Inequalities in Youth Citizenship Knowledge and Attitudes: Does Cognitive Classroom Composition Matter?

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Abstract

Amidst worries about growing inequalities in citizenship competences of younger generations, policymakers increasingly call on education to equip students for functioning in a democratic society. The degree to which teachers may address inequalities in citizenship outcomes of their students, may depend on the cognitive composition of the classroom, however. Here, we investigate to what degree cognitive peer characteristics are associated with citizenship knowledge and citizenship attitudes in primary education. Our findings suggest that particularly low language ability students benefit from being surrounded with classroom peers that display both variation in and high average levels of cognitive ability for the acquisition of citizenship knowledge.

1. Introduction

For the past two decades, policymakers and professionals have been worried about erosion of social cohesion, disengagement with politics and socially unsafe schools in many democratic societies. As of recently, increases in social and political inequalities by educational level can be added to the list of worries. In recent elections, the youngest European generations of voters show substantially greater inequalities in participation according to educational level than the generations before them did when they were young (Abendschön, Schäfer, & Rossteutscher, 2014). Such inequalities pose a fundamental threat to democracy: how can the democratic system claim legitimacy or equality of democratic opportunity when large parts of the electorate – in particular, younger and lower educated citizens - are disengaged from politics? If such inequalities already manifest themselves at an age at which individuals reach the legal voting age, they must be caused by mechanisms that are present during pre-adulthood.

Education is often seen as an instrument that can address these problems. As educational systems typically reach virtually all citizens that have not reached adulthood due to compulsory education legislature, they are thought to be particularly suited to perform two functions. First, they may elevate the general level of citizenship competence among young citizens. Secondly, in reaching practically all young citizens, they may alleviate pre-existing inequalities that are due to social background. As such, schools are thought to be able to increase the overall quality of citizenship competence in a population and provide more equality of civic opportunity.

Indeed, in response to the aforementioned perceived challenges, policymakers in many democratic societies have called on schools to equip their students for civic participation, typically by means of civic or citizenship education (Eurydice, 2012; The National Task Force on Civic Learning and Democratic Engagement, 2012). Providing citizenship education can be considered an important task for schools. As policymakers and educators have recognized the relevance of this task, researchers have begun to investigate which citizenship outcomes are particularly desirable for schools to pursue and how to achieve them. Common findings are that giving structural attention to citizenship in the curriculum, fostering an open classroom climate in which controversial topics are discussed from multiple perspectives and reflection on community service can stimulate citizenship

knowledge and attitudes (Keating, Kerr, Benton, Mundy, & Lopes, 2010; Geboers, Geijsel, Admiraal, & Ten Dam, 2013; Isac, Maslowski, Creemers, & Van Der Werf, 2014; Torney-Purta 2002; Van Goethem, van Hoof, Orobia de Castro, van Aken, & Hart, 2014).

These findings show that classroom peers may play an important role in the development of citizenship knowledge and attitudes during classroom discussion and reflection. At the individual level, cognitive ability has been shown to be strongly associated with citizenship outcomes (Eidhof, ten Dam, Dijkstra, van de Werfhorst, 2014). Are individual citizenship outcomes are also influenced by the cognitive abilities of classroom peers? The contribution of this paper lies in addressing this question, while investigating whether pre-existing inequalities in citizenship knowledge and attitudes are influenced by the cognitive characteristics of classroom peers. To our knowledge, educational citizenship outcomes, such as citizenship knowledge and citizenship attitudes, have not been used as outcome variables of interest in the literature on peer effects, not in general nor in relation to the effects of peer cognitive ability. So far, authors studying other social outcomes of education, such as interethnic friendships, have predominantly focused on the effects of peers' ethnicities (Moody, 2001; Graham, Munniksma, & Juvonen, 2014; Quillian & Campbell, 2003).

With regard to academic achievement outcomes, a wide range of studies on peer effects have been conducted, however. In a review, Sacerdote finds that methodologically more advanced studies commonly report modestly positive effects of peer characteristics such as high prior ability and socio-economic background on language and mathematics scores (2014). Typically, higher ability students have a positive effect on the achievement of their classroom peers under ceteris paribus conditions. The main goal of this paper is to investigate whether and to what extent the average classroom cognitive level and variance in cognitive level is associated with inequalities in citizenship knowledge and citizenship attitudes of primary school students.

