



Social Capital in the Classroom

A Study of the Individual and Collective Effects of Social Capital on School Adjustment

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Abstract

Social capital is generally assumed to be beneficial for pupils' school adjustment. This paper integrates the psychological literature on peer relationships and the sociological one on social capital. It distinguishes between social capital at the individual pupil level and at the collective classroom level. Effects of social capital for school adjustment on both levels are investigated. The sample consists of 1036 children in 60 first grade classes in 46 Dutch elementary schools. Multilevel regression is used for the analysis. Results include that a substantial proportion of the variance in school adjustment can be attributed to the class level and that both the child and the classroom level social capital have substantial effects on school adjustment. Furthermore, social capital also has a 'dark side', i.e. at the collective level social capital also has negative effects on adjustment.

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Introduction

School is an important setting for a child's development: poor school adjustment, academically or otherwise, is shown to be predictive of later academic failure as well as of psychopathologies, problem behavior, and low socioeconomic status later in life (Parker & Asher, 1987; Reynolds & Cuttance, 1992; Dauber, Alexander, & Entwisle, 1993). School adjustment, both academic and psycho-social, is a function of both characteristics of the child and the school climate as well as of the "fit" between the two.

In the literature, four components of school climate are distinguished: 1) the physical environment, 2) the composition of the school population, 3) the school culture, and 4) the social system of the school or the social relationships among its members (Tagiuri, 1968; Van Houtte, 2005). All the four components are considered of being important for a pupil's adjustment. The last of the four can be interpreted as the social capital within the school. The importance of social capital for a number of individual outcomes has received ample attention over the past decades, in social research in general as well as in education research in particular, despite of the different conceptualizations of social capital (Dika & Singh, 2002; Halpern, 2005; Baum & Ziersch, 2003; Szreter & Woolcock, 2004). Most important are two different perspectives: on the one hand the perspective of social capital as an individual resource based on personal relationships (Flap, 2004; Burt, 1992; Bourdieu, 1986; Lin, 2001) and on the other hand the social capital as a collective benefit that one obtains through membership of a group, in this case, by being a pupil in a particular class (see e.g., Coleman, 1990; Portes, 1998; Halpern, 2005 for an overview). In both perspectives the individual benefits from social capital: in the former through the resources provided via the personal network and in the latter through his or her group membership. According to the first perspective, one expects that the resources (emotional and practical support, information, etc.) that one can mobilize through personal relationships contribute to school adjustment, while the second perspective argues that membership in a cohesive community prevents problem behavior and enhances adjustment. Where the mechanism in

the first perspective is concrete (instrumental) help and support; the mechanism in the second perspective is behavioral conformation to existing group norms. Social capital at the collective level becomes effective through the enhancement of trust within that group, reinforcement of common norms, reduction of uncertainty, communication flows, and facilitating social control. While there are many studies directed to one of these levels, this paper is directed to the effects of *both types* of social capital on academic performance and on behavioral problems of first grade pupils in Dutch elementary schools.

Focusing on social capital as a collective attribute at the school level is the dominant approach in the literature on education. Coleman and Hoffer's (1987) landmark study found that private high schools in the US outperformed public ones because of the cohesive "functional" communities surrounding the former. Other studies have confirmed the effects of school level social capital on students' school adjustment, although they also made clear that its benefits are not universal and sometimes confounded with other measures (e.g., Teachman, Paasch, & Carver, 1997; Dijkstra, Veenstra, & Peschar, 2004; Dijkstra & Veenstra, 2000; Coleman, 1988; Morgan & Sørensen, 1999; McNeal, 1999; Parcel & Dufur, 2001; Beaulieu, Israel, Hartless, & Dyk, 2001; Büchel & Duncan, 1998; Bryk, Lee, & Holland, 1993; Crosnoe, 2004; Van de Werfhorst, 2005).

Other studies emphasize the importance of individual support networks, i.e., individual social capital, for school adjustment. The parental support literature focuses on the supportive relationships with parents as an important condition for individual student's good school adjustment (Carbonaro, 1998; Ainsworth, 2002; Teachman et al., 1997; McNeal, 1999; Parcel & Dufur, 2001; Majoribanks & Kwok, 1998; Crosnoe, 2004; Desforges & Abouchaar, 2003; Büchel & Duncan, 1998). The notion of individual level social capital generated through relationships within a school or a classroom is also consistent with the peer acceptance and more sociometric literature that sees the individual benefit from the relationships s/he has with peers. A child's poor peer relationships—or low social capital—are predictive of future academic and behavioral problems, such as school drop out, poor school performance, delinquency and developmental psychopathologies (Newcomb, Bukowski, & Pattee, 1993; Asher & Coie, 1990; Hoza, Molina, Bukowski, Sippola et al., 1995;

Rubin, Bukowski, & Parker, 1998; Guay, Boivin, & Hodges, 1999; van den Oord & Rispen, 1999; Coie, Terry, Lenox, & Lochman, 1995; Parker & Asher, 1987).

