



OPEN ACCESS

EDITED BY

Weifeng Han,
Flinders University, Australia

REVIEWED BY

Anca Lustrea,
West University of Timișoara, Romania
Raphael Koßmann,
Regionales Landesamt für Schule und Bildung
Hannover, Germany

*CORRESPONDENCE

Giuliana Pastore
✉ giuliana.pastore@phzh.ch

RECEIVED 24 April 2025

ACCEPTED 26 June 2025

PUBLISHED 16 July 2025

CITATION

Pastore G, Kassis W, Kunz A and
Luder R (2025) Patterns of student
socio-emotional development and teacher-student-relationship-quality for high-school students with and without special educational needs: a multigroup latent transition analysis approach for low and high selective schools.
Front. Educ. 10:1617527.
doi: 10.3389/feduc.2025.1617527

COPYRIGHT

© 2025 Pastore, Kassis, Kunz and Luder. This is an open-access article distributed under the terms of the [Creative Commons Attribution License \(CC BY\)](https://creativecommons.org/licenses/by/4.0/). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

Patterns of student socio-emotional development and teacher-student-relationship-quality for high-school students with and without special educational needs: a multigroup latent transition analysis approach for low and high selective schools

Giuliana Pastore^{1*}, Wassilis Kassis², André Kunz¹ and
Reto Luder¹

¹Centre of Inclusion and Health in Schools, Department of Research and Development, Zurich University of Teacher Education, Zurich, Switzerland, ²Department of Research and Development, University of Applied Sciences and Arts Northwestern Switzerland, Windisch, Switzerland

Introduction: A positive socio-emotional development of students within the school context lies basically in their perception of wellbeing, social inclusion and academic self-concept. The teacher-student-relationship-quality (TSRQ) plays here a key role, especially for students with special educational needs (SEN). There is empirical evidence that student development and TSRQ are linked in various ways to different types of SEN, and that the school model (low versus highly selective) can shape them differently. For this reason, the question was addressed whether different patterns of student development and TSRQ can be longitudinally identified. In addition, we tested whether having SEN or being in a high vs. low selective schools make a difference for the composition of each profile.

Methods: To this end, latent class (LCA) and latent transition analyses (LTA) were conducted with longitudinal data from a three-waves (2019, 2020, and 2021) questionnaire study with $N = 807$ junior high school students in Switzerland.

Results: Four similar patterns could be identified in both low and high selective schools: “happy” students, feeling generally well (emotionally, socially and cognitively) and well-supported by teachers; “unhappy” students, not feeling well and not supported, “teacher-oriented” students, not feeling well but well-supported by teachers, and finally “unstable” students, drastically changing their perceptions of wellbeing, inclusion and self-concept over time but consistently feeling less reliance on teachers. Particularly striking is the result showing that high selective schools “produce” more “unhappy” (58.2%) than “happy” students (32.8%) whereas in low selective schools 67.2% of the students are “happy.” Further, school-selectivity can significantly explain the probability to fall into the profile “unhappy” in high selective schools and “teacher-oriented” in low selective schools. Having SEN can significantly predict the profiles “unhappy” and “teacher-oriented” in low selective schools but is not predictive for the profile “unstable.” In high selective schools it seems to be irrelevant whether students have SEN or not for the likelihood of being in any profile.

KEYWORDS

teacher-student-relationship-quality, SEN, school selectivity, latent-class-analysis, latent-transition-analysis, student socio-emotional development

1 Introduction

Three important aspects for a virtuous circle of student socio-emotional development are their emotional wellbeing, their social inclusion and their academic self-concept. To safeguard these important factors, students should be able to rely on teachers' emotional and cognitive support as qualitative indicators of a strong relationship (Pastore and Luder, 2021). Indeed, the kind of relationship teachers build with their students has a big impact both on the individual development of students (Vandenbroucke et al., 2018; Ansari et al., 2020) and on classroom dynamics and peer relationships (Allen et al., 2018; Nicolay and Huber, 2021; Endedijk et al., 2022). A good and affectionate teacher-student-relationship, that is when students perceive their teacher as caring and attentive, leads to students' wellbeing (Hoferichter and Raufelder, 2022; Vösgen-Nordloh et al., 2023), to positive emotions at school (Goetz et al., 2021; Decristan et al., 2022) and a positive attitude toward school (Allen et al., 2018; Longobardi et al., 2021); it fosters pro-social behavior and better emotion regulation (Lei et al., 2016, 2018; Bolz and von Duering, 2022) as well as better participation and social inclusion (Wullschlegel et al., 2020; Nicolay et al., 2024); it increases self-concept (Zdoupas, 2022) and motivation (Roorda et al., 2017; Shin and Chang, 2022). On the contrary, when teacher-student-relationships are strained and conflictual students lose interest and become more anxious, stressed and bored as well as more at risk to be isolated (Clem et al., 2021; Nicolay and Huber, 2021; Hoferichter and Raufelder, 2022; Shin and Chang, 2022). Further, conflicts and negative expectations of teachers lead to increased students' mental health problems (Vösgen-Nordloh et al., 2023) and lower academic achievement (Rubie-Davies, 2010; Rubie-Davies and Hattie, 2025).

The teacher-student-relationship-quality (TSRQ) is for students with special educational needs (SEN) and more specifically those with social and emotional behavioral difficulties even more important (Hamre and Pianta, 2001; Sankalaite et al., 2021; Pastore, 2023). Studies found the strongest effects of TSRQ on vulnerable and disadvantaged children with weaker executive functions skills and low social economic status. That means that specially students at risk, so those with "weak" starting points, benefit the most from school interventions which focus on enhancing teacher's emotional support (Sankalaite et al., 2021; ten Braak et al., 2024). This finding appears particularly important in light of the results of Janschewski et al. (2024), which illustrate that school-avoidant behavior, social withdrawal and social difficulties of students have the strongest predictive power for psychological problems and thus proved to be significantly more predictive than academic performance, school disengagement, or aggressive-oppositional behavior. These manifestations, typical for internalizing behavioral problems are often overlooked and underestimated by teachers, who focus their attention more on learning behavior and difficulties or on externalizing behavioral problems: The ones who do not "disturb" lessons or experience bullying at school are considered less important and receive less attention by teachers (Janschewski et al., 2024). The

authors emphasize how important it is to raise teachers' awareness on the early recognition of symptoms like school avoidance or social withdrawal as psychological difficulties to be taken seriously. Ward et al. (2010) found that teachers' ratings of students' academic competencies, self-concept, the number of negative comments, social skills, critical events, peer ratings, self-image, and loneliness were the strongest predictors of depression in early adolescence. The authors underline that 25% of students can be considered as being at-risk for early depression and academic failure at the time of their transition into middle school and identified as being at greater risk for depression in late adolescence and adulthood (Ward et al., 2010). School dissatisfaction seems also to be closely linked to bullying and externalizing behavior problems (Bäker et al., 2024). In this context Bolz (2021) found that specific the teacher's emotional support has direct effects on emotion regulation strategies and these have a direct impact on externalizing and internalizing behavioral problems. In this sense the teacher's emotional support has a significant impact on students' behavior by enhancing their emotion regulation strategies, thus it has a protective role for students at risk (Vandenbroucke et al., 2018). However, having SEN has been found to be a potential disadvantage for a good relationship with teachers (Bosman et al., 2022) and with peers (Østvik et al., 2018), which put those students with SEN at greater risk to be isolated and victimized. Research could show a systematic correlation between having SEN, students' exclusion and a poor TSRQ (Huber, 2011; Nicolay et al., 2024), highlighting the "teachers' invisible hand" both for the individual student development and for peers class interactions (Endedijk et al., 2022). In this sense the quality of students' school experiences and their patterns of development are strongly linked to the relationship quality with the teachers, but this can change when relating to students who have SEN.

As differences in the quality of the teacher-student-relationship have a big impact on students, it is important to detect possible factors that may shape this quality. We argue that school selectivity could be one of them for the following reasons. Educational research has shown that selective systems, where performance is implicitly considered as a sole student responsibility, empirically have a negative impact on students' emotional experiences and their overall academic performance (OECD, 2023). As embedded in this kind of value systems, teachers in selective systems may tend to create more pressure to perform, foster more competition and be less willing to invest in the relationship with students or provide them with emotional support (Gasser et al., 2017; Civitillo et al., 2021; Xu et al., 2023). Research could show that competitive orientation, anxiety, and school burnout were significantly higher in competitive schools compared to the non-competitive ones, and this has a strong negative impact on students' wellbeing (Fülöp et al., 2025). Other studies focused on the negative impact of highly selective school environments on the academic self-concept, providing evidence that the academic self-concept of all students decreases, no matter whether having SEN or not. In comparison, in less selective schools, where learning processes are more likely to be individually fostered and prioritized over performance outcomes, students' academic

self-concept develops higher (Luder et al., submitted). Also, specific research on academic self-concept of students with SEN highlights the lower self-concept of those students who attend schools with higher performance pressure and teachers' behavior perceived as predominantly performance oriented. In comparison the academic self-concept of students with SEN is higher in those schools, where they perceive their learning environment, and more specific their teachers' behavior as caring and social inclusive (Zdoupas and Laubenstein, 2023). As well the study of Kocaj et al. (2020) reports that neither achievement nor class composition can explain self-concept differences between students with and without SEN. They assume that factors like the TSRQ and the quality of his/her teaching and instruction can probably make the difference. In this sense the learning environment in form of explicit or implicit teacher's feedback on students' performance, social comparison processes in the classroom context, culturally and contextually determined standards of comparison (dominant frame of reference and values) can change in dependence of the school models and have a big influence on how the academic self-concept develops in terms of increase or decrease (Kocaj et al., 2020; Douma et al., 2022; Nicolay et al., 2024).

The negative impact of selective systems mostly affects less privileged students (e.g., low SES, migration background) and those with SEN (Gasser et al., 2017; Sahli Lozano et al., 2023). Having SEN in selective systems has been found to be a hardly surmountable barrier to higher educational pathways (Neuenschwander and Nägele, 2017). Indeed, the quality of the reached learning competencies of students with SEN remains lower especially when they are educated in separated settings as special classes or schools, whereas their mastery grows bigger in inclusive settings (Bless, 2018; Törmänen and Roebbers, 2018). The teacher's attitude toward a low pressure to perform, but oriented to promote mastery in students in an error-friendly and supporting feedback culture has a positive impact both on classroom structures and on students' emotions (Wang et al., 2017; Mainhard et al., 2018; Decristan et al., 2022; Pastore, 2023). Research then suggests that in an inclusive school context with supportive and emotionally close teacher-student-relationships students can flourish the most, that is, feeling better at school, feeling socially included and more competent. First steps toward a better comprehension of the quality of teacher-student-relationships in different school models has been already made with results showing that students without SEN in inclusive schools perceived their teachers as more attentive and caring in comparison of teachers in selective schools (Labsch et al., 2023).