We focus on youth citizenship knowledge and attitudes of primary education students for pragmatic reasons, as it allows us to study the development of citizenship competence and relate is to the cognitive classroom composition at a very early part of the formative phase. Pre-adolescence appears to be a relatively potent period for youth citizenship development, given the stagnation of citizenship development that occurs during early adolescence in citizenship attitudes, personal efficacy and citizenship reflection development (Geijsel *et al.*

2012; Keating *et al.* 2010). Therefore, we expect variability in inequalities to be both more likely and impactful in pre-adolescent years, as both early individual differences in ability and continued exposure to peer effects[1] may accumulate over time (Heckmann, 2006; Lauder *et al.*, 1999).

2. Theoretical background

In the social sciences, there has been a growing literature on the effects of peer group characteristics on individual outcomes. The different economic, sociological and psychological studies have considered both a great number of individual outcomes and definitions of peer groups, ranging from neighborhood peers to within-classroom peers. The study of peer effects in education has thus far largely focused on academic achievement outcomes such as language ability, mathematics ability and GPA scores. On the basis of the studies carried out on peer effects, we argue that peers may also influence one's citizenship knowledge and citizenship attitudes. In particular, we hypothesize that the level of and variation in cognitive ability of classmates may affect inequalities in students' citizenship outcomes.

2.1 Peer effects on traditional academic achievement outcomes

The study of peer effects in education started with the landmark *Equality of Educational Opportunity* study by Coleman *et al.* (1966). In this U.S. study, Coleman colleagues report that students' achievement was "[…] strongly related to the educational background and aspirations of other students in the school." Subsequently, a Canadian study found student performance to increase with average classroom IQ score (Henderson, Mieszkowski, & Sauvageau 1978), although this relationship was reported to be nonlinear, with diminishing marginal returns. Both studies suggested that academic achievement of students depends in part on the characteristics of other students sharing the same classroom or school. Typically, these characteristics include students' socio-economic background and prior achievement variables, which are aggregated into school or class averages.

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[1] The term peer effects is used in multiple ways in the literature. Here, we use it to denote compositional and differential effects of peer group characteristics, in which the peer group is defined as all students belonging to the same primary school classroom.

While the study of underlying mechanisms has received little attention, peer effects have been studied in a variety of countries and educational contexts in recent years. In reviews of reported findings, evidence about the existence and magnitude of peer effects are found to be inconclusive, however (Thrupp, Lauder, & Robinson, 2002; Vigdor & Nechyda, 2007). These observations have led to a critical evaluation of the methodological soundness of many peer effect studies (Glewwe, 1997; Manski, 1993; Thrupp, Lauder, & Robinson, 2002; Ammermueller & Pischke, 2009). Recent research has attempted to incorporate these methodological considerations. Three such articles will be used to illustrate the current state of affairs in the academic achievement literature on primary education peer effects studies.

Firstly, Ammermueller and Pischke analyse the degree to which the number of books peers report to have at home influences reading test scores of primary school students in six European countries (2009). They explicitly deal with two important methodological concerns: the influence of selection of students into schools and measurement error. Having taking these into account, they find that on average across countries, a one standard deviation in peer composition leads to a 0.17 standard deviation in reading test scores.

Secondly, Vigdor and Nechyba (2007) use extensive longitudinal data on North Carolina primary schools to distinguish between effects associated with the grade level peer group and those associated with the classroom peer group. Using lagged test scores, they find that characteristics of the classroom peer group correlate substantially with individual achievement for both reading and mathematics scores. However, in a set of additional analysis on schools that exhibit more year-to-year variation in peer group characteristics, they find little evidence that relatively rapid changes in peer group composition influences individual achievement levels. This may either mean that peer composition needs to be stable over a period of time to impact individual achievement, or that the relationship between peer group characteristics and individual achievement is not causal in nature.

