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Do teachers' cultural beliefs matter for students' school adaptation? A multilevel analysis of students' academic achievement and psychological school adjustment

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Abstract

Based on two large-scale studies from Germany, we examined how different types of teachers' cultural beliefs are related to immigrant students' school adaptation. Specifically, we investigated the relationship of teachers' multicultural beliefs appreciating cultural diversity, their egalitarian beliefs focusing on all students' similarities and their assimilationist beliefs that immigrant students should conform to the mainstream context with immigrant students' academic achievement and psychological school adjustment as indicators of their school adaptation. We also explored all of these associations for non-immigrant students. Study 1 used data on the multicultural, egalitarian, and assimilationist beliefs of German language ($N_{Teachers} = 220$) and mathematics ($N_{Teachers} = 245$) teachers and on students' achievement and feelings of helplessness in German language classes ($N_{Students} = 2606$) and mathematics classes ($N_{Students} = 2851$) as well as students' school satisfaction. Study 2 analyzed data on teachers' multicultural and egalitarian beliefs ($N_{Teachers} = 456$) and students' achievement and self-concept in mathematics ($N_{Students} = 4722$). Overall, multilevel analyses revealed no relationship between teachers' cultural beliefs and any of the indicators of immigrant and non-immigrant students' school adaptation. These findings challenge the notion that overall, teachers' cultural beliefs effectively translate into students' school adaptation.

Keywords Cultural diversity · Teacher beliefs · Multiculturalism · Academic achievement · Acculturation

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1 Introduction

In times of global migration movements and growing cultural diversity in schools, it is important to identify factors that facilitate immigrant students'[1] school adaptation in the receiving societies. Previous research on how well immigrant students adapt to school provides a mixed picture. While immigrant students reach lower levels of academic achievement than their non-immigrant peers on average (e.g., Organization for Economic Co-operation and Development [OECD], 2015; Stanat & Christensen, 2006), they often show similar or even higher levels of positive psychological school adjustment, such as school satisfaction and academic self-concept (e.g., Areepattamannil & Freeman, 2008; Briones & Tabernero, 2012).

One factor that may affect both facets of students' school adaptation, i.e., academic achievement and psychological school adjustment, in culturally diverse settings is the teacher (Horenczyk & Tatar, 2012; Schachner et al., 2018a) and their way of dealing with cultural heterogeneity in the classroom (e.g., Aronson & Laughter, 2016; Banks, 2004; Gay, 2002; Ladson-Billings, 1995). Scholars argue that teachers' cultural beliefs, i.e., their views on how people from different cultural backgrounds should live together, affect how they operate in culturally diverse classrooms (e.g., Hachfeld et al., 2015, 2011). Educational researchers engage in lively discussions on how teachers' cultural beliefs may facilitate immigrant students' school adaptation (e.g., Hachfeld et al., 2015): Is it helpful if teachers appreciate differences in their students' cultural backgrounds and view them as enriching for their instruction or if they believe in the effectiveness of focusing on all students' similarities? Does it hinder immigrant students' participation if teachers believe that these students should assimilate to the mainstream context? Whereas previous work has primarily examined effects of the cultural diversity climate in schools as perceived by students on students' school adaptation (for an overview see Schachner, 2019), empirical investigations on the role of individual teachers' cultural beliefs are scarce.

Previous research on teachers' cultural beliefs (e.g., Gutentag et al., 2017; Hachfeld et al., 2015) mostly focuses on the link with teachers' self-perceived proficiency to teach in multicultural settings. Only few studies to date examined teachers' cultural beliefs in relation to students' school adaptation (e.g., Love & Kruger, 2005) and it is largely unclear whether their findings are generalizable across a variety of school adaptation outcomes and national contexts. Empirical evidence on the question whether teachers' cultural beliefs affect the school adaptation of non-immigrant majority students is even more scarce. Based on two large-scale German studies, we addressed these gaps and examined the relationship between teachers' cultural beliefs and a variety of students' school adaptation outcomes, including not only their academic achievement but also their psychological school adjustment. Psychological school adjustment captures aspects of students' motivational and social-emotional functioning in school, such as their school satisfaction, school-related

[1] In accordance with previous research, we define students' immigrant background based on their own and their parents' country of birth. In our study, an immigrant student has at least one parent who was born outside the assessment country (e.g., Schachner et al., 2018b).

helplessness, or academic self-concepts. School satisfaction, (the absence of) helplessness, and academic self-concepts are important outcomes on their own, but also relate to other adaptation outcomes, such as internalizing and externalizing behavior problems (DeSantis King et al., 2006; Elmore & Huebner, 2010), academic anxiety (Daniels et al., 2009), or subsequent achievement (Marsh & Martin, 2011). Investigating these aspects of psychological school adjustment in addition to academic achievement is therefore highly relevant.

2 Theoretical background and previous findings

2.1 Teachers' cultural beliefs

Teacher beliefs can be defined as "subjective claims that the individual accepts or wants to be true" (Fives & Buehl, 2012: 476; see also Baumert & Kunter, 2006; Richardson, 1996). Teachers' beliefs about themselves (e.g., their professional self-efficacy), about learning and instruction influence how they perceive and evaluate their students, how they make decisions and operate in the classroom (Fives & Buehl, 2012; Pajares, 1992) and may hence affect students' school adaptation. Empirical findings corroborate that teachers' beliefs are related to their instructional behavior, to students' engagement in learning (Schroeder et al., 2011), and to academic achievement (Dubberke et al., 2008; Staub & Stern, 2002). However, previous research linking teacher beliefs to student outcomes has mainly focused on teacher beliefs about learning and instruction, such as pedagogical content beliefs. Less is known about the role that teachers' *cultural beliefs* play in student adaptation.

Teachers' cultural beliefs have been studied from different theoretical perspectives, including social reconstructionist perspectives on multicultural education and culturally relevant teaching (e.g., Gay, 2010) and social cognitive psychological perspectives on motivation (e.g., Kumar & Lauermann, 2018). We conceptualize cultural teacher beliefs in accordance with educational research that adapted a social-psychological perspective on intergroup ideologies to the school context (e.g., Civitillo et al., 2019, 2021; Hachfeld et al., 2015, 2011). Research from this perspective typically focuses on three types of ideologies that describe different, but not mutually exclusive (sets of) beliefs on how to approach cultural diversity: multicultural, colorblind,[2] and assimilationist ideologies (Guimond et al., 2014; Hahn et al., 2010; Park & Judd, 2005; Whitley & Webster, 2019; Wolsko et al., 2006). In the context of school, teachers' cultural beliefs on how to approach cultural diversity in the classroom can reflect these ideologies (cf. Civitillo et al., 2021).

Teachers with *multicultural* beliefs acknowledge and appreciate cultural differences in the classroom. They view cultural diversity as enriching and are willing to incorporate students' different cultural backgrounds in their teaching (Hachfeld et al., 2015, 2011).

[2] We use the term colorblindness as it is commonly used in the literature on intergroup processes and ideologies. We do not intend any connotations relating to physical abilities.

A *colorblind* ideology, in contrast, focusses on de-emphasizing differences between minority and majority members (Hahn et al., 2010; Park & Judd, 2005). However, scholars argue that colorblind beliefs may actually represent two different perspectives (e.g., Rosenthal & Levy, 2010). A low emphasis on group memberships can result from a view that stresses similarities among members of distinct groups or from a view that ignores existing differences between groups and their experiences and highlights the importance of individual differences instead (e.g., Civitillo et al., 2021; Neville et al., 2013; Whitley & Webster, 2019). Previous research suggests that stressing similarities and ignoring differences are distinct aspects of colorblindness that are differentially related to external criteria (Civitillo et al., 2021). In the present investigation, we concentrate on colorblind teacher beliefs that focus on similarities of all students. In accordance with previous research from Germany that has labeled this facet of colorblind beliefs as "egalitarianism" (Hachfeld et al., 2011, 2015), we refer to these teacher beliefs as *egalitarian* beliefs in the following.

Teachers endorsing *assimilationist* beliefs view ethnic minority students' maintenance of values and behaviors of their "own" ethnic minority group as an obstacle to a successful adaptation to the mainstream society (Agirdag et al., 2013; Bender-Szymanski, 2000; Hachfeld & Hahn, 2008; Hachfeld & Profanter, 2018). According to this view, adaptation works best if ethnic minorities adopt the values and behaviors of the majority group and reject the values and behaviors of their ethnic community (Guimond et al., 2014; Levin et al., 2012; Verkuyten, 2011).

2.2 Theoretical assumptions on the relationship between teachers' cultural beliefs and students' school adaptation

Scholars emphasize the relevance of teachers' cultural beliefs for teaching immigrant students (e.g., Bryan & Atwater, 2002; Civitillo et al., 2018; Gay, 2010; Hachfeld et al., 2015; Harrington & Hathaway, 1995). Hachfeld et al. (2015) argue that teachers who endorse *multicultural* beliefs tend to be highly motivated to actively acknowledge and respond to the particular needs of immigrant students. They may, for instance, maintain responsive and respectful relationships with immigrant students and anticipate these students' needs when planning lessons (see also Bender-Szymanski, 2000), resulting in teaching activities that are responsive to these students' individual needs. The multicultural approach may thus enhance immigrant students' school adaptation since they might feel better understood and supported by their teacher (Baysu et al., 2021). Perceived teacher support should contribute to satisfying students' needs for competence, autonomy, and relatedness, boosting their learning motivation and ultimately their academic achievement (Niemiec & Ryan, 2009). Perceived teacher support and need satisfaction can also advance students' school satisfaction (e.g., Danielsen et al., 2011), and may hamper feelings of helplessness (e.g., Deci et al., 1991).

