Motivational developments in primary school: Group-specific differences in varying learning contexts

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CHAPTER 3

DOES CLASSROOM COMPOSITION MAKE A DIFFERENCE? EFFECTS ON DEVELOPMENTS IN MOTIVATION, WELL-BEING, AND ACHIEVEMENT IN UPPER PRIMARY SCHOOL [1]

Abstract The present study investigated effects of socio-economic and ethnic classroom composition on developments in students' motivation, well-being, and achievement. A sample of 722 primary school students filled out questionnaires from third to sixth grade. Latent Growth Curve Analyses showed that during each measurement, reading comprehension scores of low SES students were lower in more social-economically disadvantaged classes. Contrarily, reading comprehension scores were higher in classes with more ethnic minority students. These effects may often partial each other out. Furthermore, in classes with higher numbers of low SES or ethnic minority students, students of all backgrounds showed more positive developments in motivation. These findings did not support commonly held fears that disadvantaged students "bring the rest down". Relations between classroom composition and initial levels of achievement and motivation in grade three were distinct from relations between classroom composition and developments in motivation and achievement, showing the relevance of studying longitudinal developments.

Keywords: *classroom composition; school composition; peer effects; motivation; achievement*

[1] Based on Hornstra, L., Van der Veen, I., Peetsma, T., & Volman, M. (resubmitted). Does classroom composition make a difference? Effects on developments in motivation, well-being, and achievement in upper primary school.

INTRODUCTION

Students' motivation for school and their achievement can be affected by many contextual factors including instructional, interpersonal, and organizational factors (Roeser, Eccles, & Sameroff, 2000). Moreover, poor integration of students in their school environment has been found to decrease students' motivation for school and negatively affect learning outcomes (e.g., Eccles & Roeser, 2011; Roeser et al., 2000). By definition, classrooms are 'social environments' in which social interactions with the teachers, but also classmates shape the learning process (Urdan & Schoenfelder, 2006). The composition of the classroom may thus be essential for students' motivational and learning outcomes.

Like in many other countries, there is a large diversity between schools in the Netherlands with regard to social and ethnic classroom composition. Especially in urban areas, socio-economic and ethnic school segregation is a common phenomenon (Bakker, Denessen, Peters, & Walraven, 2011; CBS, 2010; Karsten, 2006; Karsten, Felix, Ledoux, Meijnen, Roeleveld, & Van Schooten, 2006). Although schools in the Netherlands receive additional funding for students with disadvantaged backgrounds (OECD, 2012), it is still feared that students in classrooms with many peers from disadvantaged backgrounds are negatively affected in comparison to similar students in classrooms with a different composition.

Many studies on classroom composition focused solely or predominantly on achievement outcomes (e.g., Driessen & Sleegers, 2000; Goldsmith, 2004; Opdenakker & Van Damme, 2007; Peetsma, van der Veen, Koopman, & Van Schooten, 2006). But as important as achievement levels may be, good grades may not be the only desired outcome of education. The context in which children learn can also affect other school related outcomes, such as their desire for learning, feelings of competence, and well-being in the classroom (Volet & Järvelä, 2001). These aspects are not only important because they could potentially enhance achievement, they could also be considered to be desirable in their own right. This study will therefore not only focus on socio-economic

and ethnic composition effects on academic achievement, but also on motivational outcomes and students' well-being with other students.

ETHNIC BACKGROUND AND SOCIO-ECONOMIC STATUS

There are three main types of immigrant groups in the Netherlands: (a) guest workers and their families from Mediterranean countries, such as Morocco and Turkey; (b) immigrants from former Dutch colonies, including Suriname and the Netherlands Antilles; and (c) refugees from countries such as Iran, Iraq, former Yugoslavia, and Somalia. Overall, immigrant students with an non-western background from each of these groups show considerable educational disadvantages compared to their Dutch peers as well as immigrant students with a western background. Therefore, educational policies in the Netherlands, often distinguish between ethnic minority and majority students instead of immigrant and non-immigrant students (The Netherlands Institute for Social Research, 2010). A similar distinction is made in this paper.

Also low SES students lag behind in school compared to higher SES students (Roeleveld et al., 2011; The Netherlands Institute for Social Research, 2010). Both in research and policy, the characteristics of ethnic minority and low SES students are often considered interchangeable. Although ethnic minorities are more likely to have a lower socio-economic status, ethnic minority students and low SES students differ from each other in many aspects, such as their historical and cultural background. Furthermore, ethnic minority students in the Netherlands usually speak Dutch as a second language (The Netherlands Institute for Social Research, 2010). Because of these differences, socio-economic and ethnic classroom composition may have different effects on students, and therefore classroom effects with regard to ethnicity and SES are considered separately in this study.

EXPLANATIONS FOR CLASSROOM COMPOSITION EFFECTS

In general, segregation is often believed to lead to adverse outcomes for those students in disadvantaged, segregated classrooms. The common held fear is that students groups that are considered disadvantaged based on their average achievement levels., i.e., ethnic minority students or students from social-economically disadvantaged backgrounds, will "bring down" other students in the classroom and that these students themselves will not be able to benefit from the potential of more privileged classrooms. There are a number of different explanations of the underlying processes through which a disadvantaged classroom composition would negatively affect students.