Thirdly, in a study on the primary school desegregation program Metco in Boston, Angrist and Lang (2004) analyze to which degree peer effects are present exploiting policy-driven exogenous shocks in classroom composition. They find that potential peer effects on four traditional academic achievement outcomes are modest and short-lived at best after addressing multiple methodological considerations such as using instrument variable analysis to control for omitted variable bias. Taken together, these three studies illustrate that the finding of studies which investigate the effect of peer group's characteristics on academic

6

achievement outcomes in primary schools remains inconclusive. The majority of the studies on primary and secondary education use linear-in-means models, which assume a general effect of the mean characteristic of the peer group, however. This implies that more subtle relationships between peer characteristics and individual outcomes may be overlooked.

In a recent review of the literature on peer effects, Sacerdote (2014) finds that approximately half of the studies that assume linear-in-means effects report modest or large effects on test scores. The other half of the studies do not find peer effects on academic achievement scores. In a qualification of this finding, Sacerdote reports that estimated peer effects can be found more often when the assumption of the linear-in-means model are replaced by assumptions that allow for a more sophisticated analysis of peer effects. In particular, taking into account that the effect may vary by both the distribution of peer characteristics and the student's position in the distribution of test scores leads to reporting of more robust peer effects (Imberman, Kugler, Sacerdote, 2012; Hoxby & Weingarth, 2005).

2.2 Peer effects mechanisms in education

As mentioned, studies on peer effects in education have not always investigated the mechanisms that allow such effects to manifest themselves. A few hypotheses have nevertheless been put forward. The first explanation that is mentioned by various authors, is that peer effects may be caused by increases in performance due to social comparison mechanisms (Eisenkopf, 2009; Blanton, Buunk, Gibbons, & Kuyper, 1999; Huguet, Dumas, Monteil, & Genestoux, 2001). Using an experimental design, Eisenkopf finds that the foresight of having a partner increases motivation before cooperation takes place. Interestingly, partners with high math scores decreased motivation, while having learning partners with an interest in logical puzzles increase test performance (Eisenkopf, 2009).

In an extensive study on peer effects, Hoxby and Weingarth (2005) distinguish between eight different models that specify interactions through which peer effects may take place. They find that if all else is equal, higher achieving peers provide positive peer effects, but also find support for two additional models: the focus model and the boutique model. These two models assume that too much diversity may hamper learning, as it may impair the learning environment from targeting students' needs when students' needs are to diverse, even when a particular student herself is not part of the group of homogeneous students.

As both studies address academic achievement outcomes, the mechanisms that have been found may not be applicable to citizenship outcomes. The models put forward by Hoxby and Weingarth can be used to interpret our findings in an intelligible manner, however.

2.3 Peer effects on social outcomes

Relatively few studies have scrutinized to what degree peer effects are relevant for social outcomes. While social outcomes are often ill-defined, we broadly define social outcomes here to be outcomes that relate to situations in which social interaction plays an important role, be they of interpersonal, public or political nature. Sacerdote (2014) finds that larger peer effects are found for social outcomes than for academic achievement outcomes. Peer effects studies on social outcomes find substantial effects of peer characteristics on binge drinking, smoking, taking up paternity leave, church going and the likelihood of joining a fraternity or sorority, among others (Duncan, Boisjoly, Kremer, Levy, & Eccles, 2005; Huisman, van de Werfhorst, & Monshouwer, 2012; Dahl, Løken, & Mogstad, 2012; Gavira & Raphael, 2001; and Sacerdote, 2001, respectively). While these outcomes clearly exhibit a social dimension, they are still rather distinct from citizenship knowledge and citizenship attitudes.

2.4 Hypotheses

One the most potent influences on student citizenship outcomes is the so-called open classroom climate. This concept indicates to which degree students feel safe in expressing their opinions and controversial topics are discussed from a variety of perspectives. Studies have consistently shown that an open classroom climate is associated with high citizenship outcomes (Geboers, et al., 2013; Isac et al. 2014; Torney-Purta 2002). Another factor that is associated with high citizenship outcomes is individual language ability (Eidhof et al, 2014). Language ability has been shown to be important for social interactions, of which citizenship situations are a subset. In particular, language is thought to be essential for developing meaning, reflection and perspective taking ability (Taylor, 1985; Hughes *et al.*, 2005; Astington & Jenkins, 1999). Moreover, verbal ability is seen as essential resource for

political participation, given its role in being able to reason, persuade and organize (Brady, Verba, & Schlozman, 1995).

