Ethnic diversity in schools and bi-ethnic Dutch students' educational outcomes and social functioning
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school, where they meet many other children. Many studies have already been performed on the influence of schools’ ethnic composition (e.g., for reviews, see Mickelson & Nkomo, 2012; Van Ewijk & Sleegers, 2010). Schools’ ethnic composition is found to influence majority and minority students. However, how ethnic diversity in school influences bi-ethnic students, to our knowledge, has not yet been studied. Most studies do not treat bi-ethnic children as a distinguishable group. Previous studies have categorized bi-ethnic students as minority students. In the study by Karssen et al. (2015), it was found that bi-ethnic students with one migrant and one non-migrant parent cannot be simply grouped together with mono-ethnic minority students. Bi-ethnic students were found to score higher on cognitive outcomes and on social-emotional functioning in school than mono-ethnic minority students. Other studies showed that bi-ethnic children have unique experiences with ethnic diversity from birth because they have parents with different ethnic backgrounds (Kerwin, Ponterotto, Jackson, & Harris, 1993). Given that bi-ethnic children experience ethnic diversity from an early age, they may function as a study group that can provide insight into how people adapt to ethnic diversity. Research into the influences of ethnic diversity in school on bi-ethnic children cannot only provide better insight into the role of the ethnic diversity within the bi-ethnic family but can also help us to understand how interacting in an ethnically diverse context affects the outcomes and social functioning of children in general.

The purpose of the study is to examine the relationship between ethnic diversity in school and a set of educational outcomes for bi-ethnic children. This study analyses the relationship between ethnic diversity in school and educational outcomes and social functioning for bi-ethnic, mono-ethnic minority, and mono-ethnic majority children in primary education in The Netherlands. The results will help determine whether there are indeed differences in responses to a school’s ethnic diversity between mono-ethnic and bi-ethnic students.

We included a diverse set of outcomes: cognitive outcomes, social-emotional functioning, and citizenship competences. For mono-ethnic groups, most studies focus on the relationship between ethnic diversity in school and this diverse set of outcomes (Dijkstra, Geijsel, Ledoux, Van der Veen, & Ten Dam, 2015; Driessen, 2002b; Mickelson & Nkomo, 2012). They are most likely to help us understand the possibly different influences of ethnic diversity for the bi-ethnic and mono-ethnic minority groups. The three sets of outcomes are important outcomes that are targeted by schools; they are important educational goals, and all three are important predictors of success later in life. Furthermore, it has been shown that achieving citizenship competences is positively related to ethnic diversity (Dijkstra et al., 2015).

**Theoretical background**

**Ethnic diversity**

In the EU and in the US, the effects of ethnic diversity in school on educational social functioning and outcomes have been and still are the subject of debate (e.g., for a review, see Driessen, 2002b; Mickelson & Nkomo, 2012; Westerbeek, 1999). Most review studies conclude that majority and minority students in schools with an ethnically diverse composition have higher cognitive outcomes and better social functioning in school than majority and minority students in segregated schools (Hallinan, 1998; Mickelson & Bottia, 2010; Mickelson & Nkomo, 2012; Welner, 2006). However, other review studies conclude that majority and minority students in schools with an ethnically diverse composition have lower cognitive outcomes and social functioning in school than majority and minority students in segregated schools (Schofield, 1995; Van Ewijk & Sleegers, 2010). The findings are still not conclusive. One reason is that comparing different studies of school ethnic composition is problematic because studies have different definitions of ethnic diversity. School ethnic composition can be conceptualised as ethnic concentration or ethnic heterogeneity (see also Agirdag, Demanet, Van Houtte, & Van Avermaet, 2011; Chan & Birman, 2009). Whereas ethnic concentration refers to the proportion of ethnic minorities or majorities in a school, ethnic...
heterogeneity refers to the degree of ethnic differences in a school. Most studies in the previously mentioned review studies use the term “ethnic concentration” to convey the notion that a school is segregated. However, this type of measurement only takes into account the size of a certain group and not the ethnic diversity within a school. In this study, we focus on ethnic heterogeneity, which refers to ethnic diversity in terms of both the number and the size of the ethnic groups that are present in a school. The more ethnic groups a school has and the larger they are, the greater its ethnic diversity will be. We do not make the distinction between majority and minority students for ethnic diversity. We focus on ethnic diversity, because we expect that ethnic diversity is especially important for bi-ethnic students because they have unique multi-ethnic experiences from birth. Further use of the term “ethnic diversity” in this article refers to our definition of it.

**Ethnic diversity and cognitive outcomes**

This section focuses on theories about the relationship between ethnic diversity in school and cognitive outcomes. Some authors argue that communication in ethnically diverse schools could enrich students as they can learn from each other’s cultures (Lazear, 1999). When a school is ethnically diverse, and ethnic groups are small, there is no statistical majority ethnic group and, according to Lazear, teachers and students would then have stronger motives to adapt to the majority culture of the country, and the instructional language is then also mostly determined by the majority culture. On the other hand, Driessen (2002b) argues that when schools are ethnically diverse, students have fewer classmates who have the host country language as their mother tongue, which may lead to fewer possibilities of learning the language of the majority group at school. Another explanation for a possible negative influence of ethnic diversity in school on students’ cognitive outcomes is from a more teaching-oriented perspective. Teachers in highly ethnically diverse schools may have problems adapting their instruction to the specific needs of such a wide diversity of students (Van Ewijk & Sleegers, 2010). Whereas in ethnically homogeneous classes, teachers can specialise instruction according to the needs of students (Peetsma, Van der Veen, Koopman, & Van Schooten, 2006), in ethnically diverse classes teachers need to adapt their teaching style to the needs of a wide diversity of students (Van Ewijk & Sleegers, 2010).