The social identity perspective (Tajfel & Turner, 1979, 1986) also suggests positive effects of multicultural teacher beliefs on immigrant students' school adaptation. According to this view, people strive for a positive social identity, which results from favorable comparisons of the in-group with a significant out-group (Tajfel & Turner,

1979). Intergroup contexts with a multicultural climate that affirm ethnic minorities' social identification with their ethnic in-group can protect them against experiences of devaluation and identity threats, thereby preserving their motivation and performance in these contexts, such as schools (Derks et al., 2007; Phalet & Baysu, 2020; Verkuyten et al., 2019). Teachers who endorse multicultural beliefs can contribute to such a multicultural climate in school, thus promoting immigrant students' school adaptation (Schachner, 2019; Schachner et al., 2018a). In sum, these arguments concordantly suggest a positive relationship between teachers' multicultural beliefs and immigrant students' academic achievement and psychological school adjustment.

Assumptions on effects of *egalitarian* approaches are mixed (cf. Civitillo et al., 2021; Schwarzenthal et al., 2020). According to the social-psychological literature, a focus on similarity can reduce intergroup bias and promote positive intergroup relations (Dovidio et al., 2007; Schwarzenthal et al., 2020). In school, better intergroup relations can contribute to a positive classroom climate, that, in turn, is related to higher academic achievement and better psychological adjustment (Schachner, 2019; Schachner et al., 2018a). However, a fixation on sameness may also reduce the acknowledgement of existing discrimination and may threaten individuals' need for a distinct and valued social identity (cf. Dovidio et al., 2007; Rattan & Ambady, 2013; Schwarzenthal et al., 2020). Moreover, teachers' who believe in the effectiveness of stressing similarities in the classroom might be less willing to adapt their instruction to the individual needs of immigrant students (Hachfeld et al., 2015). Egalitarian teacher beliefs could thus be either positively or negatively related to immigrant students' school adaptation.

Relating to teachers' *assimilationist* beliefs, several perspectives suggest that they impair immigrant students' school adaptation. Assimilationist views can entail ethnic prejudice (Whitley & Webster, 2019). It has been argued that teachers who endorse negative ethnic prejudice and stereotypes are likely to have lower achievement expectations for immigrant students than for non-immigrant students (Lorenz, 2021; van den Bergh et al., 2010). Teachers with negatively biased expectations could provide less constructive feedback and offer less input to the low expectancy students and thus hamper these students' academic achievement (Gentrup et al., 2020; Jussim et al., 2009). Moreover, according to a social identity perspective, the adoption of assimilationist views in school may communicate to immigrant students that their ethnic in-group is devalued and thereby lower these students' motivation to participate in academic classroom activities and hamper their performance (Derks et al., 2007). Similarly, a rejection of cultural diversity in the classroom could promote feelings of alienation and exclusion in immigrant students (e.g., Byrd, 2015) and impair their psychological school adjustment. Overall, these arguments suggest that teachers' assimilationist beliefs should be negatively related to the academic achievement and psychological school adjustment of immigrant students.

Although theories mainly suggest effects of teachers' cultural beliefs on immigrant students' school adaptation, they may also affect non-immigrant students' adaptation. Social-psychological research suggests that all students' school adaptation should benefit from their teachers' multicultural beliefs as multicultural views can contribute to a climate of acceptance and inclusion of all individuals ("all-inclusive multiculturalism;" Stevens et al., 2008). However, multicultural ideologies have

also been argued to cause members of the dominant majority group to feel marginalized (Jansen et al., 2016; Plaut et al., 2011), suggesting negative effects of teachers' multicultural beliefs on non-immigrant students' school adaptation. Egalitarian beliefs that focus on similarities of all students may also contribute to feelings of inclusion of non-immigrant students. However, it is also plausible that non-immigrant students remain unaffected by these beliefs, as they may not perceive identity affirmation or threat (Celeste et al., 2019). Relating to teachers' assimilationist beliefs, which place pressure on immigrant students in particular, it seems unlikely that they affect non-immigrant students' school adaptation. Some scholars, however, argue that these views may affirm non-immigrant individuals' identity as a member of the dominant majority and give them the feeling to "fit in" the dominant majority context (Celeste et al., 2019; Verkuyten, 2011), suggesting positive effects of these views on non-immigrant students' outcomes. Taken together, cultural beliefs seem particularly important for immigrant students' adaptation, yet, they may also affect non-immigrant students.

2.3 Empirical findings on the relationship between teachers' cultural beliefs and students' school adaptation

Most quantitative empirical studies on teachers' cultural beliefs focus on the link with teachers' self-reported proficiency to teach in culturally diverse classrooms (for a review for the German context, see Hachfeld & Syring, 2020). Results indicate that pre-service and in-service teachers who endorse multicultural beliefs are particularly enthusiastic about teaching immigrant students and report high levels of self-efficacy in doing so (Gutentag et al., 2017; Hachfeld et al., 2015). Such teachers are also less prone to hold negative ethnic prejudices compared to teachers with weak multicultural beliefs (Hachfeld et al., 2015, 2011). Teachers holding strong multicultural beliefs further report using effective problem-solving strategies in the classroom (Wagner et al., 2001) and are willing to adapt their instructional practices to students' individual needs in culturally diverse classrooms (Gebauer & McElvany, 2017; Hachfeld et al., 2015).

Results on relationships of teachers' egalitarian beliefs with their self-reported teaching proficiency are somehow inconclusive. Some studies revealed no relationship of these beliefs with pre-service teachers' self-efficacy and enthusiasm about teaching immigrant students (Hachfeld et al., 2015, 2011) and in-service teachers' cultural diversity-related stress (Civitillo et al., 2021). However, pre-service teachers with egalitarian beliefs were less willing to adapt their instructional practices to students' individual needs in culturally diverse classrooms (Hachfeld et al., 2015). In addition, experimental social-psychological research indicates that persons who were exposed to a prompt focusing on similarities reported a greater intergroup attitude bias than their counterparts who were exposed to a multicultural prompt (Richeson & Nussbaum, 2004).

Teachers holding strong assimilationist beliefs exhibit lower levels of self-efficacy in teaching immigrant students (Gutentag et al., 2017; Tatar et al., 2011) and higher levels of general and diversity-related burnout (Dubbeld et al., 2019) than

teachers holding weak assimilationist beliefs. Pulinx et al. (2017) found that teachers endorsing monolingual beliefs, which can be viewed as a facet of assimilationist perspectives, report lower levels of trust in the academic engagement of all of their students. In addition, social-psychological research suggests that persons endorsing assimilationist beliefs show higher levels of negative ethnic prejudice (Levin et al., 2012; for a meta-analysis, see Whitley & Webster, 2019), suggesting that teachers with such beliefs are more likely to evaluate ethnic minority students less favorable than their majority peers. In sum, these findings suggest effects of teachers' cultural beliefs on their proficiency to teach in culturally diverse classrooms, which may shape their teaching practices related to immigrant students in particular.

Yet, although results suggest that teaching practices responding to ethnic minority students' needs may increase these students' academic achievement (Matthews & López, 2019), whether teachers' cultural beliefs make a difference in students' academic achievement and psychological school adjustment remains a largely open question. Only a few quantitative studies have investigated how teachers' cultural beliefs are related to ethnic minority students' school adaptation. Love and Kruger (2005) found no relationship between teachers' multicultural beliefs and the average achievement levels in Northern American classrooms with a majority of ethnic minority students. However, the study reported only bivariate correlations at the classroom level; whether and how teachers' cultural beliefs are related to individual students' school adaptation remains unclear. Moreover, the study did not control for potential confounding factors, such as the classroom's proportion of ethnic minority students, that may be linked to teachers' cultural beliefs (Pohan et al., 2009) and student outcomes (for a meta-analysis, see Mickelson et al., 2013), at least in Northern American classrooms. Although these results may depend on the national context (e.g., Eksner & Stanat, 2011; Rjosk et al., 2014 for different results on the link between the proportion of immigrant students and individual achievement in Germany), characteristics of classrooms and schools must be considered when investigating the relationship between teachers' cultural beliefs and students' school adaptation.

Another study investigating the relationship between students' perception of their teacher's multicultural beliefs and student outcomes in the Netherlands controlled for potential confounders, including the classroom's proportion of ethnic minority students. The study found no relationship between student-perceived multicultural beliefs and students' outgroup attitudes (Geerlings et al., 2019). However, the study did not examine students' academic achievement or psychological school adjustment.