The *instructional quality* explanation states that quality is lower in disadvantaged classrooms because of several reasons. Teachers adapt their general instructional level to the average level of their students (Beckerman & Good, 1981), teacher expectations may be lower (Jussim, Eccles, & Madon, 1996; Jussim & Harber, 2005; Van den Bergh, Denessen, Hornstra, Voeten & Holland, 2010) and as a result the standard may be lowered. Moreover, disadvantaged schools may have more problems finding qualified and motivated staff (OECD, 2005). The *language contact* hypothesis brought forward by Driessen, Doesborgh, Ledoux, Van der Veen, and Vergeer (2003) furthermore states that ethnic minority students in segregated classrooms will have less opportunities to come into contact with Dutch language than ethnic minority students in classrooms with more Dutch students. Accordingly, ethnic minority students in integrated classrooms will thus become more proficient in Dutch language, which will also help them in other academic subjects as well (Driessen et al., 2003). The language contact hypothesis may hold especially for ethnic minority students, but to some extent it may also hold for socio-economic background differences, considering the distinction in 'restricted' and 'elaborated' code (Bernstein, 1964). Moreover, the *social contagion* explanation states that through social interactions students affect each other's motivation and learning outcomes and students will thus become more alike, either positively or negatively (Erbring & Young, 1979; Kelly, 2009). Likewise, the *normative explanation* states that students will become like their peers because of the norm that is being set in the classroom (Goldsmith, 2011). Based on these

two explanations, it is often assumed that students in disadvantaged classrooms will 'bring each other down' in terms of motivation and achievement. In disadvantaged classrooms, students are often believed to discourage motivation and devalue achievement (Goldsmith, 2011) and group dynamics may lead a culture of amotivation within the class (Paulle, 2002).

While most of the aforementioned explanations suggest that being in a classroom with many ethnic minority or low SES students will negatively impact motivation and achievement, others have argued that students in disadvantaged classrooms could also benefit from school segregation. Previous research (e.g., Hornstra, Van der Veen, Peetsma, & Volman, 2013) has indicated that especially ethnic minority students report higher motivation than majority students. These students have more to gain from education in terms of upward mobility (Van der Veen, 2003), suggesting that – also in line with the aforementioned *normative* explanation – students in 'disadvantaged' classrooms may set a norm of high motivation and may encourage achievement. Moreover, according to the *big-fish-little-pond effect*, students form their self-concept based on their own ability levels as well as on a comparison with the ability levels of classmates. When students are in a classroom where overall ability levels are higher than their own ability level, their expectancies about their own abilities are expected to develop more negatively (Marsh, 1987). In more disadvantaged classes where overall ability levels are lower, self-efficacy and consequent learning outcomes are more likely to develop more positively. The *specialization hypothesis* furthermore suggests that in disadvantaged classrooms, teachers may be better able to tailor their instruction to the needs of their specific classroom (Driessen et al., 2003). This could for example refer to the pace or content of instructional practices, such as focusing more on language in classrooms with many students with language delays. Specialization may also refer to adapting the instructional style to students' particular backgrounds. Teacher expectancy literature (e.g., Rosenthal 1994) showed that teacher perceptions of their students' ability or background can affect many aspects of teaching and learning outcomes. As such, teachers in classrooms with different student populations may find different instructional styles suitable for their students.

PREVIOUS RESEARCH ON CLASSROOM COMPOSITION EFFECTS

Many studies have examined classroom composition effects. Most studies focused on achievement and effects seem to differ across countries (Bakker et al., 2011; Opdenakker & Van Damme, 2007). A majority of studies (Alexander & Eckland, 1975; Caldas & Bankston III, 1997; Driessen & Sleegers, 2000; Driessen, 2002; Driessen et al., 2003; Duru-Bellat & Mingat, 1998; Goldsmith, 2011; Hanushek & Rivkin, 2009; Opdenakker & Van Damme, 2001; Opdenakker & Van Damme, 2006; Opdenakker & Van Damme, 2007; Palardy, 2008; Peetsma, Van der Veen, Koopman, & Van Schooten, 2006; Resh & Dar, 2011; Van der Slik, Driessen, & De Bot, 2006) found support for explanations that suggest harmful effects of being in a disadvantaged classroom. Outcomes of these studies indicated that when students are taught in disadvantaged classes, their achievement will be lower than in more privileged classes. Some of these studies found rather substantial effects (e.g., Caldas & Bankston III, 1997; Opdenakker & Van Damme, 2006), while other studies found weak effects of classroom composition (e.g., Alexander & Eckland, 1975; Driessen, 2002). Other studies found no effects at all (e.g., Bondi, 1991; Hauser, Sewell, & Alwin, 1974). In line with the *specialization* hypothesis, some studies that took into account differential effects found that for disadvantaged students being taught among other disadvantaged peers could be beneficial (Peetsma et al., 2006).

Most of the aforementioned studies only included cross-sectional data. Also the aforementioned explanations do not explicitly refer to developments over time. It seems however likely that processes described in these explanations will increasingly affect students over time. For example, lower instructional quality will probably not directly lead to lower achievement outcomes in disadvantaged schools, but students will probably progress less over time in comparison to students in schools where instructional quality is higher. The same may hold for the explanations that state that students will be negatively affected by their peers in disadvantaged schools – either through social contagion, the norm that is being set, or through the language levels of peers. These peer effects probably cumulate over time, and according to these explanations it can be

expected that students in these classrooms also show less progress. Likewise, according to *specialization* hypothesis, it may be expected that students show most progress over time when being taught among similar students. Only few studies have examined composition effects longitudinally. However, longitudinal studies can provide valuable insights in addition to cross-sectional studies. With longitudinal research, progress can be taken into account. Longitudinal studies thus allow for examining whether classroom composition characteristics can explain why students in some classes show more progress than in other classes.