**Ethnic diversity and social functioning in school**

Constrict theory (Putnam, 2007) and conflict theory (Blalock, 1967) explain the possible negative influence of ethnic diversity in school on students’ social functioning (Agirdag et al., 2011; Braster & Dronkers, 2014; Janmaat, 2012). According to constrict theory, more ethnically diverse settings have a negative influence on students’ outcomes and social functioning in school because an ethnically diverse school encourages students to avoid relationships with other students (Putnam, 2007). Students in ethnically diverse schools will withdraw from peer groups and have lower levels of well-being with both students of the same ethnic background and students with a different ethnic background. This will result in having fewer interethnic contacts, less engagement with other classmates, and fewer close friends. However, constrict theory only addresses the short-term effects of ethnic diversity. In the long term, according to Putnam (2007), ethnic diversity has less negative effects as people become accustomed to it.

Conflict theory holds that more diversity leads to more tensions and conflicts, because as the dominant group becomes smaller, people belonging to the dominant group will feel that they lose their privileged position and become more unfriendly towards the minority group (Blalock, 1967). Unfriendly behaviour may give rise to problem behaviour, because hostilities and conflicts in school will increase (Eitle & Eitle, 2010).

Macrostructural theory (Blau, 1974) and contact theory (Allport, 1954) take another viewpoint. According to macrostructural theory, ethnically diverse schools provide more opportunities for interethnic contact, because of the proximity of students of other ethnic groups. Additionally,
according to contact theory, more interethnic contact will lead to positive interethnic interactions and interethnic understanding. Increased interethnic contact leads to favourable outcomes such as reduced prejudices and eventually more interethnic friendships (Agirdag et al., 2011; Pettigrew & Tropp, 2006). However, according to contact theory, when certain conditions are not met, such as equal status and common goals, more interethnic contact could also amplify problem behaviour. The ethnically diverse school environment may then enhance inequality and competition, and, as a result, students become more hostile, which will result in more conflicts (Eitle & Eitle, 2003).

According to Gurin, Dey, Hurtado, and Gurin (2002), building on Piaget’s (1965) theory of intellectual and moral development, more positive interethnic interactions can provide students with opportunities to learn from each other. Piaget argues that when students interact with other students who hold different perspectives, and when they have an equal relationship, they develop intellectually and morally (Piaget, 1965). Ethnically diverse schools that foster positive interethnic interactions provide opportunities to learn from and to discuss different backgrounds, perspectives, values, and experiences and to understand common goals (Banks, 2008; Gurin et al., 2002). Through these opportunities, students may become accustomed to different norms and values (Banks, 2008) and learn to evaluate and explore different perspectives, accept conflicts, and develop social sensibility and involvement (Pettigrew & Tropp, 2006). These opportunities foster an environment that encourages citizenship competences (Gurin et al., 2002), such as societal interest, prosocial ability, reflective thinking, assertiveness, and a deeper knowledge of the social world. In a diverse environment, students become familiar with different social rules and have the opportunity to explore different perspectives (Fischer, 2011), which can increase critical reflection on social issues and social structures. An ethnically diverse environment may also challenge students to formulate and to reflect on their own ideas as they are confronted with peers with different perspectives. Students in ethnically diverse schools develop a deeper knowledge of the social world, because they are challenged to think or act in new ways (Cowan, 2005; Gurin et al., 2002).

Bi-ethnic students versus mono-ethnic students

The effect of ethnic diversity in school on the outcomes and social functioning in schools of bi-ethnic students could differ from the effect on mono-ethnic students. Bi-ethnic students have a unique ethnic diversity experience starting from birth. Not only their parents but also their other family and relatives differ in ethnicity. In general, parents in an interethnic marriage value the ethnic diversity within the family (Crippen & Brew, 2007). The frequency and quality of their interethnic experiences are mostly much higher than those of mono-ethnic students. Their experience goes far beyond mere contact and includes learning about differences in ethnic backgrounds and perspectives from an early age. Because they have interethnic contact with family and relatives, they get to know people from different ethnic backgrounds individually in an intimate way, which enables them to discern common goals and personal qualities (Kerwin et al., 1993). Their interethnic experiences could contribute not only to more positive opinions about members of the same and other ethnic groups with whom they are in direct contact but also to more positive views on the entire ethnic in-groups and out-groups with whom they do not have contact (Pettigrew, 2009; Pettigrew & Tropp, 2006). On the other hand, when ethnic diversity within the family is not valued by the family and relatives, the child may be less accustomed to ethnic diversity and could be less open and able to adjust to ethnic differences (Bratter & Eschbach, 2006). However, studies have found that bi-ethnic students are generally able to interact with multiple ethnic groups and appreciate multiple viewpoints (Lopez, 2001; Wallace, 2001).

In addition to the “natural” diversity in bi-ethnic families, which enables them to be more accustomed to ethnic diversity, parents may teach them to be more open to other ethnic cultures (Barnes, 2001). Because parents in a bi-ethnic relationship have a relationship with someone of another ethnicity, they may be more open minded than parents in a mono-ethnic relationship.
Holloway, Ellis, Wright, and Hudson (2005) found that bi-ethnic families are more likely to live in higher ethnically diverse neighbourhoods than mono-ethnic families.