Relating to ethnic majority students, the findings are inconclusive. In one study, majority students reported negative outgroup attitudes when they perceived their teachers to endorse multicultural beliefs and to have positive relationships with their ethnic minority classmates (Geerlings et al., 2019). The authors reason that this could be because majority students may feel excluded under such perceived circumstances. Similarly, other related research on school climate indicates that majority students in multicultural classrooms and schools experienced higher levels of discrimination (Schwarzenthal et al., 2018) and were less likely to perceive positive relationships with their teachers (Baysu et al., 2021). However, school climate

research has also revealed positive relationships between a multicultural school climate and majority students' intercultural competence (Schwarzenthal et al., 2020) and sense of school belonging, which resulted in enhanced life satisfaction and academic self-concepts (Schachner et al., 2018b). Majority students also possessed higher intercultural competence when they perceived their school climate as egalitarian (Schwarzenthal et al., 2020). In contrast, Celeste et al. (2019) found that majority students' academic achievement and sense of school belonging were unrelated to multicultural, egalitarian, and assimilationist school policies. Although they are mixed, previous findings overall suggest that cultural diversity perspectives in schools may also affect the school adaptation of non-immigrant majority students.

In sum, previous research shows that teachers' cultural beliefs are related to their motivation and self-perceived teaching proficiency, which may shape their teaching behavior and thus relate to immigrant students' school adaptation. In addition, a few findings from related research fields suggest that cultural perspectives in schools may also shape non-immigrant students' adaptation. However, research linking teacher beliefs to student adaptation is scarce and as teachers' beliefs do not necessarily translate into corresponding classroom behavior (Basturkmen, 2012; Fives & Buehl, 2012), the widely held assumption that teachers' cultural beliefs influence student outcomes can also be challenged. This notion is supported by a few null results for teachers' cultural beliefs and student outcomes. However, whether these findings are generalizable across student outcomes and to other national contexts is unclear. To determine whether teachers' cultural beliefs are relevant to students' school adaptation, potential confounders that may alter the findings must be controlled.

3 The present studies

The present research investigated whether teachers' multicultural, egalitarian, and assimilationist beliefs related to students' academic achievement and psychological school adjustment. Relating to immigrant students, multicultural beliefs should contribute to positive teacher-student relationships and should boost the students' academic motivation and ethnic identity. We therefore expected multicultural beliefs to be positively related to immigrant students' academic achievement and psychological school adjustment, as indicated by their school satisfaction, (a lack of) feelings of helplessness, and their academic self-concept (hypothesis 1). We also explored the role of teachers' egalitarian beliefs for the school adaptation of immigrant students. As assumptions on relationships of teachers' egalitarian beliefs with student outcomes are mixed, we had no specific hypotheses in that regard. Moreover, we assumed that teachers with assimilationist beliefs are prone to hold ethnic prejudices and that assimilationist beliefs foster teacher behaviors that impose pressure on immigrant students and give them the feeling that their ethnic in-group is devalued, thereby hampering their performance and a positive psychological school adjustment. We therefore hypothesized that teachers' assimilationist beliefs were negatively related to immigrant students' academic achievement and psychological school adjustment (hypothesis 2). We also examined whether teachers' cultural beliefs related to non-immigrant students' outcomes. As the literature suggests

conflicting relationships of these students' school adaptation with teachers' cultural beliefs, we had no specific assumptions in that respect.

We analyzed two large datasets from different studies conducted in Germany that provided several indicators of academic achievement (performance in German language and mathematics classes) and psychological school adjustment (school satisfaction, helplessness, and academic self-concept) and examined different age groups (7th grade and 9th grade students). We focused on student achievement in German language and mathematics as these subjects are key school subjects and crucial for long-term adaptation. In study 1, we analyzed students' school satisfaction and helplessness in German language and mathematics classes to capture main aspects of students' general and domain-specific psychological school adjustment. In study 2, we included students' academic self-concept in mathematics to test whether our findings were robust for this well-established measure of domain-specific psychological school adjustment. Analyzing several indicators of school achievement and psychological school adjustment and different age cohorts allowed us to determine whether the findings are robust and generalize across a variety of outcomes and educational levels. To control for potential confounders, we included relevant characteristics of classrooms and schools in our multilevel analyses.

4 Study 1

4.1 Method

4.1.1 Participants and procedure

We used data from the National Educational Panel Study (NEPS), a nationwide longitudinal investigation conducted in Germany (Blossfeld et al., 2011) and conducted cross-sectional analyses with data from the third wave of starting cohort 3 (grade 7).[3] The starting cohort 3 sample was selected with a stratified multistage sampling strategy (Aßmann et al., 2011); participation for schools and students was voluntary. In wave 3, the starting cohort 3 sample included 7730 students in regular schools, that is, all schools except for those focusing on special education. Of these, 5525 students were sampled in grade 5 in 2010/11 (first wave), and 2205 students were added to the sample ("add-on sample") in grade 7 in 2012/13 (third wave). We used questionnaire data from students, parents, and teachers as well as students' achievement test scores in our analyses and included all students for whom information on immigrant status, gender, and all outcome variables was available. Most information was collected in the third wave, with a few exceptions as noted below.

We limited our analysis sample to classes with a minimum of five participating students for which class teachers had filled out the German language class questionnaire, the mathematics class questionnaire, or both. The analyses were carried out

[3] https://doi.org/10.5157/NEPS:SC3:6.0.1. In the third wave, one of the 16 German federal states did not participate in the study.

separately for students attending German language classes and students attending mathematics classes, with an overlap between the samples of 52.18%. For brevity, we refer to these samples as the "German class sample" and the "mathematics sample" respectively.

Overall, our analysis samples included 2606 students (48.89% female; 21.68% immigrant students; $M_{age} = 13.08$, $SD_{age} = 0.52$) and 220 teachers (75.74% female; 7.14% immigrants) in 220 German language classes (average number of students per classroom $M = 11.85$) in 151 schools and 2851 students (49.35% female; 20.03% immigrant students; $M_{age} = 13.04$, $SD_{age} = 0.49$) and 245 teachers (71.43% female; 6.31% immigrants) in 245 mathematics classes (average number of students per classroom $M = 11.64$) in 165 schools.

4.1.2 Measures

4.1.2.1 Teachers' cultural beliefs The teacher questionnaire included three subscales from the Teacher Cultural Beliefs Scale (Hachfeld et al., 2011) capturing teachers' multicultural, egalitarian, and assimilationist beliefs (see also Hachfeld & Hahn, 2008; Hachfeld & Profanter, 2018). The NEPS deployed four out of six items of the original multicultural beliefs scale (e.g., "In the classroom, it is important to be responsive to differences between cultures," Cronbach's $\text{alpha}_{\text{German/math}} = 0.70/0.65$), three out of four items of the original egalitarian beliefs scale (e.g., "In the classroom, it is important that students of different origins recognize the similarities that exist between them," Cronbach's $\text{alpha}_{\text{German/math}} = 0.77/0.77$), and all three items of the original assimilationist beliefs scale (e.g., "Immigrant students often have problems at school because they are not willing to adapt to the German culture," Cronbach's $\text{alpha}_{\text{German/math}} = 0.80/0.83$). Response options ranged from 1 (*strongly disagree*) to 6 (*strongly agree*; see supplementary material, Table S.1 for all items).

We conducted confirmatory factor analyses to evaluate whether the assumed three-dimensional structure of teachers' cultural beliefs applies to the data. We tested a three-dimensional model against a two-dimensional model that distinguishes multicultural and egalitarian beliefs as a dimension with a positive stance on diversity from assimilationist beliefs with a rather negative stance on cultural diversity (see also Hachfeld & Profanter, 2018) as well as a one-dimensional model of overall cultural beliefs using χ^2-difference tests and the maximum likelihood robust (MLR) estimator robust to non-normality of the data. We also used the root mean square error of approximation (RMSEA), the comparative fit index (CFI), and the standardized root mean square residual (SRMR) to evaluate the model fit, with a RMSEA ≤ 0.06, a CFI ≥ 0.95, and a SRMR ≤ 0.08 roughly indicating an acceptable model fit (Hu & Bentler, 1999).

Although the goodness of fit is somehow restricted according to the traditional criteria from Hu and Bentler (1999), the analyses corroborated that the assumed three-dimensional measurement model (3 factor $\text{model}_{\text{German}}$: $\chi^2(31) = 60.488$, $p < 0.001$, RMSEA $= 0.075$, CFI $= 0.927$, SRMR $= 0.072$/3 factor $\text{model}_{\text{math}}$: $\chi^2(31) = 51.019$, $p = 0.013$, RMSEA $= 0.060$, CFI $= 0.952$, SRMR $= 0.075$) fitted the data better than a two-dimensional model (2 factor $\text{model}_{\text{German}}$: $\chi^2(33) = 95.844$, $p < 0.001$, RMSEA $= 0.106$, CFI $= 0.845$,

SRMR = 0.075/2 factor model$_{math}$: $\chi^2(33) = 90.115$, $p < 0.001$, RMSEA = 0.099, CFI = 0.864, SRMR = 0.081; $\Delta\chi^2(df)_{German} = 35.356(2)$, $p < 0.001/\Delta\chi^2(df)_{math} = 39.096(2)$, $p < 0.001$). The two-dimensional model demonstrated a better fit to the data than a one-dimensional model (1 factor model$_{German}$: $\chi^2(34) = 227.375$, $p < 0.001$, RMSEA = 0.182, CFI = 0.522, SRMR = 0.140/1 factor model$_{math}$: $\chi^2(34) = 262.207$, $p < 0.001$, RMSEA = 0.195, CFI = 0.458, SRMR = 0.152; $\Delta\chi^2(df)_{German} = 131.531(1)$, $p < 0.001/\Delta\chi^2(df)_{math} = 172.092(1)$, $p < 0.001$). We thus treated multicultural, egalitarian, and assimilationist beliefs as three latent factors in our analyses. Multicultural and egalitarian beliefs were substantially positively related ($r_{latent\ German} = 0.65$, $p < 0.001/r_{latent\ math} = 0.61$, $p < 0.001$), while multicultural and assimilationist beliefs were unrelated in both samples ($r_{latent\ German} = 0.01$, $p = 0.944/r_{latent\ math} = -0.08$, $p = 0.467$). The latent correlation between egalitarian and assimilationist beliefs was $r_{latent\ German} = 0.21$, $p = 0.041/r_{latent\ math} = 0.14$, $p = 0.150$.

