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Gender, teaching style, classroom composition and alienation from learning: an exploratory study

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ABSTRACT

Background: Whilst much interest is focused on gender, and classroom-level influences such as and classroom composition and teaching style on achievement, attitudinal outcomes have not received the same attention. This paper focuses on alienation from learning as one sub-dimension of school alienation. School alienation is a relevant issue for all those engaged in supporting students to thrive and have positive outcomes, as it is related to learning and social behaviour, and eventually achievement.

Purpose: This explorative study considered how classroom gender composition and perceived teaching style affected the development of alienation from learning in primary and secondary schools.

Methods: A multi-level analysis, based on quantitative longitudinal data gathered in Luxembourg, was undertaken. The database included information gathered during three consecutive waves (2016–2018) from 338 primary school students and 376 secondary school students.

Findings: Our results indicate that the gender gap in alienation from learning was more pronounced in primary school. A student-centred supportive teaching style (classroom level) decreased alienation from learning in primary school for boys – closing the gender gap; that is to say, it did change the difference in alienation between girls and boys. In secondary school, only individual-level perceived teaching style was associated with alienation if teaching style was simultaneously considered on both individual and classroom level. A high proportion of male students in the classroom seemed to go along with a higher alienation among all students in secondary school.

Conclusion: This exploratory study indicates that teaching style may be a crucial factor for the attitudes towards school of all students, suggesting that employing student-centred and supportive styles could help to prevent school alienation.

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School alienation; teaching style; classroom composition; gender; attitudes towards school; longitudinal analysis

Introduction

Providing all students with a motivating, comfortable and equitable school environment is a matter of inclusion. Gender differences in attitudes towards schooling have been

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identified as one of the key causes of the gender gap in educational achievement (e.g. Spinath, Eckart, and Steinmayer 2014; Hadjar, Backes, and Gysin 2015). Research suggests that more negative attitudes towards school in male students (Hascher and Hagenauer 2010) can translate into behaviours such as greater school deviance, or what is sometimes referred to as 'laddish behaviour' (in terms of dominant and disruptive masculine behavioural patterns; Francis 2000) and eventually lead to decreased school achievement. The study reported in this paper focuses on alienation from learning as one aspect of the concept of school alienation (Hascher and Hadjar 2018). This attitudinal aspect of schooling is both an outcome of everyday experiences in school and an important prerequisite for learning and wellbeing. It may also serve as an indicator for a student's integration into schooling.

Some individual factors in school alienation, such as social background and gender – as well as a teaching style that is not perceived as supportive by the students, and negative peer attitudes towards school – have already been identified (Hascher and Hagenauer 2010; Hadjar, Backes, and Gysin 2015). However, there are several remaining research questions to be addressed. School and classroom contexts have, thus far, received limited attention, although classroom-level factors appear to have profound effects on achievement and non-achievement outcomes (Belfi et al. 2012). Few studies have examined how classroom context, and gender composition in particular, affects a student's wellbeing, health, life satisfaction, student academic attitudes, sense of academic futility, or ethnic prejudice (Demanet et al. 2013; Lavy and Schlosser 2011; Müller and Zurbriggen 2016; Van Houtte and Vantieghem 2020). The same applies to teaching styles as another classroom-level factor. The manner in which teaching is *perceived* by students constitutes an important mechanism, because what happens in the classroom depends as much on the students as on the teachers (Hattie 2009). Finally, longitudinal studies of the development of these attitudinal factors appear to be rare.

Consequently, the exploratory study of gendered attitudes towards school reported in our paper addressed two classroom-level factors: classroom gender composition and teaching style. As part of a larger, international mixed-method project on school alienation, its causes and consequences (School Alienation in Switzerland and Luxembourg; SASAL), the research was based on quantitative longitudinal data gathered in Luxembourg from primary and secondary school students during three consecutive waves (2016–2018). Tapping into both composition and instruction (teaching style), our study included elements related to the debate on the mechanisms behind the (weak) relation between school and classroom structures and learning (Dreeben and Barr 1988). Classroom gender composition was defined as the proportion of male and female students in the classroom and this definition was used in the analysis of the primary and secondary school student samples in the study. However, as we acknowledge in the Discussion below, it is important to recognise as a limitation that the use of binary gender categories may obscure further nuanced results, as gender diversity may potentially show systematic linkages to alienation, which is clearly a much-needed focus for future research. With regard to teaching style, we were chiefly concerned with the role of a student-centred supporting teaching style that is characterised by teachers who guide their students through learning, provide support and show interest in their students. This teaching style is also called 'authoritative' (Baker et al. 2009, 374), but in this paper we will use the term *student-centred supporting teaching style* in order to avoid

confusion with authoritarian styles (i.e. the opposite). A student-centred supporting teaching style can be described as an inclusive teaching style, as this combination of responsiveness and demandingness includes a sensitivity towards diversity and specific needs (Scott and Dinham 2005), and the style benefits the achievement of different student groups (Dever and Karabenick 2011).

Overall, our research interest focused on the investigation of how school alienation develops in the course of primary and secondary schooling. We wanted to explore whether there was a difference apparent between male and female students, and how this might be affected by gender classroom composition and teaching style. Conceptualising classrooms as socialisation contexts (Baumert, Stanat, and Watermann 2006), it seems plausible that a large number of male students in the classroom would further increase attitudes of school alienation among male and female students. A student-centred supportive teaching style may – according to previous findings (Hadjar, Backes, and Gysin 2015) – prevent the development of school alienation. The data analysed in our research originates from a three-wave longitudinal study of primary and secondary school students in Luxembourg (2016–2018) who had been approached annually between Year 4 and 6 (primary school) and respectively Year 7 and 9 (secondary school). The schooling system in Luxembourg is characterised by a high heterogeneity of the school student population regarding social and ethnic diversity, but relative homogeneity regarding the composition of different classrooms. The secondary schooling system is externally differentiated (highly stratified), with school students being oriented towards (in fact being 'assigned to' at the time the current study took place) one of several secondary school tracks with distinct aspiration levels that determine educational careers to a large extent (Backes and Hadjar 2017). Findings may be of interest from an international perspective, as differences between schools and between classrooms are global issues that also affect less externally–differentiated education systems such as the US systems (e.g. Coleman et al. 1966; Johnson, Crosnoe, and Elder 2001; Fiel 2015). Before presenting our methodology and findings in more detail, though, we firstly seek to situate our study in relation to literature relevant to gender and alienation, and then explain the context of the education system in Luxembourg.

