



Master's thesis

**Broadening the range of research:  
 Links between bullying and ethnicity in Philippine classrooms**

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### **Abstract**

This study investigated the association between bullying and ethnicity in classrooms in a yet uninvestigated context, the Philippines. Two links between bullying and ethnicity have been studied: the prevalence of cross- and same-ethnic bullying and the prevalence of victims and bullies across ethnic groups. This study analyzed self- and peer-reported data on 424 Philippine children using a dyadic social network approach. Descriptive and social network analyses showed that overall, same- and cross-ethnic bullying were equally common. Children from the societal majority ethnic group were, however, more likely to report same-ethnic bullying, whereas children from societal minority ethnic groups were more likely to report cross-ethnic bullying. In addition, it was found that societal minority ethnic children were more likely to be victims than societal majority ethnic children, whereas no difference was found in the prevalence of bullies across ethnic groups. By investigating the association between bullying and ethnicity in a new and completely different context, this study was able to contribute to the existing body of knowledge and to provide useful insights for future research.

## **Introduction**

The association between bullying and ethnicity has already been subject to investigation in several studies (e.g. Hanish & Guerra, 2000; Eslea & Mukhtar, 2000; Tolsma, Van Deurzen, Stark & Veenstra, 2013). Nevertheless, a recent meta-analysis showed that overall patterns of findings on the link between bullying and ethnicity are mixed (Vitoroulis & Vaillancourt, 2015). Some studies found an association between bullying and ethnicity, whereas others did not. Despite recognition that the context of study is likely to be influential and that variation in findings may be explained by cultural and political differences (Durkin, Hunter, Levin, Bergin, Heim & Howe, 2012; Schumann, Craig & Rosu, 2013; Verkuyten & Zaremba, 2005), the range of contexts in which the association between bullying and ethnicity has been investigated is limited. So far, not much is known about the association between bullying and ethnicity in contexts with deeply rooted interethnic tensions and negative interethnic perceptions. The current study adds to the understanding of the association between bullying and ethnicity by investigating this association in a yet uninvestigated context, the Philippines.

Self- and peer-reported data on 424 children in 9 Philippine classrooms were used to investigate the relative prevalence of cross-ethnic and same-ethnic bullying and to investigate the prevalence of bullies and victims across ethnicities. The association between bullying and ethnicity was investigated using a dyadic approach: Who bullies whom? This approach makes it possible to investigate bullying relationships with both dyadic (e.g. whether the bully and the victim are from the same ethnic group) and individual characteristics (e.g. ethnicity of the bully or victim). In addition, this study acknowledged that children are not only arranged in dyads, but may also form triads and more complicated group structures. This study contributes to existing research on the association between bullying and ethnicity by analyzing the data using Exponential Random Graph Models (Robins, Pattison, Kalish & Lusher, 2007), a model to examine complete social networks and take these higher order structures into account.

## **The Philippines**

This study investigates a specific area of the Philippines, namely Mindanao. Mindanao is the second largest and most southern island of the Philippines. As of the 2010 census, the island has over 20 million inhabitants. It is the most culturally diverse island of the Philippines, with people of different languages, tribes, and ethnicities living together. Mindanao is not only the poorest region of the Philippines, but also a conflict area (Hauser, 2010; Rodil, 1994; Reese & Werning, 2013). Statistics show that between 2011 and 2013, 862 persons died, 973 persons were wounded, and 22,433 families were displaced due to conflicts in the area (BCMS, 2014). The roots of the conflicts lie in land issues but have often resulted in conflicts between different ethnic groups (Vellema, Borrás & Jara, 2011).

Mindanao is home to many different ethnic groups which can roughly be categorized in three groups according to their religion and origin: Muslim (often referred to as Moro), Indigenous People (IP, also referred to as Lumad), and Christian. The original inhabitants of Mindanao are the Moro, consisting of 13 different ethnic groups, and the IP, consisting of 18 different ethnic groups (Rodil, 1994). Initially, Moro and IP populations owned the entire land of Mindanao. However, due to land possession, started in American colonial times, and national resettlement from poorer areas in central Philippines, they now possess less than 15 percent of the land of Mindanao. The colonization by the Spanish and Americans has led to several independence wars, carried out by Moro groups. The marginalization and discrimination of the Moro and IP populations has resulted in tensions and armed conflicts between these groups and the Christian settlers. At present, there is a Peace Agreement between one of the Moro groups and the Philippine national government, that would result in an autonomous region with its own basic law. There are, however, some fractions that do not agree with this proposal and continue the fight.

The situation of conflict in Mindanao is likely to have an impact on children in the region and may influence the social relationships in the classroom. Especially Moro and IP children may often feel marginalized and discriminated. Studies investigating the prevalence of bullying in the Philippines have found that between a third and half of the children are being or have been bullied (Ancho & Park, 2013; Fleming & Jacobsen, 2009). Nevertheless, these studies did not take the association between

bullying and ethnicity into account. Apparently, investigating the association between bullying and ethnicity in Philippine classrooms does not only have a scientific relevance, but also a societal relevance; investigating bullying in a context in which the link between bullying and ethnicity may be vital to the social relationships in the classroom.

### **Same-ethnic bullying versus cross-ethnic bullying**

Bullying in classrooms can occur both between same-ethnic and cross-ethnic children. It is, however, assumed that cross-ethnic bullying is more common than same-ethnic bullying. Social identity theory (Tajfel, 1970) states that individuals have a sense of social identity and belongingness to a certain in-group. This sense of identity and belongingness leads to an in-group bias, indicating that individuals prefer members of their own group over members of out-groups (Brewer & Silver, 1978; Tajfel, 1982). Intergroup conflict theory (Sherif, 1966; Tajfel, 1982) argues that this in-group bias enhances the development of prejudiced behavior that favors the in-group and discriminates against out-groups. Prejudices are an important predictor of hostile behavior (Schulz & Six, 1996), such as bullying. This in-group bias is therefore likely to lead to less negative relationships between members of the same group and to more negative relationships between members of different groups. Group differentiation can be based on several factors, including ethnicity (Abrams, Rutland & Cameron, 2003; Barrett, 2007; McPherson et al., 2001; Phinney, Jacoby & Silva, 2007; Sabatier, 2008). Research has shown that children already develop a strong in-group bias based on ethnicity by the third grade (Doyle & Aboud, 1995).

It is hypothesized that *bullying is more common between children of different ethnic groups than between children of the same ethnic group* (H1).

Children in multicultural societies interact with members of other ethnic groups from an early age. The issue of same- and cross-ethnic bullying is therefore especially relevant to children living in multicultural societies, such as the Philippines. Two theories can be applied to the prevalence of same- and cross-ethnic bullying in multicultural societies. First, following intergroup conflict theory (Sherif, 1966; Tajfel, 1982), it could be argued that children in multicultural societies have an even more pronounced tendency to favor the in-group. Second, the contact hypothesis (Allport, 1954; Pettigrew

& Trop, 2006) states that interethnic contact leads to positive interethnic perceptions, suggesting that children in multicultural societies have a lower in-group bias. For the specific context of the Philippines, in which interethnic tensions and negative interethnic perceptions are deeply rooted in society, it could be expected that children have a pronounced tendency to favor the in-group in classrooms. Previous research has largely been conducted in Western societies with interethnic tensions and perceptions that are incomparable to the situation in the Philippines, it could therefore be expected that bullying in Philippine classrooms is even more likely to be cross-ethnic than what has already been found in previous research.

### **Prevalence of victims and bullies across ethnic groups**

The likelihood of being involved in bullying others or being victimized has also been argued to differ across ethnic groups (Tolsma et al., 2013; Verkuyten, 2003; Tippett, Wolke & Platt, 2013). One of the arguments in favor of this difference is that children's norms of bullying vary across ethnic groups (Verkuyten, 2003). Nevertheless, findings on the prevalence of victims and bullies across ethnic groups discussed in a recent meta-analysis are mixed (Vitoroulis & Vaillancourt, 2015). Some studies found that the level of victimization and bullying varied with ethnicity (e.g. Hanish & Guerra, 2000; Tippett et al., 2013; Tolsma et al., 2013), whereas others did not find a difference in the prevalence of victims and/or bullies across ethnic groups (e.g. Moran, Smith, Thompson & Whitney, 1993; Tolsma et al., 2013).

