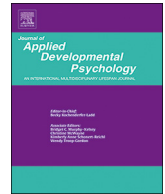




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The importance of near-seated peers for elementary students' academic engagement and achievement



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ABSTRACT

Although students are part of a group of classmates, they spend the majority of time during lessons with students who are seated next or close to them. Therefore, near-seated peers in elementary school classrooms might play a crucial role in students' academic development. It was hypothesized that near-seated peers influence students' academic engagement and achievement, especially when they are also friends. Participants were 559 fourth-sixth grade students (21 classrooms; 51.9% boys; *Mage* = 10.65 years, range = 8–12).

Longitudinal social network analysis (RSiena) showed that students' academic engagement and achievement got better when friends scored better, and vice versa, regardless of their physical position in the classroom. In contrast, near-seated peers who were not befriended got more diverse scores over time. These results imply that teachers should consider students' friendships and academic engagement and achievement in designing seating arrangements. Moreover, it is recommended to actively monitor ongoing peer influence processes.

Studies among (early) adolescents have shown that classmates affect students' academic outcomes, by either stimulating or demotivating academic engagement and achievement (e.g., (Engels et al., 2016; Geven et al., 2013; Gremmen et al., 2017; Rambaran et al., 2017; Shin & Ryan, 2014a; Shin & Ryan, 2014b)). Particularly friends play a role in students' academic outcomes, such as their academic achievement, motivation, and involvement in school (e.g., (Flashman, 2012; Kindermann & Skinner, 2009; Molloy et al., 2010)). In response to being in contact with friends, students' behaviors and attitudes often change, due to social influence processes (Snijders et al., 2007; Steglich et al., 2006). Friends can act as role models due to social comparison between friends and can be sources of academic support, and in this way directly affect students' academic outcomes (Lomi et al., 2011). They can also more indirectly affect teachers' judgments of these academic outcomes as teachers tend to cognitively associate students with the group they are part of and consequently judge friends more similar to each other than non-friends (Steglich & Knecht, 2014).

Previous studies mostly focused on the first years of secondary education (e.g., (Geven et al., 2013; Gremmen et al., 2017; Rambaran et al., 2017)) or adulthood (Lomi et al., 2011). However, students' academic engagement and achievement in elementary school affect

their level of education in secondary school and, subsequently, their future academic and career opportunities (Flashman, 2012; Witkow & Fuligni, 2010). Therefore, research needs to examine determinants of students' academic development, starting already in elementary school (Gest & Rodkin, 2011).

Schools and classrooms are inherently social places (Ryan, 2000) and students spend much time in the classroom context, together with their teacher, friends, and other classmates (Altermatt & Pomerantz, 2003). In elementary schools, classrooms often have a fixed seating arrangement. For this reason, not only friends, but also physically close peers in the classroom might play an important role in students' academic development. Students have the opportunity to especially interact with these peers in a classroom when doing school-related tasks.

Therefore, this study includes a broad scope, by not only looking at friends but also peers in close proximity. The aim of our study is to examine to what extent students' academic engagement and achievement in elementary school are influenced by near-seated peers, while taking the role of friends into account. Insights in this potentially influential role of near-seated peers, next to friends, is important for teachers, as it opens opportunities for them to design seating arrangements that promote students' academic development (Farmer et al.,

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2011).

Classroom environment and academic functioning

Especially in elementary school, teachers have many possibilities for arranging the classroom. They can for example choose for an arrangement in straight rows, in small groups, U-shaped seatings, or a classroom with flexible arrangements (McCorskey & McVetta, 1978; Wannarka & Ruhl, 2008). Additionally, they have the power to decide the exact position of each student within a seating arrangement. Some teachers mainly have academic reasons for their arrangements, by placing similar or dissimilar students close to another. Other teachers for example focus on students' social relationships, by placing friends or non-friends close to each other (Gest & Rodkin, 2011; Gremmen et al., 2016; McKeown et al., 2015).

In this way, teachers structure and arrange daily interactions between students in the classroom (Evertson & Weinstein, 2006; Farmer et al., 2011; Hughes, 2012). They can arrange tables in a certain way and assign students to a specific seat (Gremmen et al., 2016; Van den Berg & Cillessen, 2015). Consequently, teachers determine whom children are more frequently exposed to, whom they can easily interact with, and whom they can collaborate with or ask questions to. The subgroup of near-seated peers is a potentially important source of influence on students' academic outcomes. Yet, research has mostly focused on the consequences of the whole classroom environment on students' academic outcomes (Barth et al., 2004; Hastings & Schweiso, 1995; Marx et al., 1999), whereas influence processes within smaller groups of classmates have not been examined as extensively.