Not only longitudinal studies are scarce. Studies on outcomes other than achievement are especially scarce. Only few studies have focused (also) on outcomes such as well-being and self-concept (e. g., Peetsma et al., 2006; Van Landeghem, Van Damme, Opdenakker, De Frairie De Frairie, & Onghena, 2002). Outcomes of these studies are inconclusive, but seem to indicate that composition effects on achievement are somewhat stronger than on motivational outcomes or well-being. In all, more longitudinal research is thus needed to gain more insight into composition effects on achievement as well as other outcomes.

In addition to achievement, the present study will therefore also take into account developments in students self-reported well-being with fellow students, and motivational outcomes, including task-orientation, referring to the extent to which students are oriented towards mastering and understanding school-related tasks (Pintrich, 2000), self-efficacy, referring to judgments about one's capabilities to carry out actions that are needed to complete academic tasks successfully (Bandura, 1977), and school investment, which refers to motivated behaviors. These motivated behaviors can vary in terms of the intensity, persistence, and direction. Previous research (Hornstra et al., 2013) has shown that developments in students' task-orientation, self-efficacy, and school investment differ for students with different ethnic and socio-economic backgrounds. No differences were found when students were younger, but toward the end of primary school, ethnic minority students reported higher task-orientation, and self-efficacy compared to majority students, but were

rated lower on school investment by their teachers. Low SES students did not differ from other students in task-orientation, but reported lower self-efficacy at the end of primary school and were rated lower on school investment. These differences became more pronounced toward the end of primary school. Yet, to our knowledge, no studies have examined to what extent these differences in developments can be explained by socio-economic and ethnic characteristics of the classroom.

HYPOTHESES

In the present study, we examine the influence of class composition on learning gains in academic achievement as well as changes in students' well-being with fellow students and motivation during third to sixth grade of primary school.

1. Based on previous research, and in line with the instructional quality, the language contact, and the social contagion/normative explanations, it was hypothesized that a high number of low SES and/or ethnic minority students would negatively affect achievement. Negative effects were expected on both initial levels of achievement in grade three and on progress over time, as effects are expected to cumulate over time. Although previous literature is less clear on outcomes other than achievement, based on the strong relationship between motivation, well-being and achievement (e.g., Hornstra et al., 2013; Wigfield & Cambria, 2010), it was expected that composition effects on motivation and well-being would be in the same direction as composition effects on achievement. It was thus also hypothesized that a high number of low SES and/or ethnic minority students would negatively affect initial levels and developments in motivation, well-being and achievement.
2. In line with the specialization hypothesis and previous literature on differential effects (e.g. Peetsma et al, 2006), it was expected that the aforementioned effects may only hold for middle and high SES and ethnic majority students. It was hypothesized that low SES and ethnic minority students themselves may actually benefit in terms of achievement from a

high number of low SES and/or ethnic minority students in terms of initial levels and especially developments over time. Similar differential effects are expected with regard to motivational outcomes and well-being.

METHODOLOGY

SAMPLE AND PROCEDURE

A subsample of a larger national cohort study ("COOL" study) participated in the present study. The COOL study includes cohorts of students from kindergarten, grade three, and grade six. This subsample consisted of 722 third grade students from 37 classes of 25 schools across the Netherlands. Data on students' motivation in third and three years later in sixth grade were available from the triennial "COOL" study (Driessen, Mulder, Ledoux, Roeleveld, & Van der Veen, 2009). In between the two COOL measurements, three additional waves of data were collected from this subsample[2]. Students and teachers filled out questionnaires during each measurement wave. Table 1 shows a schematic overview of the data collection.

Table 1.
Schematic overview of waves of data collection

Wave	Grade	Months
1 (COOL-1)	Half way through grade 3	January/February, 2008
2	Beginning of grade 5	September/October, 2009
3	Half way through grade 5	January/February/March, 2010
4	Beginning of grade 6	September/October, 2010
5 (COOL-2)	Half way through grade 6	January/February/March, 2011

1. Analyses showed that in grade three, the motivation of the students in the subsample of schools only slightly differed from the motivation of students in a representative sample of schools (effect sizes between -0.13 and 0.01).

During the first COOL-measurement, students' average age was nine years, 361 (50.0%) students were boys and 361 (50.0%) girls. Schools provided information on students' background characteristics. Ethnicity was based on the mothers' country of origin. When a student was from a single-parent family, ethnicity was determined based on the ethnicity of this parent. A dichotomy was made between ethnic majority and ethnic minority students. Even though the group of ethnic minority students consisted of students with backgrounds in a wide variety of countries, these students were considered one group in the larger COOL-study and in the present study, because of their similarities (Driessen et al., 2009). Likewise, students with parents from another European or western country were included in the group of majority students[3]. 78 students (11%) were from ethnic minority (mostly Turkish or Moroccan) backgrounds, 644 students (89%) were from a western background.

Parental educational level was considered an indication of students' socio-economic status. Three groups were distinguished based on the highest educational level attained by either of the parents. (1) Of 96 students (16%), SES was considered low (primary school to junior vocational education). (2) The middle category (senior vocational education) consisted of 301 (50%) students, and (3) 204 (34%) students had a high SES background (higher education). From 121 students, SES information was missing. Analyses showed a significant relation between ethnicity and SES of students in this sample (*Spearman's Rho*=.112, $p<.05$).