In general, the literature on peer acceptance assumes that poor peer relationships and low social support affect future outcome primarily through its negative effects on the child's emotional and cognitive development (Coie, 1990). Peer rejection may lead to depression, low self-esteem, loneliness, stress, frustration, and underdeveloped social skills which in turn lead to other behavioral problems. This literature illustrates the importance of individual social capital, although the focus is on expressive, emotional and sometimes negative relationships, rather than on the instrumental aspects of relationships: the degree to which they provide practical and emotional support and help, information and the like (Lin, 2001). Furthermore, according to social capital theory (Flap, 2004; Coleman, 1988) not only the number and kind of relationships are important but also their *structure*. Closure of the social networks provides access to both the individual and collective resources and benefits embedded in the social relationships.

Multilevel studies have demonstrated that the variation in school adjustment can be divided up in components on the level of the individual pupil as well as on higher levels (classroom, school). For instance, although most of the variance in academic achievement can be attributed to the child level, a substantial part—usually 10 to 15%—can be allocated to higher levels (Hill & Rowe, 1996; Lee, 2000; Scheerens, Vermeulen, & Pelgrum, 1989; Lytton & Pyryt, 1998; Lee & Bryk, 1989; Caldas & Bankston, 1999; van der Werf, 1997). A few studies looked at other aspects of school adjustment, such as school attendance, delinquency, and disruptive behavior (Rutter, Maughan, Mortimore, Ouston, & Smith, 1979), the pupils' sense of well-being (Knuver & Brandsma, 1989), attention regulation (De Jong, 1992), social relationships, and behavioral problems (van den Oord & Rispen, 1999). These studies estimated between 5 and 15% of the differences in psychosocial adjustment to be associated with differences between schools or classes. A substantial amount of variance in school adjustment therefore cannot be accounted for by child-level factors, but have to be attributed to the social capital at the school and classroom level. However, to our best knowledge there is no study which examines social capital at the individual and the collective level of the classroom simultaneously.

We argue that both types of social capital contribute to school adjustment: the social capital in the pupil's individual network and the collective social capital in the classroom. The school and classroom climate is formed in part by the relationships among the pupils. These relationships and their structure are a source of social capital, not

just individually but collectively as well. Some social structures are more conducive to flows of information, to collaboration, or provide more social support than others that enhance conflict, etc. Note, that as the relationships of elementary school children remain largely limited to their own classroom, the collective social capital generated through these relationships also remains largely limited to the classroom level. Although the classroom social capital emerges from the same networks as the individual social capital, it is not reducible to the latter. The resources generated at the classroom level derive from the structure of the network which might facilitate information flows, social control, and generate a sense of belonging, shared norms, and cohesion.

Our general hypothesis is that high social capital at both levels will contribute to school adjustment; i.e. a dense personal network of a pupil as well as a highly cohesive structure of relationships in the classroom, are expected to enhance school adjustment.

Methods

SAMPLE

The data used in this paper are from the *Utrecht Social Development Project* (1998). The USDP is a longitudinal study that tracks the social development of children through elementary school, i.e., from group 1 (kindergarten, age \pm 4 years) to group 7 (grade 5, age \pm 11 years). This paper uses data of 1241 children from 71 group 3 (1st grade) classes in 49 elementary schools in the province of Utrecht and the city of Hilversum in the Netherlands. Data was collected during the 1998-99 school year, and information was obtained at child, class, and school levels. Child interviews provided information on the social relationships of the children with their classmates and on child characteristics. Teacher interviews provided not only information on class level data but also on the behavioral problems and academic performance of the children. The teacher interviews were returned by 66 out of the 71 teachers (93.0%). School level information was collected for all 49 schools. Some classes contained too few group 3 pupils to calculate reliable network indicators and were dropped from the analysis. The effective sample used in this paper consisted of 1036 children (83% of the total sample) in 60 classes and 46 schools.

VARIABLES

This paper uses variables at various levels: the child, the classroom and the school. As only about a

quarter of the schools in the sample (12/46) had multiple group 3 classes, it was difficult to distinguish statistically between class and school level effects. For this reason in the analysis class and school levels were merged into a single level.

SCHOOL ADJUSTMENT VARIABLES.

As school adjustment is more than academic performance and also includes the psychological and social adjustment of the child to the school environment, two indicators for school adjustment are included in this study: academic performance, and behavioral problems.

Academic performance. The *academic performance* of the child was measured by having the teacher rate the child's performance on 7 subject areas: language, mathematics, vocabulary, reading, art, self-reliance, and learning speed. A score of 5.5 or higher is considered a passing grade. The final variable is the mean of these subject scores. This variable proved quite reliable with a Cronbach's α of 0.92.