Summing up, the actual state of research identifies wellbeing in school, social inclusion and academic self-concept as key factors for academic achievement and general development of youth in secondary education. Furthermore, evidence shows correlations between these factors and the TSRQ, implicitly suggesting that school selectivity and SEN could shape these correlations. Indeed, little is known about the interaction of these variables in individual students and their interdependent development and mutual influence during secondary education. At this point it's reasonable to consider that students' wellbeing, social inclusion, academic self-concept and the quality of their relationship with the teacher can develop differently depending on whether students have SEN, or they are embedded in a low or high selective school model.

2 Research questions

The present study builds on existing research highlighting the key role of teachers' emotional and cognitive support for all students, considering that different school models (inclusive vs. selective) and the fact that students have SEN can lead to different TSRQ and students' socio-emotional development. Hence, this study focuses on patterns of development of wellbeing, social inclusion, academic self-concept and TSRQ, regarding SEN and school selectivity as important background conditions.

This study addresses the following key questions. First we examined whether distinct classes of junior high school students can be identified based on their assessment of wellbeing, social inclusion, academic self-concept and relationship quality with teachers, while accounting for school selectivity. Next, we investigated whether the presence of SEN and school selectivity are responsible for the composition of these classes. Further, we analyzed whether these classes exhibit different developmental trajectories over time across the entire secondary school period, spanning three school years with one measurement point per year. This is important to identify difficulties over time and address specific interventions. To this end, latent class analyses were first conducted cross-sectional for each measurement time and latent transition analysis were successively run with longitudinal data from $N = 807$ junior high school students in Switzerland.

The research questions were: (1) How many distinct classes are present at a specific time point after dividing the data into two groups based on the school model (low-selective vs. high-selective)? (2) Are the classes found replicable across distinct time points? (3) Can specific patterns of transition be identified over time? (4) What predicts latent class membership (5) and possible shifts from one class into another?

From a previous study (Pastore, 2023) three different types of TSRQ were qualitatively detected from a subsample belonging to present study (see note 1 and section 3.1). Similarly, we expect to identify at least three classes, even if more indicators (such as wellbeing, social inclusion and academic self-concept) are included in the analysis (hypothesis 1). Further, we expect to find the same number of classes in all three measurement times (hypothesis 2). Additionally, we expect that students can change their classes on wellbeing, inclusion and self-concept into another one with respect to an increase or decrease of relationship-quality with their teachers over time (hypothesis 3). Finally, we expect that having SEN and the school selectivity significantly explain the class building (hypothesis 4) as well as the shift from one class to another (hypothesis 5).

3 Method

3.1 Study and sample

Present longitudinal questionnaire study with three data-waves (2019, 2020, and 2021) relies on data from a Swiss National Science Foundation project on inclusive education in Switzerland at lower secondary level, "IFCH-SekI",¹ which covers all 3 years of the Swiss

1 IFCH-SekI is the German acronymous for "Inclusive education in Switzerland at lower secondary level."

junior high school level (grades seven to nine). The peculiarity of the junior high school in Switzerland is the cantonal and local variation in its organizational structure. For instance, there are schools which strictly separate students in three different levels according to their performance: an A-level for so-called “high achievers”; a B-level for “average skilled” and a C-level for “lower achievers” mixing all sort of learning difficulties, that do not explicitly need a special schooling. Other secondary schools maintain just two separate levels, some schools mixing A and B levels, some others mixing B and C levels. Few others have no levels of distinction and work in the most inclusive way possible. Many other variations between the last two types of school models (two distinction levels or just an inclusive one for every kind of learner) are also available. The sample involves $N = 807$ students, who enter junior high school (seventh grade) in August 2019. Of these 807 students, who were at time 1 on average 13.11 years old, there are $n = 98$ (12.1%) students with SEN; $n = 437$ students (54.4%) are male; $n = 407$ students (50.4%) were in low selective schools. The sample was stable over time, which means that the same school-classes and the same individuals participated in the study, with a loss of a few classes from time two to time three (see Table 1 for attrition rate). To run latent class and latent transition analysis we first dichotomized the school model variable in “high vs. low selective” schools (with coding 0 for low selectivity and 1 for high selectivity). We considered those schools with strict separation of three levels of performance as “high selective” and the rest with at least a minimum of inclusion as “low selective.” The decision to dichotomize the degree of selectivity was mainly attributed to the big disparity of school models with hybrid forms of separation and inclusion at the same time, then to the small number of the most inclusive type of secondary schools. The sample was split depending on the membership to one school model: as a result, one subsample has $n = 407$ students who attended $n = 22$ low selective schools, whereas $n = 400$ students were in $n = 20$ high selective schools. A similar dichotomization was given to the variable “SEN” as 0 for students without SEN and 1 for those with SEN. For each subsample differences between students with and without SEN in wellbeing, social inclusion, academic self-concept and TSRQ were analyzed per measurement point. Due to the left-skewed distribution

of the variables, we chose the median to better represent the data. All information about students’ having or not SEN, the kind of special need and the kind of support measure, was given by their teachers. Prior to the study a declaration of consent was collected by the families of each student. The study participation was on a voluntary basis both for schools and families.

3.2 Measurement tools

3.2.1 Wellbeing, social inclusion, and academic self-concept

The constructs of wellbeing, social inclusion and academic self-concept were measured with the “Perception of Inclusion Questionnaire” (PIQ), which first assumes that these are three key dimensions for school inclusion, and secondly that its quality can be well deduced from the students’ perception (Venetz et al., 2015; Zurbriggen, 2021). The three dimensions of the PIQ each consist of four items and are based on a 4-point Likert scale (1 = not at all true, 2 = somewhat not true, 3 = somewhat true, 4 = certainly true). The subscale “emotional inclusion” (EI) refers to the perceived emotional wellbeing (example item: *I like going to school*), the subscale “social inclusion” (SI) indicates the perceived level of participation and inclusion in the class (example item: *I have a lot of friends in my class*) and the subscale “academic self-concept” (AS) describes the perceived performance-related competence (example item: *I am a fast learner*) (Venetz et al., 2015). The PIQ already proved to have a good to very good internal consistency (between 0.85 and 0.94 McDonald’s ω) of the three subscales. Likewise, the reliability values for this study are estimated to be good (between 0.74 and 0.88 Cronbach’s α). Measurement equivalence regarding various students’ characteristics like SEN (with vs. without SEN) or behavioral competence (with vs. without behavioral problems) has also been demonstrated (for more details see Zurbriggen, 2021).

3.2.2 Teacher-student-relationship-quality (TSRQ)

The TSRQ is a self-developed scale focused on students’ perceptions of the teacher’s emotional- and cognitive-empathic support (Pastore et al., 2024). Its theoretical background lies on both the attachment and the joint attention theory and research, particularly stressing the distinction between these two forms of empathy (Taubner et al., 2010; Schwenck et al., 2011). The attachment theory emphasizes the relevance of close relationships with teachers as secondary caregivers. Close teacher-student-relationships, reflected in high emotional responsiveness, give students a sense of security and a safe space to rely on for building a so called “academic psychological capital” made of positive feelings like hope, resilience, optimism and a sense of competence (Roorda et al., 2011; Ainsworth et al., 2015). In the context of cognitive psychology, joint attention is known as a particular form of human information processing that is socially coordinated actions to achieve a common goal, in which intentions and emotions are shared and continuously aligned (Mundy and Newell, 2007; Mundy, 2009). These kinds of interactions give rise to important social-cognitive learning processes that intensify a sense of belonging and social cohesion (Davidesco et al., 2019). The ability to “joint attention” can be also comparable with the teacher’s cognitive

TABLE 1 Sample attrition rate from t1 to t3.

Specifics for partial samples	t1	t2	t3	χ^2 (p)
SEN	98	76	65	1.087 (n.s.)
NO SEN	681	552	398	
Overall	779	628	463	
Quotient for SEN	0.14	0.14	0.16	3.499 (n.s.)
Male	437	360	280	
Female	367	313	258	
Overall	804	673	538	
Quotient for Male	0.84	0.87	0.92	52.668 (<0.001)
Low selective	407	352	317	
High selective	400	321	221	
Overall	807	673	538	
Quotient for low selective	0.98	0.91	0.70	

Drop out was calculated based on SEN, gender and school selectivity. The label SEN was given for students with SEN; the label NO-SEN refers to students without SEN.

attunement to the psychological needs of students, which normally occurs in secure relationships. In this sense the joint attention and the attachment theory are interwoven because experiencing secure attachments normally means that understanding and sharing attention, intentions and emotions are parallelly practiced (Tomasello et al., 2005). This in turn optimally promotes emotional, social, and cognitive development (Davidesco et al., 2019; Zeegers et al., 2017). Research on joint attention has shown that this kind of teacher-student-relationships can explain students' cognitive activity and engagement at school far more than individual characteristics such as concentration and personality do (Dikker et al., 2017). Following these two research lines, the quality of a teacher-student-relationship is conceptualized through two theoretical dimensions: On one hand "emotional resonance" holds on the secure attachment idea and refers to the teacher's emotional support; on the other hand, "joint attention" catches elements of the teacher's cognitive support. These two theoretical dimensions were "translated" into two subscales of 5 items each which are based on a 5-point Likert scale (1 = not true at all; 2 = rather not true; 3 = partly true; 4 = rather true; 5 = exactly true). In order to validate the TSRQ-scale, a robust estimator (MLR) was chosen to account for the left-skewed and hierarchical structure of the data. Empirically, the TSRQ-scale has proven to be highly reliable (e.g., at t1 TSRQ α = 0.901; subscale ER = 0.868; subscale JA = 0.837; see all parameters in Table 2) and metrically invariant over time (AIC = 4692.709; BIC = 4776.556; CFI = 0.999; see Table 3). A more detailed description of the TSRQ-scale can be found in Pastore, 2023 and Pastore et al., 2024.

