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Disentangling the Interplay of the Sense of Belonging and Institutional Channels in Individuals' Educational Trajectories

Kaspar Burger[1, 2, 3]

[1] Jacobs Center for Productive Youth Development, University of Zurich
[2] Department of Sociology, University of Zurich
[3] Social Research Institute, Institute of Education, University College London

Author Note

Kaspar Burger 🆔 https://orcid.org/0000-0001-5582-7062

Correspondence concerning this article should be addressed to Kaspar Burger, University of Zurich, Jacobs Center for Productive Youth Development and Department of Sociology, Andreasstrasse 15, 8050 Zurich, Switzerland. Phone: +41 44 634 06 75; e-mail: kaspar.burger2@uzh.ch

Abstract

Accumulating evidence indicates that students' sense of school belonging has a substantial positive effect on educational attainment. At the same time, life-course and life-span developmental theories suggest that the benefits of a sense of school belonging could be weakened by the channeling effects of education systems that assign students to distinct educational tracks that lead otherwise similar students to quite different educational destinations. The current study analyzed the extent to which the sense of school belonging predicted educational trajectories in a system that partially channels students into distinct tracks. It assessed educational trajectories as they relate to transitions at two critical junctures of the system—the transition from lower- to upper-secondary education, and from upper-secondary to tertiary (university) education. The study used data from a nationally representative panel survey that followed participants from age 15 to 30 ($N = 4,986$, 44% male, 12.9% immigrants). Findings indicated that students with a stronger sense of school belonging were more likely to continue in or transition into academic tracks. However, the benefits of students' sense of belonging were bounded by the system's channeling structure. While, for students in academic tracks, the sense of school belonging strongly predicted the probability of continuing in academic tracks, it only marginally predicted the probability of moving into academic tracks for those whose educational career began in more vocationally oriented tracks. Hence the sense of school belonging may influence academic trajectories only inasmuch as institutional structures allow it to, because these structures differentially enable and constrain such trajectories.

**Disentangling the Interplay of the Sense of Belonging and Institutional Channels
in Individuals' Educational Trajectories**

Humans have a strong need to belong to a social group or community as they are fundamentally dependent on group members. We need to interact, cooperate, and engage with group members to be able to learn and grow in diverse and sometimes even hostile environments (Over, 2016). Hence, we are persistently motivated by a need to belong (Baumeister & Leary, 1995). However, belonging is not only a human need. Belonging also has a wide range of positive implications for psychological and behavioral adjustment and for broad human functioning in various domains.

This is particularly true in the school context, where a sense of belonging is an essential precondition for actively participating in class, engaging in learning activities, coping with stress, and developing a positive attitude toward school (Demanet & Van Houtte, 2012; Yeager et al., 2016). A sense of belonging in school reflects the feeling of fitting into the school environment—a sense of being accepted, respected, included, and valued by peers and teachers (Goodenow & Grady, 1993). Students who feel that they belong in school typically identify with school values and objectives (Voelkl, 1996). They exhibit adaptive behavior, academic motivation, and emotional engagement in school (Slaten et al., 2016). They also show greater persistence and goal-directed learning (Schachner et al., 2019; Walton & Cohen, 2011). As a result, they perform better (Allen et al., 2016; Hernández et al., 2017; Korpershoek et al., 2020), which in turn may lead to more academic educational trajectories and higher educational attainment (Murphy et al., 2020; Murphy & Zirkel, 2015; Strayhorn, 2018). The positive effects of a sense of school belonging on academic educational trajectories and educational attainment are typically regarded as universal. However, educational trajectories are also shaped by the structure of the education system, that is, the unique institutional conditions in which these trajectories unfold.

The significance of institutional contexts for developmental trajectories has been prominently recognized by life-course (Elder, 1998) and life-span developmental psychological theories (Baltes et al., 2006; Lerner & Damon, 2006). These theories share the central tenet that individual human development is always embedded in and shaped by institutional structures of opportunity and constraints. That suggests that the benefits of a sense of school belonging could be undermined by institutional constraints, most notably by the channeling effects of education systems that allocate students to distinct educational tracks. Indeed, education systems worldwide assign students to different tracks according to student performance levels, with the aim of tailoring instruction to students' specific needs and skills (Hanushek & Wößmann, 2006). In the process, they lead otherwise similar students to quite different educational destinations (Borghans et al., 2019; Holm et al., 2013). In fact, once students embark on a given educational track, they are likely to follow some standard sequence of transitions through the system; hence, their educational trajectories become somewhat predictable (Breen & Jonsson, 2000; Burger, 2021). Thus, the widespread view that a sense of school belonging generally promotes academic educational trajectories and higher educational attainment may be inaccurate inasmuch as educational tracks structure how students progress through the education system and potentially constrain the benefits of a sense of belonging.

Life-course and life-span developmental psychological theories also suggest that individuals and contexts are inextricably linked (Baltes et al., 1980, 2006; Goyer et al., 2021; Magnusson & Stattin, 1998; Schoon & Heckhausen, 2019). Accordingly, individual student factors, such as a sense of school belonging, might vary across educational contexts (Smerdon, 2002; Vaz et al., 2015). Thus, it might also vary across distinct educational tracks. For instance, students in academic tracks might feel a stronger sense of school belonging than their counterparts in other, less academic, tracks (Van Houtte & Van Maele, 2012).

Moreover, life-course and life-span theories suggest that educational trajectories are best understood as the result of the interplay between individuals and institutional constraints and opportunities (Baltes et al., 2006; Burger & Mortimer, 2021; Conger & Donnellan, 2007; Lerner & Damon, 2006). We may therefore expect students' sense of school belonging and the educational tracks that they attend to jointly influence educational trajectories. That is, students with a stronger sense of school belonging may remain in the education system for longer, pursuing their education up to tertiary education, whereas those with a weak sense of belonging might leave the system at an earlier stage (Murphy et al., 2020; O'Keeffe, 2013). Such differences might be exacerbated by educational tracks that have a channeling function, minimizing the range of educational options that students have and partially locking them into a given trajectory. For instance, we might assume that, for academic-track students, a given level of sense of school belonging may exert a comparatively strong influence on their academic educational trajectories; the same may not be true in other, less academic, tracks. Hence, educational tracks might moderate any potential influence that the sense of school belonging may have on educational trajectories.

