development (Hartup, 1996). Reciprocated nominations and friendships are associated with a number of assets, including greater social skills and higher sense of self-worth (Bagwell et al., 1998; Schwartz et al., 2000). Friendships offer children opportunities to enhance social and emotional growth and a chance to acquire critical skills related to emotion regulation and leadership (Rivizziago et al., 2018). Further, there is evidence indicating reciprocated nominations, and specifically best-friendship formations, are associated with greater prosociality/helping behavior (Bowker et al., 2010). As mentioned above, there is also ample research to suggest that children's friendships buffer against negative outcomes, particularly those associated with experiences of victimization. Having high-quality and reciprocated friendships both protects directly against victimization and attenuates positive relations between peer victimization and internalizing behaviors such as anxiety and depression (Bagwell & Bukowski, 2018). Overall, a large body of theoretical and empirical work supports the notion that reciprocated social ties confer positive social outcomes for children.

Less well-understood are children's one-sided or unreciprocated nominations. One-sided peer nominations are those in which a focal child sends or receives a positive nomination that is not reciprocated. Although children's pattern of sent and received nominations could signal additional, different information about children's social ties, research to date is limited (Scholte et al., 2009). In one of the first studies to examine one-sided positive peer nominations, Scholte and collogues (2009) used cross-sectional data to compare the nominations of children identified

as bullies, bully-victims, victims, or children not involved in bullying or victimization. The authors found that children who were not victimized had more reciprocated and received nominations than children who were victimized, suggesting high levels of received nominations, like reciprocated nominations, were associated with a lower risk for peer victimization. Results also indicated that victims had less socially competent friends compared to bullies and non-involved children, suggesting it is more difficult for children experiencing peer victimization to form social ties with socially skilled, competent peers. Echols and Graham (2016) used sent, received, and reciprocated nominations to examine how changes in friends' levels of victimization predict children's own level of victimization. In a sample of 3,000 sixth-grade students, Echols and Graham (2016) found that the stability of children's level of victimization across a school year was moderated by changes in friends' level of victimization and that these associations differed by nomination type. Importantly, Echols and Graham (2016) found that sent nominations were associated with increased victimization such that when a focal child's sent nominations increased in their victimization so did the focal child. However, the reverse was not found; that is, when a focal child's sent nominations decreased in their victimization the focal child's own victimization did not decrease. Received nominations followed the opposite pattern and were associated with social protection in the form of linked decreases in victimization.

Overall, studies support the notion that one-sided positive nominations signal relevant and differential information about children's social relationships and behaviors compared to reciprocated positive nominations. In line with studies showing a positive relation between peer rejection and aggressive behaviors (e.g., Lansford et al., 2010), it is possible sent nominations will also be associated with increased bullying. Received nominations, on the other hand, seem to function more similarly to reciprocated nominations and have been associated with positive

outcomes including less victimization (Scholte et al., 2009). Although past work has highlighted the positive social outcomes associated with received nominations (e.g., less peer victimization), it is possible that the lack of reciprocity in received nominations signals a focal child who is less invested in the peer group or a child who expresses less liking towards peers and the peer group.

Differential Associations by Gender

Finally, differential predictors and outcomes related to bullying have been found for boys and girls, including boys generally engage in more bullying and are more often categorized as both bullies and bully-victims compared to girls (Espelage et al., 2004; Schwartz et al., 2001). Gender differences have also been found within the peer nominations literature including the tendency for girls to have closer, high-quality, and more reciprocated positive peer nominations compared to boys (Casey-Cannon et al., 2001; Rose & Rudolph, 2006). Given the potential for outcomes to vary based on gender, I controlled for gender when relevant and examine emergent classes as a function of gender.

The Current Study

The current study is an effort to extend our understanding of children's peer relationships as indexed by their positive peer nominations. The first aim of this study was to determine if children can be sorted into meaningful subgroups based on their pattern of positive peer nominations (Aim 1). Three peer nominations variables (i.e., reciprocated, received, and sent) were used in a Latent Class Analysis (LCA) of continuous class indicators (i.e., LPA). I hypothesized that at least two distinct groups would emerge from LPA and these groups would be characterized by children having relatively high numbers of one type of positive peer nomination (i.e., reciprocated, received, or sent) and relatively low numbers of the other types of positive peer nominations (Hypothesis #1; H1).

The second aim of this study was to examine how identified classes differed with respect to measures of their social behavior and internalizing symptoms (Aim 2). Given that reciprocated nominations are generally seen as a positive social resource (e.g., Bagwell & Bukowski, 2018), I hypothesized that any classes characterized by high reciprocated friends would be comparatively well-adjusted with low levels of internalizing symptoms, peer victimization, teacher-rated disruptive behaviors, and bullying behavior, as well as higher levels of prosocial behavior and teacher-rated attention and concentration (Hypothesis #2a; H2a). Received and sent nominations are less well-studied in the literature; however, I conceptualized received nominations as a signal of peer liking without mutual liking that occurs with reciprocated nominations. Therefore, I hypothesized that children characterized by high levels of received nominations would be middling on measures of adjustment. That is, I hypothesized these children would be comparatively less well-adjusted than children with more reciprocated friends but better adjusted than children characterized by high sent nominations (Hypothesis #2b; H2b). Finally, given research linking sent nominations to increased risk for peer victimization and other negative social outcomes (e.g., Scholte et al., 2009), I hypothesized that children with high sent nominations would be the least well-adjusted and would be characterized by higher levels of internalizing symptoms, peer victimization, teacher-rated disruptive behaviors, bullying behavior, and lower levels of prosocial behavior and teacher-rated attention and concentration (Hypothesis #2c; H2c).

The third aim of this study was to add to the field's understanding of thigh-status bullies by examining how identified classes differed on concurrent and prospective levels of bullying behavior (Aim 3). Growing empirical evidence points to the existence of this subgroup of children, who are thought to bully without facing the social consequences of their bullying

behavior (e.g., van der Ploeg et al., 2019). Therefore, the current study investigates how children's positive peer nominations, and particularly their received and sent nominations, are related to their bullying behaviors over time. Consistent with past literature suggesting prosociality and reciprocated friendship formation are linked (Bowker et al., 2010), I hypothesized that children characterized by high reciprocated nominations and low received and sent nominations would engage in less bullying behavior compared to all other classes (Hypothesis #3a; H3a). Conversely, I conceptualized children with high received nominations and relatively low reciprocated and sent nominations, by virtue of their high status (i.e., high received nominations) but lack of mutual social ties (i.e., low reciprocated nominations), as potentially engaging in higher levels of bullying behavior. Similarly, I conceptualized children in groups characterized by high sent nominations would have greater levels of bullying behavior relative to children with high reciprocated nominations, due to their lack of positive social ties. Therefore, I hypothesized that children in groups characterized by high received or sent nominations only would engage in increased bullying compared to other classes (Hypothesis #3b; H3b). Finally, I hypothesized no differences in bullying behavior over time for children with high received and high sent nominations, anticipating that both classes would engage in comparatively high levels of bullying (Hypothesis #3c; H3c).