**Influence of ethnic diversity in school on bi-ethnic students**

Although to our knowledge there are no studies that focus on the influence of ethnic diversity in school on bi-ethnic children’s educational outcomes and social functioning, a few studies in the US have focused on the effects of ethnic concentration on bi-ethnic children’s educational outcomes and social functioning. Herman (2009) found that the educational performance of bi-ethnic students was related to the ethnic concentration of their neighbourhoods and schools. Bi-ethnic children who live in majority-dominated neighbourhoods and bi-ethnic children who were in tracks with more majority children than minority children scored higher grades. Burke and Kao (2013), however, found that ethnic concentration in a school had no effect on the school’s achievement of bi-ethnic students. For school belonging, they found that bi-ethnic students who attend schools with a very low concentration of majority students (< 1%) score lower than bi-ethnic adolescents who attend schools that have a higher concentration of majority students (1%–66%). Cheng and Klugman (2010) found that the concentration of European American students and of African American students in a school does not affect the school attachment of bi-ethnic students.

Although how ethnic diversity in school influences bi-ethnic students has, to our knowledge, not yet been studied, some studies have focused on how ethnic diversity in school influences students who live in multi-ethnic cities. Braster and Dronkers (2014) studied the effect of ethnic diversity in school on the educational performance of children who grew up in multi-ethnic cities and found that ethnic diversity had a positive effect on their educational outcomes. They argued that children who grew up in a multi-ethnic city considered ethnic diversity to be normal and therefore have an increased level of trust and collaboration compared to children who grew up in less ethnically diverse cities, which results in better educational performance. Mickelson and Nkomo (2012) concluded from their review that ethnically diverse schools in multi-ethnic societies can most likely promote social cohesion. The argument that children in multi-ethnic cities fare better in ethnically diverse schools because they perceive diversity as normal could also hold for bi-ethnic students. Bi-ethnic children experience ethnic diversity from birth and therefore become habituated to it. We theorise that bi-ethnic children may respond to ethnic diversity as “chameleons”. By being a part of both the ethnic minority and the ethnic majority group, they can deal flexibly with social relations by holding flexible social group boundaries, and they can therefore adapt to the cultural norms of the situation (Miville, Constatine, Baysden, & So-Lloyd, 2005).

**The present study**

This study examines the relationship between ethnic diversity in school and cognitive outcomes, social-emotional functioning, and citizenship competences for bi-ethnic students. Based on the theories mentioned above, we formulate a number of expectations. We expect that, overall, the relationship between ethnic diversity in the classroom and cognitive outcomes may be inconclusive, as both expected positive and negative effects may balance each other out. Ethnic diversity in the school can have a positive effect on cognitive outcomes because (a) ethnically diverse schools are expected to enrich students in learning from each other’s cultures; (b) a school’s culture would be mostly determined by the majority culture when ethnic groups are small, which can lead to a greater comprehension of instruction. However, teachers may have trouble adapting their instruction and teaching style to an ethnically diverse group of students. Teachers in ethnically diverse classes need to adapt their teaching style and instruction to the specific needs of such a wide diversity of students. Additionally, when schools are ethnically diverse, students have fewer classmates who have the host country language as their mother tongue, which may lead to fewer possibilities of learning the language of the majority group at school. However, for bi-ethnic
students, we expect an extra influence that is not present for mono-ethnic students. Because bi-ethnic students already have an ethnically diverse home situation, they are already enriched in learning from different cultures. Further, because we expect bi-ethnic students to respond to ethnic diversity as “chameleons”, they are less influenced by a school’s culture. Whether a school’s culture is more determined by the ethnic majority or by the ethnic minority, they can adapt to the cultural norms of the situation.

With regard to social-emotional functioning, we argue that ethnic diversity also has little influence on bi-ethnic students, because bi-ethnic students are accustomed to interethnic contact and are able to exceed ethnic differences. According to macrostructural theory, ethnically diverse schools provide more opportunities for interethnic contact, and contact theory argues that more interethnic contact will lead to positive interethnic interactions and understanding. We argue that bi-ethnic students already have interethnic interactions and understanding because of the ethnic diversity within the family. An ethnically diverse school would not lead to higher interethnic interactions and understanding for bi-ethnic students as they already are familiar with ethnic differences. Constrict theory is also expected not to hold for bi-ethnic students. Bi-ethnic students are expected not to avoid relationships with other students, because higher diversity does not cause them extra tension with classmates, as they are accustomed to ethnic diversity. As Putnam (2007) argued, ethnic diversity has less detrimental effects as people become accustomed to it. Conflict theory is also expected not to hold, because the majority group would see bi-ethnic students less as a threat, because they are not or they are perceived as being not as different, or as a minority.

For citizenship competences, we also argue that ethnic diversity has little influence on bi-ethnic students. Our arguments for this hypothesis build on the same theories and arguments as our hypothesis for social-emotional functioning. Bi-ethnic students have unique opportunities starting from birth to learn and to discuss different backgrounds, perspectives, values, and experiences. Therefore, they are already accustomed to evaluating and exploring different perspectives, accepting conflicts, and developing social sensibility, involvement, and social adaptability. We argue that their home environment encourages citizenship competences from an early age.

In addition to examining the relationship between ethnic diversity in school and cognitive outcomes, social-emotional functioning, and citizenship competences for bi-ethnic students, we also examined this relationship for mono-ethnic minority and mono-ethnic majority students. We wanted to determine whether the relationship between ethnic diversity in school and cognitive outcomes, social-emotional functioning, and citizenship competences is different for bi-ethnic and mono-ethnic students. As indicated, we expected the relationship between ethnic diversity in school and educational outcomes and social functioning for bi-ethnic students to be smaller than for mono-ethnic groups, because bi-ethnic individuals are accustomed to the ethnically diverse situation that they experience at school.