An important factor in the association between bullying and ethnicity may be the different status of ethnic groups in society (i.e. whether ethnic groups have a majority or minority status in society). Following social misfit theory (Wright, Giammarino & Parad, 1986), it could be assumed that children from minority ethnic groups are more likely to be victimized than children from the majority ethnic group because their behaviors and characteristics differ from what is normative in the dominant group in society (Eslea & Mukhtar, 2000; Vitoroulis & Vaillancourt, 2015). Studies taking ethnic groups' societal status into account, however, did not find clear-cut results (Vitoroulis & Vaillancourt, 2015). It could be argued that the context of study is influential and that the variation in findings can be explained by cultural and political differences. It is likely that ethnic groups' societal

status has a larger influence on the association between bullying and ethnicity in classrooms in a context in which differences between majority and minority ethnic groups play an important role in society than in a context in which these differences are not important or even absent.

The present study will investigate the prevalence of victims and bullies across ethnic groups by looking at ethnic groups' societal status. It is hypothesized that *children from societal minority ethnic groups are more likely to be victims than children from the societal majority ethnic group* (H2). In addition, it is hypothesized that *children from the societal majority ethnic group are more likely to be bullies than children from societal minority ethnic groups* (H3).

### **Individual characteristics in bullying**

This study controls for several individual characteristics of bullies and victims known from previous research to be associated with bullying. The first is gender. Previous research has found that boys are more often bullies than girls (e.g. Scheithauer, Hayer, Petermann & Jugert, 2006; Tippett et al., 2013), that girls are more likely to be victimized than boys (e.g. Veenstra, Lindenberg, Oldehinkel, De Winter, Verhulst & Ormel, 2005; Scheithauer et al., 2011), and that cross-gender bullying is less likely than same-gender bullying (e.g. O'Brien, 2011). Second, this study will control for children's popularity in the classroom. Bullying has been found to be positively associated with popularity (Olweus, 1993; Sijtsema, Veenstra, Lindenberg & Salmivalli, 2009). Third, children with fewer friends are more likely to be victimized than children with more friends (Ladd, Kochenderfer & Coleman, 1997; Sainio, Veenstra, Huising & Salmivalli, 2011).

### **Social network approach**

Children's bullying relationships in the classroom are interdependent. The formation of such bullying relationships does not only depend on children's characteristics (such as ethnicity), behaviors, and already established bullying relationships, but also on the existence of other relationships in the classroom. For example, bullies will be more likely to target victims who are already bullied (Huising, Snijders, Van Duijn & Veenstra, 2014). In addition, bullying relationships can be analyzed at different levels. First, they can be analyzed at the individual level, for example to investigate the

likelihood of being victimized for children from a certain ethnic group. Second, bullying relationships can be analyzed on the dyadic level, i.e. a pair of children and the ties between them. Finally, bullying relationships can be analyzed at a higher-order level, i.e. relationships between three or more children. By investigating the link between bullying and ethnicity through a social network perspective, this study is able to take these different levels and the interdependency of bullying relationships into account.



## Method

### Data and participants

To investigate the association between bullying and ethnicity, this study analyzed data collected for the Respect Education Program Effectiveness Research. This research project, conducted by the Mindanao State University in close collaboration with the University of Groningen, was requested by Cordaid Child & Development and the Respect Education Foundation and aimed to study the effectiveness of the Respect Education Program in Mindanao. The Respect Education Program<sup>1</sup> is an intervention aiming to contribute to a tolerant learning environment by organizing activities in which children learn the meaning of respect for themselves and each other.

The data collected for the Respect Education Program Effectiveness Research includes data on 1298 children in 40 schools (95 classes, grade 4 to 8) in the Southern Philippines. All data have been collected using paper-and-pencil questionnaires that children filled out during regular school hours and was administered by data collectors who were provided with detailed instructions. In total, two waves were conducted, one before the implementation of the Respect Education Program (June-July 2014) and one after the implementation (February-March 2015). In addition, two types of questionnaires were used, a basic questionnaire and a social network questionnaire. In 83 classes, ten randomly selected children per class were asked to complete the basic questionnaire during both waves of data collection, in two other classes, five randomly selected children per class were asked to complete the basic questionnaire during both waves (840 children in total). In the remaining ten classes, all children (458 children in total) were asked to complete a social network questionnaire during the first wave of data collection and to complete both the basic and the social network questionnaire during the second wave of data collection. In the basic questionnaire, children answered questions about their demographic profile (e.g. gender, date of birth, ethnicity), intra- and interpersonal characteristics (e.g. well-being, relationship with the teacher), bullying and victimization, world citizenship (e.g. attitudes towards children from different cultures), and social classroom climate. In the social network questionnaire, children were asked to nominate classmates on eight questions: (1) Which classmates

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<sup>1</sup> [www.respecteducation.me](http://www.respecteducation.me)

do you like?, (2) Which classmates do you dislike?, (3) Which classmates are your best friends?, (4) Who are the most popular children in your class?, (5) Who of your classmates always starts bullying you?, (6) Who of your classmates always joins the bully or is always there when the bullying takes place?, (7) Who defends you when you are bullied?, and (8) Who have you bullied?.

This study used the social network data collected during the first wave and the associated basic data collected during the second wave. As mentioned, ten classes participated in the social network part of this research project. Only nine of these classes were included in the present study (seven elementary school classes and two high school classes). The tenth class was not included because the school had to close between the two waves of data collection. Therefore, no data from the basic questionnaire was available for the children in this class. This study included 424 children (54% boys). Social network data was missing for 35 children (8.3%) due to absence during the first wave of data collection. On the class level, the percentage of missingness on the social network data ranges between 0% to 26.2% ( $M = 7.8\%$ ;  $st.dev. = 9.1$ ). The percentage of missing data for the basic questionnaire differed per variable and will therefore be specified per variable analyzed in this study.

### **Operationalization**

**Bullying.** *Bullying behavior* was measured using two peer nomination questions from the social network questionnaire. The first question looks at bullying from the perspective of the victim: ‘Who of your classmates always starts bullying you?’. The second question looks at bullying from the perspective of the bully: ‘Who have you bullied?’. Children were presented with a list of names of all classmates and were asked to nominate the classmate(s) to which the questions applied.

**Ethnicity.** *Ethnic groups’ societal status* was measured using the question ‘What is your ethnicity?’ from the basic questionnaire. Six response options were provided, (1) B’laan, (2) Cebuano, (3) Ilonggo, (4) Maguindanaon, (5) Tagakaolo, and (6) Other, please specify. In total, this sample consists of children from 16 different ethnic backgrounds. Detailed categorization is likely to result in sparsely filled ethnic categories and in a considerable loss of degrees of freedom. The different ethnic groups can be organized into three groups based on origin and religion. The first group, Christians, consists of: Cebuano, Bisaya, Dabawenyoy, Ilonggo, Suriganaon, Tagalog, and Waray. The second

group, Moros, consists of: Maguindanaon, Maranao, and Tausug. The third group, IPs, consists of: Bagobo, B'laan, Mandaya, Manobo, and Tagakaolo. The ethnicity of one respondent, Chinese, does not fit this categorization and has therefore been coded as missing. In total, there were 25 missing values (5.9%). In the present study, the three ethnic groups are organized according to their societal status. The first group, societal majority, consists of all Christian ethnic groups. The second group, societal minority, consists of all Moro and IP ethnic groups. Table 1 shows the proportional distribution of societal status. In addition, Table 5 in Appendix 1 gives the proportional distributions of societal status per classroom.

**Control variables.** *Gender* was measured using the question 'Are you a boy or a girl?' from the basic questionnaire. Boys were coded 0 and girls were coded 1. There were no missing values on this variable. Table 1 shows the proportional distribution of gender. Table 5 in Appendix 1 gives the proportional distribution of gender per classroom.

*Perceived popularity* was measured using the peer nomination question 'Who are the most popular children in your class?'. Children were presented with a list of names of all classmates and were asked to nominate the ones whom they considered being popular. Popularity has been operationalized as a percentage represented by the nominations each child received from the possible number of nominations they could receive (referring to the number of classmates minus the classmates absent during data collection). Table 1 shows the descriptive statistics of this variable.

