British Journal of Sociology of Education
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713409002

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Online Publication Date: 01 July 2006

To cite this Article Van de gaer, Eva, Pustjens, Heidi, Van Damme, Jan and De Munter, Agnes(2006)'Tracking and the effects of school-related attitudes on the language achievement of boys and girls',British Journal of Sociology of Education,27:3,293 — 309
To link to this Article: DOI: 10.1080/01425690600750478
URL: http://dx.doi.org/10.1080/01425690600750478

British Journal of Sociology of Education
Vol. 27, No. 3, July 2006, pp. 293–309

Tracking and the effects of school-related attitudes on the language achievement of boys and girls

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In this study we examined whether the underachievement of boys in language at the end of secondary education is related to school-related attitudes. Data were drawn from the LOSO project, a longitudinal research project in secondary education. The results showed that there were gender differences in language achievement in favour of girls in the lower tracks, but not in the highest track. The underachievement of boys was associated with boys' less positive relationships with teachers, less positive well-being at school and less positive attitude towards schoolwork. Furthermore, the results showed that—in the lower tracks—boys who were the least attentive in the classroom, the least interested in learning tasks and the least motivated towards learning tasks achieved better than expected. Post-hoc analyses revealed that these are the more intelligent boys. Possible explanations of the demotivation of the more intelligent boys in the lower tracks are discussed.

Introduction

Although recent research has shown that over the past two decades girls are closing the gender gap in mathematics (and to a lesser extent in sciences), there continues to be a fairly large gap in writing skills that boys have not closed (Cole, 1997). Girls achieve better in verbal reading and writing tests, and these differences seem to be universal as they are found in different countries (Kleinfeld, 1999; Sutherland, 1999; Organisation for Economic Co-operation and Development, 2003). Different explanations have been offered to explain the underachievement of boys in languages. These include *biological* explanations such as gender differences in brain structure and hormones that are associated with gender differences in verbal intelligence (Halpern, 1997). *Psychological* explanations focus on gender differences in interest for languages

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ISSN 0142-5692 (print)/ISSN 1465-3346 (online)/06/030293–17

DOI: 10.1080/01425690600750478

and enjoyment of reading (Clark & Trafford, 1995; Murphy & Elwood, 1998), in behaviour (McIntyre & Tong, 1998), in perception of the difficulty and the usefulness of the subject (Eccles *et al.*, 1983) and in expectations (Beyer, 1998). More *sociological*-inspired explanations concentrate on the effects of peer pressure, the lack of male role models at school and the feminization of teaching/schools (Lodge & Pickering, 1996; Jackson, 2002). Finally, *psychometrical* explanations focus on how boys and girls react to different assessment procedures (Gipps & Murphy, 1994).

In this study, we will focus on psycho/sociological explanations of gender differences in language achievement in Flanders (Dutch-speaking part of Belgium). More specifically, we will investigate how the underachievement of boys is shaped by particular masculine identities. Especially in the United Kingdom, a lot of researchers have stressed that dominant ways of expressing masculinities impede boys' progress in schools (Salisbury & Rees, 1999; Jackson, 2003). For many boys, educational effort and achievement is viewed as an activity that is not consistent with their gender role or their masculine identity (Paetcher, 1998; Francis, 1999). Especially, reading is considered by a lot of boys as a feminine activity (Head, 1999). In general, being too interested or too involved in schoolwork is considered not 'cool' (Martino, 1999). However, this does not mean that all boys create their masculinity in this way. Connell (2002) showed that boys construct their masculinities at school in differentiated ways. Also Warrington *et al.* (2000) found that some boys did work hard. These were usually the boys in the high-ability groups. But it is well documented that, by and large, more boys than girls have less positive attitudes towards schooling. Not only in the United Kingdom, but also in the United States, Australia and Belgium, research has shown that girls work harder, are better organized, spend more time at their homework, are less distracted in the classroom and break the school rules less than boys (Whitelaw *et al.*, 2000; Davies & Brember, 2001; Martin, 2003; Engels *et al.*, 2004).

In this study, we will test the association between school-related attitudes and the underachievement of boys in language. Before we turn to the research questions, we will first elaborate on the phenomenon of tracking and how tracking is associated with school-related attitudes.

Tracking and school-related attitudes

Grouping students according to their abilities into separate curricular tracks or groups, called tracking in the United States and streaming in the United Kingdom, is a pervasive educational practice in order to deal with the diversity in education. Teachers can adjust the learning pace, the learning materials and the method of instruction according to students' abilities and interests (Dar & Resh, 1994). Tracking or streaming can be distinguished from setting or banding, which refer to methods where only for certain subjects students are assigned to different groups according to the ability in the subject concerned (Harlen & Malcolm, 1999). We also need to make a distinction between tracking and within-class or between-class ability grouping where students are grouped according to their abilities but are taught the same curriculum. We use

'tracking' to denote a between-class ability grouping where different curricula are taught in the different groups.