MEASURES

Motivation and well-being with fellow students. Questionnaires on motivation and well-being with fellow students were administered to students and their teachers during regular class time. Motivation scales included self-reports on task-orientation and academic self-efficacy, and teacher reports on students'

[3] Additional analyses of variance (MANOVA's) showed that the different ethnicities *within* the groups of ethnic minority and majority students did not significantly differ in terms of their well-being, self-efficacy, task-orientation, and school investment.

investment. Although self-report measures have some limitations, as they are susceptible to self-presentation bias (Jobe, 2000), the internal nature of motivational beliefs makes self-reports one of the most suitable measures. Motivated behaviour, however, is a visible part of motivation and was therefore assessed by teacher ratings. This scale included items that represent two key aspects, intensity and perseverance, of school investment. Like task-orientation and self-efficacy, students' well-being with fellow students was measured with self-reports. The task-orientation, school investment, and well-being scales were formulated in Dutch. The self-efficacy scale was originally formulated in English and translated to Dutch for use in the COOL study. Moreover, all scales were validated for use in the COOL study (Driessen et al., 2009; Jungbluth, Roede, & Roeleveld, 2001). All items were on a 5-point Likert-scale ranging from totally not applicable to me (1) to totally applicable to me (5). In table 3, more information on the scales is reported.

Table 3.
Example items, number of items, and reliabilities of the scales used in the study

Scale	Example items	*N* of items	Reliability m1 – m5
Task-orientation from Goal Orientation Questionnaire (Seegers, Van Putten, & De Brabander, 2002)	*"I like when I learn something new in school."*	5	.65 - .82
Academic self-efficacy from 'Patterns of Adaptive Learning Survey' (PALS) (Midgley et al., 2000)	*"I can do even the hardest work in school if I try."*	6	.70 - .84
School investment from COOL student profiles (Jungbluth, Peetsma, & Roeleveld, 1996)	*"This student quickly gives up when he/she does not succeed."* *"This child works accurately"*	3	.82 - .85
Well-being with fellow students (Peetsma, Wagenaar, & De Kat, 2001)	"*I like spending time with other students in my class*"	6	.76 - .85

Mathematics achievement. Students' mathematics achievement scores on national tests from the Dutch National Institute for Educational Measurement (CITO) were obtained from the school records. These tests are administered to students in the Netherlands twice a year to monitor student progress. For eachstudent, four scores on these tests were available: from the end of fourth grade until the middle of sixth grade. Two different versions of this test were used by the schools because the test was updated by the CITO in 2007. Some schools (N=6) in the sample used the older version, while other schools (N=18) administered the updated version to their students. The scores on both versions were not comparable; therefore scores of the older version were transformed so that the mean and standard deviation of the scores on the older version of the test were the same as those of the newer version.

Reading comprehension achievement. Students' reading comprehension scores on the national tests (CITO) were also obtained from the school records. The reading comprehension tests are administered once a year to monitor student progress. For each student, three scores on these tests were available: from the middle of fourth grade until the middle of sixth grade. The reading comprehension tests were updated by the CITO in 2008. Sixteen schools in the sample used the older version, while eight schools administered the updated version to their students. One school did not administer reading comprehension tests of CITO to their students. Both versions of the test use the same scale and analyses showed scores on both versions to be comparable indeed (Feenstra, Kamphuis, Kleintjes, & Krom, 2010). Both versions had good reliability ($\alpha > 0.80$) (Evers, 2002; Feenstra et al., 2010).

Classroom composition. The composition of the class by socio-economic background was computed by calculating the percentage of students with low SES (i.e. children whose parents have had no more than junior vocational education). With regard to the ethnic classroom composition, the percentages of ethnic minority students were not normally distributed across classes. Three types of classrooms were therefore distinguished: (1) classrooms with no ethnic

minority students; (2) classrooms with <50% ethnic minority students; (3) classrooms with >50% ethnic minority students.

DATA-ANALYSES

The data were analysed using multivariate Latent Growth Curve Analyses (LGCA) with Mplus (Muthén & Muthén, 2007). With LGCA, for each individual participant, two latent variables, the initial rate (intercept) and level of growth a year (slope) of each dependent variable (i.e., task-orientation, self-efficacy, school investment, well-being, math and reading comprehension) can be estimated based on the observed scores at each measurement occasion. This allows for examining how classroom composition relates to the initial levels as well as developments in the dependent variables. Effects of classroom composition on initial levels indicate that differences between classrooms with different compositions were found in grade three and remained stable during each measurement. Composition effects on growth indicate that differences between classrooms with different compositions emerged between grade three and six.

Before analysing the relations between classroom composition and the dependent variables, preliminary analyses were conducted. Participants with missing values were not removed from the analyses. Instead, missing values were estimated by full-information maximum likelihood estimation (FIML). The FIML estimation is based on the assumption that missing values are missing at random (MAR). MAR assumes that missing values can be predicted from the available data. Removing all cases with missing values (listwise deletion) is based on the more strict assumption that the missing values are completely at random (MCAR). Furthermore, to check whether the variables reflected the same construct over time and across groups, a series of multi-group factor analyses were performed, yielding satisfactory results. For measurement invariance across groups (boys vs. girls, ethnic majority vs. minority students, and low vs. middle vs. high SES), a model was estimated for each variable in which measurement parameters were held equal across groups.

Likewise, to check for measurement invariance across measurement occasions, multi-group factor analyses were performed with groups being the measurement occasions. All models fitted the data well (CFI and TLI were above .95) and fit was not significantly better in less restrictive models.

Next, all models were first estimated for the total group of students (hypothesis 1) while controlling for the individual background variables ethnicity, SES, gender, and cognitive ability. In this first step, for each dependent variable, the intercept and slope were estimated and both classroom composition variables were included in the model. Both composition variables were included to take into account potential overlap between the ethnic and socio-economic classroom composition. As the data have a nested structure (students within classes), we corrected for the multilevel structure of the data. Non-significant paths were omitted from the model to find the most parsimonious model. To examine whether classroom composition affected developments in achievement, motivation, and well-being with fellow students, it was examined whether model fit significantly declined by removing the composition variables from the model. Model fit was determined by Chi-square difference tests, the Comparative Fit Index (CFI), and the Root Mean Square Error of Approximation (RMSEA). A significant Chi-square difference indicates whether or not model fit significantly worsened by omitting an estimate. A CFI above .90 indicates good fit of a model, and an RMSEA below .05 indicates good fit and scores between .05 and .08 indicate reasonable fit (Hu & Bentler, 1999).

