Transport and behaviour of water in oil paintings

Duivenvoorden, J.R.

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KNOWING ME, KNOWING YOU

Socio-Economic Status and (Segregation in) Peer and Parental Networks in Primary School

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Abstract

Students from different socio-economic status (SES) backgrounds are sorted into different schools. While integrating schools seems like an easy solution to enhancing inter-group interaction, this remains an empirical question as little is known about how networks structure along SES lines *in* schools. I examine the tendency for friendship and parental networks in primary school to structure by SES. I also explore the role of the local school context. To do so, I use multiplex classroom network data among Dutch students in 68 classrooms (55 schools) in their final year of primary school (grade 6; age 11–12). I link these sociometric data to register data and test the hypotheses using cross-sectional exponential random graph models and meta-analysis techniques. Findings show that the networks of primary school students and their parents display a tendency for same-SES over cross-SES ties, net of opportunity structures. Descriptive analyses also show SES disparities in the extent to which parents have ties with the parents of their children's friends (i.e., intergenerational closure), but these disparities disappear when controlling for other tie-generating mechanisms using ERGMs.

3.1 Introduction

Research has repeatedly highlighted the potential benefits of bringing students from different socio-economic status (SES) backgrounds together in schools. First, integrating schools may help reduce social inequality in educational outcomes, as students from less advantaged backgrounds may gain access to educational resources through relations with more advantaged peers (Crosnoe et al., 2003; Dika & Singh, 2002; Lessard & Juvonen, 2019; Van Ewijk & Sleegers, 2010). Conversely, segregated schools may amplify educational inequalities because this implies that the social capital embedded in peer relations will mostly accrue to advantaged students, thereby compounding individual resources (DiMaggio & Garip, 2012). Second, prior research recognizes the psycho-social benefits of friendships that cross social boundaries, as friendships with dissimilar others expose students to other perspectives and experiences, thereby promoting mutual understanding (Lessard & Juvonen, 2019). Cross-cutting friendships are also related to feelings of safety and fewer experiences of victimization (Graham et al., 2014), which is conducive to a classroom's social climate.

Motivated by the assumed benefits associated with (diverse) peer networks, prior research has investigated between-school segregation by socio-economic status (SES), demonstrating that students typically cluster in schools with students that are similar to themselves (e.g., Boterman, 2019; Brandén & Bygren, 2022). With this focus on between-school sorting, this strand of research has largely ignored *within-school* segregation (Engzell & Raabe, 2023) – i.e., the extent to which peer networks in school are segregated by SES. Though the level of between-school segregation is key in shaping opportunities for meeting (dis)similar others, having a demographically diverse student body does not necessarily lead to high levels of inter-group interaction. In fact, empirical research on ethnic and racial segregation has demonstrated that peer networks tend to be highly segregated, net of structural opportunities (e.g., McFarland et al., 2014; Moody, 2001; Smith et al., 2016). In other words, if networks *in* school are segregated by SES, policies aimed at reducing (the harmful effects of) social segregation by addressing between-school segregation may be less effective.

In this chapter, I examine the tendency for networks in primary schools to be structured by SES. I build on prior research in two main ways. First, a large body of research has focused on friendship formation along ethnic and racial lines in schools (e.g., Leszczensky & Pink, 2015; Moody, 2001; Quillian & Campbell, 2003; Smith et al., 2014, 2016; Vermeij et al., 2009). While friendships are recognized as a fundamental domain for stratification processes, relatively little attention has been paid to the role of SES in structuring school networks (for a notable exception, see Malacarne, 2017). Existing studies that include information on preferences for same-SES friends (e.g., Quillian & Campbell, 2003; Smith et al., 2014) feature students in secondary school,

where opportunities for meeting dissimilar others are often much lower than in primary school. Accordingly, it is far from clear how SES relates to network formation in primary schools, a context where opportunities to integrate are often present.

Second, I study not only student friendships, as most existing network studies do, but also parental ties in schools. In the educational context, a crucial form of social capital is intergenerational closure (IC) – i.e., relationships among parents whose children are friends. IC is theorized to enhance the spread and enforcement of pro-school norms and resources available in the network (Coleman, 1988; Geven & Van de Werfhorst, 2020). Apart from these educational benefits, relations are embedded in a larger (intergenerational) network ecology (McFarland et al., 2014; Windzio & Heiberger, 2024), and ties between students whose parents are also in contact may be more sustainable over time (Cartwright & Harary, 1956). It is important to study student friendship networks alongside parental networks: while the two are interrelated, they are also fundamentally different. In other words, the costs of overcoming social boundaries depend on the type of relation: whereas children meet daily at school, relations among parents arguably require a more active effort to establish and maintain (Hunter et al., 2012; Leszczensky & Pink, 2015; Windzio & Bicer, 2013).

Aside from describing within-school segregation, I provide additional analyses to tentatively explore potential explanations for these patterns. More specifically, I consider ongoing debates on the role of freedom of school choice in segregation. There is a widespread belief that parental freedom in school choice reinforces inter-group segregation. However, reducing parental school choice may also enhance tendencies for same-SES ties *in* school. Hence, I explore whether the studied network processes are contingent on local opportunities and parental strategies for primary school choice.

I use newly collected data on multiplex classroom networks of Dutch grade 6 students in 68 classrooms (1,416 students, 55 schools). I examine potential SES homogeneity in student friendship and parental contact networks at a crucial transition point in students' educational career – just before they are allocated to different ability tracks in secondary school. These sociometric data are linked to rich register data on parental SES, spatial proximity between classmates' home addresses, and the local school context. I test my hypotheses using exponential random graph models (ERGMs) and meta-analysis techniques.

3.2 Background and Theory

3.2.1 Student SES and Friendship Formation

School is arguably the most important context for children to form friendships. Generally, three main mechanisms are theorized to drive friendship formation: *(i)* propinquity (opportunity structure), *(ii)* homophily (preferences), and *(iii)* relational mechanisms (balance, transitivity, third party effects).

Opportunities to meet, and form friendships with, peers from dissimilar SES backgrounds are impaired by residential segregation, and differences in school choice by SES (*propinquity*) (Boterman, 2019; Denessen et al., 2005). Aside from these structural opportunities, students tend to prefer friendships with peers who are like them and to distance themselves from dissimilar others (*homophily*). The core arguments for homophilic preferences are that sharing features facilitates a sense of familiarity and joint understanding, eases communication, helps maintain a positive self-concept, and reduces uncertainty and conflict (McFarland et al., 2014; McPherson et al., 2001). In other words, interactions with similar others require less time and effort and are more rewarding (Leszczensky & Pink, 2015).