Given the importance of both language ability and classroom discussion for the development of citizenship knowledge and attitudes, we expect that peer cognitive ability characteristics may also influence these outcomes, in multiple ways. In exploring these outcomes, we will test four hypotheses. The first hypothesis is based on the previous finding in the peer effects literature that better performing students positively influences their peers academic achievement (e.g., Hoxby & Weingarth, 2005), and applies this finding to the outcome variables citizenship knowledge and citizenship attitudes. This *Linear-in-Means hypothesis* states that a high average peer group cognitive ability leads to higher citizenship attitudes and knowledge scores.

The second hypothesis states that a greater variation in peer group cognitive ability leads to increased citizenship knowledge if the average classroom cognitive level is sufficiently high. This hypothesis is based on the assumptions that a minimum average level of cognitive ability facilitates high quality classroom discussion, and that variation in peer group cognitive ability would provide students of different language abilities with more classmates from whom they can learn. This is the *conditional variation hypothesis*.

Thirdly, we will test the *differential peer effect hypothesis,* which states that low language ability students may particularly benefit from peer group effects, as their potential for citizenship learning in relation is higher relative to their high language ability peers (Eidhof *et al.*, 2014). As such, exposure to high quality classroom interaction may lead to relatively more opportunities for citizenship learning.

Finally, the *similarity in nature hypothesis* will be tested, which states that peer effects are more likely to be of higher magnitude when the nature of the outcome is similar to the peer characteristic. In particular, the cognitive peer characteristics are expected to stimulate citizenship knowledge more than citizenship attitudes, as the nature of citizenship knowledge is more akin to the nature of the aforementioned peer characteristics, in that knowledge is strictly cognitive, rather than also including a volitional component as is the case with citizenship attitudes.

2.5 Primary schools in the Dutch context

We conceptualize citizenship in accord with Ten Dam, Geijsel, Reumerman, and Ledoux. (2011), who have put forward a notion of youth citizenship that is embedded into the daily lives of young people. This influential conceptualization is centered around four exemplary citizenship tasks: acting democratically, acting in a socially responsible manner, dealing with conflicts and dealing with differences. Students that are equipped with citizenship knowledge and attitudes are expected to be able to deal with these tasks in a way that is desirable in democratic societies. Primary schools in the Netherlands are by law expected to contribute to the active citizenship and social integration of their students.

Typically, Dutch primary schools do not sort their students in classes by ability, although a minority of primary schools has indicated that they sort students by reading ability to some degree. Using representative data, Ammermueller and Pischke do not find evidence for non-random assignment of students to classes in the Netherlands, nor do they find much difference in reading scores between classes in schools that indicate the use of tracking and those that do not (2009).

3. Methods

3.1 Addressing methodological concerns in the study of peer effects

As mentioned, a number of methodological concerns have been raised in the study of peer effects in recent years, spurred by the various conflicting results that have been reported. In this section, we explain how we address a number of methodological concerns.

First of all, Calvó-Armengol, Patacchini, and Zenou (2009) argue that the boundaries of the peer group are often arbitrary in studies on peer effects. We address this by taking the classroom as the boundary for the peer group, as this gives a higher likelihood of interaction than at the school level. In particular, as classrooms represent the basic unit in which learning takes place in schools, peer effects are more likely as classroom discussions involving all students take place in this setting. This assumption is confirmed by Vigdor and Nechyba (2007), who find classroom peer effects to be more often and more substantially correlated with individual achievement than grade-level peer effects.

