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## The Young Environmental Citizens in Nordic Countries : Their Concerns, Values, Engagement, and Intended Future Actions

Huang, Lihong

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# Chapter 6

## The Young Environmental Citizens in Nordic Countries: Their Concerns, Values, Engagement, and Intended Future Actions



Lihong Huang and Saiki Lucy Cheah

**Abstract** This chapter presents an analysis of students' concerns, values, engagement, and intended future participation on environmental issues in relation to their home socioeconomic background, gender, and migrant status. Analyzing IEA International Civic and Citizenship Education Study (ICCS) 2016 data of Nordic countries, we first present descriptions of student responses to all questions related to environmental issues and compare Nordic results with European and international averages. Then, we construct a composite score of student environmental citizenship for investigating its relationship with student background factors such as gender, migrant status, and home socioeconomic status through comparing means between student groups with different background characteristics. Lastly, we apply factorial ANOVA analysis method to examine the effect sizes of student background factors and the interactions between them on youth environmental citizenship in the four countries. The results show that there are both similarities and small variations in elements of student environmental citizenship among the Nordic countries and in comparison with their European and international peers. Nordic students stand out as the concerned environmental citizens while they are somehow lower than their European and international peers in engagement, values, and intended participation of environmental citizenship. We find that student environmental citizenship is socially divided in all Nordic countries as it differs significantly between students from different socioeconomic strata and genders. Although not all differences of student environmental citizenship by migrant status are statistically significant among the Nordic countries, we find some significant influence of migrant status interaction with socioeconomic statuses and genders.

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L. Huang (✉)

Norwegian Social Research—NOVA, Oslo Metropolitan University, Oslo, Norway  
e-mail: [luhuan@oslomet.no](mailto:luhuan@oslomet.no)

S. L. Cheah

Helsinki Institute of Sustainability Science (HELSUS), University of Helsinki, Helsinki, Finland  
e-mail: [saikicheah@gmail.com](mailto:saikicheah@gmail.com)

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**Keywords** Environmental citizenship · Socioeconomic background · Nordic countries · Citizenship education · International Civic and Citizenship Education Study (ICCS)

## 6.1 Introduction

Youth activism and engagement in the recent climate change movement have illustrated that students are practicing and exercising active environmental citizenship to demand and advocate means for change at present and future. Climate and environmental activists have demonstrated a combination of knowledge, skills, values, and attitudes in activism and engagements through organizing the student movement, setting pro-environmental examples, making their voices heard, demanding for immediate actions to address environmental problems. For instance, Greta Thunberg (aged 15 then) started a School Strike for the Climate protest outside the Swedish parliament regularly on Friday since August 2018 and inspired a series of national and international mass student protests. These protests have become Fridays for Future (FFF), Youth Strike for Climate and Youth for Climate, which have extended the exercise of youth environmental citizenship across schools, local, national, and international levels. Their goals are to demand effective actions from political leaders now and future to prevent climate crisis by means of reducing carbon emissions aggressively and environmental injustice from political leaders worldwide.

Over the course of the School Strike for the Climate movement from December 2018 to September 2019, significant numbers of parents, educators, scientists,<sup>1</sup> healthcare professionals, civil servants, and public figures support and participated in the youth activism and its cause (Carrington 2019). By December 2020, more than four million protesters around the world participated in the world's two largest climate strikes. One of the main victories from the youth climate activism is gaining worldwide recognition and support including the United Nations (UN) General Secretary António Guterres who claimed that "My generation has failed to respond properly to the dramatic challenge of climate change" and "concrete realistic plans to enhance their nationally determined contributions by 2020" (Guterres 2019).

In the youth climate protest movement, students and young people exercised their environmental citizenship through youth activism and civic engagement. The continuity and success of the movement also demonstrated students' willingness and competencies to enact pro-environmental behaviours and attitudes in private and civic life for change to take place now and in the future. The exercise of environmental citizenship is strongly associated with a citizen's capacity to act in society as an agent of change and a citizen's capacity to make change also depends on the development of a person's willingness and competence for critical, active, and democratic engagement in preventing and solving environmental problems (Reis 2020). Moreover, civic engagement depends on students and their "motivation to participate

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<sup>1</sup>For example, Scientist4Future, Scientists4Climate, Nature Weekly Scientific Journal, Science Magazine, Club of Rome.

in civic activities, their confidence in the effectiveness of their participation, and their beliefs about their own capacity to become actively involved” (Schulz, Ainley, et al. 2018, p. 72). In sum, through youth activism and civic engagement, young people have exercised and practiced the essential properties of young environmental citizens; for instance, they have demonstrated their willingness (e.g., values and attitudes) for environmental protection, as well as competencies (e.g., critical understanding and behavioural skills) for dealing with environmental crisis at present and future.

Meanwhile, environmental activism enables the exercise of students’ environmental rights and duties, as well as the identification of the underlying structural and systemic causes of environmental problems, developing the willingness and the competences for critical and active engagement to address complex environmental issues, making personal and collective efforts through democratic means for change. We find most appropriate for this study a recent and comprehensive definition of environmental citizens derived from the definition of environmental citizenship and sequential environmental citizen by the European Network for Environmental Citizenship (ENEC, 2017–2022):

*Environmental Citizen* is defined as the citizen who has a coherent and adequate body of **knowledge** as well as the necessary **skills, values, attitudes** and **competences** in order to be able to act and participate in society as an **agent of change** in the **private** and **public sphere**, on a **local, national** and **global scale**, through **individual** and **collective actions**, in the direction of **solving** contemporary **environmental problems**, **preventing** the creation of new environmental problems, in **achieving sustainability** as well as **developing a healthy relationship with nature**. *Environmental Citizen* is the citizen who **exercises his/her environmental rights and duties**, is able to identify the underlying **structural causes** of environmental degradation and environmental problems, and has the **willingness** and the **competences** for **critical** and **active engagement** and **civic participation** to address those structural causes, acting individually and collectively within democratic means and taking into account **inter- and intra-generational justice**. (ENEC 2018)

We focus on all the elements of environmental citizens, i.e., concerns, values, engagement, and intended participation as measured by the International Association for the Evaluation of Educational Achievement (IEA) International Civic and Citizenship Education Study (ICCS) student survey (Schulz, Ainley, et al. 2018). This chapter investigates the extent to which students’ home socioeconomic background, gender, and migrant status in the Nordic countries are associated with youth environmental citizenship.

