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ORIGINAL ARTICLE

Longitudinal Negotiation, Navigation Processes, and School Success in High School: A Two-Wave Latent Transition Approach

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Abstract
By combining person-centered analysis with latent transition analysis (LTA) and adapting a navigation and negotiation perspective, we examined the effect of the COVID-19 pandemic on adolescents' depression and anxiety levels as well as their adaptation and success in high school. Focusing on the navigation (individual adaptation) and negotiation (social adaptation) factors that contribute to school success, our data from a longitudinal study in Switzerland (wave 1 in autumn 2020, grade eight [$n=315$]; wave 2 in spring 2021, grade eight [$n=257$]) revealed four patterns: students with high levels in both dimensions ("thriving"), students with low levels in both dimensions ("demanding"), students with low negotiation but moderate to high navigation ("unsupported bloomers"), and students with high negotiation but low navigation ("encouraged non-achievers"). The "thriving" pattern had about three times more students than the "encouraged non-achiever" pattern did and about five times more students with a lower depression/anxiety profile than the "demanding" pattern did. Parental involvement and reading comprehension were identified as crucial factors in students' academic achievement, with parental involvement being significantly associated with the "unsupported bloomers" pattern, suggesting that parents can compensate for the lack of teacher academic support and recognition and it can contribute to students' academic success. Adolescents with high navigation and negotiation resources had higher reading comprehension scores compared to those with lower navigation and negotiation resources. Reading comprehension significantly influenced grades in language subjects and mathematics. The study emphasized the importance of individual and social adaptation factors in promoting academic success and personal growth in high school.

Keywords Resilience at school · Adolescents · COVID-19 · Depression and anxiety

Resilience as Individual and Social Adaptivity: Adolescents at School During the COVID-19 Pandemic

Since the onset of the pandemic, young people across the globe have been confronted with significant disruptions to their habitual lives, including pervasive social isolation, decreased direct peer interaction, missed milestones, increased familial stress, and limited access to supportive figures such as teachers, possibly contributing to the surge in mental health problems (Cameranesi et al., 2023; Graupensperger et al., 2022a, b). Furthermore, overwhelming evidence has demonstrated that the risks of poor academic performance in high school (Makarova & Kassis, 2022; Theron, 2013) often coexist with the comorbidity of mental health and societal risks such as a pandemic (Ungar & Theron, 2020). Such stressors can precipitate psychological

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distress and mental health difficulties in adolescents. In fact, the cross-sectional and longitudinal studies conducted thus far suggest the prevalence of youth mental illness increased during the COVID-19 pandemic (Howes, 2000; Racine et al., 2021). However, addressing the mental health crisis among young people has become a global public health priority, and an increasing amount of research has been dedicated to tackle the mental health challenges this population faces (Cameranesi et al., 2023; Pivec & Kozina, 2023). This is supported not least by a meta-analysis of Racine et al. (2021), in which they evaluate the prevalence of clinically significant depression levels and generalized anxiety symptoms in young people around the world amid the COVID-19 pandemic. Among 29 samples studied with 80,879 children and adolescents, they found a pooled prevalence of 25.2% young learners for clinically elevated depression and 20.5% for anxiety symptoms, compared to the pre-pandemic estimates of 12.9% and 11.6%, respectively. These findings indicate that one in four youths worldwide experience clinically elevated depression symptoms, whereas one in five youths experience clinically elevated anxiety symptoms, revealing that the rates of mental health issues in youth during the pandemic doubled. Interestingly, the prevalence rates of anxiety were not dependent on the study participants' age (Racine et al., 2021). One possible explanation could be that parental and family resilience are important protective factors particularly during the COVID-19 pandemic (Masten, 2021).

Switzerland was one of the world's top 10 countries with the highest per capita COVID-19 infection rates (Salathé et al., 2020), a fact that may have significantly affected children and adolescents and led to limited access to education during the pandemic. Despite experiencing a relatively short school lockdown compared to other countries (from March to May 2020), the sudden announcement of the lockdown caught teachers, students, and parents off guard (Federal Office of Public Health, 2020). After the lockdown, during summer and early autumn 2020, mandatory face masks in public buildings such as schools, limits on gatherings, and recommended work-from-home measures were implemented. As a result, the pandemic posed significant challenges to students' mental health and resulted in increased internalizing symptoms (Janousch et al., 2022). Furthermore, Foster & O'Mealey (2022) report for the Swiss educational context that mental health problems were associated with challenges at home or with others, namely, in both genders. Specifically, parents' poor relationships with their partners during the lockdown seemed to be associated with increased anxiety symptoms in their children. Furthermore, in general, the pandemic seemed to affect girls psychologically more than boys. International research showed mixed results, with Graupensperger et al. (2022a, b) finding slight but non-significant increases in depression during the pandemic in American adolescents, while a study in the UK found no increase in internalizing symptoms (Daly & Robinson, 2021), suggesting there were context-specific differences in psychopathological symptoms during the pandemic.

These findings, coupled with the call to strengthen coping strategies in adolescents (Foster & O'Mealey, 2022), reveal two ways of research development. First, embedding and modeling current research in resilience concepts and the corresponding psycho-social characteristics, and second, the attempt to map changes in adolescent profile groups that lead to improved diagnostic knowledge.

Resilience as an Ordinary Magic Process of Individual and Systemic Adaptivity

According to Cameranesi et al. (2023), the most effective way to enhance children and youth's resilience and adaptivity after exposure to adversity is to improve their home and school environments, along with their interactions within these contexts. Adaptivity is an expression of realized or realizing resilience. Realized resilience focuses on the outcome, meaning that further positive possibilities for action and development paths result from the achieved result. In contrast, realizing resilience focuses on individuals' or systems' processes and concrete actions (White et al., 2023). This goes beyond the common resilience models, which focus on factors and processes for *overcoming crises* (cf. e.g., Schoon, 2006) because several characteristics are considered synoptically and, when combined, enable productive *everyday coping* (cf. e.g., Wright et al., 2013). From this perspective, resilience develops when people and systems actively adapt on a daily basis in changing and diverse everyday situations. It is not so much a formal response to experienced crises or risks being overcome, but rather a reflection of everyday challenges and tasks that people frequently cope with in daily life (cf. Masten, 2001).

Such experiences are reflected in learners' everyday school life. In a school context, multi-layered experiences that are particularly related to the development of learners' individual adaptivity become possible (Masten, 2014). Successful school adaptivity can be seen in terms of higher academic competencies and higher grades. In contrast, it might be reflected in the development of characteristics that enable learners to act adaptively in challenging situations.

Specifically, Masten (2014) examined the processes within a dynamic system for promoting resilience pathways among adolescents, thus enabling turning points in the development. This proposal guides our work and defines resilience as follows: "The capacity of a dynamic system to adapt successfully to disturbances that threaten system function, viability, or development" (Masten, 2014, p. 10). Theoretically, Masten (2014) mainly focuses on three aspects. First, disturbances that may affect a functioning

system, which might be comprised an individual, a group, or an organization. Second, disturbances that threaten this functioning system. Third, the system's ability to respond adaptively to the given situation.

This means, on the backdrop of the COVID-19 crisis, that the everyday school life, in which ordinary magic processes can enable and stabilize youth's resilience building, has changed drastically and fundamentally. Consequently, learners have to orientate themselves in a fundamentally new school reality. Thus, adaptation processes in school, understood as ordinary magic phenomena, are also exposed to the COVID-19-related context with unpredictable social processes as a whole. Focusing on school-based resilience as a form of individual and social adaptivity in the face of adversity, we investigate how learners balance the burden of acute adversities, such as COVID-19, in the experienced COVID-19 school reality.

School Closure and Social Distancing: The COVID-19-Related Context to Develop Resilience as Adaptivity in Schools

Along the abovementioned concepts of Masten's (2001) approach to resilience development as ordinary magic, we argue that both resilience in general and school-based resilience consist of ordinary rather than extraordinary processes. Meaning, to evaluate the resilience-related development of students in high school, we need specific insights into school systems of adaptation that focus not only on promoting positive practices but also on reducing existing threats to students' positive development. In this context Ungar et al. (2019) suggested that schools are dynamic systems that could and should influence their students' resilience processes. Thus, as resilience outcomes are not universally applicable, research must be conducted on schools while also collecting data on individual and environmental factors because there is no indiscriminate resilience process and no guaranteed safe path (Ungar et al., 2019). Subjects coordinate their actions as an interplay of individual and systemic factors, so that, according to Ungar (2005), "professional myopia" (p. 425) occurs when interventions in schools or social services neglect to consider young people as agentic consumers of a service. Consequently, resilience in high school moves beyond studies of how individual students overcome academic problems. Instead, successful resilience pathways at school are understood as depending on the service ecologies and result from "the interaction between what is provided to at-risk children, children's access to health resources on their own terms, and how well the resources that are provided address children's unique constellations of problem behaviors and psychopathology" (Ungar, 2005, p. 425).

Because this interplay is not very stable under the COVID-19 school reality, it is necessary to specify further the development of resilience as an adaptive dynamic between contextual and individual factors. According to Ungar (2005, 2008, 2011), successful resilience patterns require interaction between navigation (i.e., an individual's ability to navigate to resources) and negotiation (i.e., interactions carried out in a child-centered manner) to ensure that positive outcomes are maintained between the particular environment that is providing services and the individual. This implies that in the understanding of navigation and negotiation, the latter is not only determined by a set of social resources as external resources provided to the respective individual adolescent but also intertwined with the individuals' social activities. If they actively act in a real situation, negotiation may be fulfilled and enabled. Therefore, our focus relies on the question of how levels of depression and anxiety, as well as school success, among adolescent students during the COVID-19 crisis relate to navigation and negotiation changes in resources that facilitate the development of procedural resilience. This approach addresses the previous limitations of research on school failure as they were carried out by Van der Put et al. (2011) and Ungar (2005). Furthermore, and under a broader educational perspective, Govaris et al. (2021) also mention that while the studies do report on several individual risks of low school success, they rarely consider the role of schools or school systems in this educational failure. To address these limitations, and to differentiate the concept of resilience as adaptivity, recognized as a kind of ordinary magic, we introduce the concept of navigation and negotiation. We relate our focus on school-based resilience by adapting studies' approaches that originally focused on resilience among at-risk youth in child and youth services (Dueggeli et al., 2021).