Several related mechanisms can underlie SES homophily in student friendships. First, social identity concerns may play a role. Compared to gender, ethnicity, or race, there are fewer explicit markers through which SES is made salient to children in everyday life. Nonetheless, from a young age onward, children seem capable of *(i)* making global SES distinctions based on wealth markers, and *(ii)* linking (in)favorable stereotypes, such as working hard or being lazy, to SES background (Mistry et al., 2015; Vandebroeck, 2021; Weinger, 2000). Accordingly, children may notice how their housing, clothing, and possessions match, or differ from, those of classmates during play dates, birthday parties, or other interactions, and this may affect whom they identify with most. Second, SES homophily may be a "by-product" of homophily regarding features that correlate with SES, such as lifestyles, norms, values, achievement, or educational aspirations (see Smith et al., 2014, for an application of this hypothesis for ethnic homophily). Third, SES homophily may be an indirect consequence of shared experiences and contexts. Even if students from different backgrounds attend the same school and have opportunities to meet, same-SES students are likely to spend more time together, inside and outside of school. In school, teachers can use forms of within-class ability grouping where students are streamed to homogeneous ability groups to tailor instruction. Such organizational factors may restrain cross-SES interactions, as SES is related to academic performance (Hallinan & Smith, 1989). Outside school, same-SES students may be more likely to live close to each other

(Kruse et al., 2016) and (therefore) engage in the same leisure activities or attend the same clubs (Hjalmarsson & Mood, 2015; Smith et al., 2014).

In addition to structural opportunities and homophily, the structure of preexisting relations affects the creation of new ones. In particular, the tendency to reciprocate friendships (mutuality) and the pressure for friends of friends to become friends (transitivity) amplify potential SES homogeneity in student friendships (McFarland et al., 2014). Furthermore, third parties, such as parents, (in)directly affect children's peer relations. Children are socialized with out-group attitudes at home. Parents can also interfere in peer relations by prescribing norms that (dis)approve of relations with members of certain groups, or by directly affecting children's opportunities to spend time with (dis)similar peers (Smith et al., 2015). Social background is one of the factors that (in)directly affects parental approval of children's peers, potentially also because parents prefer their children to play with children of parents with similar norms, values, and parenting styles.

While homophilic preferences may apply to all parents, (active) interference in children's friendships may be more prevalent among parents from advantaged backgrounds. Scholars suggest that high-SES parents are typically actively involved in settings where their children interact with peers to limit exposure to what they view as less desirable activities or peers. Conversely, low-SES parents tend to grant children more autonomy in how, and with whom, they spend time (Fletcher et al., 2006; Hunter et al., 2012; Lareau, 2011).

There is empirical evidence showing that children, confronted with hypothetical examples of potential friends, are most likely to prefer to befriend (imagined) same-SES peers (Weinger, 2000). Most network studies using observational data focus on ethnic homophily in secondary school and only include parental SES as a control variable. These studies typically show that SES similarity plays some role in friendship formation, but that preferences for same-SES ties are weaker than for same-ethnic ties (Quillian & Campbell, 2003; Smith et al., 2014). However, these studies are executed in contexts with high levels of between-school segregation (i.e., the U.S. or countries with between-school ability tracking in secondary school), reducing opportunities for cross-cutting SES ties and making SES differences less salient. I hypothesize the following:

> **Hypothesis 1 (H1)** *(a) Primary school students display a tendency to befriend same-SES classmates, net of opportunities, and (b) this effect is stronger among higher SES students.*

3.2.2 Parental Networks and (SES Disparities in) Intergenerational Closure

Student friendship relations are embedded in a larger (intergenerational) network ecology (McFarland et al., 2014; Windzio & Heiberger, 2024). Parental networks in primary schools likely also segregate by SES, because parents also display a homophilic preference to connect with others that share certain demographic, behavioral, or status attributes (McPherson et al., 2001). Crossing SES boundaries may even require more effort for parents than for their children. While children in the same classroom meet daily for several consecutive hours, parents may only shortly cross paths when picking up children or arranging play dates. Hence, compared to students, crossing social boundaries and building relations with (dis)similar others in schools may be more "costly" for parents (Leszczensky & Pink, 2015; Windzio & Bicer, 2013). As described in the previous section, forming and maintaining connections with other parents may even be a strategy for parents to monitor (the friendships of) their children. As high-SES parents tend to play a more active role in this than low-SES parents, I again expect SES differences in the strength of homophilic tendencies in these networks:

> **Hypothesis 2 (H2)** *(a) Parents display a tendency to associate with same-SES parents of children's peers, net of structural opportunities, and (b) this effect is stronger among higher SES parents.*

In addition to potential segregation in parental networks, it is important to study the interlinkages between student friendship and parental ties. Peer relations are arguably especially beneficial for educational success if ties are "closed" at the parental level (i.e., closure relationships, see Fletcher et al., 2006; Hunter et al., 2012; Windzio & Heiberger, 2024). Intergenerational closure (IC) is argued to function as a source of social control, and creates a "norm-enforcing" environment: when parents know the parents of their children's peers, it is easier to monitor and guide children's behavior. Additionally, IC promotes the spread and exchange of information that is available in the network (Coleman, 1988; Geven & Van de Werfhorst, 2020), such as parenting advice, help with childcare, and information on children's school matters (Cox et al., 2021). Apart from these educational benefits, friendship ties that are embedded in parental networks may be more sustainable: from a structural balance perspective (Cartwright & Harary, 1956), ties between students whose parents are also connected (either before or after the children became friends), may be less likely to dissolve over time.

Peer networks of higher SES children arguably enjoy higher levels of IC. Parental school involvement tends to vary along SES lines (Lareau, 2011). In particular, higher SES parents are more likely to be in contact with teachers, volunteer at school, and be active in parent-teacher organizations. These activities provide ample opportunities to connect with the parents of children's school peers. While lower SES parents ascribe

similar importance to education, levels of school-based involvement are typically lower (Bakker et al., 2007; Horvat et al., 2003; Kelly, 2004; Li & Fischer, 2017; Ream & Palardy, 2008). This may result in weaker network integration.[1] As described, higher SES parents are also often actively involved in settings where their children interact with peers, which may cause them to meet each other while "surveilling". Accordingly, I expect the following:

> **Hypothesis 3 (H3)** *Peer networks of higher SES students enjoy higher levels of intergenerational closure.*

3.2.3 The Dutch Case

I study the tendency for peer and parental networks in primary school to structure by SES in the Netherlands. Primary education starts at age 4 (and is compulsory from age 5), and students attend primary school for eight years. I focus on students in the final grade (Dutch group 8; international grade 6). Most primary schools are small and only have one or a few classes in the same grade level, implying that students and their parents will likely know each other for years, if only by face or name. While social ties are subject to change, they have had time to develop.

Freedom of education is a constitutional right, resulting in a diverse educational landscape with a large share (70%) of state-funded "private" schools based on religious or pedagogic principles and a high degree of parental freedom in choosing a school. As both public and private schools receive state funding, financial resources play a marginal role in access to education. Catchment areas do not constrain school choice: families can, in theory, choose any school, though proximity remains important (Borghans et al., 2015).[2] Due to the country's high population density, it is often possible to choose a school among several alternatives without moving, making residential relocation less common compared to other countries (Boterman, 2021). Home–school distances are short, and most students walk or bike to primary school (Goeverden & Boer, 2013). The students in this sample lived on average 362 meters from the closest school (284 meters in strongly urbanized areas, 420 meters in rural areas), and the median distance to the chosen school equals approximately 570 meters in both urban and rural areas. While most families, even in more rural areas, have multiple primary schools to choose from, the available options naturally vary both in terms of quantity (i.e., the number of schools families can realistically pick) as well as the (diversity in) student populations. In

[1] This relationship is arguably bidirectional as better integration in parental networks may also contribute to higher levels of involvement (Sheldon, 2002).

