Examining the association between social context and disengagement: Individual and classroom factors in two samples of at-risk students

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Abstract

Disengagement is a concept that captures the gradual behavioral, affective, and cognitive distancing from school, and is thus an early indicator of students being at risk for dropout. Based on a social identity framework, we predicted that higher social identification with the class and a positive classroom climate would be associated with lower rates of disengagement at both the individual and classroom level. In two samples from 16 German middle schools ($n_1 = 255$, $n_2 = 287$) with high annual dropout rates ($> 10\%$), we assessed three disengagement facets: affect (daily mood at school), cognition (amotivation), and behavior (truancy). To examine both the individual and the classroom level, we utilized a 2-level mixed model. Gender, grade-level, and migration background were controlled in both samples, and economic learning resources (ELR) were included in sample 2 to better control for socioeconomic influences. In Study 1 (24 classrooms), we found a significant, positive association between social identification and daily mood at the individual level. In Study 2 (21 classrooms), we replicated initial findings for daily mood. In addition, social identification also impacted amotivation. At the class level, a higher grade, and a higher proportion of students with migration background were related to increased truancy. Classroom climate did not show a significant effect on disengagement in either of the studies. Our study sheds further light on the social dynamics of disengagement and highlights the need to control for classroom dynamics and student composition, particularly in classrooms with diverse student backgrounds.

Keywords Social identification · Classroom climate · Disengagement · Dropout · Multilevel

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1 Introduction

The prevention of early leaving from education and training is one of the main objectives in the European Union's education policy (Nouwen & Clycq, 2020). Dropping out of school is associated with a multitude of negative economic and social outcomes with the potential risk of limited social participation, for instance due to poorer health (Freudenberg & Ruglis, 2007) and earning lower salaries than high school graduates (Piopinuik et al., 2017). But what are the reasons why students leave school before their graduation? Stable variables such as male gender, higher age than one's classmates (often due to grade retention), lower socioeconomic status (SES), or migration background are among the factors which can identify groups that might be more at risk of eventual dropout (Kearney, 2008).

One issue facing researchers interested in dropout prevention is the immutability of individual factors such as gender or migration background (Hennemann et al., 2010). It is therefore often more instructive to examine specific reasons why students of all backgrounds might leave school early. The literature has established that student dropout is merely the endpoint of a gradual process of disengagement from school, resulting from cognitive, affective, and behavioral antecedents (Hennemann et al., 2010; Nouwen & Clycq, 2020). Indeed, environmental, time-varying factors are often found to be more influential than one's demographic background (Gubbels et al., 2019; van der Put, 2020; Witte et al., 2013). One such potentially malleable factor is the social environment of the classroom. Although various publications have addressed students' social context in frameworks of dropout or engagement (for an overview, see Gubbels et al., 2019), only few have chosen multilevel analyses for a differentiation of individual and classroom processes (e.g., Hendrickx et al., 2016; Lubbers et al., 2006). Albeit some studies report intraclass correlations (e.g., Brandseth et al., 2019), the classroom level is seldom directly represented in the chosen statistical analysis.

Therefore, the present study aims to shed light on the role of classroom climate and social identification with the class in explaining student disengagement both at the individual and classroom level. As both variables have shown to be beneficial at the individual level, we hypothesize that classroom characteristics—such as an overall warmth between students and sense of class belonging (Brandseth et al., 2019)—might contribute to decreased disengagement in a similar way. By using a multilevel approach in two samples from schools at risk, we aim to better understand individual and classroom associations with student disengagement.

1.1 Disengagement in school

In the context of the present study, which focused on high-risk schools, we were particularly interested in why students disengage from school. *Disengagement* can be defined as "not only the absence of engagement but also the presence of maladaptive processes and states" (Wang et al., 2019, p. 593). However, many conceptualizations of disengagement read as reversals of engagement (e.g., follows rules versus

breaks rules, see also Wang et al., 2019). Although engagement and disengagement are similar in their factor structure, with having behavioral, emotional, and cognitive aspects, studies have found engagement and disengagement to be distinguishable, both in terms of explained variance as well as their respective associations with student outcomes (Skinner et al., 2009; Wang et al., 2019). Although engagement usually covers student proactivity, disengagement is not characterized by mere passivity. Instead, it covers actively maladaptive states and behaviors (Wang et al., 2019).

We decided to investigate disengagement using three separate indicators of the above-mentioned facets. Specifically, we considered students to be disengaged if they reported (1) a lack of motivation to participate in school (*cognitive*), (2) generally bad mood when attending school (*affective*), and/or (3) a tendency to show truant behavior (*behavioral*). The three facets are outlined below.

1.1.1 The cognitive facet of disengagement: amotivation

In general, motivational processes are central in frameworks of disengagement and dropout (Vallerand et al., 1997). Yet theoretical approaches to the operationalization of cognitive (dis)engagement employ various concepts (Fredricks & McColskey, 2012). For instance, some studies (e.g., Wang & Eccles, 2013) argue that cognitive engagement is the use of self-regulated learning strategies. However, we assume that cognitive disengagement begins at a more "basic" level, where students cognitively regulate their overall (dis)engagement at school. We ground the choice of amotivation as a cognitive facet in Ryan and Deci's (1985, 2000) self-determination theory, where different types of regulation are associated with different levels of self-determined behavior, included in an academic context. In this framework, internal motivation is considered the regulatory style with the highest self-determination, whereas external regulation is connected to a lower level (Kröner et al., 2017), and amotivation as the lowest level of self-regulation (Ryan & Deci, 2000). Whereas being motivated is necessary for engagement, students with low *overall* motivation become increasingly disengaged over time (Skinner et al., 2007). Following Legault et al. (2006), we understand amotivation as a self-regulatory style, when students "cannot perceive a relationship between their behavior and that behavior's subsequent outcome." (p. 568). In line with literature on amotivation and disengagement (e.g., Legault et al., 2006; Skinner et al., 2007; Vallerand & Bissonette, 1992), we therefore argue that *amotivation* (the state of being neither intrinsically nor extrinsically motivated) is indicative of cognitive disengagement.

1.1.2 The affective facet of disengagement: daily mood

Attending school is associated with a variety of positive and negative emotions (Meyer & Schlesier, 2021). Aversive emotions have been shown to undermine classroom social interaction as well as to reduce academic engagement (e.g., Fiorilli et al., 2017) and are important indicators of disaffection (Skinner et al., 2009). Thus, well-being and negative emotions within the school are often used as indicators of emotional disengagement (Wang et al., 2019). The specific emotions felt, however, can be quite diverse. For instance, emotionally disengaged students might feel

worried, irritated, or frustrated in school (Wang et al., 2019). In a recent study by Bowles et al. (2022), so-called "striving" students showed significantly more negative affect than engaged ("thriving") students. Thus, although the underlying reasons for individual students' negative emotions might vary, disengaged students are unified in not feeling well at school. Summing up those negative emotions under the umbrella term "feeling unwell at school", we assume that disengaged students report generally *negative mood at school*.

1.1.3 Truancy as behavioral facet of disengagement

Attendance at school is a form of engaged behavior, in addition to working hard or completing homework (Reschly & Christenson, 2006). Conversely, finding ways to be late for school or to leave early is an indicator of behavioral disengagement (Wang et al., 2019). Additionally, absenteeism consistently emerges as a central variable in predicting eventual dropout (Hennemann et al., 2010), giving its especially high external validity and proximity. Following Havik et al. (2015), truancy is "considered a different form of non-attendance characterized by poor motivation for school or a negative attitude toward school and a tendency to seek more pleasurable activities outside of school during school time" (p. 318). Given the behaviorally maladaptive character of disengagement (Wang et al., 2019), we think of truancy as an indicator of behavioral disengagement. Since participating schools in this study had high rates of student absenteeism and student dropout, we expected that *truancy* would be a relatively common occurrence within the examined samples.