4.1.2.2 Students' academic achievement As an indicator of academic achievement in the German class sample, we used a *reading comprehension test* in German (Gehrer et al., 2013). The test was based on the concept of literacy (OECD, 1999). The students read a total of five texts, covering different text types and functions, such as literary and informational texts, and answered a number of questions after each text. Most items were in a multiple-choice format. Based on their reading comprehension levels in the first wave of data collection in the NEPS in grade 5, students received one of two test versions varying in difficulty (for detailed information, see Krannich et al., 2017). Students who did not participate in the first wave received the more difficult test version. By applying item response theory (IRT) scaling with a partial credit model to the 40 test items, weighted maximum likelihood estimates (WLEs; Warm, 1989) were generated, representing student achievement scores on a joint scale for both test versions (Krannich et al., 2017). The mean for the WLE score was set to zero, so scores close to zero represented average proficiency levels within the sample of test takers in the NEPS overall, whereas higher WLE scores indicated above-average proficiency levels. Reliability for the entire NEPS sample was good (WLE reliability = 0.79). The intraclass correlation coefficient (ICC) for our analysis sample was 0.35, indicating substantial variation in reading comprehension levels between classes.

A *mathematics achievement test* (Schnittjer & Duchardt, 2015; Schnittjer & Gerken, 2017) assessing mathematical literacy (OECD, 2003) that was based, in part, on the relevant curricula measured students' mathematics proficiency. The test covered the topics "quantity," "space and shape," "change and relationships," and "data and chance." A partial credit model was applied to the 23 test items to estimate WLEs (Schnittjer & Gerken, 2017). Reliability for the whole NEPS sample was good (WLE reliability = 0.72). The ICC for our analysis sample was 0.38, indicating that mathematics achievement levels varied substantially between classes.

4.1.2.3 Students' psychological school adjustment Students' *school satisfaction* served as a general indicator of psychological school adjustment. The NEPS assessed this indicator with an item from the overall life satisfaction scale (Cummins & Lau, 2005; TNS Infratest Sozialforschung, 2012). Students rated the item "How satisfied are you with your situation at school?" on a response scale ranging from 0 (*entirely dissatisfied*) to 10 (*entirely satisfied*). The ICCs were 0.04 for the German class sample and 0.03 for the mathematics sample, indicating rather small variations in school satisfaction levels between classes.

Two analogously constructed scales assessing students' *helplessness* in German class and mathematics class served as domain-specific indicators of psychological school adjustment. The scales are based on the concept of learned helplessness (Abramson et al., 1978) and were adapted from previous research (Ditton, 2007; Jerusalem & Schwarzer, 1993; for use within the NEPS see Wohlkinger et al., 2011). Each scale included five items (e.g., "No matter how hard I try in German/math, my grades don't get any better," Cronbach's $\text{alpha}_{\text{German/math}} = 0.85/0.90$), with response options ranging from 1 (*does not apply at all*) to 4 (*applies completely*). We included domain-specific helplessness as a latent construct in our analyses, specifying measurement models at the individual student level (level 1) and at the classroom level (level 2) with cross-level invariant loadings (doubly latent approach, see Marsh et al., 2009, 2012). This approach yielded mostly acceptable model fit results for the German class sample $\chi^2(13) = 104.440$, $p < 0.001$, RMSEA = 0.052, CFI = 0.977, $\text{SRMR}_{\text{within}} = 0.023$, $\text{SRMR}_{\text{between}} = 0.154$ and for the mathematics sample $\chi^2(13) = 54.087$, $p < 0.001$, RMSEA = 0.033, CFI = 0.993, $\text{SRMR}_{\text{within}} = 0.012$, $\text{SRMR}_{\text{between}} = 0.037$.[4] The ICCs for the latent construct were 0.07 for the German class sample and 0.05 for the mathematics sample.

4.1.2.4 Students' immigrant background We identified students' immigrant background based on their parents' country of birth. Specifically, we distinguished immigrant students, that is, students with at least one parent who was born in another country, and non-immigrant students, that is, students with parents who were both born in Germany. The largest shares of immigrant students belonged to families who migrated from the area of the former Soviet Union (German class sample: 20.71%/mathematics sample: 20.84%), Turkey (German class sample: 16.46%/mathematics sample: 13.31%), and Poland (German class sample: 12.74%/mathematics sample: 11.38%). The samples also included smaller groups of immigrants (each < 10% in our samples), e.g., from Southern European countries, the former Yugoslavia, the Middle East, Africa, or Asia.

4.1.2.5 Student-level control variables We controlled for a number of individual student characteristics in our multilevel analyses at level 1. Specifically, we included

[4] We again used the traditional cut-off criteria from Hu and Bentler (1999) to evaluate the model fit as a standard protocol for evaluating goodness of fit for multilevel confirmatory factor analyses is largely missing (but see, e.g., Hsu et al., 2015). Note that level-unspecific fit indices may be less sensitive to misspecifications at the higher order level (Hsu et al., 2015; Ryu, 2014).

information on students' *general cognitive abilities* as a proxy for prior achievement. Within the NEPS, students' nonverbal reasoning ability was assessed with the NEPS-MAT in fifth grade (Lang et al., 2014). This test applied a matrix format similar to the format of the RAVEN test (Raven, 1977) with 12 items. We included the sum of the correct answers as a manifest scale in our analyses (Cronbach's $\text{alpha}_{\text{German/math}} = 0.64/0.62$). We further controlled for students' *gender* and *age* as well as for indicators of their socioeconomic and sociocultural family background. Information provided by parents was used to derive the family's highest *International Socio-Economic Index of Occupational Status* (ISEI; Ganzeboom, 2010) as an indicator of the family's SES. The scale ranged from 10 to 90, with higher values indicating a higher status. The *number of books at home* reported by the students represented the students' sociocultural family background, with the scale ranging from 1 (*none or only very few [0 to 10 books]*) to 6 (*enough to fill a shelf unit [more than 500 books]*).

4.1.2.6 Classroom and school-level control variables To control for potential confounding effects of contextual conditions, we included characteristics of classrooms and schools at level 2 in our analyses. For this purpose, we aggregated information on students' immigrant background to account for the *proportion of immigrant students in the classroom*. The scale ranged from 0 to 1, with higher values indicating a higher proportion of immigrant students. Furthermore, individual data were aggregated at the classroom level to account for *average cognitive abilities* and *average family SES* (highest ISEI) of the class. We further controlled for the *attended school track* as it may also be linked to teachers' cultural beliefs (Hachfeld et al., 2011) and student outcomes (Baumert et al., 2006; Becker et al., 2012). We distinguished between the academic track leading to a university entrance degree in Germany and non-academic tracks (see Table 1 for further details on the descriptive statistics as well as the online supplementary material, Table S.2 and Table S.3 for details on the correlations among all variables).

4.1.3 Data analysis

We used multilevel structural equation modeling to test our hypotheses (e.g., Bovaird, 2007). This approach is appropriate and widely-used to investigate research questions as ours that examine the relationship between constructs at the teacher or classroom level (i.e., teacher beliefs) and individual student outcomes controlling for individual student background characteristics. We included teachers' cultural beliefs and students' helplessness as latent variables and students' achievement scores and school satisfaction as manifest variables and performed a series of analyses for the German class sample and for the mathematics sample separately using the software Mplus (Version 8.4; Muthén & Muthén, 1998–2019). We included control manifest variables at level 1 (students' general cognitive abilities, gender, age, family SES, number of books at home) and level 2 (proportion of immigrant students in the classroom, average cognitive abilities and average family SES in the classroom, attended school track) in all analyses. At each level, background variables were allowed to correlate. Continuous variables at level 1, that is, students' general cognitive abilities, age, family SES, and

Table 1 Descriptive statistics for the variables analyzed in Study 1

	German class		Mathematics class	
	Mean/%	SD	Mean/%	SD
Student level (L1)				
Academic achievement[a]	0.78	1.31	0.90	1.16
School satisfaction	6.86	2.38	6.94	2.33
Helplessness[b]	1.75	0.63	1.67	0.69
Immigrant background	21.68%		20.03%	
GCA	7.23	2.48	7.42	2.43
Female	48.62%		49.21%	
Age	13.08	0.52	13.04	0.49
SES	53.84	20.41	54.77	20.45
Books	3.97	1.46	4.04	1.42
Classroom level (L2)				
MCB[b]	4.89	0.64	4.89	0.61
EGB[b]	4.99	0.66	4.97	0.63
ASB[b]	3.65	0.97	3.62	0.99
Academic achievement[a]	0.71	0.62	0.82	0.56
School satisfaction	6.85	0.32	6.93	0.36
Helplessness[b]	1.76	0.13	1.68	0.13
Imm. backgr. (Prop.)	0.21	0.20	0.20	0.20
GCA (Mean)	7.07	1.54	7.20	1.43
SES (Mean)	52.60	11.94	53.59	11.74
Academic track	43.64%		46.94%	

$N_{L1\ German/math} = 2606/2851$, $N_{L2\ German/math} = 220/245$

GCA general cognitive abilities, *SES* socioeconomic status, *Books* number of books at home, *MCB* multicultural beliefs, *EGB* egalitarian beliefs, *ASB* assimilationist beliefs, *Prop.* proportion

[a]Reading achievement in German classes and mathematics achievement in mathematics classes, [b]For a latent construct, manifest mean/SD is reported

number of books at home, were centered at their grand means. The latent cultural teacher beliefs were standardized using the fixed factor method, i.e., their variances were set to one.