Behavioral problems. To measure the child's behavioral problems we used the Amsterdam Child Behavior Checklist (ACBC), a teacher-rated scale to assess behavioral problems in elementary school children, consisting of four subscales: attention problems, aggressive behavior, fear-uncertainty, and restlessness (de Jong & Das-Smaal, 1991). For this paper we combined the attention problems, aggressive behavior, and restlessness subscales into a single *externalizing problems* subscale. The ACBC consists of 21 behavioral items of which the teacher has to indicate how well they apply to the child. 17 of these items make up the three externalizing problems subscales. Several studies have confirmed the validity of the ACBC (De Jong, 1992; de Jong & Das-Smaal, 1991) and found correlations of about 0.70 with similar scales on Achenbach's TRF (de Jong, 1995). The externalizing problems scale had in this sample a very good reliability (Cronbach's $\alpha = 0.92$).

Both academic performance and externalizing problems variables were rated by the teacher. Class level variation on these variables may reflect teacher bias. The presence of teacher bias would inflate the class level variance component relative to the child level one. To the extent that this bias is unrelated to class, teacher or school characteristics it will be included in the multilevel regression models as a class level random effect.

SOCIAL CAPITAL.

The indicators for social capital are all based on the networks among the pupils. As mentioned, we focus on structural aspects of social capital, which indicate closure at the level of an

individual's network as well as at the level of the classroom. The children were all asked to nominate classmates whom they often played with. The digraph constructed from these answers formed the basis for the social capital indicators. Our indicators of social capital capture different aspects of closure at both levels. In elementary school classrooms, strong, close and dense ego-networks are the main source of social capital. Such configuration provides more support and is well suited to the maintenance and development of existing resources (Coleman, 1990; Coleman, 1988; Lin, 2001).

Individual level social capital. Major dimensions of social capital are the number and availability of persons who can be mobilized to provide resources; their willingness as well as their ability to do so (see Flap, 2004). The number of classmates to which a child has access is indicated by the *indegree*, i.e., the number of times the respondent is mentioned by others. Further, the *reciprocity* ratio—the number of reciprocal relationships divided by the outdegree—can be perceived as a structural measurement for the willingness to provide resources, because the partners of a confirmed relationship agree on their friendship and therefore, willingness to help each other can be assumed. In addition, *transitivity* and *connectedness* are measures of the ease with which support can be mobilized, i.e. they indicate the availability of support. *Transitivity* is calculated as the number of triads for which the respondent closes the transitive pattern and standardized for the respondent's outdegree and the remaining number of relationships in the network; and *connectedness* is the proportion of others in the network a respondent can reach directly or indirectly. High social capital, i.e., high closure of the child's social network, is characterized by high scores on all social capital indicators: high indegree, high reciprocity, high transitivity, and high connectedness.

Classroom level social capital. To measure social capital at the level of the classroom, we again took structural indicators of the degree of closure of the classroom social networks: *density*, *reciprocity*, *segmentation*, and *transitivity*. The density of the classroom network is seen as indicating the availability of others, because in a dense network cooperation is high (Coleman, 1988; Coleman, 1990). The density measure is the ratio of observed relationships over the total number of possible relationships ($n_k \times (n_k - 1)$). Segmentation captures the extent that short (length=1) and long path distances (length ≥ 4) dominate the network and that medium path distances are relatively rare. The S_4 segmentation measure was used (Baerveldt & Snijders, 1994). In highly segmented networks others either are close friends or far removed. Reciprocity refers to the proportion of relationships in the network that are mutual. Because reciprocity depends on the overall density of the network, the

reciprocity measure was standardized, controlling for network size and network density. Transitivity captures the extent that a network is structured, i.e. that closed triads emerge in the network. Holland and Leinhardt's (1970) standardized measure for transitivity was used. High social capital at the level of the classroom is indicated by high scores of density, low degree of segmentation as well as high reciprocity and transitivity.

CONTROL VARIABLES.

The control variables included in the analysis are measured at two levels, the child level and the class/school level. The selected variables are all mentioned in the literature as affecting school effectiveness and adjustment (see, e.g., Scheerens, 1999).

Child characteristics. Following child characteristics were included in the analysis: *sex* (0=boy, 1=girl), *ancestry* (0=Dutch, 1=foreign) and the *age* of the child in months. As indicator of the cognitive development or *intelligence* the raw test scores on the *Raven's Coloured Progressive Matrices* (CPM) were used (van Bon, 1986).

The class and school level control variables form three sets: class composition, teacher characteristics and classroom organization, and school characteristics. These sets serve as indicators for other aspects of the classroom and school climate (Fraser, 1994; Wubbels & Brekelmans, 1998; Shuell, 1996; Van Houtte, 2005).

Class composition. Class composition was measured by the *network size*, the *percentage of girls*, *sex segregation*, and the *percentage of ethnic minorities* (i.e., students with at least one non-Dutch parent) in the class. Sex segregation refers to the extent that boys and girls prefer relationships with children of their own sex to relationships with children of the other sex. The measure used is by Freeman (1978-1979).