[2] Some primary schools in cities experience over-subscription problems. Allocation procedures in such cases vary across municipalities (e.g., priority rules based on proximity, (pre-)registration). Higher SES parents, in particular, use this freedom of choice to avoid schools with a large share of disadvantaged students (Boterman, 2013; Karsten et al., 2003). They are better equipped at navigating the school choice process, including potential over-subscription issues, to ensure that their children end up at the preferred school.

urban areas, it is typically possible to select a school from a wide range of alternatives, while school choice is more restricted in rural areas. Furthermore, primary schools in cities tend to be more polarized in terms of SES composition, whereas suburban areas have more mixed schools (Boterman, 2021).

3.3 Data and Methods

3.3.1 Data

I use data from the transition from PRIMary to Secondary education (PRIMS) project, including information on classroom networks of students in their final year of primary school (grade 6; age 11-12) (for more information, see Zwier, Lorijn, et al., 2023). I enrich these data with information from the Dutch registers on, i.a., family background. Data were collected in January–February 2020 (Cohort 1, Wave 1 [C1W1]) and February–March 2021 (Cohort 2, Wave 1 [C2W1]). The cohorts are pooled to have a larger sample at the classroom level. Students filled out the web-based survey, which took approximately 45 minutes, during regular school hours under teacher supervision.[3] The research team monitored the process, and offered support through phone or e-mail to ensure smooth administration of the survey.

PRIMS applied a two-stage sampling procedure. First, primary schools were sampled from a national (stratified) sampling frame. Larger schools and schools with a greater share of students from socio-economically disadvantaged backgrounds had a higher chance of being selected. This resulted (for both cohorts) in a sample that is representative at the school level regarding region, level of urbanization, SES composition, denomination, and the track recommendations students receive. Second, all grade 6 students were invited to participate in the survey.[4] In both cohorts, about 63% of the students were granted active parental consent, yet response rates considerably varied between classrooms (range: 13.6–100%). The pooled data set includes 3,033 students (C1W1: 1,474 students, 105 classrooms, 66 schools; C2W1: 1,643 students, 111 classrooms, 79 schools), of which 2,986 (98.5%) could be successfully linked to their personal identifier in the registers.[5]

For the purpose of this study, classrooms are selected with *(i)* a response rate of at least 70%, *(ii)* at least 15 students with no missing data on all variables of interest, and

[3] As schools were closed for in-person education due to the COVID-19 pandemic from 16 December to 8 February 2021, C2 schools were offered to have students fill out the survey at home, but most students (95.6%) did not.

[4] In multi-grade classrooms, where grade 6 students shared a classroom with grade 5 and/or grade 4 students, all students were invited to ensure a better representation of classroom networks.

[5] All C1 schools were invited to stay in PRIMS; 25 schools participated in both cohorts. For this reason, a small share of students (2.8%) who were in grade 4 or 5 in 2019/20 or who repeated a grade participated in both surveys.

(iii) no more than two students who (were) never nominated in any of the sociometric questions. These selections are necessary to represent the network structure accurately and to avoid convergence issues, and they are similar to those applied in prior studies (Huitsing et al., 2012; Kruse & Kroneberg, 2019; Kruse et al., 2016; Smith et al., 2016). This results in an analytical sample of 68 classrooms (1,416 student observations, 55 schools).[6] The classrooms included in the analytical sample do not significantly differ from those excluded in terms of school size and the level of urbanization, but classrooms with an advantaged student population are slightly over-represented (for more details, see Tables B.1–B.2 in Appendix B).

3.3.2 Main Measures

Networks. Students were provided with a roster showing all classmates' names. They were allowed to nominate an unlimited number of classmates, and could tick a "Nobody" box if a question did not apply to any of them. They could also nominate classmates who did not participate but these ties were dropped, as data on student attributes is missing for non-participating students. Friendship ties are measured with the item "Which classmates are your best friends." Parental contacts are measured with the item "Whose parents do your parent(s)/caregiver(s) occasionally talk to?". Following Windzio and Heiberger (2024), I conceptualize directed ties that co-occur between both networks as IC. See Figure 3.1 for a graphical illustration of the networks for one classroom.

Socio-economic status. I measure parental SES with information on parental education and household income from the registers. *Parental education* is measured as the highest non-missing educational degree among both registered parents. I distinguish between students with at least one tertiary-educated parent (ISCED 5–8) and students without tertiary-educated parents (ISCED 0–4).[7] *Household income* is measured as disposable (equivalized) household income. Household income is corrected for household size and composition using the empirically grounded equivalence scale of Statistics Netherlands. I take the natural logarithm to correct for right-skewness. In case registered parents

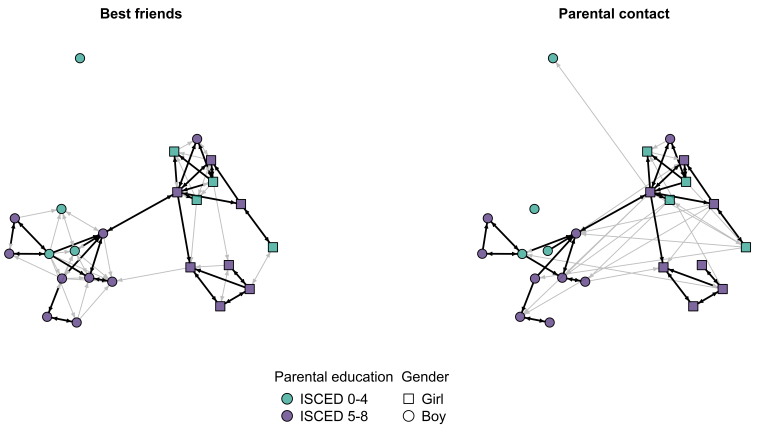
[6] The sample size in the analyses varies depending on the SES indicator. Information on parental education is missing for more students than household income (see Subsection 3.3.2). Additionally, ERGMs cannot be estimated if in- or out-group nominations for categorical features are not present. I only keep classrooms with at least two students with tertiary-educated parents, and two students without tertiary-educated parents in models for parental education. The sample includes 61 classrooms (1,259 student observations, 50 schools) for parental education and 68 classrooms (1,403 student observations, 55 schools) for household income.

[7] Educational attainment has been centrally registered for university programs since 1983 (*wo*) and for universities of applied sciences since 1986 (*hbo*). Educational attainment has not been centrally registered for other post-secondary programs. Hence, if information on parental education was missing and a student's parents were born in the Netherlands after 1966, I assumed that a student's parents likely did not finish tertiary education. I recoded these cases to ISCED 0–4 to reduce the share of missing information, and increase the sample at the classroom level.

were separated, divorced, or not living together for other reasons, I select the household income of the parent with whom the child was living.