Background

Gender and the development of alienation from learning in school

Gendered attitudes and values towards school and learning seem to be one element in the explanation of gender differences in educational success (Hadjar et al. 2014). If students do not value schooling and learning, they may exhibit anti-school behaviour rather than behavioural patterns that are positively linked to educational success, such as participation and learning behaviour. Via these behavioural patterns, the attitudes of boys and girls impact their achievement and educational success (Cameron and David Pierce 1994) and could potentially lead to early school leaving (Vallerand, Fortier, and Guay 1997).

As indicated above, alienation from learning is a sub-dimension of the multi-domain concept of school alienation, defined as a 'set of negative attitudes towards social and academic domains of schooling' (Hascher and Hadjar 2018, 179). School alienation

resembles the opposite of what Fredricks, Blumenfeld, and Paris (2004, 60) call 'emotional engagement' and use of the term 'alienation' reflects the finding that students become gradually more distant towards school, particularly during secondary schooling. Another feature of the school alienation concept is that – unlike other concepts such as disengagement (Fredricks, Blumenfeld, and Paris 2004) – attitudes and behaviour are clearly separated conceptually. Alienation refers to attitudes, and behavioural patterns such as learning or anti-social/deviant behaviour are conceptualised as external outcomes, and not as sub-dimensions within the alienation concept. This separation is similar to the distinction between 'attachment' and 'engagement' (Johnson, Crosnoe, and Elder 2001, 319). School alienation is closely related to attachment in terms of what students perceive or feel, while engagement relates to behavioural outcomes.

School alienation increases over the educational career of students. Hascher and Hagenauer (2010) suggest a developing lack of commitment and bonding to the preschooling institution as an early form that also determines the later development of school alienation. Their review of German and English research literature (including, e.g. Anderman and Maehr 1994) identifies lower secondary schooling as the period with the highest risk of students becoming alienated. This increase in school alienation is linked to changing teaching styles and higher learning expectations by the teachers, at times of more frequent examinations. The increasing importance of educational success and learning activities may cause conflicts between leisure activities and academic tasks, which may also lead to higher alienation from school. On the other hand, an increase in school alienation can also be rooted in the adolescent alienation involved in the more critical attitude of students towards adults (e.g. teachers and parents), and towards hierarchical institutions such as the school or families (Brown, Higgins, and Paulsen 2003; Hascher and Hadjar 2018). Longitudinal studies confirm the peak of school alienation in early adolescence and in lower secondary schooling (Hascher and Hagenauer 2010).

Several cross-sectional surveys have revealed that boys are more alienated from school than girls (Trusty and Dooley-Dickey 1993; Hascher and Hagenauer 2010; Hadjar, Backes, and Gysin 2015). Conceptual mechanisms that suggest reasons for this include the Stage-Environment Fit Theory (Eccles and Midgley 1989). According to this theory, the gender difference in school alienation may be caused by the mechanism wherein the needs of girls (who have been socialised during earlier processes) seem to be better fulfilled by the school, and who can adapt much better to the expectations of the school (Hadjar, Backes, and Gysin 2015). From another perspective, Cohen's theory of subculture (1955) would suggest that school alienation appears to be a reaction by boys who develop a counter-school culture. This idea is also at the centre of the ethnographic research of Willis (1977). School alienation would then be an expression of resistance to school and opposition to the authoritarian and middle-class cultures of schools, which relate to the experiences and behavioural demands that boys perceive from school, their family and their peer group.

The idea of gender-specific adolescent cultures is also central to the conceptual considerations of Steinberg, Brown, and Dornbusch (1997), who connect what students think about school (attitudes towards school) and behaviour directed towards educational success. Legewie and DiPrete (2012) refer to this and other ethnographic studies when concluding that engagement in school is often devalued as feminine and unmasculine by many boys. Male students tend to show a rather distant attitude towards

school and gain peer approval by demonstrating minimal effort and a negative attitude towards studying, while female students take school more seriously and tend to work harder. A key concept in explaining gender differences in achievement centres on the traditional image of the male identity (e.g. Skelton 1997; Francis 2000; Hadjar et al. 2014). 'Traditional' masculinity, and what is sometimes referred to as 'laddish' attitude, as core characteristics of this traditional identity, appear to be anti-academic and to devalue hard work, submission, conformity, cooperation and finally school achievement (Frosh, Phoenix, and Pattman 2002; Willis 1977). As this traditional masculinity and related attitudes contrast with school culture, this leads to greater alienation from school for those male students who internalised such 'laddish' attitudes in the socialisation processes related to the social and cultural background of their family and their peer group. The lower alienation from school among female students could also mirror the higher educational aspirations of girls, which is highlighted as one cause behind girls outperforming boys in school (Fortin, Oreopoulos, and Phipps 2015; Marcenaro-Gutierrez, Lopez-Agudo, and Ropero-Garcia 2017). Breen et al. (2010) also emphasised the increasing educational motivation of women vis-à-vis better workforce participation opportunities as a major driver behind the higher educational participation of female students in the academic upper-secondary school.

The specific importance of languages in the Luxembourgish schooling system, with Luxembourgish, German and French being languages of instruction (sequentially and in parallel), over the successive educational stages could be an additional source of school alienation, as male students tend to be less interested in language subjects and also show lower competences in language-arts subjects (Hadjar, Backes, and Gysin 2015). This may particularly apply to secondary school during which French becomes the language of instruction in certain tracks.