## 6.2 The Role of School and Home in Environmental Citizenship and Youth Activism

In recent years, environmental citizenship has become an integral element of civic and citizenship education curricula, both globally and at the European level (Council of Europe 2018; European Commission/EACEA/Eurydice 2017; Gericke et al. 2020). From a pedagogical perspective, youth activism and civic engagement exhibit active

and experiential learning among student participants who apply environmental citizenship education across their school, local, national, and global levels. In the context of environmental citizenship, Reis (2020) refers activism to a process of collective, democratic, research-informed, and negotiated problem-solving action on socio-environmental problems. Previous research show that school can support and foster a students' civic learning and engagement through open classroom/school climates (e.g., Campbell 2008; Hoskins et al. 2017; Knowles et al. 2018), democratic structures within schools (e.g., Hoskins et al. 2012; Keating and Janmaat 2016; Knowles et al. 2018), and early opportunities for active participation (Hoskins and Janmaat 2019; Reis 2020). Putting in place these elements for democratic activism, school can increase levels of civic engagement among young people as the sense of not feeling empowered enough hinders citizens' participation in decision-making processes (Hodson 2014). The role of school in empowering students through activism is to develop an atmosphere of shared responsibility and commitment and a collaborative relationship between schools and communities, through which students become critical producers of knowledge, in the attempt to find appropriate solutions for the problems they identify as important and socially relevant (Hodson 2014; Reis 2020).

The existing analyses on the 2016 ICCS study (e.g., Schulz, Ainley, et al. 2018; Chapter 5 in this book) show that students' characteristics and social background are important predictors of their civic knowledge while parental interest and students' interest in civic issues were the strongest background predictors of expected civic engagement. These analyses also found that students' perceptions of open classroom climate for discussion as well as their civic engagement at school remained significant predictors while experience with civic engagement in the community or at school tended to be positively associated with students' expected civic engagement as adults. Furthermore, students' belief of the importance of civic engagement through established channels were also more likely to predict future civic participation while female students were less inclined than male students to expect they would become actively involved politically in the future. In sum, Schulz, Carstens, et al. (2018) suggest students' characteristics (e.g., perceptions, values, interests, self-efficacy, gender) and social background (e.g., school climate, interactions at homes and schools, channels for engagement, and socioeconomic background) to be positively associated or significant predictors for citizenship practice.

Moreover, previous analysis (Cheah and Huang 2019) provided important evidence that environmental citizenship education practice in Nordic schools has a significant positive association with heightened attitudes and magnified behaviours among students toward environmental actions now and in the future. In addition, the same analysis (Huang and Cheah 2019) found that background variables such as parental education levels, migrant status and gender of the students also played a role in explaining the variation of student environmental citizenship in Nordic schools. There are signs of increasing income inequality in Nordic countries (Aaberge et al. 2018) and growing research evidence indicating a strong link between socioeconomic inequality and exposure to environmental injustice (Shen et al. 2020; Walker and Burningham 2011; Cutter et al. 2003). There is evidence of socioeconomic inequality in young people's civic learning opportunities and their civic competence

achievement in the Nordic schools (see Chapter 5 of this book). This chapter asks the question: Are there signs of socioeconomic inequalities in youth environmental citizenship in Nordic countries as well? We will analyze ICCS 2016 data and focus on a few question items that can be used as indicators of student environmental citizenship.

### 6.3 Data and Measures

The data used in this chapter are from Nordic countries that participated in IEA's ICCS 2016.<sup>2</sup> We use eight question items from the student data to measure environmental citizenship including students' concerns, values, engagement, and intended future actions relating to environmental issues (see Appendix Table 6.3 for descriptions). First, students' concerns on environmental issues are measured by two items (IS3G28A: pollution and IS3G28I: climate change) of a question asking students to identify the biggest threat to the world future with four response alternatives (recoded: 1 = not at all, 2 = to a small extent, 3 = to a moderate extent, 4 = to a large extent). Second, two items measure the values of environmental citizenship by student responses to the question "How important are the following behaviours for being a good adult citizen?" The items are IS3G23J "taking part in activities to protect the environment" and IS3G23N "making personal efforts to protect natural re-sources," which have four response alternatives (recoded: 1 = not important at all, 2 = not very important, 3 = quite important, 4 = very important).

Third, student learning as a part of engagement is a subjective measure from student responses to a question item IS3G18C "At school, to what extent have you learned about how to protect the environment (e.g., through energy-saving or recycling)?" with four response alternatives (recoded: 1 = not at all, 2 = a little, 3 = to some extent, 4 = a lot). Student engagement includes also two question items asking about student participation in environmental actions at school (i.e., IS3G16F) or in environmental organizations or groups outside school (i.e., IS3G15B) during the past with three response alternatives (recoded: 1 = never, 2 = yes, before the past year, 3 = yes, during the past year). Finally, student intended future participation as part of their values of environmental citizenship is from a question item IS3G31J "When you are an adult, will you make personal efforts to help the environment?" with four response alternatives (recoded: 1 = I would certainly not do this, 2 = I would probably not do this, 3 = I would probably do this, 4 = I would certainly do this).

The eight items measuring different dimensions of student environmental citizenship form a scale with marginally acceptable reliability (Cronbach's alpha range from lowest 0.65 for Denmark and Norway to highest 0.72 for Finland, using student weight TOTWGTS). By computing the sum from these eight items, we create a new

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<sup>2</sup>Chapter 1 of this book presents more details on the representative sample, including the number cases and schools per country.

variable with accumulated values of the students’ environmental citizenship (with minimum = 8, maximum = 30, and a Nordic mean of 22.2; standard deviation = 3.1), which contains student concerns, values, attitudes, learning, and participation, and intended future participation for protecting the environment.

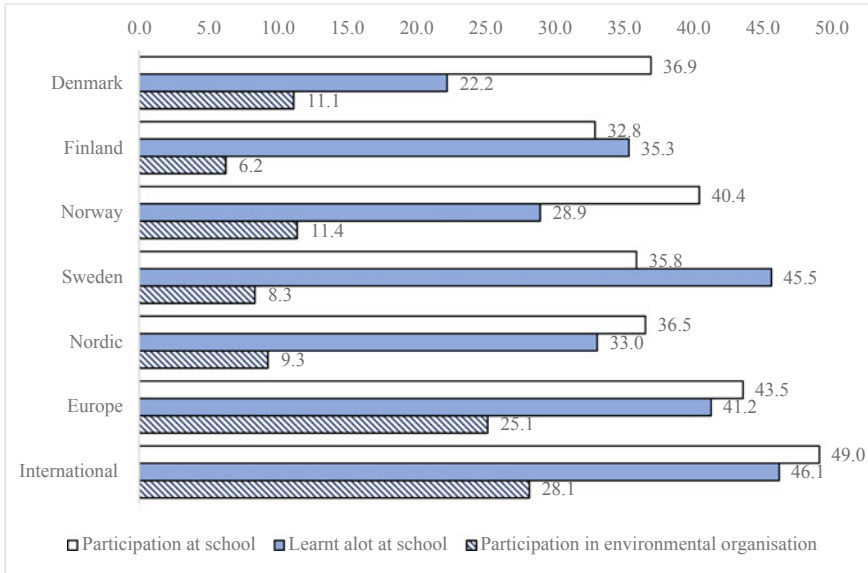
### 6.4 Analysis Plan

We analyze the data and present the results in three steps. First, we present descriptions of student responses in three subsections describing the Nordic environmental citizen (Table 6.3 in the Appendix contains detailed descriptions of the eight items). The descriptions include concerns (see Table 6.1, with numbers in bold highlighting the two most chosen concerns), learning and their engagement (Fig. 6.1), and values and future intended participation related to environmental issues (Fig. 6.2), in comparison between the Nordic countries and with that in Europe and international averages. Then, we explore if student environmental citizenship differs by their socioeconomic status (SES), gender, and migrant background. We use the national index of SES, which is a standardized score with an international/national mean of