**Method**

**Sample**

Sixth-grade students from the national Dutch cohort study (COOL5-18) participated in this study. The COOL study has the purpose of describing and explaining students’ academic careers. The data of two cohorts (2007/2008 and 2010/2011) were included ($N_{students} = 24,147$, $N_{schools} = 777$). Students’ and parents’ background characteristics were available through school administrations. Information on the ethnic background of grandparents was provided by the parents; however, the response rate in the first wave was 67% and in the second wave, 65%. The non-response analysis suggested that students with incomplete data on ethnic background characteristics were somewhat more often students who come from disadvantaged home situations and migrant families. Students whose parents filled in the parent questionnaire performed slightly higher on the
cognitive and social-emotional tests than the students whose parents did not fill in the parent questionnaire. However, the effect sizes were very small (eta-squared < .18). Students with incomplete data on both parents’ or on all four grandparents’ ethnic background characteristics were omitted from the sample because this information was needed to enable a comparison between the ethnic groups, leaving 14,529 students (60%). There were three groups of students: mono-ethnic majority (those whose two parents and all grandparents were born in The Netherlands), mono-ethnic minority (those whose parents were born in the same country but whose two parents and all grandparents were born outside of The Netherlands), and bi-ethnic (those with one parent and two grandparents born in The Netherlands and one parent and two grandparents born outside of The Netherlands). Students who could not be categorised as mono-ethnic (majority students with at least one migrant grandparent [8%] and minority students with at least one non-migrant grandparent [0.3%]) were excluded from the analyses. Students who had parents from different ethnic backgrounds but did not fit our bi-ethnic category (because they did not have two migrant grandparents and two foreign grandparents [3%]) were excluded from the analyses. We excluded these students because we wanted to ensure that the mono-ethnic children grew up in a low ethnically diverse home environment and that the bi-ethnic children grew up in a highly ethnically diverse home environment. The total sample consists of 12,841 students (53%).

Table 1 provides an overview of the number of respondents in the different groups.

The average age of the students was 11 years; 6,304 (50%) students were boys, and 6,407 (50%) were girls. Parental education level was measured by the highest education level attained by either parent. Parental education level was divided into three groups: (a) maximal junior secondary vocational education \( n = 3,071, 24\% \), which ranges from no education at all to basic vocational training; (b) senior secondary vocational education \( n = 5,345, 42\% \), which is professional education; (c) higher education \( n = 3,971, 31\% \), which is higher professional education and university education. Information for parental education level was missing for 4% of the students \( n = 454 \).

**Table 1. Number of bi-ethnic, mono-ethnic minority, and mono-ethnic majority students in Grade 6.**

<table>
<thead>
<tr>
<th>Bi-ethnic</th>
<th>Mono-ethnic minority</th>
<th>Mono-ethnic majority</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dutch</td>
<td>–</td>
<td>–</td>
<td>9961</td>
</tr>
<tr>
<td>Surinamese</td>
<td>62</td>
<td>195</td>
<td>–</td>
</tr>
<tr>
<td>Antillean</td>
<td>20</td>
<td>49</td>
<td>–</td>
</tr>
<tr>
<td>Turkish</td>
<td>31</td>
<td>841</td>
<td>–</td>
</tr>
<tr>
<td>Moroccan</td>
<td>27</td>
<td>667</td>
<td>–</td>
</tr>
<tr>
<td>Other Western</td>
<td>188</td>
<td>143</td>
<td>–</td>
</tr>
<tr>
<td>Other non-Western</td>
<td>203</td>
<td>454</td>
<td>–</td>
</tr>
<tr>
<td>Total</td>
<td>531</td>
<td>2349</td>
<td>9961</td>
</tr>
</tbody>
</table>

**Variables and instruments**

**Cognitive outcomes**

Cognitive outcomes were measured with test scores on reading comprehension and mathematics achievement from the Dutch National Institute for Educational Measurement (Cito). Both tests have two versions, because Cito updated the test for reading comprehension in 2008 and the test for mathematics achievement in 2007. All schools in the 2007/2008 cohort used the old versions of the tests, while most schools in the 2010/2011 cohort used the updated version of the reading comprehension test (75%) and/or the updated version of the mathematics achievement test (54%). The reading comprehension tests use the same scale and are comparable. The mathematics tests were not on the same scale; therefore, the scores on the old version were transformed into scores on the scale of the newer version (formula from Cito).
Social-emotional functioning in school
Social-emotional functioning in school was measured with two scales: the well-being of the pupil in relation to fellow students and externalising problem behaviour. The student questionnaire for well-being with fellow students consisted of six items, for example, “I like spending time with other students in my class” (Peetsma, Wagenaar, & De Kat, 2002). The problem behaviour of the students was scored by teachers on four items, for example, “is often brutal” (Jungbluth, Roede, & Roeleveld, 2001). Both scales are 5-point Likert-type scales, with options ranging from not applicable at all (1) to very applicable (5). Both scales had Cronbach’s alpha values of 0.82. A higher score for problem behaviour implies more problem behaviours.

Citizenship competences
Two scales concerning citizenship competences were used: citizenship orientation and citizenship knowledge (Citizenship Competence Questionnaire [CCQ]; Geboers, Geijsel, Admiraal, & Ten Dam, 2015; Ten Dam, Geijsel, Reumerman, & Ledoux, 2011). Citizenship orientation consisted of four subscales: societal interest, prosocial ability, reflective thinking, and assertiveness. Societal interest reflects an interest in social issues, other people, and respect for others. Prosocial ability reflects social skills and the ability to converse and empathise with others. Reflective thinking concerns critical reflection on social issues and social structures in society. Assertiveness concerns the skills that are needed to stand up for one’s own ideas and clearly formulate them. Items for citizenship orientation were measured on 4-point Likert scales. Citizenship knowledge consists of two subscales: societal knowledge and interpersonal knowledge. Societal knowledge reflects knowledge of the democratic principles and the norms and organisation of society. Interpersonal knowledge concerns the knowledge of prevailing social values, behavioural rules, and everyday social manners. The citizenship knowledge items involved a multiple-choice test with three response options. The scales had Cronbach’s alpha values of 0.87 (societal interest), 0.89 (prosocial ability), 0.94 (reflective thinking), 0.70 (assertiveness), 0.66 (societal knowledge), and 0.67 (interpersonal knowledge).