Researchers have concentrated on the question of whether tracking is more beneficial for students' achievement than mixed-ability or heterogeneous grouping (no tracking). The often contradictory research findings on the effect of ability grouping become comprehensive when we take into account whether the instruction or the curriculum is the same or different across the different ability groups. Studies of the effect of ability grouping in secondary education, where students are taught the same curriculum in different ability groups, on achievement found little or no effect (Slavin, 1990). Students in ability classes do not achieve better than similar students in mixed-ability classes. On the other hand, studies on the effect of tracking on achievement in secondary education found positive effects for high-track students and a negative effect for low-track students (Kerckhoff, 1986; Ireson *et al.*, 2002). Three mechanisms have been postulated to explain the effects of tracking (Pallas *et al.*, 1994). First, evidence is found for the fact that tracking leads to an enrichment of the learning environment of high achievers and an impoverishment of the learning environment of low achievers. High-track students learn more because they cover more of the curriculum, learn at a faster pace and often are taught by more qualified teachers (Gamoran *et al.*, 1995). Secondly, tracking stratifies peer contexts. These peer contexts affect students' values and behaviour, which in turn affect achievement (Rowan & Miracle, 1983). The third effect is institutional. Assigning students to different ability groups influences the expectations and perceptions of teachers and parents about the capabilities.

Tracking not only affects achievement, but research has shown that it polarizes students into pro-school and anti-school orientations: low-track students develop an anti-school culture whereas high-track students develop a positive school culture (Hargreaves, 1967; Berends, 1995). This is called the differentiation-polarization theory. Schooling is a good experience for high-track students because they belong to the top of the hierarchical ladder. Tracking creates a status hierarchy in which the high achievers are elevated above the low achievers. For low-track students schooling is a bad experience because they learn that they have failed in the educational system, which can be reinforced by the expectations of teachers. As a consequence, students from lower tracks are less motivated, put less effort into their schoolwork and drop more often out of school (Boaler *et al.*, 2000). In this study we will examine whether in Flanders tracking is associated with a polarization of students into pro-school and anti-school attitudes. We hypothesize that students in the lower tracks will have more negative school-related attitudes than students in the higher tracks.

Research questions

The main research question is whether the underachievement of boys in language at the end of secondary education is related to the negative school-related attitudes of boys. But we do not only expect gender differences in school-related attitudes and in language achievement, we also expect tracking to create differences in school-related

attitudes and in language achievement. Therefore we decided to analyse the gender differences in language achievement within the tracks. We make a distinction between the highest track (academic) and the lower tracks (technical and vocational track), and will investigate gender differences in language achievement for the highest and the lower tracks separately. In Flanders, secondary education consists of six years (Grades 7–12, age 12–18) and students are tracked during the final four years into three[1] different tracks: the academic, the technical and the vocational track. The academic track (ASO) prepares students for higher education, the technical track (TSO) contains theoretical and technical training, and the vocational track (BSO) concentrates upon practical education and prepares students for a specific vocation. Those who choose for the academic track are more likely to go on to university or higher education and enter higher-status occupations. That is why we consider the academic track as the highest track.

Before we answer our main research question, we will in a first descriptive phase test whether in Flanders low-track students have less positive school-related attitudes and achieve less in language than high-track students, whether boys have less positive school-related attitudes and whether boys achieve less in language than girls. We will explore whether the gender differences in school-related attitudes and in language achievement are the same in the highest and in the lower tracks. In order to make comparisons between the tracks, we will—in this first phase of the analyses—analyse the tracks together. In a second phase, we will investigate the gender gap in language achievement in the highest track and in the lower tracks (technical/vocational) separately. We will test whether the gender gap in language achievement is related to the gender gap in school-related attitudes. We want to rule out the possibility that any effects of tracking are related to pre-existing differences. For instance, students with a lower socio-economic background or with lower achievement may be more assigned to the lower tracks, and that this can explain why students achieve less and have less positive school-related attitudes in the lower tracks. Therefore we take into account background characteristics (including cognitive ability, the socio-economic status, the language spoken at home and age) and previous achievement that were measured before students were tracked (Grade 8). When a significant gender gap is found, we will examine whether the gender gap disappears (becomes non-significant) when we take into account the school-related attitudes. We expect no gender differences in language achievement among boys and girls who both have very positive school-related attitudes. We expect that the biggest gender differences will be found among boys and girls who have negative school-related attitudes.

In sum, our research hypotheses are:

1. The school-related attitudes and the language achievement of both boys and girls are less positive in the lower tracks than in the highest track.
2. Boys have less positive school-related attitudes than girls and achieve less in language than girls.
3. The gender differences in school-related attitudes and in language achievement are the same in the highest and in the lower tracks.

4. No significant gender difference in language achievement will be found once school-related attitudes are taken into account.
5. No significant gender differences in language achievement will be found when both boys and girls have very positive school-related attitudes. The underachievement of boys in language will be most apparent among boys and girls who have negative school-related attitudes.