3.3 Analytic strategy

3.3.1 Median split and dichotomization

To run the LCA in a first and the LTA in a second step we computed a median split of each variable per measurement point: for emotional wellbeing (EI; Mdn = 3.00) in t1, t2 and t3; for social inclusion (SI; Mdn = 3.5) likewise in all three measurement points; for academic self-concept (AS; Mdn = 3.00) also in all three measurement points. For the two indicators of the TSRQ: subscales emotional resonance and joint attention (abbreviated in tables as ER and JA) the medians for ER were (Mdn = 4.2) in t1, (Mdn = 4.0) in t2, (Mdn = 3.8) in t3; for JA they were (Mdn = 4.6) in t1, (Mdn = 4.6) in t2, (Mdn = 4.4) in t3. On these bases we dichotomized all variables in (0) for lower level and (1) higher level (Weller et al., 2020).

3.3.2 Analysis of group differences

In order to control whether the attrition rate could affect the data, we first run t-tests for descriptive variables such as gender, SEN and selectivity. In a second step, we controlled for differences on the five

indicators (wellbeing, inclusion, self-concept, emotional resonance and joint attention) between students with SEN and those without SEN, respectively, in high selective and low selective schools per measurement time. To do this, we chose a non-parametric t-test for two independent samples, such as the Mann-Whitney-U-test, due to the non-normal distribution of the data. As already mentioned in section 3.1, we first split the whole sample depending on the membership to one school model (0 = low selective; 1 = high selective). All non-parametric tests and variables dichotomization were run using SPSS (version 28.0.1.0).

3.3.3 Latent class analysis

To test our research questions, we chose LCA as a person-centered analytical approach, using self-reported data on one's own perception of wellbeing, inclusion, self-concept and the two dimensions of TSRQ (see section 3.2). We first run independently cross-sectional LCA-models with two to six classes solutions using the five self-reported indicators mentioned in section 3.2 (wellbeing, inclusion, self-concept, emotional resonance and joint attention). We analyzed latent classes by separating low from high selective schools-participants. Relying on specific information criteria (e.g., AIC, aBIC, Entropy) we determined the best solution model for each time point (Nylund-Gibson et al., 2023). Nevertheless, where statistical information criteria could not guarantee interpretable and meaningful classification nor true distinction between classes, theoretical and practical considerations were also taken into account (Nylund-Gibson and Choi, 2018; Kassiss et al., 2022). In line with this, the parsimony principle with less classes ($k-1$) containing at least 5% of the sample was followed (Nylund et al., 2007; Ferguson et al., 2020). Missings at random were detected with the full information maximum likelihood (FIML), which is a default setting in Mplus (version 8.6; Muthén and Muthén, 1998), nested data and non-normal distribution were considered using a robust maximum likelihood estimation method (MLR). To avoid local maxima, random starts were set to 1,000 and final optimizations to 500; starting value iterations were increased to 50 (Geiser, 2010).

3.3.4 Latent transition analysis

LTA is the longitudinal extension of LCA to explore changes over time among latent classes. Through LTA possible transitions of previously determined patterns of wellbeing, inclusion, self-concept and relationship quality are modeled, so that changes inside the same class or shifts of membership from one class to another can be recognized (Geiser et al., 2013; Nylund-Gibson et al., 2023). LTA are modeled like multinomial logistic regressions, so that latent classes in previous time predict latent classes in later time points. All other predictors were included after selecting the best class solution also for the LTA (Asparouhov and Muthén, 2014; Nylund-Gibson et al., 2023).

TABLE 2 Reliability statistics for the TSRQ-scale in three measurement times.

Scales	Sample size	Number of items	Cronbach's Alpha			α -values for standardized items		
			t1	t2	t3	t1	t2	t3
TSRQ	733	10	0.901	0.926	0.925	0.903	0.928	0.927
TSRQ-ER	668	5	0.868	0.895	0.898	0.870	0.895	0.900
TSRQ-JA	538	5	0.837	0.874	0.873	0.839	0.876	0.873

TSRQ = Teacher-Student-Relationship-Quality; TSRQ-ER = subscale Emotional Resonance; TSRQ-JA = subscale Joint Attention.

TABLE 3 Latent state modeling to identify measurement invariances.

Models	$\chi^2 (p)$			RMSEA			SRMR	AIC	BIC	CFI	TLI
	Value	df	<i>p</i>	Value	90% CI	<i>p</i>					
Baseline	243.425	6	n.s.	0.284	[0.255 0.316]	<0.001	0.035	4,852.114	4,940.154	0.991	0.976
L-S with is	25.820	5	n.s.	0.092	[0.059 0.129]	0.020	0.059	4,693.734	4,785.966	0.999	0.998
L-S metric	22.800	7	n.s.	0.068	[0.038 0.100]	0.147	0.082	4,692.709	4,776.556	0.999	0.999
L-S scalar	No convergence										

The Latent-State “Baseline” model has no restrictions; in “L-S with is” indicator specificity was calculated as first methodological restriction; *p*-values are corrected for MLR.

TABLE 4 Differences between SEN and No-SEN students in each of the two different school models (low vs. high selective).

	Variables	Low selective schools				High selective schools			
		Sample (<i>n</i> = 407)	<i>U</i> -value	<i>Z</i> -statistic	<i>p</i> -value	Sample (<i>n</i> = 400)	<i>U</i> -value	<i>Z</i> -statistic	<i>p</i> -value
Time 1	PIQ-EI	No-SEN = 274; SEN = 60	8,123	−0.145	n.s.	No-SEN = 308; SEN = 37	4,784	−1.608	n.s.
	PIQ-SI		7,845.5	−0.567	n.s.		4,106	−2.838	0.005
	PIQ-AS		5,312.5	−4.361	0.001		4,318	−2.444	0.015
	TSRQ-ER		7,944	−0.251	n.s.		5,346	−585	n.s.
	TSRQ-JA		8,048	−0.097	n.s.		5,635	−0.078	n.s.
Time 2	PIQ-EI	No-SEN = 230; SEN = 53	5,637.5	−0.438	n.s.	No-SEN = 244; SEN = 22	2,511.5	−0.506	n.s.
	PIQ-SI		4,650.5	−2.354	0.019		2,482	−0.596	n.s.
	PIQ-AS		3,731.5	−4.120	0.001		1,999.5	−2.006	0.045
	TSRQ-ER		6,061.5	−0.063	n.s.		2,381	−0.879	n.s.
	TSRQ-JA		5,845.5	−0.470	n.s.		2,522.5	−0.472	n.s.
Time 3	PIQ-EI	No-SEN = 222; SEN = 49	5,189.5	−0.509	n.s.	No-SEN = 178; SEN = 17	1,219	−1.342	n.s.
	PIQ-SI		5,336.5	−2.21	n.s.		1,238.5	−1.256	n.s.
	PIQ-AS		3,255.5	−4.455	0.001		1,134	−1.728	n.s.
	TSRQ-ER		5,163.5	−0.288	n.s.		1,439	−0.297	n.s.
	TSRQ-JA		5,188	−0.24	n.s.		1,287	−0.991	n.s.

Mann–Whitney–U-test for two independent samples (low vs. high selective schools). Missings are not reported on this table. Significant values are marked in bold.

4 Results

4.1 Analysis of group differences

Regarding the sample dropout (see Table 1), since no significant differences were found on gender and SEN between the subsamples (in low and high selective schools) in the three time points, we could consider them well comparable. Only for school selectivity, the two samples differ in terms that high selective schools had a systematic drop out in t2 and t3 (see Table 1). This is due to the loss of whole classes within high selective schools. This systematic drop out can affect the data by reducing the effect power of high selective schools on the detected latent classes (see limitations).

Regarding the five indicators (wellbeing, inclusion, self-concept, emotional resonance and joint attention) also no differences have been found between students with and without SEN within low or high selective schools, except for the academic self-concept. As a result, we could consider the two groups (SEN and No-SEN) and the two subsamples (low vs. high selective schools) well comparable (see Table 4 for all parameters).

4.2 Latent class analysis

By comparing LCA models with two to six classes solutions we identified for all three waves the four-classes solution to be the best. For this solution the AIC was lower than the three-class solutions (e.g., AIC = 5740.785 in t1), the aBIC increased only minimally (aBIC = 5803.464), the entropy value was reasonably higher (0.795), and the aLRT (*p* = 0.04) was significant, which suggests that this solution with one class more (*k* + 1) is preferred. Finally, the classification specificity of the four classes was better (e.g., in t1: 91.4; 78.8; 95.2; 81.4) compared to the three-class solution (e.g., in t1: 85.4; 92.5; 75). The solution with 6 classes, although showing also good model fit indices at t1, lacked classification specificity at t2 and t3 as well as in meaningful interpretability on a theoretical content level. To sum up, the analysis justifies the final choice of a four-class solution (see Table 5 for all model fit information).

Four patterns were revealed to be similar in both low selective and high selective schools. One pattern, labeled as “happy,” indicated students who had high values on their perception of wellbeing,

TABLE 5 Model fits for LCA with solutions from two to six classes.

Waves (N)	Classes	AIC	aBIC	Entropy	BLRT p	aLRT p	Class size (n)	Classification specificity in %
Time 1 (N = 735)	2	5,758.695	5,790.035	0.632	<0.001	<0.001	419/316	89.6/89.5
	3	5,740.977	5,787.986	0.699	<0.001	<0.001	289/239/152	85.4/92.5/75
	4	5,740.785	5,803.464	0.795	n.s.	0.04	301/147/245/41	91.4/78.8/95.2/81.4
	5	5,751.271	5,829.621	0.782	n.s.	n.s.	164/41/125/170/233	88.2/74.5/84.2/86.2/86.2
	6	5,766.436	5,860.455	0.822	n.s.	n.s.	124/225/53/117/161/54	90.5/86.2/96.8/82.3/86.8/91.1
Time 2 (N = 668)	2	5,076.900	5,106.143	0.799	<0.001	<0.001	289/379	93.7/95.2
	3	5,074.597	5,118.461	0.779	<0.001	<0.001	58/267/342	71.6/91.1/91.1
	4	5,078.078	5,136.564	0.789	n.s.	n.s.	200/91/258/118	86.8/73.5/92.1/95
	5	5,088.670	5,161.777	0.724	n.s.	n.s.	125/90/180/51/221	76.5/69.2/74.2/94.3/90
	6	5,105.311	5,193.04	0.781	n.s.	n.s.	198/53/92/22/131/169	77.5/89.5/89.3/74.1/68.6/97.9
Time 3 (N = 541)	2	4,043.343	4,067.963	0.735	<0.001	<0.001	297/243	92/93.6
	3	4,034.932	4,071.860	0.742	0.06	n.s.	296/160/84	94/82/80.6
	4	4,042.238	4,091.476	0.719	n.s.	n.s.	230/101/85/124	90.5/81.2/70/82.7
	5	4,048.778	4,110.326	0.764	n.s.	n.s.	65/104/149/102/119	77.1/83.4/84.2/96.6/84.2
	6	4,067.440	4,141.297	0.731	n.s.	n.s.	39/122/90/150/82/56	64/86.6/80.7/85/72.2/74.1