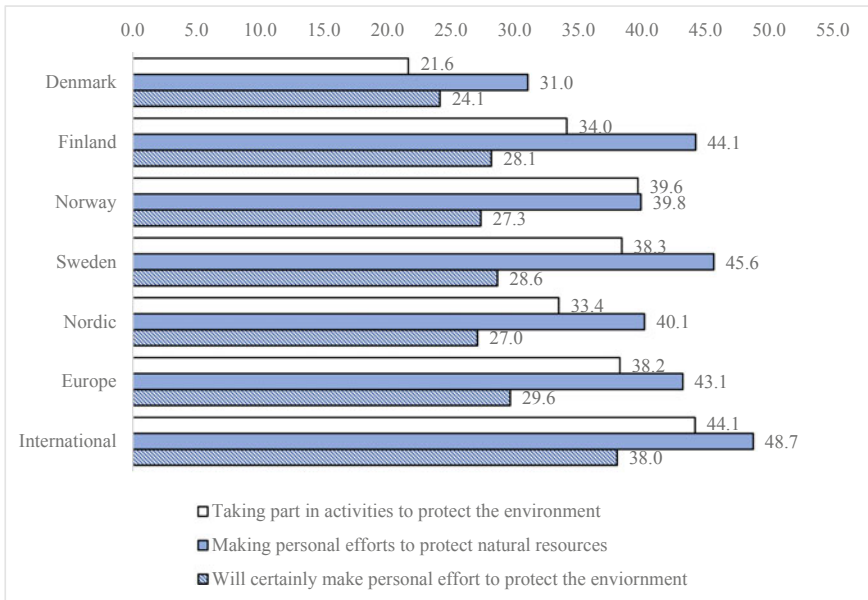
**Table 6.1** Students’ response “to a large extent” on issues of their consideration as the biggest threats to the world future, percent (standard error)

	Denmark	Finland	Norway	Sweden	Nordic	Europe <sup>^^</sup>	International <sup>^</sup>
<b>Pollution</b>	<b>75 (0.9)</b>	<b>66 (1.0)</b>	<b>76 (0.7)</b>	<b>79 (0.8)</b>	<b>74 (0.4)</b>	<b>74 (0.3)</b>	<b>76 (0.2)</b>
Terrorism	58 (0.8)	57 (1.0)	54 (0.8)	51 (1.1)	55 (0.5)	<b>67 (0.3)</b>	<b>66 (0.2)</b>
Water shortage	54 (0.9)	44 (1.1)	41 (1.0)	46 (1.1)	46 (0.5)	63 (0.3)	65 (0.2)
Food shortage	50 (0.8)	49 (1.2)	52 (0.8)	48 (1.3)	50 (0.5)	61 (0.3)	62 (0.2)
Infectious diseases	46 (0.9)	36 (0.8)	40 (0.9)	34 (0.9)	39 (0.4)	56 (0.3)	59 (0.2)
<b>Climate change</b>	<b>64 (1.2)</b>	<b>62 (1.1)</b>	<b>66 (0.8)</b>	<b>68 (0.9)</b>	<b>65 (0.5)</b>	56 (0.3)	55 (0.2)
Poverty	41 (0.8)	36 (1.1)	49 (0.6)	43 (1.2)	42 (0.5)	51 (0.3)	53 (0.2)
Crime	30 (0.8)	27 (0.3)	33 (0.8)	28 (0.9)	29 (0.4)	44 (0.3)	50 (0.2)
Violent conflict	27 (0.7)	28(0.8)	32 (0.7)	34 (1.2)	30 (0.4)	42 (0.3)	46 (0.2)
Global financial crisis	33 (0.8)	32 (0.9)	38 (0.7)	31 (0.9)	33 (0.4)	40 (0.3)	44 (0.2)
Energy shortage	35 (0.7)	27 (0.9)	28 (0.7)	30 (1.0)	30 (0.4)	38 (0.3)	43 (0.2)
Unemployment	26 (0.7)	30 (0.8)	28 (0.7)	27 (1.1)	28 (0.4)	38 (0.3)	41 (0.2)
Overpopulation	39 (0.8)	27 (1.1)	37 (0.9)	41 (1.1)	36 (0.5)	38 (0.3)	39 (0.2)

Notes Data presented here are from ICCS 2016 student survey question Q28 items IS3G28A-M. In bold are the two items with highest percentages of students responding “to a large extent;” <sup>^</sup>Tables 5.13 and 5.14 in Schulz et al. 2018b; <sup>^^</sup>average of 14 European Union member states participated in ICCS 2016



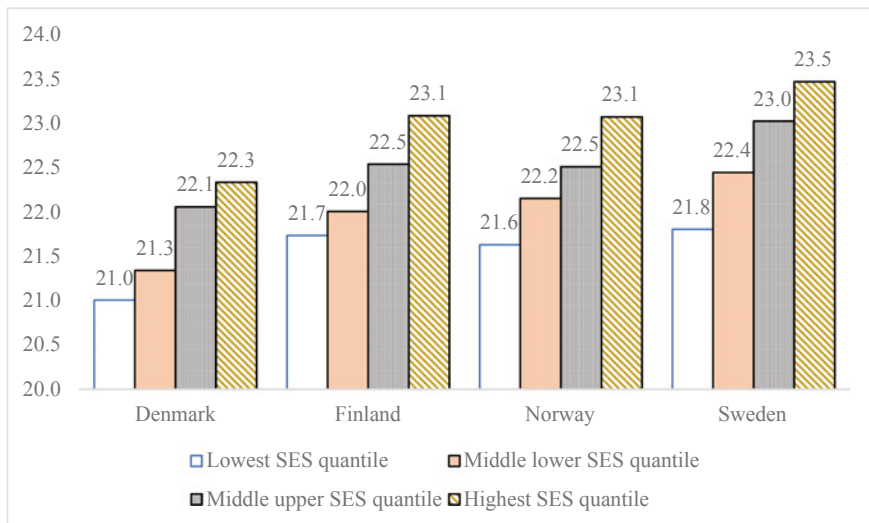
**Fig. 6.1** Student responses to their learning (IS3G18C) and participation in activities at school (IS3G16F) related to protecting the environment and their participation in environmental organisations outside of school (IS3G15B), percent (standard error in Appendix Table 6.3)