Method

Data

Data were drawn from the 'Longitudinaal Onderzoek Secundair Onderwijs' (LOSO) project (Longitudinal Research in Secondary Education Project) (Van Damme & Onghena, 2002). This project started in 1990 and followed a cohort of more than 6000 students during secondary school and afterwards (age 12–21) in Flanders. Flanders constitutes the northern part of Belgium, which borders on The Netherlands to the north. Dutch[2] is spoken in Flanders. In the southern part of Belgium they speak French, and a very small eastern part of Belgium speaks German. Each part has its own educational system. Since our study is limited to Flanders, we investigate gender differences in native language skills.

Our data-set consists of 2342 students (1011 boys and 1331 girls), 298 Dutch classes in Grade 12 and 62 schools: 1531 students (601 boys and 930 girls) are in the highest track and 811 students (410 boys and 401 girls) in the lower tracks. We selected a data-set of students who did not drop out of secondary education, who did not repeat a grade in secondary education and who did not change schools or tracks during the final four grades in secondary education. We excluded students who changed schools or tracks to make sure that the language achievement at the end of secondary education could not be attributed to different schools or tracks. Only students who did not repeat a grade in secondary education were considered because we wanted to take into account background characteristics and previous achievements and only for those students this information was available.

Variables

The dependent variable is the score on a language achievement test (DUTCH12) taken at the end of secondary education (age 18). Since there are no national examinations, the achievement test was especially constructed for the LOSO project. The test is composed of curriculum relevant multiple-choice items, approved by a board of inspectors and teachers. The language test covers spelling, comprehension, literature, reading, modality, word order, metaphors and linguistic performance. Four different versions of the test were constructed to address the differences in curricula for Dutch at the end of secondary education. Thanks to a partial overlap in items between the different versions, the scores on the different versions were made comparable using IRT analyses with BIMAIN (Zimowski *et al.*, 1994). The resulting IRT scores were used as the dependent variable.

At the pupil level our main variable of interest is gender (GENDER), which is dummy coded with '0' for boys and '1' for girls. We further make a distinction between control variables and explanatory variables. The *control variables* are the initial cognitive ability (COGNITIVE ABILITY), the socio-economic status of the family (SES), the language spoken at home (DUTCH AT HOME), prior mathematics (MATH8) and language achievement (DUTCH8) and, finally, the age at the start of secondary education (AGE). The initial cognitive ability is a combination of scores on an intelligence test and on a language and a mathematics achievement test that were administered at the start of secondary education. The measure of the socio-economic status of the family is a weighted composite score of six indicators, namely the educational and the occupational level of both parents, monthly income and cultural capital of the family. This information was taken from the parents' questionnaire that was administered at the beginning of secondary education. The language spoken at home also characterizes families. The variable 'DUTCH AT HOME' was coded as a dummy variable: '0' for families where another language than or besides Dutch is spoken at home and '1' for families where only Dutch is spoken at home. We also controlled for prior mathematics and language achievement. A school achievement test for language and mathematics was administered at the end of the eighth grade. Finally, the measurement of 'the age at the start of secondary education' was coded as a dummy variable ('0' = started secondary education with delay, '1' = started secondary education without delay).

The *explanatory variables* are the attitudes at the pupil level: interest in learning tasks (e.g. 'I enjoy doing most of the subjects in this school'), relationship with teachers (e.g. 'I think that most of the teachers are very helpful when I have problems with the school work'), well-being at school (e.g. 'I am glad to go to this school'), attentiveness in the classroom (e.g. 'I find it difficult to keep my mind on my work during a whole lesson'), motivation towards learning tasks (e.g. 'I work hard for all subjects to get good results'), attitude towards homework (e.g. 'When I have homework, I start as soon as possible') and social integration in the class (e.g. 'I get on well with my classmates'). These seven scales were based on 52 items of a questionnaire; the number of items ranged between a minimum of four and a maximum of 10 items per scale. The questionnaire was administered at the end of Grade 12. The Cronbach α values are situated between 0.82 and 0.89 (for more information on the scales, see Van Damme *et al.*, 2002).

Finally, the track at the end of secondary education is included. We make a distinction between three tracks: the ASO, the TSO and the BSO. When the tracks are analysed together, two dummy variables are used to distinguish between the different tracks: 'TSO' (technical) and 'BSO' (vocational). ASO (academic) is the reference category. When separate analyses are carried out for the academic and for the technical/vocational tracks, only one dummy is needed to differentiate between the technical and the vocational track (0 = TSO, 1 = BSO). We will analyse the highest track (academic) and the lower tracks (technical/vocational) separately because there exists a large gap in curriculum, in teaching approach and in language achievement between the highest and the lower tracks. The technical and the vocational track are analysed together because they are almost always organized within the same schools in Flanders.