Navigation at School

Applying Ungar's (2005) findings from the field of social services to school-based resilience (Dueggeli et al., 2021), the inflection points for resilience in schools consist of resilience pathways that the students' proactive actions and personal resources (called navigation) reinforce and that are identified by students' self-determination, self-efficacy regarding coping with challenging demands in life, and their ability to follow routines and remain organized at school.

The self-determination theory (SDT) of proactive actions identifies positive autonomy, growth in academic competence, and relations with others as essential aspects representing a decisive requirement for intrinsic motivation and satisfaction of individuals' basic psychological needs at school (Deci & Ryan, 2008; Deci & Ryan, 1991, Ryan

& Deci, 2000). Therefore, the degree of self-determination is a central factor for individuals to become active in their school context. Adolescent students' need for social relatedness encompasses the universal urge to be connected and experience interrelated caring at school. The psychological need for competence focuses on reliable instrumentalities that lead to specific outcomes (Deci & Ryan, 1991; Deci & Ryan, 2014). The need for autonomy focuses on adolescent students' aspirations to experience the self as the origin of their actions at school (Deci & Ryan, 2008). Adapting Ryan & Deci (1991, 2000) insights on SDT specifically on adolescence as a developmental stage with high risks regarding psychological challenges and adjustments, we must be very aware of adolescent students' attempts to fulfill their basic psychological needs to navigate intrinsically toward school success.

Bandura (1994) refers to perceived self-efficacy as people's belief in their capability to produce designated levels of performance that exercise influence over events that affect their lives (p. 71). According to this definition, self-efficacy is one of the constitutive characteristics of the psychosocial prerequisites of students' navigation and it is considered a fundamental characteristic of questions on how people feel, think, motivate themselves, and act (e.g., Bandura, 1994; Schwarzer, 1994). Thus, self-efficacy is a personal resource that enables individuals to remain active in challenging situations and to navigate situational contexts that further enable them to experience stable self-efficacy. If self-efficacy increases, well-being and general self-esteem will also increase. Similarly, a higher level of self-efficacy buffers stressful situations better than a lower one (cf. Bandura 1994). If self-efficacy is fundamentally lower, the risk of (learned) helplessness, powerlessness, and depression increase (cf. Seligman, 1975). This points to the importance of self-efficacy in the context of learners' school navigation. In this sense, we are referring to students' belief that they can perform an action, thus producing a positive effect at school.

A further important resilience factor in adolescence Hjemdal et al. (2006) identified is a structured lifestyle, contributing significantly to students' individual psychological and psychosocial stability and promoting productive navigation. These positive and proactive beliefs and needs at school must be closely connected to the respective actions because students need to follow routines to achieve their goals. Accordingly, the ability to structure one's life along certain guidelines and goals is a basic component for developing navigational ability to act. Students must be organized and plan specific school-centered activities before undertaking specific activities. At the same time, self-efficacy is a prerequisite for acting to promote individual development in these contexts productively. This structured lifestyle is constitutive for school success (Hjemdal et al., 2006).

Negotiation at School

Navigation at school must be accompanied by child-centered supportive interactions within the school, referred to as negotiation. Negotiation at school means that, in general, learners are not only receptive individuals in educational situations. They need to focus on the interaction between themselves and the context. Learners actively influence the situation through their behavior and thus, they shape it in such a way that it becomes the best possible environment for their resilience development. This refers in a specific way to understanding resilience as a dynamic and multisystemic process that involves reinforcing multiple systemic influences at the individual, family, and community levels to achieve successful adaptation following adversity (Masten & Motti-Stefanidi, 2020; Masten et al., 2021; Ungar & Theron, 2020). Thus, negotiation highlights the importance of supportive interactions in schools in successful adaptation to adversity. Negotiation is based on schools not only offering general support but also providing student-focused means that the individual student accepts. Obtaining acceptance for the support provided and fostering students' ability to establish social relationships at school is in high demand during adolescence (Hjemdal et al., 2006), referring to a flexible social competence approach on schools' and students' side. Hjemdal et al. (2006) considers the specific students' beliefs and experiences that the support provided is approachable, effective, and fundamental to adolescents' resilience. Therefore, supportive social contexts, such as teacher academic support or teacher recognition (Govaris et al., 2021), imply socially competent individuals as actors in specific contexts (Jennings and Greenberg, 2009). Without socially competent individuals, learners might not experience teacher recognition or teacher academic support, despite it being provided. The effect of these aspects, which are to be understood in a broader sense as pedagogical relation, has been extensively researched in recent years. Relevant findings from numerous sources (e.g., Hamre & Pianta, 2001; Lippard et al., 2018; McLaughlin & Clarke, 2010; Monahan et al., 2010; Pianta & Stuhlman, 2004; Sulkowski et al., 2012) highlight the quality of relationships between teachers and students as significantly predicting students' school performance and social-emotional development (Ansaria et al., 2020; Heatly & Votruba-Drzal, 2017; Howes, 2000; Spilt et al., 2012). Meta-analyses Cornelius-White (2007) and Roorda et al. (2011) have shown that students' motivation to learn, their level of school participation and learning satisfaction, and their academic performance are significantly influenced by teachers' attitudes and behaviors, such as empathy, respect, and emotional "warmth."

The quality of pedagogical relationships closely relates to teachers' attitudes and behaviors when meeting

students' basic needs for recognition in the school environment. According to Helsper & Lingkost (2002), students' recognition needs include affective, moral, and social recognition. Experiences of deficient empathy, morale, and social esteem negatively affect student's academic performance and can lead to discrimination and barriers to learning. In the school context, this type of negotiation requires adolescent students to feel securely connected with, supported by, and understood by teachers or significant others. This might be seen as a part of social contexts, supported by teacher recognition (Govaris et al., 2021), and this implies socially competent individuals as actors within these specific contexts (Jennings and Greenberg, 2009). In concrete terms, negotiation at schools includes the following three aspects: teachers and significant others' recognition, academic support provided among these, and teachers' or friends' capacity to establish social support on school matters (Dueggeli et al., 2021; Govaris et al., 2021).

Teacher Recognition: Teachers' attitudes and behaviors when meeting students' basic needs for recognition in the school environment are one of the core points on pedagogical relationships at school. According to Helsper & Lingkost (2002), students' recognition needs include affective, moral, and social recognition. In particular, experiences of inadequate moral respect strongly predict school performance for students from immigrant backgrounds as well as for students from families with low educational attainment (Govaris et al., 2021). In the case of inadequate moral respect, such students experience unequal treatment by their teachers in the form of comparatively lower learning expectations and limited opportunities to participate in teaching compared to their peers (Vieluf & Sauerwein, 2018). Personal and academic support teachers provide act as a negotiation-oriented child-centered supportive interaction that students accept (Govaris et al., 2021). The effect of pedagogical relationships on students' behavior and academic development has been extensively researched in recent years. Relevant findings from numerous sources (e.g., Hamre & Pianta, 2001; Lippard et al., 2018; McLaughlin & Clarke, 2010; Monahan et al., 2010; Pianta & Stuhlman, 2004; Sulkowski et al., 2012) highlight the quality of relationships between teachers and students as a significant predictor of students' school performance and social-emotional development (Ansaria et al., 2020; Heatly & Votruba-Drzal, 2017; Howes, 2000; Spilt et al., 2012). Meta-analyses that Cornelius-White (2007) and Roorda et al. (2011) performed have shown that students' motivation to learn, their level of school participation and learning satisfaction, and their academic performance are significantly influenced by teachers' attitudes and behaviors, such as empathy, respect, and emotional "warmth." A significant part of this recognition manifests in the perception of the learner receiving academic support.

Teacher Academic Support: Communicative exchange between learners and teachers requires that learners are convinced their inquiries will be met with communicative openness on the teachers' part. Content-related negotiation processes that learners carry out with their teachers are not possible if learners do not experience a willingness to be helped. Without their teachers' or of significant others' willingness, a central aspect on which learners base their successful progress is missing (Govaris et al., 2021). This may be seen as a central aspect of the broader construct of recognition in educational contexts.

Capacity to Establish Social Support: Another basic aspect for building negotiation is that learners are confident in their ability to build interactions in ways that shape and develop their current and upcoming relationship formation with a concentration on moving forward. Managing interactions with their teachers or significant others in their environment in a way that allows them to advance productively their development depends on the learners' belief that they can manage such processes and interactively shape them in a purposeful way. Here, an understanding is formed that can be located in the context of self-related cognitions, such as those that Sticca et al. (2023) assigned to the domain of non-academic self-concept in their model as social self-concept.

Inequalities in Resource Distribution

Moreover, we need to understand the interplay between the covariates and the respective navigation and negotiation patterns as well as the potential changes. Research suggests that familial involvement (Kassis, 2003) plays a crucial role, particularly when examining the specific quality of family interaction styles, especially in the context of the pandemic, and the effects of parental involvement on adolescent's navigation and negotiation patterns. The family environment relationship dimension focuses on its sustainability as well as the safety of individual family members, including whether others are there for them and whether a sustainable relationship can be built between parents and teenagers. This holds especially true for adolescent students whose teachers are not supporting them (Ungar, 2021) because need adult significant others. It is essential to tailor resilience-building approaches with topological precision (Masten, 2014). Furthermore, it is crucial to recognize that the concept of "functioning well" within a family, as relevant to a child, may differ from that of a teacher, who seeks to promote "functioning well" within a school setting. Despite the interconnectedness of these fields (family and school), their interpretations of "functioning well" may diverge and therefore, should be analyzed separately.