Teacher characteristics and classroom organization. The "teacher-characteristics" variables include the teacher's *work experience*, i.e., the number of years he or she has been working in education; whether the teacher is *full-time* or *part-time employed*; the *performance-orientation* of the teacher; and his or her *systematic reaction* in case of problem behaviors. The latter two instruments were obtained from Doolaard (1996). The performance-orientation scale captures the teacher's orientation towards traditional knowledge acquisition and cognitive development rather than towards student expressiveness and personality development. This 8-item scale has an acceptable reliability ($\alpha = 0.65$). The systematic-reaction-scale looks how the teacher reacts to the behavioral problems of students, whether he systematically observes these students, makes notes, talks to

colleagues about it, and develops a plan to help these students or not. The reliability of this scale is acceptable ($\alpha = 0.65$). A systematic response may point to uncertainty on part of the teacher about how to deal with problems in the classroom and to a more distant relationship between teacher and pupils.

Classroom organization was measured by the extent that *formal rules* apply during *instruction periods* and *task periods*. These scales measure whether it is permitted to go to the restroom, to drink water, walk around, consult with another student, consult within a group, consult between groups; obtain materials, obtain new course materials (Doolaard, 1996). The reliability of both scales was good with $\alpha = 0.85$ for rules during instruction and $\alpha = 0.77$ for rules during tasks. These two variables are indicators of the teacher's emphasis on discipline and authority in the classroom, but also of the possibilities for students to interact with each other in the classroom and for cooperative learning. A final class organization variable was whether the teacher had a *class assistant* to help him or her in the classroom. All the teacher characteristics and class organization variables were obtained from the teacher questionnaire.

School characteristics. The variables in the school characteristics set measure the school organization and the environment in which the school operates, and which contribute to the classroom and school climate as well as to the school-level social capital. This set includes the *percentage minority children* in the school, and the level of *truancy* (i.e., the mean proportion of students absent on an average day), and the *tuition* (i.e., the amount of school fees parents had to pay). Other variables in this set are the *outflow* of pupils to advanced secondary education, which is indicative of the academic level of the school, as well as the *educational level of the parents* of the pupils, and the *parental unemployment level*, which measure the social background of the pupils. These latter two variables are ordinal variables comparing the school to the average one and with as answer categories: more than average (3), average (2), and less than average (1). These school characteristics variables were all provided by the school administration.

Results

DESCRIPTIVE STATISTICS

Table 1 presents the descriptive statistics for the variables. The mean score on the externalizing problems scale was about 1.75 (out of 4). Only 50 out of 1025 children (or 4.9%) had major

externalizing problems as indicated by a score of 3 or higher, while 85 children (8.3%) did not display any externalizing problems. The average child in the sample was rated by his or her teacher as performing well in school. Only 70 out of 1013 (or 6.9%) children received a failing score (≤ 5.5), and 189 (or 18.7%) did very well academically with scores of 8 or higher. As expected there also was a substantial correlation between academic performance and externalizing problems ($r = -0.54$, $p = 0.000$). Better performance tends to go hand in hand with fewer behavioral problems. However, the correlation is not that strong that it would justify combining both indicators of school adjustment.

The proportion ethnic minorities in a class varied widely. Where the average class contained 12% children from non-Dutch ancestry, quite a few classes did not have any minority students (21 or 35%), while a few contained more than one third minority students (5 or 8.3%). The sex distribution in the classes is less skewed, but the percentage girls in a class still varied from 0% to 78%.

The average age of the children in the sample was 6 years and 10 months. The youngest child in the sample was 5 years and 8 months, while the oldest child was already 9 years and 1 month. The sample was equally divided between boys and girls, and 11% of the sample had foreign ancestry.

With regard to individual social capital a child was named by 3.7 classmates on average as someone one often played with. Only a minority of children was not mentioned by anyone (52/1036 or 4.0%), while another small group was mentioned by more than 8 classmates as frequent playmates (48 or 4.6%). All the other indicators of social capital show a rather large variation.

There was also a large variation in the classroom social capital. The density of the networks ranged from 0.10 to 0.32, with a mean of 0.19. Both, reciprocity and transitivity were found to be relatively high. Segmentation also varied widely, from 0.03 to 1.00, with a mean segmentation score of 0.54.

With regard to the population the schools recruited from, most schools claimed that unemployment among their pupils' parents was below average (33/46 or 72%). Only 4 schools (9%) claimed higher than average unemployment among the pupils' parents. 10 schools (22%) reported the average socioeconomic status of parents was below average, while 16 (35%) claimed above average socioeconomic status.

MULTILEVEL DECOMPOSITION OF SCHOOL

ADJUSTMENT

First we examined the relative contributions of the child and classroom/school levels to the

variation of the school adjustment variables. The results indicate that although school adjustment is mainly accounted for by child-related factors, class and school factors still play a significant part (at $p < 0.010$) in how well a child adjusts to life in school. The class/school level accounted for 9.4% of the variance in the externalizing problems scale. The findings here do not support the claim that academic performance is more affected by class and school factors than other aspects of school adjustment. The size of the class/school level variance component for academic performance was only 8.0%.