To investigate differential effects of classroom composition, multi-group LGCA's were performed. In the first multigroup comparison, the effects of socio-economic classroom composition were compared for low, middle, and high SES students. In the other multigroup comparison, the effects of ethnic classroom composition were compared for ethnic minority and majority students. For these multigroup analyses, first a model with no equality constraints was defined. One by one, equality constraints were added to the model. Fit indices indicated whether or not model fit significantly declined by adding the equality constraint, indicating that a parameter differed across the

groups. If the model fit did not significantly worsen by adding the equality constraint, the parameter was considered equal.

To evaluate the size of the relations between classroom composition and developments in motivation, well-being, and achievement, standardized coefficients (i.e., correlations) of the relations were calculated and the size of the effect was indicated by means of Cohen's *d*. A standardized correlation of 0.10 is indicative of a small, 0.30 a medium, and 0.50 a large correlation (Cohen, 1988).

RESULTS

DESCRIPTIVE STATISTICS

Table 3 provides an overview of the descriptive statistics of each dependent variable (task-orientation, self-efficacy, school investment, well-being with fellow students, math achievement, and reading comprehension achievement) at every measurement occasion.

Table 3. *Descriptive statistics and correlations of task-orientation (TO), self-efficacy (SE), school investment (SI), well-being with fellow students (WB), math, and reading comprehension (RC)* (*N*=722)

		M	*sd*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.	TO gr 3	4.11	0.60	1.00														
2.	TO gr 5_1	4.05	0.54	.07	1.00													
3.	TO gr 5_2	3.92	0.60	.09*	.50**	1.00												
4.	TO gr 6_1	3.92	0.59	.05	.41**	.59**	1.00											
5.	TO gr 6_2	3.85	0.61	.04	.33**	.43**	.57**	1.00										
6.	SE gr 3	3.71	0.62	.44**	.04	.06	.02	.01	1.00									
7.	SE gr 5_1	3.62	0.61	.06	.47**	.27**	.27**	.21**	.07	1.00								
8.	SE gr 5_2	3.65	0.57	.03	.34**	.43**	.32**	.21**	.02	.56**	1.00							
9.	SE gr 6_1	3.72	0.57	.07	.31**	.41**	.48**	.34**	.02	.49**	.66**	1.00						
10.	SE gr 6_2	3.76	0.61	.02	.27**	.25**	.34**	.52**	-.01	.40**	.52**	.61**	1.00					
11.	SI gr 3	3.38	0.89	.15**	.04	.02	-.01	.02	.06	.02	.01	.02	.03	1.00				
12.	SI gr 5_1	3.43	0.93	.07	.10*	.13**	.14**	.13**	.12**	.13**	.15**	.09*	.15**	-.02	1.00			
13.	SI gr 5_2	3.44	0.97	-.03	.07	.11**	.11*	.10*	.04	.15**	.15**	.09*	.13**	.01	.77**	1.00		
14.	SI gr 6_1	3.43	0.88	.01	.11*	.21**	.20**	.15**	.02	.17**	.15**	.14**	.17**	.06	.58**	.60**	1.00	
15.	SI gr 6_2	3.53	0.87	.06	.09	.15**	.17**	.16**	.02	.15**	.14**	.16**	.20**	.11*	.57**	.63**	.70**	1.00
16.	WB gr 3	3.38	0.89	.28**	.07*	.05	.01	.03	.25**	.07	-.01	.09*	.01	.12**	.01	-.04	-.05	-.05
17.	WB gr 5_1	3.44	0.93	-.02	.23**	.15**	.17**	.13**	-.01	.17**	.14**	.12**	.08**	.02	.07	.10**	.06	.02
18.	WB gr 5_2	3.44	0.98	-.01	.19**	.25**	.23**	.14**	-.04	.14**	.25**	.19**	.10**	.05	.13**	.12**	.12**	.08
19.	WB gr 6_1	3.43	0.88	.08	.15**	.13**	.24**	.17**	.01	.13**	.18**	.26**	.17**	.01	.11*	.09*	.06	.07
20.	WB gr 6_2	3.53	0.87	.06	.11*	.14**	.17**	.21**	-.06	.08	.16**	.14**	.18**	.00	.12**	.13**	.11**	.13**
21.	RC gr 4	34.58	13.80	.10	.04	.04	.01	-.04	.12*	.11*	.16**	.11*	.09	.01	.37**	.27**	.26**	.27**
22.	RC gr 5	44.02	14.15	.01	.04	.14**	.08	-.01	.08	.18**	.25**	.21**	.15**	.01	.40**	.40**	.38**	.42**
23.	RC gr 6	57.93	16.58	-.04	.02	.13**	.06	.01	.00	.19**	.30**	.21**	.17**	-.01	.41**	.42**	.32**	.37**
24.	Math gr 4_2	85.78	15.22	.01	.06	-.01	-.06	-.03	.05	.28**	.22**	.17**	.19**	-.01	.26**	.27**	.15**	.13*
25.	Math gr 5_1	95.58	15.43	.02	.04	.02	-.02	.00	.15*	.27**	.25**	.21**	.22**	.05	.26**	.27**	.21**	.23**
26.	Math gr 5_2	103.22	12.46	-.01	.08	.12*	.02	.03	.00	.39**	.36**	.32**	.27**	.00	.37**	.38**	.34**	.38**
27.	Math gr 6_1	107.71	15.13	-.04	.10	.06	.03	.06	-.08	.23**	.23**	.23**	.22**	-.02	.11	.11	.19**	.22**

Table 3 (*continued*).