Method

Participants

Participants for the current study were recruited as part of a larger longitudinal data collection project at the University of Arkansas. Participants were 677 fourth-grade students (*M* Age = 9.31 years, *SD* = .50 years, Range = 8-11 years; girls = 51.3%; Hispanic/Latino/a/x = 42.3%, White/European American = 30.3%, Black/African American = 2.2%, Asian/Asian

American/Pacific Islander = 11.9%, Native American = 2.2%, Bi/Multiracial = 7.9%, Other or Missing = 4.5%), enrolled in 37 mainstream classrooms at 10 public schools in northwest Arkansas. Consistent with methodological requirements for peer nominations research, classrooms were excluded from analyses if less than 40% of students in the class participated or if the classroom had fewer than 10 potential peer raters (Marks et al., 2013; Terry, 2000). This resulted in the exclusion of 3 classrooms and a total of 18 participants. Thus, the final sample consisted of 659 children from 34 classrooms. Demographics were similar for this slightly smaller sample and the full sample (*M* Age = 9.31 years, *SD* = .49 years, Range = 8-11 years; girls = 50.6%; Hispanic/Latino/a/x = 41.9%, White/European American = 29.4%, Black/African American = 2.3%, Asian/Asian American/Pacific Islander = 11.5%, Native American = 2.3%, Bi/Multiracial = 8.0%, Other or Missing = 4.5%).

Procedure

IRB approval was obtained for all procedures and measures used. Parent consent and child assent were obtained from all study participants prior to data collection. Teachers also gave their consent to participate. All teacher and child measures were administered in the Fall (October; Time 1), Winter (December; Time 2), and again in the Spring (May; Time 3) of a single academic year, with order of measures counterbalanced across participants. Trained graduate and undergraduate research assistants administered child measures in a group setting (e.g., class, cafeteria, library). Instructions were standardized and all items read aloud. To minimize distraction or conversations, children were adequately spaced, instructed to keep answers covered, and worked on distracter activities (e.g., mazes, word searches) between measures. Teachers received a small gift card incentive for completing measures and classrooms

were also incentivized via a small gift card to return parental consent forms (regardless of whether or not the child was given permission to participate).

Measures

Reciprocated, Sent, and Received Peer Play Nominations

Reciprocated, sent, and received nominations were derived from positive peer nominations in which children were asked to nominate at least three classmates they "play with the most" (Coie et al., 1982). Consistent with recent recommendations, nominations were collected using an unlimited nomination strategy (for review see: Cillessen & Marks, 2017). Research assistants coded peer nominations data for one of three mutually exclusive categories including mutually endorsed play nominations (i.e., reciprocated play nominations), focal child only endorsed play nominations (i.e., sent play nominations), and other child only endorsed play nominations (i.e., received nominations). While one-sided nominations are less well-established compared to reciprocated nominations, research has examined one-sided friendships and nominations in the past (e.g., Scholte et al., 2009; Wei & Jonson-Reid, 2011).

Internalizing Problems

Children's self-rated general anxiety and depression symptoms were measured with self-report subscales from the Revised Children's Anxiety and Depression Scale (RCADS; Chorpita et al., 2000). The RCADS, a commonly used measure of children's internalizing symptoms, was developed using items from the Spence Children's Anxiety Scale (1997). Chorpita and colleagues (2000) evaluated psychometric properties of the RCADS in sample of 1,641 children and adolescents and found the measure had an underlying factor structure consistent with current conceptualizations of internalizing disorders and was internally consistent. Further work has continued to indicate strong psychometric properties for the RCADS, including acceptable test-

retest reliability and clinical utility (Bouvard & Denuis, 2012; Chorpita et al., 2005). The current study used 15-items from the RCADS to assess depressive (10-items) and general anxiety (5-items) symptoms. Depressive items (e.g., "I feel sad or empty") and general anxiety items (e.g., "I worry about things") were rated on a 4-point scale (0 = "Never" to 3 = "Often") and internal consistency, assessed with Cronbach's alpha, for the current study was good for both depression (T1 $\alpha = .83$) and anxiety (T1 $\alpha = .85$).

Victimization

Children's experiences of physical and relational victimization were assessed via an adapted version of the School Experiences Questionnaire (SEQ; Kochenderfer-Ladd, 2004) which has previously been utilized in peer victimization research (e.g., Elledge et al., 2010). The SEQ was created as a composite of well-established psychological measures assessing peer victimization (Kochenderfer-Ladd, 2004) and has evinced good internal consistency in previous peer victimization research (Elledge et al., 2010). The current study used 6-items from the SEQ to assess physical (3-items) and relational (3-items) victimization experiences. Children rated items on a 5-point scale (0 = "Never" to 4 = "Always"), and questions asked about specific physical (e.g., "how much do kids in your class hit you?") or relational (e.g., "how much do kids in your class tell you that you can't play with them?") incidents. For the current study, estimates of internal consistency, measured by Cronbach's alphas, for each subscale were acceptable (Physical T1 $\alpha = .67$; Relational T1 $\alpha = .69$). Teachers also rated children's peer victimization via three items on a parallel 5-point scale (e.g., "How much is this student hit, pushed, or kicked by other students?"; 0 = "Never" to 4 = "Always"). Items were averaged together to create a single composite score representing teacher-reported victimization. The scale had good internal consistency in the current study ($\alpha = .86$).

Finally, peer-rated victimization was also obtained using a modified version of the Revised Class Play (RCP; Masten, et al., 1995) in which peers nominated children who they perceive as often experiencing peer victimization. The RCP asks children to imagine they are directing a play and have to nominate three classmates who could best fit parts in the play, which correspond to various social roles. Peer victimization subtypes included physical ("Which kids can play the part of someone who gets pushed, hit, or kicked by other kids?"), verbal ("Which kids can play the part of someone who gets teased, called mean names, or told hurtful things by other kids?"), and relational ("Which kids can play the part of someone who is told they can't play with other kids, has mean things and lies said about them, or isn't invited to things just to get back at them?"). Scores for each subtype were averaged to create a single peer-report score of victimization.