MULTILEVEL REGRESSION RESULTS

Academic performance. The results of the final multilevel regression models are shown in Table 2. This table shows only the full (a) and parsimonious (b) models. The full model explains 24% of the total variance in academic performance, the parsimonious model 23%. At the child level about 22% of the variance was explained by these models, and at the class/school level 50% by the full model, and 36% by the parsimonious model. The parsimonious model was derived by stepwise backward deletion from non-significant effects at $\alpha = 5\%$ from the full model.

A child's academic performance was significantly affected by one's social capital, with a gross effect of 2.9% ($p < 0.001$). Children who were sought out more often as playmates—as indicated by the indegree variable—performed significantly better than children who were less popular. For instance, a child who scored at the P_{90} ($= 7$) on the indegree variable is expected to have an academic score 6×0.079 or 0.47 points (0.48 SD) higher than a child who scores at P_{10} ($= 1$).

All other child characteristic variables had also statistically significant effects on academic performance. Older children performed on the average less well than younger ones. However, one needs to keep in mind that the causal effect here may be reversed as the older children are those that already have been held back for one reason or another, including poor academic performance. The children's intelligence was, as expected, a strong predictor of academic performance; higher intelligence led to better performance. For example, children who scored at the 90th percentile for intelligence ($P_{90} = 31$) were expected to score 1.01 points higher (1.02 SD) than children scoring at the 10th percentile level ($P_{10} = 19$). Girls on the average performed better than boys while ethnic minorities did less well than Dutch-ancestry children.

Although minority status of the child on the individual level had a negative effect on academic performance, the proportion of ethnic minorities in the class had no significant effect on academic performance. In classes with a high proportion of

girls, however, average academic performance is significantly lower than in classes with only few girls. Children in classes with a proportion girls at P_{90} ($= 0.66$) are estimated to score 0.38 points (0.39 SD) lower than children in classes at P_{10} ($= 0.34$).

Academic performance was affected not only by the child level social capital but by classroom level as well (gross effect: 2.9%, $p < 0.010$). Children in more segmented classes, i.e., classes in which children have a few preferential playmates and have little interaction with other classmates, tend to do better academically than children in classes with low segmentation, i.e., where all children were more equally likely to play with each other. Children in classes at the P_{90} level of segmentation ($= 0.84$) scored 0.37 points (0.38 SD) higher than similar children in classes at the P_{10} level ($= 0.28$). High transitivity in the class social network, to the contrary, which is indicative of the formation of more clique-like structures, led to lower academic performance. If one again compares children in classes at P_{90} ($= 13.2$) and P_{10} ($= 1.6$), the latter scored on the average 0.36 points (0.36 SD) higher on academic performance than the former. Note that transitivity is not a consequence of segmentation. As segmentation cuts off contacts with parts of the network it leads to lower overall transitivity in the network ($r = -0.50$, $p = 0.000$, $N = 60$). Therefore, while differentiation of one's relationships within the classroom is good for academic performance, clique-formation is not.

The characteristics of the teacher and the class organization had little effect on the academic performance of the pupils. Only one variable in this set had a statistically significant effect on academic performance, namely, whether or not the teacher reacts in a systematic manner to problem behavior in the classroom. In classrooms where the teacher adopted a more systematic response to such disturbances rather than an informal one the pupils tended to perform worse.

School characteristics also only had a minor effect on a child's academic performance. Worth mentioning is that the proportion of ethnic minorities in the school had a statistically significant positive net effect on academic performance, while class ethnic composition did not. School and class ethnic composition are of course highly correlated ($r = 0.86$, $p = 0.000$, $N = 60$), especially as the creation of "black" and "white" classes within a mixed school is discouraged. Children in schools with a proportion of minorities at P_{90} ($= 26.5\%$ minorities), *ceteris paribus*, score 0.17 points (0.17 SD) better academically than children in schools without minority students (P_{10}). The amount of tuition asked by the school also had a statistically significant effect on the child's academic performance. Children in more expensive schools performed significantly better than pupils in less expensive schools. The effect of tuition on academic

performance, however, should not be overestimated; pupils of a school at the P_{90} level regarding tuition ($= \text{NLG } 98.5$ or $\text{€ } 45$) scored, *ceteris paribus*, only 0.07 points (0.07 SD) higher than similar children in a P_{10} school ($= \text{NLG } 22$ or $\text{€ } 10$).

Behavioral problems. The full model (a) explained 22% of the total variance in externalizing problems, 17% of the variance at the individual level, and no less than 63% of the variance at the class/school level. Most of the variance explained at the class/school level, however, is due to non-significant variables. In the parsimonious model (b) for externalizing problems the proportion of the variance explained at the class/school level drops to only 27%, while the variance explained at the individual level remains stable. The total explained variance drops to 18%.