Prior to testing our hypotheses, we assessed whether the relationship between students' school adaptation and immigrant background varied significantly between classes (i.e., random slopes). To do so, we estimated random-intercept-random-slope models predicting students' academic achievement and their psychological school adjustment by their immigrant background. If the relationship between students' school adaptation and their immigrant background differed systematically between classrooms, we were able to analyze whether the characteristics of the classroom, particularly teachers' cultural beliefs, could account for this variation.

We then tested whether this variation in the slope (i.e., school adaptation predicted by immigrant background) between classes could be explained by teachers' multicultural, egalitarian, or assimilationist beliefs controlling for the respective other teacher belief scales. As teacher beliefs may be related to immigrant and non-immigrant students' school adaptation differentially, we estimated cross-level interaction effects (i.e., intercepts-and-slopes-as-outcomes models). That is, the random slope for the link between immigrant background and student outcomes was predicted by teachers' cultural beliefs. If, for example, multicultural teacher beliefs have a positive conditional main effect on academic achievement, this would indicate a positive relationship between these teacher beliefs and non-immigrant students' achievement (with dummy coded immigrant background 0 = non-immigrant, 1 = immigrant). A significant positive cross-level interaction effect would suggest that teachers' multicultural beliefs differentially relate to immigrant and non-immigrant students' academic achievement, with a stronger association of multicultural teacher beliefs with immigrant students' academic achievement.

Some of the variables had missing values. In the German class sample, the percentage of missings was lowest for the number of books at home (0.96%) and highest for SES (36.42%) at level 1. At level 2, the percentage of missings was 22.27% for multicultural beliefs, 24.09% for egalitarian beliefs, and 23.18% for assimilationist beliefs. In the mathematics sample, the percentage of missings ranged from 0.70% for the number of books at home to 34.27% for SES at level 1. At level 2, the percentage of missings was 27.76% for multicultural beliefs, 29.80% for egalitarian beliefs, and 28.98% for assimilationist beliefs. Students' cognitive abilities were assessed only in wave 1 (grade 5) and thus not available in the add-on sample in wave 3 (grade 7). Consequently, missing rates for cognitive abilities were comparably high at level 1, with 49.46% in the German class sample and 44.44% in the mathematics sample. As the original sample and the add-on sample were selected with the same sampling strategy, it is, however, unlikely that missing patterns differed systematically between the two samples. To account for missing values, we estimated our models using full information maximum likelihood estimation (FIML; Arbuckle, 1996; Enders, 2010).

4.2 Results

Random-intercept-random-slope models showed that immigrant students, on average, reached significantly lower achievement levels than their non-immigrant peers, even when accounting for the control variables at level 1 and level 2 ($b_{German} = -0.16$, $p = 0.012$/$b_{math} = -0.17$, $p < 0.001$). However, the slopes did not vary significantly across classrooms ($\tau_{11\text{German}} = 0.029$, $p = 0.642$/$\tau_{11\text{math}} = 0.009$, $p = 1.000$),[5] indicating that the relationship between achievement and immigrant background was similar across classrooms when background characteristics at

[5] We performed likelihood-ratio tests based on model deviances using a chi-bar distribution to test whether the slopes varied significantly between classes (e.g., Snijders & Bosker, 2012).

both levels were controlled. At the same time, immigrant students and their non-immigrant peers, on average, did not differ in their school satisfaction across classes ($b_{German} = -0.03$, $p = 0.847$/$b_{math} = -0.20$, $p = 0.124$). While the slopes varied significantly between German language classes ($\tau_{11\text{German}} = 0.598$, $p = 0.014$), they were similar across mathematics classes ($\tau_{11\text{math}} = 0.161$, $p = 0.575$). On average, students with an immigrant background felt similarly helpless as their non-immigrant peers in German language classes ($b_{German} = 0.02$, $p = 0.614$) and mathematics classes ($b_{math} = 0.06$, $p = 0.119$), although the relationship between domain-specific helplessness and immigrant background varied significantly across classes ($\tau_{11\text{German}} = 0.037$, $p = 0.017$/$\tau_{11\text{math}} = 0.030$, $p = 0.001$).

In sum, these results indicate that the variability in immigrant and non-immigrant students' school adaptation across classes was small and that the potential for detecting moderator effects of teacher beliefs was therefore limited. As the theoretical rationale suggests that teachers' cultural beliefs affect immigrant students' school adaptation, we followed recommendations by Snijders and Bosker (2012) and computed intercepts-and-slopes-as-outcomes models (see Table 2 for German language classes and Table 3 for mathematics classes).

None of the conditional main effects of teachers' multicultural, egalitarian, or assimilationist beliefs were significant in the German class sample or the mathematics sample. Their interactions with the respective slope for the link between immigrant background and student outcomes were also mostly not significant, suggesting that teachers' cultural beliefs were mostly unrelated to non-immigrant and immigrant student outcomes alike. However, there was a significant positive cross-level interaction effect between teachers' egalitarian beliefs and the link between immigrant background and helplessness in German classes (Table 2, Model 8), indicating that the gaps between immigrant and non-immigrant students' feelings of helplessness differ across classrooms with varying levels of teachers' egalitarian beliefs. To further probe this effect, we plotted the slopes for immigrant and non-immigrant students as a function of their teachers' egalitarian beliefs (i.e., conditional effects, not displayed) including confidence bands (Bauer & Curran, 2005). These confidence bands always encompassed the zero line, indicating that neither immigrant students' nor non-immigrant students' helplessness in German class was substantially related to teachers' egalitarian beliefs. Moreover, the slopes' confidence bands fully overlapped across a meaningful range of the egalitarian beliefs scale, suggesting that the gaps between immigrant and non-immigrant students' feelings of helplessness do not significantly differ within this range. Taken together, our results do not support the notion that immigrant students benefit from teachers' multicultural beliefs in their academic achievement or their psychological school adjustment (hypothesis 1) or that they suffer from teachers' assimilationist beliefs (hypothesis 2). Teachers' egalitarian beliefs were also not substantially related to students' school adaptation.

We conducted supplementary analyses to further probe the robustness of our findings. First, as almost none of the cross-level interactions were significant, we estimated random-intercept models and included standardized regression coefficients to evaluate the magnitude of associations (see supplementary material, Tables S.6 for German language classes and S.7 for mathematics classes). These additional analyses again show that teachers' multicultural, egalitarian, and assimilationist

Table 2 Multilevel structural equation models predicting students' reading achievement and psychological school adjustment by teachers' cultural beliefs in Study 1 (German language classes)

	Reading achievement						School satisfaction						Helplessness in German class					
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7		Model 8		Model 9	
	b	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*
Student level (L1)																		
Imm. backgr.[a]	− 0.16*	0.06	− 0.16*	0.06	− 0.16*	0.06	− 0.03	0.15	− 0.04	0.15	− 0.03	0.15	0.02	0.04	0.02	0.04	0.02	0.04
GCA[d]	0.09***	0.01	0.09***	0.01	0.09***	0.01	0.06	0.03	0.06	0.03	0.06	0.03	0.00	0.01	0.00	0.01	0.00	0.01
Female[b]	0.16***	0.04	0.16***	0.04	0.16***	0.04	0.32**	0.10	0.32**	0.10	0.32**	0.10	− 0.15***	0.03	− 0.15***	0.03	− 0.15***	0.03
Age[d]	− 0.05	0.04	− 0.05	0.04	− 0.05	0.04	− 0.31**	0.11	− 0.31**	0.11	− 0.31**	0.11	0.06	0.03	0.06	0.03	0.06*	0.03
SES[d]	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Books[d]	0.11***	0.02	0.11***	0.02	0.11***	0.02	0.10*	0.04	0.10*	0.04	0.10*	0.04	− 0.05***	0.01	− 0.05***	0.01	− 0.05***	0.01
Classroom level (L2)																		
MCB	− 0.02	0.07	− 0.04	0.06	− 0.03	0.06	− 0.10	0.11	− 0.11	0.12	− 0.11	0.11	0.04	0.03	0.05	0.03	0.05	0.03
EGB	0.04	0.06	0.05	0.06	0.04	0.06	0.10	0.12	0.12	0.13	0.09	0.11	− 0.03	0.03	− 0.04	0.03	− 0.03	0.03
ASB	− 0.07	0.04	− 0.07	0.04	− 0.07	0.05	− 0.02	0.08	− 0.02	0.08	− 0.02	0.08	0.00	0.02	0.00	0.02	0.00	0.02
Imm. Backgr. (Prop.)	0.16	0.21	0.16	0.21	0.16	0.21	− 0.53	0.35	− 0.52	0.35	− 0.54	0.35	− 0.06	0.09	− 0.06	0.08	− 0.05	0.08
GCA (Mean)	0.13**	0.05	0.13**	0.05	0.13**	0.05	− 0.04	0.11	− 0.04	0.11	− 0.04	0.11	− 0.01	0.03	− 0.01	0.03	− 0.01	0.03
SES (Mean)	0.01**	0.00	0.01**	0.00	0.01**	0.00	− 0.01	0.01	− 0.01	0.01	− 0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Academic track[c]	0.56***	0.12	0.57***	0.12	0.57***	0.12	0.32	0.23	0.33	0.23	0.32	0.23	− 0.13	0.07	− 0.13	0.07	− 0.12	0.07