From these conceptual considerations, we derived the following individual-level hypotheses that are analysed in the empirical section: Male students are more alienated from learning than female students (Hypothesis 1); Alienation from learning increases over time (Hypothesis 2); Alienation increases more strongly among male students than among female students (Hypothesis 3). All hypotheses given here and further below are assumed for developments during both primary schooling (Years 4–6; student ages 9–11 in the case of regular trajectories) and during secondary schooling (Years 7–9; student ages 12–14 in the case of regular trajectories).

Classroom context and alienation from learning

When analysing learning in school from a multilevel perspective, contextual factors and compositional factors appear to be of interest (Rathmann, Herke, and Richter 2020), with classroom level factors being more relevant to students than the school level, as this is the more proximal environment for interactions and comparisons. Our study dealt with the relationship between classroom gender composition in terms of an aggregated compositional factor, and perceived teaching style (classroom level) on a student's individual alienation from learning as a reflective aggregation factor (i.e. aggregation of individual perceptions of classroom-level factors; Müller and Zurbriggen 2016). In the paragraphs below, we provide conceptual starting points and an overview of previous research into

classroom gender composition and *teaching styles* relating to other (in some cases similar) outcome variables.

Classroom gender composition

Several composition researchers, such as Demanet et al. (2013), adhere to the reference group theory as a general conceptual framework helping to understand the connection between classroom gender composition and outcomes such as student attitudes, behaviour and achievement. The idea of reference groups in terms of significant others that shape the attitudes and behaviours of individuals was systematised by Merton and Kitt (1950), based on previous conceptual considerations. Individuals both identify with (normative reference group; Kelley 1952) and compare themselves with reference groups (comparative reference group; Kelley 1952). While they adopt the values and attitudes they perceive as being dominant among the majority of the members of their reference group, what they perceive as the economic, intellectual, social, and cultural achievements of their reference group become their own goals. Of particular interest for the study of classroom composition is the early work of Wilson (1959), in which it was established that the numerically dominant group within a school 'can determine the overall attitudes at school' (Demanet et al. 2013, 467) and, thus, the values and behaviours in school.

Empirical evidence relating to the outlined conceptual framework is manifold. Demanet et al. (2013) used a multi-level analysis of data gathered in Belgian schools to show that girls have more positive attitudes towards school than boys, and in classrooms with a high proportion of girls, both male and female students show more positive educational attitudes (study attitudes) and less deviant behaviour. They found that boys not only perform better when girls are present, but also that their performance increases with the proportion of girls. Lavy and Schlosser (2011) discovered that the benefits in cognitive outcomes resulting from a higher proportion of girls are particularly high among disadvantaged students, and that these effects are mediated by less classroom disruption, less violent behaviour, and more positive relationships within the classroom. The general impact of classroom gender composition on positive classroom behaviours was identified by Drudy and Chatháin (2002) in their teacher observation study in Irish classrooms. Boys and girls participated more in the classroom when their own gender was in the majority, but the results did not generally reveal the positive outcome of a female majority as indicated in other studies.

The impact of classroom composition on attitudinal outcomes is of particular interest for the present study. Demanet et al. (2013) revealed more positive attitudes towards school in classrooms with a higher percentage of girls, but the study of Van Houtte and Vantieghem (2020) showed a cross-level interaction between gender composition and academic futility – as another concept sharing some similarities with the school alienation concept: the more girls at school, the fewer feelings of academic futility boys show, although boys, on average, often adhere more to academic futility, traditional gender roles and 'laddish' attitudes. Studying life satisfaction, Rathmann, Herke, and Richter (2020) found no relationship between the proportion of female students and life satisfaction.

Legewie and DiPrete (2012) argued that gender identities are co-constructed in the classroom, with boys being portrayed as competitive and dominating, and that peer effects have a crucial role in fostering or inhibiting the development of negative attitudes

towards school and related behaviours, particularly among boys. Their findings suggest that boys' attitudes do depend more strongly on school and classroom environments – as 'school and class environments shape how masculinity is constructed in peer culture and thereby influence boys' orientation toward school' (Legewie and DiPrete 2012, 80) – while the more positive attitudes of girls towards school and learning do not depend on environment to the same extent. The study of Briole (2021) reveals another finding: an increase of the proportion of girls among school peers has a strong effect on girls' behaviour (such as punctuality, compliance with internal rules and participation in school life) and eventually their achievement. Boys, by contrast, did not benefit from a high proportion of girls, but showed even lower performance and lower graduation rates from high school. However, there is no clear evidence on the question whether there exists symmetry or asymmetry in terms of gendered responses on the increase in the proportion of females (or males) in class (Borbely, Norris, and Romiti 2021). As it is well documented that girls tend to be more prone to collaborate and participate in the classroom (Briole 2021; Lindow, Marrett, and Cherry Wilkinson 1985), our tentative assumption is that the gendered peer effects may be slightly different for boys and girls (Anil et al. 2016) with a higher proportion of male students in a classroom affecting male students' negative school attitudes in particular.

Findings from research relating to the co-educational debate would, however, suggest a different argument: as teachers could better adapt their teaching and materials to the preferences and needs of boys and girls in boy-only or girl-only school environments (see literature review of Belfi et al. 2012), such settings would feature better classroom climate, fewer non-academic distractions and fewer disciplinary problems. Boys in a boy-only classroom or in a classroom with a male majority could benefit from these better conditions and demonstrate lower school alienation. This view is also contested, however, by findings that could not identify any profound effects from single-sex classes (e.g. Hattie 2002). Our hypotheses will thus relate to the first set of arguments based on the reference group theory outlined above. Our study focus is the proportion of girls at school as a continuous measure aiming at more fine-grained analyses of gender compositional effects (Demanet et al. 2013; Lavy and Schlosser 2011; Schneeweis and Zweimüller 2012). We therefore hypothesised: The higher the percentage of male students in a classroom, the more school alienation (Hypothesis 4); The higher the percentage of male students in a classroom, the greater the gender gap in alienation from learning (Hypothesis 5).