Against this background, the current study sought to analyze 1) whether students' sense of school belonging differs between educational tracks; 2) whether students' sense of school belonging predicts educational trajectories; and 3) whether any potential benefits of a sense of school belonging for educational trajectories vary as a function of the educational tracks that individuals follow. The study focused on the Swiss education system, which is a good case to understand the interplay between the sense of belonging and educational tracks because it sorts students into distinct educational tracks that provide either academically oriented or more vocationally oriented educational paths. However, at the same time, the system is relatively open, offering multiple educational tracks through secondary and into tertiary education. It thereby allows students to follow qualitatively different and alternative paths to a given educational destination. Thus, despite its channeling structure, the Swiss education system offers a structure of opportunity for students to pursue either direct trajectories along academic tracks, or indirect trajectories from vocational tracks via academic tracks, to tertiary education.

Institutional Channels and Educational Trajectories

Many education systems allocate students to distinct educational tracks that differ in terms of academic requirements (Hanushek & Wößmann, 2006). This purposive clustering of students in classes within schools or in different types of schools is known as tracking. Educational tracks may be conceived of as channels because they steer individuals and their educational trajectories in a given direction. Once students are on a given track, they are likely to progress through the system by following a standard series of transitions, which eventually

leads to a given educational destination (Breen & Jonsson, 2000). Thus, by channeling educational trajectories along tracks, education systems put students on the path to distinct educational attainments (Domina et al., 2017; Pfeffer, 2008). Channeling structures are inherent in any education system. Importantly, however, in most systems students can follow either direct or indirect trajectories to a given educational destination. Multiple pathways exist, and therefore students' educational trajectories may diverge at some junctures, only to converge at a later stage (Cedefop, 2012; Eurydice, 2010; Hillmert & Jacob, 2010; Milesi, 2010).

The Swiss Education System

The Swiss education system provides multiple tracks through secondary and into tertiary education (see Figure 1). Following comprehensive education in primary school (grades 1 – 5/6), students are allocated to different tracks at lower-secondary level (grades 6/7 – 9). These tracks differ in terms of their academic demands and are therefore referred to as low, intermediate, and high tracks. However, some students attend comprehensive, nontracked lower-secondary schools that teach students with diverse ability and academic achievement levels together using a common curriculum. The upper-secondary level (grades 10 – 12/13) is divided into two main tracks: 1) the academic track (*Gymnasium*), which primarily prepares students for tertiary education, and 2) vocational education and training, which prepares students for entry into the labor market and for colleges of higher education. Finally, the tertiary level (following grade 12/13) consists of conventional universities; universities of applied sciences and teacher education; and colleges of higher education, which provide an advanced level of professional education and training.

The tracking structure partially channels students along certain educational tracks through secondary education and into tertiary education. However, because the system offers multiple tracks to a given educational destination, the system allows for some variation in educational trajectories. For instance, students can follow direct trajectories that take them along academic tracks into university, but they can also follow indirect trajectories and eventually end up in university. Thus, irrespective of the educational track that students initially attend, they can, in principle, pursue their educational careers up to university by following either direct or indirect trajectories, provided that they meet the respective academic requirements.

Study Aims and Hypotheses

Previous research has typically regarded the consequences of a strong sense of school belonging for educational outcomes as universal; possible variations in these consequences across educational contexts have received little attention. However, life-course and life-span developmental psychological theories challenge this assumption of universality and stress the key significance of contexts. The suggestion here is that institutional structures also influence educational outcomes, potentially in conjunction with students' sense of school belonging. With this in mind, this study's main aim was to assess how the sense of belonging and educational tracks individually and interactively predict educational trajectories.

The study assessed educational trajectories at two critical transition junctures—from lower- to upper-secondary education tracks and from upper-secondary tracks to university—

within a system that offers multiple tracks from lower-secondary school up to university. It is important to examine these educational transitions because they represent central developmental tasks. How young people tackle educational transitions in adolescence and early adulthood has long-term implications for their future development and life chances (Nurmi, 1993; Roisman et al., 2004; see also Lippold et al., 2013; Seidman et al., 2004; Tomasik et al., 2009).

Because the sense of belonging may vary across contexts (Van Houtte & Van Maele, 2012), the study initially analyzed the extent to which the sense of belonging differs between educational tracks. Overall, the study tested four hypotheses:

Hypothesis 1. The sense of school belonging differs between educational tracks.

Hypothesis 2a. Individuals with a stronger sense of school belonging at the lower-secondary school level are more likely to transition into academic upper-secondary education than their counterparts with a weaker sense of school belonging.

Hypothesis 2b. Individuals with a stronger sense of school belonging at the upper-secondary school level are more likely to ever transition into a university than their counterparts with a weaker sense of school belonging.

Hypothesis 3. The benefits of a sense of school belonging for educational trajectories vary as a function of the educational tracks that individuals follow.

Because the study looked at a 15-year period, it was able to consider individuals' likelihood of moving to university, regardless of whether they had previously followed a direct trajectory (from an academic track to university) or an indirect trajectory (from a vocational track via an academic track to university). The study considered enrolment at university after completion of upper-secondary education at any point over a period of up to ten years, that is, during the phase of life when virtually all university-bound students first enrolled in a university (BFS, 2015).

Method

Transparency and Openness

I report all data exclusions, all manipulations, and all measures in the study, following journal article reporting standards (Kazak, 2018). The study used data that are publicly available at SWISSUbase and can be accessed at doi.org/10.23662/FORS-DS-816-7. The data are de-identified. Materials and analysis code for this study are available by emailing the corresponding author. Data were analyzed and visualized using *R,* version 3.5.0 (R Core Team, 2020) as well as the packages *mice,* version 2.46.0 (Buuren et al., 2021), *ggplot2,* version 3.3.3 (Wickham, 2016), *ggeffects,* version 1.1.0 (Lüdecke, 2018), *sjmisc*, version 2.8.7 (Lüdecke et al., 2021), and *lattice*, version 0.20-44 (Sarkar et al., 2021). The study's design and analyses were not preregistered. The current study is part of a project that received approval of the Institutional Review Board of the University of Minnesota ([Micro-, Meso-, and Macro-Level Determinants of Educational Inequalities: An Interdisciplinary Approach], IRB ID: 00004882, 11/07/2018).

Sample

Data were taken from the TREE (Transitions from Education to Employment) survey, a panel study investigating individuals' educational and labor market trajectories from age 15

to 30 (TREE, 2016). The original sample consisted of 6,343 adolescents who participated in the Program for International Student Assessment (PISA), when they were enrolled in the last year of lower-secondary school (in 2000). In PISA, a two-step stratified sampling design was used to select a nationally representative sample of students. First, schools were selected with probabilities proportional to the size of the student body. Second, individual students were selected at random in schools (OECD, 2015). The TREE survey is a longitudinal PISA follow-up study. That is, following the PISA survey in 2000 (t_0), the TREE survey collected data from 2001 until 2014. From 2001 to 2007, panel waves were conducted at annual intervals (t_1 - t_7); two additional waves took place in 2010 (t_8) and 2014 (t_9).