Analytical approach

The data are analysed using multilevel analysis because they are hierarchically structured (Snijders & Bosker, 1999; Hox, 2002). Three levels are distinguished: students are nested within classes (student-level), classes are nested within schools (class-level[3]) and schools are at the highest level (school-level). In this article, we will not investigate differences between classes and schools, but we wanted to model the classes and schools to take into account the random structure. All the variables that are used in this article are situated at the individual or student level.

Students in Flanders are tracked in the final four grades of secondary education. We will not only take into account the initial cognitive ability at the start of secondary education, but also the language and mathematics achievement at the end of the eighth grade in order to evaluate the progress made during the final four grades of secondary education. To make sure that the effects of tracking are not due to pre-existing differences in students' abilities and background characteristics (such as SES and ethnicity) between the tracks, we take these pre-existing differences (at Grade 8) into account. All the variables used in the analyses are centred around the grand mean, except the dummy variables.

Results

Gender differences in language achievement and school-related attitudes by track

In a first phase, the different tracks are analysed together to investigate gender differences, the differences between the tracks, and the interaction effects between gender and track on school-related attitudes and on language achievement (See Table 1). The main effects of track on the school-related attitudes and on language achievement give an answer to the questions whether boys and girls in lower tracks have significant less positive school-related attitudes and achieve less in language than boys and girls in the highest track (hypothesis 1). We used ASO (academic track) as the reference category and introduced two dummy variables, TSO (technical) and BSO (vocational), to distinguish between the three tracks. The 'TSO' and 'BSO' dummies indicate, respectively, the difference between the technical and the academic track and the difference between the vocational and the academic track. The difference between the technical (TSO) and the vocational (BSO) track is not tested. The results showed that students from the highest track (ASO) have a significant better relationship with teachers ($\chi^2(1, n = 2342) = 4.02, p < 0.05$), have a more positive well-being at school ($\chi^2(1, n = 2342) = 9.69, p < 0.01$) and have a more positive attitude towards homework ($\chi^2(1, n = 2342) = 15.88, p < 0.001$) than students from the vocational track (BSO). Contrary to our expectations, students from the technical track (TSO) are more interested in learning tasks than students from the highest track (ASO) ($\chi^2(1, n = 2342) = 5.73, p < 0.05$). This was especially true for girls. A possible explanation might be that the nature of the learning tasks is different in the two tracks. In the technical track learning tasks are more practically orientated and realistic than the more abstract learning tasks in the academic track. Research has shown that girls have

Table 1 Effects of gender, track and the interaction between gender and track on school related attitudes and language achievement

	INTEREST IN LEARNING TASKS	ATTENTIVENESS IN THE CLASSROOM	RELATIONSHIP WITH TEACHERS	SOCIAL INTEGRATION IN THE CLASS	MOTIVATION TOWARDS LEARNING TASKS[a]	WELL-BEING AT SCHOOL	ATTITUDE TOWARDS HOMEWORK	DUTCH12[a]
Fixed								
INTERCEPT	−0.066	−0.007	0.010	0.066	−0.050	0.165	0.026	0.628
(ASO)	(0.038)	(0.036)	(0.033)	(0.040)	(0.039)	(0.057)	(0.057)	(0.077)
GENDER	0.027	0.072	0.096*	0.031	0.307***	0.0003	0.297***	0.075
	(0.039)	(0.041)	(0.035)	(0.039)	(0.046)	(0.051)	(0.045)	(0.058)
TSO	0.136*	0.060	0.041	0.050	0.086	−0.075	−0.018	−1.287***
	(0.063)	(0.061)	(0.055)	(0.065)	(0.066)	(0.091)	(0.069)	(0.124)
BSO	0.119	−0.021	−0.128*	−0.099	0.018	−0.320**	−0.314***	−2.641***
	(0.072)	(0.070)	(0.063)	(0.072)	(0.077)	(0.100)	(0.077)	(0.139)
GENDER	−0.068	−0.005	−0.125	−0.177*	−0.009	−0.153	−0.005	0.051
x TSO	(0.080)	(0.082)	(0.072)	(0.081)	(0.099)	(0.108)	(0.089)	(0.138)
GENDER	0.059	0.062	0.161*	0.085	−0.210*	0.216	0.010	0.184
x BSO	(0.090)	(0.092)	(0.081)	(0.090)	(0.101)	(0.120)	(0.099)	(0.160)
Random								
SCHOOL	0.008	0.005	0.004	0.013**	0.004	0.039***	0.016**	0.042*
	(0.005)	(0.004)	(0.003)	(0.006)	(0.005)	(0.013)	(0.006)	(0.024)
CLASS					0.018*			0.092***
Grade 10					(0.009)			(0.022)
CLASS	0.035***	0.023***	0.028***	0.024***	0.008	0.042***	0.006	0.186***
Grade 12	(0.007)	(0.007)	(0.006)	(0.006)	(0.008)	(0.010)	(0.005)	(0.031)
STUDENT	0.324***	0.397***	0.275***	0.321***	0.514***	0.509***	0.458***	0.592***
	(0.010)	(0.012)	(0.008)	(0.010)	(0.016)	(0.016)	(0.014)	(0.019)
Deviance	4194.536	4601.671	3790.898	4148.826	5195.637	5254.943	4887.918	5904.592