Teaching styles

Another important issue at the classroom level is teaching style, as one dimension of classroom climate (Evans et al. 2009). It is a concept that includes a teacher's communication and instructional style, classroom management and student-teacher relationships. School and classroom climate have a significant impact on student wellbeing (Sellström and Bremberg 2006) and mental and emotional health (Kidger et al. 2012). According to Allodi (2010), social climate does not only have short term, but also long term effects on student achievement, wellbeing and later employment. School climate fulfils a protective function, particularly for vulnerable student groups. In the present study reported in this paper, boys are conceptualised as a vulnerable group who are, on average, more prone to school alienation, despite the fact that gender groups are not homogeneous groups and male students from low SES backgrounds with non-egalitarian

gender role orientations are among the most disadvantaged (Martino 2008; Hadjar, Backes, and Gysin 2015). Teachers play a crucial role in the classroom (Hattie 2009). A lack of teacher engagement and effort regarding their teaching activities and the progress and wellbeing of their students has serious negative consequences, such as school misconduct that disrupts learning processes (Demanet and Van Houtte 2012). Focusing particularly on teaching styles, Baker et al. (2009) found an association between the provision of warmth and a teacher's control (student-centred, authoritative teaching) and the degree to which students liked school (see Rathmann, Herke, and Richter 2020). The 'combination of sensitivity, caring, high expectations and structure' in terms of an authoritative style (Dinham 2008, 64) appears to have a positive impact on child development. In a study of Dever and Karabenick (2011), authoritative teaching – that is to say, a student-centred supportive style – benefitted the achievement of all student groups, while it increased the interest of some student groups. A Swiss study showed that a teacher's authoritative (i.e. student-centred) teaching style is positively associated with attitudes towards school, and, via these attitudes, with the absence of deviant behaviours and educational achievement, especially among boys (Hadjar, Backes, and Gysin 2015).

For the purpose of deriving exploratory hypotheses regarding the question of how teachers are more likely to compensate for (gender asymmetric) school alienation effects, Legewie and DiPrete (2012) may, again, provide an important argument. According to their research, boys and their attitudes towards school are more sensitive towards their learning environment. If teachers provide a learning-oriented environment – e.g. by employing a student-centred supportive teaching style – school alienation may be less likely to increase strongly among male students, and thus, the gender gap in alienation may be less pronounced. The results of a study on the interplay between classroom heterogeneity and teaching quality – indicating the importance of a supportive climate for heterogeneous and vulnerable student groups (Decristan et al. 2017) – seem, on the face of it, to lend support to this argument: according to our abstracted conceptualisation, boys are a vulnerable group in terms of school alienation. However, there is also evidence that does not support this assumption: Wentzel (2002) found that the relationship between teaching dimensions (such as control, maturity demands, democratic communication and nurturance) and student outcomes were the same for boys and girls. Further, Fassinger (1995) concluded from a study in American higher education institutions that females respond to the emotional climate of a class more than males.

As, in our conceptualisation, boys are understood to be a vulnerable group regarding school alienation, we thus hypothesise a positive effect of teaching styles, particularly for boys: The more a student-centred and supportive teaching style is perceived in a classroom, the lower the school alienation (Hypothesis 6); The more student-centred and supportive the teaching style, the lower the gender gap in alienation from learning (Hypothesis 7).

Study contextualisation: the Luxembourgish education system

The Luxembourgish education system is characterised by a high vocational specificity and a high degree of stratification/external differentiation. Compulsory schooling starts at the age of four, with two pre-school years (Cycle 1), and this is followed by six years of primary

schooling (Cycle 2–4). The primary schooling system is comprehensive, but spatial segregation leads to a homogeneous student composition in certain areas (e.g. a predominance of students with immigrant backgrounds, students from low SES backgrounds, etc.). After Year 6 in primary school, students are oriented towards one of three main tracks for secondary education starting from Year 7: an academic secondary track (enseignement secondaire classique, ES) preparing for a later transition to university; technical secondary tracks (enseignement secondaire technique, EST), since the latest reform called enseignement secondaire générale, ESG relates to different ability levels (only the highest technical track allowing for direct access to universities) and a vocational track (préparatoire), which mainly prepares for the later transition to vocational training or a direct transition to the labour market. Decisions made by a commission about track orientation after primary school have been binding, but a recent reform gives parents limited opportunity to participate. The landscape of Luxembourgish secondary schools includes both schools which combine academic, technical and vocational tracks, and schools that are specialised for either the technical track or the academic track. All in all, the stratified school system of Luxembourg can be characterised as a separation model that follows a principle of homogenisation in dealing with heterogeneous students (Backes and Hadjar 2017). A secondary control for the secondary school track seems to be meaningful for the stratified education system of Luxembourg, as stratification/external differentiation (Hadjar and Gross 2016; Schaltz and Klapproth 2014) as a characteristic of the education system appears to be of major importance, as it affects individual learning processes and educational decisions. This relates to a Swiss study by Pregaldini, Backes-Gellner, and Eisenkopf (2018) showing that gender composition effects on achievement also depend on school track (in this study: different self-selected vocational specialisations). The results indicate a positive effect of a higher proportion of girls on the achievements of girls and boys in language tracks.