Secondly, Ammermueller and Pischke (2009) note that measurement error can lead to substantial bias in the estimation of peer effects. Our peer characteristics suffer less from measurement error, as they are not measured by self-reports but assessed objectively. Moreover, to avoid imprecise measurement of aggregated peer characteristics due to high proportions of missing data at the classroom level, classrooms with more than 30% missing data are removed.

Thirdly, Manski (1995) and others have pointed out that peer effect studies in education may suffer from selection bias, as students may not sort randomly into schools. Instead the characteristics of the peer population may influence school selection by students and parents. In studies that have explicitly controlled for contextual effects (McEwan, 2003; Ammermueller & Pischke, 2009), the magnitude of such effects was found to be small and of little practical significance. We nonetheless include with school fixed effects analyses to address these concerns.

An additional methodological criticism is directed at the linear-in-means approach, in which the mean peer characteristic is assumed to have a similar, linear effect on all students. However, means are likely not the only peer group characteristic that matters, while possible also affecting students of different ability in different ways (Glewwe, 1999; Hoxby & Weingarth, 2005; Sacerdote, 2014). We address this methodological consideration in two ways: (1) by including the standard deviation of peer cognitive ability and (2) by including the interactions between individual language and mathematics ability on the one hand and the peer group characteristics on the other hand. The latter allows us to investigate whether high ability student are impacted differently by peer group characteristics than low ability students.

3.2 Data

The analyses have been performed on the Cohort Research on Educational Careers data, a nationally representative school cohort study in the Netherlands. The samples of this school-based survey consisted of 17.403 students in 1081 grade 6 classes at 671 primary schools in the Netherlands (Driessen, Mulder, & Roeleveld, 2012). The average age of the grade 6 Dutch primary schools that participated was 12 years and 5 months (S.D. = approximately 7 months).

3.3 Analytical design

Given the nested structure of the data, multilevel analyses were performed for each of the dependent variables. The results of three models are given; model 1 includes student-level variables control variables, model 2 adds class-level variables to model 1, while model removes schools with only one class and includes school fixed effects. Cohorts from both 2008 and 2011 were present in the sample. Possible cohort effects were controlled for by including *cohort* as a control variable.

3.4. Independent variables

With regard to cognitive peer characteristics, both *Class average cognitive level* and *Class standard deviation in cognitive level* have been included. The latter is constructed by taking the standard deviation of pupil's cognitive performance scores. With regard to individual cognitive level, we distinguish between students' z-standardized *Language ability* and *Mathematics ability* scores, as measured by standardized national reading comprehension and mathematics tests provided by national testing agency Cito. Moreover, the interaction between the two peer characteristics and cross-level interactions between the individual and peer characteristics variables are added.

3.5. Control variables

To exclude variance caused by other factors than language ability, the control variables *gender* (0 = male, 1 = female), *household religion* (operationalized as a student's mother's religion)*, ethnicity* (*Surinam Dutch*, *native Dutch*, *Turkish Dutch, Moroccan Dutch* and *Other*) and *parental education* (highest level of education completed = pre-vocational education (1), general/vocational secondary education or senior vocational education (2) and higher education (3)[2]) were included. For *household religion*, 34% of respondents displayed missing data. Multiple imputation was used to impute missing values for *household religion* using the dependent variables, parental education and ethnicity as predictor variables. At the

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[2] In our Dutch sample, these levels are operationalized as LBO (including LO, BaO, VBO), MBO (including MAVO, HAVO and VWO) or HBO/WO as maximum levels of education completed.

class level, the variables *Classroom Climate* and *Class average cognitive level* are included. *Classroom Climate* indicates the proportion of students scoring higher than 3 points on a 5 point scale. This scale consisted of six items, measuring agreement to statements such as *'I have a lot of contact with my classmates'* and *'My classmates and I get along well.'*

To control for the socio-economic composition of the classroom, variables for the proportions of students with parents that have completed pre-vocational education (1), general/vocational secondary education or senior vocational education (2) and higher education (3) have been included. Moreover, the ethnic composition of the classroom was controlled for by variables indicating the proportions of students with Surinam Dutch, native Dutch, Turkish Dutch and Moroccan Dutch ethnic backgrounds per classroom, as these represent the largest ethnic groups in the Netherlands. To improve reliability of classroom composition measures, classes were only included if five or more students provided data without missing values and no more than 30% of students exhibit one or more missing values after multiple imputation on household religion.