AIC, Akaike's Information Criterion; aBIC, adjusted Bayes Information Criterion; BLRT, Bootstrapped Likelihood Ratio Test; aLRT, adjusted Likelihood Ratio Test. Values relevant to the class decision are shown in bold.

inclusion and academic self-concept as well as high values on their perception of teachers being caring and attentive with them. Showing high responses on each indicator implies somehow that these students are doing generally well at school: they assessed themselves to feel very well, feel included and competent at school as well as well supported by their teachers. For this reason, labeling them as “happy students” might be appropriate, even if we do not directly refer to the research on positive psychology (e.g., Seligman et al., 2005). Another pattern of students was assumed to be “unhappy” because they had very low values on all five indicators. So, they assessed themselves neither to feel generally well at school nor supported by their teachers. A third pattern of students showed drastically changing values on the perceptions of wellbeing, inclusion and self-concept over time but had consistently low to very low values on the two indicators of TSRQ, which suggested that they felt less reliance on their teachers. For this reason, we considered them as kind of “unstable.” Finally, we detected a fourth pattern of students, who might be “teacher-oriented” due to their consistent low values of wellbeing, inclusion and academic self-concept over time (so, feeling generally uncomfortable) but showing very high values on emotional resonance and joint attention, that is feeling well supported by their teachers. Figure 1 illustrates how the four patterns are built between low or high values on student development (that is wellbeing, inclusion and academic self-concept) and TSRQ. Further, Figures 2, 3 show the four patterns, comparing them in t1 and t3, respectively in low and high selective schools.

4.3 Latent transition analysis

The following step was to run different LTA models and compare the different solutions from two to six classes. We identified the four-class solution to be the best, based on AIC, aBIC as well as classification

specificity and class size per detected class (see Table 6 for all parameters). We could reasonably consider that four latent profiles were replicable over time.

As a first noteworthy remark, we could see the distribution of the four profiles within low and high selective schools in t3 (see Table 7): so, 67.2% of the “happy” students, 40.8% of “unhappy,” 50.6% of the “unstable” students, and 51.9% of “teacher-oriented” were in low selective schools; in comparison, in high selective schools were 32.8 “happy,” 59.2 “unhappy,” 49.4% students “unstable,” and 48.1% “teacher-oriented.” When observing the distributions per time point and school selectivity, we found that in low selective schools the profile “happy” (from 22.1 to 23.6%) and “unstable” (from 19.2 to 25.6%) slightly increased, whereas the “unhappy” (from 29 to 28.7) slightly decreased over time. Instead, the percentage of the “teacher-oriented” students remarkably dropped from almost 30 to 22% (see Table 8). In high selective schools the fluctuations were much more notably: while the profiles “happy” (from 17.8 to 11.3%) and “teacher-oriented” (from 26.5 to 18%) decreased, the groups of “unhappy and “unstable” students considerably grew (unhappy: from 33 to 44.5%; unstable: from 22.8 to 26.3%; see Table 9). These changed distributions over time suggested a significant fluctuation of membership from one class to another.

Indeed, by looking at the main transitions from t1 to t3 depending on the school model we found that in low selective schools 5.5% of “happy” students from t1 shifted to the groups “unstable” and “teacher-oriented” in t3, whereas only one student (1.1%) changed from happy in t1 to unhappy in t3. Further, 15.4% of “unstable” students in t1 shifted into “happy” in t3. Of the “teacher-oriented” students, 11.5% shifted to “happy,” whereas 24% changed into “unhappy” (see all parameters in Figure 4).

In high selective schools 21.1% of the “happy” students shifted into “unhappy” and 26.7% in “unstable.” Further, 0% of “unhappy” shifted to “happy,” on the contrary 93.2% of “unhappy” students

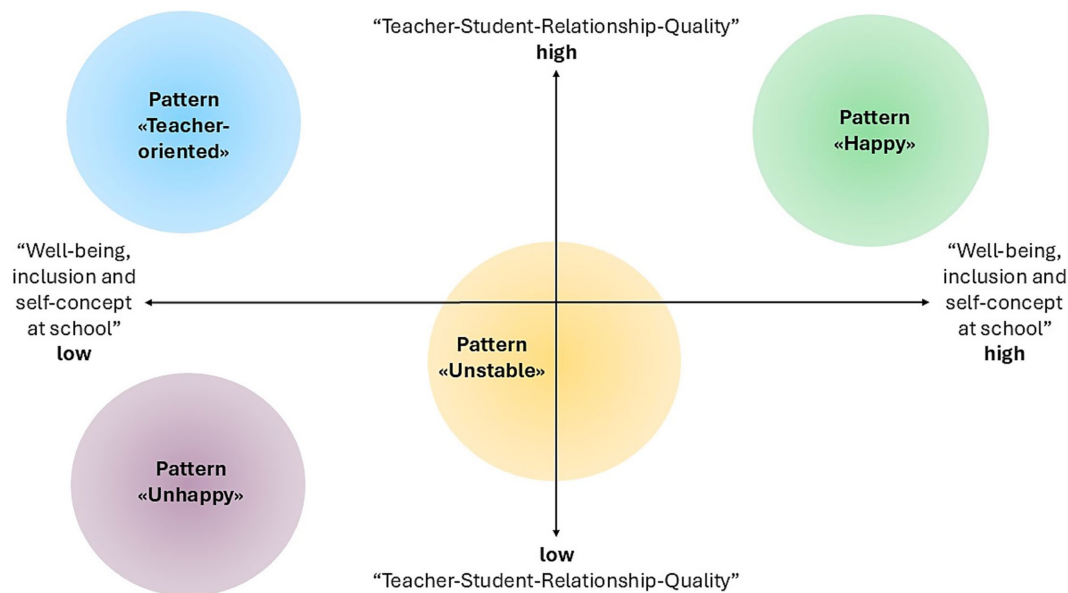


FIGURE 1
General visualization of patterns for enhanced profile traceability.

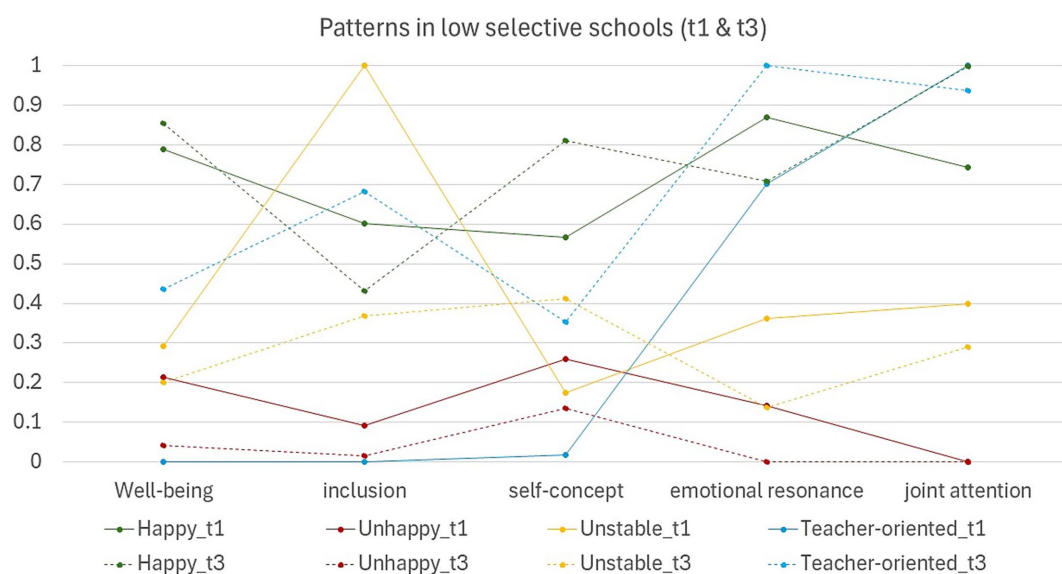


FIGURE 2
The four patterns in low selective schools in t1 and t3.

remained in the same profile. Of the “teacher-oriented” students 33% changed into the profile “unhappy” and only 4.7% shifted to “happy” (see Figure 5).

4.4 Multinomial logistic regressions

Multinomial logistic regressions were used to examine the impact of the factors school selectivity and SEN on the students’ profiles (happy, unhappy, unstable and teacher-oriented). Each impact of these two factors has been analyzed independently using them as predictors

in the respective logit-models. The regressions were controlled by taking, respectively, the group “happy” and the group “unhappy” as reference. The results reported below refer to the group “happy” as reference group.

In time 1 the factor selectivity has no significant influence on the probability of belonging to one of the profiles “unhappy, unstable or teacher-oriented” compared to “happy.” The results show that the probability of being assigned to the “unhappy” profile is lower at low-selective schools compared to high-selective schools ($B = -0.349$, $p = 0.085$), but this effect was not significant. The odds ratio was 0.705 (95% CI: 0.474–1.050) suggesting a higher probability of being happy