1.2 Predictors of disengagement: social identification and classroom climate

During adolescence, the influence of peer relations in frameworks of school engagement and belonging increases, for instance, supportive peer surroundings have been found to positively influence students' school engagement (Wang & Eccles, 2012). Research based on social identity theory (Tajfel & Turner, 1986) emphasizes the importance of *social identification* for one's self-concept (Bizumic et al., 2009). Young people spend a large part of their time at school. It is a place where identity formation and affiliation with peer groups takes place. Accordingly, there is reason to consider the influence of these group processes for disengagement. In line with this, recent research suggests that low levels of identification with one's school contribute to decreased individual well-being at school, which can perpetuate a gradual process of disengaging from and dropping out of school (Hennemann et al., 2010). On an individual level, higher identification with one's school predicts higher rates of engagement, which in turn decreases the risk of dropout (Fall & Roberts, 2012). Following Leach et al. (2008), social identification reflects the individual student's relation with their in-group (e.g., their classroom), whereas the underlying social identity reflects the part of their self-concept that derives from being part of this group. If students do not see themselves as connected to their class mates, for example, due to harassment or rejection, this might also impede feelings of belonging with the school as

a whole (Furrer et al., 2014; Juvonen, 2012). Conversely, feelings of integration and relatedness with the class may discourage disengaged behaviors, since good relationships might compensate for other negative experiences at school (Holt et al., 2008).

Furthermore, social rejection and negative *classroom climate* are associated with reduced academic achievement (O'Neil et al., 1997) and increased risk of grade retention (Lubbers et al., 2006). Several studies have extended these findings and examined connections between classroom climate, interactions within the classroom and engagement (Fredricks et al., 2004) or dropout (Gubbels et al., 2019). For instance, student disengagement can be influenced by the quality of relationships with one's peers (Nouwen & Clycq, 2020). Moreover, a longitudinal study by Haugan et al. (2019) found that students' loneliness in school was the strongest predictor of their dropout intentions. Geng et al. (2020) found evidence for a direct effect of positive classroom climate on engagement. Vice versa, students with high levels of engagement also reported more positive peer relationships (Geng et al., 2020).

Only few studies have directly addressed social identification and/or classroom climate beyond the individual level (e.g., Thornberg et al., 2017 for the relation between classroom climate and bullying). This is a particular oversight with regards to classroom climate which, by definition, is a construct originating at the class-level, even if it is reported by individual students (Zitzmann et al., 2022). Recent research suggests that—in addition to individual associations—classroom level variables such as ethnic composition have an impact on school identification (e.g., Thijs et al., 2019). Although in an individual-level only model, Bizumic et al. (2009) found that the relation between organizational functioning and individual well-being at school was mediated by social identification.

Social identification with a group in which members interact on a daily basis may be understood as the outcome of a social process (Tajfel & Turner, 1986). As a result of this process, individual responses may not be independent from one another and it is plausible to assume that the class as a whole moves towards the upper or the lower end of the continuum. If this happens, group level identification may explain variance in disengagement while individual level identification may not. Also, studies from different fields of research have found that the aggregation of values for social identification on a group level contributes to the understanding of social processes within a group (e.g., Thomas et al., 2017).

This raises the question of whether influences of social identification and classroom climate on disengagement might also extend to a higher level. Following Juvonen (2012), we argue that a "social climate of belonging" (p. 656) can result from an overall high identification within the classroom and/or higher ratings of classroom climate. Consequently, an overall high rating of classroom climate and/or identification with the class might—over and above individual ratings—relate to decreased disengagement, as students might benefit from an overall positive and supportive climate in their classroom as well as from a collective identification with the class. Consequently, the present studies additionally investigate classroom levels of social identification, classroom climate, and disengagement.

1.3 The current studies

Using a diverse sample of middle-school[1] students from 16 schools with student dropout rates of 10% or higher in the German state of Thuringia, we investigated the impact of classroom climate and social identification with the class on three facets of students' disengagement from school. We aim to increase the understanding of classroom processes for the social context of disengagement with a focus on students at risk. Following recommendations by Wang and Degol (2014), we chose a multilevel approach, with an individual and a classroom level. As all schools were chosen for their high rates of dropout, we assumed that variation within disengagement-relevant variables at the school level would be comparable between schools. The three facets of disengagement were assessed using three separate measures including cognition (amotivation), affect (daily mood), and behavior (truancy). Based on the existing literature outlined above, we expected that higher levels of social identification with one's class would be associated with higher daily mood and lower levels of truancy and amotivation at the individual (Hypothesis 1a) level. Given that research on grade level aggregations of social identification with the class is still scarce, we added an explorative hypothesis regarding the negative relation between collective social identification with the class and overall disengagement in class (Hypothesis 1b). We furthermore expected that students' positive evaluations of overall classroom climate would be connected to less pronounced disengagement facets at the individual (Hypothesis 2a) and the classroom level (Hypothesis 2b).

Results controlled for students' gender, grade, and first language (as an indicator of ethnic family background) as these demographic factors are common predictors for higher risks of dropout (Kearney, 2008). In Study 2, some adjustments were made to the used measures, and an additional measure of students' economic learning resources (ELR) was included as covariate. The present study reports within-subjects, cross-sectional field data self-reported by two samples of students.[2] The first sample ("Study 1") was surveyed in the spring of 2020, the second sample ("Study 2") was surveyed in autumn of the same year, four months after the end of the first COVID-19 lockdown in Germany.

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[1] The sample comprised students from secondary schools (*Regelschule*) and comprehensive schools (*Gemeinschaftsschule*). Students begin "Regelschule " in 5th grade and graduate at the end of 10th grade, which qualifies for an apprenticeship or vocational training. "Gemeinschaftsschule" covers grades 1 to 12, students can apply for vocational training after 10th grade, or go on to complete 12th grade, which qualifies them for university.

[2] As we assessed field data, the size of both samples was pre-determined and precluded an a priori power analysis.

2 Study 1

2.1 Method

2.1.1 Sample

While participants of Studies 1 and 2 were different individuals, all came from the same pre-determined pool of Thuringian schools with an annual dropout rate of above 10%. These schools, both from urban and rural districts, took part in a larger project funded by the European Social Fund, for which they were approved based on their economic and social need.[3] Data from the Thuringian Ministry of Education, Youth and Sports provided information on averages of school characteristics for participating schools ($n_{\text{sample 1 schools}} = 12$) in school year 2018/2019, compared to all other secondary and comprehensive schools in Thuringia that participated neither in Study 1 nor 2 ($n_{\text{other schools}} = 254$): Participating schools were comparable to non-participating schools in terms of the average number of students per school (sample 1: 279 students, other: 260), student–teacher ratio (10.3, other: 11.2), percentage of students with special needs (12.3%, other: 9.4%), and mean teachers' age (all schools: 51 years). However, sampled schools had a more than three times higher percentage of students with migration background (20.8%, other: 6.5%). Moreover, in our sample the percentage of students who missed at least one school day was 22% (other: 7.9%), along with an increased frequency of class retentions (7.5%, other 3.5%), and significantly more student dropout from school (24%, other: 9.3%).

All twelve participating schools were allowed to choose freely which classrooms would be eligible for the trial. Of these, 24 classrooms were invited and accepted for participation in this study. Altogether, 255 of 454 eligible students participated in the survey (response rate: 56.2%). Another 6.6% were missing in attendance at the time of data collection while 37.2% were present but could not participate, given they had not returned parental consent forms. Migration background was based on students' self-report of whether they spoke languages other than German at home. Any language other than German was considered evidence of a migration background ($=0$). Some students with low proficiency in German chose to complete translated versions of the questionnaire (English: 1, Arabic; 6, Persian: 1). Full demographics are presented in Table 1.

2.1.2 Ethics and procedure

All materials and procedures were approved by the Thuringian Ministry of Education, Youth and Sports. All eligible students received a letter with information about the study as well as a parental consent form several weeks before data collection.

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[3] As described in the "Guideline on the granting of funds from the European Social Fund (ESF) and the Free State of Thuringia to increase equal opportunities and educational equity and to promote school-based vocational orientation measures at secondary general schools in Thuringia (ESF school funding guideline)", (2019).