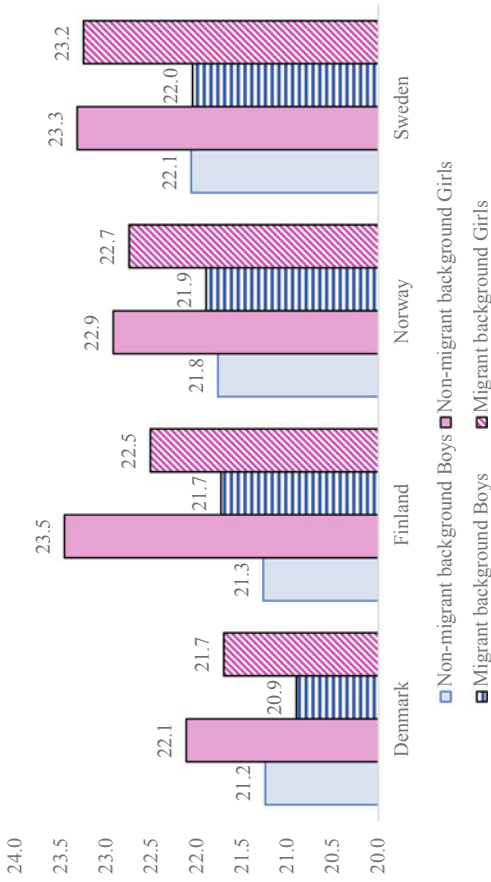
**Fig. 6.2** Students' responses "most important" individual traits of being a good adult environmental citizen (IS3G23J, IS3G23N) and "will certainly do" in participation of future environmental efforts (IS3G31J), percent (standard error in Appendix Table 6.3)



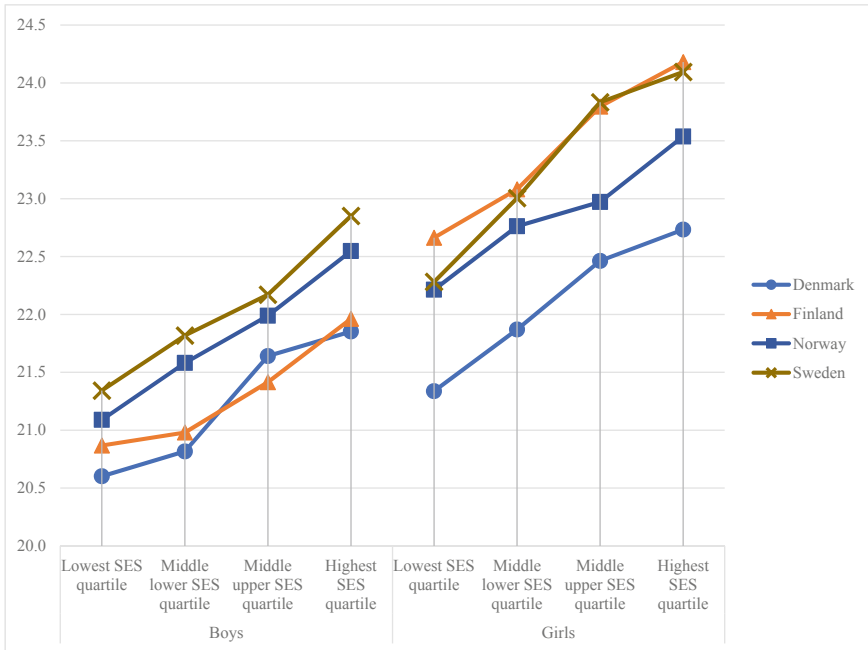
zero, a maximum value of 4.73, and a minimum value of -5.27. The national index is constructed on three indices: parents' highest occupational status, parents' highest level of education, and the number of books at home (Schulz, Carstens, et al. 2018). To understand the levels of socioeconomic inequalities in environmental citizenship, we used the national socioeconomic index variable to divide the ICCS data into four equal groups in each country: students in lowest SES quartile, middle-lower SES quartile, middle-upper SES quartile, and highest SES quartile. Figure 6.3 provides a visual presentation of the average environmental citizenship by four SES strata in the Nordic countries. We also performed t-tests to assess if student environmental citizenship differs significantly between SES quartiles, by dividing the difference by its standard error estimated by using jackknife replication in the IEA IDB Analyzer. With this goal in mind, we performed the same analysis to assess differences between student genders (boy = 0; girl = 1) and migrant status (0 = at least one parent were born in country; 1 = both parents were migrants), as presented in Fig. 6.4 (see Table 1.1 in Chapter 1 of this book for the distributions of gender and migrant status). Finally, we present means of student environmental citizenship by SES strata and gender interaction (Fig. 6.5) and SES strata and migrant status interaction (Fig. 6.6), using Factorial ANOVA technique available at SPSS analysis programme to test the strength of effect of all three background factors and interactions between them on student environmental citizenship (see Appendix Table 6.4 for all estimated means).



**Fig. 6.3** Student environmental citizenship in four socioeconomic strata, by country (Notes All differences between the socioeconomic strata are significant at 0.05 level, except the non-significant differences in Finland between lowest and middle lower SES quartiles and in Denmark between middle upper and highest SES quartiles. See Appendix Table 6.4 for numeric values with standard errors)



**Fig. 6.4** Student environmental citizenship between genders and migrant statuses (*Notes* All differences between boys and girls are significant at 0.05 level. Difference between migrant boys and non-migrant boys is significant only in Denmark and difference between migrant girls and non-migrant girls is significant in Denmark, Finland, and Norway but not in Sweden. See Appendix Table 6.4 for numeric values with standard errors)

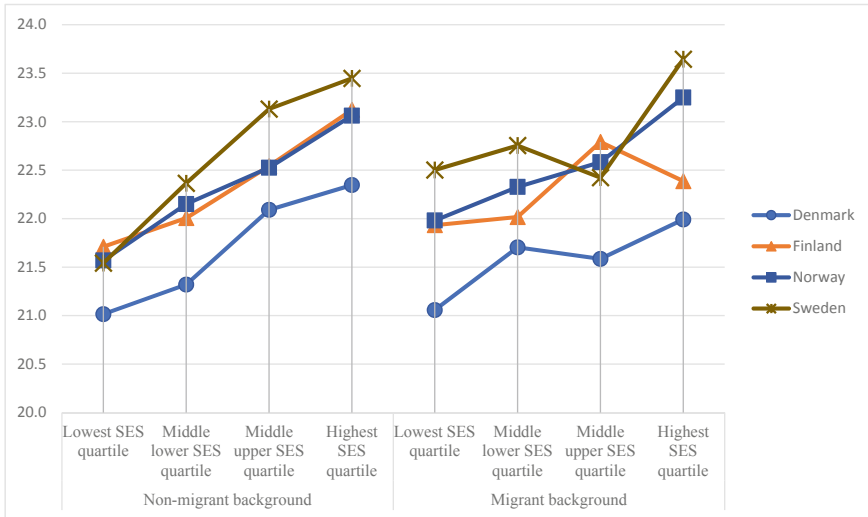


**Fig. 6.5** Means of student environmental citizenship in gender groups and four socioeconomic strata (Notes All differences are significant except: For boys, in Denmark non-significant differences between lowest and middle lower SES strata and between highest and middle upper SES strata; in Finland non-significant differences between lowest and middle lower SES strata and between middle lower and middle upper SES strata; in Sweden non-significant difference between middle lower and middle upper SES strata. For girls, in both Denmark and Sweden non-significant difference between highest and middle upper SES strata; in Finland non-significant difference between lowest and middle lower strata; in Norway non-significant difference between middle lower and middle upper SES strata. See Appendix Table 6.4 for numeric values with standard errors)

We also report ETA-squared as a comprehensive measure of inter-class differences in the multiple comparisons.