The number of *friends* was measured using the peer nomination question 'Which classmates are your best friends?'. Children were presented with a list of names of all classmates and were asked to nominate the ones with whom they were best friends. The number of friends has been operationalized as a percentage represented by the nominations each child received from the possible number of nominations they could receive (referring to the number of classmates). Table 1 shows the descriptive statistics of this variable.

### **Analytical strategy**

The link between bullying and ethnicity has been analyzed using descriptive analyses and Exponential Random Graph Models. First, both links between bullying and ethnicity, the prevalence

*Table 1: Description of variables included in the analyses (N=424)*

<i>Variable</i>	<i>Mean (standard deviation)<sup>a</sup></i>	<i>Minimum</i>	<i>Maximum</i>
Societal status (societal majority=1; societal minority=0)	62.7% societal majority 31.4% societal minority 5.9% missing/other		
Gender (boy=0; girl=1)	54% boy 46% girl		
Popularity	.08 (.13)	.00	.82
Friendships	.11 (.10)	.00	1.00

*Note.* <sup>a</sup> The frequency distribution of nominal variables is indicated in percentages.

of cross- and same-ethnic bullying relationships and the prevalence of victims and bullies across ethnic groups, have been investigated using descriptive statistics. In addition, the prevalence of victims and bullies across ethnic groups with varying numerical classroom statuses have been investigated on the classroom level.

Second, the prevalence of cross- and same-ethnic bullying relationships was analyzed more in depth using Exponential Random Graph Models (ERGMs, also called  $p^*$  models). ERGMs are probability models for complete networks that are used to estimate parameters of dyadic (e.g. reciprocity), triadic (e.g. transitivity), and higher-order level effects (Robins et al., 2007). These parameters represent network configurations; subsets of respondents with specific patterns of relations between them. The combination of the configurations represent the dependence structure of the observed social network, and the corresponding parameters can be interpreted as the outcome of structural processes in the network. Computation of the ERGMs has been carried out using XPNNet (Wang, Robins & Pattison, 2009). This program uses the Monte Carlo maximum likelihood methods of Snijders (2002).

In the ERGM analyses, missing values for individual attributes were treated as non-informative in the estimation process (Huisman and Steglich, 2008). Following the approach proposed by Lubbers and Snijders (2007), all nine class-level networks were analyzed separately and combined in a meta-analytic procedure. This procedure assumes a model in which each network has a true parameter, which is estimated with some estimation error. The true parameters are distributed across the networks according to a normal distribution. The estimation errors are independently and normally

distributed, with a mean of zero and a standard deviation equal to the estimated standard error. The meta-analytic procedure was carried out using the program MLwiN (Rasbash, Charlton & Browne, 2015). The estimated mean parameter resulting from this procedure represents an unstandardized aggregated estimate across classrooms. The accompanying standard deviation represents the degree to which estimates vary across classrooms. The statistical significance of the mean parameters was tested by dividing the estimate by its standard error; this was tested using a *t*-ratio with approximately a normal distribution. The significance of the parameters for the standard deviations was tested using a chi-square difference test with one degree of freedom.

To test the hypothesis, two models were estimated. One model of bullying from the perspective of the victim and one model of bullying from the perspective of the bully. The hypothesis on cross- and same-ethnic bullying was tested in both models by including the societal status variable as a dyadic covariate. Four types of dyads were created: minority-minority, minority-majority, majority-minority, and majority-majority. Minority-minority was chosen as the reference category.

In all estimated models, additional effects were included to capture relational mechanisms that have been found in research on bullying networks (Huitsing et al., 2012). First, the *in-ties spread effect* reflects the variation in how frequently children are nominated as bullies and/or victims. Second, the *shared in-ties effect* reflects the agreement of children to nominate the same bullies and/or victims. Third, the *isolates effect* reflects the presence of uninvolved children in the classroom. Fourth, the *sinks effect* reflects the presence of children who are nominated as bully and/or victim but do not nominate classmates as bullies and/or victims themselves. Fifth, the *multiple two-paths effect* reflects the presence of children who are nominated as bully and/or victim and who nominate classmates as bullies and/or victims themselves as well.

To control for the effect of gender, the *ego* and *alter gender effects* were added to both models. To control for the effects of popularity and friendship, the *ego* and *alter popularity* and *friendship effects* were added to both models. The *ego effect* reflects the tendency for nodes with a specific characteristic to nominate others. The *alter effect* reflects the likelihood for nodes with a specific characteristic to be nominated by others. The *same effects* for gender, popularity, and friendship, which reflects the likelihood for two nodes to have a tie based on their similarity on a

specific characteristic, were not added to the models because these effects are already captured in the combination of the *ego* and *alter effects*. Adding the *same effects* to the models would therefore result in overlapping parameters and biased estimates.

Initially the models for each classroom included the same structural and control effects. For some classrooms, however, effects were excluded because they could not be estimated (e.g. in classrooms without isolates, an *isolate effect* could not be obtained). In all models, the graph density was fixed to its observed value because this improves model convergence considerably. The goodness of fit was assessed for all graph statistics in XPNNet, including the ones not directly estimated in the models. Not directly estimated statistics had acceptable goodness of fit when the deviations between observed and average simulated statistics, divided by the standard deviation of the simulated values, were less than two in absolute value. Although all models converged, not all graph statistics were reasonably estimated. For some classrooms, additional effects (i.e. reciprocity, in-2-star, transitive triangles) were added to the model to improve the goodness of fit.

## Results

### Descriptive analysis

Descriptive statistics for the bullying networks are given in Table 2 for the network (relationship), individual (child), and classroom level. In addition, Tables 6 and 7 in Appendix 1 give descriptive statistics for the bullying networks per classroom. Victims provided in total 1,171 bullying nominations, which is 5.6 percent of all possible ties. According to the bullies, there were 1,003 bullying relationships, equal to 4.8 percent of all possible bullying relationships. In total, 21 children were isolated from bullying from the perspective of the victim (i.e. they neither nominated classmates who bullied them nor were reported as bullies) and 26 children were isolated from bullying from the perspective of the bully (i.e. they neither nominated classmates to have bullied themselves nor were reported as victims). About 5.9% of the children were nominated as bullies but not reported being bullied themselves (25 victim perspective-“sinks”) and 19.6% of the children were nominated as victims but not reported to bully classmates themselves (83 bully perspective-“sinks”). In addition, 21.7% of the children were not nominated as bullies but did report being bullied (92 victim perspective-“sources”) and 11.6% of the children were not nominated as victims but did report to bully classmates themselves (49 bully perspective-“sources”). Finally, 59.2% of the children were nominated as bullies and also reported to have been bullied themselves (251 victim perspective-“bully-victims”) and 54.5% of the children were nominated as victims and also reported to have bullied others themselves (231 bully perspective-“bully-victims”).

Descriptive statistics on the prevalence of cross- and same-ethnic bullying can also be found in Table 2. The percentages given for a certain composition are relative to the total number of possible dyads for that certain composition. Table 2 shows that, from the perspective of the victim, same-ethnic bullying occurred at a similar rate as cross-ethnic bullying (respectively 5.3% and 5.4%). More specifically, Table 2 shows that societal minority victims were more likely to report cross-ethnic bullying (i.e. with the bully being from the societal majority) than same-ethnic bullying (i.e. with the bully being from the societal minority) (respectively 6.1% and 5.3%), whereas societal majority victims were more likely to report same-ethnic bullying than cross-ethnic bullying (respectively 5.4% and 4.2%).

From the perspective of the bully, Table 2 shows that, similar to the perspective of the victim, same-ethnic bullying occurred at a similar rate as cross-ethnic bullying (respectively 4.8% and 4.6%). In addition, Table 2 shows that for both societal majority (respectively 4.5% and 4.9%) and minority bullies (respectively 4.5% and 4.7%), cross- and same-ethnic bullying were comparably common.