Teacher-Reported Prosocial Behavior, Attention/Concentration, and Disruptive Behaviors

Teachers rated children's prosocial behaviors, attention/concentration, and disruptive behaviors using an abbreviated Teacher's Observation of Classroom Adaptation (TOCA; Kellam et al., 1975) measure. The TOCA was originally created as a structured interview for teacher to assess general adaptability of students to a classroom context (for review of measure history see: Koth et al., 2009). The TOCA has been adapted to a shorter 24-item checklist (i.e., TOCA-C; Koth et al., 2009) that can be used as a teacher-report measure of children's concentration, aggressive/disruptive, and prosocial behaviors in the classroom. The TOCA-C has been used extensively in research, and studies demonstrate it has a stable and consistent factor structure, good internal consistency, and correlates with the original TOCA interview (Bradshaw, 2015; Koth et al., 2009; Kourkounasiou et al., 2014). The current study uses an abbreviated 6-item TOCA with two items loading on respective subscales. Items, including prosocial, (e.g., "Has

many friends") attention/concentration, (e.g., "Completes assignments") and disruptive behaviors (e.g., "Breaks rules") are rated on a 6-point scale (1 = "Never" to 6 = "Almost Always"). Internal consistency, measured by Cronbach's alpha, was good for prosocial, T1 $\alpha = .88$ and attention, T1 $\alpha = .92$ subscales and acceptable for the disruptive, T1 $\alpha = .76$ subscale.

Bullying

Children's bullying behaviors were assessed via the adapted version of the School Experiences Questionnaire (SEQ; Elledge et al., 2010; Kochenderfer-Ladd, 2004). Consistent with past studies (e.g., Mapes et al., 2020) three SEQ items were used to assess children's bullying behaviors (e.g., "How much do you hit, or push, or kick other kids in your class?"). Items were rated on a 5-point scale (0 = "Never" to 4 = "Always") and Cronbach's alphas were acceptable across timepoints, T1 $\alpha = .63$, T2 $\alpha = .64$, and T3 $\alpha = .65$. Bullying behaviors were also assessed via peer-report by again using the modified version of the Revised Class Play (RCP; Masten, et al., 1995) in which peers nominated, using an unlimited nominations procedure, children who bully others using a single-item (e.g., "Which kids can play the part of someone who hits other kids, teases other kids, or tells other kids they can't play with them?").

Results

Data Analytic Plan

Primary analyses and models were run using Mplus version 8.7 (Muthén & Muthén, 1998-2020). Class extraction occurred for one, two, three, four, and five class solutions. For all class model, the three types of peer nominations (i.e., reciprocated, received, and sent) were entered as continuous class indicators. All models controlled for child gender and age as well as data clustering by classroom. Relative fit indices for overall models included were Aikaike Information Criterion (AIC; Akaike, 1987), Bayesian Information Criterion (BIC; Schwarz,

1978), and Sample-Size Adjusted BIC (SSA-BIC; Sclove, 1987). These fit criteria have a lower bound of 0 and no upper bound. Better model fit is indicated as AIC, BIC, and SSA-BIC decrease across models. Further, some recent empirical evidence suggests BIC is the most reliable relative fit index (Nylund et al., 2007). One significance test, the Lo-Mendell-Rubin test (LMR; Lo et al., 2001) was also used to assess relative model fit, with $p < .05$ denoting significantly better model fit compared to the previous class model. Finally, entropy and model problems were both used to assess absolute model fit. Entropy is an overall measure of within-class homogeneity and between-class heterogeneity which ranges from 0 to 1.00 with one indicating perfect class separation. The current study used a cut-off of .80 indicating acceptable entropy and previous work has stated that entropy values "approaching one" signify better model fit (Celeux & Soromenho, 1996; Tein et al., 2013). Model problems assessed in all class solutions included failure to replicate the best loglikelihood, model termination problems, and convergence problems. Number and percentage of children in each class and average probabilities of latent class membership for each latent class were also assessed and reported for all class solutions.

Concurrent and distal outcomes were examined in the best fitting class solution using the three step BCH method, consistent with recent recommendations for using mixture modeling in Mplus (Asparouhov and Muthen, 2021). The current study used the "automatic" BCH approach in Mplus which uses the statistical approach described in Bakk and Vermunt (2016) to estimate differences across class means. The BCH method uses a weighted multiple group analyses where weights correspond to the measurement error in the latent class variable and groups correspond to the latent classes. Unlike other methods (e.g., 3-step approach by Vermunt, 2010), this method allows classes to be fixed and therefore prevents the possibility of a substantial shift in the

previously estimated LPA measurement model which other methods of estimation are suspectable to (Asparouhov & Muthen, 2020). Results of individual class contrasts were reported in cases where the overall chi-square test was significant.

Missing Data and Preliminary Analyses

Due to the longitudinal design and large sample size of the current study, some missingness, primarily due to participant attrition, was expected. Although a definitive percentage of missing data that warrants further examination of missingness patterns has not been identified in the literature, research suggest that less than or between 5-10% is a small percentage of missing data that is unlikely to lead to biased results (Bennett, 2001; Schaefer, 1999). Therefore, the current study used a cut-off of 10% missingness, where greater than 10% would indicate the need for further examination of missingness patterns. Overall, only Time 3 peer- and teacher-reported bullying was missing at a rate greater than 5%. Specifically, across all study variables and timepoints, percent of missingness ranged from 0.3% (n = 3) to 7.9% (n = 52). With regards to attrition, average missingness across time 1 study variables was 1.91%, for Time 2 average missingness was 2.81%, and, for Time 3, average missingness was 5.09%, suggesting that, as expected, a large amount of missingness was due to attrition between study timepoints.

Preliminary analyses were conducted with SPSS Statistics version 27. Composite mean scores were created for all study variables when participants had greater than half of scale items completed. Research suggests outliers may bias the results of LPA class extraction and can lead to profiles characterized by extreme outliers with very few cases (Spurk et al., 2020). Therefore, consistent with recent recommendations for LPA procedures (Hirschi & Valero, 2017; Spurk et al., 2020), the current study identified outliers, identified as responses 2 standard deviations

above or below the mean, on LPA indicator variables (i.e., reciprocated, received, and sent peer nominations) and these scores were recoded to take on the next largest value in the distribution. Percentage of recoded values was low, between 3-5%, which is consistent with other empirical studies utilizing LPA as their primary data analytic strategy (e.g., Vannucci et al., 2013). Table 1 provides descriptive statistics for all study variables as well as correlations among key study variables. All study variables were examined for univariate normality indicated by skew and kurtosis. Consistent with structural equation modeling (SEM) literature recommendations, cutoffs of 2 and 7 were used for skewness and kurtosis, respectively (e.g., West et al., 1995). Using this cutoff, one variable, child-reported bullying at Time 1, had unacceptable levels of skew and kurtosis. To accommodate elevated skew and kurtosis, particularly in bullying at Time 1, maximum likelihood with robust standard errors (MLR) was used as an estimator which past work suggests is an effective way of handling both univariate and multivariate non-normality in data within an SEM framework, particularly in medium to large samples (Curran et al., 1996; Finney & Stefano, 2013; West et al., 1995).