Table 1 Sociodemographic characteristics of participants from Study 1 and 2

	Sample 1	Sample 2
N	255	287
Gender		
Female	44.3%	42.2%
Diverse	1.6%	3.5%
Male	53.3%	53.7%
No gender reported	0.8%	0.7%
Age[a]		
Range	10–17	10–17
M (SD)	13.2 (1.7)	11.9 (1.6)
Grade		
5	22.4%	46.0%
6	22.4%	23.3%
7	32.2%	5.6%
8	5.5%	19.2%
9	17.6%	5.9%
Migration background[b]		
No migration background	80.0%	54.0%
Migration background	18.0%	44.6%
Missing data	2.0%	1.4%
Economic learning resources (ELR)[c]		
M (SD)		4.20 (1.01)
α		0.69
ω		0.71

[a]Data on students' age was originally derived from teachers' reports for sample 1 ($n=141$). Due to the low response rate, age was reported directly from students for sample 2 ($n=282$)

[b]Migration background was operationalized slightly differently in the two samples, but labelling remained the same with 0 = *migration background* and 1 = *no migration background*

[c]ELR were only assessed in Study 2, with two items on a 5-point scale (1 = *fully disagree*, 5 = *fully agree*)

Formal consent was given by their parents, yet assent of students was additionally ensured on the day of data collection. Materials were available in simplified German language as well as in English, Arabic, and Persian. Data was collected in February and March of 2020 during two normal school hours (each lasting 45 min with a short break in between). Depending on the classroom's size, three to five experimenters were present and conducted the session using standardized instructions.

2.1.3 Measures

All present scales were adapted from their original versions to be as inclusive and child friendly as possible, while still maintaining the integrity of the measured

Table 2 Psychometric properties of all included measures

	Range	Sample 1					Sample 2				
		n	M	SD	α	ω	n	M	SD	α	ω
Amotivation[a]	1–5	254	2.94	0.69	.67	.52	286	2.76	0.77	.70	.54
Daily mood[a,b]	1–11	251	7.33	2.24			286	6.41	2.64		
Truancy behavior[a]	1–5	255	1.55	0.83	.72	.74	275	1.51	0.87	.76	.77
Social identification	1–5	254	3.24	0.93	.87	.87	286	3.37	1.05	.89	.90
Classroom climate	1–5	254	3.26	0.93	.80	.79	287	3.33	0.95	.84	.84

Alpha and Omega values were calculated only for students without missing answers whereas scale means for truancy behavior, amotivation, social identification, and classroom climate were calculated for all students

[a]Higher values indicated higher amotivation, better mood at school, or more frequent truancy behavior

[b]Daily mood was a single item measure, hence no measure of internal consistency or reliability was calculated

constructs.[4] Any questionnaires that were not already available in German were translated using standard back-translation procedure by native speakers.[5] Visual aids in the form of smiling or frowning emoticons (as in Hall & Nielsen, 2020), were used where appropriate. We report the descriptives and psychometrics of present measures for both samples in Table 2.

Although Cronbach's alpha is an overly popular measure of reliability, its restrictive assumptions and difficulties in estimating magnitude or source of biases have been thoroughly criticized (Dunn et al., 2014; McNeish, 2018). In cases where the assumption of tau equivalence is not met, Cronbach's alpha usually underestimates the scales' reliability (Dunn et al., 2014). Following recommendations by McNeish (2018), we therefore additionally supply Omega values (ω) as a less restrictive and hence more sensitive estimate of reliability, especially when tau equivalence is not met (McDonald, 1999). The small overall sample size as well as the subsample sizes for grade, gender, and language status precluded the application of a measurement invariance analysis among these groups (see also Tabachnick & Fidell, 2014).

2.1.3.1 Dependent measures As outlined above, *amotivation* was defined as a lack of both intrinsic and extrinsic motivation, as measured by the reverse coding of seven items from the Academic Self-Regulation Questionnaire (SRQ-A) by Ryan and Connell (1989) (German version by Kröner et al., 2017). We selected four items from

[4] On forehand, we applied a pre-test with school children during an open day at our institution. Children participated with their parents' written permission. Their comments on the presented scales were documented and formulations were adjusted for better understanding.

[5] Translations were done by native speakers of English and Norwegian within our research group. The backward translation was not done by native speakers, but scientists with high language proficiency [in the case of the Norwegian scale, we used the English translation as provided by Havik et al. (2015)]. For the Arabic and the Persian version of our questionnaire, we abstained from a backward translation as we only expected a small number of participants making use of these translated versions.

the subscale *external regulation* (original α = .75), for instance, "because I want my teachers to like me." and three items from *intrinsic motivation*, for example, "because I like doing my tasks" (original α = .88). We added an item referring to parents to the extrinsic motivation scale, "because my parents expect me to do so". All items were reverse coded, with high values indicating amotivation (alphas for the subscales were 0.70 (ω = .71) for extrinsic motivation and 0.80 (ω = .80) for intrinsic motivation, respectively).

Daily mood in school was assessed using a "mood-thermometer" similar to the Emotion Thermometers by Mitchell (for example, see Beck et al., 2016), which are widely applied in clinical contexts. Students were asked to indicate their general daily mood in school on an 11-point-scale ranging from 1 = *very unhappy* to 11 = *very happy*. We did not tie daily mood to any particular timeframe, but instead asked children to report their mood in school "generally". We made this decision mainly because we expected that conditionally phrased questions would be hard to answer (and thereby less reliable) for young children or those with learning difficulties.

Self-reported truancy was measured using three items from a subscale developed by Havik et al. (2015), with α = 0.85 for the original scale. Students were asked how often (1 = *never*, 5 = *very often*) they skip classes due to truancy-related reasons (e.g., "because I wanted to do something more fun.").

2.1.3.2 Independent measures *Identification with the class* was measured with six items adapted from the Social Identity Scale by Roth and Mazziotta (2015, German version; original by Leach et al., 2008). Three items each were selected from the subscales *satisfaction* (original α = 0.88-0.91), for instance "I am glad to be [in-group].", and *solidarity* (original α = 0.79-0.82, e.g., "I feel committed to [in-group]."). For present purposes "my class" was inserted as the in-group. Students responded on a 5-point Likert-scale (1 = *totally disagree* to 5 = *totally agree*).

Classroom climate was assessed using three items asking about students' cooperation in the classroom (original α = 0.71–0.74), adapted from Jerusalem et al. (2009), such as "If someone in our class feels sad, another will comfort them." (1 = *totally disagree* to 5 = *totally agree*).

2.1.4 Transparency and openness

We follow the reporting standards for studies using no experimental manipulation as outlined in the "Journal article reporting standards for quantitative research in psychology" by Appelbaum et al. (2018). As we collected field data, the sample size could not be determined beforehand. Students with single missing item-values on either the truancy or amotivation scale were included because preliminary analyses indicated no significant change of psychometrics and correlations when those students were excluded. No other participants were excluded from analysis, although, as can be seen in Tables 4 and 5, sample sizes differed slightly for each model, which occurred due to occasionally missing values for dependent, independent, or demographic variables. We report relevant measures and psychometrics of all measures in the study in Table 2. All scales are made available via the Repository "Open

Science Framework" [https://osf.io/xzs9b/?view_only=None], including an English translation. Analysis code is available by emailing the corresponding author. Due to their sensitivity, data are not available. This study's design and analysis were pre-registered with the Thuringian Ministry for Education, Youth and Sports.

2.1.5 Data analysis

Means, standard deviations, and if applicable, reliability values (Cronbach's alpha, McDonald's Omega) were computed for all measures. Initial descriptive, corre-lation, and mediation analyses were performed using IBM SPSS version 29 with PROCESS v3.5 by Andrew F. Hayes, and subsequent random-intercept multilevel models were run using the packages lme4 (Bates et al., 2015), lmerTest (Kuznet-sova et al., 2017), effectsize (Ben-Shachar et al., 2020), MBESS (Kelley, 2022), and r2mlm (Rights & Sterba, 2019) in *R* version 4.2.2.