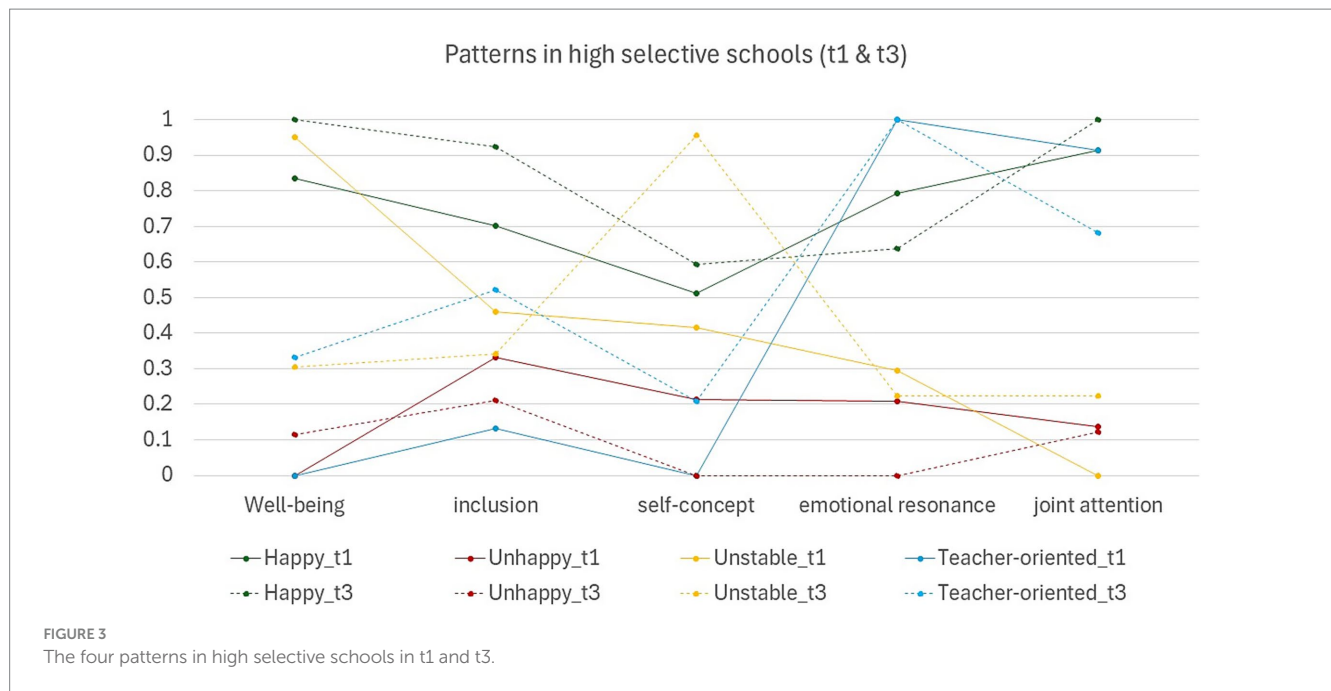


TABLE 6 Latent transition analysis.

Classes	AIC	aBIC	Entropy (for each of the three waves t1/t2/t3)	Sample sizes per wave	Classification specificity in %
2	12,984.678	13,015.033	0.645/0.693/0.660	t1: 390/416; t2: 408/398; t3: 477/329	89.4/89.4
3	12,825.183	12,885.893	0.670/0.703/0.705	t1: 350/241/215; t2: 373/225/208; t3: 450/215/141	88.4/90/78.1
4	12,686.025	12,786.196	0.633/0.670/0.656	t1: 184/174/233/213; t2: 160/182/259/204; t3: 221/149/288/147	80.1/83.3/81.4/79
5	12,623.192	12,771.931	0.682/0.715/0.689	t1: 173/151/165/243/73; t2: 152/90/188/267/110; t3: 211/76/134/296/90	80.4/76/79/84/78
6	12,585.789	12,792.203	0.702/0.727/0.674	t1: 179/78/107/206/100/136; t2: 175/103/46/236/98/147; t3: 127/161/43/264/89/122	79.4/79.8/73.9/84.1/79.9/78.4

Model fit statistics to select longitudinally the number of classes. Values relevant to the class decision are shown in bold.

TABLE 7 Distribution of class membership per school model in t3.

Classes in t3 in %	School selectivity	
	Low	High
Happy	67.2	32.8
Unhappy	40.8	59.2
Unstable	50.6	49.4
Teacher-oriented	51.9	48.1

TABLE 8 Fluctuation in low selective schools.

Classes	% in t1	% in t2	% in t3
Happy	22.1	23.8	23.6
Unhappy	29	31.4	28.7
Unstable	19.2	17	25.6
Teacher-oriented	29.7	27.8	22.1

in low-selective schools than in high-selective schools, but the confidence interval includes 1, indicating a lack of significance. Also, the probability of being assigned to the “unstable” profile with a

$B = -0.391$, $p = 0.077$ ($\text{Exp}(B) = 0.676$, 95% CI: 0.438–1.044) or to the “teacher-oriented” profile ($\text{Exp}(B) = 0.901$, $p = 0.613$, 95% CI: 0.600–1.351) was not significantly associated with the selectivity of the school (Tables 10).

TABLE 9 Fluctuation in high selective schools.

Classes	% in t1	% in t2	% in t3
Happy	17.8	16.5	11.3
Unhappy	33	37.8	44.5
Unstable	22.8	22.3	26.3
Teacher-oriented	26.5	23.5	18

At time 2 selectivity matters instead, since in low-selective schools, students are significantly less likely to fall into the “unhappy” profile compared to the reference group “happy,” with $B = -550$ ($\text{Exp}(B) = 0.577$, 95% CI: 0.390–0.853, $p = 0.006$). A negative significant effect was also observed for the profile “unstable” in low-selective schools ($B = -0.640$, $\text{Exp}(B) = 0.528$, $p = 0.005$, 95% CI: 0.339–0.822). On the contrary, no significant effect was observed for

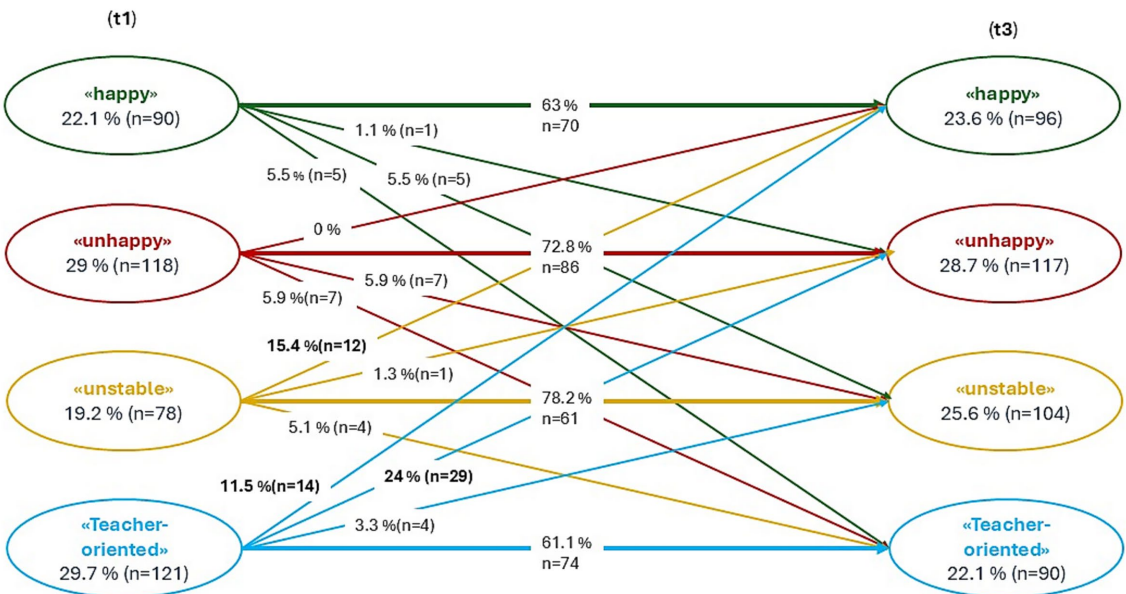


FIGURE 4 Transitions in low selective schools. Note: N = 407 Transitions over time among different patterns of students' well-being, inclusion, self-concept and teacher-student-relationship-quality between t1 and t3.

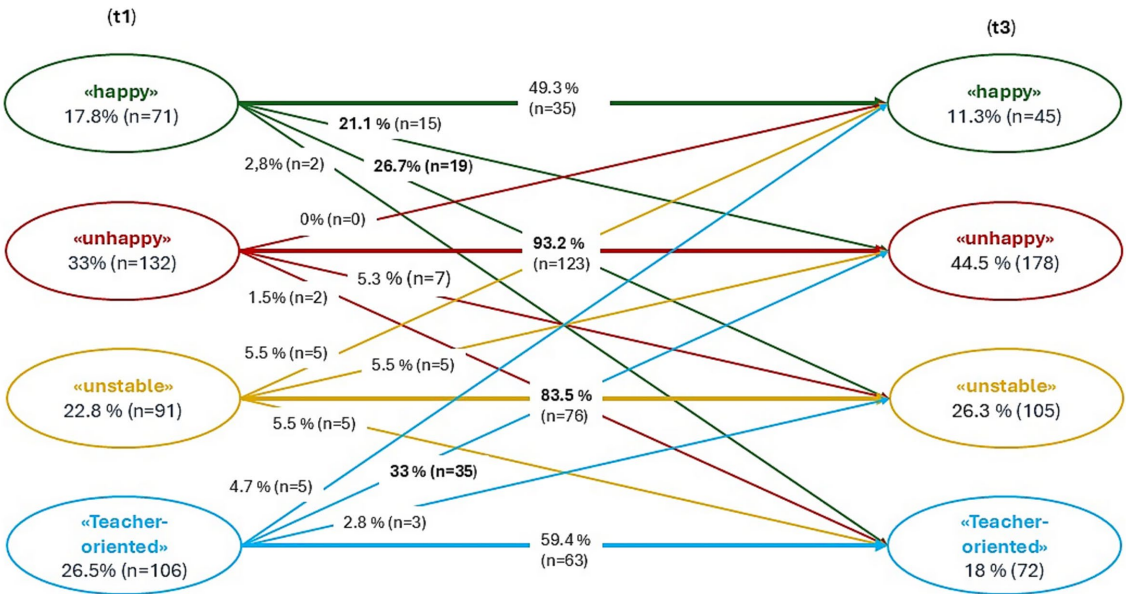


FIGURE 5 Transitions in high selective schools. Note: N = 400 Transitions over time among different patterns of students' well-being, inclusion, self-concept and teacher-student-relationship-quality between t1 and t3.

TABLE 10 Logistic regressions for class building.

Factor	Waves	% Cox & Snell	Unhappy			Unstable			Teacher-oriented		
			B	OR [95% CI]	Wald	p	B	OR [95% CI]	Wald	p	p
Low selectivity	t1	0.006	−0.350	0.705 [0.474–1.050]	2.957	n.s.	−0.391	0.676 [0.438–1.044]	3.124	n.s.	n.s.
	t2	0.015	−0.550	0.577 [0.390–0.853]	7.591	0.006	−0.640	0.528 [0.339–0.822]	7.991	0.01	n.s.
	t3	0.041	−1.177	0.308 [0.202–0.471]	29.613	<0.001	−0.767	0.464 [0.297–0.725]	11.369	<0.001	0.03

Selectivity as predictor.
Reference group is “happy”; reference factor is “high selectivity”. Only significant values are shown in bold.

the group “teacher-oriented” in low-selective schools ($B = -0.201$, $\text{Exp}(B) = 0.818$, $p = 0.343$, 95% CI: 0.540–1.239).