### 6.5 Result 1: Description of Students’ Environmental Citizenship

First, we present descriptive analyses of student responses to all questions related to environmental issues also in comparison between Nordic countries and European and international averages. In three subsections, we present students’ biggest concerns, their learning and current engagement, and their values and intended participation.



**Fig. 6.6** Means of student environmental citizenship in non-migrant and migrant groups and four socioeconomic strata (Notes For non-migrant background, all differences are significant except non-significant difference between highest and middle upper SES strata in both Denmark and Sweden, non-significant difference between lowest and middle lower strata in Finland. For migrant background, all differences are non-significant except significant differences between the highest and both the lowest and middle lower SES strata in Norway, significant differences between the highest and both middle upper and the lowest SES strata in Sweden)

### 6.5.1 Students’ Biggest Concerns with the Environment

Table 6.1 provides the description of students’ responses to the question on the biggest threats to the world future in the four Nordic countries and in comparison with European and international averages. Nordic students are most concerned with pollution and climate change as the two biggest threats to the world future while their European and international peers are most concerned with pollution and terrorism. Interestingly, pollution and climate change as the top two concerns of Nordic students are two closely related issues that highlight the current crisis and demonstrate the relationship between human behaviours and the future of the world.

Taking these two biggest concerns together underlies the structural causes of the environmental crisis. More than their European and international peers, Nordic students considered that climate change would pose the biggest threat to the world future. However, there are small variations between the Nordic countries in terms of the students’ responses to the category “to a large extent” regarding both pollution and climate change as the biggest threats to the world future. While students in Finland appear to have slightly lower percentages for both concerns than their counterparts in the other three countries, students in Sweden have slightly higher percentages than their counterparts in the other three countries.

### ***6.5.2 Students' Learning and Practice of Environmental Citizenship***

Figure 6.1 visualizes students' responses to questions asking if they have learnt or participated in activities related to protecting the environment at school or in environmental organizations or groups outside of school (see Appendix Table 6.3 for detailed data description). On the whole, lower percentages of Nordic students than those of their European and international peers have participated in or learnt a lot on protecting the environment. Among the four countries, Finland has the lowest percentage of students who have participated in both school activities (32.8%) and environmental organizations outside of school (6.2%) while Norway has the highest percentages of students for participation both at school (40.4%) and outside (11.4%). Denmark has the lowest percentage of students who have learnt a lot at school on protecting the environment (22.2%) while Sweden has the highest percentage of students who have learnt a lot on this subject (45.5%). However, significantly higher proportions of students in Finland and Sweden than those in Denmark and Norway, report to have learnt a lot school. This corresponds well with the fact that "promoting respect for and safeguard of the environment" has become one of the three most important aims of civic and citizenship education in their schools in 2016 as reported by school principals in Finland and Sweden but not by those in Denmark and Norway (see Table 3.1 of Chapter 3 in this book).

### ***6.5.3 Students' Values and Intentions with Respect to Environmental Citizenship***

Figure 6.2 shows students' responses to the category "very important" for a good adult citizen to take part in activities to protect the environment and to make personal effort to protect natural resources; their responses to the category "will certainly make personal efforts to protect the environment when becoming an adult" are also shown (see Appendix Table 6.3 for data descriptions). Here again, the percentages of Nordic students are lower than those of European and international students who responded "very important" on values of a good adult environmental citizen and their willingness to participate when becoming adults.

Among the four countries, Denmark has the lowest percentages in all three indicators of values and intention of environmental citizenship, Sweden has highest percentage of students who responded "very important" on making personal efforts to protect nature resources while with regard to intended future participation there are similar percentages in Finland, Norway, and Sweden.

## 6.6 Result 2: Differences in Terms of Students' Environmental Citizenship by Socioeconomic and Migrant Background and by Gender

To answer the second research question—"Are there signs of inter-individual and socioeconomic inequalities in youth environmental citizenship in Nordic countries?"—we apply factorial ANOVA analysis on effect of student background factors on youth environmental citizenship and the interactions between them in the four Nordic countries. Here, we present means of the composite score of student environmental citizenship for investigating its relationship with student background factors such as gender, migrant status, and home socioeconomic status through comparing means between student groups with different background characteristics. At the same time, we report on the effect sizes of the background variables and interactions between them, respectively.

### 6.6.1 Differences According to Socioeconomic Status

Figure 6.3 represents the average scores of environmental citizenship in four socioeconomic groups (for the numerical values, see Appendix Table 6.4). In all countries, students from the highest SES group have significantly higher average scores of environmental citizenship than those from the lowest and middle lower SES strata.

Among the Nordic countries, students of the lowest scores of environmental citizenship are from the lowest and middle lower SES strata in Denmark and students of the highest scores of environmental citizenship are from the highest SES group in Sweden. Also, the students from the highest SES strata in Finland and Norway have the same score of environmental citizenship as those from middle upper SES group in Sweden. However, the average scores of environmental citizenship in all four SES strata in Finland are nearly identical with those in Norway.

### 6.6.2 Differences According to Gender and Migrant Status

Figure 6.4 shows average scores of environmental citizenship between boys and girls with and without migrant background (see Table 6.4 in Appendix for descriptive means). In all four countries, girls have significantly higher scores than boys do regardless of their migrant statuses while the gender difference is biggest among non-migrant students in Finland and smallest in Denmark.

A difference between non-migrant and migrant students is significant in both gender groups in Denmark, Finland, and Norway but not in Sweden. Interestingly, migrant girls appear to have lower scores than non-migrant girls do in Denmark, Finland, and Norway while migrant boys have lower scores than non-migrant boys

only in Denmark but they have higher scores than non-migrant boys in Finland and Norway. However, as shown in Table 6.2 gender effect size is smallest in Denmark ( $ETA^2 = 0.0062$ ) and biggest in Sweden ( $ETA^2 = 0.0228$ ). Migrant status effect is significant only in Denmark ( $ETA^2 = 0.0013$ ) and Finland ( $ETA^2 = 0.0002$ ) while an interaction between gender and migrant status is significant only in Finland ( $ETA^2 = 0.0018$ ) and Norway ( $ETA^2 = 0.0002$ ).