Table 3.1 displays descriptive statistics of all variables. The measurement of student-level control variables (gender, grade, migrant background) can be found in Table 3.2.

Figure 3.1: Example of (co-occurrences between) student friendship and parental contact networks for one classroom.



Source: PRIMS (C1W1 and C2W1), and CBS microdata.
Note: Closure relationships (i.e., directed ties that co-occur between friendship and parental networks) are in black.

Table 3.1: Descriptive statistics.

	M	*SD*	*N*
Female *(ref. = male)*	0.49		1,416
Grade			
Grade 4	0.02		1,416
Grade 5	0.10		1,416
Grade 6	0.88		1,416
Parental education *(ref. = ISCED 0–4)*	0.53		1,358
Equivalized household income	36568.71	19201.80	1,403
Minority background *(ref. = majority)*	0.11		1,416

Source: PRIMS (C1W1 and C2W1), and CBS microdata.

3.3.3 Methods

I use a two-step procedure to test the hypotheses. First, I estimate cross-sectional directed exponential random graph models (ERGMs) to identify the importance of certain tie-generating mechanisms for friendship and parental networks in each class (Lusher et al., 2013). ERGMs model the probability that a network is observed as a function of tie configurations. To test how important tie-generating mechanisms are for the overall network, ERGMs compare the prevalence of a tie configuration in the empirical network to its prevalence in a series of simulations. Estimated parameters indicate the extent to which a tie configuration is more or less likely to occur than expected by chance, given all structures specified. This method enables me to examine SES homophily in student friendship and parental contact networks, net of structural opportunities to form ties, and network-endogenous mechanisms that are controlled for. Second, I use meta-analysis techniques to combine estimates across classrooms (Snijders & Baerveldt, 2003).[8]

For every class, I estimate multiple specifications for both SES indicators (see Table 3.2 for an overview). The set-up slightly differed depending on (the measurement level of) the SES indicator included. Given the association between both SES indicators, they are not included in the same model. All models control for other tie-generating mechanisms identified as important in prior research, such as mutuality, transitivity, and homophily by gender. The first two specifications assessed H1 and H2, and are estimated for both student friendship and parental contact networks. I capture homophily based on household income (Model 1a) with a term accounting for the *absolute difference in household income* between ego and alter, and homophily based on parental education with a term capturing the tendency to associate with alters with the *same parental education* (Model 1b). I estimate SES differences in SES homophily by *(i)* including an interaction between household income (sender) and the difference in household income (Model 2a); and *(ii)* estimating differential homophily parameters for both parental education categories (Model 2b). Since residential areas are segregated, and this may (partly) explain SES homophily (Kruse et al., 2016), I conduct supplementary analyses where I control for the spatial proximity between classmates' home addresses.

The last two models assess (SES disparities in) IC. In Model 3, I add the edge covariate of whether a tie exists among parents as a predictor for friendship networks to Model 1 (see also Windzio & Heiberger, 2024). The higher this coefficient, the more co-occurring ties between student and parental networks. Note that this estimate cannot inform us about the order in which co-occurring ties were created: children may become friends because their parents know each other, yet parents may also get to know each other

[8] All analyses were conducted in R 4.0.5. I used the "ergm" package (4.0.1) to estimate the ERGMs (Handcock et al., 2021; Hunter et al., 2008; Krivitsky et al., 2023), "metafor" (3.0-2) for the meta-analyses (Viechtbauer, 2010), and "ergMargins" (0.1.3) to calculate average marginal effects (Duxbury, 2021).

because their children are friends. Yet, irrespective of these dynamics, which I could not study with these cross-sectional data, higher coefficients indicated a stronger tendency towards IC. To test for SES disparities in IC (H3), I include an interaction between household income (sender) (Model 4a) or parental education (sender) (Model 4b) on the one hand, and parental ties on the other.[9]

I present estimates as average marginal effects (AMEs), as proposed by Duxbury (2023), because conventional ERGM coefficients suffer from scaling issues that are well known in the context of other nonlinear probability models (see Mood, 2010). AMEs are robust to scaling and comparable across different model specifications. Furthermore, AMEs offer a more intuitive interpretation of effect sizes than logistic estimates: AMEs can be interpreted as the absolute change in the probability of observing a tie with each one-unit change in a covariate. As AMEs are still relatively new in the context of ERGMs, I also present the main results in terms of logistic estimates in Appendix B.

The AMEs form the input for univariate random effects meta-analyses to test the hypotheses across classrooms. This method weighs lower-level estimates (AMEs) by their inverse standard errors so that classes with more precise estimates contribute more to the averaged estimates.[10] Only class-specific estimates where the estimation turned out successful in terms of convergence and model fit were included in the meta-analyses. If the model did not converge well, I reran it until all t-ratios for convergence are below |0.1| (Robins et al., 2009).[11] I examine goodness of fit (GOF) regarding edgewise-shared partners, indegree, outdegree, and geodesic distances. GOF-ratios with values below |2| indicate satisfactory fit (Robins et al., 2009). If less than 80% of the classroom's GOF-ratios met this criterion, the classroom is excluded. Finally, I drop classrooms with logistic coefficients or standard errors exceeding |10| or |5|, respectively, as this suggests that the model does not fit the observed network, or that the classroom is a strong outlier (Kruse et al., 2016; Smith et al., 2016). See Table B.3 in Appendix B for the number of excluded classrooms for each criterion per model.

[9] I do not formally model friendships and parental ties simultaneously. Due to the increased complexity and methodological challenges, empirical studies estimating ERGMs on multiplex networks are scarce (notable exceptions include Huitsing et al., 2012; Oldenburg et al., 2018; Rambaran et al., 2022), and packages to implement such methods were not available on CRAN at the time these analyses were conducted.

[10] Other scholars (e.g., Kruse & Kroneberg, 2019; McFarland et al., 2014) have used multivariate meta-analyses to account for the interdependencies between estimates in each network (for more information, see An, 2015b). Since I do not apply a universal model set-up, I opted for univariate meta-analyses instead.

[11] I re-estimate the model until all estimates fulfilled this criterion, while using the values of the previous run as initial values. I apply a set-up with a Markov chain Monte Carlo (MCMC) burn-in of 15,000, a MCMC sample size of 30,000, and a maximum of 10 iterations. The MCMC burn-in and sample size are increased with a factor of 1.5 (run 2–5), and 2 (run 6–10) in repetitions. If at least one of the t-ratios still exceeds |0.1| after 10 runs, the classroom is dropped from the meta-analysis.

Table 3.2: Overview ERGM terms in main model specifications.