Also, with regards to time 3 students in low-selective schools are significantly less likely to fall into the “unhappy” profile compared to the reference group (happy), with an odds ratio of $\text{Exp}(B) = 0.308$ (95% CI: 0.202–0.471, $p < 0.001$). As well, there is a significant negative effect for the group “unstable” ($B = -0.767$, $\text{Exp}(B) = 0.464$, $p = <0.001$, 95% CI: 0.297–0.725), as well as for the “teacher-oriented” ($B = -0.535$, $\text{Exp}(B) = 0.586$, $p = 0.02$, 95% CI: 0.366–0.938). This means that students in low selective schools are less likely to be unhappy, unstable and teacher-oriented and more likely to be happy (see all parameters in Table 10).

Summing up the results show a significant relation between school selectivity and the probability to fall into a specific profile, highlighting that in low selective schools, students are more likely to fall into the profile “happy” rather than being “unhappy,” “unstable” or “teacher-oriented.” High selective schools seem to “produce” more unhappy students.

We then analyzed whether having-SEN has an impact on the probability of falling into any profile.

In t1 we found for low selective schools a significant association between having-SEN and the probability of being in one specific profile. More specifically, students with SEN have an increased probability of falling into the profile “teacher-oriented” compared to the group “happy” but this effect is slightly above the significance value ($\text{Exp}(B)$ of 2.110, 95% CI: 0.944–4.717, $p = 0.06$) (Table 11). In high selective schools it is not relevant whether students have SEN or not for being in any profile.

In t2 in low selective schools, students with SEN are more likely to be “unhappy” ($\text{Exp}(B) = 2.472$, $p = 0.04$, 95% CI: 1.035–5.901) and “teacher-oriented” ($\text{Exp}(B) = 3.524$, $p = 0.004$, 95% CI: 1.497–8.296) rather than “happy.” In high selective schools no significant effect of SEN was found on the probability of being in any profile in t2.

In t3 similar effects were found on the probability for students with SEN of being in the profiles “unhappy” ($\text{Exp}(B) = 2.958$, $p = 0.01$, 95% CI: 1.239–7.062) and “teacher-oriented” ($\text{Exp}(B) = 4.096$, $p = 0.002$, 95% CI: 1.705–9.841) in low selective schools. Still no significant effects were found for high selective schools. (see all parameters in Table 11).

5 Discussion

As different school environments with their specific value systems shape the people embedded in them differently, this has a big impact both on the TSRQ and on student socio-emotional development affecting their wellbeing, inclusion and academic self-concept (Gasser et al., 2017; Xu et al., 2023). Hence, we analyzed the kind of student socio-emotional development and TSRQ in low or high selective schools reflected in different patterns. Based on the available data we could identify four profiles to be similar in both low and high selective schools: “happy,” “unhappy,” “unstable” and “teacher-oriented.” However, how these profiles are distributed in low or high selective schools is remarkably different since in low selective schools, students seemed to fall more likely in the profile “happy” (feeling well, included, self-confident and supported by teachers) whereas the “unhappy” profile seemed to be much more prominent in high

TABLE 11 Logistic regression for class building.

Factor	Waves	Samples	% Cox & Snell	Unhappy			Unstable			Teacher-oriented		
				B	OR [95% CI]	Wald	p	B	OR [95% CI]	Wald	p	p
<i>Students with SEN</i>	t1	Overall	0.016	0.456	1.578 [0.806–3.089]	1.771	n.s.	−0.085	0.919 [0.421–2.003]	0.046	n.s.	0.013
		Low selec.	0.028	0.605	1.831 [0.798–4.200]	2.039	n.s.	−0.464	0.629 [0.216–1.834]	0.721	n.s.	n.s.
		High selec.	0.011	0.454	1.575 [0.480–5.169]	0.562	n.s.	0.480	1.616 [0.464–5.632]	0.569	n.s.	n.s.
	t2	Overall	0.028	0.803	2.232 [1.100–4.529]	4.949	0.026	−0.024	0.977 [0.409–2.334]	0.003	n.s.	0.001
		Low selec.	0.051	0.905	2.472 [1.035–5.901]	4.152	0.04	−0.474	0.623 [0.178–2.173]	0.551	n.s.	0.004
		High selec.	0.011	0.928	2.529 [0.707–9.042]	2.036	n.s.	0.578	1.782 [0.441–7.209]	0.657	n.s.	n.s.
	t3	Overall	0.036	0.779	2.179 [1.051–4.516]	4.385	0.036	−0.155	0.856 [0.363–2.021]	0.125	n.s.	<0.001
		Low selec.	0.070	1.085	2.958 [1.239–7.062]	5.970	0.015	−0.444	0.642 [0.213–1.937]	0.620	n.s.	0.002
		High selec.	0.015	0.934	2.543 [0.566–11.439]	1.481	n.s.	0.486	1.625 [0.323–8.184]	0.346	n.s.	n.s.

SEN as predictor.
Reference group is “happy,” reference factor is “students without SEN.” Only significant values are shown in bold.

selective schools. Furthermore, results suggested that school selectivity significantly explained the profile building in t2 and t3.

Another important finding regards the fluctuation of students from one class into another, which is also associated with school selectivity. In low selective schools, considerable shifts were from “unstable” and “teacher-oriented” to “happy.” Still, 24% of the students who were in the “teacher-oriented” profile shifted to the “unhappy” profile. In high selective schools the biggest shifts were from “happy” to “unhappy” and “unstable.” Also, 33% of the students who were in the “teacher-oriented” profile in t1 shifted to the “unhappy” profile in t3. These students’ transitions from one class into another support the argument that school selectivity shapes the profiles; hence it has a big impact on how students develop. This may indicate that relationship quality differs depending on the school model. These results are in line with the study of [Labsch et al. \(2023\)](#) showing that teachers in inclusive schools are perceived by their students as more caring and attentive than teachers in selective schools. Hence, the resulting transitions suggest that the TSRQ might have a prominent role for students to increase or decrease their wellbeing, inclusion and self-concept. Furthermore, results showed that having SEN is still a risk factor in low selective schools, since students with SEN are more likely to be “unhappy” or “teacher-oriented” as “happy.” These results imply that still too many students with SEN are not developing well at schools, feeling uncomfortable, not included and not competent. We argue that structural and organizational factors at school and system level play an important role, since low selective schools still exhibit selective elements and cannot be yet considered as inclusive. This in turn can adversely impact the socio-emotional development of students with SEN instead of supporting and sustaining them.

Summing up these results reveal that (1) student socio-emotional development goes hand in hand with the TSRQ; (2) there is a considerable amount of students, who are struggling at school and need teachers’ qualitative emotional- and cognitive-empathic support; (3) there are three groups of students, which can be considered at risk to academic failure and maladaptive developments as they have low to very low values on wellbeing, inclusion and self-concept as well as two of these groups feel not supported by the teachers; (4) school selectivity has a negative impact on these students, especially for those with SEN, which involves a necessary paradigm shift to promote and strengthen the effectivity of inclusive systems and enhance teachers’ awareness of their role for students’ psychological needs.

In light of these results, we argue that (1) high selective learning environments can be detrimental to student socio-emotional development. This is in line with the research of [Fülöp et al. \(2025\)](#), which highlights the negative impact of competitive class climate on students’ wellbeing, with ([Luder et al., submitted](#)) that highlights the influence of high-selective school models on the development of all students’ academic self-concept and with the results of [Pastore \(2023\)](#) about the impact on TSRQ on the perception of being included of students with SEN. Further, (2) as having SEN involves a risk for student socio-emotional development and the quality of their relationship with teachers especially in low selective schools, we advocate for a more effective and discrimination-sensitive use of special educational measures and for enhancing teachers’ awareness on their emotional and cognitive supportive competences by facing a wide range of special needs while respecting the psychological ones. In addition, in line with [Gasser et al. \(2017\)](#), we believe that the implications of school selectivity (implicit culturally and contextually

determined standards of comparison that establish high pressure for performance, promote competitiveness and unhealthy social comparison processes in the classroom context) have a significant impact on the relationship quality with teachers and these different qualities in emotional and cognitive support in turn impact students' psychological and learning development.

In practical terms, these results have significant implications. Teacher training and ongoing professional development should prioritize evidence-based inclusive attitudes and strategies that support students emotionally and cognitively. Educators should be trained to interpret behavior difficulties as expressions of unmet psychological needs rather than deliberate provocation. Training should also enhance teachers' relational skills, particularly with students facing socio-emotional challenges, to foster positive relationships that benefit both students' and teachers' wellbeing. Additionally, such programs should address problematic and discriminatory school practices that might negatively influence teachers' perceptions of students' emotional needs and reactions. On the other hand, educational policies must complement these efforts by creating an inclusive school system that strengthens teachers' relational competencies and provides adequate human and structural resources to support their daily work. As has been wisely said: the true progress of society is measured by its ability to protect and care for its most vulnerable members.

Also, to ensure discrimination-sensitive special educational measures, it is essential to first clarify the ambiguity in the debate on inclusive schools regarding different aspects of students' diversity. This would allow for targeted support of students' needs and difficulties as well as preserving their dignity and intrinsic value. Special educational measures should be dissociated from the social and political risks of being underestimated or leading to exclusion. The label SEN, fundamental to diagnosing difficulties or disabilities, should solely serve to identify and address students' disadvantages. It must not hinder their potential to achieve learning mastery or contribute to maladaptive socio-emotional development in schools.

Current and future research can uncover the conditions that enable schools to fully achieve their inclusive potential.

6 Limitations

We consider the forced dichotomization of the school models as a limitation as low selective schools still keep those selective elements that can shape the TSRQ and have a negative impact on student development. More research to unravel differences of TSRQ in diametral and unequivocal different school systems should follow. After all, research is limited to the currently available school models. Further, as a longitudinal study, this was also liable for attrition rate. A significant dropout was detected in the high selective subsample. This in turn can affect data results by decreasing the impact of selectivity on each profile and their transitions. Bigger and nationwide samples can eventually deal better with this problem. Also, data about students' migration background, socio-economic status and learning development are not available and could not be recorded in this study. Furthermore, student socio-emotional development was assessed solely from the students' own perspective.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors without undue reservation.

Ethics statement

The studies involving humans were approved by Swiss National Science Foundation. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation in this study was provided by the participants' legal guardians/next of kin. Written informed consent was obtained from the minor(s)' legal guardian/next of kin for the publication of any potentially identifiable images or data included in this article.

Author contributions

GP: Writing – original draft, Formal analysis, Visualization, Methodology, Supervision, Writing – review & editing, Data curation, Validation. WK: Writing – review & editing. AK: Writing – review & editing. RL: Writing – review & editing.