**Table 6.2** Partial ETA-squared values of the ANOVA means testing of environmental citizenship by socioeconomic strata, gender, migrant status, and interactions

		Denmark	Finland	Norway	Sweden
Figure 6.4	Intercept	0.9431	0.8766	0.9551	0.9695
	Gender (girls = 1)	0.0062	0.0079	0.0107	0.0228
	Migrant status (both parents migrants = 1)	0.0013	0.0002	–	–
	Gender × migrant status	–	0.0018	0.0002	–
	<i>R-squared (corrected model)</i>	0.0227	0.1224	0.0341	0.0407
Figure 6.5	Intercept	0.9822	0.9840	0.9826	0.9833
	Gender (girls = 1)	0.0219	0.1221	0.0313	0.0433
	Socioeconomic status	0.0320	0.0307	0.0286	0.0425
	Gender × socioeconomic status	0.0004	0.0014	0.0002	0.0019
	<i>R-squared (corrected model)</i>	0.0536	0.1479	0.0604	0.0837
Figure 6.6	Intercept	0.9143	0.8245	0.9453	0.9621
	Migrant status (both parents migrants = 1)	–	–	0.0004	0.0005
	Socioeconomic status	0.0059	0.0020	0.0089	0.0142
	Migrant status × socioeconomic status	0.0006	0.0003	0.0002	0.0050
	<i>R-squared (corrected model)</i>	0.0323	0.0303	0.0303	0.0467
Total model	Intercept	0.9143	0.8405	0.9469	0.9635
	Gender (girls = 1)	0.0041	0.0052	0.0082	0.0227
	Migrant status (both parents migrants = 1)	–	–	0.0004	0.0009
	Socioeconomic status	0.0060	0.0025	0.0089	0.0155
	Gender × migrant status	–	0.0014	0.0002	0.0002
	Gender × socioeconomic status	0.0004	–	0.0002	0.0016
	Migrant status × socioeconomic status	0.0004	0.0002	0.0002	0.0044
	Gender × socioeconomic status*migrant status	0.0002	0.0004	0.0003	0.0004
	<i>R-squared (corrected model)</i>	0.0540	0.1498	0.0617	0.0891

Notes –indicates a non-significant effect

### **6.6.3 Interaction Effects Between Socioeconomic Status and Gender**

Figure 6.5 is a graphical representation of mean differences in terms of student environmental citizenship in interaction between SES and gender (see Table 6.4 in the Appendix for numeric means). It shows that girls have higher scores than boys across all SES strata while students from higher SES strata have higher scores than those in lower SES strata regardless of genders. In Finland, girls of the lowest SES have higher average score of environmental citizenship than boys of the highest SES while in the other three countries, girls of the middle lower SES have similar score of environmental citizenship as boys of the highest SES.

However, the interaction between SES and gender is significant in all four countries and girls have higher scores of environmental citizenship regardless of their socioeconomic strata. Table 6.2 presents the results from factorial ANOVA analysis testing means variance explained (i.e., partial Eta squared). Although gender has significant effect in all four countries, biggest gender effects on student environmental citizenship in all four SES strata are in Finland ( $\text{ETA}^2 = 0.1221$ ) while the weakest gender effects are in Denmark ( $\text{ETA}^2 = 0.0219$ ). Meanwhile, SES has weakest explanation power in Norway ( $\text{ETA}^2 = 0.0286$ ) and the strongest power in Sweden ( $\text{ETA}^2 = 0.0433$ ) but SES appears to have more effect for girls than for boys in the Nordic countries as there is a significant positive interaction effect between SES and gender in all countries (see Table 6.2).

### **6.6.4 Interaction Effects Between Socioeconomic Status and Migrant Status**

Figure 6.6 is a graphical presentation of mean differences in terms of student environmental citizenship according to SES and in interaction with migrant status (see Table 6.4 in Appendix for numeric values). It shows that in all four countries, for the non-migrant students, the average scores of environmental citizenship increase along with the increase of socioeconomic strata but this is not the same case for migrant students. For the migrant students, SES appears to have a less clear, linear relationship with student environmental citizenship in both Denmark and Finland where the differences are not statistically significant between SES strata. While in Norway, only the differences between migrant students of the highest and those of both lowest and middle lower SES strata are significant, in Sweden, only the differences between migrant students of the highest and those of both lowest and middle upper SES are significant.

Although migrant status does not appear to have any notable effect on student environmental citizenship in Denmark and Finland, factorial ANOVA analysis shows that the interaction between SES and migrant status is statistically significant in all four countries (see Table 6.2). Moreover, migrant status makes a significant difference



among students in all socioeconomic strata only in Sweden where migrant students have higher scores of environmental citizenship than non-migrant students in the lowest, middle lower, and the highest SES strata while non-migrant students have higher score than migrant students only in middle upper SES group. Among the other three countries, significant differences between migrant and non-migrant students can be found only in some social strata but not the others. For instance, non-migrant students have higher scores of environmental citizenship than migrant students do only in middle upper and the highest SES strata in Denmark, the highest SES group in Finland, and the lowest SES group in Norway. Nevertheless, in all four countries, there is a significant SES\*migrant status interaction effect (see Table 6.2).

### **6.6.5 *Limited but Persistent Effects of Background Factors on Environmental Citizenship***

Using factorial ANOVA analysis, we estimated the effect sizes of all student background factors together with their interactions (i.e., gender\*migrant status, gender\*socioeconomic status, migrant status\*socioeconomic status, gender\*socioeconomic status\*migrant status) on the composite score of student environmental citizenship. As shown in Table 6.2, all background variables taken together explain rather limited amount of variance in all four countries, i.e., 5.4% in Denmark, 15% in Finland, 6.2% in Norway, and 8.9% in Sweden. However, SES and gender have stronger effects than any other variables in all countries.

## **6.7 Discussion and Conclusion**

Our analysis shows that there are both similarities and variations in elements of student environmental citizenship among the Nordic countries and in comparison with their European and international peers. First, Nordic students stand out as the concerned environmental citizens when most of them consider pollution and climate change as the two biggest threats to the world's future while their European and international peers' biggest concerns are first pollution and second terrorism. Nordic students are less engaged in environmental activities at school and in environmental organizations. Moreover, they are lower in their endorsement of the relevant most important values and are less certain in their willingness of future participation in environmental efforts, than their European and international peers. Among Nordic students as well as their international peers, the discrepancies between concerns and understanding on the one hand and engagement, values, and intended participation of environmental citizenship on the other hand might change after the student climate strike movement, inspired by Swedish teenager Greta Thunberg who incidentally, was within the target student population participated in ICCS 2016 study. As the

movement of School Strike for the Climate had generated opportunities to exercise active environmental citizenship across school, local, national, and international levels. Future research may revisit this topic and examine the effectiveness of youth activism in closing the gap between values, concerns, and understanding of environmental crisis and engagement, and intended participation in tackling environmental issues.

Second, student environmental citizenship is socially differentiated in all Nordic countries as it differs significantly between students from different SES strata and genders. In all countries, students from the highest SES group have significantly higher average scores of environmental citizenship than those from the lowest and middle lower SES strata. The students from the highest SES strata in Finland and Norway have the same score of environmental citizenship as those from middle upper SES group in Sweden. In all four countries, girls have significantly higher scores than boys regardless of their migrant status. The interaction between SES and gender is significant in all four countries and girls have higher scores of environmental citizenship regardless of their SES strata. SES appears to have more effect for girls than for boys in the Nordic countries except in Norway where SES has more effect for boys than for girls. However, in all four countries, for the non-migrant students, the average scores of environmental citizenship increase along with the increase of SES strata but it is not the same case for migrant students. For the migrant students, SES strata appear to have little to do with student environmental citizenship in both Denmark and Finland where there is no remarkable difference between SES strata. Although not all differences of student environmental citizenship by migrant status are statistically significant among the Nordic countries, there is some significant influence of migrant status interaction with SES and genders.