Luxembourg has traditionally represented a 'strong male breadwinner model' (Lewis and Ostner 1994, 19) and has been developing towards a 'moderate male breadwinner model' (Lewis and Ostner 1994, 25; see also Pascall and Lewis 2004 on gender regimes). Luxembourg has exhibited a fairly high participation rate in child-care institutions outside the family at the age of three, which is linked to female labour force participation (66.0%; STATEC 2021). The growth rate in female employment in Luxembourg was one of the highest in the EU27 countries during the period 1999–2008 (Valentova 2013). The 2015 Educational Report (MENEJ/SCRIPT and Université du Luxembourg, FLSHASE 2015) reveals profound gender inequalities in the Luxembourgish education system. While, in primary schooling, there are only small gender differences, gender differences appear to be greater at the transition from primary to secondary education and in secondary education. Female students are more often placed in the academic secondary track (31.4% of female Year 7-students attended the academic university-bound track in the school year 2013/14) than male students (26.2%). Male students are overrepresented in the low-aspiration level vocational school track that carries a high risk of early school leaving. While the risk for male students to attended this track in Year 7 was 14.1% in the school year 2013/14, the risk of female students was 9.2%. Male students (48.9%) experienced grade retention more often than female students (43.3%). The higher competencies of girls in languages are reflected in their school marks, but the male advantage in mathematics competencies does not result in their better school marks (MENEJ/SCRIPT

and Université du Luxembourg, FLSHASE 2015, 53–55). Male students' trajectories differ from those of their female counterparts, as they more often experience intra-secondary downwards transitions towards less demanding tracks (Backes and Hadjar 2017).

Purpose

With the research and contextualisation described above in mind, the main research questions we investigated in our study were: How does school alienation develop in the course of primary and secondary schooling, is there a difference between male and female students, and how is this affected by gender classroom composition and teaching style?

Methods

Ethical considerations

With regard to ethical protocols, the entire project went through an ethics approval procedure with the Ethics Review Panel of the University of Luxembourg, meeting all state-of-the-art ethics requirements. Information on the purpose of the study, the understanding that the participants could opt out of the study at any stage, as well as a guarantee of anonymity was provided to the participating students and their parents. We gathered written consent from the parents and oral assent from all students prior to their participation in the research. Confidentiality was assured throughout the research process.

Data and measurements

As mentioned above, the empirical study reported here was based on the Luxembourgish panel data of an international mixed-method project on school alienation, its causes and consequences (SASAL project). The research reported in the current paper centres on a quantitative survey of primary and secondary school students in 17 primary schools and four secondary schools in Luxembourg, based on a cluster sample, as all classrooms in the particular grades/years were surveyed. The school sample was not a random sample, but rather a theoretical sample covering different regions in Luxembourg (North, Centre, South) and different socio-demographic contexts. The database included information gathered during three waves (2016–2018) from 338 primary school students followed from Year 4 to Year 6 (approximate student ages 9–11) and 376 secondary school students followed from Year 7 to Year 9 (approximate student ages 12–14). The primary school student sample consisted of 53.7% male and 46.3% female students, and the secondary school student sample included 57.4% male and 42.6% female students (Wave 1). Alienation from learning was measured as a sub-scale of the three-first-order-factor construct of school alienation, developed and validated in the context of the international project School Alienation in Switzerland and Luxembourg (SASAL). The eight-item-scale of alienation from learning (sample items: 'I don't find pleasure in learning at school', 'What we learn in school is boring') was measured on a four-point Likert scale ranging from '1' for disagreement to '4' for agreement (Morinaj et al. 2017). All scales were developed following an emic approach with the goal of identifying items that could be

Table 1. Descriptive statistics.

	Sample: Primary school students (n=345)			Sample: Secondary school students (n=387)		
	Year 4 (2016)	Year 5 (2017)	Year 6 (2018)	Year 7 (2016)	Year 8 (2017)	Year 9 (2018)
Individual level						
Alienation from learning (Scale)	x = 1.56 SD = .55 Cronbach's Alpha/8 items =.83	x = 1.56 SD = .49 Cronbach's Alpha/8 items =.81	x = 1.63 SD = .53 Cronbach's Alpha/8 items =.85	x = 1.84 SD = .59 Cronbach's Alpha/8 items =.85	x = 2.09 SD = .61 Cronbach's Alpha/8 items =.87	x = 2.22 SD = .62 Cronbach's Alpha/8 items =.88
Classroom level						
Perceived student-centred supportive teaching style (Scale)	x = 3.38 SD = .22 Cronbach's Alpha/7 items =.82	x = 3.43 SD = .22 Cronbach's Alpha/7 items =.81	x = 3.43 SD = .22 Cronbach's Alpha/7 items =.89	x = 3.09 SD = .19 Cronbach's Alpha/7 items =.86	x = 3.03 SD = .20 Cronbach's Alpha/7 items =.85	x = 3.02 SD = .19 Cronbach's Alpha/7 items =.86
Gender composition (percentages male students)	53.3%	53.2%	53.2%	58.2%	58.2%	58.1%
Bivariate correlations (individual level)						
Perceived student-centred supportive teaching style/ Alienation from learning	−.41 ***	−.43 ***	−.48 ***	−.48 ***	−.50 ***	−.51 ***
Male gender/Alienation from learning	.24 ***	.19 ***	.26 ***	−. 04	.04	.10 †

Significance levels: †.10, *.05, **.01, ***.001.
Data source: SASAL – School Alienation in Switzerland and Luxembourg (University of Bern/CH & University of Luxembourg/LU, 2015–2019, Waves 1–3).

used in all sub-samples. The alienation from learning scale performed well in the panel study, among both primary and secondary school students. On average, alienation levels appeared to be low (primary school) to medium (secondary school); however, as the standard deviation of this variable indicates, a number of students show strong alienation from learning (Table 1).

Considering a score at the factor average (2.5) and above as pronounced alienation level, less than ten percent of the primary school students (Year 4: 9%, Year 5: 6%, Year 6: 8%) were severely alienated from learning, and in the secondary school sample, this percentage increased from 17% (Year 7) to 34% (Year 9). Considering simple individual-level correlations between perceived student-centred supportive teaching style and alienation from learning indicated a strong negative association in all groups, that is to say, the more students perceived teachers applying this teaching style, the lower was their alienation. The gender differences in alienation were pronounced in primary school with boys being more strongly alienated from learning than girls, while among the sample of secondary school students, gender differences were much weaker and did not meet the significance threshold of 5%. However, these bivariate analyses do not take into account complex interdependencies and classroom level effects. This is done in the multilevel analyses presented below in the results section.