[a]Besides the variance of class Grade 12, the variance of class Grade 10 was also estimated because this was a significant improvement of the model. * $p < .05$, ** $p < .01$, *** $p < .001$

a preference for tasks that are relevant and that can be applied to every day situations (Murphy & Gipps, 1996). Regarding language achievement, we found that students from the academic track (ASO) have the highest score for language followed by students from the technical track (TSO) and, finally, students from the vocational track (BSO). Students from the vocational and the technical track score significantly lower for language than students from the academic track (respectively, $\chi^2(1, n = 2342) = 67.24$, $p < 0.001$; $\chi^2(1, n = 2342) = 150.79$, $p < 0.001$).

Next, we investigated whether boys have significantly more negative school-related attitudes than girls and whether girls perform better for languages than boys (main effect of gender; hypothesis 2). We found that girls have a significantly better relationship with teachers ($\chi^2(1, n = 2342) = 7.13$, $p < 0.01$), are more motivated towards learning tasks ($\chi^2(1, n = 2342) = 44.61$, $p < 0.001$) and have more positive attitudes towards homework than boys ($\chi^2(1, n = 2342) = 41.93$, $p < 0.001$) (hypothesis 2). No significant gender differences were found in the interest in learning tasks, in the attentiveness in the classroom, in the social integration in the class and in their well-being at school. Regarding achievement (hypothesis 3), only marginally significant and very small differences were found between boys and girls on language achievement ($\chi^2(1, n = 2342) = 2.86$, $p = 0.11$; $d = 0.12$). We will return to this result later.

Finally, we tested the interaction effects between gender and track on school-related attitudes and on language achievement (hypothesis 3). We found no significant interactions between gender and track on language achievement. This means that the underachievement of boys is apparent in all the tracks. We did find three significant interactions between gender and track on school-related attitudes. The interaction effect between gender and track on the relationship with teachers reveals that in the vocational track boys had a much worse relationship with teachers than girls (mean girls, 0.14; mean boys, –0.12) compared with the gender difference in the academic track (mean girls, 0.11; mean boys, 0.01) ($\chi^2(1, n = 2342) = 3.95$, $p < 0.05$). The interaction between gender and motivation towards learning tasks ($\chi^2(1, n = 2342) = 4.26$, $p < 0.05$) shows that the motivation towards learning tasks of girls was less positive in the vocational track (mean girls, 0.06; mean boys, –0.03) compared with the highest track (mean girls, 0.26; mean boys, –0.05). The interaction between gender and the social integration in the class ($\chi^2(1, n = 2342) = 4.55$, $p < 0.05$) reveals that the social integration in the class of girls was lower in the technical track (mean girls, –0.03; mean boys, 0.12) than in the highest track (mean girls, 0.10; mean boys, 0.07).

Are adjusted gender differences in language achievement mediated by gender differences in school-related attitudes?

In a next phase, we examine gender differences in language achievement in the highest (academic) track and in the lower tracks (technical/vocational) separately. In the previous section, no significant gender differences were found in language achievement in the three tracks. In this section, we will investigate adjusted gender differences, meaning that we will take into account the initial cognitive ability, the socio-economic status, the language spoken at home, the age and previous (prior to

tracking) language and mathematics achievement. In the highest track (ASO) we found no significant gender differences in language achievement when no control variables were taken into account ($\chi^2(1, n = 1531) = 1.53$, $p = 0.21$; $d = 0.08$) and marginally significant gender differences when we adjusted for background characteristics and previous achievement ($\chi^2(1, n = 1531) = 2.84$, $p = 0.09$; $d = 0.18$). This means that in the highest track girls with similar initial cognitive abilities, who come from similar socio-economic backgrounds, have the same age, speak the same language at home and achieve similarly on previous language and mathematics achievement, do not achieve significantly better than boys for language. Because there are no significant differences, we did not further examine whether the relation between gender and language achievement is mediated by school-related attitudes.

In the lower tracks (TSO/BSO), no gender differences in language achievement were also found when no background characteristics or previous achievement were taken into account ($\chi^2(1, n = 811) = 0.99$, $p = 0.32$; $d = 0.15$). However, when background and previous language and mathematics achievement were taken into account we found that girls scored significantly better for language than boys ($\chi^2(1, n = 811) = 7.62$, $p < 0.05$; $d = 0.27$). This means that, in the lower tracks, girls with similar background characteristics and similar previous language and mathematics achievement achieve significantly better in language at the end of secondary education than boys. According to Cohen (1988) the gender effect is a small effect. When the attitude towards homework, the motivation towards learning tasks and the relationship with teachers were taken into account the gender gap dropped from 0.181 to 0.162 and was not significant anymore. The drop was found when the attitude towards homework and the relationship with teachers were taken into account, but adding the motivation towards learning tasks did not further reduce the gender coefficient. In other words, in the lower tracks girls achieve better in language because they have more positive attitudes towards homework and because they have a better relationship with the teachers (hypothesis 4).