Due to the clustered nature of the data (i.e., students nested within classrooms) ICCs and design effects were investigated to determine if there was a need to control for classroom level effects. ICCs ranged between .026 and .265 indicating that between 2.6% and 26.5% of the variability was explained by classroom level effects. Design effects, which suggest values greater than 2 indicate a need for controlling higher-level effects (see guidelines provided by L. Muthen, http://www.statmodel.com/discussion/messages/12/18.html), were between 1.48 and 5.87. Therefore, ICCs and design effects suggested significant amounts of variability were explained by the nested structure of the data, and, consequently, standard errors and fit statistics were

adjusted to account for classroom level clustering using the complex mixture type and cluster function in Mplus (Muthén & Muthén, 1998-2020).

Primary Analyses

LPA Model and Class Enumeration (Aim 1)

In line with study Aim 1, an LPA was conducted to determine if multiple classes characterized by high levels of one nomination type and low levels of the other nomination types would emerge (H1). Fit indices for all five LPA models are presented in Table 2. AIC and SSA-BIC decreased continuously across model solutions indicating best fit for the 5-class solution. However, BIC decreased continuously across model solutions until the 5-class solution where it increased, indicating best fit for the 4-class solution. The LMR test indicated significant improvements in fit from 1-class to 2-classes, 2-classes to 3-classes, and 3-classes to 4-classes. LMR was not significant and therefore did not indicate better model fit from 4- to 5-classes. Entropy was poor for the 2-class solution and acceptable for the 3-, 4-, and 5-class solution. Finally, model problems, including failure to replicate the best loglikelihood and convergence problems, occurred for the 5-class solution only. Taken together, two out of four relative fit statistics suggested the 4-class solution as the best fitting model. Further, entropy and model problems (the two measures of absolute model fit) were both acceptable for the 4-class solution. Therefore, the 4-class solution was retained as the best fitting class solution and utilized in subsequent analyses.

Profiles of class indicator means for the 4-class solution are displayed in Figure 1. The four classes were significantly distinguished by all nomination types. Class 3 was labeled "Average" in that children had similar numbers of reciprocated, received, and sent nominations. This class was also the largest class in the solution (52.16%). Class 4, the second largest class

(23.04%), was characterized by relatively high numbers of reciprocated and received nominations and relatively low sent nominations. Therefore, Class 4 was labelled "High Reciprocated/Low Sent" (HRP/LS). Class 2's profile, which appears to be opposite of Class 4's profile, was labeled "Low Reciprocated/High Sent" (LRP/HS) and was characterized by low reciprocated and received nominations and high sent nominations. Finally, Class 1, the smallest class (7.68%), was characterized by high levels of *both* reciprocated and sent nominations, along with low received nominations. This class was labelled "High Reciprocated/High Sent (HRP/HS).

Examination of Concurrent Adjustment Variables for 4-Class Solution (Aim 2)

Consistent with Aim 2, the BCH procedure was used to investigate class differences on adjustment variables including internalizing symptoms, peer victimization experiences, prosocial behaviors, attention and concentration, and disruptive behaviors (H2a, H2b, and H3c). Classes were also examined for differences on demographic variables including age, gender, and ethnicity as well as differences on class indicator variables (i.e., peer nomination variables). Table 3 presents equality tests of means for concurrent and distal outcomes using the extracted 4-class solution. Classes were significantly distinguished on all class indicators. For reciprocated nominations, the HPR/LS class had the highest amount followed by the HPR/HS class, Average class, and LPR/HS class respectively. All contrasts for reciprocated nominations were significant except for the HPR/LS and HPR/HS classes who were not significantly distinguished by their reciprocated nominations. For received nominations, ordering of classes from highest to lowest was HPR/LS, Average, LPR/HS, HPR/HS. The only non-significant contrast was between the HPR/HS and LPR/HS classes who had similarly low numbers of received nominations. All class

contrasts between sent nominations were significant with highest to lowest class ordering of HPR/HS, LPR/HS, Average, HPR/LS.

Classes were compared on demographic factors (i.e., gender, ethnicity, and age) and concurrent outcomes to examine significant differences among the four groups. Significant demographic differences emerged for gender only with the HRP/LS class having significantly more girls compared to the Average, $\chi^2(3) = 8.95$, $p = .003$, and LRP/HS classes, $\chi^2(3) = 7.92$, $p = .005$. Groups differed significantly on measures of depression, self-reported physical peer victimization, peer-, and teacher-reported peer victimization, teacher-reported prosocial behavior, and teacher-reported attention/concentration. For depression, individual class contrasts indicated that children in the HRP/LS class reported significantly less depression symptoms than children in the Average, $\chi^2(3) = 7.89$, $p = .005$, and LRP/HS classes, $\chi^2(3) = 15.40$, $p < .001$. In addition, children in the LRP/HS class reported significantly more depression symptoms than children in the Average class, $\chi^2(3) = 8.95$, $p = .046$. For self-reported physical victimization, individual class contrasts indicated that children in the HRP/LS class reported significantly less victimization than children in the Average, $\chi^2(3) = 3.84$, $p = .050$, and LRP/HS classes, $\chi^2(3) = 5.52$, $p = .019$. Individual class contrasts also indicated that both peers and teachers respectively rated children in the HRP/LS class as experiencing significantly less peer victimization compared to the Average, $\chi^2(3) = 13.79$, $p < .001$ and $\chi^2(3) = 5.14$, $p = .023$, and LRP/HS classes, $\chi^2(3) = 20.23$, $p < .001$ and $\chi^2(3) = 8.85$, $p = .003$, and rated the HRP/HS class as experiencing significantly less peer victimization compared to children in the LRP/HS class, $\chi^2(3) = 6.32$, $p = .012$ and $\chi^2(3) = 5.83$, $p = .016$. Teachers rated children in the LRP/HS group as significantly less prosocial than all other groups, including the Average, $\chi^2(3) = 11.87$, $p = .001$, HRP/HS, $\chi^2(3) = 19.49$, $p < .001$, and HRP/LS classes, $\chi^2(3) = 30.11$, $p < .001$. Teachers also

rated children in the HRP/LS class as significantly more prosocial than children in the Average class, $\chi^2(3) = 14.73$, $p < .001$. Teachers' ratings of attention/concentration mirrored their ratings on prosocial behavior in that they again rated children in the LRP/HS group significantly lower on attention/concentration than all other groups, including Average, $\chi^2(3) = 7.33$, $p = .007$, HRP/HS, $\chi^2(3) = 10.41$, $p = .001$, and HRP/LS classes, $\chi^2(3) = 33.66$, $p < .001$. Also mirroring their prosocial ratings, teachers rated children in the HRP/LS class significantly higher on attention/concentration than children in the Average class, $\chi^2(3) = 20.32$, $p < .001$.