The main classroom variable is the *proportion of male students in a classroom* (in percentage). As not all students in a classroom participated in all survey waves (as students dropped out and new students came into the classrooms who had not been

involved in the panel survey), classroom composition is based on information for the entire classroom (including the students who were not part of the panel data set). A few schools practiced subject-specific internal differentiation in opening up the classroom structure (e.g. PROCI project), but, in our analysis, 'classroom' relates to the main classroom to which students were assigned, and most often participated in. The *perceived student-centred teaching style* related to the average of individual student responses on the teaching style scale. This was more appropriate than the individual score for our analysis, as the average in a classroom may be a more reliable perception of the teaching style than an individual perception and less biased by individual experiences and attitudes towards particular teachers. The *perceived student-centred teaching style* scale consisted of seven items about teacher instructions and how teachers approach the students. In primary school, this related to the main classroom teacher who was usually the instructor in all main subjects, but in secondary school this should be interpreted as a general perception of the teachers involved in the lessons within a classroom, and thus, to a higher number of different teachers. Sample items included 'Our teacher/most of the teachers care for me' and 'Our teacher/most of the teachers help me if I need aid'. The scale also performed well in all sub-groups (Table 1).

Findings

To evaluate the aforementioned exploratory hypotheses, we ran multivariate multilevel models. The stepwise multivariate random slope models (Level 1: time/year, Level 2: individual development, Level 3: classroom) are depicted in Table 2 (primary schooling) and 3 (secondary schooling). Model 1 and 2 only include time-variant and time-invariant individual level variables and controls. Classroom level variables were added in Model 3, and the complex Model 4 features cross-level interactions regarding the question of whether classroom factors (gender composition, average perceived teaching style) have an impact on gender differences in school alienation. Additionally, Model 5 introduces individually perceived supported teaching style as a control to allow an even more rigid test of our hypothesis on the impact of teaching style at classroom level, as individual student views on teaching style and their views on alienation are presumably related in a causative fashion. Thus, in Model 5, this individual-level link is simultaneously taken into account. The effect of the classroom-level perceived teaching style then relates even more to what teachers do in the classroom rather than to individual student tastes and perceptions.

In primary schooling (Table 2), the gender effect – male students showing higher school alienation than female students – appears to be robust across all models. Alienation from learning increases towards the end of primary school in Year 6 (Models 2–4), whereas the gender effect is not significant when perceived supportive student-centred teaching style is controlled for on the individual level. Students in Year 6 perceive their teachers' teaching styles less student-centred than students in lower grades, which is associated with their school alienation (Model 5). The increase of school alienation in upper primary school grades does not differ significantly between male and female students. While the gender composition of the classroom has no genuine effect at the classroom level, a student-centred supportive teaching style seems to reduce alienation

Table 2. Development of alienation from learning in primary schooling (multilevel mixed-effects linear regression models).

Unstandardised B *(95% confidence intervals)*	Model 1 Gender/wave, individual controls	Model 2 + individual development	Model 3 + classroom variables	Model 4 + cross-level interactions	Model 5 + individual-level Perceived teaching style (control)
Primary schooling					
Classroom level					
Percentage of male students in classroom			.13 (−.16/.42)	.01 (−.41/.43)	.13 (−.26/.53)
Average Perceived supportive student-centred teaching style			**-.42 *** (−.57/-.26)**	−.18 (−.41/.06)	.15 (−.08/.37)
Individual level					
Gender (Ref. female)					
male	**24 *** (.14/.35)**	**.28 *** (.17/.38)**	**.28 *** (.17/.39)**	**.36 *** (.24/.48)**	**.27 *** (.15/.38)**
Year/grade (wave)					
(Ref. Year 4 ; C3.2) Year 5, C4.1	.06 (−.03/.16)	.06 (−.03/.16)	.08 (−.01/.17)	.07 (−.03/.16)	.05 (−.04/.15)
Year 6, C4.2	.09 † (−.00/.18)	**.09 † (−.00/.18)**	**.11 * (.01/.20)**	**.09 * (.00/.19)**	.04 (−.06/.13)
Interaction gender * wave					
(Ref. Year 4 ; C3.2 * male)					
Year 5, C4.1 * male		−.08 (−.21/.05)	−.09 (−.22/.04)	−.08 (−.20/.05)	−.05 (−.18/.08)
Year 6, C4.2 * male		−.00 (−.13/.13)	−.01 (−.14/.12)	.00 (−.13/.13)	.03 (−.10/.16)
Perceived supportive student-centred teaching style					**-.34 *** (−.40/-.28)**
Cross-level interactions					
Male gender *					
Percentage of male students in classroom				.19 (−.38/.77)	.06 (−.47/.60)
Average Perceived supportive student-centred teaching style				**-.43 *** (−.75/-.12)**	**-.37 * (−.65/-.08)**
Random effects					
Classroom level (sd)	.28	.28	.26	.25	.23
Individual level (sd)	.19	.19	.20	.20	.14
Residual (sd)	.37	.37	.37	.37	.36
N	338	338	338	338	338
Wald Chi-Square	56.63	59.24	88.08	96.59	252.39
Constant	1.44 ***	1.43 ***	2.77 ***	2.02 ***	2.07 ***

Significance levels: †.10, *.05, **.01, ***.001. Controlled for immigrant background, social origin (low SES student) on individual level.
Null model: Classroom level (sd) .24, Individual level (sd) .27, Time level (sd) .38.
Data source: SASAL – School Alienation in Switzerland and Luxembourg (University of Bern/CH & University of Luxembourg/LU, 2015–2019, Waves 1–3).

Table 3. Development of alienation from learning in secondary schooling (multilevel mixed-effects linear regression models).