To examine educational trajectories up to the university level, I focused on participants who reported whether or not they had been enrolled at a university during any of the panel waves (n = 4,986). This analytic sample and the original sample were very similar with respect to key sociodemographic characteristics and academic performance. Relative to the original sample, the analytic sample comprised slightly fewer men (43.8% vs. 45.8%) and slightly fewer first-generation immigrants (12.9% vs. 14.3%). Welch two-sample t-tests documented that the two samples were virtually identical in terms of parental socioeconomic status, as measured on the standard international socio-economic index, or ISEI, scale ($M_{analytic\ sample}$ = 51.0, SD = 16.3; versus $M_{original\ sample}$ = 50.4, SD = 16.3, [$t(10,703.7)$ = 1.95, p = 0.052]). The two samples were also virtually identical in terms of participants' age in the year 2000 ($M_{analytic\ sample}$ = 15.5, SD = 0.6; versus $M_{original\ sample}$ = 15.5, SD = 0.7, [$t(11,242.6)$ = 0.00, p = 1.00]). However, the analytic sample included individuals who exhibited better academic performance, as indicated by the PISA reading score ($M_{analytic\ sample}$ = 520.0, SD = 85.1; versus $M_{original\ sample}$ = 510.0, SD = 89.0, [$t(10,905.4)$ = 6.08, p < 0.001]).

Measures

Data were collected by means of questionnaires and telephone interviews. Data collection typically took place between April and June in each wave. Data from the year 2000 were taken to assess participant characteristics in lower-secondary education; data from the year 2002 were taken to assess participant characteristics in upper-secondary education; and data from 2004 to 2014 were taken to assess whether a participant had ever attended a university. All measures used here were self-reported by study participants and are presented in what follows. Table 1 summarizes the descriptive statistics, including the percentage of missing values, for each variable; Table 2 reports the zero-order correlations.

Sense of Belonging

To capture sense of belonging at the lower-secondary school level, three items from the PISA survey (year 2000, t_0) were used, beginning with "My school is a place where…" and ending with the statement "I feel like an outsider (or left out of things)," "I feel like I belong," and "I feel awkward and out of place." Respondents assessed the items on a scale ranging from 1 (strongly agree) to 4 (strongly disagree). Where necessary, responses were reverse coded for the purpose of the analysis (Cronbach's α = .67).

To assess sense of belonging at the upper-secondary school level, three items from the TREE survey (year 2002, t_2) were used: "I am proud of my school," "School is a place where

I like to be," and "I want to keep going to school." Respondents assessed the items on a scale ranging from 1 (not at all true) to 4 (entirely true) (Cronbach's α = .77).

Although it would have been ideal to have had identical scales across measurement points, both operationalizations of the construct used items employed in multiple prior studies (Goodenow, 1993; Korpershoek et al., 2020; Voelkl, 1996). The items from the PISA survey have been used widely in research on students in lower-secondary school (Chiu et al., 2016; Cueto et al., 2010; Godor & Szymanski, 2017; OECD, 2003, 2017; Tan et al., 2022), whereas items similar to those used in the TREE survey have been used repeatedly in research on students in upper-secondary school (Demanet & Van Houtte, 2012; D'hondt et al., 2015; Holt & Espelage, 2003; see also Galliher et al., 2004).

Educational Track at the Lower-Secondary Level

The lower-secondary school tracks differ in terms of their academic demands (basic to advanced). Here, they are termed the *low, intermediate,* and *high* track. In addition, there are some comprehensive schools that do not use any formal tracking and instead instruct students of diverse ability and achievement levels together. The four school track types were dummy coded, with comprehensive schools serving as the reference category. This made it possible to compare educational transition probabilities between individuals in comprehensive schools and tracked schools.[1]

Educational Track at the Upper-Secondary Level

At the upper-secondary level, I distinguished between three education types: 1) the *academic* track (*Gymnasium*), which prepares students for tertiary education; 2) the *vocational* track, which combines education in specialized colleges with firm-based training with immediate practical utility and thus prepares students for labor market entry and for colleges of higher education; and 3) *other* education, which refers to various short-term activities, including language courses, internships, and preparatory courses for academic or vocational education; this category also includes individuals who were not in education, employment, or training. The indicator of upper-secondary education was recoded into a dummy variable, with the reference category being the vocational education group, as this group represented the majority (59.8%) of the study participants (see also Supplement Part 1).

University Enrollment

A binary variable was used to evaluate whether a participant had ever attended a university between 2004 and 2014 (the first study participants transitioned into university in 2004).

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[1] Comprehensive schools exist alongside formally tracked schools in 14 out of 26 cantons; hence, there was no systematic confounding of track type and cantons in the analysis. However, note that most students are assigned to a tracked school, with only a minority attending comprehensive nontracked schools (SKBF, 2007). The sample reflects these proportions, with 40% of study participants attending a high track, 32% an intermediate track, 22% a low track, and 6% a comprehensive nontracked school.

Control Variables

The study controlled for sociodemographic characteristics: Sex (0 = female, 1 = male), age (in years), immigrant background (0 = born in Switzerland, 1= born abroad), and parental socioeconomic status, measured using the standard international socio-economic index of occupational status (ISEI) scale (Ganzeboom et al., 1992). Moreover, the PISA reading score was used as a proxy for academic performance (given that reading literacy was measured among all study participants). It captured three major facets of literacy: retrieving information from reading material, interpreting the reading material, and reflecting upon and evaluating this material (*PISA 2000 Technical Report*, 2002). All these variables were assessed when the panel survey began, in the year 2000, when the study participants were in grade 9.

Data Analyses

Missing Data

Missing data represent a challenge in most longitudinal research and potentially limit the generalizability of findings. In the analytic sample, the percentage of missing data (item nonresponse) ranged from 0.0% to 22.0% and amounted to 6.0% on average across items and waves (Table 1). To adjust the estimation of model parameters to the presence of missing data and minimize bias, I used multiple imputation, which replaces missing values with imputed data based on observed data, thereby accounting for the uncertainty associated with missing data (Lang & Little, 2018). This approach enables a more precise estimation of parameters while preserving the variability and associations among study variables and it is therefore considered an ideal method for dealing with missing data (Graham, 2009). Twenty-five imputations were generated, each based on five iterations, using the Multivariate Imputation by Chained Equations (MICE) (van Buuren & Groothuis-Oudshoorn, 2011).