Interactions between gender and school-related attitudes on language achievement

Because girls have more positive attitudes towards schooling and because attitudes towards schooling are positively related to (language) achievement, we expected that boys with positive school-related attitudes will not perform worse than girls in language, and that mainly boys with negative school-related attitudes will underachieve in language (hypothesis 5). Therefore, we looked at the interactions between school-related attitudes and gender on language achievement. A significant gender difference in language achievement after taken into account background characteristics and previous achievement was found only in the lower tracks (and not in the highest track). Therefore we shall investigate interactions between gender and the school-related attitudes on language achievement only in the lower tracks. However, no significant (linear) interactions were found. In a next step we looked for quadratic interactions and we found three significant quadratic interactions: gender x interest in learning tasks ($\chi^2(1, n = 811) = 6.75$, $p < 0.01$), gender x attentiveness in the

classroom ($\chi^2(1, n = 811) = 5.451, p < 0.05$) and gender x motivation towards learning tasks ($\chi^2(1, n = 811) = 5.562, p < 0.05$). For boys, we always found a U-shaped curve. This means that boys who are not very interested in learning tasks, who are not very attentive in the classroom, and are not very motivated towards learning tasks are among the best achievers in language as well as boys who are very interested in learning tasks, are very attentive in the classroom, and are very motivated towards learning tasks. For girls, a nearly positive linear trend with a slight drop at the final end was found. As an example, the interaction between gender and the interest in learning tasks is shown graphically in Figure 1. The other two interactions show the same pattern. For the majority of the students in the lower tracks we found that girls achieve better in language than boys. But for some student we found remarkable results because they run counter to the general idea that attitudes are positively linearly related to achievement. Therefore, we wanted to investigate what type of boys have negative school-related attitudes and achieve well in language and what type of girls have very positive school-related attitudes but do less well in language.

Post-hoc research

To investigate the aforementioned effect, we examined which background characteristics and previous achievement of boys and girls are associated with their interest in learning tasks, attentiveness in the classroom and motivation towards learning tasks in the lower tracks (TSO/BSO). We constructed multilevel models with the

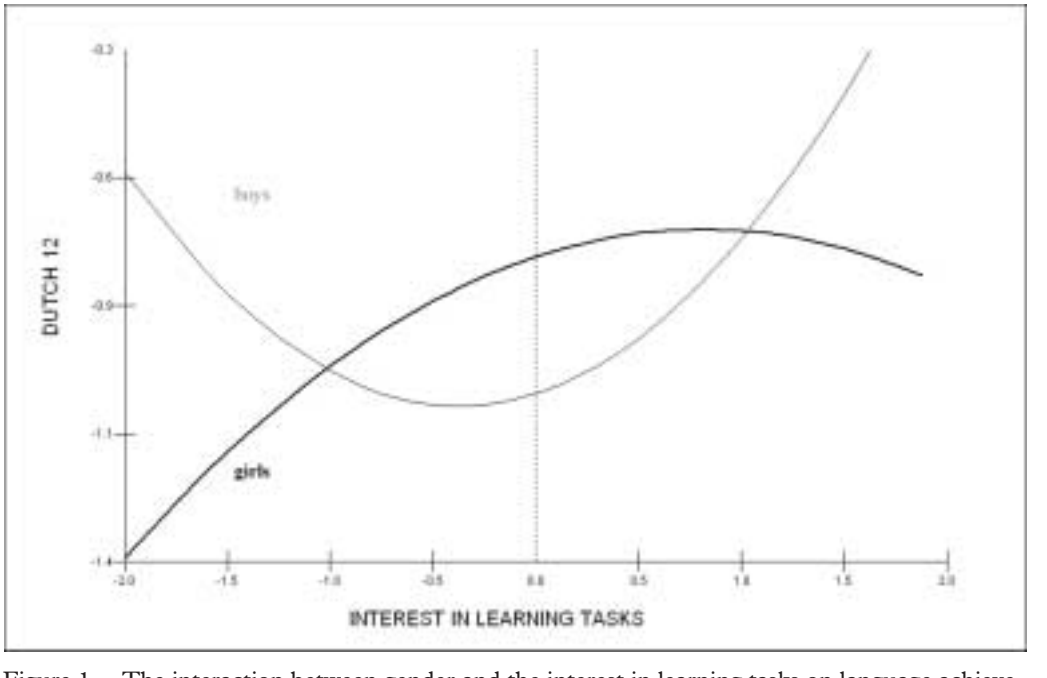

Figure 1. The interaction between gender and the interest in learning tasks on language achievement in the lower tracks (TSO/BSO)