Descriptive statistics on the prevalence of victims and bullies across ethnic groups can be found in Table 3. In addition, Table 8 in Appendix 1 gives descriptive statistics on the prevalence of victims and bullies across ethnic groups per classroom. The percentages given are relative to the total number of children from the specific ethnic group in the sample. The table shows that, based on self-reports, societal minority children were more likely to be victims (87.2%) than societal majority children (77.4%). Although the difference between societal minority and societal majority children is smaller for peer-reports, societal minority children were also more likely to be nominated as victims (82.7%) than societal majority children (77.8%). On the prevalence of bullies, Table 3 shows that the percentages of children being bullies, both self- and peer-reported, did not differ much between societal majority and societal minority children (for both self-reports the percentage is 70.7%, and the peer-reports are respectively 66.9% and 66.2%).

### **Exponential Random Graph Models**

Table 4 presents the results of the ERGM meta-analyses on the bullying relationships from the perspectives of the victim and the bully. In addition, Tables 9 and 10 in Appendix 2 present the results of the ERGM analyses per classroom.

Results of the meta-analyses on the structural effects, the third part of Table 4, show that the in-ties spread was estimated to be significantly positive in both models (respectively .80,  $p < .01$  and .49,  $p < .01$ ). This implies that there is variation in how frequently children were nominated as bullies or victims. In the victim perspective-model, the variation in frequency of being nominated also varied significantly over classrooms (.29,  $p < .05$ ). The shared in-ties effect shows that there was agreement of children to nominate the same victims (.07,  $p < .05$ ), whereas this was not the case for children nominating bullies (-.06,  $p > .05$ ). For both models, the shared in-ties effect varied over classrooms (respectively .19,  $p < .01$  and .06,  $p < .05$ ). Regarding isolated children, the effect had a positive



Table 2: Descriptive statistics for networks of bullying from the perspectives of the victim and the bully ( $N_{\text{classrooms}}=9$ ;  $N_{\text{children}}=424$ )

	Victim perspective	Bully perspective
<b>Network level</b>		
Prevalence (density) <sup>a</sup>	1,171 (5.7%)	1,003 (4.8%)
Ethnic composition <sup>b</sup>		
Same-ethnic	679 (5.3%)	621 (4.8%)
Cross-ethnic	336 (5.4%)	286 (4.6%)
Societal status composition <sup>c</sup>		
Minority-minority	144 (5.3%)	128 (4.7%)
Minority-majority	177 (6.1%)	130 (4.5%)
Majority-minority	120 (4.2%)	131 (4.5%)
Majority-majority	574 (5.4%)	520 (4.9%)
<b>Individual level</b>		
Average indegree per child ( <i>standard deviation</i> )	2.8 (4.1)	2.4 (2.4)
Average outdegree per child ( <i>standard deviation</i> )	3.0 (2.8)	2.6 (3.0)
Total number of sinks <sup>b</sup>	25 (5.9%)	83 (19.6%)
Total number of sources <sup>b</sup>	92 (21.7%)	49 (11.6%)
Total number of isolates <sup>b</sup>	21 (5.0%)	26 (6.1%)
Total number of bully-victims	251 (59.2%)	231 (54.5%)
<b>Classroom level</b>		
Minimum-maximum number of nominations per child	0–21	0–24
Average density per classroom ( <i>standard deviation</i> )	6.4% (2.1%)	5.2% (2.0%)
Minimum-maximum density per classroom	2.1%–8.6%	2.3%–8.5%
Average reciprocity per classroom ( <i>standard deviation</i> )	12.5% (6.8%)	11.0% (7.6%)
Minimum-maximum reciprocity per classroom	0%–21.4%	3.7%–28.4%
Average percentage of sinks per classroom ( <i>standard deviation</i> ) <sup>b</sup>	6.0% (2.7%)	20.9% (18.5%)
Average percentage of sources per classroom ( <i>standard deviation</i> ) <sup>b</sup>	22.0% (6.6%)	11.8% (6.8%)
Average percentage of isolates per classroom ( <i>standard deviation</i> ) <sup>b</sup>	6.0% (7.0%)	9.0% (9.7%)

Notes. <sup>a</sup>The density is the number of nominations, relative to the total number of possible nominations (20,724).

<sup>b</sup>The percentages are relative to the total number of possible nominations, which are: same-ethnic = 12,845; cross-ethnic = 6,256.

<sup>c</sup>The percentages are relative to the total number of possible nominations, which are: minority-minority = 2,695; minority-majority = majority-minority = 2,885; majority-majority = 10,636.

<sup>d</sup>*Sinks* are actors with zero out-ties and at least one in-tie; *Sources* are actors with at least one out-tie and zero in-ties; *Isolates* are actors with zero in-ties and zero out-ties; *Bully-victims* are actors with at least one in- and out-tie.

Table 3: Distribution of the prevalence of victims and bullies across ethnic groups<sup>a</sup>

	<i>Self-reported victim</i>	<i>Nominated bully</i>	<i>Self-reported bully</i>	<i>Nominated victim</i>
Societal majority	206 (77.4%)	188 (70.7%)	178 (66.9%)	20 (77.8%)
Societal minority	116 (87.2%)	94 (70.7%)	88 (66.2%)	110 (82.7%)

Note. <sup>a</sup> The percentages are relative to the total number of children from the societal status group, which are: societal majority = 266; societal minority = 133.

parameter for both models (respectively 1.75,  $p < .01$  and 2.80,  $p < .01$ ). Similarly, the sinks effect had a positive parameter in both models (respectively 1.18,  $p < .05$  and 1.59,  $p < .01$ ) and varied over classrooms (respectively 1.24,  $p < .01$  and .96,  $p < .01$ ). Finally, the multiple two-paths effect had no significant parameter in both models (respectively .05,  $p > .05$  and -.06,  $p > .05$ ). Table 4 also shows that this effect varied over classrooms in both models (respectively .10,  $p < .05$  and .08,  $p < .01$ ). In the bully perspective-models that included reciprocity, the effect had a positive parameter (1.47,  $p < .01$ ), indicating that bullying relationships from the perspective of the bully were reciprocated, i.e. bullies mentioned each other as their victims. In the victim perspective-models that included in-2-star, the parameter was estimated positively (.11,  $p < .01$ ). This indicates the presence of children being nominated by two or more classmates as a bully. In both victim and bully-perspective models that included transitive triangles, the effect had a positive parameter (respectively .54,  $p < .01$  and .56,  $p < .01$ ). This indicates that there are transitive and hierarchical structures present in the networks.

Results of the meta-analyses on the control effects, the second part in Table 4, show that the ego gender effect was not estimated significantly in both models (respectively -.08,  $p > .05$  and -.14,  $p > .05$ ). The alter gender effect, on the other hand, was estimated significantly positive in the victim perspective-model (.41,  $p < .01$ ), indicating that girls are more likely than boys to be nominated as bullies, and significantly negative in the bully perspective-model (-.19,  $p < .01$ ), indicating that girls are less likely than boys to be nominated as victims. On popularity, Table 4 shows a positive ego effect in the victim perspective-model (.57,  $p < .01$ ), indicating that more popular children nominated more bullies. In addition, the alter popularity effect had a positive parameter in the bully perspective-model (.67,  $p < .21$ ), indicating that more popular children are more likely to be nominated as victims. On friendships, Table 4 shows a positive ego effect in the victim perspective-model (4.71,  $p < .01$ ),

indicating that children with more friends nominated more bullies. No significant parameter was found for the alter friendship effect.

The first part of Table 4 presents the results of the meta-analyses on ethnicity (i.e. societal status of the ethnic group), with minority-minority dyads as the reference category. In both models, neither cross-ethnic dyads (i.e. minority-majority and majority-minority) occurred significantly more or less frequent than minority-minority dyads. The majority-majority dyads effect had, however, a significant positive parameter in both models (respectively  $.18, p < .01$  and  $1.22, p < .05$ ), indicating that, both from the perspective of the victim and the bully, majority-majority dyads occur more often than minority-minority dyads. Note that all ethnicity effects had systematic variation over the classrooms in the bully perspective-model. This means, for example, that in some classrooms, bullies reported more majority-majority dyads than minority-minority dyads, whereas in other classrooms, bullies reported fewer majority-majority dyads compared with minority-minority dyads.