Term	Description	Model 1	2	3	4
1. Structural network features					
Edges	Baseline density, functions as intercept in ERGM.	×	×	×	×
Mutual	Tendency to reciprocate nominations (mutuality).	×	×	×	×
GWESP	Geometrically weighted edge-wise shared partner. Tendency to nominate the tie of a tie (transitivity) with decreasing marginal returns; i.e., the more shared ties, the smaller the effect of each additional shared tie on tie formation.	×	×	×	×
2. Household income (HI)					
HI sender	Sociality based on household income.	×	×	×	×
HI receiver	Popularity based on household income.	×	×	×	×
Abs. difference HI	Tendency to associate with (parents of) peers with dissimilar household income.	×	×	×	×
HI sender × diff. HI	SES disparities in homophily by household income.				×
3. Parental education (PE)					
PE sender	Sociality based on parental education.		×		××
PE receiver	Popularity based on parental education.		×		××
Same PE	Tendency to associate with (students with) parents with similar education.		×		××
Same PE: ISCED 0–4	SES homophily among (students with) non-tertiary educated parents (differential homophily).				×
Same PE: ISCED 5–8	SES homophily among (students with) tertiary-educated parents (differential homophily).				×
4. Intergenerational closure					
Parental tie	Tendency towards intergenerational closure, edge covariate of whether a tie exists among parents.				××
HI/PE sender × parental tie	SES disparities in tendency towards intergenerational closure.				×
5. Nodal attribute controls					
Same gender	Tendency to associate with (parents of) same-gender peers. Student gender is measured with a dummy (female = 1).	×	×	×	×
Same grade[ac]	Tendency to associate with (parents of) grademates. Grade is measured as grade 4 (group 6 in the Dutch educational system), grade 5 (group 7), or grade 6 (group 8).	×	×	×	×

Table continued on next page.

Table 3.2 Continued.

Term	Description	Model 1	2	3	4
Same mig. background[bc]	Tendency to associate with (parents of) peers with a similar migration background. Migration background is derived from the registers. I make a broad distinction between "majority" and "minority" backgrounds as there is not enough variation in ethnic origin in the sample to consider students from different origin countries separately. Children are coded to have a "majority" background if they and their parents are born in the Netherlands, or immigrated from another European country (excl. Turkey), the United States, Oceania, Indonesia, or Japan. This is done as children from these origin countries are considered more similar to children without a migration background than students from other countries (Vermeij et al., 2009). If at least one parent is born in another origin country, students are coded to have a "minority" background.	×	×	×	×

Note:

[a] Only included in multi-grade classrooms (N = 15).

[b] Only included in classrooms that are not too homogeneous in this respect (i.e., at least two students with a "minority" background; N = 40).

[c] If the model does not converge or GOF-statistics indicate unsatisfactory fit when including these terms, I include the results based on a more parsimonious model (excl. these terms) in the meta-analysis.

3.4 Results

3.4.1 Descriptive Results

Table 3.3 presents descriptive statistics of the two types of networks, summarized over all classrooms. The average number of participating students per classroom equals 20.8 ($SD = 3.9$). On average, students (are) nominate(d) by 8.7 classmates as best friends, and 65% of all nominations are reciprocated. Students indicate that their parents are, on average, in contact with 7.6 parents. The average density of the parental networks (0.19) is relatively high, compared to prior research using child-report information on parental networks in primary school (0.04) (Windzio & Heiberger, 2024).[12] Both types of networks have relatively few students who are neither nominated by classmates

[12] This may be explained by subtle differences in question wording, tapping into parental ties of different strength. I ask "Whose parents do your parent(s)/caregiver(s) occasionally talk to?", while the study by Windzio and Heiberger (2024) asks "Do your parents know other classmates' parents (so that they sometimes meet up or phone)". The latter is similar to the question in the Children of Immigrants Longitudinal Survey in Four European Countries (CILS4EU), showing that parental networks in secondary school (where

nor nominate any classmates themselves (isolates). Parental contact networks have a relatively high share of sinks (i.e., students indicating that their parents are not in contact with other parents, though they receive nominations on this item by classmates).

Figure 3.2 displays descriptive statistics on the share of co-occurrences between friendship and parental ties among all students, and separated by parental education. On average, for 52% of the outgoing friendship ties children indicate that their parents are connected with the parents of the nominated peer. The mean share of co-occurrences is higher among children with tertiary-educated parents (55%) than children without tertiary-educated parents (47%). Among students from advantaged backgrounds, same-SES ties enjoy higher levels of IC than cross-SES ties (60% versus 49%). Such a pattern is not observed among students from more disadvantaged backgrounds (44% versus 47%). Overall, these descriptive results align with my expectations, as they point toward a substantial overlap between friendship and parental ties, and potential SES disparities in IC.

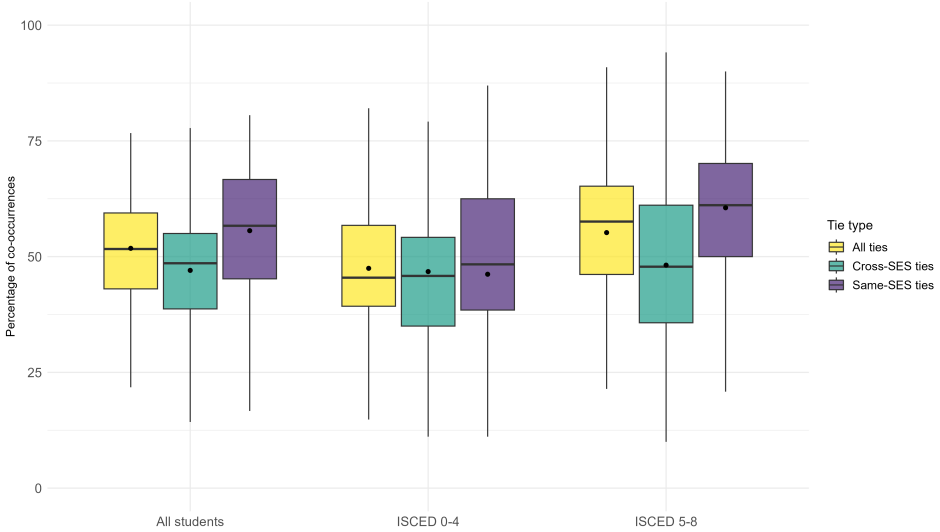
Table 3.3: Descriptive statistics friendship and intergenerational classroom networks.

	Friendships		Parental contact	
	M	*SD*	*M*	*SD*
Density indicators				
Number of ties	91.94	33.57	81.01	38.82
Density	0.22	0.06	0.19	0.07
Degree	8.70	2.22	7.63	2.93
SD in-degree	2.02	0.49	2.05	0.60
SD out-degree	2.61	0.85	3.12	1.25
Dyadic and triadic indicators				
Number of mutual ties	29.87	10.29	21.56	11.13
Number of asymmetric ties	32.21	15.54	37.90	20.39
Reciprocity	0.65	0.07	0.53	0.11
Transitivity	0.50	0.10	0.35	0.11
Students				
% Isolates	0.84	1.94	3.63	6.08
% Sinks (zero out-degree)	3.12	3.42	15.14	9.54
% Sources (zero in-degree)	2.85	3.36	7.52	9.18

Source: PRIMS (C1W1 and C2W1), and CBS microdata.
Note: 1,416 students, 68 classrooms, 55 schools. Reciprocity is measured as the ratio of the number of (directed) reciprocated ties to the total number of tie, transitivity as the number of transitive triplets divided by the number of two-paths.

opportunities for parents to meet each other are lower than in primary school) have a mean density between 0.07 and 0.12, depending on the academic track, in the Netherlands (see Geven & Van de Werfhorst, 2020, p. 47).