Regarding the factors that cause problems in school adjustment and that hinder the achievement of high school

performance in students from low socioeconomic backgrounds and immigrant families, in recent years, research has systematically focused on the importance and role of the quality of student–teacher exchanges in the school environment (Dimitrova et al., 2016; Govaris et al., 2021; Schachner et al., 2017). For example, migrant students experience a negatively charged context of pedagogical relations at school, mainly due to their teachers' stereotypical treatment of their origin. According to Stojanov (2013), the stereotypical perception that "foreign" backgrounds inevitably have limiting effects on the development of motivation, competence, and learning outcomes is pervasive in many schools that migrant students attend. Because a school environment of stereotyping relationships also creates significant barriers to building a sense of belonging, which is also an important determinant of school adjustment and school outcomes (Ham et al., 2017; Voight et al., 2015), immigrant students lack important institutional supports necessary for school success.

Because inequalities not only happen on an individual or social basis but also on societal level, we have to consider social stratification variables as being an additional predictor of school success (OECD, 2020; Becker et al., 2018; Dueggeli et al., 2021) as adolescents with immigrant backgrounds are disadvantaged in academic areas, especially in language and literacy skills. This applies not only to young people with a migration background but also to pupils from educationally disadvantaged families with low socioeconomic status who face the same significant challenges regarding discrepancies between their existing language skills and assumed skills for learning in school (Schümer et al., 2001). This is because many pupils rarely develop in their out-of-school environment the literacy-related practices typical for teaching and learning processes, particularly reading skills; however, these practices are nevertheless mostly assumed as an *implicit curriculum* and hardly ever taught explicitly (Morek & Heller, 2012). Therefore, reading literacy is a cross-curricular skill that contributes greatly to school success, and it should not be disregarded in studies that consider psychosocial components of school success, especially in connection to school grades.

Reading Literacy and School Success

Considering the insights on navigation and negotiation for school success during the COVID-19 pandemic and following Ungar's (2005) suggestions, it is valuable to draw from social service studies and to apply this knowledge to enhance school success with reading competencies, one of the essential qualifications for active participation in social life. Reading competence significantly influences learning at school and therefore, is a central developmental task: subject knowledge is predominantly conveyed through written texts, particularly from secondary school onward (Becker-Mrotzek & Roth, 2017), leading to a cumulative disadvantage in subject learning for children and adolescents with limited literacy competencies that accumulate with increasing learning age (Schümer et al., 2001). Therefore, curriculum-based reading programs are crucial for successful learning in general and the associated overall success at school (Hattie, 2008, p. 129 ff). Due to that, reading competence is central to performance in school language subjects. It extends to subjects such as foreign languages, mathematics (Paetsch, 2016), or biology (Schneider et al., 2018).

This discrepancy affects adolescents with an immigrant background more than it does their non-immigrant peers. They have achieved worse reading literacy scores in all Pisa studies (Reiss et al., 2019). However, for the most part, the reading literacy gaps associated with migration status or parents' country of birth are not independent but are related to that immigrant families are often in a socially weaker position, and they frequently speak a language other than German (Walter, 2009).

Current Study

Although identifying adolescent students' navigation and negotiation patterns at a specific time is an important first step, understanding the longitudinal changes in these patterns is crucial for designing school-specific prevention and intervention programs. However, currently there is a lack of data on how these patterns change over time, and how students navigate and negotiate these patterns throughout adolescence remains unclear. Even though there is evidence for both instability and stability, there is more evidence for instability, indicating a significant change across adolescence (Dueggeli et al., 2021; Kassis et al., 2021). This study examined the combined contribution of navigation and negotiation factors for understanding school success over time by applying latent transition analysis (LTA) to address this issue. LTA is a longitudinal analysis technique that characterizes transitions over time (Collins & Lanza, 2009). Using this person-oriented procedure, we aim to estimate and understand the continuity of navigation and negotiation levels among students at two time points by conducting two distinct latent class analyses (LCA) to determine whether the transition is developmentally forward (e.g., transition to a pattern with higher levels of navigation and negotiation) or backward (e.g., transition to lower levels of navigation and negotiation). This methodology allows grouping subjects into distinct classes according to the adolescent students' indicators included in the analysis. Then, it estimates the probability that a particular subject (thus also a

person-oriented method) is a member of that class (Hagenaars et al., 2002).

Our research team embarked on a study aimed at investigating the adequacy of navigation and negotiation indicators in determining academic achievement in adolescents. This innovative approach had not been implemented before; hence, we formulated and tested six partially exploratory hypotheses to obtain additional conclusive insights.

First, we predicted that the introduced navigation and negotiation indicators would allow identifying distinct resilience-outcome classes regarding available resources for adolescents.

Second, following previous research insights, we expected to identify four classes: a class with high levels of both navigation and negotiation, a class with low levels of both navigation and negotiation, a class with high levels on navigation and low levels on negotiation, and a class with low levels on navigation and high levels on negotiation.

Third, considering navigation and negotiation patterns are a state and not traits, we expected fluctuations between the to-be-identified classes at different time points. We expected adolescents with low levels of both navigation and negotiation would most likely remain in their class. In contrast, the class with high levels of both navigation and negotiation would be the least stable.

Fourth, we expected that sociodemographic predictors, such as gender, migration background, socioeconomic status, school level, and grades, would influence the participating adolescents' class membership in the model.

Fifth, considering navigation and negotiation patterns related to school success, such as reading competence and grades, we expected students from the class with higher negotiation and navigation levels to be more successful at school.

Sixth, we expected students with higher levels of navigation and negotiation to display lower levels of psychological distress, such as depression and anxiety.

Materials and Methods

Procedures

The sample was collected anonymously by completing an online questionnaire twice at one-year intervals. Consent forms were obtained from students and their parents. No incentives were given. An ethics research committee at the University of Zurich in Switzerland authorized the project. On the day of the study, the instructed research team members gave students a short oral introduction to the survey, and the students completed the questionnaire in approximately 45 min.

Participants

The random sample data of wave 1 included ($n = 315$) eighth-grade adolescent students and wave 2 ($n = 257$) the same high school students out of 33 school classes in German-speaking Northwestern Switzerland. Data for wave 1 was collected in autumn (September/October) 2020, and for wave 2 in spring (May/June) 2021, almost one school year later. The sample average age was 13.6 ($SD = 0.7$) at wave 1 and 14.6 ($SD = 0.7$) at wave 2. At wave 1, 45.4% of participants ($n = 143$) were female and 0.1% ($n = 2$) identified as neither female nor male; at wave 2, 43.2% of participants ($n = 111$) were female and 2.7% ($n = 7$) identified as neither female nor male.

Measures

The Three Navigation Indicators for the LTA

Self-Determination. Based on Ryan & Deci (1991, 2000) SDT on basic psychological need satisfaction, we measured the three subscales of autonomy, competence, and relatedness. The short scales included six items each, such as, "I was free to do things in my way" for autonomy, "I have accepted and mastered great challenges" for competence, and "I had the feeling of being in contact with classmates who are close to me" for relatedness. The 18-item scale (α wave 1 = 0.79; α wave 2 = 0.82) was measured on a 4-point Likert scale ranging from 1 (*not true at all*) to 4 (*completely true*), with a fair test–retest reliability ($r = 0.59$). To perform LCA/LTA, the data were dichotomized into two groups based on a median split for wave 1 ($Mdn = 2.8$) and wave 2 ($Mdn = 2.8$), representing lower levels (0) or higher levels (1) of anxiety and depression symptoms.

Self-Efficacy. Schwarzer and Jerusalem (Schwarzer & Warner, 2013) developed the General Self-Efficacy Scale as a psychometric tool to evaluate optimistic self-confidence toward managing demanding situations with items, such as, "I have faith in my abilities to handle unexpected events efficiently." The 10-item scale, which is measured on a 4-point Likert scale ranging from 1 (*not true*) to 4 (*completely true*), demonstrates a high level of internal consistency for wave 1 ($\alpha = 0.89$) and wave 2 ($\alpha = 0.91$) with an acceptable test–retest reliability ($r = 0.50$). To perform LCA/LTA, the data were dichotomized into two groups based on a median split for wave 1 ($Mdn = 2.8$) and wave 2 ($Mdn = 2.9$), representing lower levels (0) or higher levels (1) of anxiety and depression symptoms.

Structured Life. The Resilience Scale for Adolescents (Hjemdal et al., 2006) includes a structured life subscale comprising four items that assess an individual's inclination toward routines and goals, organization, and planning before engaging in activities with items such as, "I excel at

managing my time." Using a 5-point Likert scale ranging from 1 (*totally disagree*) to 5 (*totally agree*), participants rated the items, resulting in a moderate level of internal consistency for wave 1 ($\alpha = 0.60$) and wave 2 ($\alpha = 0.62$) with an acceptable test–retest reliability ($r = 0.50$). To perform LCA/LTA, the data were dichotomized into two groups based on a median split for wave 1 ($Mdn = 3.7$) and wave 2 ($Mdn = 3.8$), representing lower levels (0) or higher levels (1) of anxiety and depression symptoms.