Ethnic diversity
Because the number of classes for Grade 6 in a school in The Netherlands is small (mean number < 2), ethnic diversity was calculated by the ethnic diversity in the entire Grade 6 for every school. Ethnic diversity was determined with the Herfindahl index (Braster & Dronkers, 2014), which varies from 0 to 1. The Herfindahl index takes into account both the number and the size of the ethnic groups. The formula that was used to calculate the ethnic diversity is: 1 − [(% ethnic group 1)^2 + (% ethnic group 2)^2 + ... + (% ethnic group n)^2]. The following ethnic groups were distinguished: Dutch, Surinamese, Antillean, Moroccan, Turkish, other Western, and other non-Western. Bi-ethnic students were assigned to the ethnic group of the mother. A school with a high score has a high degree of ethnic diversity, which indicates that there are more relatively large ethnic groups in Grade 6.

Background characteristics
We used control variables on the individual and the school level to assess whether the link between ethnic diversity and cognitive outcomes, social-emotional functioning, and citizenship competences is not a reflection of other influences. Individual factors could influence students’ educational outcomes and social functioning (Benner & Crosnoe, 2011; Driessen, 2002a; Karsten, 2010). The students could differ in background characteristics, which may be related to their educational outcomes and social functioning. The individual factors that have been found in previous studies to influence pupils’ competences (Benner & Crosnoe, 2011; Driessen, 2002a; Karsten, 2010) were controlled for. We controlled for cohort, gender, parental education level, birthplace of the child, language spoken at home, grade retention, and structure of the family composition. Cohort was included to control for the fact that the students came from two cohorts, cohort 2007/2008 and cohort 2010/2011. Parental education level was measured with separate questions regarding the educational levels of the mother and the father and was divided into four
categories: maximal junior secondary vocational, senior secondary vocational education, higher education, and unknown. Parental education level was based on the highest level of education within the family. Whether the student was born in The Netherlands was controlled for. This measure is an indicator of the generation of the child. The language that is spoken at home was measured with separate questions regarding the language that was spoken with the student by the mother and by the father. If at least one of the parents spoke another language with the students than the Dutch language, the language spoken at home was coded as non-Dutch. Retained a grade is constructed on the basis of the age of the student. Delay was assumed if the student was at least one year older than supposed in a certain group. The structure of the family composition was coded as two-parent family or single-parent family. On the school level, we controlled for urbanisation to control for influences outside of the school. The students could differ in urbanisation level, which could be related to their educational outcomes and social functioning (Benner & Crosnoe, 2011). Urbanisation was divided into five groups: very high, high, moderate, and low urbanisation, and not at all urbanised. The categories were included as dummies.

Data analysis
To test whether the relationship between ethnic diversity in school and cognitive outcomes, social-emotional functioning, and citizenship competences differs for bi-ethnic, mono-ethnic minority, and mono-ethnic majority students, multivariate multi-group multilevel analyses were performed using Mplus 7. Because the students were nested within schools, we modelled the groups of dependent variables as clusters because it reduces the risk of Type 1 errors (finding a non-existing effect) and Type 2 errors (failing to find an existing effect) (De Maeyer, Van den Bergh, Rymenans, Van Petegem, & Rijlaarsdam, 2010). First, an empty model was tested (without independent variables) to determine the amount of variance that was situated at the school level. Second, ethnic diversity with random slopes across groups was included at the school level. Finally, the control variables with random slopes were included at the student and school level to examine whether ethnic diversity was related to the dependent variables beyond individual and school background characteristics.

Results
Descriptive statistics
The mean scores and standard deviations of the three groups for the dependent variables are shown in Table 2. Table 3 presents the descriptive statistics of ethnic diversity in school for the three groups of students. The mean for ethnic diversity differs according to the group to which the students belong. Whereas mono-ethnic majority students on average go to low ethnically diverse schools, bi-ethnic students on average go to medium ethnically diverse schools and mono-ethnic minority students on average go to highly ethnically diverse schools.

The relationship between ethnic diversity and educational outcomes and social functioning for bi-ethnic, mono-ethnic majority, and mono-ethnic minority students
Whether the relationship between ethnic diversity in school and cognitive outcomes, social-emotional functioning, and citizenship competences differs between bi-ethnic, mono-ethnic minority, and mono-ethnic majority students was examined. Table 4 presents the results after school year, gender, parental education level, the generation of the child, the language spoken at home, grade retention, the structure of the family composition, and urbanisation were controlled for. Significant estimates (p value < .05) are shown in bold.
The results show that ethnic diversity was only related to the outcomes and social functioning of mono-ethnic majority students; no relation between ethnic diversity and outcomes and social functioning was found for bi-ethnic and mono-ethnic minority students. Mono-ethnic majority students in ethnically diverse schools scored lower on reading comprehension and well-being with fellow students and showed more problem behaviours than mono-ethnic majority students in lower ethnically diverse schools. However, mono-ethnic majority students in ethnically diverse schools scored higher on the citizenship orientations that are characterised by societal interest, reflective thinking, and assertiveness than mono-ethnic majority students in lower ethnically diverse schools.