Dependent variables

For measurement of youth citizenship outcomes in the COOL data, the Citizenship Competences Questionnaire (Ten Dam *et al.*, 2011) was used. This instrument aims to measure youth citizenship by putting emphasis on four citizenship tasks: acting democratically, acting in a socially responsible manner, dealing with conflicts and dealing with differences.

The knowledge test consisted of 27 multiple-choice questions with three response options for each question and the instruction to indicate which option best answers the question. For instance: *"All children have a right to*: a) *an allowance*, b) *choose who they want to live with* or c) *education"*. Citizenship attitudes were assessed using 24 survey items rated along four-point Likert scales. The general question accompanying the attitude items is *How well does this statement apply to you?* Sample statement: *I like knowing something about different religious beliefs*. Both citizenship knowledge and citizenship attitudes scores were z-standardized.

4. Results

As can be seen in table 1, with most variance is explained by factors at the individual level for both citizenship outcomes, with school and class factors jointly explaining 12,2% and 10,8% of the total variance for citizenship attitudes and citizenship knowledge, respectively.

[Table 1 and 2 about here]

[Table 3 about here]

As reported in table 4 and 5, regression coefficients are similar when controlling for class level variables and non-random selection into schools. All significant regression coefficients are similar in direction across the three models, although the significant interaction between classroom average and classroom standard deviation in cognitive level with citizenship knowledge disappears after controlling for contextual effects (model 3).

[Table 4 and 5 about here]

Class average cognitive level is negatively correlated with individual citizenship knowledge, with a one standard deviation rise in classroom average cognitive level corresponding to a 0.16 standard deviation decline in citizenship knowledge. Two cross-level interactions are significant for citizenship knowledge: lower language ability students report relatively higher citizenship scores in classes with a high average classroom cognitive level or a high classroom diversity in cognitive level. These peer language ability coefficients are respectively 9,8% and 19,7% of students' individual language ability coefficients.

With regard to citizenship attitudes, no significant main effects for peer characteristics are found (table 5). One cross-level interaction is significant, however: higher language ability students report higher citizenship attitudes in classes with a high average cognitive level; a one standard deviation in classroom average language ability is associated with a 0.05 increase in citizenship attitudes. As with citizenship knowledge, citizenship attitudes are significantly correlated with individual language ability, although to a lower magnitude.

14

5. Discussion

The educational system is expected to prepare students for their functioning in democratic society. As such, schools attempt to increase the citizenship learning outcomes of their students. Moreover, they potentially address pre-existing inequalities in students' citizenship outcomes due to differences in social background. Does classroom composition need to be taken into account when pursuing these objectives?

Our findings suggest a cautious affirmative answer to this question, although further research needs to be conducted to strengthen the evidence and investigate the causal nature of the studied relationships. First of all, our findings show that while cognitive classroom composition has only minor significant associations with citizenship attitudes, several peer mechanisms are at play in relation to citizenship knowledge. Interestingly, a high class average cognitive level is *negatively* associated with citizenship knowledge, refuting the Linear-in-Means hypothesis. Unfortunately, as our data does not allow further analysis of classroom practices, we can only speculate about the mechanisms involved. One explanation might be that classes with high language ability students experience relatively more emphasis on language learning, while spending less time on citizenship development. Alternatively, classes with many low language ability students may experience more conflicts that are addressed by nonverbal, aggressive means. This in may in turn spur additional allocation of resources to citizenship programs. Indeed, one of the more frequently implemented primary education citizenship programs in the Netherlands, the Peacable School (in Dutch, *"De Vreedzame School"*), was initially often implemented as a means to restore classroom order. The findings show no support for the conditional variation hypothesis either, as students in high cognitive ability classrooms that also display a relatively high degree in variation of cognitive level do not report higher citizenship outcomes.