Figure 3.2: Boxplot mean co-occurrences between friendship and intergenerational ties.



Source: PRIMS (C1W1 and C2W1), and CBS microdata.
Note: These statistics are averaged over the sub-sample of 61 classrooms (1,259 student observations) that are included in the ERGMs for parental education.

3.4.2 SES Homophily in Student and Parental Networks

Table 3.4 presents the results of univariate meta-analyses of various ERGM set-ups (in AMEs; for logistic estimates, see Table B.4 in Appendix B). Model 1 is used to assess the general tendency for ties between students or parents of similar SES background while controlling for other tie-generation mechanisms (H1a–H2a). For student friendships, the significant negative AME for household income difference suggests that students from dissimilar SES backgrounds are less likely to be friends: an increase of $1SD$ in household income difference, reduces the tie probability by -0.67 percentage points (see Model 1a). Similarly, the positive coefficient for same parental education suggests that students from similar SES backgrounds tend to connect: compared to a cross-SES tie, a same-SES tie is 1.27 percentage points more likely (see Model 1b).[13] Given that students nominate 22% of their classmates as friends on average (see Table 3.3), this effect is not negligible. These results are consistent with H1a. Parental ties are more strongly driven by homophily with respect to SES (H2a): parents who differ less in

[13]A formal test for moderation using AMEs is the second difference approach (Duxbury, 2023). Empirical studies using this approach for pooled networks using meta-analyses did not exist when this study was conducted, so I focus on interaction coefficients instead. Second differences of aggregated AMEs yield the same conclusions. For example, additional calculations suggest that the aggregated sender effect of parental education is -2.49 for low-SES alters, and -1.33 for high-SES alters. The second difference is 1.16, indicating high-SES/high-SES friendships are 1.16 percentage points more likely than high-SES/low-SES friendships.

Table 3.4: Results univariate meta-analysis ERGMs, SES homophily.

	Friendships				Parental contact			
	(1)		(2)		(1)		(2)	
	AME	I^2	*AME*	I^2	*AME*	I^2	*AME*	I^2
a. Household income								
Mutual	17.14***	33.0	16.92***	79.8	15.54***	32.2	13.99***	64.7
	(0.69)		(0.87)		(0.73)		(0.86)	
GWESP	6.57***	58.6	6.25***	74.3	5.78***	58.3	5.46***	73.0
	(0.46)		(0.49)		(0.43)		(0.48)	
Same gender	12.16***	72.7	12.42***	80.0	7.81***	48.0	6.94***	62.8
	(0.70)		(0.79)		(0.44)		(0.47)	
Same grade	6.33***	71.6	5.93***	69.5	5.89***	40.6	5.03***	42.7
	(1.25)		(1.14)		(0.91)		(0.58)	
Same mig. bg.	1.08*	38.0	1.17**	30.3	2.58***	46.4	2.69***	38.6
	(0.47)		(0.44)		(0.54)		(0.47)	
HI receiver	1.69***	53.0	1.89***	56.7	1.77***	56.9	1.54**	57.8
	(0.46)		(0.57)		(0.53)		(0.56)	
HI sender	−1.14+	69.6	−1.92*	54.1	−0.64	71.6	−0.60	56.4
	(0.60)		(0.92)		(0.73)		(0.94)	
Distance HI	−0.67*	37.0	−0.80*	46.8	−1.37***	48.1	−1.07**	42.3
	(0.29)		(0.37)		(0.40)		(0.36)	
HI sender × Distance HI			0.14	45.3			−0.09	32.5
			(0.27)				(0.44)	
$N_{classes}$	56		56		56		57	
b. Parental education								
Mutual	17.14***	42.5	16.36***	44.7	16.10***	43.0	15.40***	43.7
	(0.80)		(0.81)		(0.84)		(0.85)	
GWESP	6.57***	45.0	6.96***	52.4	5.92***	65.6	6.01***	66.5
	(0.43)		(0.47)		(0.51)		(0.53)	
Same gender	11.64***	69.0	11.57***	68.2	7.57***	53.4	7.66***	53.3
	(0.73)		(0.71)		(0.49)		(0.50)	
Same grade	7.10***	77.3	7.34***	77.3	5.55***	52.2	5.62***	51.5
	(1.70)		(1.73)		(1.10)		(1.11)	
Same mig. bg.	1.08*	28.1	1.15*	27.2	2.85***	55.6	2.96***	56.5
	(0.46)		(0.48)		(0.75)		(0.80)	
PE receiver	2.00***	40.4			1.35+	59.9		
	(0.54)				(0.72)			
PE sender	−2.67***	57.3			−1.40	74.1		
	(0.68)				(1.00)			
Same PE	1.27***	26.9			2.20***	28.1		
	(0.33)				(0.38)			
Same PE: low/medium			1.22***	-4.3			1.62***	12.8
			(0.35)				(0.34)	
Same PE: high			0.86*	32.1			2.17***	38.1
			(0.41)				(0.47)	
$N_{classes}$	44		44		49		47	

Source: PRIMS (C1W1 and C2W1), and CBS microdata.

Note: AMEs and standard errors are multiplied by 100 to facilitate interpretation. All models control for the baseline density (edges term) (not included in table). Household income is mean-standardized. I^2 indicates the share of variability attributable to variation between networks rather than sampling error. Same grade and same mig. bg. terms are included for part of the classrooms (see Table 3.2), so $N_{classes}$ does not reflect the number of classes for which these terms are included. $^{+}p < .10$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

terms of household income ($AME = -1.37$, $p < 0.001$) or have a similar educational background ($AME = 2.20$, $p < 0.001$) are more likely to connect. Considering the mean density of 0.19, these effects are substantial in size.

Model 2 tests for SES differences in the strength of SES homophily (H1b–H2b). For both the friendship and the parental network, I find no significant interaction between a student's household income (sender) and household income difference (friendships: $AME = 0.14$, $p > 0.10$; parental contact: $AME = -0.09$, $p > 0.10$, see Model 2a). This suggests that the level of SES homophily (measured by household income) does not vary depending on household income. In Model 2b, I estimate differential homophily coefficients for educational categories. These results suggest that highly educated parents are slightly more likely to associate with parents from similar SES backgrounds than low/medium educated parents ($AME_{low/medium} = 1.62$, $p < 0.001$; $AME_{high} = 2.17$, $p < 0.001$), while the reversed pattern is found in friendship networks ($AME_{low/medium} = 1.22$, $p < 0.01$; $AME_{high} = 0.86$, $p > 0.10$). Note, however, that differences in these mean AMEs are small. Altogether, these results do not provide support for H1b-H2b.