The Three Negotiation Indicators for LTA

Teacher Recognition. To evaluate teacher recognition toward students, as Honneth (1996) proposed, we assessed three subscales for empathy, solidarity, and law using a 4-point Likert scale ranging from 1 (*do not agree at all*) to 4 (*strongly agree*). The subscale for empathy included items such as, "My teacher motivates me to express my emotions." An example item for solidarity is, "My teacher takes care of me," and for law, "My teacher treats me unfairly." A revised version of Böhm-Kasper & Selders (2013) 16-item scale on recognition relations between teachers and students was used to collect data, yielding high levels of internal consistency for wave 1 ($\alpha = 0.85$) and wave 2 ($\alpha = 0.87$) with a good test–retest reliability ($r = 0.61$). To perform LCA/LTA, the data were dichotomized into two groups based on a median split for wave 1 ($Mdn = 3.2$) and wave 2 ($Mdn = 3.3$), representing lower levels (0) or higher levels (1) of anxiety and depression symptoms.

Teacher Academic Support. We employed a revised version of Hertel et al.'s (2014) scale to identify the extent of academic support and positive teacher–student relationships. The five items included, "When I require extra support, my teachers provide it," and they were assessed using a 4-point Likert scale ranging from 1 (*do not agree at all*) to 4 (*strongly agree*) with a high internal consistency each for wave 1 ($\alpha = 0.88$) and wave 2 ($\alpha = 0.88$). The items yielded a fair test–retest reliability ($r = 0.56$). To perform LCA/LTA, the data were dichotomized into two groups based on a median split for wave 1 ($Mdn = 3.2$) and wave 2 ($Mdn = 3.0$), representing lower levels (0) or higher levels (1) of anxiety and depression symptoms.

Social Competence. The Resilience Scale for Adolescents, which Hjemdal et al. (2006) developed, includes a social competence subscale comprising five items that assess social flexibility, acceptance of social support, and the capacity to form social relationships within a school setting with items such as, "I am good at talking to new people." Participants used a 5-point Likert scale ranging from 1 (*totally disagree*) to 5 (*totally agree*) to rate the items, yielding a high level of internal consistency for wave 1 ($\alpha = 0.77$) and wave 2 ($\alpha = 0.72$) with a fair test–retest reliability ($r = 0.56$). To perform LCA/LTA, the data were dichotomized into two groups based on a median split for both wave 1 ($Mdn = 4.0$) and wave 2 ($Mdn = 3.8$), representing lower levels (0) or higher levels (1) of anxiety and depression symptoms.

Depression/Anxiety as a Predictor

Symptoms of Anxiety and Depression. We used the Hopkins Symptom Checklist (Derogatis et al., 1974) to evaluate symptoms of anxiety and depression with 24 items such as, "I feel fear and thoughts of ending my life." The original 25-item scale was reduced by one item (loss of sexual interest or pleasure) due to the participants' young age range (approximately 12–14 years old). Participants rated the items on a 4-point Likert scale, from 1 (*not at all*) to 4 (*extremely*), with high internal consistency for wave 1 ($\alpha = 0.95$) and wave 2 ($\alpha = 0.95$).

Covariates

Gender. We assessed the students' genders with three response options (0 = boy, 1 = girl, and 3 = other).

Migration Background. Not having a migration background meant the student and their parents were born in Switzerland and that all three possessed only a Swiss passport. Having a migration background was operationalized such that one or more of the conditions mentioned above did not apply.

Socioeconomic Status. To infer students' socioeconomic backgrounds at wave 2, we utilized their socioeconomic status information regarding parental education obtained from the parent questionnaire, with response options ranging from 0 (*university degree or higher*) to 5 (*not completed primary school*); for instances of missing data, we also consulted wave 1 data.

School Level. In Switzerland, adolescents in high schools are divided based on performance and teacher recommendations on three main levels (lower, higher secondary school level, and gymnasium). Our study was on the lower and higher secondary school level (1 = lower school level, 2 = higher school level).

Parental Involvement. In the Parental Involvement Scale (Kassis, 2003), the interest of family members in each other is placed at the center, examining a particular quality of the family's interaction style. The scale included items such as, "In our family, we always have time for the other who needs help," and the items were measured on a 4-point Likert scale ranging from 1 (*not true at all*) to 4 (*completely true*) with high internal consistency for wave 1 ($\alpha = 0.83$). Due to differences in the interpretation of "functioning well" of family and teachers, we applied parental involvement as a covariate and not within the school-focused profiles on negotiation.

Indicators of School Success

Reading Competence and Grades. To assess reading competence, we used the LGVT 5–12 + (Schneider et al., 2017a, b), a method for assessing students' reading comprehension and reading speed in fifth through twelfth grades. However, we decided to focus mainly on reading comprehension outcomes in our study because reading comprehension plays an essential role in acquiring knowledge. Therefore, it is an important prerequisite for success at school. Additionally, we used students' academic performance as displayed in German, English, and mathematics. Students' grades in German, English, and mathematics of the last term were noted with response rates of 1 (*lowest grade*) to 6 (*highest grade*) in half steps.

Analytic Strategy

This study's aim was three-fold and six analyses with steps ran it. First, to test the introduced navigation and negotiation conceptualization. Second, to assess adolescent students' navigation and negotiation patterns over time to help aid in prevention and intervention programs. Third, to detect if LTA's identified navigation and negotiation patterns are related to specific depression/anxiety levels.

As analytic methods, LCA and LTA focus on the individual and aim to classify latent variables into subgroups based on similarities in their observed data (Hagenaars et al., 2002; Lanza & Cooper, 2016; Lanza et al., 2013). Individuals can be grouped into different patterns or classes using posterior probabilities. Therefore, this study's statistical analysis was conducted in six steps. First, wave 1 versus wave 2 survey differences in the six applied LCA/LTA indicators (SDT, self-efficacy, structured life, teacher recognition, teacher academic support, and social competence) were examined using *t*-tests. Additionally, we tested correlations for multicollinearity of all LCA/LTA variables. Second, adolescent students' navigation and negotiation classes were identified separately by computing LCA using six classification variables, each for wave 1 and wave 2. Additionally, invariance analysis across time was applied to ensure both waves had the reliability for the identified number of navigation and negotiation patterns (configural invariance) and the same relevance of the navigation and negotiation patterns (metric invariance). Third, we ran LTA to indicate significant differences in the longitudinal classification variables on the identified navigation and negotiation patterns. Fourth, gender, migration background, socioeconomic status, school level, reading comprehension, parental involvement, and students' grades were included as predictors of multinomial logistic regression analyses to predict the identified latent pattern membership. Testing the relationship between reading comprehension and students' grades on the specific resilience patterns was mainly applied as a validation strategy for exploring the connection between navigation and negotiation to formal school success. Using multinomial logistic regression, we additionally tested if parental involvement might have substituted missing negotiation at school and if this affects the distribution of the respective adolescents to the different navigation and negotiation patterns. As the fifth analytic step, we tested by multinomial logistic regression for the relation of reading competence to the respective German, English, and mathematics grades. Sixth, we analyzed multinomial logistic regression analyses to understand the connection between the identified navigation and negotiation patterns by the depression/anxiety levels. For all conducted LCA/LTA, we used Mplus version 8.6 (Muthén & Muthén 2020). For the multinomial regression, we used SPSS 25.

Results

Attrition

Regarding attrition from wave 1 to wave 2, there were no significant differences in terms of the tested socio-demographic variables between participants for wave 1 ($n = 315$) and wave 2 ($n = 257$). Participants did not differ significantly in gender ($t[254] = -0.654$, $p = 0.514$), migration background ($t[257] = -0.832$, $p = 0.121$) or socioeconomic status ($t[254] = 0.320$, $p = 0.612$). Due to this, the two samples were comparable even though some participants were lost due students being ill at the day of study, moving away, or changing to a new school. Between wave 1 and wave 2 we lost one class, because the teacher changed, and the new teacher did not want to participate anymore. Within COVID-19, we consider this a great success and were able to activate all the remaining 33 teachers with the classes by information on the wave 1 results and email contact.

Analytic Step One: Differences in all Measures Between the Two Waves and Intercorrelations

We ran *t*-tests (see Table 1) to analyze for mean differences between the two waves of the nine applied measures in our sample (n wave $1 = 315$, n wave $2 = 257$). For self-efficacy and depression/anxiety, a low effect, and reading comprehension, a middle effect between wave 1 and wave 2 was displayed for all three, with a significantly higher level at wave 2. Meaning that self-efficacy as well as depression/anxiety levels were significantly higher at wave 2. Especially, we noted the very high levels of depression/anxiety at wave 1 and wave 2, both being higher than the internationally accepted cut-off point ($M = 1.75$) for clinical caseness, as Mollica et al. (1987) and Winokur et al. (1984) defined. This

Table 1 Wave 1 and wave 2 sample mean levels (and standard deviations) of all observed variables

Variables	Range	Wave 1 *M* (*SD*)	Wave 2 *M* (*SD*)	Cohen's *d*
SDT	1–4	2.86 (0.45)	2.88 (0.47)	-
Self-efficacy	1–4	2.83 (0.54)	2.94** (0.55)	0.20
Structured life	1–5	3.67 (0.66)	3.72 (0.69)	-
Recognition by teacher	1–4	3.26 (0.56)	3.26 (0.55)	-
Academic support from teacher	1–4	3.24 (0.57)	3.24 (0.59)	-
Social competence	1–5	3.94 (0.72)	3.92 (0.67)	-
Grades in German	1–6	4.77 (0.44)	4.80 (0.44)	
Grades in English	1–6	4.84 (0.61)	4.77 (0.63)	
Grades in mathematics	1–6	4.72 (0.62)	4.73 (0.66)	
Reading comprehension (LGVT-test, raw value)	< 2–84	25.06 (11.40)	29.12*** (13.04)	0.33
Depression/anxiety	1–4	1.90 (0.67)	2.01 (0.70) **	0.18
Parental involvement	1–4	3.32 (0.64)	3.26 (0.69)	-

Sample mean levels and standard deviations of observed variables to analyze for mean differences between both waves. *n* wave 1 = 315, *n* wave 2 = 257

** = $p < 0.01$, between wave 1 and wave 2

was also established for the German version of the Hopkins scale by Glaesmer et al. (2014).