Does the relation between these peer characteristics and students' citizenship knowledge hold equally for students of different ability levels? Our findings suggest that on the contrary, low language ability students report higher citizenship knowledge in classroom with a high average cognitive ability when controlling for other factors. This differential peer effect is even strong when the peer characteristics is variation in cognitive classroom, in line with the differential peer effect hypothesis. In other words, particularly low language ability students appear to have higher citizenship knowledge when being surrounded by classroom

15

peers of which some have a higher language ability and others display a level of language ability similar to their own. These cross-level interactions are not significant for individual math ability, suggesting that the peer effects mechanisms at work might relate to the understanding and/or quality of language-related activities such as classroom discussion. This difference in significance between mathematics peer effects and language peer effects replicates earlier findings in the academic achievement peer effects literature (Hoxby, 2000; Zimmerman, 2003).

Interestingly, peer characteristics were not found to be significantly correlated with general student citizenship attitudes. However, high language ability students score somewhat higher citizenship attitude scores in high average language ability classes. As with citizenship knowledge, individual language ability is significantly associated with citizenship attitudes. In general, citizenship attitudes may be less affected by peer cognitive ability as attitudes are different in nature; they also involve a volitional component, which may not be as easily influenced through peer cognitive ability mechanisms.

Taken together, these findings do provide support for the Linear-in-Means hypothesis, which assumes high achieving peers to have a positive influence on their classmates' achievement. They do provide some support for the Boutique model, which states that being surrounded by peers with similar characteristics may experience higher achievement, as the learning environment adapts more to the presence of a certain type of students when these students are more numerous. One can certainly imagine that low language ability students are increasingly catered to in classroom discussions when they are more numerous or vice versa: that they are less taken into account when their numbers are small.

A number of questions are spurred by the results reported here: Do teachers adapt their teaching strategies and educational priorities to the ability distribution present in the classroom? What happens in low average language ability classrooms that results in higher citizenship knowledge scores? And to which degree can the inequalities in citizenship outcomes be impacted by classroom composition or teaching strategies in the long run? Further research may address these questions by using a combination of longitudinal and (quasi-)experimental designs. For now, we warn against using these findings to base policy on, for two reasons. First, additional evidence must be gathered to establish the causal nature of the relationships suggested by our analyses. Secondly, changes in peer group composition can lead to unexpected outcomes, as the falling apart of artificially created social groups

based on peer effects studies has illustrated (Carrell, Sacerdote, & West, 2013). Finally, our findings demonstrate that when policymakers and school officials consider making changes to classroom composition, this may affect not only academic achievement outcomes, but also citizenship outcomes differently for students of different ability. Therefore, the possible effects of changes in classroom composition need to be consider along multiple dimensions.

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Table 1. Descriptive statistics. Categorical variables

	% students
Sex	
Boy	49.8
Girl	50.2
Parental ethnicity	
Non-migrant (Dutch)	76.3
Turkey	6.5
Morocco	5.5
Suriname	2.6
Other	9.1
Household religion	
None	32.7
Roman Catholic	30.2
Dutch Protestant Church	13.8
Protestant Orthodox Church	2.7
Evangelical	1.6
Other Christian	1.6
Islamic	14.6
Other	3.0
Highest educational level of parents:	
Pre-vocational education	26.4
Sec. education or senior vocational education	42.4
Higher education	31.2
Year	
2008	47.8
2011	52.2
Total	100.0

Table 2. Descriptive statistics. Continuous variables

	Mean	*SD*	Min	Max
<u>Dependent variables</u>				
Citizenship attitudes	0.00	1.00	-4.67	2.42
Citizenship knowledge	0.00	1.00	-4.56	1.39
<u>Independent variables</u>				
Language ability	0.00	1.00	-4.39	5.35
Math ability	0.00	1.00	-6.99	5.02
Class average cognitive ability	0.00	0.80	-3.20	3.24
Class S.D. in cognitive ability	1.77	0.38	0.40	3.86
<u>Control variables</u>				
Percentage non-migrant	0.76	0.30	0.00	1.00
Percentage Turkish	0.06	0.13	0.00	0.88
Percentage Moroccan	0.06	0.13	0.00	1.00
Percentage Surinam	0.03	0.10	0.00	1.00
Proportion high classroom climate scores	0.93	0.07	0.50	1.00
Proportion max. educational level parents = jun. sec. voc. Educ.	0.27	0.22	0.00	1.00
Proportion max. educational level parents = sen. Sec. voc. Educ.	0.42	0.17	0.00	1.00

Note. The independent variables language ability and math ability were z-standardized, as were the dependent

variables.