Results for the control variables are consistent with other network studies (e.g., Kruse & Kroneberg, 2019; McFarland et al., 2014). In both types of networks, I observe a tendency for mutuality and triadic closure, as indicated by the positive and significant mutual and GWESP parameters. As shown by the positive same gender coefficients, students are more likely to befriend same-gender classmates, and parents of same-gender students are more likely to be in contact. I also find evidence for homophily by migration background and grade (in multi-grade classrooms). Finally, household income and parental education are associated with a lower out-degree (negative sender effect) and a higher in-degree (positive receiver effect) in most specifications, implying that students from higher SES backgrounds receive more (friendship) nominations and send less.

Results for SES homophily may be (partly) explained by spatial proximity. Because neighborhoods are segregated by SES, same-SES classmates may live closer to each other than to dissimilar others. As mentioned in the theory section, these recurrent opportunities to connect and spend time together can increase chances of friendship ties (Kruse et al., 2016). Similarly, parents who live in the same neighborhood may also have more low-stakes opportunities to connect, for example, at sport clubs or during grocery shopping. To assess if this neighborhood propinquity effect (partly) drives SES homophily, I run supplementary analyses including an edge covariate measuring the straight-line distance between the home addresses of ego and alter to Model 1.[14] As travel distances are generally short (median = 0.87 km, $SD = 2.03$), the neighborhood

[14] Missing values on spatial proximity (1.0%) are imputed with the classroom mean.

propinquity effect is arguably local and non-linear (i.e., travel distance may matter less as students live further away from each other). To account for such non-linearities, I also add a quadratic term.

As expected, the results (see Table B.5 in Appendix B) show that students living further away from each other, are less likely to become friends (see Model 1a; $AME = -0.85$, $p < 0.05$). Furthermore, I find a negative neighborhood propinquity effect in parental contact networks that becomes significantly less negative at further travel distances (see Model 1a; $AME = -1.37$, $p < 0.001$). Accounting for spatial proximity, the results for homophily by parental education remain virtually unchanged. The AMEs for homophily by household income decrease in size (friendships: $\Delta_{AME} = -27\%$; parental contact: $\Delta_{AME} = -15\%$) but remain negative. Together, this suggests that the neighborhood proximity mechanism is more important for explaining homophily by household income than by parental education, and cannot (fully) explain homophilic tendencies by SES in friendship and parental networks.

3.4.3 SES and Intergenerational Closure

I study (SES disparities in) IC by including the edge covariate of whether a tie exists among students' parents as a predictor of students' friendships. Table 3.5 displays the average coefficients and their standard errors based on meta-analyses (in AMEs, for logistic estimates see Table B.6 in Appendix B). Model 3 shows a strong association between (directed) friendship and parental ties. More specifically, the probability of a friendship tie is about 14 percentage points higher among students whose parents are also in contact, net of the other tie-generation mechanisms included. Though I should refrain from causal interpretations, this finding suggests that student friendship and parental contact networks are strongly interlinked.

To test for SES disparities in IC, Model 4 includes interaction terms between household income (sender) or parental education (sender) on the one hand, and parental ties on the other. While the positive direction of the interaction terms between household income and parental tie, and parental education and parental tie, is in line with my theoretical expectation, the estimates are not statistically significant. This indicates that, controlling for other tie-generating mechanisms, I find no evidence that the peer networks of students from advantaged SES backgrounds display a stronger tendency towards IC than those of less advantaged backgrounds (H3).

Table 3.5: Results univariate meta-analysis ERGMs, co-occurrences.

	Household income				Parental education			
	(3a)		(4a)		(3b)		(4b)	
	AME	I^2	*AME*	I^2	*AME*	I^2	*AME*	I^2
Mutual	13.90***	15.0	13.77***	17.1	13.56***	22.9	13.39***	31.8
	(0.53)		(0.54)		(0.59)		(0.65)	
GWESP	5.54***	53.8	5.53***	55.0	5.90***	50.0	6.02***	50.8
	(0.40)		(0.41)		(0.41)		(0.42)	
Same gender	10.67***	67.3	10.75***	66.8	9.75***	58.0	9.41***	61.1
	(0.65)		(0.65)		(0.60)		(0.59)	
Same grade	4.35***	62.3	4.77***	61.9	5.46***	68.5	5.67***	70.6
	(1.07)		(1.02)		(1.34)		(1.54)	
Same mig. bg.	0.06	13.3	0.20	24.9	−0.29	32.8	−0.32	32.3
	(0.45)		(0.46)		(0.53)		(0.55)	
Parental tie	14.17***	58.6	14.14***	58.8	14.08***	51.0	13.36***	50.3
	(0.57)		(0.61)		(0.55)		(0.82)	
HI receiver	1.12**	43.4	1.05**	41.4				
	(0.39)		(0.38)					
HI sender	−1.27+	74.2	−1.66*	70.6				
	(0.67)		(0.70)					
Distance HI	−0.17	26.7	−0.21	23.3				
	(0.29)		(0.28)					
HI sender × parental tie			0.88	43.1				
			(0.80)					
PE receiver					1.15*	42.3	0.95*	35.5
					(0.49)		(0.42)	
PE sender					−2.56***	62.9	−2.86***	59.8
					(0.70)		(0.78)	
Same PE					0.81*	21.9	0.77*	12.3
					(0.34)		(0.32)	
PE sender × parental tie							1.48	37.6
							(1.10)	
$N_{classes}$	58		59		49		47	

Source: PRIMS (C1W1 and C2W1), and CBS microdata.
Notes: AMEs and standard errors are multiplied by 100 to facilitate interpretation. All models control for the baseline density (edges term) (not included in table). Household income is mean-standardized. I^2 indicates the share of variability attributable to variation between networks rather than sampling error. $^{+}p < .10$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

3.4.4 The Role of Local Opportunities for School Choice

Findings show that network processes significantly vary across classes. To illuminate this further, I explore tentative explanations for this variation. More specifically, regional variations in school supply may be important for the network processes under study. Research suggests that in contexts where institutional factors already hamper the opportunity to form cross-cutting ties in school, the expression of homophilic preferences by students and parents decreases (Engzell & Raabe, 2023; Kruse, 2019).

In this line of thought, the local school context may affect preference-based segregation in networks in school. If parents (can) opt for a primary school with a large share of same-SES children, they already "satisfy" in-group preferences, intentionally or not, in the school choice process, and may feel less need to steer children's relations in school. Conversely, if parents face a limited school supply, it may be more difficult to satisfy certain wishes – unless they relocate, or select a school outside the residential area. In these contexts, parents may interfere more actively in children's peer relations by (dis)approving of friendships with (dis)similar others, and/or showing a stronger tendency to connect with same-SES parents in school.