Analytic Strategies

Analysis of variance was performed to assess Hypothesis 1. Moreover, logistic regression models were run to test Hypotheses 2a, 2b, and 3. Specifically, I estimated main effects of students' sense of school belonging and educational track attendance to assess Hypotheses 2a and 2b, and I estimated interactions between the sense of belonging and educational tracks to assess Hypothesis 3. The logistic regression models produced parameter estimates that reflect the conditional average change in the log odds of an outcome that is associated with a one-unit increase in a given predictor. I considered that students were nested in educational tracks at lower- and upper-secondary level, computing cluster-robust standard errors. The results were also expressed as odds ratios and as predicted probabilities, which allow for a substantive interpretation of the coefficient estimates and effect sizes.

Results

Hypothesis 1—Sense of Belonging in Different Educational Tracks

Table 3 reports the means and standard deviations of the sense of belonging scale in the different tracks at lower- and upper-secondary level. Addressing Hypothesis 1, the analysis of variance revealed that the levels of self-reported sense of belonging varied

significantly between lower-secondary school tracks, $F(3, 4955) = 16.09$, $p < .000$. Post-hoc analyses using the Scheffé significance criterion indicated that the average level of sense of belonging was higher in the intermediate track than in the high and low tracks and in nontracked comprehensive schools (all $p < .001$). However, Table 3 also reveals both substantial within-track variation and between-track overlaps in the distributions of the sense of belonging.

Moreover, the analysis of variance indicated significant differences in the sense of belonging between different tracks at upper-secondary level, $F(2, 3959) = 164.85$, $p < .000$. Scheffé post-hoc analyses suggested that, on average, students in the upper-secondary academic track exhibited a stronger sense of belonging than their counterparts in vocational and other education, respectively (both $p < .001$). Table 3 illustrates these mean differences while also showing the overlaps in the distributions of sense of belonging between tracks.

Hypotheses 2a and 2b—Sense of Belonging and Educational Trajectories

Logistic regression models were estimated to test Hypotheses 2a and 2b, stating that students with a stronger sense of school belonging would be more likely to transition into academic upper-secondary education (2a) and into university (2b) than their counterparts with a weaker sense of school belonging. These models accounted for educational track attendance and observable potential confounders (sex, age, immigrant status, academic performance, and parental SES). Model 1 (see Table 4) confirms Hypothesis 2a. It reveals that the sense of belonging at t_0 was significantly positively related to students' probability of transitioning into academic upper-secondary education ($p < .001$), even when controlling for all other variables. Model 3 (see Table 5) confirms Hypothesis 2b. It reveals that the sense of belonging at upper-secondary school level (i.e., at t_2) was significantly positively related to students' probability of transitioning university ($p < .001$), even when controlling for all other variables.

Hypothesis 3—Interplay Between the Sense of Belonging and Educational Tracks

Models 2 and 4 were run to test Hypothesis 3 which posited that the benefits of a sense of school belonging for educational trajectories would vary as a function of the educational tracks that individuals follow (see Tables 4 and 5). Specifically, these models estimated interactions between the sense of school belonging and educational track attendance. In addition, Figures 2 and 3 show the results from these models as predicted probabilities, illustrating the extent to which educational transition probabilities differed as a function of the sense of school belonging and educational track attendance.[2]

Trajectories from Lower- to Upper-Secondary Education

Model 2 (Table 4) shows significant interactions between the sense of school belonging at t_0 and track attendance in an intermediate or low track, providing evidence in

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[2] The predicted probabilities reflect the results for respondents with baseline characteristics on the binary variables and average values on continuous variables. While comparisons across groups are complicated by the fact that group sizes differ, the 95% confidence intervals provide the estimated ranges of values that are likely to include the true transition probabilities in the respective populations. For the sake of completeness, Supplement Part 2 provides an overview of the percentages of students who transitioned from a given track at the lower-secondary level to a given track at the upper-secondary level, and from there into university.

support of Hypothesis 3. These interactions document that the benefits of a sense of school belonging for a trajectory to academic upper-secondary education depended to some extent on the track that individuals attended at lower-secondary level. To facilitate the interpretation of these results, Figure 2 illustrates the interactions on a probability scale. It shows that students from a high track were substantially more likely to transition into academic upper-secondary education than their counterparts from comprehensive nontracked schools, intermediate tracks, and low tracks—irrespective of their sense of school belonging. However, in any given educational track, students with a stronger sense of belonging were more likely to transition into academic upper-secondary education, but the association between the sense of belonging and that transition probability was stronger for students in the high track and in nontracked comprehensive schools than for those in the intermediate and low tracks. Simple slopes analysis confirmed these findings, showing that the sense of school belonging was strongly associated with the probability of transitioning to academic upper-secondary education for students in the high track (OR = 1.100, 95% CI [1.063, 1.138], p < .001) and for students in comprehensive (nontracked) school (OR = 1.153, 95% CI [1.062, 1.251], p < .001). However, the sense of school belonging was only weakly associated with the probability of transitioning to academic upper-secondary education for students in the intermediate track (OR = 1.015, 95% CI [1.003, 1.026], p < .05), and it was not significantly associated with that probability for students in the low track (OR = 1.003, 95% CI [0.981, 1.025], p = .813).

It is also particularly noteworthy how the transition probabilities differed across tracks when comparing students with equivalent levels of school belonging (see Figure 2). For instance, students who reported the strongest possible sense of belonging in a high track were estimated to be 8.4 times more likely to transition into academic upper-secondary education than their counterparts in a low track (59% vs. 7%). Moreover, they were almost 2.0 times more likely to transition into academic upper-secondary school than their counterparts in comprehensive schools (30%) and 3.9 times more likely than their counterparts in an intermediate track (15%). Taken together, these results provide evidence in support of Hypothesis 3, showing that the benefits of a sense of belonging for academic educational trajectories varied considerably as a function of the educational tracks that individuals followed.

Trajectories from Upper-Secondary Education to University

Model 4 (Table 5) provides further evidence in support of Hypothesis 3, showing that the benefits of a sense of school belonging for a trajectory to university depended on the track that individuals followed. This finding is reflected in the significant interaction between the sense of belonging at t_2 and academic-education track attendance. It is also shown in Figure 3, which illustrates that the sense of school belonging mattered for students' probability of transitioning into university—but only for those students who pursued academic upper-secondary education. Their transition probabilities were estimated to range from 33% to 73% as a function of the level of school belonging. In contrast, among students who had pursued vocational or other education, the probability of transitioning into university was low almost irrespective of their sense of school belonging. It was estimated to range from roughly 2% to 7% for those in vocational education, and from 3% to 13% for those in other education, depending on their level of belonging. Simple slopes analysis confirmed these findings,

providing evidence that the sense of school belonging was significantly associated with students' probability of transitioning into university for students in academic upper-secondary education (OR = 2.012, 95% CI [1.627, 2.494], $p < .001$), but not for students in vocational education (OR = 1.203, 95% CI [0.879, 1.665], $p = .255$) or in other education (OR = 1.904, 95% CI [0.339, 10997.93], $p = .322$). Thus, the benefits of a sense of belonging for academic trajectories seemed to vary considerably as a function of the educational tracks that individuals followed.