Table 2 (continued)

	Reading achievement						School satisfaction						Helplessness in German class					
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7		Model 8		Model 9	
	b	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*
Cross-level interactions																		
Imm. backgr. x MCB	− 0.05	0.06					− 0.07	0.16					0.08	0.05				
Imm. backgr. x EGB			− 0.03	0.06					− 0.13	0.18					0.10*	0.05		
Imm. backgr. x ASB					− 0.01	0.07					0.02	0.20					− 0.03	0.05
Variance components																		
Intercept (L2) variance (τ_{00})		0.07		0.07		0.07		0.08		0.08		0.08		0.01		0.01		0.01
Slope (L2) variance (τ_{11})		0.03		0.03		0.03		0.62		0.60		0.62		0.03		0.03		0.03
Intercept-slope (L2) covariance (τ_{01})		− 0.01		− 0.03		− 0.01		− 0.12		− 0.12		− 0.12		0.00		0.00		0.00

$N_{L1} = 2606$, $N_{L2} = 220$

Imm. backgr. immigrant background, *GCA* general cognitive abilities, *SES* socioeconomic status, *Books* number of books at home, *MCB* multicultural beliefs, *EGB* egalitarian beliefs, *ASB* assimilationist beliefs, *Prop.* proportion

[a]Reference group: non-immigrant students, [b]Reference group: male, [c]Reference group: non-academic tracks, [d]Continuous variables at level 1 were centered at their grand means

*$p < .05$, **$p < .01$, ***$p < .001$

Table 3 Multilevel structural equation models predicting students' mathematics achievement and psychological school adjustment by teachers' cultural beliefs in Study 1 (mathematics classes)

	Mathematics achievement						School satisfaction						Helplessness in mathematics class					
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7		Model 8		Model 9	
	b	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*
Student level (L1)																		
Imm. backgr.[a]	− 0.17***	0.05	− 0.17***	0.05	− 0.17***	0.05	− 0.20	0.13	− 0.20	0.13	− 0.20	0.13	0.06	0.04	0.06	0.04	0.06	0.04
GCA[d]	0.13***	0.01	0.13***	0.01	0.13***	0.01	0.04	0.03	0.04	0.03	0.04	0.03	− 0.03**	0.01	− 0.03**	0.01	− 0.03**	0.01
Female[b]	− 0.43***	0.03	− 0.43***	0.03	− 0.43***	0.03	0.26**	0.09	0.26**	0.09	0.26**	0.09	0.14***	0.03	0.14***	0.03	0.14***	0.03
Age[d]	− 0.11**	0.04	− 0.11**	0.04	− 0.11**	0.04	− 0.07	0.11	− 0.07	0.11	− 0.08	0.11	0.03	0.03	0.03	0.03	0.03	0.03
SES[d]	0.00	0.00	0.00	0.00	0.00	0.00	0.01**	0.00	0.01**	0.00	0.01**	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Books[d]	0.10***	0.01	0.10***	0.01	0.10***	0.01	0.04	0.04	0.04	0.04	0.04	0.04	− 0.06***	0.01	− 0.06***	0.01	− 0.06***	0.01
Classroom level (L2)																		
MCB	0.06	0.06	0.06	0.05	0.06	0.05	− 0.14	0.13	− 0.14	0.13	− 0.13	0.13	0.01	0.04	0.00	0.04	0.01	0.04
EGB	− 0.04	0.05	− 0.04	0.06	− 0.04	0.05	0.09	0.12	0.07	0.13	0.08	0.12	0.01	0.04	0.01	0.04	0.01	0.04
ASB	− 0.04	0.04	− 0.04	0.04	− 0.05	0.04	− 0.02	0.07	− 0.02	0.07	− 0.06	0.08	− 0.01	0.02	− 0.01	0.02	− 0.01	0.02
Imm. Backgr. (Prop.)	− 0.21	0.16	− 0.22	0.16	− 0.22	0.17	− 0.29	0.32	− 0.31	0.32	− 0.30	0.32	− 0.09	0.10	− 0.09	0.10	− 0.10	0.10
GCA (Mean)	0.12***	0.03	0.12***	0.03	0.12***	0.03	− 0.05	0.08	− 0.05	0.08	− 0.05	0.08	0.01	0.02	0.01	0.02	0.01	0.02
SES (Mean)	0.01	0.00	0.01	0.00	0.01	0.00	− 0.01	0.01	− 0.01	0.01	− 0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Academic track[c]	0.60***	0.09	0.60***	0.09	0.60***	0.10	0.35*	0.15	0.35*	0.15	0.35*	0.15	− 0.10*	0.04	− 0.10*	0.04	− 0.10*	0.04

Table 3 (continued)

	Mathematics achievement						School satisfaction						Helplessness in mathematics class					
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7		Model 8		Model 9	
	b	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*
Cross-level interactions																		
Imm. backgr. x MCB	− 0.01	0.04					− 0.01	0.15					− 0.04	0.06				
Imm. backgr. x EGB			0.02	0.05					0.12	0.18					− 0.03	0.06		
Imm. backgr. x ASB					0.06	0.05					0.18	0.16					0.03	0.05
*Variance componen*ts																		
Intercept (L2) variance (τ_{00})		0.08		0.08		0.08		0.11		0.11		0.11		0.01		0.01		0.01
Slope (L2) variance (τ_{11})		0.01		0.01		0.01		0.19		0.18		0.12		0.03		0.03		0.03
Intercept-slope (L2) covariance (τ_{01})		− 0.01		− 0.01		− 0.01		− 0.09		− 0.08		− 0.07		0.01		0.01		0.01

$N_{L1} = 2851$, $N_{L2} = 245$

Imm. backgr. immigrant background, *GCA* general cognitive abilities, *SES* socioeconomic status, *Books* number of books at home, *MCB* multicultural beliefs, *EGB* egalitarian beliefs, *ASB* assimilationist beliefs, *Prop.* proportion

[a]Reference group: non-immigrant students, [b]Reference group: male, [c]Reference group: non-academic tracks, [d]Continuous variables at level 1 were centered at their grand means

*$p < .05$, **$p < .01$, ***$p < .001$

beliefswere not significantly related to students' school adaptation. This finding was corroborated by rather small effect sizes. Second, we reran the intercepts-and-slopes-as-outcomes models using another common, but more rigorous operationalization of students' immigrant background and defined only students with two parents born abroad as immigrants (11.75% in the German sample and 10.84% in the mathematics sample). Again, teachers' cultural beliefs were not significantly associated with immigrant and non-immigrant students' academic achievement and psychological school adjustment (see supplementary material, Tables S.11 and S.12).

5 Study 2

5.1 Method

5.1.1 Participants and procedure

In the second study, we used data from the German National Assessment Study 2012[6] (Lenski et al., 2016; Pant et al., 2015) carried out by the Institute for Educational Quality Improvement (IQB). The nationwide study tested mathematics and science achievement in a sample of ninth-grade students and collected information on teachers' cultural beliefs. In addition, student questionnaires were administered. The total sample included 44 584 ninth graders. Participation in the achievement tests was mandatory for all students, while the guidelines for participation in the questionnaires differed between the 16 German federal states: in six states, answering questions on student and family background information was mandatory, while it was voluntary in ten states. Different versions of test booklets and questionnaires were randomly distributed to the students within one classroom, such that a subsample of students in each classroom participated in mathematics tests and answered questions on mathematics-related characteristics (see Hecht et al., 2013).

As in study 1, the analyses were based on data from students attending regular schools whose immigrant background and gender could be determined. We further restricted our sample to students who took part in the mathematics achievement testing and who provided data on at least one item of the mathematical self-concept scale administered in the student questionnaire. We limited our analysis sample to classes with a minimum of five participating students whose mathematics teachers had filled out a questionnaire. Our analysis sample included 4722 students (50.19% female; 22.38% immigrant students; $M_{age} = 15.48$, $SD_{age} = 0.58$) and 456 teachers (50.11% female; 3.06% immigrants) in 456 mathematics classes (average number of students per classroom: $M = 10.36$) in 428 schools.

5.1.2 Measures

5.1.2.1 Teachers' cultural beliefs The IQB study administered basically the same scale to measure teachers' multicultural beliefs as the NEPS, whose data we used in

[6] https://doi.org/10.5159/IQB_LV_2012_v1.

study 1, with the exception that the IQB study included only three out of the original six items (Cronbach's alpha = 0.64; see supplementary material, Table S.1 for the exact wording). Teachers' egalitarian beliefs were assessed with two items in the IQB study (Cronbach's alpha = 0.79; see supplementary material, Table S.1 for the exact wording). The IQB study did not assess assimilationist beliefs.