As students are nested within classrooms, multilevel regression models were used to accommodate the hierarchical data structure. In order to mitigate convergence problems with a small sample, we utilized a random intercept, fixed coefficient model, as suggested by Bosker and Snijders (2012). The small number of sampled schools (12 in Study 1, 13 in Study 2) with maximum two classrooms per school precluded analysis of school-level effects. To avoid underestimating the amount of class-level variance that is present, reported models were estimated using Restricted Maximum Likelihood[6] for model fit, and t-tests were run using Satterthwaite's method, which is more suitable for small sample sizes (Hox et al., 2018).

The three outcome variables were amotivation, daily mood, and truancy. Identi-fication with the class and classroom climate were predictors; gender,[7] grade[8] and migration background were included as control variables. Model coefficients were standardized as recommended by Hox et al. (2018), using the "basic" standardiza-tion in the effectsize-package (Ben-Shachar et al., 2020). All predictors and covari-ates were centered on the grand mean, and were inserted into the models as fixed effects.

Intercept-only models at the individual level were run as a baseline for all three disengagement facets as outcomes. We then added the level-2 random intercept ($n = 24$ classrooms) to determine the amount of variance at the classroom level and compared the two models using an ANOVA. For every outcome variable, pre-dictor (social identification and classroom climate) and control variables (gender,

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[6] Initial model estimation was done using Maximum Likelihood, to compare loglikelihood ratios of models with and without the random intercept for class. These analyses showed that there was relatively little variance at the class level, although in the case of behavioral disengagement it was still a significant percentage. We therefore calculated all models applying Restricted Maximum Likelihood, which is less biased in its variance estimates, particularly when the sample size is small.

[7] According to Appleton et al. (2008), males tend to be at higher risk of disengagement. Hence, gender was coded as a contrast between male gender and all other reported genders (female and diverse). This inclusive solution did not substantially change interpretation of results when compared to a binary model of gender which excluded diverse students.

[8] For better comparability and due to the low response rates for students ' age in sample 1 (see Table 1), we included grade instead of age for our multilevel models.

Table 3 Intercorrelations (Spearman's Rho) for study variables for sample 1 and 2

Variable	1	2	3	4	5	6	7	8
1. Daily mood	–	-.14*	.02	.38**	.22**	-.07	.07	-.05
2. Amotivation	-.24**	–	.03	-.12	-.13*	-.05	.15*	.08
3. Truancy	-.03	.15*	–	.02	-.09	-.21**	-.05	-.14*
4. Social identification	.53**	-.33**	-.05	–	.42**	-.06	.01	-.03
5. Classroom climate	.43**	-.36**	-.10	.70**	–	.15*	-.13*	-.03
6. Gender[a]	.03	-.17**	-.12	-.02	.10	–	.00	-.04
7. Grade	-.11	-.16**	.27**	-.10	-.17**	.01	–	.04
8. Migration background[b]	.05	-.03	-.15*	.01	.00	.03	-.02	–
9. ELR[c]	.20**	-.22**	-.18**	.20**	.27**	.02	.03	-.00

The results for sample 1 are shown above, results for sample 2 below the diagonal

*$p < .05$; **$p < .01$

[a]0 = male; 1 = female/diverse

[b]0 = migration background; 1 = no migration background

[c]*ELR* economic learning resources

migration background, and grade) were entered stepwise at the individual and at the classroom level.

Depending on the final model, only 2.7 to 4.3% of participants had missing values. We re-ran the models using imputed means for missing values, which showed that there were no notable changes in the size, direction, or significance of the standardized or unstandardized beta values. Hence, we chose not to impute missing data.

2.2 Results

2.2.1 Descriptives and correlations

Descriptive statistics are reported in Table 2, correlations (Spearman's Rho) are reported in Table 3. Between the three disengagement facets, only daily mood and amotivation correlated negatively. Both daily mood and amotivation correlated with classroom climate. The highest positive correlations were found for social identification, with classroom climate, and respectively daily mood. Demographic variables (gender and grade) correlated significantly with classroom climate, but not with social identification. Higher truancy was significantly connected to male gender and the presence of a migration background, and amotivation correlated with higher grade.

2.2.2 Multilevel regression

In the following, results for the three final models for affective, cognitive, and behavioral disengagement are outlined separately. Detailed results are reported in Table 4.

Table 4 Social identification, classroom climate, and control variables for cognitive, affective, and behavioral disengagement facets for sample 1

Final model	M_1: cognitive disengagement (n = 247)			M_2: affective disengagement (n = 244)			M_3: behavioral disengagement (n = 248)		
	b (SE)	β	95% CI	b (SE)	β	95% CI	b (SE)	β	95% CI
Fixed parts									
Intercept	2.92** (0.06)	0.00	[0.00, 0.00]	6.35** (0.19)	0.00	[0.00, 0.00]	1.56** (0.07)	0.00	[0.00, 0.00]
Level 1 covariates									
Gender[a]	0.09 (0.09)	-0.07	[-0.20, 0.06]	-0.40 (0.28)	-0.09	[-0.21, 03]	-0.25* (0.11)	-0.15	[-0.28, -0.02]
Migration background[b]	0.13 (0.12)	0.08	[-0.05, 0.20]	-0.20 (0.35)	-0.03	[-0.15, 0.08]	-0.14 (0.14)	-0.07	[-0.19, 0.06]
Identification	-0.09 (0.06)	-0.11	[-0.26, 0.03]	0.81** (0.17)	0.33	[0.19, 0.47]	0.01 (0.07)	0.01	[-0.13, 0.16]
Classroom climate	-0.08 (0.06)	-0.10	[-0.25, 0.05]	0.24 (0.17)	0.10	[-0.04, 0.24]	-0.04 (0.07)	-0.05	[-0.19, 0.10]
Level 2 covariates									
Grade	0.05 (0.05)	0.10	[-0.10, 0.29]	0.18 (0.16)	0.11	[-0.10, 0.32]	-0.02 (0.06)	-0.03	[-0.22, 0.16]
Identification	0.17 (0.21)	0.09	[-0.14, 0.32]	-0.15 (0.71)	-0.02	[-0.28, 0.23]	-0.05 (0.25)	-0.02	[-0.25, 0.21]
Classroom climate	0.08 (0.22)	0.05	[-0.22, 0.31]	- 0.06 (0.73)	-0.01	[-0.29, 0.27]	0.01 (0.26)	-0.00	[-0.25, 0.26]
Gender	-0.02 (0.39)	-0.00	[-0.19, 0.19]	1.24 (1.31)	0.09	[-0.12, 0.29]	-0.44 (0.46)	-0.09	[-0.27, 0.10]
Migration background	0.06 (0.48)	0.01	[-0.16, 0.18]	-0.90 (1.58)	-0.05	[-0.22, 0.13]	-0.96 (0.56)	-0.14	[-0.31, 0.03]
Random parts									
Residual (σ^2_e)	0.44 (0.66)			4.12 (2.03)			0.63 (0.79)		
Intercept (σ^2_{u0})	0.03 (0.18)			0.41 (0.64)			0.04 (0.20)		

Standard Errors are reported in parentheses. *b* = unstandardized beta. β = standardized beta. *CFI* = confidence interval

*p < .05; **p < .01

[a]0 = male; 1 = female/diverse

[b]0 = migration background; 1 = no migration background

2.2.2.1 Cognitive disengagement: amotivation The ICC for amotivation was 0.051, indicating that 5.1% of variance in amotivation was at the class level. When compared to a model predicting amotivation from the fixed intercept only, the random-intercept model did not improve overall fit ($p = .061$). Thus, there was no significant covariation at the class-level, indicating that a standard regression would have been sufficient. To ensure comparability of models between outcome variables and samples, however, we proceeded with the multilevel approach. In the final model, neither social identification ($\beta = -0.11$, $t(223.1) = -1.54$, $p = .126$) nor classroom climate ($\beta = -0.10$, $t(223.6) = -1.37$, $p = .172$) had a significant impact on amotivation. Following the variance decomposition approach of Rights and Sterba (2019) for grand-mean-centered predictor variables, the analysis revealed 5% explained variance due to the level-1 and level-2 predictors in the final model.