school-related attitudes as the dependent variable and with the background characteristics, previous language and mathematics achievement, gender and the interactions between gender and the background characteristics and previous achievement as the predictors. The most important finding was the significant quadratic interaction between the initial cognitive ability and gender on the interest in learning tasks ($\chi^2(1, n = 811) = 7.12, p < 0.01$), on the attentiveness in the classroom ($\chi^2(1, n = 811) = 4.12, p < 0.05$) and on the motivation towards learning tasks ($\chi^2(1, n = 811) = 3.26, p = 0.07$). In Figure 2 the interaction between gender and initial cognitive ability on the interest in learning tasks is shown as an example. The other interactions show the same pattern. We found a negative trend for boys; namely, the higher the initial cognitive ability, the less positive the interest in learning tasks, the less the attention in the classroom and the less positive the motivation towards learning tasks. For girls, we found a U-shaped association, meaning that girls with high as well as low initial cognitive ability are very interested in learning tasks, are very attentive in the classroom and are very motivated towards learning tasks. But especially, girls with low initial cognitive ability were the most interested, were the most attentive and were the most motivated. In other words, the most intelligent boys in the lower tracks have negative school-related attitudes whereas the least intelligent girls in the lower tracks have the most positive school-related attitudes. This can explain why we found the unexpected effect. Boys who have negative school-related attitudes achieve better than girls in language because they are the more intelligent boys in the lower tracks, whereas boys with very positive school-related attitudes

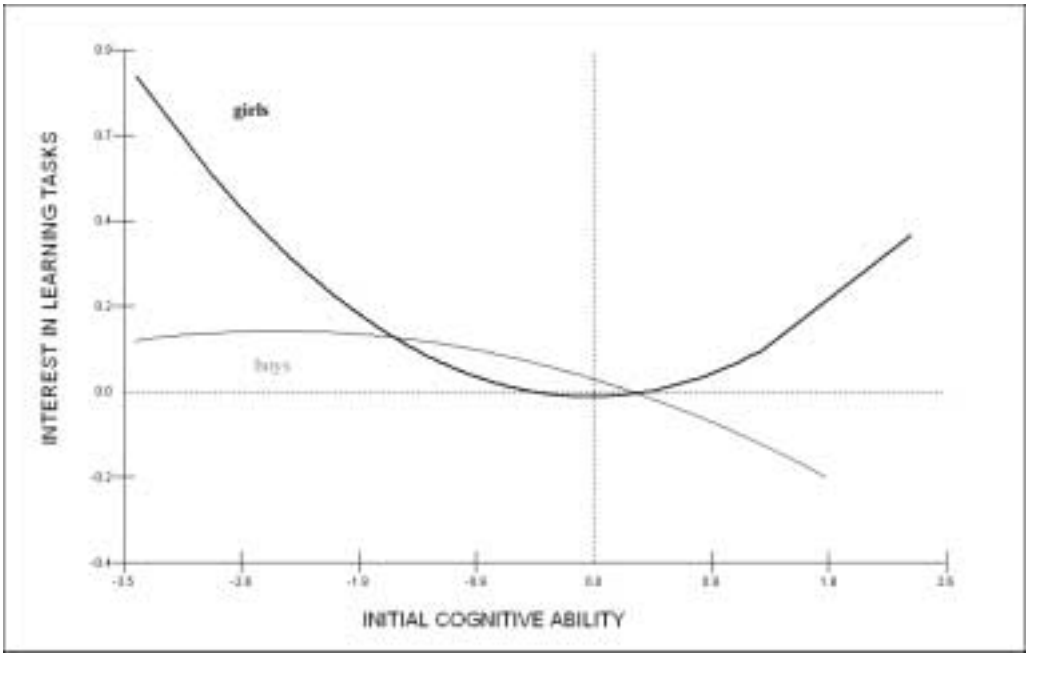

Figure 2. The interaction between the initial cognitive ability and gender on the interest in learning tasks in the lower tracks (TSO/BSO).

achieve better than girls because these girls are the least intelligent in the lower tracks. Our results seem to highlight an important problem; namely, the demotivation of intelligent boys in the lower tracks.

Discussion

The key question in this study is whether the underachievement of boys in language at the end of secondary education is related to the less positive school-related attitudes of boys and what role tracking plays therein. In concordance with previous research (Ireson *et al.*, 2002), we found that students in the lower tracks achieve less in language than students in the highest track. We also found some support for the differentiation-polarization theory, which states that the differentiation of students into different tracks creates a polarization of school-related attitudes (Hargreaves, 1967). In our study, students from the highest track have a better relationship with teachers, have a more positive well-being at school and have a more positive attitude towards homework than students from the lower tracks. Since—at this stage of the analysis—we did not take into account pre-existing differences between pupils, we cannot conclude that tracking created the polarization. The polarization may be a consequence of the assignment of students on the basis of their abilities and their school-related attitudes to the different tracks. What is important is that we demonstrated that in the lower tracks students have less positive school-related attitudes. As a consequence an anti-school culture more easily emerges in the lower tracks, which can have negative effects on achievement.

