Ethnic segregation of friendship networks in school: Testing a rational-choice argument of differences in ethnic homophily between classroom- and grade-level networks

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ABSTRACT

Adolescents' school-based friendship networks tend to be segregated along ethnic lines. But few studies have examined whether variation in network boundaries affects the degree of ethnic friendship segregation. We use rational-choice theory to argue that ethnic homophily is more pronounced for friendships between classrooms than for those within classrooms. We empirically test this hypothesis using two-wave German panel data ($N = 1258$) and stochastic actor-oriented models (RSiena). In line with our theoretical argument, we find that the tendency to form same-ethnic friendships is indeed stronger at the grade level, which translates into stronger ethnic segregation in friendship networks at the grade level than at the classroom level. Implications for research on ethnic segregation in school-based friendship networks are discussed.

1. Introduction

Ethnic segregation is a persistent feature of friendship networks in general, and of adolescent friendship networks in particular (e.g., McPherson et al., 2001; Quillian and Campbell, 2003; Smith et al., 2014; Vermeij et al., 2009). This is an important finding, as the ethnic segregation of friendship networks is often seen as a major obstacle to the integration of immigrants and their descendants. For example, a lack of native friends prevents immigrants from developing host-language proficiency (Chiswick and Miller, 2001; Espinosa and Massey, 1997), decreases their labor market performance (Kalter, 2006; Kanas et al., 2011), and precludes the benefits of interethnic friendships for reducing prejudices and discrimination (Binder et al., 2009; Pettigrew and Tropp, 2006).

These negative consequences of ethnic friendship segregation in adulthood may be caused by ethnically segregated friendship networks at earlier stages of the life-course. Since adolescents often meet new people through their friends (Grossetti, 2005), if they have friends from different ethnic backgrounds they are more likely to form additional interethnic friendships (Ellison and Powers, 1994; Martinovic et al., 2011). Thus, ethnic friendship segregation may reinforce itself over time. It is therefore not surprising that

numerous studies have focused on explaining ethnic segregation in adolescents' friendship networks, as this stage of life sets lifelong patterns.

Many studies empirically measure ethnic segregation within adolescents' *school-based* friendship networks (e.g., Baerveldt et al., 2004; Currarini et al., 2009; McFarland et al., 2014; Moody, 2001; Mouw and Entwisle, 2006; Stark and Flache, 2012; Smith et al., 2014; Vermeij et al., 2009). This is reasonable since school is arguably the most important meeting place for adolescents, and most friendships originate there (George and Hartmann, 1996). Yet, meeting opportunities within schools differ along sub-contexts like classrooms, grades, courses, tracks, or extracurricular activities (Frank et al., 2013; Hallinan and Williams, 1989; Kubitschek and Hallinan, 1998; Moody, 2001). Thus the question arises how to specify the *boundary* of school-based networks (see Laumann et al., 1983). Many studies surveying friendship networks measure these networks at the classroom level (e.g., Geven et al., 2013; Stark and Flache, 2012; Smith et al., 2014; Vermeij et al., 2009), and other studies extend their measurement to the grade level (e.g., Goodreau et al., 2009; Moody, 2001). However, while the boundary specification problem is widely acknowledged in social network analysis, empirical evidence of how variation in school-based network boundaries affects the ethnic composition of networks remains scarce (see Valente et al., 2013 for an exception).

Based on a rational-choice perspective on interethnic friendship formation (Windzio and Bicer, 2013), we expect different

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network boundaries (i.e., classroom or grade level) to affect the degree of ethnic segregation in adolescents' school-based friendship networks. Using the example of Germany, we argue that friendships in school are primarily formed within classrooms, because the classroom constitutes a low-cost situation in which students frequently and repeatedly interact.[1] Engaging in grade-level friendships (i.e., with students *outside* one's classroom), by contrast, requires additional time and effort – and therefore particularly strong preferences to compensate for the higher-cost situation in which these friendships are formed. Suggesting that the preference for same-ethnic friends, i.e., ethnic homophily, constitutes a strong enough preference, we hypothesize that there is more ethnic segregation in grade-level than in classroom-level friendship networks, because grade-level friendships are more costly and ethnic homophily is more pronounced in high(er)-cost situations.[2] If this hypothesis holds, measuring ethnic segregation at the classroom level would systematically *under*estimate the degree of ethnic segregation in adolescents' overall school-based friendship networks. Put differently, the degree of ethnic segregation measured in adolescents' school-based networks would then partly depend on how network boundaries are specified by researchers.

Our contribution is both substantive and methodological. On the one hand, we test a rational choice-based mechanism that explains adolescents' friendship selection within ethnically diverse schools. On the other hand, we demonstrate how this mechanism translates into differences in the degree of observed ethnic segregation in school-based friendship networks depending on how network boundaries are defined. This has important implications for the growing body of research measuring the ethnic segregation of adolescents' school-based friendship networks.