Funding

The author(s) declare that financial support was received for the research and/or publication of this article. The study “IFCH-Sek-I” (Integrative Förderung in der Schweiz auf der Sekundarstufe I) on inclusive education in Switzerland at secondary level I was funded by the Swiss National Science Foundation with project nr. 100019_188899.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The authors declare that no Gen AI was used in the creation of this manuscript.

Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

References

- Ainsworth, M. D. S., Blehar, M. C., Waters, E., and Wall, S. N. (2015). Patterns of attachment: a psychological study of the strange situation. Abels, New York & London: Psychology Press.
- Allen, K., Kern, M. L., Vella-Brodrick, D., Hattie, J., and Waters, L. (2018). What schools need to know about fostering school belonging: a meta-analysis. *Educ. Psychol. Rev.* 30, 1–34. doi: 10.1007/s10648-016-9389-8
- Ansari, A., Hofkens, T. L., and Pianta, R. C. (2020). Teacher-student relationships across the first seven years of education and adolescent outcomes. *J. Appl. Dev. Psychol.* 71:101200. doi: 10.1016/j.appdev.2020.101200
- Asparouhov, T., and Muthén, B. (2014). Auxiliary variables in mixture modeling: three-step approaches using Mplus. *Struct. Equ. Model.* 21, 329–341. doi: 10.1080/10705511.2014.915181
- Bäker, N., Bolz, T., Eils, J., von Düring, U., and Schütz-Wilke, J. (2024). Empirische Arbeit: Bullying und externalisierende Verhaltensprobleme: Eine Frage der Schulfriedenheit? *Psychol. Erzieh. Unterr.* 71, 163–179. doi: 10.2378/peu2024.art17d
- Bless, G. (2018). Wirkungen der schulischen Integration auf Schülerinnen und Schüler. *Schweizerische Zeitschrift für Heilpädagogik* 24, 6–14. Available at: <https://www.szh-csp.ch/z2018-02-01>
- Bolz, T. (2021). Schüler*innen-Lehrer*innen-Beziehung aus bindungstheoretischer Perspektive im Förderschwerpunkt der Emotionalen und Sozialen Entwicklung. Institut für Sonder- und Rehabilitationspädagogik. Available online at: <https://oops.uni-oldenburg.de/5176/> (Accessed September 20, 2024).
- Bolz, T., and von Düring, U. (2022). Der Einfluss emotionaler Unterstützung durch Lehrkräfte auf Emotionsregulation sowie Verhaltensprobleme von Schülerinnen und Schülern mit Förderbedarf in der emotionalen und sozialen Entwicklung. Hildesheim: Deutsche Gesellschaft für Psychologie.
- Bosman, R. J., Koomen, H. M. Y., Zee, M., and de Jong, P. F. (2022). Patterns of problematic teacher–child relationships in upper elementary school. *J. Appl. Dev. Psychol.* 83:101478. doi: 10.1016/j.appdev.2022.101478
- Civitillo, S., Göbel, K., Preusche, Z., and Jugert, P. (2021). Disentangling the effects of perceived personal and group ethnic discrimination among secondary school students: the protective role of teacher–student relationship quality and school climate. *New Dir. Child Adolesc. Dev.* 2021, 77–99. doi: 10.1002/cad.20415
- Clem, A.-L., Rudasill, K. M., Hirvonen, R., Aunola, K., and Kiuru, N. (2021). The roles of teacher–student relationship quality and self-concept of ability in adolescents' achievement emotions: temperament as a moderator. *Eur. J. Psychol. Educ.* 36, 263–286. doi: 10.1007/s10212-020-00473-6
- Davidesco, I., Laurent, E., Valk, H., West, T., Dikker, S., Milne, C., et al. (2019). *Brain-to-Brain Synchrony between Students and Teachers Predicts Learning Outcomes*. bioRxiv, 27. doi: 10.1101/644047
- Decristan, J., Kunter, M., and Fauth, B. (2022). Die Bedeutung individueller Merkmale und konstruktiver Unterstützung der Lehrkraft für die soziale Integration von Schülerinnen und Schülern im Mathematikunterricht der Sekundarstufe. *Z. Pädag. Psychol.* 36, 85–100. doi: 10.1024/1010-0652/a000329
- Dikker, S., Wan, L., Davidesco, I., Kaggen, L., Oostrik, M., McClintock, J., et al. (2017). Brain-to-brain synchrony tracks real-world dynamic group interactions in the classroom. *Curr. Biol.* 27, 1375–1380. doi: 10.1016/j.cub.2017.04.002
- Douma, I., de Boer, A., Minnaert, A., and Grietens, H. (2022). The I of students with ID or SEBD: a systematic literature review of the self-concept of students with ID or SEBD. *Educ. Res. Rev.* 36:100449. doi: 10.1016/j.edurev.2022.100449
- Endedijk, H. M., Breeman, L. D., van Lissa, C. J., Hendrickx, M. M. H. G., den Boer, L., and Mainhard, T. (2022). The teacher's invisible hand: a meta-analysis of the relevance of teacher–student relationship quality for peer relationships and the contribution of student behavior. *Rev. Educ. Res.* 92, 370–412. doi: 10.3102/00346543211051428
- Ferguson, S. L., Moore, G., W. E., and Hull, D. M. (2020). Finding latent groups in observed data: a primer on latent profile analysis in Mplus for applied researchers. *Int. J. Behav. Dev.* 44, 458–468. doi: 10.1177/0165025419881721
- Fülöp, M., Varga, B. A., and Sebastyén, N. (2025). Competitive and non-competitive school climate and students' well-being. *Learn. Instr.* 95:102036. doi: 10.1016/j.learninstruc.2024.102036
- Gasser, L., Grütter, J., Torchetti, L., and Buholzer, A. (2017). Competitive classroom norms and exclusion of children with academic and behavior difficulties. *J. Appl. Dev. Psychol.* 49, 1–11. doi: 10.1016/j.appdev.2016.12.002
- Geiser, C. (2010). Datenanalyse mit Mplus: eine anwendungsorientierte Einführung. 1. Auflage Edn. Wiesbaden: VS Verlag.
- Geiser, C., Bishop, J., Lockhart, G., Shiffman, S., and Grenard, J. (2013). Analyzing latent state-trait and multiple-indicator latent growth curve models as multilevel structural equation models. *Front. Psychol.* 4:975. doi: 10.3389/fpsyg.2013.00975
- Goetz, T., Bieleke, M., Gogol, K., van Tartwijk, J., Mainhard, T., Lipnevich, A. A., et al. (2021). Getting along and feeling good: reciprocal associations between student-teacher relationship quality and students' emotions. *Learn. Instr.* 71:101349. doi: 10.1016/j.learninstruc.2020.101349
- Hamre, B. K., and Pianta, R. C. (2001). Early teacher–child relationships and the trajectory of children's school outcomes through eighth grade. *Child Dev.* 72, 625–638. doi: 10.1111/1467-8624.00301
- Hoferichter, F., and Raufelder, D. (2022). Kann erlebte Unterstützung durch Lehrkräfte schulische Erschöpfung und Stress bei Schülerinnen und Schülern abfedern? *Z. Pädag. Psychol.* 36, 101–114. doi: 10.1024/1010-0652/a000322
- Huber, C. (2011). Lehrerfeedback und soziale Integration. Wie soziale Referenzierungsprozesse die soziale Integration in der Schule beeinflussen könnten. *Empir. Sonderpädagog.* 3, 20–36. doi: 10.25656/01:9315
- Janschewski, J., Käßler, C., and Berens, P. (2024). Schulische Prädiktoren für psychische Auffälligkeiten bei Kindern und Jugendlichen anhand einer Befragung von Schülerinnen und Schülern an Klinik- und Regelschulen. *Z. Pädag. Psychol.* 38, 227–243. doi: 10.1024/1010-0652/a000339
- Kassis, W., Aksoy, D., Favre, C. A., Janousch, C., and Artz, S. T.-G. (2022). Thriving despite parental physical abuse in adolescence: a two-wave latent transition analysis on hedonic and Eudaimonic violence-resilience outcome indicators. *Children* 9:553. doi: 10.3390/children9040553
- Kocaj, A., Jansen, M., Kuhl, P., and Stanat, P. (2020). “Zusammenhänge der Klassenkomposition an Förderschulen und allgemeinen Schulen mit schulischen Kompetenzen, akademischem Selbstkonzept und Interesse” in Schüler*innen mit sonderpädagogischem Förderbedarf in Schulleistungserhebungen: Einblicke und Entwicklungen. eds. C. Gresch, P. Kuhl, M. Grosche, C. Sälzer and P. Stanat (Wiesbaden: Springer Fachmedien), 213–262.
- Labsch, A., Schmitt, M., and Schüpbach, M. (2023). Nehmen Schüler*innen ohne sonderpädagogische Förderbedarfe in inklusiven Klassen die Beziehung zu ihren Lehrkräften anders wahr als ihre Peers in nicht-inklusive Klassen? *Z. Pädag.* 69, 811–831.
- Lei, H., Cui, Y., and Chiu, M. M. (2016). Affective teacher–student relationships and students' externalizing behavior problems: a meta-analysis. *Front. Psychol.* 7:1311. doi: 10.3389/fpsyg.2016.01311
- Lei, H., Cui, Y., and Chiu, M. M. (2018). The relationship between teacher support and students' academic emotions: a Meta-analysis. *Front. Psychol.* 8:2288. doi: 10.3389/fpsyg.2017.02288
- Longobardi, C., Settanni, M., Lin, S., and Fabris, M. A. (2021). Student–teacher relationship quality and prosocial behaviour: the mediating role of academic achievement and a positive attitude towards school. *Br. J. Educ. Psychol.* 91, 547–562. doi: 10.1111/bjep.12378
- Luder, R., Kunz, A., and Pastore, G. (submitted). Die Entwicklung des akademischen Selbstkonzepts in der Sekundarstufe I bei unterschiedlichen Bedingungen von Schulorganisation. VHN. Vierteljahresschrift für Heilpädagogik und ihre Nachbargebiete (VHN).
- Mainhard, T., Oudman, S., Hornstra, L., Bosker, R. J., and Goetz, T. (2018). Student emotions in class: the relative importance of teachers and their interpersonal relations with students. *Learn. Instr.* 53, 109–119. doi: 10.1016/j.learninstruc.2017.07.011
- Mundy, P. (2009). “Lessons learned from autism: an information-processing model of joint attention and social cognition” in Minnesota symposium on child psychology: Meeting the challenge of translational research in child psychology (Hoboken, NJ, US: John Wiley and Sons), 59–113.
- Mundy, P., and Newell, L. (2007). Attention, joint attention, and social cognition. *Curr. Dir. Psychol. Sci.* 16, 269–274. doi: 10.1111/j.1467-8721.2007.00518.x
- Muthén, L. K., and Muthén, B. O. (1998). Mplus user's guide. 8th Edn. Los Angeles, CA: Muthén & Muthén.
- Neuenschwander, M. P., and Nägele, C. (Eds.) (2017). *Bildungsverläufe von der Einschulung bis in den ersten Arbeitsmarkt*. Wiesbaden: Springer Fachmedien Wiesbaden.
- Nicolay, P., and Huber, C. (2021). Wie Schulleistung und Lehrkraftfeedback die soziale Akzeptanz beeinflussen: Ergebnisse einer Experimentalstudie. *Empir. Sonderpädagog.* 1, 3–20. doi: 10.25656/01:23568
- Nicolay, P., Weber, S., Huber, C., and Spilles, M. (2024). “Vermittelt Lehrkraftfeedback den Zusammenhang von Verhaltensproblemen und sozialer Akzeptanz in der Primarstufe? Eine Mehrebenen-Mediationsanalyse unter der Berücksichtigung der Bezugsnormorientierung von Lehrkräften als Moderator,” *Zeitschrift für Pädagogische Psychologie*. 1–12. doi: 10.1024/1010-0652/a000385
- Nylund, K. L., Asparouhov, T., and Muthén, B. O. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: a Monte Carlo simulation study. *Struct. Equ. Model.* 14, 535–569. doi: 10.1080/10705510701575396
- Nylund-Gibson, K., and Choi, A. Y. (2018). Ten frequently asked questions about latent class analysis. *Transl. Issues Psychol. Sci.* 4, 440–461. doi: 10.1037/tps0000176
- Nylund-Gibson, K., Garber, A. C., Carter, D. B., Chan, M., Arch, D. A. N., Simon, O., et al. (2023). Ten frequently asked questions about latent transition analysis. *Psychol. Methods* 28, 284–300. doi: 10.1037/met0000486
- OECD (2023). PISA 2022 results (volume I): the state of learning and equity in education. Paris: Organisation for Economic Co-operation and Development.