Table 4: Exponential Random Graph Models for bullying from the perspective of the victim and the bully

Parameter	Victim perspective				Bully perspective			
	Mean estimate		Standard deviation		Mean estimate		Standard deviation	
	Est.	Std. Err.	Est.	$\chi^2$	Est.	Std. Err.	Est.	$\chi^2$
<b>Dyadic covariates</b>								
Minority-minority	Ref.							
Minority-majority	-.11	.07	.00	.00	.71	.73	1.96	20.15**
Majority-minority	-.03	.07	.00	.00	.78	.66	1.79	13.81**
Majority-majority	.18	.07**	.00	.00	1.22	.62*	1.66	19.35**
<b>Actor covariates</b>								
Ego gender	-.08	.11	.26	4.88*	-.14	.11	.28	8.24**
Alter gender	.41	.10**	.23	7.86**	-.19	.07**	.09	.20
Ego popularity	.57	.17**	.00	.00	.01	.28	.45	1.96
Alter popularity	.18	.13	.00	.00	.67	.21**	.00	.00
Ego friendship	4.71	1.54**	4.18	40.49**	.71	.38	.00	.00
Alter friendship	.83	.54	1.21	4.71*	2.01	1.16	2.99	6.10*
<b>Structural effects</b>								
In-ties spread <sup>a</sup>	.80	.13**	.29	4.78*	.49	.10**	.00	.00
Shared in-ties	-.06	.08	.19	19.65**	.07	.03*	.06	5.01*
Isolates <sup>b</sup>	1.75	.35**	.22	.02	2.80	.42**	.00	.00
Sinks	1.18	.50*	1.24	6.79**	1.59	.40**	.96	7.38**
Multiple two-paths <sup>c</sup>	-.05	.04	.10	5.99*	-.06	.03	.08	7.69**
Reciprocity <sup>d</sup>					1.47	.28**	.32	.75
In-2-star <sup>e</sup>	.11	.01**	.00	1.32				
Transitive triangles <sup>f</sup>	.54	.08**	.00	.00	.56	.10**	.00	.00

Notes. \*  $p < .05$ ; \*\*  $p < .01$ .

<sup>a</sup> The *in-ties spread* parameter was included in the victim perspective-model for eight classrooms.

<sup>b</sup> The *isolates* parameter was included in the victim and bully perspective-model for five classrooms.

<sup>c</sup> The *multiple two-paths* parameter was included in the victim perspective-model for eight classrooms.

<sup>d</sup> The *reciprocity* parameter was included in the bully perspective-model for three classrooms.

<sup>e</sup> The *in-2-star* parameter was included in the victim perspective-model for three classrooms.

<sup>f</sup> The *transitive triangles* parameter was included in the victim and bully perspective-models for three classrooms.

## **Conclusion and discussion**

### **Bullying in Philippine classrooms**

On the overall prevalence of bullying in classrooms, in terms of percentages, this study found results comparable to previous research into bullying in classrooms (e.g. Huitsing et al., 2012; Huitsing & Veenstra, 2012). It should, however, be taken into account that the classrooms investigated in the current study are much larger than the classrooms investigated in previous studies and that the absolute numbers of bullying relationships are therefore much higher. Compared to previous studies, the total number of children involved in bullying in the classroom was relatively high in current study, presented by low numbers of isolates. In addition, the total number of children being involved in bullying as both a bully and a victim was high in current study. Whereas previous studies already showed that bullying is a prominent issue in classrooms in western contexts, it seems that in Philippine classrooms, bullying is an even more prominent issue.

### **Same-ethnic bullying versus cross-ethnic bullying**

This study examined two links between bullying and ethnicity in Philippine classrooms. The first link is the relative prevalence of same- and cross-ethnic bullying. It was hypothesized that bullying is more common between children of different ethnic groups than between children of the same ethnic group (H1). The analyses in this study rejected this hypothesis. The descriptive analyses showed that overall, cross-ethnic and same-ethnic bullying is equally common, both from the perspective of the victim and from the perspective of the bully. Nevertheless, the analyses also showed that according to victims from the societal majority (Christians), bullying is more likely to be same-ethnic than cross-ethnic, whereas victims from the societal minority (Moro and IP) are more likely to report cross-ethnic bullying. The ERGM analyses showed that, compared to same-ethnic dyads between two minority children, cross-ethnic dyads are just as common, whereas same-ethnic dyads between two majority children are more common.

It was not only expected that cross-ethnic bullying is more common than same-ethnic bullying in general, it was also expected that cross-ethnic bullying is even more common than same-ethnic bullying in the Philippines than what has been found in previous research. In line with intergroup

conflict theory (Sherif, 1966; Tajfel, 1982), it could be assumed that children in the Philippines have a (more) pronounced tendency to favor the in-group as a consequence of deeply rooted interethnic tensions and negative interethnic perceptions in society. Nevertheless, this study did not support these expectations. It may be the case that these societal interethnic tensions and negative interethnic perceptions do not influence the social relationships in the classroom. Instead, the assumptions underlying the contact hypothesis (Allport, 1954; Pettigrew & Tropp, 2006) may be applied, stating that interethnic contact leads to more positive interethnic perceptions. It should, however, be taken into account that although overall levels of cross- and same-ethnic bullying were similar, descriptive analyses showed that societal minority children reported slightly higher levels of cross-ethnic bullying. It could be argued that for Moro and IP children, who are in a marginalized and discriminated position in society, the influence of societal interethnic tensions and negative interethnic perceptions on their social relationships is larger than for Christian children, who are not marginalized or discriminated in society.

### **Prevalence of victims and bullies across ethnic groups**

The second link between bullying and ethnicity investigated in this study is the prevalence of victims and bullies across ethnic groups. It was hypothesized that children from ethnic minority groups are more likely to be victims than children from ethnic majority groups (H2), and that children from ethnic majority groups are more likely to be bullies than children from ethnic minority groups (H3).

The analyses showed that societal minority children are indeed more likely to report being victimized than societal majority children. In addition, classmates are also more likely to report societal minority children as victims than societal majority children. Nevertheless, it should be taken into account that for both groups, the percentage of children reporting to be victimized or being reported as victims were relatively high. Results from the descriptive analyses did not support hypothesis 3, stating that societal majority children are more likely to be bullies than societal minority children. Instead, this study's descriptive analyses found that societal majority and societal minority

children are equally likely to be a bully. Again, the percentage of children reporting to bully or reported as bully were relatively high for both groups.

Whereas this study supported the hypothesis that ethnic minority children are more likely to be victimized than ethnic majority children, this study did not support the hypothesis that ethnic majority children are more likely to bully than ethnic minority children. Apparently, the societal status influences whether the child has a vulnerable position in the classroom or not, but does not influence whether the child has a dominant and strong position in the classroom or not. This conclusion is, however, likely to be specific to the context under study. In the entire Philippines, minority ethnic groups (Moro and IP) are marginalized and discriminated, i.e. take in the vulnerable position in society (Hauser, 2010; Rodil, 1994; Reese & Werning, 2013). The ethnic group that takes in the dominant and strong position in society, however, varies across areas. In some areas, the Christians take the dominant position, whereas in other areas the Moros take the dominant position. Nevertheless, even if the minority ethnic group has the dominant position in a certain area, this ethnic group is still discriminated, for example by the national government. Results from investigating the association between bullying and ethnicity in classrooms found in this study largely replicate this pattern.

### **Structural and control effects**

In the model specification of this study, structural parameters were added to the models found in previous research to capture relational mechanisms in bullying networks (Huitsing et al., 2012). For four of these parameters (in-ties spread, shared in-ties, isolates, and sinks), this study found results comparable to previous research. For the multiple two-path parameter, however, this study did not find results comparable to previous research. In addition, three additional structural parameters (reciprocity, in-2-star, transitive triangles) had to be added to some models to increase the goodness of fit, which were not found in previous research to capture relational mechanisms in bullying networks. The classrooms analyzed in the present study are, however, different from classrooms analyzed in previous social network studies into bullying. The most important difference is the size of the classroom. The average number of children in one classroom in the current study is around 50, whereas previous research included classrooms with a maximum of around 30 children. Consequently,

the structural parameters found in previous research may not capture all relational mechanisms in large classrooms. This may explain why not all graph statistics were reasonably well estimated, why the multiple two-path parameter did not give similar results, and why additional structural parameters had to be added. In depth investigation on the relational mechanisms in such large classrooms goes, however, beyond the scope and purpose of the current study. Further research into these relational mechanisms is needed in order to be able to unravel the structures in bullying networks in such large classrooms and to be able to obtain a better understanding of the association between bullying and ethnicity.