Child level social capital also proved an important factor for externalizing problems, with a gross effect of 5.1% of the variance explained ($p < 0.001$). Children who were frequently sought out by their classmates to play with displayed fewer externalizing problems than children who were not or only rarely nominated as playmate. The children at P_{10} of indegree ($= 1$) scored compared to those at P_{90} ($= 7$), 0.37 (0.63 SD) higher on the externalizing problems scale. The other child level social capital variables did not have a significant effect on externalizing problems.

Further, more intelligent children on the average showed fewer externalizing problems than less intelligent ones. Children at P_{90} of intelligence ($= 31$) are estimated to score 0.37 (0.63 SD) points lower on the externalizing problems scale than children at P_{10} of intelligence ($= 19$). Girls also scored significantly lower than boys on the externalizing problems scale. No significant effects were observed for the ancestry or the age of the child.

The classroom level social capital variables did have significant effects on externalizing problems. A denser network of friendship relationships among pupils in a class leads to an increase in externalizing problems. For instance, pupils in classes with density at P_{90} ($= 0.25$) on the average score 0.35 points (0.59 SD) higher than those in classes at P_{10} for density ($= 0.12$), when controlling for the other variables in the model. Higher transitivity in classroom friendship relationships, to the contrary, leads to a decrease in problem behavior in the class. The interpercentile comparison ($P_{10} = 1.6$, $P_{90} = 13.2$) shows a decline with 0.37 points (0.63 SD). Combined these effects suggest that while a dense, non-structured, network in a classroom supports externalizing behaviors, the structuring of these relationships in closed groups, which are supposed to provide a lot of support, do inhibit externalizing behaviors. Where cliques are bad for the academic performance in the class it

does seem to be good for preventing externalizing problems such as aggression.

Furthermore, class/school level variables had a net contribution of 6.4% to the explained variance for externalizing problems ($p < 0.001$). The network size had a significant effect on externalizing problems. Children in larger classes showed higher levels of externalizing problems than children in smaller ones. If one compares children in a 15-child network with those in a 25-children network, the latter scored 0.29 points (0.49 SD) higher on the externalizing problems scale than the former. The gender and ethnic composition of the class did not have significant effects on externalizing problems, and neither did the teacher characteristics and classroom organization variables, nor the school characteristics variables.

Conclusion and discussion

The results presented here support earlier research: although most of the variation in school adjustment tends to occur at the child level, a substantial part of the variation is associated with class and school level factors. As school adjustment refers to how well the child adapts to the school environment it is no surprise to find that characteristics of both the child and the environment affect the outcomes. The child characteristics remain by far the most important predictors of school adjustment. Noteworthy is also the almost complete lack of effects for the teacher characteristics and classroom organization variables. Only the manner in which a teacher responded to problem behavior in the classroom had marginally significant effects on school adjustment. The effect of school level characteristics was also limited. They had some effect on academic performance, but none on externalizing problems.

The focus of this paper was however on the social capital generated within the school-based social networks among pupils. The results presented in this paper indicate that this kind of social capital, both at the child and at the classroom level, affect school adjustment, and not just academic achievement but behavioral problems as well. However, at least at this age, the child's individual level social capital tends to be more important than its classroom level social capital, especially with regard to externalizing problems and after control variables were added to the model.

At the individual level our findings are consistent with the sociometric and peer acceptance literature (Newcomb et al., 1993). Children who were popular with their classmates tended to perform better academically and showed fewer externalizing problems than children with only few nominations. Given the lack of formal

differentiation among the pupils and the non-specific nature of the resources, the simplest way of accumulating social capital is by obtaining many relationships. At the individual level no evidence of the benefits of further closure or more cohesion of one's social network was observed.

The results for the classroom social capital suggest that more social capital is not always beneficial with regard to the objectives of the education system. Not only did a denser friendship network among pupils lead to more behavioral problems, but the presence of more clique-like structures as indicated by higher levels of transitivity also lead to lower academic performance while higher segmentation in the network lead to improved performance. Higher transitivity, however, did lead to fewer behavior problems in the class.

We can offer at best tentative explanations for these findings. Denser networks provide more opportunities for mischief, more 'partners in crime'. Large networks of highly connected pupils are more difficult to control than isolated ones. In addition, in larger cohesive groups, problematic behavior can be a means to achieve a particular group position, e.g. being dominant and gaining status (see Geary, Byrd-Craven, Hoard, Vigil, & Numtee, 2003). High closure as indicated by higher levels of transitivity in the classroom friendship network creates, according to balance theory, a more psychologically comfortable environment (Holland & Leinhardt, 1972; Leinhardt, 1973) and allows for more peer social control. This peer control also may enforce informal norms that play down the importance of academic performance, and stress sufficient performance rather than an excellent one. In a highly closed network there is little room for academic competition as it would put stress on the network. The presence of different groups within a class, such as indicated by the segmentation variable, on the other hand does stimulate competition. A somewhat more competitive academic climate might benefit overall academic performance.