2.2.2.2 Affective disengagement: daily mood In the daily mood model, 7.0% of variance were found on the classroom level, yet the multilevel model did not significantly improve overall fit compared to the intercept only model ($p = .068$). For reasons given above, the multilevel approach was retained. In the final model, daily mood was associated with social identification at the individual level, $\beta = 0.33$, $t(206.0) = 4.72$, $p < .001$. Individual ratings of classroom climate did not significantly predict disengagement, $\beta = 0.10$, $t(207.5) = 1.38$, $p = .170$. The final model explained 15.4% of total variance in daily mood.

2.2.2.3 Behavioral disengagement: truancy The multilevel approach for the truancy model significantly improved overall fit ($p = .021$), and 7.7% of variance were found on the classroom level. Yet in the final model, neither social identification ($\beta = 0.01$, $t(222.5) = 0.19$, $p = .852$) nor classroom climate ($\beta = -0.05$, $t(223.1) = -0.64$, $p = .525$) had a significant impact on truancy. Instead, male gender was associated with higher truancy on the individual level ($\beta = -0.15$, $t(222.6) = -2.32$, $p = .021$). For truancy, 7.8% of total variance was explained by the chosen model.

As previous research suggested (e.g., Reynolds et al., 2017), the relation between classroom climate and affective disengagement on the individual level might have been mediated by social identification in the model for daily mood. We inserted classroom climate as predictor, social identification as mediator, covariates, and daily mood into model 4 of Hayes' PROCESS procedure in SPSS. Indeed, we found an indirect effect of classroom climate via social identification when controlled for gender, grade-level, and migration status for daily mood ($b = 0.37$, BCa CI [0.19, 0.56]). Conclusions from these results were incorporated into Study 2 and are outlined in the following sections.

3 Study 2

3.1 Method

3.1.1 Sample

The second sample included 21 classrooms from 13 Thuringian middle schools. Nine of these schools had already participated in Study 1, albeit with different classrooms. Another four schools (with two classrooms each) were new to the study. However, selection criteria and procedure remained the same. Characteristics in school year 2019/20 of the schools in our second sample ($n_{\text{sample 2 schools}} = 13$) only differed slightly: they were comparable to all other secondary/comprehensive schools in Thuringia ($n_{\text{other schools}} = 251$) regarding school size (sample 2: 289 students, other schools: 268), student–teacher ratio (10.8, other: 11.5), percentage of students with special needs (9.9%, other: 8.8%), and average teachers' age (all schools: 50 years). Differences to non-participating schools were somewhat smaller in the second sample. The percentage of students from a migration background was comparable to sample 1 (21.6%, other: 6.8%). Moreover, 19.4% of students were held back a year (other: 7.1%), 6.7% students repeated classes (other: 3.4%) and 16.3% amongst the students leaving school left without graduation certificate (other: 7.7%).

The second sample was of comparable size, with 453 eligible students. Response rates for the parental consent forms improved to 63.3% (32.7% lacked their parents' permission and another 4.0% were missing in attendance), resulting in a sample of 287 participating students. See Table 1 for frequencies and descriptives of all demographics. Three students chose the Arabic version of the questionnaire. Students were asked how often they spoke languages other than German at home (1 = *never*, 5 = *very often*). Speaking any other language likely indicates other cultural influence close to home, hence responses of 2 (*seldom*) or higher were coded as 0 (*student has a migration background*), responses of 1 (*never*) were coded as 1 (*student has no migration background*). Furthermore, economic learning resources (ELR) as an indicator of the socioeconomic background were included as a further covariate.

3.1.2 Ethics and procedure

Given that Arabic had been the most frequent second language in Study 1, only this alternate translation was offered to the second sample. Data collection took place between September and October 2020. Procedure largely remained the same, variations happened mostly to comply with contact restrictions and hygiene protocols in connection with the COVID-19-pandemic. For instance, students sat separately, which had the added benefit of resulting in a quieter atmosphere.

3.1.3 Changes to previous measures

No changes in wording or composition were made to the amotivation scale, the measure for daily mood, and the social identification scale. As can be seen in

Table 3, all reliabilities slightly improved in the second sample. For the two sub-scales within the amotivation measure, alphas and omegas increased as well ($\alpha_{intrinsic} = \omega_{intrinsic} = 0.81$; $\alpha_{extrinsic} = \omega_{extrinsic} = 0.73$).

Based on experiences during data collection, some participants of the first study may have misinterpreted the truancy scale, reporting presence of reasons for being absent from school despite never actually being truant. The scale was therefore supplemented by two further items. Students were asked whether they had skipped lessons on purpose at least once ($0 = No$, $1 = Yes$) and if so, how often they had skipped lessons during a year (*once, sometimes, several times a month, several times a week*). Based on this information, we ensured that those who reported to have never intentionally skipped school had scores of "1—never" for the three truancy items. The scope of the classroom climate scale was broadened beyond cooperation, with two additional items developed by the authors, assessing the general atmosphere in the classroom (e.g., "Most of the time, everyone gets along in this class.").

Holistic measures of socioeconomic background consider economic, cultural, and social resources (Ehmke & Siegle, 2005). Since students might be unable or ashamed to accurately report their family's economic resources, we decided to compose a short measure of economic learning resources (ELR). Considering the shift towards home schooling during the pandemic, the ELR measure was assumed to provide important information on socioeconomic disparities. Similar to Li et al. (2017), we included two items which asked for the student's learning environment at home, "At home I have a quiet place for studying." and "At home I have everything that I need for learning.". Descriptives, Cronbach's Alpha and McDonald's Omega for the resulting 5-point scale ($1 = fully\ disagree$, $5 = fully\ agree$) are reported in Table 1.

3.1.4 Data analysis

Except for the mentioned improvements to included scales, the analytical strategy remained the same as in Study 1, with all predictors being grand-mean centered, and covariates entered first, followed by predictors and compound effects. ELR were complemented and added to the covariates at the individual and classroom level. Again, only a small number of students had any missing data (2.4—5.9%). Parallel analyses of the multilevel models with imputed means did not produce differing outcomes. We therefore chose not to impute missing values.

3.2 Results

3.2.1 Descriptives and correlations

All descriptive statistics and reliability measures are reported in Table 2, correlations (Spearman's Rho) are reported in Table 3. Overall, we found more significant and more pronounced correlations within the second sample. In line with theoretical considerations, amotivation correlated negatively with daily mood, and positively with truancy. Both social identification and classroom climate correlated positively

with daily mood and negatively with amotivation. Truancy correlated with grade, migration background, and ELR. The highest correlation was again found between identification with one's class and classroom climate. The new measure of ELR showed correlations with all dependent and independent measures, highlighting its relevance as an additional control variable.

3.2.2 Multilevel regression

3.2.2.1 Cognitive disengagement: amotivation The three final models for cognitive, affective, and behavioral disengagement are presented in Table 5. Contrary to Study 1, the random-intercept amotivation model significantly improved model fit compared to the intercept-only model ($p < .001$), and 9.6% of variance in amotivation were found at the class level. Social identification at the individual level was negatively associated with amotivation ($\beta = -0.19$, $t(255.8) = -2.48$, $p = .014$). Individual ratings of classroom climate were only marginally related to amotivation ($\beta = -0.14$, $t(255.9) = -1.72$, $p = .088$). Additionally, fewer individual ELR were related to a higher individual level of amotivation ($\beta = -0.16$, $t(255.8) = -2.82$, $p = .005$). The final model explained 18.8% of the overall variance in amotivation.

3.2.2.2 Affective disengagement: daily mood For daily mood, the multilevel approach with a random-intercept model significantly improved model fit ($p = .032$) as well, and the ICC indicated that 5.5% variance could be found at the classroom level. Again, daily mood was associated with social identification at the individual level in the final model ($\beta = 0.43$, $t(254.1) = 5.70$, $p < .001$). Individual ratings of classroom climate did not significantly predict affective disengagement, $\beta = 0.10$, $t(254.4) = 1.31$, $p = .193$. Of the total variance in daily mood, 27.1% were explained by the final model.