2. Theory and hypotheses

We first present a rational-choice argument for why ethnic homophily (i.e., the preference for same-ethnic friendships) should differ between low- and high-cost situations. Then we apply this argument to the school context by distinguishing between classroom-level and grade-level friendship networks as low- and high-cost situations, respectively. We deduce three hypotheses from our theoretical considerations.

2.1. Ethnic homophily in low- and high-cost situations

Friendship, above all, is a choice that involves the pursuit of individual preferences within given opportunities (Zeng and Xie, 2008). Arguably the most important preference is *homophily*, the preference for friends who are similar to oneself on salient attributes (Lazarsfeld and Merton, 1954; Kandel, 1978; McPherson et al., 2001). Research has repeatedly shown that ethnicity is one of the most crucial sources of homophily in Western societies (Smith et al., 2014; Wimmer and Lewis, 2010). And indeed, adolescents report a stronger preference for same-ethnic than for interethnic friends (Brüß, 2005; Phinney et al., 1997; Verkuyten and Kinket, 2000).

Rational-choice theory provides a way of understanding the importance of ethnic homophily. While initiating and maintaining friendship ties generally requires *costs* in the form of investment in time and effort, interactions with similar others lower these transaction costs and are more rewarding (Block and Grund, 2014; Völker et al., 2008: 327). For example, same-ethnic peers are more

likely to share similar experiences, attitudes, and values. This leads to increased mutual understanding and shared interests, and thus to stronger emotional support and social affirmation (Lazarsfeld and Merton, 1954; Martinovic et al., 2009). As a result, same-ethnic friends tend to spend more time together (Kao and Joyner, 2004), and same-ethnic friendships are characterized by greater intimacy and closeness (Aboud et al., 2003; Schneider and Udvari, 2007). Interethnic friendships, by contrast, may not only be less rewarding but may also be more costly, because actors have to cross ethnic boundaries (e.g., Alba, 2005; Wimmer, 2008).

Applying a simple version of rational-choice theory, Windzio and Bicer (2013) suggest that ethnic homophily is more pronounced in *high-cost* than in *low-cost situations*. For instance, it is more costly to visit a classmate at home than to only spend time with him or her in school. Meeting outside school requires an active effort and more time, whereas students meet on a daily basis in class anyway. Visiting at home may also require parental consent, which might pose an additional burden in the case of ethnic boundaries (Edmonds and Killen, 2009; Munniksma et al., 2012). While befriending same-ethnic peers is generally more rewarding than befriending interethnic peers, this preference may become particularly important in situations in which additional costs are imposed. Forming friendships in high-cost situations (i.e., visiting friends at home) thus requires particularly strong individual preferences, like ethnic homophily, to compensate for their increased costs.

Following this argument, ethnic segregation should generally be greater in high-cost (e.g., visiting other students at home) than in low-cost friendship networks (e.g., seeing them only in the classroom). Providing empirical evidence that this is indeed the case, Windzio and Bicer (2013: 139) point to the macro-level implications of this mechanism by concluding "that focusing only on friendship networks could lead to an underestimation of actual segregation in everyday social reality." While their study investigates different types of *social relations*, the underlying argument derived from rational-choice theory is in fact much more general. Using the example of friendship networks in school, we apply this theoretical approach to variations in network boundaries, i.e., to different types of *social settings* rather than to different types of social relations.[3]

2.2. Classroom- and grade-level networks as low- and high-cost situations in school

Schools are the main place that adolescents form friendships (Cotterell, 2007; Khmelkov and Hallinan, 1999). However, schools are not monolithic blocks. Students are clustered into classrooms and grades, which is why most studies investigate friendship formation either at the classroom level (e.g., Geven et al., 2013; Stark and Flache, 2012; Smith et al., 2014; Vermeij et al., 2009) or at the grade level (e.g., Goodreau et al., 2009; Moody, 2001; Mouw and Entwisle, 2006; Quillian and Campbell, 2003).

Studying classroom- or grade-level friendship networks makes it possible to distinguish between individual preferences, like ethnic homophily, and opportunity effects, like group size (see Wimmer and Lewis, 2010). Many studies find a tendency toward same-ethnic friendships even when controlling for the school's ethnic composition (Quillian and Campbell, 2003; Vermeij et al., 2009). More recent studies that additionally control for relational mechanisms like reciprocity or transitivity often interpret this residual

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[1] In Germany, as in many other European countries, students are mainly taught inside classrooms.

[2] Researchers use the term "homophily" quite differently. We follow Wimmer and Lewis (2010: 588) and reserve the term for individual preferences for similar others, i.e., the tie-generating mechanism (also see McFarland et al., 2014: 1091).

[3] While the general argument of Windzio and Bicer (2013) can be extended to network boundaries, costs are produced somewhat differently in this case. For example, parents' preferences affect the perceived costs of students' maintaining cross-ethnic relations more strongly for some types of social relations (e.g., visiting at home) than for others (e.g., meeting in school only). In our application, *within*-school, by contrast, cost differences follow from different types of social settings themselves rather than from different degrees of third-party influences in different types of social relations.