This study controlled for several individual characteristics of bullies and victims known from previous research to be associated with bullying. Nevertheless, the results from this study's analyses showed associations between the individual characteristics and bullying in a different direction than would have been expected from previous research. First, previous research showed that boys are more likely to be bullies than girls (e.g. Scheithauer et al. 2006, Tippett et al., 2013) and girls are more likely to be victims than boys (e.g. Veenstra et al., 1005; Scheithauer et al., 2011). This study, however, showed that girls are more likely to be bullies than boys, whereas boys are more likely to be victims than girls. This difference in findings may be a result of societal differences. The Philippines are often described as a nation of strong women, who do not only run the family, but also run businesses and take in management positions (Reese & Werning, 2013), which could be assumed to result in girls taking in dominant positions in the classroom as well. Nevertheless, it should also be taken into account that the current study did not specify different types of bullying. Previous research has, for example, shown that boys are more involved in physical bullying than girls, whereas girls are more likely to be involved in relational bullying (Scheithauer et al., 2011). In order to clarify this study's results, investigation into the link between gender and specific forms of bullying in Philippine classrooms may be useful.

Second, previous research indicated that popular children are more likely to be bullies (Olweus, 1993; Sijtsema et al., 2009). This study, however, found a positive association between popularity and victimization. Finally, it was expected that the more friends a child has, the less likely he or she is to be victimized (Ladd et al., 1997; Sainio et al., 2011). A positive association between



friends and victimization was, however, found in the current study. Again, differences in societal norms may explain these differences in findings. Philippine children may perceive popularity or friendships differently than children participating in previous studies. In Philippine society, status is often determined by education and academic achievement (Reese & Werning, 2013). Likewise, popularity in the classroom may, for example, be perceived as to what extent children want to relate to a classmate because that classmate is very smart and can help with course material. Apparently not only the association between bullying and ethnicity can be assumed to vary between contexts with cultural and social differences, also the association between bullying and individual characteristics such as gender, popularity, and friendships.

### **Strengths and limitations**

By being the first to implement a social network approach in a country such as the Philippines, this study not only attempted to increase our understanding of the association between bullying and ethnicity, but also to increase our knowledge of the applicability of such an approach in a wide range of contexts. Nevertheless, as a first attempt, this study is accompanied by several weaknesses. First of all, because this was the first study to implement a social network approach, there was a lack of resources and possibilities to collect data, resulting in a dataset including only nine classrooms. In addition, this study only used cross-sectional data. Previous research into bullying has, however, shown that bullying is a process which is best measured using longitudinal data (Huitsing et al., 2014). Resources and possibilities build up during the current study, however, enable follow up research to enhance data collection and to facilitate a more in depth investigation of the association between bullying and ethnicity in this specific context.

Although the current study already acknowledged that children's bullying relationships are interdependent and take place at various levels, it should also be acknowledged that bullying in classrooms is not an isolated process. Several studies have already shown that bullying relationships are related to, among others, defending relationships (Huitsing et al., 2014) and friendship relationships (Sentse, Dijkstra, Salmivalli & Cillessen, 2013; Sijtsema, Rambaran & Ojanen, 2013) in the classroom. In the process of obtaining a better understanding of the association between bullying

and ethnicity and the influence of the social and cultural context, the interaction between these different social relationships may be an important element.

Compared to previous studies investigating the association between bullying and ethnicity, the present study has contributed to the existing body of knowledge by examining a yet uninvestigated context, the Philippines. It is not only an uninvestigated context, it also has a completely different social and cultural context compared to contexts studied before. In addition, by taking a dyadic approach and by taking into account higher order structures in classrooms, the present study has been able to get more in depth information on the association between bullying and ethnicity. Nevertheless, it should be mentioned that this study was only a first investigation of the association between bullying and ethnicity in a context such as the Philippines. This study's results should therefore be treated with caution, but are nevertheless useful insights for future research.

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**Appendix 1 – Descriptive statistics per classroom***Table 5: Proportional distribution of ethnicity and gender per classroom included in the analyses*

<i>Classroom ID number</i>	<i>Number of students</i>	<i>Ethnicity<sup>a</sup></i>	<i>Societal status</i>	<i>Gender</i>
1121	40	40.0% Christian 50.0% Moro 0.0% IP 10.0% missing/other	40.0% societal majority 50.0% societal minority 10.0% missing/other	72.5% boy 27.5% girl
1151	32	3.1% Christian 78.1% Moro 3.1% IP 15.6% missing/other	3.1% societal majority 81.3% societal minority 15.6% missing/other	65.6% boy 34.4% girl
1171	58	82.8% Christian 8.6% Moro 8.6% IP 0.0% missing/other	82.8% societal majority 17.2% societal minority 0.0% missing/other	46.6% boy 53.4% girl
1181	55	40.0% Christian 9.1% Moro 45.5% IP 5.5% missing/other	40.0% societal majority 54.5% societal minority 5.5% missing/other	47.3% boy 52.7% girl
1241	29	24.1% Christian 55.2% Moro 0.0% IP 20.7% missing/other	24.1% societal majority 55.2% societal minority 20.7% missing/other	51.7% boy 48.3% girl
1281	42	83.3% Christian 16.7% Moro 0.0% IP 0.0% missing/other	83.3% societal majority 16.7% societal minority 0.0% missing/other	52.4% boy 47.6% girl
1291	60	70.0% Christian 18.3% Moro 10.0% IP 1.7% missing/other	70.0% societal majority 28.3% societal minority 1.7% missing/other	51.7% boy 48.3% girl
2031	61	85.2% Christian 1.6% Moro 3.3% IP 9.8% missing/other	85.2% societal majority 4.9% societal minority 9.8% missing/other	50.8% boy 49.2% girl
2051	47	91.5% Christian 0.0% Moro 8.5% IP 0.0% missing/other	91.5% societal majority 8.5% societal minority 0.0% missing/other	57.4% boy 42.6% girl

Table 6: Descriptive statistics for networks of bullying from the perspective of the victim per classroom

	1121	1151	1171	1181	1241	1281	1291	2031	2051
<b>Network level</b>									
Prevalence (density) <sup>a</sup>	108 (6.9%)	84 (8.4%)	168 (5.1%)	185 (6.2%)	68 (8.4%)	112 (6.5%)	171 (4.8%)	88 (2.4%)	187 (8.6%)
Ethnic composition <sup>b</sup>									
Same-ethnic	41 (6.3%)	40 (6.4%)	128 (5.4%)	68 (6.0%)	9 (3.0%)	77 (6.0%)	107 (5.6%)	48 (1.8%)	161 (8.6%)
Cross-ethnic	49 (7.7%)	13 (12.7%)	35 (3.5%)	107 (6.8%)	9 (4.0%)	35 (7.1%)	58 (3.7%)	5 (1.6%)	26 (7.6%)
Societal status composition <sup>b</sup>									
Minority-Minority	26 (6.5%)	52 (7.7%)	3 (3.0%)	48 (5.3%)	7 (2.7%)	1 (2.0%)	7 (2.4%)	0 (0.0%)	0 (0.0%)
Minority-Majority	28 (8.8%)	0 (0.0%)	17 (3.5%)	49 (7.4%)	3 (2.7%)	16 (6.5%)	39 (5.5%)	4 (2.6%)	21 (12.2%)
Majority-Minority	21 (6.6%)	1 (3.8%)	17 (3.5%)	35 (5.3%)	6 (5.4%)	19 (7.8%)	15 (2.1%)	1 (6.4%)	5 (2.9%)
Majority-Majority	15 (5.9%)	0 (0.0%)	126 (5.5%)	42 (8.7%)	2 (4.1%)	76 (6.2%)	104 (5.9%)	48 (1.8%)	161 (8.7%)
<b>Individual level</b>									
Average indegree per child ( <i>standard deviation</i> )	2.7 (2.6)	2.6 (3.5)	2.9 (4.2)	3.4 (4.6)	2.3 (4.1)	2.7 (3.2)	2.9 (2.4)	1.4 (4.0)	4.0 (4.8)
Minimum-maximum indegree	0-11	0-15	0-27	0-25	0-22	0-13	0-10	0-24	0-20
Average outdegree per child ( <i>standard deviation</i> )	2.7 (2.2)	2.6 (2.0)	3.0 (3.8)	3.8 (4.0)	2.3 (1.3)	3.6 (2.1)	2.9 (4.5)	1.6 (1.5)	4.8 (2.8)
Minimum-maximum outdegree	0-11	0-9	0-20	0-21	0-6	0-8	0-24	0-5	0-10
Sinks <sup>c</sup>	1 (2.5%)	1 (3.1%)	3 (5.2%)	4 (7.3%)	2 (6.9%)	1 (2.4%)	5 (8.3%)	6 (9.8%)	2 (4.3%)
Sources <sup>c</sup>	8 (20.0%)	11 (34.4%)	9 (15.5%)	9 (16.4%)	5 (17.2%)	9 (21.4%)	13 (21.6%)	19 (31.1%)	9 (19.1%)
Isolates <sup>c</sup>	0 (0.0%)	0 (0.0%)	4 (6.9%)	2 (3.6%)	0 (0.0%)	2 (4.8%)	3 (5.0%)	10 (16.4%)	0 (0.0%)
Bully-victims <sup>c</sup>	31 (77.5)	20 (62.5%)	40 (69.0%)	34 (61.8%)	22 (75.9%)	19 (45.2%)	37 (61.7%)	20 (32.8%)	28 (59.6%)