Secondly, we tested the intercorrelations of all variables (see Table 2); we assured that in our LCA/LTA analyses no multicollinearity problems existed.

Analytic Step Two: Identifying Navigation and Negotiation Patterns Separately for Wave 1 and Wave 2 by LCA

In step two, we identified adolescent students' navigation and negotiation patterns by computing two separate LCAs (for wave 1 and wave 2) using six indicator variables. Individuals in each group shared the same pattern of navigation and negotiation. The LCA was conducted for a range of two to six latent classes. The main aim was to determine significantly distinct navigation and negotiation classes using statistical indices to determine the optimal number of latent classes: AIC, aBIC, and significant LMR, aLMR, and BLRT. However, the final model for an LCA/LTA (i.e., how many classes) was chosen based on a mixture of statistical indicators and theoretical considerations (Lanza & Cooper, 2016; Lanza et al., 2013).

For both waves, we identified the four-class solution as the most appropriate, with aBIC being the lowest, and the five-class solution having higher levels than the four-class solution (see Table 3). Another argument for the four-class solution was that it gave insights into differential processes (see Fig. 1) on patterns of navigation and negotiation in school compared to the three-class solution. The analysis revealed a class with high levels of both navigation and negotiation, which we named "thriving" (see Fig. 1) while recognizing that additional indicators are needed to map overall thriving. Nevertheless, this group reflects a profile where the name thriving fits best. Furthermore, we detected a class with a mixed profile on both navigation and negotiation. This mixed class had mostly low negotiation and

Table 2 Correlations between measures of the LCA/LTA

	Recognition by teacher	Academic support from teacher	Social competence	SDT	Self-efficacy	Structured life
Recognition by teacher	1	0.46***	0.23***	0.33***	0.18**	0.18***
Academic support from teacher	0.65***	1	0.14*	0.29***	0.28***	0.19***
Social competence	0.09	0.08	1	0.25***	0.29***	0.32***
SDT	0.20**	0.37***	0.29***	1	0.38***	0.19***
Self-efficacy	0.17*	0.37***	0.24***	0.47***	1	0.26***
Structured life	0.19**	0.13*	0.23***	0.07	0.19**	1

Correlations above the center are referring to wave 1, under the center to wave 2

***, $p < 0.001$; **, $p < 0.01$; *, $p < 0.05$

Table 3 Latent class analysis model fit statistics to select the number of classes of navigation and negotiation at school for both waves, sequentially

Classes	Wave 1							Wave 2						
	AIC	aBIC	LMR	aLMR	BLRT	Entropy	Classification accuracy	Samples	AIC	aBIC	LMR	aLMR	BLRT	Entropy	Classification accuracy	Samples
2	2550	2560	< 0.001	< 0.001	< 0.001	0.69	0.90–0.93	187/190	2183	2193	< 0.001	< 0.001	< 0.001	0.81	0.95	274/103
3	2531	2547	< 0.05	< 0.05	< 0.001	0.78	0.78–0.93	183/166/28	2137	2152	< 0.05	< 0.05	< 0.001	0.76	0.88–0.92	89/98/190
4	2526	2547	< 0.05	< 0.05	< 0.05	0.82	0.75–0.95	158/28/133/58	2129	2150	> 0.05	> 0.05	< 0.05	0.74	0.78–0.91	82/33/78/184
5	2525	2551	> 0.05	> 0.05	> 0.05	0.78	0.74–0.92	66/92/44/32/143	2132	2158	> 0.05	> 0.05	> 0.05	0.66	0.65–0.91	74/167/82/26/26
6	2526	2557	< 0.05	< 0.05	> 0.05	0.78	0.79–0.91	63/34/59/55/24/142	2137	2168	< 0.01	< 0.01	> 0.05	0.66	0.64–0.86	44/40/63/167/30/33

Select the number of classes of navigation and negotiation at school with a latent class analysis model

AIC, Akaike information criterion; aBIC, sample-size adjusted BIC; LMR, Vuong-Lo-Mendell-Rubin likelihood ratio test; aLMR, Lo-Mendell-Rubin adjusted LRT test; BLRT, bootstrap likelihood ratio test

middle navigation levels, named "unsupported bloomers." We identified a class with high levels of negotiation except for social competence and low levels of navigation, named "encouraged non-achievers." A class with low levels of both navigation and negotiation was named "demanding." Before running an LTA but after establishing the same number of classes for both waves and proving configural invariance, we also tested for measurement invariance over time. When comparing the constraint to the unconstraint model using a chi^2 test ($\chi^2(24) = 35.67$, $p = 0.05$), the two models did not differ significantly, and a full measurement invariance was assumed.

Analytic Step Three: LTA to Indicate Significant Differences in the Longitudinal Classification Indicators

After determining the optimal number of classes separately at each time point to be four (see analysis step two), we performed an LTA by using the previously mentioned six classification variables (for model fits, see Table 4) to estimate the probabilities of navigation and negotiation pattern transitions over time from one latent class to another (Lanza et al., 2013). In this statistical step, the probability of transitioning to a latent navigation and negotiation pattern at wave 2 represents change, given latent status membership at wave 1 (Lanza et al., 2013). Additionally, it explores whether the same latent patterns can be identified in both wave 1 and wave 2. The LTA was conducted for a range of two to six latent classes to test if the conditional response probabilities had been constrained to be time invariant.

The aBIC dropped (see Table 4) between the three- and four-class solutions ($-\Delta 57$), and the corresponding aBIC stability ($+\Delta 2$) from the four- to the five-class solution, indicated a four-class solution as appropriate. The detected samples for the respective solutions (see Table 5) supported the four-class solution, with the five-class solution having numerous subsamples with far too few ($n < 14$) students allocated to the subsamples. Due to the subsample sizes and the rule of deference to more constrained models, a four-class solution was selected for the longitudinal analysis via LTA.

Regarding the distribution of the four classes for both waves (see Table 5), we identified significant changes, a drop over time for the "thriving" class and the "encouraged non-achiever" class. We noticed a low decrease in the "unsupported bloomers" class from wave 1 to wave 2. The only noticeable increase was detected in the "demanding" class from wave 1 to wave 2.

Regarding comparing the classes' stability over one school year, a multilayered picture can be identified (see Fig. 2). Concerning the stability over time, only one pattern (demanding) out of four classes showed a remarkable immobility (84%) of the students being reassigned to the same class. In contrast, fewer (65.9%) of the students assigned in wave 1 to the

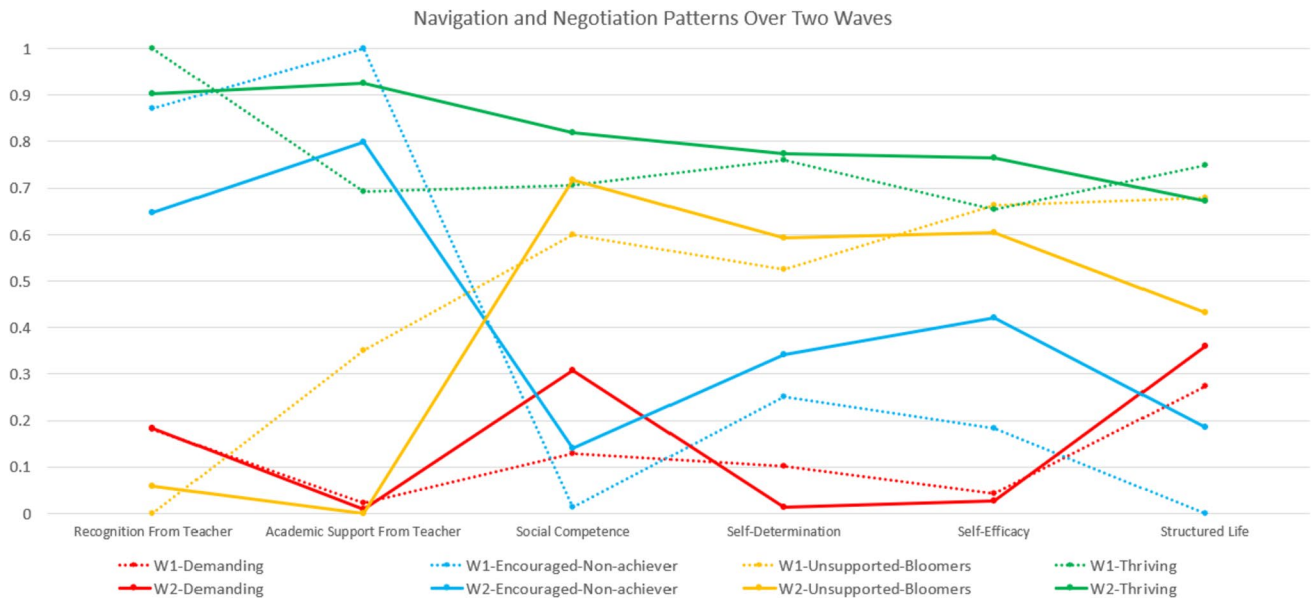

Fig. 1 LCA pattern plot for both waves with class-specific probabilities of the respective high level for the six indicators. Note: The analysis revealed several classes with different navigation and negotiation levels

Table 4 Latent transition analysis model fit statistics to select longitudinally the number of classes of navigation and negotiation at school

Classes	AIC	aBIC	Entropy	Samples	Classification Accuracy
2	4665	4676	.75	w1: 184/193; w2: 130/247	.64-.92
3	4570	4590	.75	w1: 83/168/126; w2: 77/209/91	.82-.92
4	4504	4533	.77	w1: 135/94/63/85; w2: 192/81/41/63	.86-.90
5	4494	4535	.81	w1: 26/66/136/89/60; w2: 14/50/192/77/44	.85-.91
6	4494	4548	.84	w1: 33/62/47/59/38/138; w2: 16/27/39/83/27/185	.81-.92

Estimation of the probabilities of navigation and negotiation pattern transitions over time from one latent class to another

AIC, Akaike information criterion; *aBIC*, adjusted Bayesian information criterion

The chosen solution is highlighted in grey

Table 5 Estimated longitudinal probabilities of the four resilience patterns by latent transition analysis

Navigation and negotiation pattern	Wave 1	Wave 2	ΔW2 – W1
Demanding	34.2%	46.7%	+ 12.5%
Unsupported bloomers	26.0%	24.9%	− 1.1%
Encouraged non-achiever	18.0%	12.4%	− 5.6%
Thriving	21.8%	15.9%	− 5.9%

"thriving" class were in the same class in wave 2, with similar numbers for the stability in the "unsupported bloomers" pattern. The lowest stability (51.1%) over the two waves was noticed for the "encouraged non-achiever" pattern.