Examination of Concurrent and Prospective Bullying for 4-Class Solution (Aim 3)

Finally, in line with Aim 3, I tested for significant differences in children's concurrent and prospective self- and peer- rated bullying behavior (H3a, H3b, and H3c). Regarding self-rated bullying behavior, there were no significant differences on concurrent or prospective bullying behavior. For concurrent peer-reported bullying behavior, individual contrasts indicated that children in the HRP/LS group were rated by peers as displaying significantly lower levels of bullying behavior compared to children in all other classes including the Average, $\chi^2(3) = 8.24$, $p = .004$, HRP/HS, $\chi^2(3) = 7.49$, $p = .006$, and LRP/HS classes, $\chi^2(3) = 6.94$, $p = .008$. Prospectively at Time 2, children in the HRP/LS group were rated by peers as displaying significantly lower levels of bullying behavior compared to children in the LRP/HS, $\chi^2(3) = 9.55$, $p = .002$, and Average classes, $\chi^2(3) = 7.43$, $p = .006$, only. At Time 3, no significant differences among classes on peer-reported bullying behaviors emerged.

Discussion

In this study, I used children's positive peer nominations to identify meaningful subgroups of children who could be distinguished by social adjustment and bullying variables (van der Ploeg et al., 2019). These children are thought to be socially skilled bullies who persist

both in high-status and negative social behavior over time. I used LPA to classify children into distinct classes based on their positive peer nominations (Aim 1) and examined the concurrent and prospective utility of these classes (Aim 2), particularly with respect to bullying behavior over time (Aim 3).

LPA results suggested a 4-class solution as the best fitting model with classes distinguished by all three peer nomination scores (i.e., reciprocated, received, and sent). Classes were named for their co-occurring reciprocated and sent nomination patterns: High Reciprocated/High Sent (HRP/HS), High Reciprocated/Low Sent (HRP/LS), Low Reciprocated/High Sent class (LRP/HS), and Average, a class whose children had relatively similar levels for all three nomination types. I had hypothesized (H#1) that at least two distinct classes would emerge, characterized by relatively high numbers of one type and relatively low numbers of the other two types. Although four classes were identified, configurations were different from hypothesized groups. Specifically, only the LRP/HS group had relatively high levels of sent nominations and relatively low levels of reciprocated and received nominations. Conversely, whereas reciprocated and received nominations were high in some classes, (e.g., HRP/HS) they were never the only high type of peer nomination in any class. That is, reciprocated or received nominations, when relatively high, always co-occurred with another nomination type that was also high (e.g., LRP/HS).

Emergence of both the HRP/LS and LRP/HS classes is consistent with recent literature that conceptualizes reciprocated and received nominations as protective factors or social resources that tend to co-occur, which makes them distinct from sent nominations, which were conceptualized in the current study as a potential social risk factor. In line with this risk/protection framework, Scholte and colleagues (2009) found that children who were

classified as non-victimized had higher number of both reciprocated and received nominations compared to victimized children, suggesting these nomination types are associated with less exposure to negative peer interactions. Conversely, for sent nominations, Echols and colleagues (2013) found that when a focal child sent nominations to children whose victimization increased over the course of the academic year, that child's risk for victimization also increased. However, the reverse was not true: A focal child's level of victimization did not decrease when the recipients of their sent nominations' experienced decreased peer victimization. Echols and colleagues' findings suggest that sent nominations may carry social risk in the form of linked increases in victimization but not social reward in the form of linked decreases in victimization. Overall, for the HRP/LS and LRP/HS classes, profiles align with a conceptualization in which reciprocated and received nominations are protective social factors that co-occur and sent nominations are a marker of social risk that is inversely related to reciprocated and received nominations.

Interestingly, for the remaining class (i.e., HRP/HS), the risk/protection framework does not hold. Instead, the HRP/HS class had high levels of both reciprocated and sent nominations and low levels of received nominations. This was the smallest class that emerged, so its status as a distinct group awaits replication in future samples. One possible interpretation of the HRP/HS class is that sent nominations function as *either* a risk or protective factor in certain contexts. For example, this group may represent a small group of children who are prosocial and agreeable and thus report liking many of their classmates, who, in turn, report liking them in return. This explanation aligns with a body of empirical research linking peer liking with children having high levels of prosocial behavior (Caputi et al., 2012; Ettekal & Mohammadi, 2020; Wang et al., 2019) and low levels of aggressive behavior (Arslan, 2021; Wang et al., 2019). There were also

several class patterns that did not emerge in this study that may have been expected. For example, no class emerged with low nominations on each type, which might represent children who are disengaged or socially withdrawn. One possible explanation for the lack of a class low on reciprocated, received, and sent nominations is that classes in this study were derived from data gathered at a single time point at the start of the school year; therefore, the current methodology cannot capture social processes or transitions among classes over time. For instance, it is possible that children in the LRP/HS class could, over time, pull back from sending high numbers of positive nominations if their low peer status were to persist and they became more attuned to their lack of peer acceptance. Future work perhaps involving latent growth analysis can be used to examine patterns of nominations and distinct classes that emerge overtime. Data from this study also does not address children's intentions or motives behind their sent nominations; therefore, future work should consider ways to examine the conditions under which high levels of sent nominations reflect a strong prosocial demeanor or a strong but non-reciprocated desire to be liked my many peers.

Consistent with study Aim 2, I next investigated differences among the four latent classes on children's demographic variables and their level of various social behaviors. Classes differed significantly as a function of gender composition with the HRP/LS group having more girls compared to the Average and LRP/HS group. This finding is consistent with a large body of literature that finds girls tend to have more reciprocated social ties compared to boys (Lee et al., 2007) as well as higher quality relationships and friendships (Malcolm et al., 2006; for review: Rose and Rudolph, 2011). As the HRP/LS class was also more prosocial compared to other classes, this gender difference is also consistent with research indicating that girls are more likely to engage in prosocial and helpful behavior compared to boys (Rose & Rudolph, 2011). Classes

were not significantly differentiated by age or by ethnicity (Hispanic/Latino/a/x vs. non-Hispanic). Although ethnicity in this study did not significantly differ across classes, a large body of research suggests demographic characteristics, including race and ethnicity, play a role in social process and peer relationships (e.g., Kogachi & Graham, 2021). Future research that examines race and ethnicity at variables levels is needed. For example, aside from considering individual demographic characteristics, peer relations studies that examine same- or cross-race and ethnicity dyadic relationships and group level race/ethnicity composition of schools and communities is a promising area of future research (Kogachi & Graham, 2021). Given that peer nominations are in part a dyadic process, it would be especially important for future research to examine race, ethnicity, and other demographic characteristics in the context of positive peer nominations data.