Notes. <sup>a</sup> The density is the number of nominations, relative to the total number of possible nominations, which are: 1121 = 1,570; 1151 = 992; 1171 = 3,306; 1181 = 2,970; 1241 = 812; 1281 = 1,722; 1291 = 3,540; 2031 = 3,660; 2051 = 2,162.

<sup>b</sup> The percentages are relative to the total number of possible nominations.

<sup>c</sup> *Sinks* are actors with zero out-ties and at least one in-tie; *Sources* are actors with at least one out-tie and zero in-ties; *Isolates* are actors with zero in-ties and zero out-ties; *Bully-victims* are actors with at least one in- and out-tie.



Table 7: Descriptive statistics for networks of bullying from the perspective of the bully per classroom

	1121	1151	1171	1181	1241	1281	1291	2031	2051
<b>Network level</b>									
Prevalence (density) <sup>a</sup>	105 (6.7%)	43 (4.3%)	218 (6.5%)	125 (4.2%)	69 (8.5%)	54 (3.1%)	169 (4.8%)	85 (2.3%)	135 (6.2%)
Ethnic composition <sup>b</sup>									
Same-ethnic	42 (6.4%)	31 (4.9%)	167 (7.1%)	51 (4.5%)	13 (4.3%)	45 (3.5%)	92 (4.8%)	68 (2.5%)	112 (6.0%)
Cross-ethnic	41 (6.4%)	2 (4.9%)	51 (5.0%)	68 (4.3%)	8 (3.6%)	24 (4.9%)	67 (4.3%)	4 (1.3%)	22 (6.4%)
Societal status composition <sup>b</sup>									
Minority-Minority	33 (8.3%)	32 (4.7%)	3 (3.0%)	42 (4.7%)	8 (3.1%)	1 (2.0%)	9 (3.0%)	0 (0.0%)	0 (0.0%)
Minority-Majority	22 (6.9%)	1 (3.8%)	17 (3.5%)	30 (4.5%)	4 (3.6%)	17 (6.9%)	25 (3.5%)	4 (2.6%)	10 (5.8%)
Majority-Minority	19 (5.9%)	0 (0.0%)	32 (6.7%)	18 (2.7%)	4 (3.6%)	7 (2.9%)	39 (5.5%)	0 (0.0%)	12 (7.0%)
Majority-Majority	9 (3.5%)	0 (0.0%)	166 (7.2%)	29 (6.0%)	5 (10.2%)	44 (3.6%)	87 (4.9%)	68 (2.5%)	112 (6.1%)
<b>Individual level</b>									
Average indegree per child ( <i>standard deviation</i> )	2.6 (2.2)	1.3 (1.0)	3.8 (2.4)	2.3 (1.8)	2.4 (3.3)	1.3 (1.7)	2.8 (2.4)	1.4 (1.7)	2.9 (3.1)
Minimum-maximum indegree	0-10	0-4	0-11	0-9	0-16	0-8	0-11	0-7	0-13
Average outdegree per child ( <i>standard deviation</i> )	2.6 (2.1)	1.3 (4.3)	3.9 (3.6)	2.5 (3.7)	2.4 (1.7)	1.7 (1.9)	2.9 (2.6)	1.6 (1.7)	3.5 (2.9)
Minimum-maximum outdegree	0-8	0-24	0-18	0-15	0-7	0-6	0-10	0-5	0-10
Sinks <sup>c</sup>	2 (5.0%)	21 (65.6%)	7 (12.1%)	16 (29.1%)	4 (13.8%)	9 (21.4%)	6 (10.0%)	14 (23.0%)	4 (8.5%)
Sources <sup>c</sup>	7 (17.5%)	1 (3.1%)	1 (1.7%)	5 (9.1%)	5 (17.2%)	8 (19.0%)	6 (10.0%)	12 (19.7%)	4 (8.5%)
Isolates <sup>c</sup>	0 (0.0%)	3 (9.4%)	4 (6.9%)	1 (1.8%)	0 (0.0%)	4 (9.5%)	0 (0.0%)	11 (18.0%)	3 (6.4%)
Bully-victims <sup>c</sup>	31 (77.5%)	7 (21.9%)	44 (75.9%)	27 (49.1%)	20 (69.0%)	10 (23.8%)	46 (76.7%)	18 (29.5%)	28 (59.6%)

Notes. <sup>a</sup> The density is the number of nominations, relative to the total number of possible nominations, which are: 1121 = 1,570; 1151 = 992; 1171 = 3,306; 1,181 = 2,970; 1241 = 812; 1281 = 1,722; 1291 = 3,540; 2031 = 3,660; 2051 = 2,162.

<sup>b</sup> The percentages are relative to the total number of possible nominations.

<sup>c</sup> *Sinks* are actors with zero out-ties and at least one in-tie; *Sources* are actors with at least one out-tie and zero in-ties; *Isolates* are actors with zero in-ties and zero out-ties; *Bully-victims* are actors with at least one in- and out-tie.

Table 8: Distribution of the prevalence of victims and bullies across ethnic groups per classroom<sup>a</sup>

	<i>Self-reported victim<sup>b</sup></i>	<i>Nominated bully<sup>b</sup></i>	<i>Self-reported bully<sup>b</sup></i>	<i>Nominated victim<sup>b</sup></i>
1121	100.0% Christian 95.0% Moro n.a. IP	75.0% Christian 85.0% Moro n.a. IP	93.8% Christian 95.0% Moro n.a. IP	68.8% Christian 100.0% Moro n.a. IP
1151	100.0% Christian 100.0% Moro 100.0% IP	0.0% Christian 64.0% Moro 100.0% IP	0.0% Christian 28.0% Moro 0.0% IP	100.0% Christian 84.0% Moro 100.0% IP
1171	83.3% Christian 100.0% Moro 80.0% IP	79.2% Christian 80.0% Moro 60.0% IP	81.3% Christian 60.0% Moro 40.0% IP	93.8% Christian 60.0% Moro 100.0% IP
1181	81.8% Christian 100.0% Moro 72.0% IP	86.4% Christian 60.0% Moro 68.0% IP	59.1% Christian 40.0% Moro 64.0% IP	90.1% Christian 100.0% Moro 84.0% IP
1241	100.0% Christian 93.8% Moro n.a. IP	71.4% Christian 81.3% Moro n.a. IP	100.0% Christian 81.3% Moro n.a. IP	85.7% Christian 81.3% Moro n.a. IP
1281	65.7% Christian 71.4% Moro n.a. IP	68.6% Christian 71.4% Moro n.a. IP	37.1% Christian 71.4% Moro n.a. IP	57.1% Christian 57.1% Moro n.a. IP
1291	85.7% Christian 81.8% Moro 66.7% IP	76.2% Christian 63.6% Moro 66.7% IP	85.7% Christian 81.8% Moro 100.0% IP	92.9% Christian 72.7% Moro 100.0% IP
2031	61.5% Christian 0.0% Moro 100.0% IP	44.2% Christian 100.0% Moro 0.0% IP	50.0% Christian 100.0% Moro 50.0% IP	59.6% Christian 0.0% Moro 0.0% IP
2051	76.7% Christian n.a. Moro 100.0% IP	81.4% Christian n.a. Moro 75.0% IP	67.4% Christian n.a. Moro 75.0% IP	79.1% Christian n.a. Moro 75.0% IP

*Note.*<sup>a</sup> The percentages are relative to the total number of children from the specific ethnic group in the classroom.