For example, poor classroom environments, characterized by high aggression scores, poor peer relations, and low academic focus by students, led to lower academic engagement and achievement for fifth grade students (Barth et al., 2004). Other studies have also looked at the effect of the lay-out of specific classroom arrangements (e.g., arrangements in rows or small groups) on students' academic behavior, such as their on-task behavior and question-asking (Hastings & Schweiso, 1995; Marx et al., 1999; Wannarka & Ruhl, 2008). These studies, including 7 to 15-year-old students, showed that seating arrangements in rows stimulated question-asking to teachers more than seating arrangements in small groups, stressing that teachers should consider the importance of the consequences of their physical arrangements. Seating arrangements in rows seem to facilitate individual work, whereas seatings in groups encourage interaction and collaboration.

In addition, some studies focused on the characteristics of within-class groupings of students, particularly temporary groupings for specific courses in elementary school classes. The role of teachers in implementing temporary groupings has been studied across two core curriculum areas, English and mathematics (Kutnick et al., 2002). It was shown that teachers predominantly focused on same-ability groupings, whereas they rarely grouped students by friendships. However, in another study it was examined whether cognitive development could be enhanced by having pairs of same-sex friends working together (Kutnick & Kington, 2005). Especially pairs of female friends facilitated performance, as girls integrated school issues more into friendship compared to boys.

Temporary groupings to complete concrete tasks have also been studied, showing that effective group work within these small groups of students enhanced their academic engagement and progress over time (Blatchford et al., 2005). Teachers play an important role in the implementation of cooperative learning in the classroom with groupings (Gillies et al., 2008). They can facilitate interactions between students and consequently stimulate learning by means of the organizational structure of the classroom. In sum, these studies have shown the importance of the general classroom lay-out and the effects of groupings on students' interactions, group work, academic engagement, and academic achievement. Although effect sizes were generally small, these

were meaningful.

Near-seated peers and academic functioning

Although some research has been conducted on the role of the classroom structure in students' learning (e.g., (Gaskins et al., 2012)), little is known about the direct interplay between physical proximity of peers in the classroom and students' academic development. However, children spend a large amount of time in their daily lives in the company of peers (Dijkstra & Veenstra, 2011), especially their near-seated peers (Van den Berg et al., 2012).

Previous studies have clearly shown the importance of a social network approach for understanding students' development concerning a wide range of behaviors, such as alcohol use, bullying, and smoking behaviors (Veenstra et al., 2018). With this approach, the interplay between relations and behaviors is taken into account. Moreover, two fundamental processes that can explain similarity between groups of people can be distinguished, that is, selection and influence processes. Selection refers to students selecting peers as friends whereas influence processes refer to similarities between peers as a result of being in contact with each other (Veenstra et al., 2018). Due to methodological advancements regarding stochastic actor-based modelling (RSiena), it is possible to distinguish peer influence and selection in a statistically sound way (Ripley et al., 2016). For this study, an extra effect has even been developed to examine both static networks (i.e., seatings) as well as changing networks (i.e., friendships) simultaneously.

In social network studies, the main focus is on three aspects, that is, students' behaviors, their relationships, and their proximity (Rivera et al., 2010). As suggested by Rivera and colleagues, a promising avenue is to explore more deeply the interactions between these three mechanisms. The main mechanism behind proximity is that interaction between students increases due to physical propinquity. This is related to students' relationships, as being proximate to each other encourages interaction and is in this way associated with the formation and maintenance of friendship relationships (Gest & Rodkin, 2011). Moreover, proximity can influence students' behavior. When students see each other and interact, social influence can occur (Webb, 1989). Students want to be liked, to belong to a group, and seek social approval by their peers (Cialdini & Goldstein, 2004; Gifford-Smith & Brownell, 2003). In order to achieve this and avoid rejection, they are susceptible to behaviors of peers and often adjust their behaviors to those of the peer group. This influence can be explained by various theories and mechanisms.

According to the social learning theory, students learn by observing peers (Bandura, 1977). When students are close to certain peers, they regularly observe their academic engagement and achievement (Evertson & Weinstein, 2006). They likely imitate behaviors by peers and get reinforced by valued peers through social rewards or social sanctions. Influence processes in academic achievement and engagement can also be explained by social capital (Crosnoe et al., 2003). Through contact with specific peers, students can gain access to their resources, such as their knowledge and skills with regard to schooling and academic subjects. These resources can promote both students' involvement in school and their achievement. In this way, peers who have contact with each other will become more similar over time concerning academic outcomes.

Physically close peers have direct opportunities to motivate students to pay attention to class and to get good grades. This can be, among others, by asking and receiving help, by cooperation in academic tasks, and by showing pro-school behavior with a positive working attitude and posture. In contrast, students can also demotivate near-seated peers, by showing distracting behavior or by being negative role models through getting low grades (Dieterich, 2015). For example, when near-seated peers keep on talking during lessons, it can hamper a student's concentration. In this regard, near-seated peers might be potentially important contributors to a student's academic outcomes, with more

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