Interestingly, when looking closer at these changes over time from the "demanding" class, no student moved to the "thriving" class and few (2.9%) to the "unsupported bloomers" class. Very few students (1.9%) transitioned to

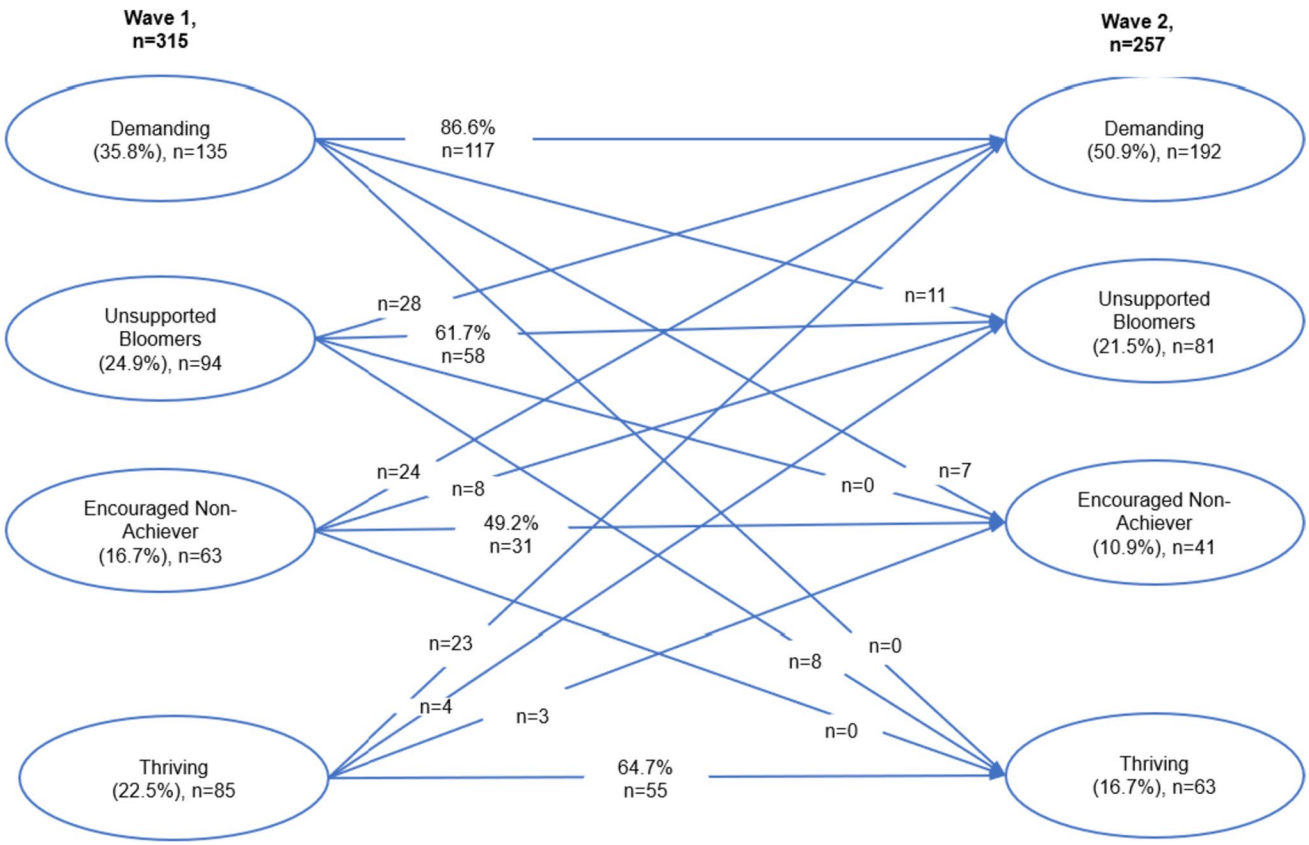

Fig. 2 Transition over time among different patterns of navigation and negotiation levels between wave 1 and wave 2, in parentheses, estimates of patterns membership probabilities

the "encouraged non-achiever" class. Regarding "ordinary magic," as Masten (2001) described, positive developments, called resilience, despite specific risks, when taken together, only an almost negligible proportion of the participating students (< 2.1%) transitioned from the other three classes to the "thriving" class. Additionally, when focusing on the "thriving" class, from wave 1 to wave 2, almost none (0.8%) moved to the "encouraged non-achiever" class, very few (1.1%) to the "unsupported bloomers," and some (6.1%) directly to the "demanding" class.

Analytic Step Four: Testing Factors Predicting the Latent Pattern Membership at Wave 2

After identifying the classes for both waves, we tested several wave 1 factors predicting the latent pattern membership at wave 2 using a multinomial logistic regression. In the first step, our analyses included socio-demographic covariates that could plausibly relate to navigation and negotiation pattern variations at school (see Table 6): gender, migration background, socioeconomic status, and school level were included as socio-demographic predictors to the identified latent pattern membership. Secondly, we ran additional multinomial analyses to validate the identified navigation and negotiation patterns for detecting if reading comprehension and German, English, and mathematics grades also predict latent pattern membership at wave 2.

The sociodemographic variables showed (see Table 6) a very low prediction of the respective identified LCA patterns at wave 2: gender and school level were not significant to the prediction of class membership. The prediction strength of migration background for students with no migration background was twice as high as for students with a migration background in the class "thriving" compared to the class "demanding." A higher socioeconomic status is associated with a significant increase in the relatively long odds of being in class "thriving" than in class "demanding."

We detected significant and high predictions when analyzing the connection between reading comprehension and German, English, and mathematics grades on the latent pattern membership at wave 2. Especially reading comprehension showed a very high prediction. With an odds of almost seven times higher (see Table 6), students with higher test values in reading comprehension were in the class "thriving" compared to the class "demanding." This holds similarly, but on a lower level, for the relative log odds of being in a "thriving" class

Table 6 Multinomial logistic regression of predictors in the four LCA wave 2 classes

LCA wave 2 class	Predictor	*B*	*SE*	Wald statistic	*p*	*OR*	Prediction in % pseudo-R^2		
							Cox and Snell	Nagelkerke	Mac-Fadden
Encouraged-non-achiever	Intercept	−0.66	0.29	4.93	0.026		2.0	2.2	0.8
	Gender (1 male; 2 female)	−0.54	0.42	1.65	0.199	0.57			
Unsupported-bloomers	Intercept	−0.23	0.26	0.82	0.363				
	Gender (1 male; 2 female)	0.21	0.33	0.42	0.516	1.24			
Demanding	Intercept	1.01	0.20	24.91	< 0.001				
	Gender (1 male; 2 female)	−0.44	0.27	2.66	0.103	0.64			
Encouraged-non-achiever	Intercept	−1.23	0.28	18.89	< 0.001		3.1	3.4	1.3
	Migration background (0 no MB, 1 with MB)	0.77	0.42	3.37	0.066	2.16			
Unsupported-bloomers	Intercept	−0.05	0.19	0.08	0.772				
	Migration background (0 no MB, 1 with MB)	0.01	0.33	0.01	0.956	1.01			
Demanding	Intercept	0.50	0.17	8.69	0.003				
	Migration background (0 no MB, 1 with MB)	0.73	0.27	6.98	0.008	2.08			
Encouraged-non-achiever	Intercept	−1.17	0.27	18.80	< 0.001		1.2	1.3	0.5
	Socio-economic status (0 high, 1 low)	0.74	0.42	3.01	0.083	2.10			
Unsupported-bloomers	Intercept	−0.21	0.19	1.14	0.284				
	Socio-economic status (0 high, 1 low)	0.50	0.33	2.26	0.132	1.66			
Demanding	Intercept	0.59	0.16	13.16	< 0.001				
	Socio-economic status (0 high, 1 low)	0.53	0.29	3.37	0.066	1.70			
Encouraged-non-achiever	Intercept	−0.91	0.26	11.99	< 0.001		0.01	0.01	0.01
	School level (1 lower; 2 higher)	0.01	0.42	0.01	0.971	1.01			
Unsupported-bloomers	Intercept	−0.04	0.20	0.04	0.840				
	School level (1 lower; 2 higher)	−0.02	0.32	0.00	0.942	0.97			
Demanding	Intercept	0.75	0.17	19.18	< 0.001				
	School level (1 lower; 2 higher)	0.14	0.27	0.26	0.607	1.15			
Encouraged-non-achiever	Intercept	−0.94	0.23	15.88	< 0.001		17.7	19.4	8.0
	Reading comprehension (1 low; 2 high)	0.12	0.48	0.07	0.791	1.13			
Unsupported-bloomers	Intercept	−0.04	0.17	0.07	0.788				
	Reading comprehension (1 low; 2 high)	−0.00	0.38	0.01	0.981	0.99			
Demanding	Intercept	0.01	0.17	0.01	1.000				
	Reading comprehension (1 low; 2 high)	1.89	0.30	37.83	< 0.001	6.66			
Encouraged-non-achiever	Intercept	−1.24	0.29	17.99	< 0.001		6.1	6.6	2.6
	Grade German (1 low; 2 high)	0.73	0.41	3.06	0.080	2.08			
Unsupported-bloomers	Intercept	−0.51	0.22	5.19	0.023				
	Grade German (1 low; 2 high)	0.96	0.32	8.79	0.003	2.62			
Demanding	Intercept	0.09	0.19	0.22	0.632				
	Grade German (1 low; 2 high)	1.31	0.28	21.95	< 0.001	3.71			
Encouraged-non-achiever	Intercept	−0.82	0.28	8.47	0.004		3.6	3.9	1.5
	Grade English (1 low; 2 high)	−0.18	0.41	0.19	0.659	0.83			
Unsupported-bloomers	Intercept	−0.10	0.22	0.20	0.651				
	Grade English (1 low; 2 high)	0.10	0.31	0.10	0.746	1.10			