To explore whether the (SES disparities in) homophily and IC are contingent on a lack of school choice, I distinguish between "restrictive" and "non-restrictive" school contexts. In the Netherlands, this distinction is not simply a matter of urbanization, because in some rural areas families can still choose between multiple schools. Hence, I use geospatial information to do so: classrooms where at least 80% of the students *(i)* have only one school in a 1 km radius from home, or *(ii)* whose second option is located 500 m further than the first (making one school clearly superior in terms of proximity) are coded as "restricted." This does not imply that school choice is formally restricted, but it makes it more difficult to satisfy parental wishes. Overall, 14 out of the 68 classrooms are coded as "restricted choice" contexts. Table B.7 in Appendix B shows meta-regression results with homophily and IC coefficients as dependent variables, and the class-level "restricted choice" dummy as a predictor. The findings do not suggest that SES homophily and (SES disparities in) IC are contingent on local opportunities for school choice: the "restricted choice" dummy does not significantly explain variation in any of the network processes, and most coefficients are relatively small compared to the intercept.

Next, for families living in areas with multiple schools to choose from, I assess whether the studied network processes are contingent on attending a school with a particular student population – in other words, if homophily and SES disparities in IC are weaker when families satisfy in-group preferences in the school choice process. I again use meta-regressions to study whether contextual measures (i.e., a school's SES composition) contribute to classroom variation in the studied network processes. I fit a quadratic function to allow for potential non-linearities (Malacarne, 2017; Smith et al., 2016). Figure B.1 in Appendix B summarizes the results for parental education (results for household income are similar but not reported). The results indicate that estimates are not clearly scattered around the regression lines, and the margin of error is large. This suggests that the network processes under study are not contingent on school SES composition.

3.5 Conclusion and Discussion

Peer relations in school can facilitate social capital that contributes to educational success. Prior research has shown that students typically cluster in schools with similar others in terms of SES background. However, less attention has been paid to the extent to which social relations *in* school are segregated by SES. In this chapter, I examined the tendency for student friendship and parental networks to structure along SES lines in school.

First, my findings demonstrate that both student and parental networks are structured by SES. Dutch late primary school students and their parents are more likely to connect with same-SES others than cross-SES others in class, net of opportunity structures and homophily based on other characteristics, such as migration background. This finding is consistent across both SES indicators (i.e., household income and parental education). Moreover, these results remain after controlling for spatial proximity between classmates' home addresses, suggesting that the neighborhood proximity mechanism cannot (fully) explain SES homophily.

Against my expectation, I find no clear SES differences in the strength of SES homophily. While previous studies have found that parents of different socio-economic backgrounds tend to be involved in their children's education in different ways (Lareau, 2011), these findings suggest that this is not reflected in different tendencies among them or their children to connect with (dis)similar others in primary school.

Interestingly, my results do show a positive association between SES and the number of incoming nominations, suggesting that socio-economic status markers can form socially valued qualities for tie formation for student friendships and parental contacts. This finding corroborates prior research in Sweden, showing that students with less economic resources tend to have fewer friends, and are more likely to experience peer rejection and social isolation (Hjalmarsson, 2018; Hjalmarsson & Mood, 2015).

Second, I observe a strong tendency towards the embeddedness of student friendships and parental networks in schools. Though my design does not allow for causal interpretations, this finding is consistent with prior research among German late primary school students (Windzio & Heiberger, 2024). Descriptive results suggest that networks of socio-economically advantaged students enjoy higher levels of intergenerational closure. Additionally, for high-SES students, same-SES ties display a higher degree of overlap across friendship and parental networks than cross-SES ties, while I do not observe such a pattern for low-SES students. Prior research suggests that high-SES parents are typically better integrated in parental networks, and forge closure relations with other parents to monitor their children's peer relations (Cox et al., 2021; Fletcher et al., 2006; Horvat et al., 2003; Ream & Palardy, 2008). Yet, once I control for other

tie-generating mechanisms in ERGMS, SES disparities in intergenerational closure are no longer significant. This suggests that the patterns I find may be explained by other network mechanisms that contribute to friendship formation (e.g., students' tendency to form ties with the friends of friends, and their tendency to form friendships with students from similar SES backgrounds).

Third, I find that levels of SES homophily and IC varied between classes. To shed more light on this, I explored whether this variation can be explained by theoretically relevant contextual factors. More specifically, I compared network tendencies in contexts where school choice is "restricted" to contexts where this is not the case, and explored the role of a school's SES composition. I argued that SES homophily may be more pronounced in areas in which parents have fewer opportunities to choose a school. When parents have the opportunity to explicitly select a school with a student population that matches their own background, parents and students may express less homophilic preferences in the relations they form *in* school. I did not find support for this idea. Possibly, families self-select into neighborhoods such that, even in contexts with a restricted supply, the student population of the available schools still meets parental wishes. Another possibility is that school choice is more often restricted in rural areas, while SES integration is simultaneously higher in these areas than in (sub)urban areas. In this case, social life is centered around a limited number of amenities (e.g., sports clubs, religious buildings, shops) and neighborhoods are less segregated, which may help to cross-cut SES boundaries. Furthermore, one may argue that families who deliberately choose a school with many same-SES students have strong homophilic preferences, and also express these by forming ties *in* school. This may counteract the pattern we would expect. A fruitful direction for future research would be to further theorize and test under which conditions (preference-based) segregation is most pronounced.

This study is not free of limitations. First, this cross-sectional design does not allow me to study tie formation processes in (the interplay between) student and parental networks. I conceptualize IC as a source of social capital in the educational context, irrespective of how co-occurring ties are formed. While these dynamics are less crucial for the research question at hand, this issue deserves further scrutiny in future research. Furthermore, the relatively small sample size at the classroom level does not allow me to fully explore differences in the network processes across school classes. To the best of my knowledge, this is the first study to explore the potential role of the local school context in network formation processes in schools, as I was able to link survey data to detailed register data. However, to provide a more definitive test of this theoretically promising relationship, a larger sample of schools is needed to account for factors potentially conflating this relation. Third, data on parental contacts is reported by children, as time and resource constraints prevented me from also collecting data among parents. Moreover, a separate parental survey could have resulted in a smaller

and more selective sample. Though this type of measure is commonly used in research on parental networks (e.g., Geven & Van de Werfhorst, 2020; Windzio & Heiberger, 2024), it may be that some children have difficulties indicating with whom their parents are in contact.

My study focuses on the Netherlands, but I believe the results are of great interest to other countries as well. Most prior research on friendship formation using sociometric data has been situated in secondary school. This study informs the understanding of how a personal characteristic that is arguably less visible to children than, for example, gender or ethnicity, plays a role in structuring peer relations, beginning in primary school – a context where opportunities for contact with dissimilar others are often present, and teachers have more power than in secondary school to stimulate inter-group interactions via seating arrangements or group work (Gremmen et al., 2018; Keller & Takács, 2019). Moreover, the network patterns I find may amplify each other and leave a long-lasting imprint on students' networks, as homophilous ties that are embedded in parental networks arguably have more potential to survive the transition to secondary school. From a policy perspective, this study stresses that school de-segregation efforts would require interventions that do not solely focus on stimulating students from dissimilar backgrounds to attend similar schools, but also on fostering connections that students and parents form *in* schools.