Because the relationships with ethnic diversity and some outcomes and functioning were significant for the mono-ethnic majority group and not for the bi-ethnic and mono-ethnic minority students, we can conclude that this relationship is different for the groups. However, this is considered to be weak evidence because coefficient estimates with similar p values in different groups can be considered to be different. Therefore, we also examined whether the magnitude of the relationship between ethnic diversity and the outcomes and functioning varied significantly across the groups. The coefficients were fixed to be equal across groups, and a likelihood ratio test was used to determine if the chi-square statistic of model fit differed significantly from the unconstrained model. Only for social-emotional functioning, the fit of the constrained model differed significantly from the fit of the unconstrained model (\(\chi^2_{df = 4} = 18.39, p < .01\)), but this was only true for the differences across bi-ethnic students and mono-ethnic majority students (\(\chi^2_{df = 2} = 7.64, p < .05\)). This finding indicates that the magnitude of the associations between ethnic diversity and social emotional functioning differs significantly across bi-ethnic students and mono-ethnic majority students.

**Table 2.** Mean scores and standard deviations of cognitive outcomes, social-emotional functioning in school, and citizenship competences (\(N_{maxstudents} = 11,892\)).

<table>
<thead>
<tr>
<th></th>
<th>Mono-ethnic majority</th>
<th>Bi-ethnic</th>
<th>Mono-ethnic minority</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Cognitive outcomes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading comprehension</td>
<td>57.78</td>
<td>16.86</td>
<td>58.30</td>
</tr>
<tr>
<td>Mathematics</td>
<td>110.96</td>
<td>11.62</td>
<td>110.39</td>
</tr>
<tr>
<td>Social-emotional functioning in school</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Well-being</td>
<td>4.17</td>
<td>0.64</td>
<td>4.11</td>
</tr>
<tr>
<td>Problem behaviour</td>
<td>2.22</td>
<td>0.82</td>
<td>2.25</td>
</tr>
<tr>
<td>Citizenship competences</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Societal interest</td>
<td>2.97</td>
<td>0.42</td>
<td>3.08</td>
</tr>
<tr>
<td>Prosocial ability</td>
<td>2.95</td>
<td>0.42</td>
<td>3.01</td>
</tr>
<tr>
<td>Reflective thinking</td>
<td>2.23</td>
<td>0.55</td>
<td>2.35</td>
</tr>
<tr>
<td>Assertiveness</td>
<td>3.07</td>
<td>0.54</td>
<td>3.14</td>
</tr>
<tr>
<td>Societal knowledge</td>
<td>0.79</td>
<td>0.18</td>
<td>0.80</td>
</tr>
<tr>
<td>Interpersonal knowledge</td>
<td>0.78</td>
<td>0.19</td>
<td>0.77</td>
</tr>
</tbody>
</table>

**Table 3.** Descriptive statistics of ethnic diversity in school for mono-ethnic majority, bi-ethnic and mono-ethnic minority students.

<table>
<thead>
<tr>
<th>Ethnic diversity</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mono-ethnic majority</td>
<td>9961</td>
<td>0.16</td>
<td>0.18</td>
<td>0.00</td>
<td>0.84</td>
</tr>
<tr>
<td>Bi-ethnic</td>
<td>531</td>
<td>0.38</td>
<td>0.24</td>
<td>0.00</td>
<td>0.84</td>
</tr>
<tr>
<td>Mono-ethnic minority</td>
<td>2349</td>
<td>0.59</td>
<td>0.19</td>
<td>0.00</td>
<td>0.84</td>
</tr>
</tbody>
</table>

The results show that ethnic diversity was only related to the outcomes and social functioning of mono-ethnic majority students; no relation between ethnic diversity and outcomes and social functioning was found for bi-ethnic and mono-ethnic minority students. Mono-ethnic majority students in ethnically diverse schools scored lower on reading comprehension and well-being with fellow students and showed more problem behaviours than mono-ethnic majority students in lower ethnically diverse schools. However, mono-ethnic majority students in ethnically diverse schools scored higher on the citizenship orientations that are characterised by societal interest, reflective thinking, and assertiveness than mono-ethnic majority students in lower ethnically diverse schools.

Because the relationships with ethnic diversity and some outcomes and functioning were significant for the mono-ethnic majority group and not for the bi-ethnic and mono-ethnic minority students, we can conclude that this relationship is different for the groups. However, this is considered to be weak evidence because coefficient estimates with similar p values in different groups can be considered to be different. Therefore, we also examined whether the magnitude of the relationship between ethnic diversity and the outcomes and functioning varied significantly across the groups. The coefficients were fixed to be equal across groups, and a likelihood ratio test was used to determine if the chi-square statistic of model fit differed significantly from the unconstrained model. Only for social-emotional functioning, the fit of the constrained model differed significantly from the fit of the unconstrained model (\(\chi^2_{df = 4} = 18.39, p < .01\)), but this was only true for the differences across bi-ethnic students and mono-ethnic majority students (\(\chi^2_{df = 2} = 7.64, p < .05\)). This finding indicates that the magnitude of the associations between ethnic diversity and social emotional functioning differs significantly across bi-ethnic students and mono-ethnic majority students.

**Discussion**

The present study explored the relationship between ethnic diversity in school and cognitive outcomes, social-emotional functioning, and citizenship competences of bi-ethnic students with
Table 4. Unstandardised coefficients and effect sizes (ES) of the multivariate multi-group multilevel analyses of the final model for the relation between ethnic diversity and cognitive outcomes (Nstudents = 11531; Nschools = 690), social-emotional functioning in school (Nstudents = 11314; Nschools = 701), and citizenship competences (orientation: Nstudents = 11107; Nschools = 700; knowledge: Nstudents = 11082; Nschools = 700) of mono-ethnic majority, bi-ethnic, and mono-ethnic minority students.