Discussion

Educational trajectories involve transitions from one level to the next. These transitions represent important developmental tasks that may have long-term consequences for individuals' future development. The current study analyzed the extent to which educational trajectories result from an interplay between individuals' sense of school belonging and the channeling structure of educational tracks in an education system that offers multiple, qualitatively different tracks leading to a given educational destination. The study was informed by a growing body of evidence suggesting that the sense of school belonging generally promotes academic attainment (Murphy et al., 2020; Slaten et al., 2016). It was also guided by life-course and life-span developmental psychological theories claiming that individuals and contexts are inextricably linked, challenging assumptions about the universality of the benefits of psychological resources for attainment processes and stressing that individuals and institutional contexts jointly contribute to individual attainment (Baltes et al., 2006; Lerner & Damon, 2006). With this in mind, the study examined whether the sense of school belonging differed between educational tracks; whether that sense of belonging was associated with individuals' probability of further following or transitioning into academic tracks; and whether the implications of the sense of belonging were contingent upon the educational tracks that individuals attended.

The findings provided some support for Hypothesis 1, showing that the sense of school belonging differed between educational tracks. The largest difference was between students in academic and vocational upper-secondary tracks, with those in the academic track reporting higher levels of sense of belonging on average. This is consistent with prior findings indicating that students in vocational schools perceive lower levels of belonging than their counterparts in academic schools (Smerdon, 2002; Van Houtte & Van Maele, 2012), potentially because students in vocational schools suffer from status deprivation as a result of being on a less academic path (Berends, 1995). However, it is critical to note that there was considerable variation in the sense of belonging within different educational tracks and that the distributions of the sense of belonging overlapped substantially between tracks, highlighting that a simplistic focus on mean-level differences is clearly misleading.

The findings also supported Hypotheses 2a and 2b, showing that students with a stronger sense of school belonging were significantly more likely to transition into academic upper-secondary education and ultimately into university than their counterparts with a weaker sense of school belonging. For instance, regarding students from a high track at the lower-secondary level, recall that those with the weakest possible sense of belonging had an estimated 38% probability of subsequently transitioning into academic upper-secondary education. In contrast, those with the strongest possible sense of belonging were estimated to

have a 59% transition probability. Similarly, among students in academic upper-secondary education, the estimated probabilities of transitioning into university ranged from 33% to 73%, depending on how strong the sense of school belonging was. Thus, how individuals moved through the education system partly depended on the extent to which they felt that they belonged in that system.

However, while the sense of belonging mattered, educational tracks also structured educational trajectories to a considerable extent, and they moderated any potential effect that the sense of belonging had on educational trajectories. These findings are in line with Hypothesis 3, revealing that the benefits of a strong sense of belonging for academic educational trajectories are constrained by institutional structures. Students with equivalent levels of belonging exhibited quite different probabilities of moving into academic upper-secondary and university education, depending on the educational paths they previously followed. For instance, students with a particularly strong sense of belonging in a high track were over eight times more likely to move into academic upper-secondary education than their counterparts in a low track who reported identical levels of belonging, even when controlling for observable potential confounders. Similarly, students with a strong sense of belonging in academic upper-secondary education were estimated to be roughly nine times more likely than their counterparts in vocational education to ever make it into a university over a ten-year period following completion of upper-secondary education.

These results illustrate an essential principle of life-course and life-span developmental psychological theories—that institutional structures open up and constrain opportunities unevenly, leading to unequal developmental outcomes (Baltes, 1987; Burger & Mortimer, 2021; Heckhausen & Buchmann, 2019). Students on academic paths were more likely than those on vocational paths to further pursue their academic trajectories. For them, the benefits of a sense of school belonging were also stronger than for their counterparts on vocational paths. This challenges the view that the sense of school belonging is universally beneficial for educational outcomes across different contexts. Clearly, psychological resources alone are not sufficiently powerful to overcome structural obstacles to educational attainments, although developmental research has long emphasized the important role of such resources for later attainment (e.g., Grabowski et al., 2001; Murphy et al., 2020; Schoon et al., 2021). Individual psychological resources may influence attainment only when opportunity structures allow it (Goyer et al., 2021) and their impact on educational trajectories is likely comparatively negligible for those who are progressing within education systems that strongly channel such trajectories.

However, the current study also suggests that while the sense of school belonging cannot unleash its full effects in some institutionalized pathways, a lack of sense of school belonging is consistently associated with a decreased likelihood of moving along academic paths. When children feel uncertain about belonging in school, they do not take full advantage of the educational opportunities provided to them and are consequently less likely to transition into or follow academic tracks. A low sense of belonging was associated with a reduced likelihood of following an academic trajectory among students in any educational track. It is therefore crucial to reduce alienation from school to help students who feel out of place benefit more from available learning opportunities and reach their full academic potential (Murphy & Zirkel, 2015; Walton & Cohen, 2011). This can be achieved by creating a

supportive and caring school environment, where acceptance and inclusion are promoted, students' diverse views and backgrounds are embraced as a resource (Schachner et al., 2019), students' right to participate is guaranteed (Burger, 2017, 2019), discriminatory behavior is sanctioned, and hence a feeling of group membership and of being valued is fostered (O'Keeffe, 2013).

Limitations and Recommendations for Further Research

This study is not without limitations. First, although the study used a longitudinal design and controlled for observable confounders, the findings provide evidence consistent with, but not unambiguously establishing, causal associations between the sense of belonging and institutional channels on the one hand and educational transition probabilities on the other. Bidirectional causality cannot be excluded; in fact, we might expect reciprocal effects between students' attendance in a given track and the development of their sense of school belonging. An intensive longitudinal study with multiple observations of the sense of school belonging across, for instance, a school year would allow for testing such reciprocal effects. Moreover, a field experiment in which students would be assigned randomly to different tracks would also allow researchers to estimate causal effects more accurately. However, because such an experiment would present important ethical challenges, the value of longitudinal observational data is substantial, especially in light of the comparatively greater ecological validity of findings resulting from a large-scale sample.

Second, this study used a standardized measure of academic performance measured at a single time point, t_0. Ideally, future research should evaluate academic performance repeatedly over the course of schooling. This would allow researchers to assess whether academic performance differentially predicts transition probabilities at different stages of an educational career.

Third, the scales measuring the sense of belonging in lower- and upper-secondary education relied on different indicators, reflecting somewhat distinct facets of the sense of belonging. It would have been ideal to have had identical measures to achieve greater comparability across measurement points. However, both the indicators and the scales were positively correlated, and there is little reason to assume that the findings are specific to the operationalization of the constructs given that both scales used items employed in prior research on sense of belonging (Korpershoek et al., 2020).