		M	*sd*	16	17	18	19	20	21	22	23	24	25	26	27
16.	WB gr 3	3.38	0.89	1.00											
17.	WB gr 5_1	3.44	0.93	.11**	1.00										
18.	WB gr 5_2	3.44	0.98	.01	.61**	1.00									
19.	WB gr 6_1	3.43	0.88	.07	.50**	.60**	1.00								
20.	WB gr 6_2	3.53	0.87	.05	.47**	.52**	.65**	1.00							
21.	RC gr 4	34.42	13.36	.01	-.02	.00	-.07	-.04	1.00						
22.	RC gr 5	43.78	13.86	.02	.08	.09	.03	.05	.69**	1.00					
23.	RC gr 6	57.75	16.10	-.08	.03	.03	.03	.04	.53**	.68**	1.00				
24.	Math gr 4_2	85.78	15.22	.05	.04	.00	.00	.00	.36**	.41**	.48**	1.00			
25.	Math gr 5_1	95.58	15.43	.08	.07	.01	-.02	-.05	.24**	.42**	.36**	.61**	1.00		
26.	Math gr 5_2	103.22	12.46	.09	.02	.04	-.02	-.02	.35**	.52**	.54**	.64**	.70**	1.00	
27.	Math gr 6_1	107.71	15.13	.05	-.06	.03	-.03	.01	.15*	.26**	.25**	.44**	.45**	.59**	1.00

**$p < 0.01$ level (2-tailed); *$p < 0.05$ level (2-tailed).

GENERAL CLASSROOM COMPOSITION EFFECTS

First it was examined for all students whether a higher number of ethnic minority or low SES students in the class would negatively affect initial levels and developments in achievement, motivation, and well-being with fellow students. Results from latent growth analyses on the direct relations between the socio-economic and ethnic classroom composition and initial levels and developments in motivation, well-being with fellow students, and achievement are presented in table 4. In all analyses, we controlled for individual SES, gender, ethnicity, and cognitive ability to examine whether classroom composition affected motivation, well-beding and achievement beyond individual background variables. Fit indices indicate that each of the models fitted the data well. Below, results on socio-economic and ethnic classroom composition are discussed separately.

Socio-economic classroom composition. The outcomes of table 4 show that after controlling for students' individual SES and other individual background variables, the percentage of low SES students in the class did not relate to the intercept, but related to growth in task-orientation. In other words, in classes with more low SES students, students had similar initial levels of task-orientation compared to classes with lesser low SES students, but showed more progress in task-orientation toward the end of primary school. 10% of growth in task-orientation can be explained by socio-economic classroom composition. The effect size for this effect can be considered small to medium. Moreover, the socio-economic classroom composition related negatively to the initial level of reading comprehension, indicating that in classes with more low SES students, reading comprehension scores were lower across all grades. Note, that is after controlling for individual background characteristics, i.e., individual SES, ethnicity, gender, and cognitive ability. 4% of variance in initial levels of reading comprehension could be explained by the socio-economic classroom composition. The effect size of this relation was small to medium. No relation with growth rate of reading comprehension was found. Socio-economic classroom composition did not relate to initial levels or developments in self-efficacy, school investment, well-being, or math achievement.

Table 4.
Standardized estimates of socio-economic and ethnic classroom composition effects on intercepts (Int) and slopes (Sl; growth a year) of motivation, well-being with fellow students and achievement for the total group of students.

	Socio-economic composition				Ethnic composition				Fit indices		
	Int	R^2	Sl	R^2	Int	R^2	Sl	R^2	χ^2 (df)	CFI	RMSEA
Task-orientation	*ns*		0.25	10%	*ns*		*ns*		47.076 (25)	.974	.029
Self-efficacy	*ns*		*ns*		0.15	2%	*ns*		20.871 (25)	1.000	.000
School	*ns*		*ns*		*ns*		*ns*		50.622 (33)	.977	.027
Well-being	*ns*		*ns*		*ns*		*ns*		47.496 (28)	.978	.031
Mathematics	*ns*		*ns*		*ns*		*ns*		34.995 (22)	.900	.029
Reading comprehension	-0.25	4%	*ns*		0.23	4%	*ns*		28.839 (11)	.954	.047

Note. Control variables: individual SES, ethnicity, gender, and cognitive ability.

Ethnic classroom composition. Table 4 furthermore shows that after taking into account individual ethnicity, SES, gender, and cognitive ability, ethnic composition significantly related to students' initial level of self-efficacy, suggesting that in classes with more ethnic minority students, self-efficacy was on average higher during each measurement. This explained 2% of variance in initial levels of self-efficacy. The effect size was small. No relation with growth rate of self-efficacy was found. After controlling for individual ethnicity and other individual background variables, ethnic classroom composition also positively related to the initial level of reading comprehension. This showed that at each measurement, students with similar background characteristics achieved higher in classes with higher numbers of ethnic minority students as compared to classes with less ethnic minority students. The effect size of this relation was small to medium. Ethnic classroom composition did not relate to initial levels or developments in task-orientation, school investment, well-being, or math achievement.

DIFFERENTIAL CLASSROOM COMPOSITION EFFECTS

After examining composition effects for the total group of students, differential effects were examined to compare the effects of classroom composition across groups. Results are reported in table 5 and 6. Fit indices indicate that each of the models had reasonable to good fit to the data. Below results with regard to differential effects of socio-economic classroom and ethnic classroom composition are considered separately.