The presence of an anti-school culture in the lower tracks can explain why boys make less progress in language achievement in the lower tracks than girls and not in the highest track after taken into consideration background characteristics and pre-existing differences in achievement. Previous research has already suggested that certain types of masculinities and peer pressure to conform to this image are related to the underachievement of boys (Clark & Trafford, 1995). For many boys, educational effort and achievement is viewed as an activity that is not consistent with their gender role or their masculine identity (Francis, 1999). In the lower tracks boys are more confronted with an anti-school culture than in the highest track. Through social mechanisms such as socialization and group pressure, students internalize the values and norms of their educational setting (Barth *et al.*, 2004). In other words, in the lower tracks boys are more confronted with students with less positive school-related attitudes that are likely to strengthen these attitudes in individual students, and consequently have a negative effect on the achievement. This does not mean that girls do not experience peer pressure, but previous research has shown that it seems more acceptable for girls to work hard than for boys (Warrington *et al.*, 2000). The effects of the anti-school culture in the lower tracks on the attitudes and the achievement of boys are not tested in this study and we would like to see more research that tests this link directly. Nevertheless, we offer a possible mechanism that might be responsible for the underachievement of boys in the lower tracks.

We did find support for the hypothesis that the gender gap in language achievement (in the lower tracks) is associated with the less positive school-related attitudes of boys. More specifically, when gender differences in attitudes towards homework and in relationship with teachers were taken into account, the gender gap in language achievement in the lower tracks disappeared (was reduced to non-significance). The direction of the effect is less clear. It is possible that boys underachieve because they have less positive attitudes towards schooling, but it is also possible that boys underachieve and therefore have less positive attitudes. However, we controlled for pre-existing differences such as previous language and mathematics achievement and found effects of school-related attitudes on the achievement of boys and girls. This gives at least some indication that attitudes can have an effect on subsequent achievement.

Contrary to our expectations, the results showed that (in the lower tracks) boys who were the *least* attentive in the classroom were the *least* interested in learning tasks and were the *least* motivated towards learning tasks achieved better than expected. A post-hoc analysis revealed that these are the more intelligent boys in the lower tracks. Several explanations can be offered to explain this effect. First, it is possible that the more intelligent boys in the lower tracks try to compensate their high achievement by not paying attention in the classroom and showing that they are not very interested in, and not very motivated towards, learning tasks. Previous research has shown that boys who are high achievers often get bullied or ridiculed (Renold, 2001). Working hard for school and getting good grades is something that is not consistent with the image of the 'macho lad'. Disruptive behaviour and acting out can be a strategy to avoid being bullied. So, it seems plausible that in our study the more intelligent boys in the lower tracks need to compensate their high achievement in language by a macho attitude. Secondly, an alternative explanation could be that the more intelligent boys in the lower tracks are demotivated because they are not enough challenged by the curriculum. Studies that examine the underachievement of gifted students identify a mismatch between intellectual capabilities and the curriculum as one of the main reasons why gifted students underachieve (Reis & McCoach, 2000). It is possible that more boys are assigned by teachers or schools to the lower tracks than girls leading to a bigger chance of the presence of relatively more intelligent boys than girls in the lower tracks. In addition, more boys than girls choose for the lower tracks since the lower tracks offer the more typically male subjects. In our study 40% of the boys are in the lower tracks, compared with 30% of the girls. In short, it is possible that relatively more intelligent boys than girls are (mis)assigned to the lower tracks, and are not sufficiently challenged by the curriculum, with negative school-related attitudes as a consequence. More research is needed to clarify whether more boys are being misassigned to the lower tracks than girls. In any case, there seems to be a loss of talent of boys in the lower tracks.

We do, however, need to realize that this 'unusual' effect only counts for a small percentage of the students in the lower tracks. Moreover, we are dealing with a rather specific group of students, namely students who did not repeat a grade in secondary

education. Nevertheless, we did find support for our hypothesis that the underachievement of boys in language is related to their less positive school-related attitudes. The underachievement of boys and the demotivation of boys seemed to be a bigger problem in the lower ability tracks. Especially, the more intelligent boys in the lower tracks appeared to be demotivated.

Acknowledgement

Thanks to the Department of Education of the Ministry of the Flemish Community for funding the project.

Notes

1. There also exists a fourth track; namely, the artistic track, which combines general education with active practice of art. We do not mention it here because we have too few students following this track in our data.
2. The official language in Flanders is Dutch. The Belgian variant of Dutch is Flemish. The difference between Flemish and Dutch that is spoken in The Netherlands can be compared with the difference between American and British English.
3. We will examine the language achievement at the end of secondary education (Grade 12) corrected for achievement differences four years earlier (Grade 8). During the final four years of secondary education, students belong to different classes. We will use a cross-classification to model the classes of two grades, namely the classes of Grade 10 and the classes of Grade 12 (for more information about cross-classification, see Rasbash *et al.*, 2000). We restrict the cross-classification to two grades in order to not make the model too complex.

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