Fourth, the ideal time point to measure sense of belonging during upper-secondary education was in 2002, when most students pursued either academic or vocational upper-secondary education, rather than interim options. However, individuals' sense of belonging in upper-secondary education fluctuated to some extent between 2001 (when the first study participants started upper-secondary education) and 2004 (when the first participants transitioned into university). Yet, the sense of belonging was moderately to strongly positively correlated across the three waves from 2001 to 2003 ($r_{t1\text{-}t2} = .543$, $r_{t2\text{-}t3} = .627$, and $r_{t1\text{-}t3} = .450$), suggesting that the sense of belonging was comparatively stable in the time period during which study participants pursued upper-secondary education.

Fifth, among students in vocational education, the sense of school belonging was not significantly associated with the probability of subsequently enrolling in university. While this may be a consequence of the education system's channeling effects, it is also possible

that, for these students, a strong sense of school belonging amounted to identifying strongly with their vocational education, which did not prepare them for an academic career and thus could not necessarily be expected to predict the probability of a subsequent transition into university. However, because students in vocational tracks retain the opportunity to embark on an academic track, as occurred in some cases considered here, it was nonetheless important to examine the extent to which their sense of school belonging was related to their probabilities of later switching to an academic path.

Sixth, the TREE panel survey followed individuals across a 15-year period. The study participants pursued educational and occupational trajectories in a wide range of schools and in many different regions across the country. Importantly, these trajectories diverged substantially across the observation period. Against this background, the survey did not collect information about the specific schools that participants attended or their residential districts over time. Consequently, the present study could not take into account potential clustering of study participants in schools or districts over time.

Seventh, a main goal of this study was to examine whether educational tracks moderate the benefits of a sense of school belonging for educational trajectories. The findings suggest that this is the case. They indicate, for instance, that in nonacademic tracks, the sense of school belonging only weakly predicted subsequent trajectories to academic tracks and into university, whereas in academic tracks, the sense of belonging strongly predicted subsequent academic trajectories. At the same time, it is important to keep in mind that academic tracks also had a protective function for students with a low sense of school belonging, leading those students to academic destinations even if they felt to some extent alienated from school.[3] Finally, it is noteworthy that a sense of belonging in *nonacademic* tracks might be highly relevant to vocationally-oriented trajectories, which could be explored in future research.

Conclusions

How students progressed through the education system depended in part on whether they felt that they belonged in that system. A stronger sense of school belonging was associated with a higher probability of moving along or transitioning into academic tracks. Yet the benefits of a strong sense of school belonging were restricted by the institutional structure. While a sense of belonging mattered substantially for academic trajectories among students who had already embarked on an academic path earlier in their educational career, it mattered much less for those who were following less academic tracks. The education system partially channeled educational trajectories in diverging directions and hence moderated the influence that the sense of school belonging could have on academic trajectories. Students who initially followed nonacademic tracks were much less likely to pursue their education up to university, even when they exhibited identical levels of school belonging as their counterparts in academic tracks. Overall, the findings are consistent with life-course and life-span developmental psychological theories suggesting that developmental outcomes are associated with both individual and contextual characteristics and further showing that

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[3] For instance, inspection of Figure 2 indicates that high-track students with the *weakest* possible sense of belonging were, on average, still more likely to transition into academic upper-secondary education (38%) than those with the *strongest* possible sense of belonging in comprehensive nontracked schools (30%), intermediate tracks (15%), and low tracks (7%)

education systems enable and constrain academic trajectories differentially for students on different paths. The findings also indicate that psychological resources may only benefit students to the extent that educational institutions provide opportunity structures within which the influence of those resources can take effect.

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Table 1

Descriptive Statistics (Based on Nonimputed Data)

Variable	Measured in	M	SD	Min.	Max.	N	% missing values
Male	2000	0.44		0	1	4,986	0.00
Age	2000	15.50	0.64	11.83	19.00	4,974	0.24
First-generation immigrant	2000	0.13		0	1	4,962	0.48
Academic performance (reading)	2000	519.97	85.12	27.60	884.49	4,982	0.08
Socioeconomic status (SES)	2000	51.00	16.25	16.00	90.00	4,614	7.46
Lower-secondary education	2000					4,984	0.04
High track		0.40		0	1		
Intermediate track		0.32		0	1		
Low track		0.22		0	1		
No tracking		0.06		0	1		
Sense of belonging t_0	2000						
I feel like an outsider		3.61	0.69	1	4	4,928	1.16
I feel like I belong		2.99	0.89	1	4	4,893	1.87
I feel awkward, out of place		3.37	0.80	1	4	4,899	1.74
Upper-secondary education	2002					4,640	6.94
Vocational education		0.60		0	1		
Academic education		0.34		0	1		
Other education		0.06		0	1		
Sense of belonging t_2	2002						
Proud of my school		2.96	0.75	1	4	3,920	21.38
Like to be at school		2.89	0.80	1	4	3,932	21.14
Want to keep going to school		3.21	0.86	1	4	3,887	22.04
Tertiary education	2004-2014					4,986	0.00
University		0.26		0	1		

Note. N refers to the number of observations present in the dataset ($N_{complete}$ = 4,986). First-generation immigrant signifies individuals born abroad. "Other education" refers to activities as described in the *Measures* section. Note that all study participants were first surveyed when they attended grade 9, in the year 2000. At that time, 82.5% of the participants were between 14 and 16 years of age.

Table 2
Zero-Order Correlations (Based on Nonimputed Data)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
2	.056**													
3	.004	.121**												
4	-.129**	-.122**	-.247**											
5	.007	-.135**	-.142**	.293**										
6	-.043**	-.036*	-.079**	.394**	.271**									
7	.002	.020	-.040**	-.007	-.036*	-.555**								
8	.046**	.043**	.135**	-.429**	-.248**	-.438**	-.366**							
9	.003	-.042**	.005	-.044**	-.057**	-.205**	-.172**	-.135**						
10	-.017	.106**	-.039**	.084**	-.008	-.021	.081**	-.026	-.069**					
11	.110**	.155**	.004	-.333**	-.286**	-.440**	.218**	.261**	.029*	-.005				
12	-.079**	-.209**	-.054**	.419**	.342**	.512**	-.240**	-.316**	-.039**	.031*	-.882**			
13	-.070**	.099**	.099**	-.151**	-.095**	-.115**	.029*	.094**	.019	-.054**	-.305**	-.181**		
14	-.067**	-.117**	.017	.113**	.088**	.129**	-.053**	-.076**	-.037*	.116**	-.259**	.276**	-.056**	
15	-.016	-.174**	-.065**	.373**	.307**	.392**	-.154**	-.266**	-.039**	.027	-.621**	.711**	-.141**	.157**

Note. 1 = Male; 2 = Age; 3 = First-generation immigrant; 4 = Academic performance (reading); 5 = Socioeconomic status (SES); 6 = High track; 7 = Intermediate track; 8 = Low track; 9 = No tracking; 10 = Sense of belonging at t_0; 11 = Vocational education; 12 = Academic education; 13 = Other education; 14 = Sense of belonging at t_2; 15 = University. Pearson coefficients are provided for correlations between continuous variables, point-biserial coefficients for correlations that include a dichotomous variable, and Phi coefficients when two dichotomous variables are involved.
* $p < .05$, ** $p < .01$.