- Østvik, J., Ytterhus, B., and Balandin, S. (2018). 'So, how does one define a friendship?': Identifying friendship among students using AAC in inclusive education settings. *Eur. J. Spec. Needs Educ.* 33, 334–348. doi: 10.1080/08856257.2017.1312799
- Pastore, G. (2023). Beziehungsqualität und Integration. Die Rolle der Lehrperson-Lernende-Beziehung für die Integration von Jugendlichen mit sonderpädagogischen Bedürfnissen in inklusiven Schulen auf der Sekundarstufe I in der Schweiz. Freiburg (CH): Universität Freiburg. doi: 10.2440/003-0030
- Pastore, G., and Luder, R. (2021). Teacher-student-relationship quality in inclusive secondary schools: theory and measurement of emotional aspects of teaching. *Front. Educ.* 6:64361. doi: 10.3389/feduc.2021.643617
- Pastore, G., Luder, R., Kunz, A., and Paccaud, A. (2024). Lehrperson-Lernenden-Beziehungsqualität. Eine Skala zur Erhebung der Beziehungsqualität aus Schülerinnen- und Schülerperspektive. *Empirische Sonderpädagog.* 24, 223–239. doi: 10.2440/003-00
- Roorda, D. L., Jak, S., Zee, M., Oort, F. J., and Koomen, H. M. Y. (2017). Affective teacher-student relationships and students' engagement and achievement: a meta-analytic update and test of the mediating role of engagement. *Sch. Psychol. Rev.* 46, 239–261. doi: 10.17105/SPR-2017-0035.V46-3
- Roorda, D. L., Koomen, H. M. Y., Spilt, J. L., and Oort, F. J. (2011). The influence of affective teacher-student relationships on students' school engagement and achievement: a meta-analytic approach. *Rev. Educ. Res.* 81, 493–529. doi: 10.3102/0034654311421793
- Rubie-Davies, C. M. (2010). Teacher expectations and perceptions of student attributes: is there a relationship? *Br. J. Educ. Psychol.* 80, 121–135. doi: 10.1348/000709909X466334
- Rubie-Davies, C. M., and Hattie, J. A. (2025). The powerful impact of teacher expectations: a narrative review. *J. R. Soc. N. Z.* 55, 343–371. doi: 10.1080/03036758.2024.2393296
- Sahli Lozano, C., Wüthrich, S., Wicki, M., and Brandenberg, K. (2023). Soziale Selektivität bei der Vergabe der integrativen schulischen Maßnahmen reduzierte individuelle Lernziele, Nachteilsausgleich und integrative Förderung. *Z. Erziehungswiss.* 26, 997–1027. doi: 10.1007/s11618-023-01173-9
- Sankalaite, S., Huizinga, M., Dewandeleer, J., Xu, C., de Vries, N., Hens, E., et al. (2021). Strengthening executive function and self-regulation through teacher-student interaction in preschool and primary school children: a systematic review. *Front. Psychol.* 12:718262. doi: 10.3389/fpsyg.2021.718262
- Schwenck, C., Schmitt, D., Sievers, S., Romanos, M., Warnke, A., and Schneider, W. (2011). Kognitive und emotionale Empathie bei Kindern und Jugendlichen mit ADHS und Störung des Sozialverhaltens. *Z. Kinder Jugendpsychiatr. Psychother.* 39, 265–276. doi: 10.1024/1422-4917/a000118
- Seligman, M. E. P., Steen, T. A., Park, N., and Peterson, C. (2005). Positive psychology Progress: empirical validation of interventions. *Am. Psychol.* 60, 410–421. doi: 10.1037/0003-066X.60.5.410
- Shin, H., and Chang, Y. (2022). Relational support from teachers and peers matters: links with different profiles of relational support and academic engagement. *J. Sch. Psychol.* 92, 209–226. doi: 10.1016/j.jsp.2022.03.006
- Taubner, S., Wiswede, D., Nolte, T., and Roth, G. (2010). Mentalisierung und externalisierende Verhaltensstörungen in der Adoleszenz. *Psychotherapeut* 55, 312–320. doi: 10.1007/s00278-010-0753-8
- ten Braak, D., Cadima, J., Guedes, C., Ferreira, T., and Størksen, I. (2024). "Associations between teacher-child relationship and executive function: a quantile regression approach" in *Neurodiversity in education: research and practice* (Valencia: OSF).
- Tomasello, M., Carpenter, M., Call, J., Behne, T., and Moll, H. (2005). Understanding and sharing intentions: the origins of cultural cognition. *Behav. Brain Sci.* 28, 675–691. doi: 10.1017/S0140525X05000129
- Törmänen, M. R. K., and Roebbers, C. M. (2018). Developmental outcomes of children in classes for special educational needs: results from a longitudinal study. *J. Res. Spec. Educ. Needs* 18, 83–93. doi: 10.1111/1471-3802.12395
- Vandenbroucke, L., Spilt, J., Verschueren, K., Piccinin, C., and Baeyens, D. (2018). The classroom as a developmental context for cognitive development: a meta-analysis on the importance of teacher-student interactions for children's executive functions. *Rev. Educ. Res.* 88, 125–164. doi: 10.3102/0034654317743200
- Venet, M., Zurbriggen, C. L. A., Eckhart, M., Schwab, S., and Hessels, M. G. P. (2015). The perceptions of inclusion questionnaire (PIQ). Deutsche version. [www.piqinfo.ch](http://uni-bielefeld.de/erziehungswissenschaft/piq/). Available online at: <http://uni-bielefeld.de/erziehungswissenschaft/piq/> (Accessed April 3, 2019).
- Vösgen-Nordloh, M., Leidig, T., Koomen, H., Casale, G., Hennemann, T., and Bolz, T. (2023). How relevant is teacher- and student-perceived relationship quality for mental health in special and regular schools? *Empir. Sonderpädagog.* 15, 252–274. doi: 10.2440/003-0010
- Wang, H., Hall, N. C., Goetz, T., and Frenzel, A. C. (2017). Teachers' goal orientations: effects on classroom goal structures and emotions. *Br. J. Educ. Psychol.* 87, 90–107. doi: 10.1111/bjep.12137
- Ward, S., Sylva, J., and Gresham, F. M. (2010). School-based predictors of early adolescent depression. *Sch. Ment. Health* 2, 125–131. doi: 10.1007/s12310-010-9028-3
- Weller, B. E., Bowen, N. K., and Faubert, S. J. (2020). Latent class analysis: a guide to best practice. *J. Black Psychol.* 46, 287–311. doi: 10.1177/0095798420930932
- Wullschleger, A., Garrote, A., Schnepel, S., Jaquière, L., and Moser Opitz, E. (2020). Effects of teacher feedback behavior on social acceptance in inclusive elementary classrooms: exploring social referencing processes in a natural setting. *Contemp. Educ. Psychol.* 60:101841. doi: 10.1016/j.cedpsych.2020.101841
- Xu, C., Huizinga, M., De Luca, G., Pollé, S., Liang, R., Sankalaite, S., et al. (2023). Cultural universality and specificity of teacher-student relationship: a qualitative study in Belgian, Chinese, and Italian primary school teachers. *Front. Psychol.* 14:1287511. doi: 10.3389/fpsyg.2023.1287511
- Zdoupas, P. (2022). Selbstkonzept und Klassenlehrkraftverhalten. Bielefeld: Springer VS.
- Zdoupas, P., and Laubenstein, D. (2023). 'I feel well, accepted and competent in school'—determinants of self-perceived inclusion and academic self-concept in students with diagnosed behavioral, emotional and social difficulties (BESD). *Soc. Sci.* 12:154. doi: 10.3390/socsci12030154
- Zeegers, M. A. J., Colonnese, C., Stams, G.-J. J. M., and Meins, E. (2017). Mind matters: A meta-analysis on parental mentalization and sensitivity as predictors of infant-parent attachment. *Psychol. Bull.* 143, 1245–1272. doi: 10.1037/bul0000114
- Zurbriggen, C. (2021). Was und wie gut misst der Perceptions of Inclusion Questionnaire? Qualität, Spezifität und (Weiter-)Entwicklung. Available online at: <https://digital.hfh.ch/forschungsbericht-2021/chapter/4-was-und-wie-gut-misst-der-perceptions-of-inclusion-questionnaire/> (Accessed November 22, 2021).