However, the present analysis provided some evidence as to the research question: "Are there signs of socioeconomic inequalities in youth environmental citizenship in Nordic countries?" First, there is a clear sign of socioeconomic inequality of youth environmental citizenship in all four countries in that students from higher SES strata have higher average score of environmental citizenship than those from lower SES strata. Second, socioeconomic inequality of environmental citizenship is larger for girls than for boys in all Nordic countries except in Norway, where the opposite is true. Third, whereas migrant status alone has little effect on student environmental citizenship, socioeconomic inequality is larger for non-migrant students than for migrant students while the gender effect in favour of girls is larger for non-migrant students than for migrant students as well.

In this study, the results and hypothesis concerning the relationship of SES and student environmental citizenship can be linked to the theories of socialization process, economic capital, and cultural capital on education achievement. In the process of socialization, the main components of the SES used are in fact cultural capital (i.e., parents' educational attainment, parents' occupational status, and numbers of books at home) as embodied disposition, tendencies, and social group influences. Those from higher SES strata tend to have more economic capital and cultural capital transfer to the next generation. While not all types of cultural

capital are transferable or transmissible, namely embodied disposition and tendencies, those from higher SES strata are more capable of providing the time, resources, and social environment to cultivate certain cultural capital in the next generation. Hence, students from higher SES strata are more prepared to deploy cultural capital (e.g., disposition, language skills, and social network) for building the components of environmental citizenship with appropriate disposition, skills, pro-environmental understanding, and behaviours.

As a final note, we must admit that our conclusion is constrained by the data limitations. Although the quality and representative nature of the ICCS 2016 data are of high standard internationally, it is important to note that the survey variables considered here are based on self-reports as measures of environmental citizenship. Environmental citizenship is presently an omnipresent subject around the world accompanied by the current highly mobilized youth consciousness of environmental crisis but research of this concept is rather fragmented geographically and across different scientific disciplines at different analytical levels. We are aware that a number of studies have explored concepts and measures relevant to environmental education, e.g., teachers' understanding of sustainable development and student attitudes and consciousness towards the environment, school education and student learning for environmental citizenship, and a collective effort in conceptualization of environmental citizenship (Hadjichambis et al. 2020). The current state-of-art in research, however, lacks a comprehensive measurement that is able to assess and compare youth environmental citizenship across systems and national borders. We therefore encourage future research and in particular international studies such as ICCS 2022 to develop a comprehensive measurement of student environmental citizenship.

## Appendix

See Tables 6.3 and 6.4

**Table 6.3** Descriptions of question items measuring student environmental citizenship

Student survey questions	Recorded response alternative	Denmark	Finland	Norway	Sweden	Nordic	Europe	International
Have you ever been involved in environmental organizations or groups (IS3G15b)	2 + 3 = Yes, have been	11.1 (0.7)	6.2 (0.5)	11.4 (0.5)	8.3 (0.6)	9.3 (0.3)	25.1 (0.3)	28.1 (0.2)
	1 = Never	88.9 (0.7)	93.8 (0.5)	88.6 (0.5)	91.7 (0.6)	90.7 (0.3)	74.9 (0.3)	71.9 (0.2)
Have you ever been participating in an activity to make the school more environmentally friendly (IS3G16f)	2 + 3 = Yes, have done	36.9 (1.2)	32.8 (1.1)	40.4 (1.1)	35.8 (0.9)	36.5 (0.5)	43.5 (0.4)	49 (0.3)
	1 = Never	63.1 (1.2)	67.2 (1.1)	59.6 (1.1)	64.2 (0.9)	63.5 (0.5)	56.5 (0.4)	51 (0.3)
A school, to what extent have you learnt how to protect the environment (IS3G18c)	4 = A lot	22.2 (1.1)	35.3 (1.1)	28.9 (0.9)	45.5 (1.3)	33 (0.6)	41.2 (0.4)	46.1 (0.3)
	3 = To some extent	39.2 (0.8)	50 (1.0)	40.5 (0.8)	38.4 (0.9)	42 (0.4)	37.9 (0.3)	34.7 (0.2)
	2 = A little	31.7 (1.0)	12.8 (0.7)	25.7 (0.9)	13.3 (0.8)	20.9 (0.4)	16.5 (0.2)	15.2 (0.2)
	1 = Not at all	6.9 (0.5)	1.9 (0.3)	4.9 (0.3)	2.8 (0.5)	4.1 (0.2)	4.4 (0.2)	3.9 (0.1)
How important for a good adult citizen to participate in protecting the environment (IS3G23j)	4 = Very important	21.6 (0.8)	34 (0.9)	39.6 (0.8)	38.3 (1.2)	33.4 (0.5)	38.2 (0.3)	44.1 (0.2)
	3 = Quite important	50.9 (0.8)	48.5 (0.9)	46.2 (0.7)	45.1 (1.1)	47.7 (0.4)	43.8 (0.3)	41.3 (0.2)
	2 = Not very important	23.8 (0.8)	15 (0.7)	12.1 (0.6)	13.8 (0.7)	16.2 (0.3)	15.1 (0.2)	12.1 (0.1)
	1 = Not important at all	3.7 (0.3)	2.5 (0.3)	2.1 (0.2)	2.7 (0.3)	2.7 (0.1)	2.9 (0.1)	2.5 (0.1)
How important for a good adult citizen make personal effort to protect the environment (IS3G23n)	4 = Very important	31 (0.9)	44.1 (1.1)	39.8 (0.8)	45.6 (1.1)	40.1 (0.5)	43.1 (0.3)	48.7 (0.2)
	3 = Quite important	53.6 (0.8)	45.8 (0.9)	47.3 (0.8)	42.4 (1.2)	47.3 (0.5)	43.9 (0.3)	40.7 (0.2)
	2 = Not very important	13.7 (0.7)	8.6 (0.6)	11 (0.5)	9.6 (0.7)	10.8 (0.3)	10.9 (0.2)	8.8 (0.1)
	1 = Not important at all	1.7 (0.3)	1.4 (0.2)	1.8 (0.2)	2.4 (0.4)	1.9 (0.1)	2.1 (0.1)	1.9 (0.1)

(continued)