Table 3

Descriptive Statistics of the Sense of Belonging in Different Tracks

| | Lower-secondary track | | | | Upper-secondary track | | |
| | High | Intermediate | Low | Nontracked | Academic | Vocational | Other |
	M(SD)	M(SD)	M(SD)	M(SD)	M(SD)	M(SD)	M(SD)
Sense of belonging	3.20 (0.61)	3.28 (0.61)	3.18 (0.62)	3.04 (0.62)	3.26 (0.57)	2.88 (0.68)	2.72 (0.71)

Note. Means and standard deviations (SD) of the sense of belonging scale scores.

Table 4

Logistic Regression Predicting the Probability to Transition to Academic Upper-Secondary Education

	Model 1				Model 2			
	Estimate	95% CI	OR	95% CI	Estimate	95% CI	OR	95% CI
Male	-0.025*	[-0.049, -0.001]	0.975*	[0.952, 0.999]	-0.024*	[-0.048, 0.000]	0.976*	[0.953, 1.000]
Age	-0.109***	[-0.128, -0.090]	0.897***	[0.880, 0.914]	-0.109***	[-0.129, -0.090]	0.896***	[0.879, 0.914]
First-generation immigrant	0.097***	[0.062, 0.132]	1.102***	[1.064, 1.141]	0.093***	[0.058, 0.128]	1.098***	[1.060, 1.137]
Academic performance	0.001***	[0.001, 0.001]	1.001***	[0.001, 0.001]	0.001***	[0.001, 0.001]	1.001***	[1.001, 1.001]
Socioeconomic status	0.005***	[0.004, 0.005]	1.005***	[1.004, 1.005]	0.004***	[0.004, 0.005]	1.004***	[1.004, 1.005]
Sense of belonging t_0	0.035***	[0.016, 0.055]	1.036***	[1.016, 1.056]	0.115**	[0.036, 0.192]	1.122**	[1.037, 1.214]
High track (ref. = compr. school)	0.254***	[0.201, 0.306]	1.289***	[1.223, 1.358]	0.241	[-0.026, 0.508]	1.272	[0.974, 1.661]
Intermediate track (ref. = compr. school)	-0.108***	[-0.160, -0.056]	0.897***	[0.852, 0.946]	0.437**	[0.166, 0.707]	1.547**	[1.181, 2.028]
Low track (ref. = compr. school)	-0.111***	[-0.165, -0.058]	0.895***	[0.848, 0.949]	0.238	[-0.040, 0.516]	1.269	[0.961, 1.675]
High track : Sense of belonging t_0					0.001	[-0.084, 0.085]	1.001	[0.920, 1.089]
Intermediate track : Sense of belonging t_0					-0.172***	[-0.257, -0.086]	0.842***	[0.773, 0.918]
Low track : Sense of belonging t_0					-0.114*	[-0.202, -0.025]	0.893*	[0.817, 0.975]

Note. Parameter estimates with 95% confidence intervals and corresponding odds ratios (OR) with 95% confidence intervals. Reference group = Comprehensive (nontracked) schools.

* $p < .05$, ** $p < .01$, *** $p < .001$ (two-tailed tests).

Table 5

Logistic Regression Predicting the Probability to Transition to University

	Model 3				Model 4			
	Estimate	95% CI	OR	95% CI	Estimate	95% CI	OR	95% CI
Male	0.042***	[0.023, 0.061]	1.043***	[1.024, 1.063]	0.042***	[0.023, 0.061]	1.043***	[1.024, 1.063]
Age	-0.023**	[-0.038, -0.007]	0.978**	[0.963, 0.993]	-0.022**	[-0.038, -0.007]	0.978**	[0.963, 0.993]
First-generation immigrant	0.012	[-0.016, 0.040]	1.012	[0.984, 1.041]	0.016	[-0.012, 0.044]	1.016	[0.988, 1.045]
Academic performance	0.001***	[0.000, 0.001]	1.001***	[1.000, 1.001]	0.001***	[0.000, 0.001]	1.001***	[1.000, 1.001]
Socioeconomic status	0.002***	[0.001, 0.003]	1.002***	[1.001, 1.003]	0.002***	[0.001, 0.003]	1.002***	[1.001, 1.003]
Sense of belonging t_2	0.042***	[0.027, 0.058]	1.043***	[1.028, 1.059]	0.011	[-0.007, 0.028]	1.011	[0.993, 1.029]
Other education (ref. = voc. educ.)	-0.003	[-0.065, 0.058]	0.997	[0.937, 1.060]	0.014	[-0.162, 0.190]	1.014	[0.850, 1.209]
Academic education (ref. = voc. educ.)	0.535***	[0.500, 0.571]	1.708***	[1.649, 1.770]	0.176**	[0.062, 0.291]	1.193**	[1.064, 1.338]
Other education : Sense of belonging t_2					-0.005	[-0.068, 0.057]	0.995	[0.934, 1.059]
Academic education : Sense of belonging t_2					0.115***	[0.080, 0.150]	1.122***	[1.084, 1.161]

Note. Parameter estimates with 95% confidence intervals and corresponding odds ratios (OR) with 95% confidence intervals. Reference group = vocational education.

* $p < .05$, ** $p < .01$, *** $p < .001$ (two-tailed tests).