This paper links two research traditions: the more psychological peer acceptance literature and the more sociological social capital literature. The findings of this paper can be summarized as 1) social capital generated by a pupil's social networks does affect school adjustment; 2) it is relevant to distinguish social capital at different levels; and 3) social capital at different levels cannot be reduced to one another. and 4) the degree of structural closure as indicated by transitivity affects performance as well as problem behaviour. Social networks with low transitivity enhance individual performance is better, but also increase the chance of problem behaviors. One can interpret this finding as that close, highly transitive networks provide little room for individual performance due to high social control (see Burt, 1992) but they also provide

a comfortable psychological climate which dampens problematic behavior. The former interpretation is similar to Burt's (1992) notion of structural holes which enhance performance, while the latter follows balance theory (Heider, 1958; , see also for example the discussion by Hummon & Doreian, 2003). One needs to keep in mind that causality might be reversed here: that high rates of problem behaviour cause intransitive classroom networks, rather than the other way around.

This paper points out that social capital can have multiple sources and can manifest itself at multiple levels. In the literature the emphasis has been on either the school or the individual level, with little attention for intermediate levels such as the classroom or for the internal networks in the school as a source of social capital. The various networks, be it internal school networks among pupils or external networks among parents, provide access to distinct resources and therefore should be treated as separate forms of social capital. Theoretically, the two are independent of each other, yet empirically they may prove related. Notwithstanding that all relationships are among individuals they also generate social capital at higher levels, i.e., provide access to collective resources available to all or some of the members of the group. This higher level social capital (classroom, school) is an emergent property of the individual-level network. The resources that make up the school or classroom social capital are not the simple aggregates of individual resources, but emerge through the structure of the overall network. These resources include information flows, social control, a sense of belonging, the reinforcement of norms and the classroom climate. Too often one sees social capital as something exclusively positive, i.e., as contributing to positive outcomes such as better school adjustment. But as with other kinds of capital, the effects of social capital depend on the goals of the actors. In education studies one too readily assumes that good academic performance is a shared goal of all participants, including the pupils. Educational aspiration and motivation, however, can vary widely and are certainly not shared by all pupils. A perverse side effect of high social capital—its 'dark' side (Field, 2003) — may be the development and the spread of informal classroom norms that put less value on academic achievement. Closed networks form ideal settings for the development and reinforcement of such informal norms.

The effects of still higher levels of social capital or social capital generated through external ties to e.g. parents or friends in the neighborhood were not investigated in this paper. These, of course, will also have their effects on school adjustment. There is some evidence that social capital around a school benefits general school adjustment. The tuition charged by the school had a positive effect on academic performance. Coleman

and Hoffer (1987) already mentioned that even a slight tuition fee led to a more selective school attracting much more motivated parents that contributed substantially to the social capital of the school. On the other hand, no effects were found for the socio-economic composition of the school. Which form of social capital will have which effect and how different forms of social capital will interact is an open question. The study of Morgan and Sørensen (1999), for instance, found that in American high schools, after controlling for internally generated social capital, school-level social capital due to external ties among parents was even negatively associated with mathematics achievement. Although this study was criticized (see Hallinan & Kubitschek, 1999; Carbonaro, 1999) it does point out that social capital is not always beneficial. One could hypothesize that different forms of social capital reinforce each other, but also that they compensate for each other or cancel each other out. For instance, in schools with low school level social capital, individual level social capital may be much more important than in schools with high social capital. To answer such questions is a task of future research.

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Tables

Table 1: Descriptive statistics for school adjustment variables and explanatory variables at the child and class/school levels

Variable	N	Range ^d	M	SD
School adjustment^a				
Academic performance	1013	3 - 10	7.04	0.99
Externalizing problems	1025	1.00 - 3.76	1.76	0.59
Child characteristics^a				
Ancestry: Foreign	1036	0 - 1	0.11	0.32
Sex: female	1035	0 - 1	0.50	0.50
Age	1036	68 - 109	81.99	5.18
Intelligence	1036	10 - 36	24.79	4.59
Child social capital^a				
Indegree	1036	0 - 14	3.69	2.40
Reciprocity	1036	0.00 - 1.00	0.51	0.37
Transitivity	1036	-10.54 - 2.06	-1.13	1.77
Connectedness	1036	0.00 - 1.00	0.78	0.34
Classroom social capital^b				
Density	60	0.10 - .32	0.19	0.05
Reciprocity	60	0.27 - 8.37	4.02	1.90
Segmentation	60	0.00 - 1.00	0.54	0.22
Transitivity	60	0.00 - 17.87	6.36	4.43
Class composition^b				
Proportion minorities	60	0.00 - .88	0.12	0.16
Proportion girls	60	0.00 - .78	0.50	0.13
Network size	60	5 - 32	19.20	7.06
Sex segregation	60	-0.08 - 1.00	0.52	0.25
Teacher characteristics and classroom organization^b				
Rules: Instruction	60	1.00 - 3.00	2.56	0.42
Rules: Tasks	60	1.00 - 2.75	1.46	0.34
Experience	60	1 - 35	15.10	9.80
Part-time	60	0 - 1	0.45	0.50
Systematic response	60	1.25 - 4.00	2.80	0.58
Performance orientation	60	2.00 - 3.63	2.83	0.36
Class assistant	60	0 - 1	0.23	0.43
School characteristics^c				
Proportion minorities	46	0 - 91	8.76	16.16
Tuition	46	0 - 600	74.48	118.58
Truancy	46	1 - 3	1.39	0.58
Outflow	46	0 - 77	25.15	18.59
Parental education	46	1 - 3	2.13	0.75
Parental unemployment	46	1 - 3	1.37	0.64