**Appendix 2 – ERGM analyses per classroom***Table 9: Exponential Random Graph Models for bullying from the perspective of the victim per classroom: estimate (standard error)*

<i>Parameter</i>	<i>1121</i>	<i>1151</i>	<i>1171</i>	<i>1181</i>	<i>1241</i>	<i>1281</i>	<i>1291</i>	<i>2031</i>	<i>2051</i>
<b>Dyadic covariates</b>									
Minority-minority	Ref.								
Minority-majority	.16 (.17)	-1.30 (1.18)	-.02 (.70)	-.16 (.10)	.26 (.40)	1.59 (1.13)	-.25 (.14)	-.27 (.49)	3.16 (2.02)
Majority-minority	-.06 (.17)	-3.43 (3.06)	0.37 (.68)	-.07 (.09)	-.96 (.55)	1.37 (1.11)	.08 (.13)	.28 (.39)	3.48 (2.00)
Majority-majority	-.10 (.22)	4.73 (3.05)	.09 (.61)	.23 (.11)	.70 (.50)	1.64 (1.09)	.18 (.10)	-.02 (.31)	3.36 (2.00)
<b>Actor covariates</b>									
Ego gender	.06 (.24)	.13 (.21)	.33 (.16)*	-.11 (.12)	.73 (.41)	-.76 (.27)**	-.38 (.16)*	-.46 (.23)*	-.03 (.18)
Alter gender	-.42 (.24)	.07 (.13)	-.73 (.20)	-.48 (.13)**	-.91 (.36)*	-.74 (.23)**	-.37 (.15)*	-.60 (.26)*	-.15 (.10)
Ego popularity	.25 (1.82)	1.12 (.97)	.50 (.55)	.73 (.24)**	-4.04 (2.33)	.55 (.73)	.47 (.45)	-1.37 (2.09)	.29 (.52)
Alter popularity	2.97 (1.27)*	1.12 (.97)	.19 (.20)	-.11 (.39)	5.35 (1.41)**	.08 (.50)	-.45 (.49)	0.04 (1.13)	.11 (.29)
Ego friendship	8.70 (2.57)**	1.68 (1.04)	.07 (.43)	1.31 (.41)**	-.79 (3.13)	12.23 (2.65)**	3.86 (1.72)*	5.72 (2.91)	12.10 (1.93)**
Alter friendship	1.59 (1.94)	-.03 (.74)	-.63 (.41)	-.01 (.50)	7.39 (3.09)*	3.85 (1.54)*	.32 (.45)	-1.30 (2.06)	3.12 (.97)**
<b>Structural effects</b>									
In-ties spread	.78 (.25)**	1.00 (.27)**	.27 (.21)	1.30 (.24)**	.04 (.35)	.84 (.28)**	.55 (.20)**	1.23 (.27)**	1.10 (.23)**
Shared in-ties	.09 (.06)	.22 (.05)**		.10 (.02)**	-.61 (.28)*	-.35 (.14)*	.04 (.07)	-.21 (.20)	-.28 (.08)**
Isolates				1.18 (.69)		2.43 (.96)*	1.12 (.76)	1.33 (.69)	
Sinks	-1.73 (1.03)	-.77 (1.18)	1.43 (.59)*	1.15 (.54)*	.39 (1.27)	3.25 (.85)**	1.12 (.60)	.82 (.69)	3.72 (.78)**
Multiple two-paths	-.05 (.06)	.02 (.03)		-.09 (.03)**	.31 (.09)**	-.10 (.05)	-.06 (.03)	-.29 (.10)**	-.07 (.03)*
In-2-star		.16 (.02)**	.10 (.01)**				.08 (.01)**		
Transitive triangles				.53 (.12)**			.46 (.13)**	.91 (.24)**	

Note. \*  $p < .05$ ; \*\*  $p < .01$ .

Table 10: Exponential Random Graph Models for bullying from the perspective of the bully per classroom: estimate (standard error)

Parameter	1121	1151	1171	1181	1241	1281	1291	2031	2051
<b>Dyadic covariates</b>									
Minority-minority	Ref.								
Minority-majority	.12 (.17)	-1.86 (3.23)	.19 (.55)	-.42 (.17)*	-.38 (.46)	4.08 (1.96)*	.11 (.11)	-1.39 (1.27)	6.03 (.94)**
Majority-minority	.15 (.17)	-1.62 (1.85)	-.14 (.60)	-.07 (.13)	-.42 (.44)	4.43 (1.95)*	-.20 (.13)	.76 (.68)	5.82 (.94)**
Majority-majority	-.27 (.23)	3.48 (3.03)	.12 (.51)	.49 (.17)**	.80 (.45)	4.01 (1.95)*	.10 (.10)	.64 (.65)	5.88 (.93)**
<b>Actor covariates</b>									
Ego gender	.38 (.21)	.40 (.20)*	-.27 (.12)*	-.57 (.16)**	.09 (.35)	-.50 (.28)	-.47 (.17)**	-.04 (.18)	-.16 (.17)
Alter gender	-.12 (.21)	.52 (.45)	-.28 (.17)	-.55 (.21)**	-.62 (.42)	.02 (.21)	-.17 (.15)	-.54 (.22)*	-.01 (.13)
Ego popularity	-.34 (1.74)	-.72 (1.40)	-.56 (.45)	1.04 (.37)**	-.00 (1.73)	-1.09 (.97)	.18 (.41)	-.77 (1.74)	-.17 (.47)
Alter popularity	2.04 (1.34)	1.79 (1.91)	.57 (.49)	1.37 (.56)*	-.19 (2.05)	-.25 (.72)	.13 (.44)	-4.34 (2.40)	.72 (.35)*
Ego friendship	5.34 (2.23)*	1.74 (1.21)	.42 (.24)	1.22 (.49)*	17.91 (3.31)**	4.75 (2.00)*	4.01 (1.71)**	2.90 (2.40)	7.45 (1.96)**
Alter friendship	-.54 (1.95)	3.57 (2.22)	-.42 (.46)	.44 (.85)	14.37 (3.01)**	.21 (1.83)	2.42 (1.56)	4.99 (2.52)	-.70 (1.28)
<b>Structural effects</b>									
In-ties spread	.67 (.25)**	.96 (.57)	.32 (.31)	.34 (.29)	-.60 (.40)	.61 (.37)	.44 (.21)	.84 (.27)**	.63 (.28)
Shared in-ties	.14 (.05)**	.18 (.02)**	.10 (.01)**	.10 (.01)**	-.40 (.19)*	-.18 (.16)	.04 (.04)	-.07 (.15)	-.08 (.08)
Isolates			3.76 (.97)**	1.37 (.99)		2.73 (1.02)**		2.87 (.81)**	3.13 (.92)
Sinks	-1.16 (.82)	2.68 (.73)**	1.97 (.50)**	2.10 (.51)**	.85 (.88)	2.73 (.89)**	.33 (.49)	2.91 (.81)**	1.95 (.67)
Multiple two-paths	-.03 (.06)	.06 (.03)*	-.00 (.03)	-.08 (.05)	-.36 (.08)**	-.16 (.12)	-.07 (.04)	.01 (.06)	-.05 (.05)
Reciprocity			1.86 (.26)**				.83 (.37)*	1.60 (.55)**	
Transitive triangles						.94 (.28)**	.57 (.15)**		.42 (.16)*

Note. \*  $p < .05$ ; \*\*  $p < .01$ .