The HRP/LS class was associated with the most positive social outcomes. This offers support for my hypothesis that children in classes characterized by high reciprocated nominations would be the most well-adjusted (H2a), although of note this class was also characterized by high received nominations. Outcomes for children in the HRP/LS group indicated better adjustment across self-, peer- and teacher- report measures, including less depressed, less victimized, more prosocial, and more attentive in class, compared to the LRP/HS group. Findings regarding the HRP/LS class are in line with a large body of literature suggesting reciprocated peer nominations are associated with several positive outcomes that signal positive adjustment, including greater social skills and higher sense of self-worth (Bagwell et al., 1998; Schwartz et al., 2000). Positive peer contexts, such as those involving reciprocated social ties, also provide children with opportunities to enhance skills related to emotion regulation, prosocial/helping, and leadership (Rivizziago et al., 2018). Conversely, and again consistent with

study hypotheses regarding sent nominations as a marker for social risk, the LRP/HS class appeared to be the least well-adjusted class including higher levels of self-, peer-, and teacher-reported peer victimization compared to children in the HRP/LS and HRP/HS classes (H2c). While less is known regarding sent nominations, recent work does suggest these nominations confer at least indirect risk for peer victimization (Echols et al., 2013) which is in line with findings from the present study regarding the LRP/HS class. I made no hypotheses regarding a class that was high in both reciprocated and sent nominations, but children in this group also appeared to be generally well-adjusted, particularly when compared to children in the LRP/HS class. For instance, children in the HRP/HS class experienced significantly less physical peer victimization compared to children in the LRP/HS class. Finally, given that no class emerged that was characterized by high received nominations only, hypothesis 2b was no supported.

Finding from this study underscore the importance of attending to the pattern of different types of positive nominations that emerge and not simply to any individual nomination on its own. For example, high sent nominations are associated with more self-reported physical peer victimization and more peer- and teacher- reported victimization only when paired with low reciprocated and received nominations. Also, children in the HRP/HS group appeared to fare better than children in the LRP/HS group on some outcomes, but they did not appear as well-adjusted as children in the HRP/LS group. For instance, children in the HRP/LS class were generally less depressed compared to children in other classes; however, children in the HRP/HS class were not less depressed compared to any other class. Interestingly, children in the HRP/HS and HRP/LS classes were not statistically different on teacher-report measures of prosocial and attentive classroom behaviors, and teachers saw both groups as equally prosocial and attentive.

My third aim focused on examining group differences over time with regards to bullying behavior. I expected to find that classes characterized by high reciprocated nominations engaged in the least bullying behavior (H3a) and that classes characterized by high received or high sent nominations engaged in more bullying behavior relative to high reciprocated classes (H3b) with no differences in bullying between received and sent classes (H3c). For self-reported bullying behaviors, this study did not find significant differences among classes regarding either concurrent or prospective bullying behaviors. For peer-rated bullying behaviors, the HRP/LS class engaged in significantly less bullying compared to all other classes at Time 1 and significantly less bullying compared to the LRP/HS and Average class at Time 2. This finding is partially consistent with my hypothesis that classes characterized by high reciprocated nominations would be associated with less bullying behaviors (H3a); however, the HRP/LS class was also characterized by relatively high received nominations which I hypothesized would be associated with increased bullying, specifically high-status bullying. Therefore, this finding was not consistent with hypothesis 3b. There was also little support for that sent nominations were associated with increased bullying given the LRP/HS class only engaged in increased bullying relative to the HRP/LS class and no other significant class differences emerged (H3b). Findings from recent studies support the existence of a group of children who are high-status bullies (e.g., van der Ploeg, 2019), so the discrepancy with findings from the current study could be due to my use of different types of positive peer nominations to identify distinct classes. I had hypothesized that high levels of received nominations might be characteristic associated with high-status bullies, but the LPA did not yield a class characterized only by high received nominations. Therefore, I was limited in my ability to assess hypotheses that involved classes characterized by a high received nominations class (H3b and H3c). Importantly, the current study measured

elementary school children's peer preferences among their classmates, which is distinct, both theoretically and empirically, from asking students to complete a measure of *perceived popularity* (Cillessen and Mayeux, 2004; Farmer et al., 2011). Perhaps constructs like perceived popularity or social dominance are more closely linked to high status bullying than positive peer nominations (e.g., de Bruyn et al., 2010). Clearly, further work is needed if we are to understand the paradox of high-status bullies and their developmental risks (van der Ploeg et al., 2019).

Strengths and Limitations

The current study has several conceptual and methodological strengths. This is the first study to use three different types of positive peer nominations as indicators of an underlying latent class structure. Received and sent nominations, which are non-reciprocated or one-sided, are typically overlooked by researchers. Only recently have researchers begun to examine the utility of including received and sent nominations alongside counts of reciprocated nominations (e.g., Echols et al., 2013). The current study extends that work using a diverse sample of children from over 30 classrooms. Children's race and ethnicity have been linked to various aspects of their peer relationships (e.g., Kogachi & Graham, 2021) and although the current study did not find significant differences between classes in ethnicity, it is important for future work to continue to parse apart demographic and background characteristics as they relate to these social processes. Particularly important may be studies who examine ethnicity as a multifaceted construct. For instance, in the current study, the sample was majority Hispanic/Latino/a/x although the larger area of Northwest Arkansas is predominantly non-Hispanic/white. Therefore, relative to the broader community, children in these school are attending a more diverse school system. Empirical research has documented that increased diversity increases the likelihood of children selecting same-race/ethnicity friendships (e.g., McDonald et al., 2013). Therefore, one

potential future direction would be assessing positive peer nominations as a function of same- or cross- race/ethnicity dyads and examining how these patterns given school and community race and ethnicity composition.

I tested my hypotheses using mixture modeling in Mplus, which has several advantages (e.g., probabilistic group assignment) over more traditional methods for identifying meaningful subgroups such as median or mean splits (Hubbard et al., 2013). It will be important for these results to be replicated with other samples to substantiate the underlying class structure that was found in the current study. This is particularly true given that HRP/HS was less than 10% of the sample which may suggest it will be a difficult class to replicate (Nyland et al., 2007). Finally, data were drawn from a multi-informant (i.e., teacher-, peer-, and child-report) longitudinal study that allowed for asking questions about changes in children's social behavior over time.

This study also had limitations worth noting. LPA results used to identify underlying classes were derived from data gathered at single timepoint; future work should examine whether these classes are stable across time as well as the degree to which children move among groups from one time point to the next. Another limitation pertains to the age of children in this study; all participants were enrolled in the fourth grade; therefore, it will be important in future studies to examine how positive peer nominations function as indicators of socially meaningful groups at different developmental periods such as early childhood and adolescence. Second, although the current study is multi-informant, child-report makes up most information collected, and future methodologies and informant reports are needed. Especially helpful would be studies that involved direct observational methods of peer interactions or qualitative interviews with children from these identified classes. In this way, the meaning of say, high sent nominations, could be more thoroughly elucidated.