<table>
<thead>
<tr>
<th>Cognitive outcomes</th>
<th>Mono-ethnic majority</th>
<th>Bi-ethnic</th>
<th>Mono-ethnic minority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading comprehension</td>
<td>-5.48 1.94 0.01 -0.35</td>
<td>-0.55 3.79 0.89 -0.04</td>
<td>-3.97 2.43 0.10 -0.25</td>
</tr>
<tr>
<td>Mathematics</td>
<td>-0.40 1.64 0.81 -0.04</td>
<td>2.18 2.46 0.38 0.20</td>
<td>-1.84 1.77 0.30 -0.17</td>
</tr>
<tr>
<td>Well-being</td>
<td>-0.22 0.06 0.00 -0.35</td>
<td>-0.09 0.12 0.45 -0.14</td>
<td>0.13 0.11 0.22 0.21</td>
</tr>
<tr>
<td>Problem behaviour</td>
<td>0.22 0.08 0.01 0.27</td>
<td>-0.28 0.21 0.18 -0.35</td>
<td>-0.06 0.14 0.67 -0.07</td>
</tr>
<tr>
<td>Social-emotional functioning in school</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Well-being</td>
<td>0.12 0.04 0.00 0.30</td>
<td>0.07 0.09 0.47 0.16</td>
<td>0.12 0.07 0.12 0.28</td>
</tr>
<tr>
<td>Societal interest</td>
<td>0.03 0.04 0.39 0.08</td>
<td>0.04 0.10 0.72 0.09</td>
<td>-0.09 0.07 0.19 -0.21</td>
</tr>
<tr>
<td>Prosocial ability</td>
<td>0.14 0.05 0.01 0.33</td>
<td>0.12 0.13 0.34 0.29</td>
<td>-0.06 0.09 0.49 -0.14</td>
</tr>
<tr>
<td>Reflective thinking</td>
<td>0.15 0.04 0.00 0.36</td>
<td>-0.04 0.12 0.75 -0.09</td>
<td>0.12 0.09 0.16 0.30</td>
</tr>
<tr>
<td>Assertiveness</td>
<td>-0.02 0.02 0.36 -0.09</td>
<td>0.02 0.04 0.66 0.10</td>
<td>-0.05 0.03 0.05 -0.29</td>
</tr>
<tr>
<td>Societal knowledge</td>
<td>-0.01 0.02 0.74 -0.03</td>
<td>-0.01 0.05 0.87 -0.04</td>
<td>-0.02 0.03 0.51 -0.10</td>
</tr>
<tr>
<td>Interpersonal knowledge</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Control variables: school year, gender, parental education level, generation of the child, language spoken at home, grade retention, structure of family composition, and urbanisation.
one migrant and one non-migrant parent. Although some studies have focused on the relationship between school composition and the educational outcomes and social functioning of bi-ethnic students, to our knowledge, no studies have focused on the relationship between ethnic diversity in school and the educational outcomes and social functioning of bi-ethnic students. Previous studies have only focused on the role of school ethnic composition in terms of the size of one particular ethnic group; however, we focused on ethnic diversity within schools: both the number and size of ethnic groups in schools. The more ethnic groups a school has and the larger they are, the greater its ethnic diversity will be. We focus on ethnic diversity, because we expect that ethnic diversity is especially important for bi-ethnic students because they have unique multi-ethnic experiences from birth.

The results indicated that ethnic diversity was not related to bi-ethnic students’ cognitive outcomes, social-emotional functioning, and citizenship competences. Thus, bi-ethnic students perform and function at the same level in more and less ethnically diverse schools. To put the results in context, we also explored this relationship for mono-ethnic minority and mono-ethnic majority students. For mono-ethnic minority students, we found no relationship between ethnic diversity and cognitive outcomes, social-emotional functioning, and citizenship competences. However, for mono-ethnic majority students, such a relationship was found. Mono-ethnic majority students in highly ethnically diverse schools scored lower on reading comprehension and well-being with fellow students and showed more problem behaviour, but they scored higher on the citizenship orientations characterised by societal interest, reflective thinking, and assertiveness than did the mono-ethnic majority students in low ethnically diverse schools. Our findings that mono-ethnic minority students’ outcomes and social functioning are not related to ethnic diversity and mono-ethnic majority students’ outcomes and social functioning are related to ethnic diversity is not totally supported by other studies. Most studies have found that all mono-ethnic students score higher cognitive outcomes, score higher on social-emotional functioning, and score higher on citizenship competences when they attend ethnically diverse schools (for a review, see Mickelson & Nkomo, 2012). However, most of these studies did not focus on ethnic diversity the way that is done in our study; most focused on the influence of a certain percentage of one group of students. Differences in the conceptualisation of ethnic diversity influence the results (Maestri, 2011). Most studies that focused on ethnic diversity in a way that was similar to the current study also found that mono-ethnic majority students’ cognitive outcomes are negatively influenced by ethnic diversity, and ethnic minority students’ cognitive outcomes are not influenced by ethnic diversity (Braster & Dronkers, 2014; Veerman, Van de Werfhorst, & Dronkers, 2013). Corresponding with our findings for social-emotional functioning, Maestri (2011) found that ethnic diversity is negatively related with school well-being for mono-ethnic majority students and not related with school well-being for ethnic majority students. For citizenship competences, Janmaat (2012) found that in general, ethnic majority students in Germany and Sweden scored higher on citizenship competences when they attended ethnically diverse schools. This finding is broadly in line with our findings. However, he did not find this relationship for ethnic majority students in England. He argued that the effect differed across countries because British students would be more accustomed to immigrants than Swedish and German students, because England has a longer history with immigrants. England also has a longer history with immigrants than The Netherlands. To our knowledge, no study has measured the relationship between ethnic diversity and citizenship outcomes for ethnic minority students.