Like in study 1, we conducted confirmatory factor analyses (MLR estimator) to evaluate whether the assumed two-dimensional structure of teachers' multicultural and egalitarian beliefs applies to the data. Unexpectedly, the two-dimensional model (2 factor model: $\chi^2(4) = 9.278$, $p = 0.055$, RMSEA = 0.055, CFI = 0.982, SRMR = 0.023) did not fit the data better than a one-dimensional model (1 factor model: $\chi^2(5) = 11.517$, $p = 0.042$, RMSEA = 0.054, CFI = 0.978, SRMR = 0.031; $\Delta\chi^2(\text{df}) = 2.239(1)$, $p = 0.135$). This finding was corroborated by a strong latent correlation between teachers' multicultural and egalitarian beliefs ($r_{\text{latent}} = 0.90$, $p < 0.001$). As multicultural and egalitarian beliefs are conceptually distinct and because we wanted to keep the results comparable to study 1 as far as possible, we still analyzed the two scales separately. To avoid problems of multicollinearity, we ran separate analyses including either multicultural or egalitarian beliefs. In addition, we conducted analyses using a cultural beliefs scale that comprises all items (see supplementary material). We treated all cultural beliefs as latent constructs in our analyses.

5.1.2.2 Students' academic achievement A standardized *mathematics achievement test* measured students' mathematics proficiency based on national educational standards (see Secretariat of the Standing Conference of the Ministers of Education and Cultural Affairs of the Länder in the Federal Republic of Germany [KMK], 2004, 2005). The test covered five content areas: "numbers," "measurement," "space and shape," "functional relationships," and "data and chance." Items were administered based on a multiple-matrix design (see Hecht et al., 2013), assigning a total of 300 items to 31 test booklets with six item blocks each. A generalized Rasch model was used to estimate student achievement scores on a common scale as WLEs. Reliability for the entire IQB sample was good (WLE reliability = 0.90). The ICC for our analysis sample was 0.49, indicating that the achievement levels varied substantially between classes.

5.1.2.3 Students' psychological school adjustment A scale capturing students' *self-concept in mathematics* served as a domain-specific indicator of psychological school adjustment. The scale was adapted from the PISA 2003 study (OECD, 2005; Ramm et al., 2006). Students were asked to respond to four items (e.g., "I have always believed that mathematics is one of my best subjects," Cronbach's alpha = 0.91) on a scale ranging from 1 (*does not apply at all*) to 4 (*applies completely*). The ICC for the latent construct was 0.04, indicating little variation between classes. We included self-concept as a latent construct in the analyses,

specifying measurement models at level 1 and level 2 with invariant loadings across levels (i.e., doubly latent approach, see study 1). This approach yielded acceptable model fit results $\chi^2(7) = 100.644$, $p < 0.001$, RMSEA = 0.053, CFI = 0.989, $SRMR_{within} = 0.013$, $SRMR_{between} = 0.068$.

5.1.2.4 Students' immigrant background As in study 1, we identified students' immigrant status based on their parents' country of birth and distinguished immigrant students (students with at least one parent who was born in another country) from non-immigrant students (students with parents who were both born in Germany). Similar to study 1, our sample included a large number of immigrant groups, with most of the immigrant students' families being from the area of the former Soviet Union (20.15%), Turkey (18.35%), or Poland (8.99%). Again, the sample also included a large number of smaller groups of immigrants, such as those from the former Yugoslavia.

5.1.2.5 Student-level control variables We again controlled for a number of individual student characteristics. These included information on students' *general cognitive abilities*, which were measured with a nonverbal reasoning test consisting of 16 items (BEFKI; Wilhelm et al., 2014). A generalized Rasch model was used to estimate WLEs for this scale (WLE reliability in the total sample = 0.70). We further accounted for students' *gender* and *age*. Based on information collected with the student questionnaire, two indicators represented students' socioeconomic and sociocultural family background. First, the family's *highest ISEI* (Ganzeboom, 2010) served as an indicator of SES. Second, the *number of books at home* served as an indicator of students' sociocultural family background, with the scale ranging from 1 (*0 to 10 books*) to 6 (*more than 500 books*).

5.1.2.6 Classroom and school-level control variables As in study 1, we also included classroom and school-level control variables. To account for the *proportion of immigrant students in the classroom*, we aggregated information on students' immigrant background at the classroom level. The scale ranged from 0 to 1, with higher values indicating a higher proportion of immigrant students. Individual-level data were further aggregated to account for students' *average cognitive abilities* and *average family SES* (highest ISEI) in the classroom. We also controlled for *school tracks*, distinguishing the academic track from non-academic tracks. Table 4 summarizes descriptive statistics for all variables used in the analyses (see supplementary material, Table S.4 and Table S.5 for correlations among the variables).

5.1.3 Data analysis

Study 2 applied the same analysis strategy as study 1. We estimated multilevel structural equation models using the software Mplus (Version 8.4; Muthén & Muthén, 1998–2019). This time we included teachers' cultural beliefs and students'

self-concept in mathematics as latent variables and students' mathematics achievement score as manifest variable in our analyses, controlling for manifest covariates at both levels. Similar to study 1, we first explored whether the relationships between students' achievement and self-concept in mathematics and their immigrant background varied between classes. We therefore estimated random-intercept-random-slope models predicting students' adaptation outcomes by students' immigrant background.

In a next step, we estimated intercepts-and-slopes-as-outcomes models as the relationship between teachers' cultural beliefs and students' school adaptation may vary between immigrant and non-immigrant students. We predicted students' school adaptation by their immigrant background, teachers' multicultural and egalitarian beliefs, and the cross-level interaction between the slope (i.e., school adaptation predicted by immigrant background) and teachers' cultural beliefs.

Some of our variables had missing values. The proportion of missings ranged from 0.02% for general cognitive abilities to 8.56% for SES at level 1. At level 2, the proportion of missings was 3.29% for multicultural beliefs and 3.07% for egalitarian beliefs. We again estimated our models using FIML to account for missing values (Arbuckle, 1996; Enders, 2010).

5.2 Results

The random-intercept-random-slope models revealed that immigrant students, on average, reached a lower level of mathematics achievement than their non-immigrant peers ($b = -0.19$, $p < 0.001$). At the same time, both groups reported similar levels of mathematical self-concept on average ($b = 0.03$, $p = 0.314$). These results are similar to our findings on school adaptation from study 1. However, neither the relationship between mathematics achievement and immigrant background ($\tau_{11} = 0.021$, $p = 0.352$)[7] nor the relationship between mathematical self-concept and immigrant background ($\tau_{11} = 0.032$, $p = 0.142$) varied significantly between classes.

To test our hypotheses, we predicted the relationship between students' school adaptation outcomes and their immigrant background by teachers' multicultural and egalitarian beliefs, respectively (i.e., intercepts-and-slopes-as-outcomes models, see Table 5). Neither the effects of teachers' multicultural or egalitarian beliefs nor the interaction terms were significant. Including an overall cultural beliefs measure that comprises both subscales did not alter the findings (see supplementary material, Table S.8). The results thus support the findings from study 1, rejecting the hypothesis that teachers' multicultural beliefs are positively related to immigrant students' academic achievement or psychological school adjustment (hypothesis 1). As in study 1, teachers' egalitarian beliefs were also unrelated to immigrant students' school adaptation. Moreover, neither teachers' multicultural nor egalitarian beliefs were associated with non-immigrant students' school adaptation.

We conducted supplementary analyses to further probe our findings. As none of the cross-level interactions were significant we estimated random-intercept models

[7] As in study 1, we performed likelihood-ratio tests based on model deviances using a chi-bar distribution to test for random slope effects.

Table 4 Descriptive statistics for the variables analyzed in Study 2

	Mean/%	SD
Student level (L1)		
Mathematics achievement	0.48	1.27
Mathematics self-concept[a]	2.67	0.86
Immigrant background	22.38%	
GCA (WLE)	0.30	1.15
Female	50.19%	
Age	15.48	0.58
SES	54.37	20.43
Books	3.80	1.48
Classroom level (L2)		
MCB[a]	4.75	0.75
EGB[a]	5.04	0.77
Mathematics achievement	0.40	0.64
Mathematics self-concept[a]	2.68	0.16
Imm. backgr. (Prop.)	0.24	0.22
GCA (Mean)	0.22	0.59
SES (Mean)	52.95	11.13
Academic track	49.12%	

$N_{L1} = 4722$, $N_{L2} = 456$

GCA general cognitive abilities, *SES* socioeconomic status, *Books* number of books at home, *MCB* multicultural beliefs, *EGB* egalitarian beliefs, *Prop.* proportion

[a]For a latent construct, manifest mean/SD is reported

including standardized regression coefficients to evaluate the magnitude of associations (see supplementary material, Table S.9). Again, neither teachers' multicultural beliefs nor their egalitarian beliefs were significantly related to students' school adaptation. The corresponding effect sizes were also rather small. Analyses including the overall cultural beliefs scale reproduced these findings (see supplementary material, Table S.10). We further checked the robustness of our results and reran the intercepts-and-slopes-as-outcomes models grouping only students with two parents born abroad as immigrants (12.79%). These results corroborated our previous findings indicating no significant relationship between teachers' cultural beliefs and students' academic achievement and psychological school adjustment (see supplementary material, Tables S.13 and S.14).