Future Directions and Clinical Implications

Identifying distinct, socially meaningful subgroups of children has important implications for developing tools for screening and for prevention of poor social adjustment. This study speaks to the importance of considering sent nominations alongside reciprocated and/or received nominations, which have been more commonly used to index either children's friendships or social preference scores (e.g., Coie et al., 1982; Hartup, 1996). While more research is needed to replicate these classes and to examine their stability over time, it may be that researchers and clinicians should also seek to include sent nominations to find children most at risk for poor adjustment and outcomes. Future work should also seek to examine potential mechanisms or reasons why children who send high amounts of liking nominations and who receive few liking nominations (i.e., children in the LRP/HS class) appear to be at risk for poorer overall adjustment. One possibility is this combination of positive peer nominations signals a child who does not have good awareness of their social standing within the peer group. That is, children in the LRP/HS may be at risk due to their lack of nominating peers who reciprocally liked them back. Future work may wish to examine children's awareness of their social standing and its relationship with reciprocated, received, and sent positive peer nominations. Another possible explanation for poorer adjustment of children in the LRP/HS class is that these children are at risk due to their tendency to indiscriminately approach or interact with peers. It is possible that children who are the most successful in social situations are those who tend to be selective about children they interact with and befriend. This perspective is in line with work highlighting the importance of friendship selection and subsequent influence processes on social behaviors over time (Veenstra et al., 2013). Future work should continue to investigate how children's selection and maintenance of social ties is associated with their social behaviors and adjustment.

In sum, this study investigated how reciprocated and non-reciprocated positive peer nominations can be used to identify socially meaningfully subgroups of children. Although children in groups characterized by high reciprocated and/or received nominations seemed to exhibit positive adjustment including relatively high levels of prosocial behavior, low levels of depression symptoms, and decreased peer-reported bullying, children in groups characterized by high sent nominations appeared to be functioning less well, including having higher levels of physical peer victimization and depressive symptoms. These findings provide initial support for conceptualizing one-sided sent nominations as a risk factor associated with negative social outcomes.

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Tables and Figures

Table 1.

Descriptive Statistics and Bivariate Correlations Among Study Variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.
1. Recip Nom	-																	
2. Receiv Nom	.14**	-																
3. Sent Nom	-.46**	-.25**	-															
4. Dep CR	-.15**	-.01	.14**	-														
5. Anxiety CR	-.09	-.01	.09*	.67**	-													
6. Phys Vict CR	-.12**	-.01	.09*	.43**	.37**	-												
7. Rel Vict CR	-.11**	<.01	.07	.43**	.40**	.52**	-											
8. Peer Vict PR	-.07	-.03	.05	.08*	.05	.01	-.03	-										
9. Peer Vict TR	-.17**	-.11	.08*	.15**	.10*	.14**	.21**	.29**	-									
10. Bul CR T1	-.10**	-.10*	-.09*	.20**	.11**	.34**	.27**	-.02	.17**	-								
11. Bul CR T2	-.06	-.01	.06	.20**	.19**	.23**	.28**	-.03	.17**	.40**	-							
12. Bul CR T3	-.06	.02	.09*	.20**	.13**	.25**	.26**	-.04	.19**	.42**	.46**	-						
13. Bul PR T1	-.07	-.10*	-.12**	.13**	.11**	.22**	.16**	.18**	.20**	.22**	.14**	.21**	-					
14. Bul PR T2	-.12**	-.05	.07	.09*	.07	.15**	.12**	-.05	.20**	.26**	.14**	.22**	.51**	-				
15. Bul PR T3	-.02	-.03	.06	.02	.03	.13**	.06	-.04	.15**	.23**	.13**	.19**	.18**	.55**	-			
16. Pro Bx TR	.32**	.20**	-.18**	-.26**	-.16**	-.18**	-.16**	-.04	-.47**	-.12**	-.11**	-.16**	-.14**	-.14**	-.08	-		
17. Att/Con TR	.30**	.16**	-.17**	-.23**	-.10**	-.21**	-.18**	-.04	-.40**	-.17**	-.11**	-.16**	-.24**	-.21**	-.14**	.63**	-	
18. Dis Bx TR	-.15**	-.08	.07	.17**	.12**	.16**	.21**	.02	.58**	.21**	.17**	.23**	.36**	.38**	.30**	-.38**	-.47**	-
M	1.83	1.69	1.67	0.82	1.16	0.61	1.04	2.90	0.69	0.44	2.67	4.69	2.87	2.83	2.76	4.69	4.76	1.87
SD	1.17	1.29	1.22	0.57	0.78	0.77	0.96	1.52	0.65	0.60	0.82	0.99	2.20	2.22	2.42	0.99	1.17	0.87
Range	0-4	0-4	0-4	0-3	0-3	0-4	0-4	0-8	0-3	0-4	0-4	0-6	0-12	0-13	0-13	0-6	0-6	0-5.50

Note. Recip Nom = Reciprocated Peer Nominations; Receiv Nom = Received Peer Nominations; Sent Nom = Sent Peer Nominations; Dep = Depression; Phys Vict = Physical Peer Victimization; Rel Vict = Relational Peer Victimization; Peer Vict = Peer Victimization; Bul = Bullying; Pro Bx = Prosocial Behavior; Att/Con = Attention/Concentration; Dis Bx = Disruptive Behavior; CR = Child Report; PR = Peer Report; TR = Teacher Report; T1 = Time 1; T2 = Time 2; T3 = Time 3; Gender coded as girl = 2, boy = 1; *p < .05, **p < .01, ***p < .001

Table 2

Information Criteria for Model Fit, Model Comparisons, and Average Class Probabilities

Fit statistics	1 Class	2 Class	3 Class	4 Class	5 Class
AIC	6105.14	5869.09	5756.97	5652.55	5637.16
BIC	6131.78	5917.91	5827.97	5745.71	5752.55
SSA-BIC	6112.73	5882.98	5777.17	5679.07	5670.00
Entropy	-	.73	.86	.84	.86
LMR test	-	-3042.18	-2923.55	-2862.48	-2805.27
LMR *p*-value	-	<.001	<.001	<.001	.569
Model Problems	No	No	No	No	Yes
Latent Class Probabilities for Most Likely Class Membership (Row) by Latent Class (Column)					
Two-class model					
1. *n*=313 (50.01%)	0.925	0.075			
2. *n*=312 (49.92%)	0.060	0.940			
Three-class model					
1. *n*=313 (50.01%)	0.954	0.041	0.005		
2. *n*=268 (42.89%)	0.042	0.949	0.009		
3. *n*=44 (7.04%)	0.008	0.130	0.862		
Four-class model					
1. *n*=48 (7.68%)	0.907	0.071	0.022	0.000	
2. *n*=107 (17.12%)	0.002	0.955	0.044	0.000	
3. *n*=326 (52.16%)	0.009	0.041	0.896	0.054	
4. *n*=144 (23.04%)	0.007	0.000	0.039	0.954	
Five-class model					
1. *n*=10 (1.60%)	0.873	0.112	0.015	0.000	0.000
2. *n*=244 (39.04%)	0.000	0.931	0.060	0.000	0.010
3. *n*=189 (30.02%)	0.011	0.025	0.925	0.031	0.008
4. *n*=137 (21.92%)	0.000	0.000	0.082	0.911	0.008
5. *n*=45 (7.20%)	0.000	0.046	0.002	0.000	0.952

Note. AIC = Aikaike Information Criterion; BIC = Bayesian Information Criterion; SSA-BIC = Sample-Size Adjusted BIC; LMR= Lo-Mendell-Rubin test; BLRT = Bootstrap Likelihood Ratio Test. n = number of children in class (percentage). Child gender controlled for in all models.