Differential effects of socio-economic classroom composition. The outcomes of table 5 show that some effects of socio-economic classroom composition differed for low, medium, and high SES students. The positive relation between socio-economic classroom composition and growth in task-orientation was however similar for these groups. Being in a classroom with more low SES students thus related positively to progress in task-orientation, regardless of students' own socio-economic background. For low SES students this explained more variance in growth in task-orientation, than for medium and high SES students (7%, 3%, and 1%, respectively). Effect sizes were small to medium. Furthermore, for medium and high SES students, a significant positive effect of socio-economic classroom composition on growth in self-efficacy was found, while for low SES students, socio-economic classroom composition did not relate to growth in self-efficacy. For both the middle and high SES groups, a higher number of low SES students in the class related to more growth in their self-efficacy, explaining 3 to 1% of variance respectively. Table 5 also shows that only for low SES students, developments in their well-being with fellow students was affected by the socio-economic classroom composition. While initially no differences in the relation between classroom composition and well-being were found, results showed that for low SES students, well-being with fellow students decreased when being in a classroom with more other low SES students, explaining 15% of variance of growth in well-being. The effect size of this effect was medium to large. Finally, table 5 also shows that only for low SES students, the initial level of reading comprehension was negatively affected by a higher number of low SES students in the class, explaining 15% of

variance in the intercept of reading comprehension. This outcome shows that when low SES students were taught in classes with more low SES students, their reading comprehension scores were lower during each measurement than when they would be in classes with more middle or high SES students. The effect size was medium.

Differential effects of ethnic classroom composition. The outcomes of table 6 show the differential effects of ethnic classroom composition. Table 6 first shows that after controlling for individual background variables, ethnic majority students in classrooms with more ethnic minority students show higher initial levels of task-orientation, self-efficacy, math achievement, and reading comprehension, explaining 1-13% of variance. Effect sizes are small, and medium for task-orientation. For ethnic majority students, ethnic classroom composition did not relate to growth rates in any of the dependent variables. For ethnic minority students, growth rates of task-orientation and well-being with fellow students were both higher in classes with more ethnic minority students, suggesting that ethnic minority students increase more in task-orientation and well-being when being in a classroom with other ethnic minority students. This explained 10 and 16% of variance in growth rates, respectively. Effect sizes were both medium. For ethnic minority students, a medium negative effect of the number of ethnic minority students on the initial level of mathematics achievement was found, indicating that ethnic minority students achieved better on mathematics, during each measurement, when they are in classrooms with more majority students. This explained 10% of variance in the intercept of mathematics achievement. Contrarily, for ethnic minority students, also a small positive effect of the number of ethnic minority students on the initial level of reading comprehension was found, indicating that ethnic minority students achieved better on reading comprehension during each measurement in classrooms with more ethnic minority students. 10% of variance in the intercept of reading comprehension was explained by ethnic classroom composition.

Table 5.

Standardized estimates of ethnic classroom composition effects on intercepts (Int) and slopes (Sl; growth a year) of motivation and achievement for the total group of students and separately effects for Dutch background and ethnic minority students

	Socio-economic background												Fit indices		
	Low				Middle				High						
	Int	R^2	Sl	R^2	Int	R^2	Sl	R^2	Int	R^2	Sl	R^2	χ^2 (df)	CFI	RMSEA
Task-orientation	*ns*		0.26	7%	*ns*		0.26	3%	*ns*		0.26	1%	81.740 (79)	.996	.013
Self-efficacy	*ns*		*ns*		*ns*		0.10	3%	*ns*		0.17	1%	121.143 (77)	.974	.055
Investment	*ns*		*ns*		*ns*		*ns*		*ns*		*ns*		99.030 (80)	.983	.032
Well-being	*ns*		-.39	15%	*ns*		*ns*		*ns*		*ns*		119.826 (74)	.948	.055
Mathematics	*ns*		*ns*		*ns*		*ns*		*ns*		*ns*		91.285 (47)	.919	.068
Reading Compr.	-.35	15%	*ns*		*ns*		*ns*		*ns*		*ns*		52.674 (32)	.960	.057

Note. Control variables: individual ethnicity, gender and cognitive ability.

Table 6.

Standardized estimates of ethnic classroom composition effects on intercepts and slopes (growth a year) of motivation and achievement for the total group of students and separately effects for Dutch background and ethnic minority students

	Ethnic background								Fit indices		
	Majority				Minority						
	Int	R^2	Sl	R^2	Int	R^2	Sl	R^2	χ^2 (df)	CFI	RMSEA
Task-	0.13	2%	*ns*		*ns*		0.32	10%	71.236 (50)	.969	.034
Self-efficacy	0.35	13%	*ns*		*ns*		*ns*		84.135 (45)	.957	.049
Investment	*ns*		*ns*		*ns*		*ns*		84.954 (53)	.976	.041
Well-being	*ns*		*ns*		*ns*		0.39	16%	82.136 (49)	.966	.043
Mathematics	0.11	1%	*ns*		-0.28	10%	*ns*		87.372 (34)	.926	.066
Reading	0.08	1%	*ns*		0.08	10%	*ns*		61.091 (23)	.944	.068

Note. Control variables: individual SES, gender and cognitive ability.