**Table 6.3** (continued)

Student survey questions	Recorded response alternative	Denmark	Finland	Norway	Sweden	Nordic	Europe	International
Biggest threat to the world future is pollution (IS3G28a)	4 = To a large extent	75.2 (0.9)	66.4 (1.0)	75.5 (0.7)	79.5 (0.8)	74.2 (0.4)	73.6 (0.3)	75.3 (0.2)
	3 = To a moderate extent	20.4 (0.8)	29.8 (1.0)	19.6 (0.6)	15.8 (0.7)	21.4 (0.4)	21.5 (0.3)	20 (0.2)
	2 = To a small extent	3.5 (0.2)	3.1 (0.3)	3.9 (0.3)	3.2 (0.3)	3.4 (0.2)	3.7 (0.1)	3.5 (0.1)
	1 = Not at all	0.8 (0.2)	0.7 (0.2)	1 (0.1)	1.5 (0.3)	1 (0.1)	1.2 (0.1)	1.2 (0.0)
Biggest threat to the world future is climate change (IS3G28i)	4 = To a large extent	63.7 (1.2)	62.1 (1.1)	66 (0.8)	68.4 (0.9)	65.1 (0.5)	55.6 (0.3)	56.8 (0.2)
	3 = To a moderate extent	27.2 (0.9)	28.1 (0.9)	25.4 (0.6)	23.9 (0.7)	26.2 (0.4)	29.6 (0.3)	28.4 (0.2)
	2 = To a small extent	7.7 (0.5)	8.2 (0.6)	7.1 (0.5)	6 (0.5)	7.2 (0.3)	11.9 (0.2)	11.9 (0.1)
	1 = Not at all	1.4 (0.2)	1.6 (0.3)	1.4 (0.2)	1.7 (0.3)	1.5 (0.1)	2.9 (0.1)	2.8 (0.1)
When becoming adult, will you make personal efforts to protect the environment (IS3G3 1j)	4 = I would certainly do	24.1 (1.0)	28.1 (1.1)	27.3 (0.8)	28.6 (1.2)	27 (0.5)	29.6 (0.3)	38 (0.2)
	3 = I would probably do	52.7 (0.8)	49.5 (1.0)	43.7 (0.6)	43.3 (0.9)	47.3 (0.4)	45 (0.3)	41.4 (0.2)
	2 = I would probably <u>not</u> do	19 (0.6)	18.1 (0.8)	20.8 (0.6)	21.5 (0.9)	19.9 (0.4)	19.2 (0.2)	15.3 (0.2)
	1 = I would certainly <u>not</u> do	4.2 (0.4)	4.2 (0.4)	8.2 (0.85)	6.6 (0.6)	5.8 (0.2)	6.1 (0.2)	5.3 (0.1)

Note Calculations presented in this table are facilitated by IDB Analyzer applying student weight

**Table 6.4** Descriptive means of student environmental citizenship of ANOVA analyses (Standard error)

	Denmark	Finland	Norway	Sweden	
Socioeconomic status	Lowest SES quantile	21.0 (0.1)	21.7 (0.1)	21.6 (0.1)	21.8 (0.1)
	Middle lower SES quantile	21.3(0.1)	22.0 (0.1)	22.2 (0.1)	22.4 (0.1)
	Middle upper SES quantile	22.1 (0.1)	22.5 (0.1)	22.5 (0.1)	23.0 (0.1)
	Highest SES quantile	22.3 (0.1)	23.1(0.1)	23.1 (0.1)	23.5 (0.2)
	Total national average <sup>a</sup>	21.7 (0.1)	22.3 (0.1)	22.3 (0.1)	22.7 (0.1)
Non-migrant background	Lowest SES quantile	21.0 (0.1)	21.7 (0.1)	21.6 (0.1)	21.5 (0.2)
	Middle lower SES quantile	21.3 (0.1)	22.0 (0.1)	22.2 (0.1)	22.4 (0.2)
	Middle upper SES quantile	22.1 (0.1)	22.5 (0.1)	22.5 (0.1)	23.1 (0.1)
	Highest SES quantile	22.3 (0.1)	23.1 (0.1)	23.1 (0.1)	23.4 (0.2)
	Boys	21.2 (0.1)	21.3 (0.1)	21.8 (0.1)	22.1 (0.1)
Migrant background	Girls	22.1 (0.1)	23.5 (0.1)	22.9 (0.1)	23.3 (0.1)
	Total non-migrant	21.7 (0.1)	22.3 (0.1)	22.4 (0.1)	22.7 (0.1)
	Lowest SES quantile	21.1 (0.2)	21.9 (0.7)	22.0 (0.3)	22.5 (0.2)
	Middle lower SES quantile	21.7 (0.5)	22.0 (0.7)	22.3 (0.2)	22.8 (0.3)
	Middle upper SES quantile	21.6 (0.4)	22.8 (0.6)	22.6 (0.4)	22.4 (0.4)
Boys	Highest SES quantile	22.0 (0.5)	22.4 (0.7)	23.2 (0.3)	23.6 (0.5)
	Girls	20.9 (0.2)	21.7 (0.6)	21.9 (0.2)	22.0 (0.2)
	Total migrant	21.7 (0.2)	22.5 (0.4)	22.7 (0.2)	23.2 (0.2)
	Lowest SES quantile	21.3 (0.2)	22.1 (0.4)	22.3 (0.2)	22.6 (0.2)
	Boys	20.6 (0.1)	20.9 (0.2)	21.1 (0.2)	21.3 (0.2)

(continued)

Table 6.4 (continued)

	Denmark	Finland	Norway	Sweden
Middle lower SES quantile	20.8 (0.2)	21.0 (0.2)	21.6 (0.1)	21.8 (0.2)
Middle upper SES quantile	21.6 (0.1)	21.4 (0.2)	22.0 (0.2)	22.2 (0.2)
Highest SES quantile	21.9 (0.2)	22.0 (0.2)	22.5 (0.1)	22.9 (0.2)
Non-migrant	21.2 (0.1)	21.3 (0.1)	21.8 (0.1)	22.1 (0.1)
Migrant	20.9 (0.2)	21.7 (0.6)	21.9 (0.2)	22.0 (0.2)
Total boys	21.2 (0.1)	21.3 (0.1)	21.8 (0.1)	22.0 (0.1)
Lowest SES quantile	21.3 (0.1)	22.7 (0.2)	22.2 (0.1)	22.3 (0.2)
Middle lower SES quantile	21.9 (0.1)	23.1 (0.2)	22.8 (0.1)	23.0 (0.1)
Middle upper SES quantile	22.5 (0.1)	23.8 (0.1)	23.0 (0.1)	23.8 (0.2)
Highest SES quantile	22.7 (0.2)	24.2 (0.1)	23.5 (0.1)	24.1 (0.2)
Non-migrant	22.1 (0.1)	23.5 (0.1)	22.9 (0.1)	23.3 (0.1)
Migrant	21.7 (0.2)	22.5 (0.4)	22.7 (0.2)	23.2 (0.2)
Total girls	22.1 (0.1)	23.4 (0.1)	22.9 (0.1)	23.3 (0.1)

Notes: Calculations presented in this table are facilitated by IDB Analyzer applying student weight; \* all differences between the countries are significant except the one between Finland and Norway

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**Lihong Huang** is a research professor in youth research with extensive research experience in school education and survey studies. She was the national research coordinator of the Norwegian IEA International Civic and Citizenship Education Study (ICCS) (2016) with strong expertise in research methodology and cross-country quantitative comparative analyses. She currently leads a research project on democratic citizenship education in the Norwegian school system (DEMOCIT) funded by the Research Council of Norway.

**Saiki Lucy Cheah** is a researcher of Education for Sustainable Development (ESD) and facilitator of the Community of Philosophical Inquiry (CPI). She holds a PhD in Political Theory from LUISS Guido Carli University in Italy, M.A in International education from Stockholm University in Sweden and EdM Philosophy & Education degree from Teachers College, Columbia University in USA. She is currently a visiting scholar at Helsinki University.

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