3.2.2.3 Behavioral disengagement: truancy Compared to the intercept-only model, a random-intercept model for truancy significantly improved overall fit ($p = .003$), and 9.4% of variance were found at the classroom level. Neither social identification ($\beta = -.03$, $t(247.5) = -0.38$, $p = .704$) nor classroom climate ($\beta = .03$, $t(245.8) = 0.30$, $p = .761$) had a significant impact on truancy. However, several covariates had significant influences on truancy. At the individual level, lower ELR were related to higher truancy ($\beta = -.20$, $t(246.1) = -3.18$, $p = .002$). At the classroom level, higher grade ($\beta = .18$, $t(17.1) = 2.33$, $p = .032$) and a higher proportion of students with migration background ($\beta = -.17$, $t(16.3) = -2.34$, $p = .030$) were connected to higher truancy. The analysis of explained variance revealed that 14.5% of the total variance were explained in the final model.

Again, we tested whether, in the models for daily mood (affect) and amotivation (cognition), effects of classroom climate were mediated by social identification. For both facets of disengagement, we found an indirect effect of classroom climate via social identification when controlled for gender, grade-level, and migration status (daily mood: $b = 0.86$, BCa CI [0.53, 1.20], amotivation: $b = -0.11$, BCa CI [-0.21, -0.01]).

Table 5 Social identification, classroom climate, and control variables for cognitive, affective, and behavioral disengagement facets for sample 2

Final model	M1: cognitive disengagement (n=280)			M2: affective disengagement (n=280)			M3: behavioral disengagement (n=270)		
	b (SE)	β	95% CI	b (SE)	β	95% CI	b (SE)	β	95% CI
Fixed parts									
Intercept	2.76** (0.06)	0.00	[0.00, 0.00]	6.41** (0.17)	0.00	[0.00, 0.00]	1.52** (0.06)	0.00	[0.00, 0.00]
Level 1 covariates									
Gender[a]	-0.01 (0.08)	-0.00	[-0.22, 0.22]	0.18 (0.28)	0.03	[-0.07, 0.14]	-0.13 (0.10)	-0.08	[-0.19, 0.04]
Migration background[b]	-0.04 (0.08)	-0.03	[-0.13, 0.08]	0.13 (0.28)	0.02	[-0.08, 0.13]	-0.13 (0.10)	-0.07	[-0.19, 0.04]
ELR	-0.12** (0.04)	-0.16	[-0.28, -0.05]	0.07 (0.14)	0.03	[-0.08, 0.13]	-0.17** (0.05)	-0.20	[-0.32, -0.07]
Identification	-0.14* (0.06)	-0.19	[-0.35, -0.04]	1.08** (0.19)	0.43	[0.28, 0.57]	-0.03 (0.07)	-0.03	[-0.20, 0.13]
Classroom climate	-0.11[+] (0.06)	-0.14	[-0.29, 0.02]	0.28 (0.21)	0.10	[-0.05, 0.25]	0.02 (0.08)	0.03	[-0.14, 0.20]
Level 2 covariates									
Grade	0.06 (0.05)	0.11	[-0.09, 0.30]	-0.10 (0.15)	-0.05	[-0.21, 0.11]	0.12* (0.05)	0.18	[0.02, 0.34]
Identification	-0.14 (0.06)	0.08	[-0.21, 0.36]	0.06 (0.75)	0.00	[-0.23, 0.25]	0.23 (0.25)	0.11	[-0.13, 0.35]
Classroom climate	-0.22 (0.33)	-0.10	[-0.42, 0.22]	-0.11 (0.95)	-0.02	[-0.28, 0.25]	-0.44 (0.31)	-0.18	[-0.44, 0.09]
Gender[a]	-0.09 (0.63)	-0.01	[-0.22, 0.20]	-1.92 (1.81)	-0.09	[-0.26, 0.09]	0.29 (0.60)	0.04	[-0.13, 0.21]
Migration background[b]	-0.16 (0.51)	-0.03	[-0.21, 0.16]	0.75 (1.46)	0.04	[-0.12, 0.19]	-1.17* (0.49)	-0.17	[-0.32, -0.02]
ELR	-0.12 (0.30)	-0.05	[-0.31, 0.22]	0.74 (0.87)	0.09	[-0.31, 0.31]	0.28 (0.29)	0.10	[-0.12, 0.32]
Random parts									
Residual (σ^2_e)	0.45 (0.67)			5.04 (2.25)			0.66 (0.81)		
Intercept (σ^2_{u0})	0.04 (0.20)			0.21 (0.46)			0.01 (0.11)		

Standard Errors are reported in parentheses. *b* = unstandardized beta. β = standardized beta. *CFI* = confidence interval

[+] *p* < .10; *p* < .05; **p* < .01

[a] 0 = male; 1 = female/diverse

[b] 0 = migration background; 1 = no migration background

4 Discussion

In two studies, we were able to contribute to the understanding of the role of class context in predicting disengagement by analyzing the association of social identification and classroom climate with students' disengagement from school. We examined the three facets—amotivation (cognition), daily mood (affect), and truancy (behavior) separately for a more detailed understanding of disengagement.

Hypothesis 1a was confirmed in part: individual social identification with the class was connected to affective disengagement in sample 1 and 2, and to cognitive disengagement in the second sample. Although no causal conclusions should be drawn, this indicates that students' identification with the class was associated with feeling better on an average school day in both samples, and additionally with reporting higher overall motivation in the second sample. This extends previous findings by showing that not only identification *with the school* (Fall & Roberts, 2012), but also *with one's classroom* in particular is connected to students' disengagement. Apparently, social identification positively influences students' well-being at school, not only when they feel connected to their school in general (as it was found by Bizumic et al., 2009), but also with their classroom in particular.

Contrary to other studies (e.g., Geng et al., 2020), classroom climate (Hypothesis 2a) did not generally predict disengagement for the present samples. We merely found a marginal effect of classroom climate on cognitive disengagement for the second sample. Due to the high correlation between social identification and classroom climate in both samples, we tested for a potential mediating effect of social identification and found that classroom climate had been mediated by social identification for affective disengagement in both samples, and for cognitive disengagement in the second sample.

Both hypotheses regarding the classroom level effects of social identification (Hypothesis 1b) and classroom climate (Hypothesis 2b) had to be rejected. That is, all effects of classroom climate and social identification were at the individual level only, independent of class averages. Given that sample 1 had very little variance in disengagement at the class-level and sample 2 was surveyed during the COVID-19 pandemic, which led to reduced contact to one's classmates, there may, however, been reduced potential for class-level effects to be detected. Nevertheless, examining effects of social context variables at the class-level remains a promising approach. Multilevel modeling contributes not only to a more detailed view on social processes within the classroom, but it also ensures that individual-level effects are free of bias when the data has a nested structure. Further investigation of classroom levels (or, additionally, the school level), might help to clarify the underlying processes.

Where the multi-level approach has yielded particularly interesting results is in our examination of demographic influences. Male gender, low socio-economic status and a migrant background are often found to contribute to disengagement (Kearney, 2008). We found a significant impact of male gender on truant behavior for the first sample, and for ELR on cognitive and behavioral disengagement in the second sample. Furthermore, we detected some influence at the classroom level regarding the classrooms' ethnic composition. For the second sample, we

found an association between classroom diversity and behavioral disengagement such that more diversity relates to more overall truancy.

As young people from a migration background are often found to be particularly at risk of low educational attainment (European Commission, 2020), our results stand out. Contrary to previous findings (e.g., Nouwen & Clycq, 2020), we could not find that these students are individually less engaged with school. Considering this, the significant association of migration background and disengagement at the classroom level is surprising. One explanation could be the presence of selection biases. Statements of teachers during data collection indicated that some schools had decided to form separate classrooms for "special needs" students, which presumably included factors besides migration background which we did not control for, such as learning difficulties. Such classrooms may be particularly at-risk with regards to disengagement, given the diversity of needs which require attention.