It was expected that the relationship between ethnic diversity and the educational outcomes and social functioning of bi-ethnic students would be smaller than the relationship between ethnic diversity and the educational outcomes and social functioning of the mono-ethnic students. Because bi-ethnic students grow up in an ethnically diverse home environment, with ethnically diverse parents, family, and relatives, we supposed they would be less affected by an ethnically diverse school environment than mono-ethnic students whose home environment is less ethnically diverse. We argued that the relationship between ethnic diversity and cognitive
outcomes of bi-ethnic students may be smaller, because we expect bi-ethnic students to respond to ethnic diversity as “chameleons”; they are less influenced by the school culture. For the social-emotional outcomes, we argued that ethnic diversity also has little influence on bi-ethnic students, because bi-ethnic students are accustomed to interethnic contact and are able to overcome ethnic differences. For citizenship competences, we argued that ethnic diversity also has little influence on bi-ethnic students, because they are already accustomed to evaluating and exploring different perspectives, accepting conflicts, developing social sensibility, involvement, and social adaptability. Our results supported our expectations to a certain extent. The relationship between ethnic diversity and educational outcomes and social functioning was not significant for bi-ethnic students, and this relationship was significant for mono-ethnic majority students. However, the differences between this relationship for bi-ethnic and for mono-ethnic majority students was only significant for social-emotional functioning. For mono-ethnic minority students, no relationship between ethnic diversity and outcomes and social functioning was found either, and this relationship for bi-ethnic and for mono-ethnic minority students was also not significant. Nonetheless, the effect sizes for bi-ethnic students were, in general, smaller than for mono-ethnic minority students. One explanation for the fact that for mono-ethnic minority students we did not find a relationship between ethnic diversity and outcomes and social functioning could be that mono-ethnic minority students also have bi-cultural experiences out of school. Unlike bi-ethnic students, the bi-cultural experience is not present within their homes (the parents and family have the same ethnic background), but they are confronted with cultural differences between home and society (Geijsel, Ledoux, Reumerman, & Ten Dam, 2012). Their cultural experiences in their home and outside of their home environment could differ greatly, and therefore, they could be accustomed to diverse cultures.

We may have found a relationship between ethnic diversity and educational outcomes and social functioning for mono-ethnic majority students, because the mono-ethnic majority students that go to more ethnically diverse schools differ in background characteristics from mono-ethnic majority students who go to less ethnically diverse schools. We controlled for a couple of background characteristics; however, it is possible that the parents who choose an ethnically diverse school for their child differ in certain characteristics from parents who choose not to put their child in an ethnically diverse school.

The non-response analysis showed that students with incomplete data on ethnic background characteristics were students who come from disadvantaged home situations and migrant families. The omission of the students with incomplete data may have biased our results. We performed an extra analysis to test whether students whose parents filled in the parent questionnaire performed higher on the cognitive and social-emotional tests than students whose parents did not fill in the parent questionnaire. We found that there are differences between the two groups of students; however, the effect sizes were small (eta-squared < .18).

We interpret our findings, that is, that ethnic diversity in school makes no difference for bi-ethnic students’ educational outcomes, social functioning, and citizenship competences, as the result of their experiences within the microsystem of family and relatives. However, other microsystems, such as peer groups, could also play a role. A child is influenced by multiple environments and is directly and indirectly affected by relationships between these environments. In addition, causes and consequences need to be identified. Carter (2012) argues that ethnically diverse schools foster the development of cultural flexibility and the ability to successfully navigate between ethnic contexts. Bi-ethnic students, as do mono-ethnic minority students, go to more ethnically diverse schools than mono-ethnic majority students and perhaps therefore become accustomed to ethnic diversity. However, because this study is a cross-sectional study, it is difficult to make causal inferences. We cannot conclude that the relationship between ethnic diversity and educational outcomes and functioning is explained by the way in which someone is accustomed to ethnic diversity.
Because bi-ethnic individuals form a very diverse group – not only in terms of their ethnic background but also in terms of their migration background (some migrant parents came to The Netherlands for labour; others are refugees or expats) and education level – future studies should examine whether the relationship of ethnic diversity in school with the educational outcomes and school functioning of bi-ethnic students varies by background characteristics, such as the ethnic composition of the family and the educational level of the parents.

This study provides important insight into the situation of bi-ethnic children. The findings of this study indicate that bi-ethnic students are relatively “immune” to ethnic diversity in school. The potential contribution of this study is substantial because it helps to fill in the gaps in the existing literature by providing empirical data on bi-ethnic students. Additionally, this study can also further our understanding of how interacting in an ethnically diverse context affects the outcomes and social functioning of children in general. More studies are needed to determine how people adapt to ethnic diversity. As many countries are becoming more and more ethnically diverse, we need more information about how people adapt to ethnic diversity. The ability to become accustomed to ethnic diversity could lead to less discrimination and prejudice and could contribute to a “well-functioning” multi-ethnic society, where social cohesion is the default.

Acknowledgement

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Notes on contributors

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Ineke van der Veen is a senior researcher at the Kohnstamm Institute of the University of Amsterdam. Her current research involves learning motivation, self-regulated learning, and educational careers, with a focus on students from different ethnic and social backgrounds.

Monique Volman is a professor of education at the Research Institute of Child Development and Education of the Faculty of Social and Behavioural Sciences of the University of Amsterdam. Her main areas of research are learning environments for meaningful learning, diversity, and the use of ICT in education.

References