Notes:

^a Unit of analysis: children;

^b Unit of analysis: classes;

^c Unit of analysis: schools;

^d Minimum and maximum values for dichotomous, count and ordinal variables are provided as integer values.

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Table 2: Multilevel regression results for school adjustment variables

b (s.e.)	Academic performance		Externalizing problems	
	(a)	(b)	(a)	(b)
N	1013		1025	
FIXED COMPONENTS				
Constant	6.164*** (1.331)	7.259*** (0.602)	2.239** (0.772)	1.722*** (0.251)
Child level variables				
<i>Child characteristics</i>				
Ancestry: Foreign	-0.225* (0.102)	-0.221* (0.100)	-0.014 (0.061)	
Sex: Girl	0.167** (0.055)	0.160** (0.055)	-0.301*** (0.033)	-0.301*** (0.033)
Age	-0.021*** (0.006)	0.022*** (0.006)	0.007 (0.003)	
Intelligence	0.084*** (0.006)	0.084*** (0.006)	-0.031*** (0.004)	-0.031*** (0.004)
<i>Child level social capital</i>				
Indegree	0.070*** (0.015)	0.079*** (0.014)	-0.056*** (0.009)	-0.062*** (0.008)
Reciprocity	0.117 (0.087)		-0.089 (0.052)	
Transitivity	-0.029 (0.019)		0.013 (0.011)	
Connectedness	-0.129 (0.097)		0.098 (0.058)	
Class level variables				
<i>Class level social capital</i>				
Density	2.781 (2.568)		0.817 (1.494)	2.614*** (0.636)
Reciprocity	0.025 (0.035)		-0.026 (0.020)	
Segmentation	1.267 (0.653)	0.660** (0.231)	-0.178 (0.382)	
Transitivity	-0.052** (0.020)	-0.031** (0.011)	-0.024* (0.012)	-0.032*** (0.010)
<i>Class composition</i>				
Proportion minorities	0.551 (0.624)		-0.054 (0.365)	
Proportion girls	-1.283** (0.440)	-1.192*** (0.361)	0.402 (0.253)	
Network size	0.020 (0.020)		0.022 (0.012)	0.029*** (0.007)
Sex segregation	-0.127 (0.240)		-0.090 (0.137)	
<i>Teacher characteristics and classroom organization</i>				
Rules: Instruction	-0.169 (0.120)		-0.073 (0.070)	
Rules: Tasks	0.275 (0.158)		-0.075 (0.093)	
Experience	-0.006 (0.006)		0.005 (0.003)	
Part-time employment	0.003 (0.108)		-0.020 (0.059)	
Systematic response	-0.165* (0.083)	-0.168* (0.073)	0.062 (0.048)	0.113* (0.047)
Performance orientation	0.005 (0.130)		-0.044 (0.076)	
Class-assistant	-0.100 (0.116)		0.053 (0.067)	

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b (s.e.)	Academic performance		Externalizing problems	
	(a)	(b)	(a)	(b)
School level variables				
<i>School characteristics</i>				
Proportion minorities	0.004 (0.008)	0.006* (0.003)	0.003 (0.004)	
Tuition	0.001* (0.000)	0.001** (0.000)	0.000 (0.000)	
Truancy	-0.033 (0.102)		0.042 (0.059)	
Outflow	0.000 (0.003)		-0.002 (0.002)	
Parental education	0.015 (0.077)		-0.013 (0.045)	
Parental unemployment	0.053 (0.119)		-0.094 (0.070)	
RANDOM COMPONENTS				
Class/school level				
Constant	0.039** (0.015)	0.050** (0.017)	0.012* (0.005)	0.024** (0.007)
<i>Individual level</i>				
Constant	0.705*** (0.032)	0.709*** (0.032)	0.260*** (0.012)	0.262*** (0.012)
EXPLAINED VARIANCE				
Individual level	21.9%	21.5%	17.3%	16.7%
Class/school level	50.1%	36.0%	63.3%	26.6%
Total	24.2%	22.6%	21.7%	17.6%

significance: *: 0.050; **: 0.010; ***: 0.001



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