Generalizability of present results is strengthened by using two separate samples surveyed at different time points. This allowed replication and extension of our own results from Study 1 as well as an improvement of some of our measures, evident in the significantly stronger effect sizes for Study 2. Strictly speaking, the multilevel approach was only necessary for behavioral disengagement in the first sample, and the three disengagement models in the second sample, due to non-significant classroom level variation for cognitive and affective disengagement in Study 1, indicating that participating classrooms in Study 2 were somewhat more diverse. For instance, only in the second sample did grade-level have a significant positive relationship with behavioral disengagement. This finding is in line with previous research showing a general decline of engagement with age throughout adolescence (for an overview, see Appleton et al., 2008).

Whereas gender composition and school types were comparable between the two samples, they differed regarding the composition of grade levels (with 5th graders presenting the highest proportion in the second sample) and time points of assessment. Additionally, complete data on students' age was only available for the second sample. In general, the relatively wide age range might have had an impact on the connection between social identification or classroom climate and disengagement, as processes might variate between age groups. During adolescence, the importance of peer relationships increases (Kindermann et al., 1997). For future research, it might be interesting to separately examine children and adolescents for further clarification of age differences.

Data collection for sample 1 took place shortly before the first COVID-19 lockdown in spring 2020, whereas students from the second sample were exposed to a longer period of home schooling prior to the assessment in autumn 2020. This could influence all relevant outcomes, especially student-reported classroom climate—as some students had rarely seen their classmates during spring and summer 2020. Also, a study by Thorsteinsen et al. (2021) found that the disliking of one's learning group during the pandemic was related to a decrease in affective engagement. In general, older students' evaluations of their social context might be more realistic given they had spent more time together with their classmates prior to the assessment.

Due to methodological limitations, it was not possible to obtain the fullness of information considering students' socioeconomic status. SES was originally intended to be provided by parents in the first sample, but response rate was very low. That being said, ELR proved to be a short and relevant measure that children in Study 2 were able to self-report, and which showed correlational patterns similar to other measures of the socioeconomic background—a central variable in predicting dropout (e.g., Fan & Wolters, 2014). Hence, it can be assumed that the ELR are indeed a reflection of students' SES (see also Li et al., 2017), narrowing the focus to more proximal aspects of economic resources. This is an especially important consideration in times of home schooling due to the global COVID-19 pandemic, where these deficits cannot be compensated for by in-school support structures.

4.1 Implications for educational practice

Investigating the social context of disengagement processes in two at-risk samples is particularly important for the successful design and application of intervention strategies within classrooms, as these interventions should especially apply for students in need. Classroom social structures as well as their representations within the self are particularly promising for preventing dropout (Hennemann et al., 2010; Wang & Degol, 2014), as they are accessible to educational intervention. For cognitive and affective facets of disengagement, our results are consistent with the hypothesis that disengagement might be reduced by fostering students' individual identification and relatedness within their class. However, the disengagement facets were neither predicted by class-average social identification nor overall classroom climate. Thus, interventions may be more successful when they focus on increasing children's personal sense of belonging in the classroom, as opposed to overall classroom processes.

Our findings regarding associations of migration background and disengagement at the class level call into question whether it is wise to "single out" children with a migration background in "special needs classrooms". It is plausible, for instance, that being taught in classrooms with high ethnic diversity might be interpreted as a sign of social exclusion, and thereby connected to higher disengagement overall. Moreover, low ELR were associated with disengagement, speaking for a vulnerability of students from families with low SES.

Ecological approaches that focus on classroom management have shown promising results in the prevention of early dropout and remain attractive because *all* students within the classroom might benefit (Hennemann et al., 2010). This is particularly relevant when vulnerable students (e.g., with migration background and/or low parental support) enter school (Finn & Kasza, 2009). Measuring the three facets of disengagement separately might capture early warning signs for dropout, as they appear long before students form the intention to drop out of school (Alexander et al., 1997). Using this approach, it might be an option for detecting those students before their path is set.

4.2 Limitations and future directions

We were able to confirm the applicability of disengagement frameworks to a particularly vulnerable sample of students, although results may not be generalized to all other contexts. Given that we utilized field data collected from a pre-determined pool of students, an a priori power analysis was not possible. Certainly, a higher number of classrooms would have increased the power in our analyses of class-level effects. Additionally, the relatively low number of schools within our sample precluded analysis at the school-level. In following studies, the nested structure of classrooms within schools might be further examined.

The engagement literature has yet to arrive at a completely unified approach to measuring its core concept (Fredricks & McColskey, 2012), and it would have been beyond the scope of this study to attempt to solve these problems. Truancy as an indicator of behavioral disengagement did not correlate with social identification or classroom climate in either of the studies. This might be due to truancy being a comparatively "advanced" and therefore rare form of disengaged behavior. Future research might address less severe forms of behavioral disengagement, such as not paying attention in class (Wang et al., 2019). Furthermore, our measure of amotivation showed low internal validity in both samples. This is not surprising, as we combined two originally separate sub-dimensions of a scale by Kröner et al. (2017). Our three measures were rather different in nature, both in terms of scale length and severity of the described dimensions. The application of a sounder measure might be more promising instead, for example, the scales of Wang et al. (2019). Still, assessing the three facets of disengagement separately appears a promising approach in disentangling the underlying dynamics of disengaging processes when the focus is to identify students at risk for dropout early.

Although response rates were improved in the second sample, a significant number of students who did not participate remained. It is quite likely that chronically truant students were among those who we failed to capture, which is a common issue in studies on absenteeism and dropout (e.g., Havik et al., 2015). All data were self-reported and therefore vulnerable to a social desirability bias, especially for self-reported truancy. An integration of more robust data such as administrative measures (e.g., days missing in attendance) might also validate the usefulness of the three disengagement facets as a predictors of dropout or grade retention, as those measures have shown to be influenced by disengagement (Wang et al., 2019). We made significant effort to obtain these records from teachers, but response rates were so low that data could not be integrated into final models.

5 Conclusion

The present study showed the importance of individual social identification with the classroom in frameworks of disengagement, and as a promising avenue for further research. Although the present study found no effects of social context at the class-level, the use of multilevel analyses appears as a promising approach to localizing the influence of both social context and demographic aspects on school functioning

in general, and different facets of disengagement in particular. Dropout is a gradual process (Nouwen & Clycq, 2020), thus focusing on students' disengagement offers an avenue to detecting this process of detachment from school early. This is essential in that it enables professionals to shift their focus to malleable factors, including disengagement, when attempting to prevent dropout. Further research may expand models to also capture the school-level and add additional measurement occasions to broaden the understanding of disengagement as a gradual, reciprocal, and cyclical process.

Appendix

All measures used in the studies are reported in the following in their original layout. When items deviated from the original version (as cited in the method section) because they had been simplified, this is marked with italics.

Demographics

Sample 1

I am… (Ich bin…).

☐   A boy (ein Junge)   ☐   A girl (ein Mädchen)   ☐   _____
My mother tongue is: (Meine Muttersprache ist:)   _____

Sample 2

I am… (Ich bin…).
☐   A boy (ein Junge)   ☐   A girl (ein Mädchen)   ☐   _____ How often do you speak another language than German at home? (Wie oft sprichst du Zuhause eine andere Sprache als Deutsch?).

Never (nie)   ☐   ☐   ☐   ☐   ☐   Very often (sehr oft)

Economic learning resources (only sample 2)

Economic Learning Resources (only sample 2)

At home… (Bei mir Zuhause…)	Not at all true (stimmt gar nicht)	Somewhat true (stimmt wenig)	Partly true (teils, teils)	Mostly true (stimmt ziemlich)	Very true (stimmt völlig)
…there is a computer that I can use for my school work. (gibt es einen Computer, den ich für Schulaufgaben benutzen kann.)	☐	☐	☐	☐	☐
…I have a quiet place for studying. (habe ich einen ruhigen Platz zum Lernen.)	☐	☐	☐	☐	☐
… I have everything that I need for learning. (habe ich alles, was ich zum Lernen brauche.)	☐	☐	☐	☐	☐

Amotivation

In school, a lot of things have to be done. Please tick the box indicating why *you* participate in school. There are no right or wrong answers. (In der Schule müssen viele Dinge gemacht werden. Bitte kreuze an, warum *du* in der Schule mitarbeitest. Es gibt keine richtigen oder falschen Antworten).