Figure 1

Illustration of the Key Features of the Education System
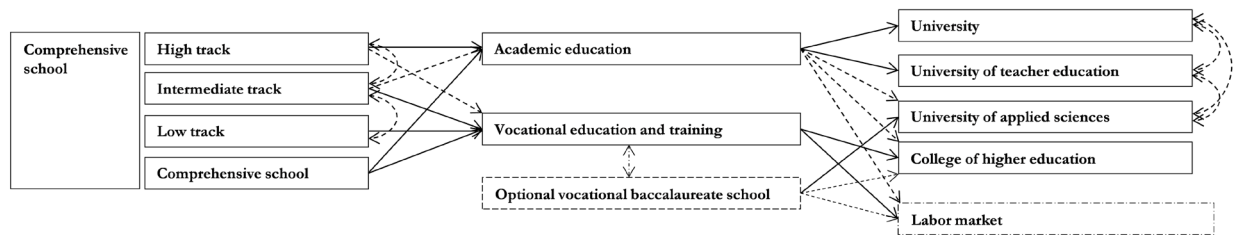
| Primary level	Lower secondary level	Upper secondary level	Tertiary level
Grades 1 – 5/6	Grades 6/7 – 9	Grades 10 – 12/13	Following grade 12/13

Note. Primary school is comprehensive, instructing pupils of all performance and ability levels using a common curriculum. The lower-secondary level consists of different educational tracks, which vary in their academic demands (high, intermediate, and low), and comprehensive schools that use no formal tracking. The upper-secondary level is divided into academic education and vocational education and training. Typically, direct admission to the academic upper-secondary track requires successful completion of a high track at the lower-secondary level. Yet it is also possible to take indirect paths to the academic upper-secondary track. Solid arrows denote typical (widespread) educational trajectories. Dashed arrows represent more atypical trajectories. Dashed curved double-headed arrows illustrate options to transition between tracks. These transition options are available to students who meet certain requirements or pass supplementary exams. Depending on the canton, primary school consists of either five or six grades. Lower-secondary education consists of three or four grades, up to grade nine. Upper-secondary education consists of three or four grades. While the structure of the system differs somewhat between and within subnational administrative units (cantons), the main features are identical in all parts of the country (SKBF, 2007). Illustration adapted with permission from "Human agency in educational trajectories: Evidence from a stratified system," by K. Burger, 2021, *European Sociological Review*, 37(6), p. 954. Copyright 2021 by Oxford University Press.

Figure 2

Predicted Probabilities of Attending Academic Education at the Upper-Secondary Level, as a Function of Lower-Secondary Track Attendance and Self-Reported Sense of Belonging
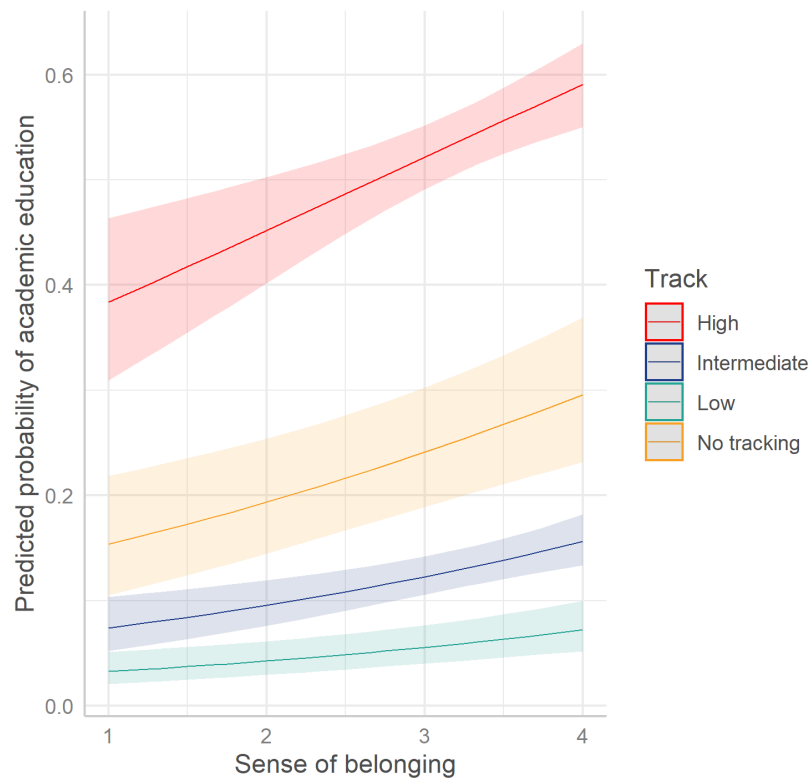
Note. 95% confidence intervals are shown. $N_{\text{high track}} = 1,989$ (red (top) line); $N_{\text{intermediate track}} = 1,578$ (blue line (third from top)); $N_{\text{low track}} = 1,118$ (green (bottom) line), $N_{\text{no tracking}} = 297$ (yellow line (second from top)).

Figure 3

Predicted Probabilities of Attending University Within a Period of up to Ten Years after Completion of Upper-Secondary Education, as a Function of the Type of Upper-Secondary Education Pursued and Self-Reported Sense of Belonging
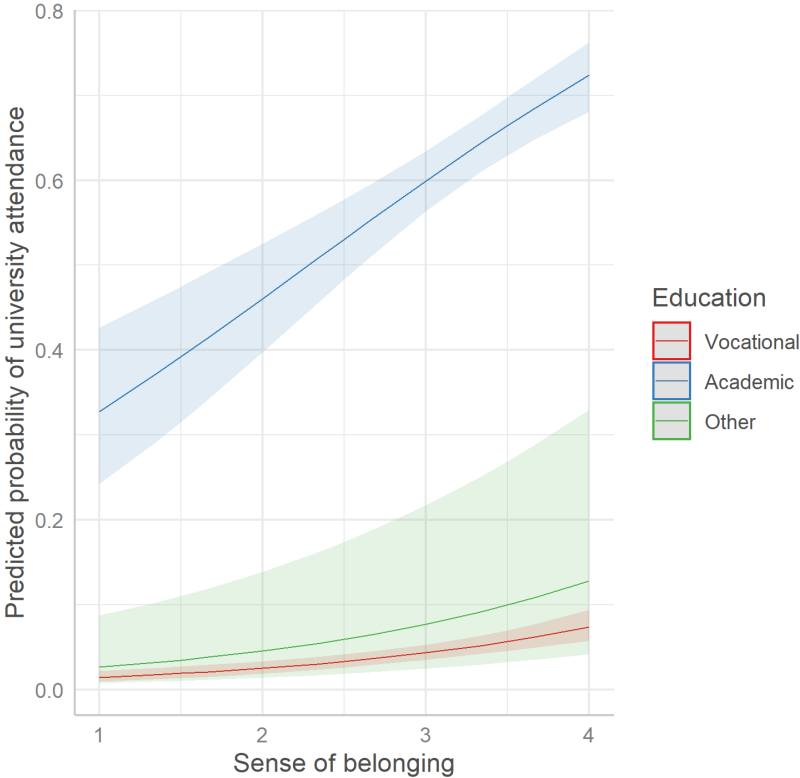
Note. 95% confidence intervals are shown. $N_{\text{academic education}}$ = 1,591 (blue (top) line); $N_{\text{vocational education}}$= 2,776 (red (bottom) line); $N_{\text{other education}}$ = 273 (green (middle) line).