DISCUSSION

This study examined socio-economic and ethnic classroom composition effects on achievement, motivation, and well-being in grade three, and on developments in achievement, motivation, and well-being from grade three to grade six. Furthermore, it was examined whether these effects differed for different groups of students. In all, our outcomes present a mixed picture, but for low SES and ethnic minority students, results were mostly in line with the *specialization* explanation (Driessen et al., 2003), suggesting that in disadvantaged classes, teachers are better able to meet the specific needs of their student population. Especially ethnic minority students seemed to benefit from being taught in classes with other ethnic minority students in terms of motivational outcomes as well as achievement in reading comprehension, but not with regard to mathematics achievement. Low SES students also benefited from being taught among other low SES students with regard to their motivation but not their well-being with fellow students or achievement in reading comprehension. Moreover, groups of students that are generally doing comparatively well in school, i.e., middle and high SES and majority students were not negatively affected by higher numbers of low SES or ethnic minority students in the class, and with regard to motivation they were found to be positively affected. Below, the results will be discussed in more detail.

We expected that being taught in a class with a high number of low SES or ethnic minority students would negatively affect initial levels and growth in achievement. This hypothesis was only partly confirmed. Growth in achievement did not depend on classroom composition, but initial levels of reading comprehension scores were lower in classes with more low SES students and remained lower. This was after controlling for individual background characteristics. However, surprisingly, initial reading comprehension scores were found to be higher in classes with more ethnic minority students and to remain higher. This was again after controlling for individual background characteristics. Since there is an overlap between the socio-economic and ethnic classroom composition, these effects will probably

partial each other out and may often go undetected in research. This indicates socio-economic and ethnic classroom characteristics, although sometimes overlapping, are distinctly different and affect students in different ways. These are thus important to study separately.

Differential analyses showed that the aforementioned negative effect of being in a class with many low SES students only held for low SES students. This outcome may be explained by the *language contact* hypothesis (Driessen et al., 2003). In classes with many low SES students, these students may be deprived of language opportunities they would have in classes with more middle and high SES students. However, in classes with many ethnic minority students, and in support of the specialization explanation, language delays may be more prominent and visible, and in these schools financial resources may be especially allocated at language, benefiting both ethnic minority and majority students. The additional funding schools used to receive for ethnic minority students (OECD, 2012) thus seems to have been successfully invested in combatting language delays. Funding policies have recently changed and funding is now only based on the educational level of the parents (Roeleveld et al., 2011). The extra focus of schools with more ethnic minority students on language may have a downside; this could be at the expense of mathematics achievement for ethnic minority students, as ethnic minority students in classes with many more ethnic minority students, showed less progress in mathematics achievement.

Contrary to our expectations, but in line with the *big-fish-little-pond* effect, students in classes with more ethnic minority students or low SES students, actually showed more positive developments in self-efficacy. Ethnic majority students were higher in self-efficacy from grade three onwards when they were in a class with a higher number of ethnic minority students, and middle and high SES students became more self-efficacious over time in more socio-economically disadvantaged classrooms. Furthermore, all students, especially ethnic minority students, became more task-oriented over time when their class consisted of more low SES or ethnic minority students. Previous research (Hornstra et al., 2013) showed that ethnic minority students report higher

motivation. A positive process of *social contagion* (Erbring & Young, 1979; Kelly, 2009) may thus explain these composition effects. Especially in more disadvantaged classes, the importance of schooling may be stressed and this may create a classroom climate where learning is fostered. Moreover, in line with the specialization hypothesis, teachers in these disadvantaged classes may find ways to adapt to students needs and consequently encourage motivation.

The strongest effects were found with regard to well-being with fellow students. While low SES students decreased in well-being when in a classroom with other low SES students, ethnic minority students increased in well-being when they were in a classroom with more other ethnic minority students. This again illustrates that socio-economic and ethnic composition effects are not always similar and the complex underlying processes need to be studied taking into account different aspects of classroom composition.

Furthermore, the relations of classroom composition with initial levels of achievement and motivation in grade three were distinct from the relations of classroom composition with progress in achievement and developments in motivation, showing the relevance of focusing on longitudinal developments. Whereas composition effects on achievement were already present in grade three and remained stable throughout the years, composition effects on motivation and well-being mainly developed over time. In upper primary school, student become increasingly aware of and concerned with what their peers think about them (Molloy, Gest, & Rulison, 2011), and peer group effects on motivation and well-being may therefore become especially important as students get older. Contrarily, composition effects on achievement may have had their onset in earlier years of primary school when students start to develop important basic skills with regard to mathematics and reading. The first measurement of our study – and therefore what we named the "initial level" – was in grade three. However, the actual initial level of schooling is before that, when students enter kindergarten or in first grade when they start their formal schooling in mathematics and reading. Unfortunately, we do not have insight into the developmental process that have taken place before our study started.

To gain further insight into longitudinal classroom composition effects, also studies are needed that focus on earlier grades.

Some other limitations of the present study should also be noted. In the present study, the number of classes with high numbers of ethnic minority or low SES students was relatively limited in comparison to the number of other classes. However, results were in line with other longitudinal studies on classroom composition (e.g., Peetsma et al., 2006). Second, the relation between classroom composition and each separate aspect of motivation and achievement was examined in this study. We did not take into account these different aspects simultaneously. A larger sample would have allowed for such statistical analyses and could have strengthened the outcomes of the present study. Finally, the biggest limitation of the study may be that the processes by which classroom composition affects developments in students' achievement outcomes, motivation, and well-being were not examined. Future research could aim at identifying the processes that take place within classrooms with varying classroom composition that may explain the current findings.

In spite of the aforementioned limitations, due to its longitudinal design and focus on more than achievement, the present study provided some interesting new insights. The findings of the present study did not support commonly held fears that high numbers of disadvantaged students would bring down the rest. Students that are doing relatively well, will do so despite the composition of the class. Furthermore, especially ethnic segregation in schools can have benefits for ethnic minority students. This does not imply however that we should aim for segregated schools. There may be other arguments that may perhaps weigh more heavily, such as social integration, to continue to aim for schools with a balanced student population.