Unstandardised B *(95% confidence intervals)*	Model 1 Gender/wave, individual controls	Model 2 + individual development	Model 3 + classroom variables	Model 4 + cross-level interactions	Model 5 + individual-level Perceived teaching style (control)
Secondary schooling					
Classroom level					
Percentage of male students in classroom			**.25 † (−.04/.53)**	**.45 * (.04/.88)**	**.49 * (.10/.88)**
Average Perceived supportive student-centred teaching style			**-.31 ** (−.50/.13)**	**-.26 † (−.54/.02)**	.02 (−.25/.29)
Controls					
School track (Ref. academic ES)					
Technical secondary track EST/Proci			**-.27 *** (−.39/-.14)**	**-.27 *** (−.40/.-15)**	**-.23 *** (−.34/.-12)**
Lower vocational secondary track (Modulaire)			**-.46 *** (−.62/-.29)**	**-.46 *** (−.62/-.29)**	**-.42 *** (−.56/-.27)**
Individual level					
Gender (Ref. female)					
male	−.06 (−.04/.16)	−.03 (−.15/.19)	.02 (−.10/.14)	.01 (−.12/.14)	−.07 (−.18/.05)
Year/grade (wave) (Ref. Year 7)					
Year 8	**.23 *** (.18/.29)**	**.18 *** (.10/.26)**	**.16 *** (.08/.25)**	**.17 *** (.09/.26)**	**.11 ** (.03/.20)**
Year 9	**.37 *** (.31/.42)**	**.27 *** (.18/.36)**	**.25 *** (.17/.34)**	**.27 *** (.17/.35)**	**.19 *** (.11/.28)**
Interaction gender * wave					
(Ref. Year 7 * male) Year 8 * male		**.10 † (−.02/.21)**	.09 (−.02/.20)	.08 (−.04/.20)	.07 (−.04/.18)
Year 9 * male		**.17 ** (.06/.29)**	**.16 ** (.05/.28)**	**.15 * (.03/.27)**	**.11 † (−.01/.22)**
Perceived supportive student-centred teaching style					**-.43 *** (−.49/-.37)**
Cross-level interactions					
Male gender *					
Percentage of male students in classroom				.32 (−.81/.16)	−.32 (−.72/.13)
Average Perceived supportive student-centred teaching style				−.08 (−.44/.28)	−.15 (−.49/.19)
Random effects					
Classroom level (sd)	.07	.07	.07	.07	.12
Individual level (sd)	.46	.46	.42	.42	.34
Residual (sd)	.39	.39	.39	.39	.36
N	376	376	376	376	376
Wald Chi-Square	168.89	179.46	229.01	231.41	488.59
Constant	1.85 ***	1.90 ***	2.85 ***	2.58 ***	3.11 ***

Significance levels: †.10, *.05, **.01, ***.001. Controlled for immigrant background, social origin (low SES student) on individual level. Null model: Classroom level (sd) .12, Individual level (sd) .44, Time level (sd) .43 Data source: SASAL – School Alienation in Switzerland and Luxembourg (University of Bern/CH & University of Luxembourg/LU, 2015–2019, Waves 1–3).

from schooling as long as cross-level interactions are not taken into account. If this is considered for male and female students separately, introducing cross-level interactions, male students seem to benefit more from such a teaching style, as there is a robust negative cross-level interaction (Models 4 and 5) indicating that when the gender gap in alienation from learning is lower, the classroom scores on perceived student-centred supportive teaching style are higher.

Following an argument derived from Decristan et al. (2017) that supportive teaching styles could be particularly beneficial in heterogeneous or vulnerable environments such as classrooms with a higher percentage of boys, we also did validity checks including the interaction effects of classroom gender composition and teaching style. None of the interaction effects showed a significant impact. We thus did not increase the complexity of this study further by introducing this issue conceptually or empirically.

The results for secondary schooling (Table 3) indicate no general gender effect on alienation from learning, but a profound increase in alienation from learning between Year 7 and 8 and towards Year 9. In the less complex models, there is a significant interaction effect between male gender and the grades/Years 8 and 9, indicating that alienation from learning increases more strongly among male students towards Year 9. This effect vanishes, however, for Year 8 if the cross-level interaction effect between male gender and teaching style is considered. For Year 9, this effect only holds significant on the 10% significance level as soon as perceived supportive teaching style (individual level) is considered as well (Model 5). Presumably, this stronger increase in alienation from learning among boys is explained by the differential response of male and female students to a student-centred supportive teaching style, with male students being more sensitive towards teaching styles. The academic ES track (with a high proportion of high SES students) appears to be more prone to alienation from learning than the (lower) technical tracks. Considering classroom level factors in secondary schooling, a higher percentage of male students in a classroom has an increasing effect on alienation from learning, while the effect of student-centred supportive teaching style (classroom level) on school alienation – as a protective factor – seems to be fully explained by students' individual views on supportive teaching styles (Model 5). In contrast with the results gained from the primary school sample, male students in secondary schooling do not seem to benefit more from a student-centred supportive teaching style (perception at classroom level, see cross-level interactions in Model 4 and 5).

Discussion

The objective of this paper was to analyse the development of alienation from learning in primary and secondary schooling, focusing on the roles of the classroom-level factors of gender composition and perceived teaching style. In general, average alienation from learning was low in primary school with less than ten percent of strongly alienated students and increased only towards a medium level in secondary school, increasing up to one third of the student population in Year 9. As studies indicate that alienation from school is linked to lower classroom participation, deviant behaviour in school and lower educational success (Hadjar, Backes, and Gysin 2015; Morinaj, Marcin, and Hascher 2019), this issue deserves attention. As factors beyond the student-centred individual level

appear to be highly under-researched, our main focus was the classroom factors of classroom gender composition and teaching style.