Table 3. Intra-class correlations for citizenship attitudes and knowledge.

	Grade 6 primary education	
Level	*Attitudes*	*Knowledge*
School	0.061	0.052
Class	0.063	0.056
Individual	0.886	0.891

Table 4. Regressions for Citizenship Knowledge - Peer Effects and Interactions

	(1)			(2)			(3)		
	Effect	Interaction with Language ability	Interaction with Math ability	Effect	Interaction with Language ability	Interaction with Math ability	Effect	Interaction with Language ability	Interaction with Math ability
Class average cognitive level	**-0.15 (0.07)**	**-0.05 (0.01)**	0.00 (0.01)	**-0.20 (0.07)**	**-0.05 (0.01)**	0.00 (0.01)	**-0.16 (0.08)**	**-0.06 (0.01)**	0.01 (0.01)
Class SD cognitive level	**-0.07 (0.03)**	**-0.10 (0.02)**	-0.02 (0.02)	**-0.07 (0.03)**	**-0.10 (0.02)**	-0.02 (0.02)	-0.03 (0.04)	**-0.12 (0.02)**	-0.01 (0.02)
Class SD * CA cognitive level	0.07 (0.04)	n/a	n/a	**0.07 (0.04)**	n/a	n/a	0.05 (0.04)	n/a	n/a
Individual language ability	**0.56 (0.04)**	n/a	n/a	**0.55 (0.04)**	n/a	n/a	**0.61 (0.04)**	n/a	n/a
Individual math ability	**0.19 (0.04)**	n/a	n/a	**0.19 (0.04)**	n/a	n/a	**0.17 (0.05)**	n/a	n/a
Student-level variables	✓	✓	✓	✓	✓	✓	✓	✓	✓
Class-level variables				✓	✓	✓	✓	✓	✓
Only schools >1 class							✓	✓	✓
School fixed effects							✓	✓	✓
N (students)		17048			17048			12881	
N (classes)		1046			1046			788	
N (schools)		654			654			406	

Table 5. Regressions for Citizenship Attitudes - Peer Effects and Interactions

	(1)			(2)			(3)		
	Effect	Interaction with Language ability	Interaction with Math ability	Effect	Interaction with Language ability	Interaction with Math ability	Effect	Interaction with Language ability	Interaction with Math ability
Class average cognitive level	-0.10 (0.07)	**0.05 (0.01)**	0.00 (0.01)	-0.08 (0.07)	**0.04 (0.01)**	0.00 (0.01)	0.00 (0.08)	**0.05 (0.01)**	-0.01 (0.02)
Class SD cognitive level	-0.03 (0.03)	-0.03 (0.02)	-0.02 (0.02)	-0.03 (0.03)	-0.03 (0.03)	-0.02 (0.02)	-0.04 (0.04)	0.02 (0.03)	-0.03 (0.03)
Class SD * CA cognitive level	0.03 (0.04)	n/a	n/a	0.03 (0.04)	n/a	n/a	-0.02 (0.04)	n/a	n/a
Individual language ability	**0.23 (0.04)**	n/a	n/a	**0.23 (0.04)**	n/a	n/a	**0.22 (0.05)**	n/a	n/a
Individual math ability	0.04 (0.04)	n/a	n/a	0.04 (0.04)	n/a	n/a	0.06 (0.05)	n/a	n/a
Student-level variables	✓	✓	✓	✓	✓	✓	✓	✓	✓
Class-level variables				✓	✓	✓	✓	✓	✓
Only schools >1 class							✓	✓	✓
School fixed effects							✓	✓	✓
N (students)	17048			17048			12881		
N (classes)	1046			1046			788		
N (schools)	654			654			406		