Table 6 (continued)

LCA wave 2 class	Predictor	*B*	*SE*	Wald statistic	*p*	*OR*	Prediction in % pseudo-R^2		
							Cox and Snell	Nagelkerke	Mac-Fadden
Demanding	Intercept	1.09	0.18	36.48	< 0.001				
	Grade English (1 low; 2 high)	−0.76	0.27	7.77	0.005	0.46			
Encouraged-non-achiever	Intercept	−1.25	0.30	17.08	< 0.001		5.2	5.7	2.2
	Grade mathematics (1 low; 2 high)	0.70	0.41	2.80	0.094	2.01			
Unsupported-bloomers	Intercept	−0.33	0.22	2.31	0.128				
	Grade mathematics (1 low; 2 high)	0.60	0.32	3.52	0.060	1.82			
Demanding	Intercept	0.11	0.19	0.34	0.557				
	Grade mathematics (1 low; 2 high)	1.20	0.27	18.70	< 0.001	3.32			

SE, standard error; *OR*, odds ratio

[a]Reference LCA wave 2 class is "1," the class "thriving" with high levels on both navigation and negotiation

than in a "demanding" class when having higher grades in German, English, and mathematics (see Table 6).

Summarizing the multinomial regression analyses, we identified only very low prediction by gender and school level for specific latent patterns. In contrast, both social stratification covariates had a high impact. Additionally, no migration background as well as a higher socioeconomic status led to a significant increase in the relative odds of being in the class "thriving" than in the class "demanding." Finally, we note the higher prediction to the latent pattern membership at wave 2 for reading comprehension and all three introduced grades (German, English, and mathematics). Especially, the enormous prediction strength of reading comprehension can be highlighted separately.

Further, we tested the effect of parental involvement on the distribution of the four navigation and negotiation patterns. To understand especially how the students of class 3, unsupported bloomers, showed middle to higher levels of navigation and higher levels of academic competence (reading comprehension, grades in German, English, and mathematics) despite their low negotiation levels, we tested if their family might have substituted the missing negotiation at school. The 78 adolescents of the class 3 unsupported bloomers ($M = 3.09$, $SD = 0.75$) compared to the 33 participants of the class 2 encouraged non-achiever ($M = 3.20$, $SD = 0.61$) reported significantly higher scores on parental involvement ($t[107] = 6.41$, $p < 0.001$).

Analytic Step Five: Variance Analysis on the Effects of Reading Comprehension on Various Grades at Wave 2

The fifth variance analysis step was about understanding the effect of reading comprehension on various grades at wave 2. All three tested grades were significantly tied to reading comprehension: grades in German ($F[3, 229] = 3.88$, $p < 0.01$, $\eta^2 = 4.8\%$), grades in English ($F[3, 231] = 4.02$, $p < 0.01$, $\eta^2 = 5.0\%$), and grades in mathematics ($F[3, 229] = 4.80$, $p < 0.01$, $\eta^2 = 5.9\%$). These results emphasize the importance of reading comprehension skills for different school subjects and they simultaneously show that this is not only true for language subjects such as German and English but also for mathematics.

Analytic Step Six: Symptoms of Depression and Anxiety Predicting the Latent Pattern Membership at Wave 2

To predict the connection between depression/anxiety levels and the identified navigation and negotiation patterns at wave 2, we ran first a *t*-test to compare the respective wave 1 and wave 2 levels on depression/anxiety levels for the four classes and second, a multinomial logistic regression.

First, we ran *t*-tests (see Table 7) to analyze for mean differences in the depression/anxiety levels between the two waves of the four identified LTA classes for our sample. As established in Table 1 for the overall sample, we noticed a significant increase in depression/anxiety between waves 1 and 2. When introducing the four classes the LTA detected only for class demanding, we identified a significant effect between wave 1 and wave 2 with a middle Cohen's *d*. Additionally, we noted only the depression/anxiety levels of the class thriving being lower than the cut-off point ($M = 1.75$).

The depression/anxiety scale indicator (see Table 8) had a high prediction strength to the respective identified LCA patterns at wave 2, with thriving adolescent students having about four times lower levels on depression/anxiety than students from the encouraged non-achiever class, and more than five times lower levels on depression/anxiety than students from the demanding class, but no difference to the

Table 7 Depressions/anxiety levels (sample mean levels and standard deviations) at wave 1 and wave 2 of all four classes

Class	Depression/anxiety Wave 1 *M* (*SD*)	Depression/anxiety Wave 2 *M* (*SD*)	Cohen's *d*
Class 1, demanding ($n=80$)	2.17 (0.66)	2.39 (0.70)**	0.36
Class 2, encouraged-non-achiever ($n=33$)	2.26 (0.75)	2.34 (0.73)	-
Class 3, unsupported-bloomers ($n=76$)	1.80 (0.58)	1.86 (0.58)	-
Class 4, thriving ($n=56$)	1.68 (0.63)	1.74 (0.60)	-

Table shows the mean levels of depression/anxiety levels at both waves for each class

**, $p<0.01$, between wave 1 and wave 2

Table 8 Multinomial logistic regression of depression/anxiety in the four LCA wave 2 classes

LCA wave 2 class	Predictor	B	*SE*	Wald statistic	*p*	*OR*	Prediction in % pseudo-R^2		
							Cox and Snell	Mac-Fadden	Nagelkerke
Encouraged-non-achiever	Intercept	−0.35	0.27	1.71	> 0.05		12.1	13.0	4.8
	Depression/anxiety (1 low; 2 high)	−1.31	0.45	8.37	< 0.01	0.27			
Unsupported-bloomers	Intercept	−0.09	0.25	0.14	> 0.05				
	Depression/anxiety (1 low; 2 high)	0.07	0.32	0.05	> 0.05	1.07			
Demanding	Intercept	0.32	0.22	2.07	> 0.05				
	Depression/anxiety (1 low; 2 high)	−1.69	0.39	18.37	< 0.001	0.19			

SE, standard error; *OR*, odds ratio

Reference LCA wave 2 class is "1," the class "thriving" with high levels on both navigation & negotiation

bloomers. Summarizing these results, we could identify at wave 2 comparatively the lowest levels of depression/anxiety in the thriving class.

Discussion

Applying Ungar's (2005) resilience conceptualizations to school settings, we aimed to understand how resilience pathways are formed by students' proactive actions, called navigation, and student-centered supportive interactions with school, called negotiation. We aimed to explore their link to school success and depression and anxiety regarding COVID-19 in schools with a multisystemic resilience framework. The chosen LCA/LTA analyses as person-centered approaches captured quantitative and qualitative individual differences that offered new insights into adolescent's resilience trajectories considering the COVID-19 pandemic.

Through our partially exploratory approach, we identified two expected and two unexpected patterns related to navigation and negotiation processes. Confirming existing findings (Kassis et al., 2022; Makarova & Kassis, 2022), one of the expected patterns was the "thriving" pattern, including students with both high levels of negotiation and high levels on navigation. The second expected pattern was "demanding," consisting of students with low levels in both navigation and negotiation.

The other two patterns were unexpected and they comprised about half the sample. One of the unexpected patterns was the "unsupported bloomers," consisting of students with low levels of negotiation, which means low levels of teacher academic support, but still middle to high levels of navigation, with higher levels of self-activity and middle to high school success at wave 2. They still exhibited some success, although their school environment did not support them. The second unexpected pattern, the "encouraged non-achiever," consisted of students with high negotiation levels but low navigation levels and low school success at wave 2. Despite the support they received, their lack of individual competencies could hinder their ability to achieve academic success at wave 2.

Interestingly, in comparison to the pattern of encouraged non-achiever, significantly higher levels of parental involvement could predict the unsupported bloomers pattern. This suggests that parents, as essential adult caregivers, may compensate for the lack of teacher academic support or teacher recognition and ultimately contributing to their academic success. This finding is consistent with Ungar et al.'s (2013)

perspective, which emphasizes the importance of parents becoming more involved in education to support young people's academic success. In summary, the unsupported bloomer pattern shows that students can achieve moderate to high academic success despite demonstrating low levels of teacher academic support and teacher recognition through greater parental involvement.

The "thriving" pattern with the highest levels of both navigation and negotiation included about three times more students than the pattern "encouraged non-achiever" did and about five times more students with low depression/anxiety symptoms than the pattern "demanding" did. The combination of high navigation and negotiation resources among adolescents in the "thriving" pattern may contribute to that at wave 2; young people with low depression/anxiety symptoms had a higher chance of being represented in this pattern. This may suggest that some students' mental health can be positive despite a catastrophic event such as COVID-19 and this may relate to being provided with a supportive and nurturing environment characterized by proactive skills and supportive school interactions.