I participate in school…(Ich mache in der Schule mit,…)	Not at all true (stimmt gar nicht)	Somewhat true (stimmt wenig)	Partly true (teils, teils)	Mostly true (stimmt ziemlich)	Very true (stimmt völlig)
… because it's fun (weil es mir Spaß macht).	☐	☐	☐	☐	☐
…because I have to (weil ich es muss).	☐	☐	☐	☐	☐
… because I enjoy participating in class (weil ich gerne im Unterricht mitarbeite).	☐	☐	☐	☐	☐
… because I don't want to get in trouble. (damit ich keinen Ärger bekomme).	☐	☐	☐	☐	☐
… because I enjoy doing my schoolwork (weil ich gerne meine Aufgaben mache).	☐	☐	☐	☐	☐
…because I want my teachers to like me (weil ich möchte, dass meine Lehrer mich mögen).	☐	☐	☐	☐	☐
… so that the teacher won't scold me (damit meine Lehrer nicht mit mir schimpfen).	☐	☐	☐	☐	☐
… because my parents expect me to (weil meine Eltern es von mir erwarten).	☐	☐	☐	☐	☐

Daily mood

How do you feel on a normal school day when you're in your class? Indicate your mood on the thermometer. (Wie fühlst du dich an einem normalen Tag, wenn du in deiner Klasse bist? Kreuze deine Stimmung auf dem Thermometer an.)
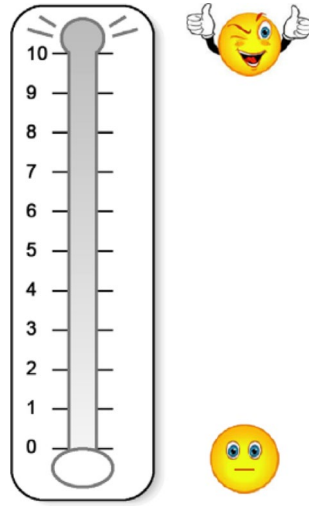
Truancy behavior

Sample 1

There are many reasons for not attending school. Here you see some questions on the reasons why one would not attend school. Tick a box for the answer that suits you best. (Es gibt verschiedene Gründe dafür, in der Schule zu fehlen. Hier sind ein paar Fragen über die Gründe, warum man in der Schule fehlt. Kreuze immer die Antwort an, die für dich am besten passt.)

How often do you miss school because… (Wie oft fehlst du in der Schule weil…)	Never (nie)	Seldom (selten)	Some-times (manch-mal)	Often (oft)	Very often (sehr oft)
…you are with friends outside of school instead (du stattdessen mit Freunden unterwegs bist?)	☐	☐	☐	☐	☐
…you are tired after going to bed late (du müde bist, weil du nachts spät ins Bett gegangen bist?)	☐	☐	☐	☐	☐
…you are going to do more appealing things outside of school (du coolere Sachen außerhalb der Schule vorhast?)	☐	☐	☐	☐	☐

Sample 2

Have you ever skipped school? By that we mean: purposely not going to school, pretending to be sick or simply going home before the end of your scheduled lessons. We won't tell anyone your answers. (Hast du schon mal die Schule geschwänzt? Damit meinen wir, wenn du absichtlich gar nicht zur Schule gehst, so tust, als ob du krank bist oder einfach früher nach Hause gehst. Wir sagen deine Antwort niemandem weiter.)

☐ Yes, I've skipped lessons at least once. (Ja, ich hab schon Mal geschwänzt.)

☐ No, I never do that. (Nein, das mache ich nie.) If you do skip lessons, for what reason do you skip school? (Wenn du mal schwänzt, aus welchem Grund tust du das dann?).

How often do you skip lessons because… (Wie oft schwänzt du die Schule weil…)	Never (nie)	Seldom (selten)	Some-times (manch-mal)	Often (oft)	Very often (sehr oft)
…you are out with friends instead (du stattdessen mit Freunden unterwegs bist)?	☐	☐	☐	☐	☐
…you are tired after going to bed late (du müde bist, weil du nachts spät ins Bett gegangen bist)?	☐	☐	☐	☐	☐
…you plan to do things outside of school that are more fun (du coolere Sachen außerhalb der Schule vorhast)?	☐	☐	☐	☐	☐

Social identification

These items are **about you and your class**. Please read the sentences carefully one by one. Tick the box indicating **how true the sentence is for you.** (Hier geht es **um dich und deine Klasse**. Lies dir die Sätze bitte nacheinander gut durch. Kreuze bei jedem Satz an, **wie gut er auf dich zutrifft.)**

	Not at all true (stimmt gar nicht)	Somewhat true (stimmt wenig)	Partly true (teils, teils)	Mostly true (stimmt ziemlich)	Very true (stimmt völlig)
I feel a bond with my class (Ich fühle mich mit dieser Klasse verbunden.)	☐	☐	☐	☐	☐
I am glad to be in this class. (Ich bin froh, dass ich in dieser Klasse bin.)	☐	☐	☐	☐	☐
I am commited to this class. *(Ich setze mich für diese Klasse ein.)*	☐	☐	☐	☐	☐
It is pleasant, to be part of this class. (Ich finde es angenehm, in dieser Klasse zu sein.)	☐	☐	☐	☐	☐
I feel like I'm part of this class. (Ich fühle mich als Teil dieser Klasse.)	☐	☐	☐	☐	☐
Being in this class gives me a good feeling. (Es gibt mir ein gutes Gefühl, in dieser Klasse zu sein.)	☐	☐	☐	☐	☐

Class climate

Sample 1

Please read every sentence carefully. **Tick the box indicating how true this sentence is for your class.** What do you think? (Lies hier bitte jeden Satz gut durch. **Kreuze an, wie sehr der Satz zu deiner Klasse passt.** Was meinst du?).

	Not at all true (stimmt gar nicht)	Somewhat true (stimmt wenig)	Partly true (teils, teils)	Mostly true (stimmt ziemlich)	Very true (stimmt völlig)
If someone is in trouble, they can rely on their classmates. (Wenn jemand in der Klemme ist, kann er sich auf seine Mitschüler verlassen.)	☐	☐	☐	☐	☐
If someone is sad in class, someone will take care of them. (Wenn jemand in der Klasse traurig ist, tröstet ihn jemand.)	☐	☐	☐	☐	☐
If someone faces difficulties, their classmates will help them. (Wenn jemand Schwierigkeiten hat, helfen ihm Mitschüler.)	☐	☐	☐	☐	☐

Sample 2

Please read every sentence carefully. **Tick the box indicating how true this sentence is for your class.** What do you think? (Lies hier bitte jeden Satz gut durch. **Kreuze an, wie sehr der Satz zu deiner Klasse passt.** Was meinst du?).

	Not at all true (stimmt gar nicht)	Somewhat true (stimmt wenig)	Partly true (teils, teils)	Mostly true (stimmt ziemlich)	Very true (stimmt völlig)
In our class, we work together closely. (In unserer Klasse arbeiten wir eng zusammen.)	☐	☐	☐	☐	☐
If someone is in trouble, they can rely on their classmates. (Wenn jemand in der Klemme ist, kann er sich auf seine Mitschüler verlassen.)	☐	☐	☐	☐	☐
If someone is sad in class, someone caresses them. (Wenn jemand in der Klasse traurig ist, tröstet ihn jemand.)	☐	☐	☐	☐	☐
If someone faces difficulties, their classmates helps them. (Wenn jemand Schwierigkeiten hat, helfen ihm Mitschüler.)	☐	☐	☐	☐	☐
The mood in our class is generally good. (Die Stimmung in unserer Klasse ist meistens gut.)	☐	☐	☐	☐	☐
Most of the time, everybody gets along with each other in our class. (Die meiste Zeit verstehen sich alle in dieser Klasse gut.)	☐	☐	☐	☐	☐

Declarations

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval This study was pre-registered with the Thuringian Ministry of Education, Youth and Sports.

Informed consent All eligible students received a letter with information on the study and a parental consent form several weeks before data collection. Formal consent was given by their parents, although assent of students was ensured on the day of data collection.

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