Considering the results in light of the exploratory hypotheses postulated in the introductory section, the following picture emerges. Hypothesis 1, regarding the gender gap in alienation from learning, only holds for the primary school sample. Male students appear to be more alienated from learning than female students. The results do not indicate a general gender gap in secondary school. The increase in alienation from learning, as postulated in Hypothesis 2, was supported for the period from Wave 2 (Year 5) to Wave 3 (Year 6) in primary school and for the entire period covered by our study in secondary school (Wave 1, Year 7 to Wave 3, Year 9). This may indicate that the increase in school alienation, and more precisely alienation from learning, seems to start around Year 6, with some important examinations regarding the transition from primary to secondary schooling and differently perceived teaching styles, and continues throughout secondary schooling. Hypothesis 3 on the gendered increase in alienation from learning was confirmed for secondary schooling only. While there is no interaction effect between year/wave and gender in primary school, in secondary school alienation from learning increased more strongly between Year 8 and Year 9 among male students than among female students. With regard to the impact of classroom level factors, Hypothesis 4, regarding a positive link between the percentage of male students in the classroom and alienation from learning, only finds support in the secondary school sample. Hypothesis 6 – assuming that the more a student-centred and supportive teaching style is perceived in a classroom, the lower the school alienation – is only backed by our results for primary schooling – although in both primary and secondary school perceived teaching style on the individual level shows a strong effect on alienation. Hypotheses 5 and 7 postulate the way in which the classroom factors in focus impact the gender gap in alienation from learning, i.e. how strongly female and male school students differ in alienation. Again, teaching style matters more than classroom gender composition. While classroom gender composition shows no effect at all (no support for Hypothesis 5), a supportive student-centred teaching style decreases the gender gap in alienation from learning for primary school students in line with Hypothesis 7; that is to say, boys in primary school show a (decreased) alienation level that is closer to that of their female classmates in classroom settings with strong supportive and student-centred teaching styles.

As perceived student-centred and supportive teaching style shows a negative effect on school alienation in secondary schooling, our results resonate with Demanet and Van Houtte (2012) or the general findings of Hattie (2009), in that they suggest that teachers have a crucial function in the classroom and may help prevent school alienation through a student-centred and supportive (authoritative) teaching style, as was expected from the perspective of Baker et al. (2009). As the gap in alienation from learning is smaller in settings that feature a more pronounced student-centred supportive teaching style, boys in primary school may particularly benefit from such a teaching style. This can be interpreted as an indication that boys are more sensitive towards learning environments and teaching styles than girls, as implied by Legewie and DiPrete (2012) and Decristan et al. (2017). The results regarding classroom gender composition are not as clear – perhaps most similar to the mixed arguments and previous findings on how a large number of boys in the classroom would impact

classroom interaction. At least for secondary school, assumptions based on reference group theory (Wilson 1959) were supported by the finding that a higher number of boys in the classroom accompanies a stronger alienation from learning in both boys and girls, and that the male majority group may have functioned as reference (see Demanet et al. 2013). Classroom gender composition, however, showed no differential effects on female and male students. Contributing to the debate launched by Dreeben and Barr (1988), instruction (here: teaching style) rather than student composition seems to be the key factor.

Another counter-intuitive finding was the higher school alienation in the higher-aspiration school track, the general secondary school track ES, where girls and socio-economically advantaged students are over-represented. This may mirror the manifold measures in the Luxembourgish system to increase wellbeing, but to keep achievement pressure low in educational settings with a high proportion of low SES students. Qualitative research indicated that the higher school alienation relates to the higher achievement aspiration, while in the low-achievement track *Modulaire*, the absence of a strong achievement motivation may come with a lower school alienation (Grecu, Hascher, and Hadjar 2019). Another argument could relate to differential degrees of critical thinking: as high SES students come from more highly educated families, and instruction and learning content in academic tracks (ES) foster intelligence and cognitive mobilisation (Guill, Lüdtke, and Köller 2016) as well as political thinking, engagement and discussion (Nieuwelink, Dekker, and ten Dam 2019), students in academic tracks tend to be more critical about their school environment.

Limitations and directions for further research

Our findings have to be interpreted in the light of limitations including the following. The results, particularly those on the linkage between teaching style and alienation, cannot be interpreted in a casual way, although both were measured time-variant, i.e. by school year. The coefficients indicate strong associations between teaching style (students' perception) and alienation, but this could also be driven by a scenario whereby teachers adapt their teaching styles to alienated students or that alienated students perceive teaching styles differently. Our analyses are not based on a randomly selected school sample, as the Luxembourgish educational administration did not allow a random sample to be drawn, to avoid the 'over-fishing' of schools and students when the survey was prepared. The sample selection, attempting to reflect the heterogeneity of schools and regions, as well as presumed different levels of school alienation in the sample, may have led to some bias affecting the gender composition. As the main objective of the present study was to analyse differences between boys and girls, however, and we furthermore controlled for other possible bias (e.g. social background, immigrant background, school track), we accounted for this. This strategy of controlling for certain selection biases is in line with the strategy of Shadish, Clark, and Steiner (2008), which was also been employed by Demanet et al. (2013) in their composition research. We suggest that our findings regarding primary schooling can be generalised, with the scientific caution needed, to many primary schooling systems, as this educational stage involves comprehensive schools in most of the European countries and beyond. Results for the secondary school sample may only be related to highly

stratified education systems, such as the Luxembourgish education system. Future research, including research involving a larger number of schools and classrooms, may be able to consider more school- and classroom-level factors at the same time, in order to examine the mechanisms behind gender inequities in more detail. As noted earlier, the definition of classroom gender composition as the proportion of male and female students in the classroom is a limiting factor that could potentially mask important, nuanced findings. Clearly, research into inequalities at the intersection between gender, covering gender diversity, and other axes of inequality such as social background or immigrant background, and considering the heterogeneity within gender groups on the base of much larger samples, is necessary and may reveal valuable outcomes.

Conclusion

School alienation is a significant issue for all those engaged in efforts to support students' development, as it is related to learning and social behaviour, and eventually achievement. In this paper, we have presented an exploratory study which was focused on alienation from learning as one sub-dimension of school alienation. Overall, our research suggests that while classroom gender composition did not play the expected role in the development of school alienation and gender differences, it was evident that teaching style *did* play a role. A student-centred supportive teaching style may be an important part of school environments that facilitate learning processes for all students, helping to prevent school alienation.

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Data availability

Data relate to the international project School Alienation in Switzerland and Luxembourg (SASAL) and is available on request from the authors.

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