The effects discovered between the "thriving" pattern and students with low depression/anxiety symptoms suggest that schools need to take depression and anxiety symptoms as a very serious matter, especially but not only after the COVID-19 pandemic (White et al., 2023). Following this line of thought, and consistent with preexisting research insights (Makarova & Kassis, 2022; Theron, 2013), depression/anxiety does not offer a causal prediction to school performance but a systemic moderating condition to adolescent students' general well-being. The results are consistent with resilience-pathway research highlighting the critical effects of proactive actions and navigation of the students in question and the quality of pedagogical relationships on students' school integration and success (Govaris et al., 2021). Adolescents with low levels of navigation who received low recognition and low academic support from teachers consistently stayed in a low navigation and negotiation status over one school year, thus demonstrating the highest stability of all patterns.

Our research findings clearly show that a supportive social environment, including elements like teacher academic support or recognition, is important for socially adept individuals to engage in specific contexts (Govaris et al., 2021). If socially competent individuals are not present, learners may not benefit from teacher recognition or academic support, even if it is available (Jennings & Greenberg, 2009). Taking Ungar's (2005; 2013) standpoint, we argue that social competence involves the capacity to establish and embrace social support. This capacity is crucial for students to not only recognize supportive interactions with their teachers or significant others in their environment but also effectively manage them to promote personal growth. Ultimately, social competence reflects an individual's ability to negotiate toward the needed social support.

According to recognition theory, the low school success a portion of the students in the study experienced can be interpreted as the results of deficiencies in the practices implemented in the school to offer all students, without exception, opportunities for participation and inclusion in daily lessons and daily school life in general. This interpretation is supported by Sirlopú & Renger's (2020) findings, according to which students' participation in everyday school life is shaped in terms that work preferentially for students with high academic performance and are distinguished for their communication skills. Not providing inclusive opportunities for students of certain groups to participate, for example, students from immigrant backgrounds, becomes for them an experience of the school ignoring them, which ultimately has a negative effect on their learning and development (Sauerwein, 2019). It may also be that teachers who focus on students' achievement of high academic performance create barriers to build quality recognition relationships with all students in a classroom (Krane et al., 2016), which works to the detriment of students from underprivileged backgrounds because they comparatively need the most support (Hamre & Pianta, 2001; Liew et al., 2010).

With the highest proportion of adolescents with a migration background in the "demanding" pattern with the lowest negotiation and navigation resources, the findings are consistent with studies that demonstrated that students with a migration background often encounter lower expectations from their teachers about their learning abilities (Lorenz et al., 2016; McKown & Weinstein, 2008; Ready & Chu, 2015; Tenenbaum & Ruck, 2007). These studies show that teachers' expectations are biased because they underestimate the performance of students in these groups, which negatively affects their academic adjustment and academic achievement.

We found that adolescents with low negotiation and navigation resources display poorer reading comprehension scores than do adolescents with high negotiation and navigation scores who are thriving. Here, we detect parallels to the school grades (German, English, and mathematics). Adolescents with higher grades in German, English, and mathematics also had a higher chance of being in the "thriving" pattern with higher negotiation and navigation levels compared to adolescents in the "demanding" pattern with low negotiation and navigation levels. In addition, the results show that reading comprehension significantly affects school grades in language-related subjects such as German or English as well as mathematics: the higher the reading comprehension, the higher the school grades. Reading comprehension plays a dual role in school success. First, reading comprehension skills serve as a measure of school success because the development of reading comprehension skills

(in all subjects) is still part of the school curriculum in secondary school, albeit not always explicitly stated (Schmellentin & Lindauer, 2020). Second, reading comprehension and subject-specific literacy play a crucial role in learning all subjects, thus contributing to school success. For example, comparing the results of IGLU- and TIMSS-studies, there are clear positive correlations between competencies in reading and mathematics ($r = 0.54$) and reading and science ($r = 0.74$) (Bos et al., 2012). Therefore, building high levels of reading comprehension competence with special subject-specific literacy must be considered one of the school's central tasks. The corresponding prerequisites that the school must provide include teaching these skills and creating conditions within a school that enable students to develop resilience. Therefore, we interpret that reading comprehension also depends on school-based resilience factors. This assumption is consistent with previous findings, as Vieluf & Sauerwein (2018) were able to show, for example, that a slower development of reading skills is not only found in the more difficult starting position of children with a migration background but can also be indirectly attributed to the behavior of teachers who give these children less recognition (Garrote et al., 2021) regarding their cognitive abilities and thus slow down, if not prevent, learning processes concerning reading. In accordance with literature focusing on the societal and neither only social (student–teacher interaction) nor just individual predictors leading to higher levels of school support (OECD, 2020; Becker et al., 2018; Dueggeli et al., 2021), we identified that both social stratification covariates (no migration background and high socioeconomic status) led to a significant increase in the relative odds of being in the class "thriving" than in the class "demanding."

This paper's findings are consistent with earlier research (Cameranesi et al., 2023) that highlights the insufficiency of strengthening only individual qualities of young people to foster their resilience; it is equally important to address their ecological resources (Dueggeli et al., 2021; Govaris et al., 2021). This includes balancing daily demands and confronting major crises adolescents may encounter in their world and their self-relation (Clark, 2015). Furthermore, here, as a further element of school contextual considerations, aspects of professional theory come into play. From this perspective, a school should not be limited to impart factual learning but its potential as a space for action and encounter must be utilized. This means that in addition to preparing content matters as effectively as possible, there is the duty to enable learners to develop well through supportive education (Biesta, 2015). Factors that Marzano (2003) identified, such as a safe and orderly environment or challenging goals and effective feedback, are relevant in this context and contribute to create a sense of community, which is crucial for fostering resilience in youth.

Following Masten's (2001, 2014) findings that resilience refers to the positive adaptation of a system, not just an individual, in the context of risk or adversity, we asked what this adaptation of systems might look like in high school when the goal is to promote academic success as well as to foster students' personal growth. We believe that Masten's resilience model has been enriched by Ungar's (2005, 2017) findings from the social services field on school resilience. Resilience inflection points in schools would consist of resilience pathways that are reinforced by these students' proactive actions, referred to as navigation, and correspond with interventions that focus on students from their comparison schools who maintain positive academic outcomes, referred to as negotiation.

Limitations

The present study generated significant findings and had several strengths, such as a longitudinal sample with person- and variable-oriented analyses, including adolescents recruited from the population. Nevertheless, we need to address a few limitations.

The sample was representative but from one country only, Switzerland. Therefore, the results must be interpreted cautiously and cannot be generalized to different countries. An international study on the topic would be needed. Additionally, when asking students about their teacher academic support and/or aspects of teacher recognition, we did not consider the variety of the heterogeneous experiences with the different teachers involved. We suggest clarifying this by specifying which teacher is addressed, for example, the headmaster or German teacher, as in the Swiss school context, adolescents often rotate teachers depending on the school subject.

By the applied exploratory method, the LTA, we could also detect a mostly neglected school resilience pattern consisting of low levels of negotiation but still higher levels of school success. This pattern would have to be analyzed closer in the future and explored regarding which other social relationships or out-of-school experiences might be substituting negotiation processes for teachers. Case studies would be advised to understand the particular developmental conditions.

With two data waves included, we believe we made a good start, but we needed at least three waves for a true longitudinal study. Connected to that is the limitation that the study focused on how resilience outcomes appeared, but we did not analyze processual factors leading to the four identified resilience outcomes. Because of our data, we only applied a two-wave longitudinal design; thus, we could not analyze these processes.

Dichotomizing data for LCA/LTA consistently restricts findings. Through applying a median split, participants are divided into two groups, and through that, the standard deviation is reduced artificially (Iacobucci et al., 2015; Rucker et al., 2015), but a mandatory step to conduct LCAs and LTA. Additionally, we dichotomized the two socio-demographical predictors, migration background and gender. Such a formal categorization, even if commonly performed, which is not the adolescents' self-identification (Horvath, 2019), comes with a loss of information.

The structural life subscale comprised only four items; therefore, the internal consistency is low. Former validation studies on the overall structure of the READ-scale have shown that even if this problem exists, the content validity is still given (Janousch et al., 2020).

Conclusions

Schools should not be viewed solely as institutionalized contexts in adolescents' lives but also as developmental spaces for constructing navigation and negotiation skills. This is especially true if corresponding pedagogical concepts are not developed and implemented. We consider that students' incomplete experiences of recognition in their relationships with teachers are related to deficits in terms of the need for an inclusive culture in the field of teaching in a classroom as well as in the field of social relations in the daily life of a school unit. These deficits can be addressed, among other factors, by strengthening initial and in-service teacher training in the direction of inclusive education and by designing and implementing practices aimed at strengthening a participatory and inclusive culture in everyday school life (Govaris et al., 2021).

In essence, the goal is to create school environments that facilitate the exploration of developmental opportunities where students can engage with various social structures and navigate through them. Moreover, at the same time, the learners must be allowed to negotiate and, if necessary, have a formative influence on jointly shared daily and working encounters (negotiation). This is about the proposal to design school and classroom spaces as social contexts so that young people can build and stabilize their emerging selves as navigating and negotiating selves. This aligns with school models oriented toward resilience empowerment where the culture of school fosters resilience (cf., e.g., Doll et al., 2004; Seligman, 1975). Viewing school contexts in this manner enables them to become contexts of empowerment, and school development would take it beyond resilience empowerment to the idea of empowerment as a pedagogical concept more fundamentally (cf. Nussbaum, 2011; Clark, 2015; Cefai et al., 2022; Martinsone et al., 2022).

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Data availability Data are available on request from the first author.

Declarations

Ethical Approval Informed consent was obtained via consent forms, which students and their parents signed and provided. No incentives were given. The ethics research committee at the University of Zurich in Switzerland authorized the project.

Conflict of Interest The authors declare no competing interests.

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