Figure 1

4-Class Solution Latent Profile Class Indicator Means

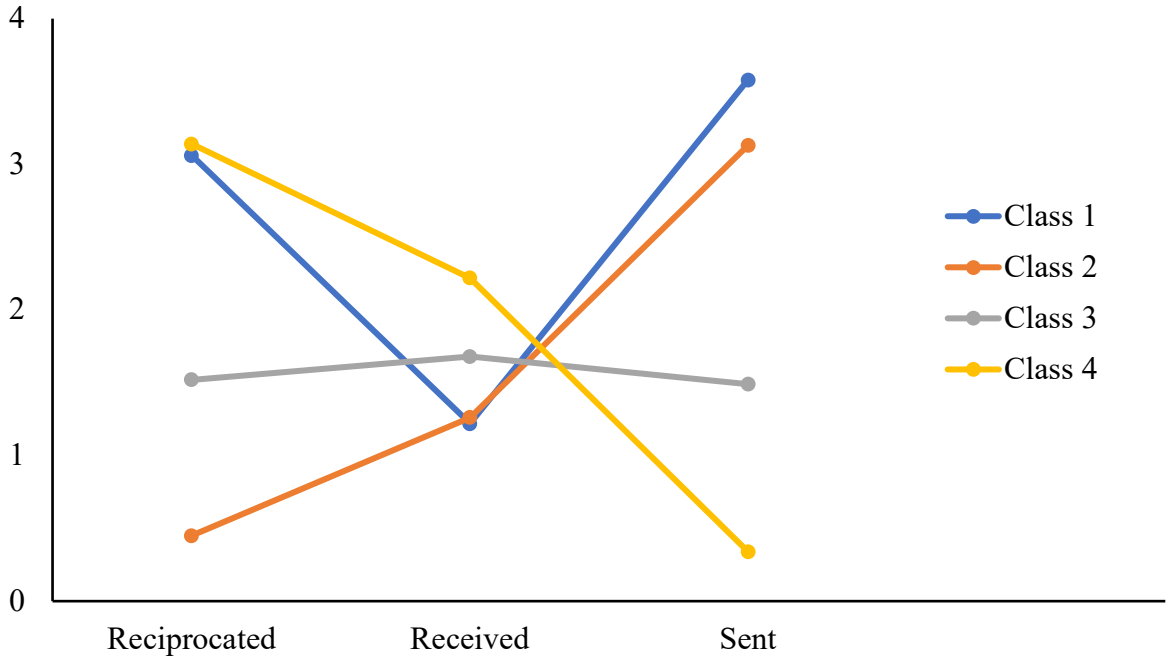

Table 3

Equality Tests of Means Across 4-Class Solution Using the BCH Procedure

Model Var Construct	Class 1 *M* (*SE*)	Class 2 *M* (*SE*)	Class 3 *M* (*SE*)	Class 4 *M* (*SE*)	X^2	Significant Class Contrasts
Class Ind						
Recip Nom	3.06 (.17)	0.45 (.07)	1.52 (.05)	3.14 (.08)	1290.75***	2 < 1, 3, 4 & 3 < 1, 4
Receiv Nom	1.22 (.16)	1.26 (.11)	1.68 (.08)	2.22 (.11)	54.17***	4 > 3, 2, 1 & 3 > 2, 1
Sent Nom	3.58 (.10)	3.13 (.09)	1.49 (.05)	0.34 (.05)	1692.47***	All
Covariate						
Gender	-	-	-	-	9.92*	4 > 3, 2
T1 Outcomes						
Age	9.32 (.06)	9.27 (.06)	9.33 (.05)	9.28 (.04)	1.14	-
Ethnicity	1.52 (.09)	1.33 (.05)	1.40 (.04)	1.47 (.06)	6.77	-
Dep CR	0.83 (.13)	0.96 (.06)	0.84 (.05)	0.66 (.05)	17.02**	2 > 4 < 3 & 2 > 3
Anxiety CR	1.21 (.14)	1.26 (.06)	1.17 (.06)	1.05 (.07)	5.83	-
Phys Vict CR	0.48 (.13)	0.79 (.12)	0.65 (.05)	0.45 (.09)	9.57*	4 < 3, 2 & 2 > 1
Rel Vict CR	0.93 (.16)	1.20 (.11)	1.03 (.05)	0.88 (.10)	6.57	-
Peer Vict TR	0.58 (.11)	0.86 (.10)	0.69 (.09)	0.55 (.09)	13.27**	4 < 3, 2 & 1 < 2
Peer Vict PR	2.68 (.20)	3.38 (.17)	2.98 (.09)	2.43 (.10)	26.91**	4 < 3, 2 & 1 < 2
Bul CR T1	0.26 (.07)	0.39 (.07)	0.28 (.03)	0.22 (.04)	4.98	-
Bul PR T1	3.53 (.40)	3.03 (.18)	2.96 (.11)	2.33 (.15)	15.11**	4 < 3, 2, 1
Pro Bx TR	4.92 (.16)	4.14 (.14)	4.63 (.12)	5.13 (.11)	36.90***	2 < 1, 3, 4 & 3 < 1, 4
Att/Con TR	5.02 (.21)	4.27 (.15)	4.65 (.11)	5.32 (.12)	37.63***	2 < 1, 3, 4 & 3 < 1, 4
Dis Bx TR	1.82 (.14)	2.06 (.16)	1.83 (.09)	1.76 (.10)	4.70	-
Dis Outcomes						

Table 3 (Cont.)

Bul CR T2	0.38 (.08)	0.39 (.05)	0.36 (.05)	0.28 (.04)	3.39	-
Bul CR T3	0.55 (.12)	0.50 (.06)	0.44 (.05)	0.33 (.05)	7.07	-
Bul PR T2	3.04 (.43)	3.17 (.23)	2.94 (.14)	2.29 (.16)	14.66**	4 < 2, 3
Bul PR T3	3.52 (.52)	2.92 (.26)	2.74 (.16)	2.45 (.17)	4.85	-

Note. CR = Child Report; TR = Teacher Report; T2 = Time 2; T3 = Time 3; SE = Standard Error; Significant class contrasts are only displayed in cases where the omnibus X^2 is significant; Gender coded as girl = 1, boy = 2; *$p < .05$, **$p < .01$, ***$p < .001$