6 Discussion

The present studies examined whether and how teachers' cultural beliefs, that is, their beliefs about how to approach cultural diversity in the classroom, relate to immigrant students' adaptation to school. To our knowledge, this study was the first

Table 5 Multilevel structural equation models predicting students' mathematics achievement and psychological school adjustment by teachers' cultural beliefs in Study 2

	Mathematics achievement				Self-concept in mathematics			
	Model 1		Model 2		Model 3		Model 4	
	b	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*
Student level (L1)								
Imm. backgr.[a]	− 0.19***	0.03	− 0.19***	0.03	0.03	0.03	0.03	0.03
GCA (WLE)[d]	0.38***	0.02	0.38***	0.02	0.22***	0.01	0.22***	0.01
Female[b]	− 0.29***	0.03	− 0.29***	0.03	− 0.42***	0.02	− 0.42***	0.02
Age[d]	− 0.12***	0.02	− 0.12***	0.02	− 0.08***	0.02	− 0.08***	0.02
SES[d]	0.00*	0.00	0.00*	0.00	0.00	0.00	0.00	0.00
Books[d]	0.07***	0.01	0.07***	0.01	0.02	0.01	0.02	0.01
Classroom level (L2)								
MCB	0.01	0.02			0.01	0.02		
EGB			0.01	0.02			− 0.01	0.02
Imm. backgr. (Prop.)	− 0.35***	0.08	− 0.35***	0.09	− 0.01	0.08	0.00	0.08
GCA (Mean)	0.52***	0.05	0.52***	0.05	− 0.11**	0.04	− 0.11**	0.04
SES (Mean)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Academic track[c]	0.51***	0.06	0.51***	0.06	− 0.02	0.05	− 0.02	0.05
Cross-level-interactions								
Imm. backgr. x MCB	0.01	0.04			− 0.03	0.04		
Imm. backgr. x EGB			− 0.03	0.04			− 0.05	0.03
Variance components								
Intercept (L2) variance (τ_{00})	0.06		0.06		0.02		0.02	
Slope (L2) variance (τ_{11})	0.02		0.02		0.03		0.03	
Intercept-slope (L2) covariance(τ_{01})	0.01		0.01		− 0.01		− 0.01	

$N_{L1} = 2851$, $N_{L2} = 245$.

Imm. backgr. immigrant background, *GCA* general cognitive abilities, *SES* socioeconomic status, *Books* number of books at home, *MCB* multicultural beliefs, *EGB* egalitarian beliefs, *Prop.* proportion

[a]Reference group: non-immigrant students, [b]Reference group: male, [c]Reference group: non-academic tracks, [d]Continuous variables at level 1 were centered at their grand means

*$p < .05$, **$p < .01$, ***$p < .001$

to investigate this issue based on data from large samples in Germany. We examined two facets of school adaptation, academic achievement and psychological school adjustment, including several indicators for each facet. Using data from two studies enabled us to cross-validate our findings and thus increases confidence in their generalizability.

Our findings do not support the hypothesis that teachers' multicultural or assimilationist beliefs are related to immigrant students' academic achievement or psychological school adaptation. Teachers' egalitarian beliefs were also not substantially related to immigrant students' school adaptation. The findings do also not support

the notion that multicultural, egalitarian or assimilationist teacher beliefs are related to non-immigrant students' school adaptation.

Our findings thus suggest that immigrant and non-immigrant students neither benefit nor suffer from teachers' cultural beliefs in their school adaptation. These findings are in line with previous research that found no relationship between (perceived) cultural teacher beliefs and students' achievement or outgroup attitudes (Geerlings et al., 2019; Love & Kruger, 2005). However, previous work revealed relationships between teachers' cultural beliefs and their self-reported proficiency and motivation to teach in culturally diverse classrooms, such as their self-efficacy or their willingness to adapt their teaching (Gebauer & McElvany, 2017; Gutentag et al., 2017; Hachfeld et al., 2015), which are assumed to affect teaching practices and immigrant students' school adaptation (Hachfeld et al., 2015). More research is needed to disentangle the relationship between cultural teacher beliefs, self-perceived teaching proficiency, actual teaching practices, and student outcomes.

One possible explanation for the missing associations in our study is that teachers' cultural beliefs do not translate into actual teaching practices that are relevant for students' school adaptation. For instance, teachers may not always know how to put their beliefs into teaching practice (Dubberke et al., 2008). Moreover, teaching practices are subject to contextual constraints that may prevent beliefs from unfolding their potential effects (Basturkmen, 2012). For instance, teachers may find it difficult to fit contents that reflect their multicultural beliefs into their teaching because of time constraints imposed by the curriculum. The finding that teachers regard the requirements of the prescribed curriculum as an obstacle to converting their multicultural beliefs into practice supports this notion (Civitillo et al., 2016).

Another possible explanation for the missing link between teacher beliefs and student outcomes in our studies is that the diversity climate of the larger school context may supersede the effects of a single teacher's cultural beliefs. Previous research suggests that school-wide diversity policies and students' perceptions of their school's diversity climate affect their school adaptation (Celeste et al., 2019; Schachner et al., 2018b). Future studies should hence investigate the cultural beliefs of more teachers, ideally the whole school's teaching staff, to more comprehensively grasp contextual influences on students' adaptation. In addition, we focused on secondary school students, i.e., adolescents, for whom peers become increasingly important (Brown & Larson, 2009) and likely matter more than teachers. Although the teachers in our sample taught one of the core subjects and thus should have had a major impact on students' development, teachers may have a stronger influence on younger children than on adolescents. More research on whether teachers' cultural beliefs affect younger children's adaptation to school is needed.

Another possible explanation for the null findings is that immigrant students' may not see their ethnic minority identities as an important part of their selves. Hence, they may not perceive any identity affirmation or threat relating to their minority group membership, and their school adaptation may be unaffected by environments that affirm or devalue minority identities. Previous research (Edele et al., 2013; Jugert et al., 2020; Schotte et al., 2018; Spiegler et al., 2019), however, indicates that minority students in Germany on average identify relatively strong with their

ethnic in-group, although ethnic identification varies individually and by ethnicity. It is therefore unlikely that overall low levels of ethnic identification account for our zero findings. However, future research should include students' ethnic identification to explore whether it alters the relationship between teachers' cultural beliefs and immigrant students' school adaptation and to potentially identify subgroups of students for which teacher beliefs matter more or less (for an experimental study with young adults see Verkuyten, 2010).

In sum, teachers' cultural beliefs seem to be less important for students' school adaptation than suggested by some authors (e.g., Hachfeld et al., 2015). It cannot, however, be inferred that these beliefs are generally irrelevant for students' adaptation. It is important to note that the teachers in our study reported relatively high levels of multicultural and egalitarian beliefs, and the empirical ranges of these scales were therefore restricted. In contexts with a larger variability in teachers' multicultural and egalitarian beliefs, the relationships with student outcomes may be more pronounced. However, we did also not detect relationships between teachers' assimilationist beliefs and student outcomes, although teachers used the full range of this scale. Our results thus indicate that the role of teachers' cultural beliefs in students' school adaptation seems to be restricted in the context of our investigation, although we cannot fully rule out that cultural beliefs may be more meaningful in students' adaptation under different conditions.

7 Limitations

Our research has several limitations. The cultural beliefs scales used in our study captured the constructs broadly. The original scales have been validated in previous studies (Hachfeld & Profanter, 2018; Hachfeld et al., 2011) and showed the respective expected relationships with teachers' self-efficacy and enthusiasm for teaching immigrant students, their ethnic prejudices, and whether they are willing to adapt their instruction to a culturally diverse student body. Yet, we cannot completely rule out that using more fine-grained measures that capture more specific and behavior-related aspects of cultural beliefs would have yielded different findings. This is particularly substantiated by our findings from study 2, which applied considerably shortened subscales of multicultural and egalitarian beliefs from the Teacher Cultural Beliefs Scale. In consequence, they did not capture the different nuances on how to approach cultural diversity in the classroom anymore (i.e., all items loaded on the same factor). Future studies should examine whether using more detailed and multidimensional measures of cultural beliefs, such as beliefs about the cultural content that should be taught, beliefs about culturally sensitive teaching practices (Civitillo et al., 2018), or beliefs about the effectiveness of special teaching behaviors, would yield links with students' adaptation. Moreover, as cultural diversity is not only reflected by static markers such as immigrant backgrounds or ascribed ethnicity, future research should further refine measures of multiculturalism to capture cultural diversity in superdiverse societies more broadly.

Another limitation is that students' school satisfaction was captured with a single item. Although multi-item scales would be desirable to increase the measurements'

reliability and validity, previous results suggest that the validity of a single item measure of school satisfaction is acceptable (Danielsen et al., 2011). Moreover, including multi-item-based indicators of psychological school adjustment (school-related helplessness in study 1, academic self-concept in study 2) did not alter the findings, which increased confidence in the robustness of the findings.

In addition, we examined our research questions in only one context, namely, Germany. As relationships between cultural beliefs and intergroup relations may vary with the diversity climate of the specific context (e.g., Guimond et al., 2013), more international comparative research is needed to examine whether our findings can be generalized across different contexts. We also could not determine the possible long-term effects of teachers' cultural beliefs on how students adapt to school due to the cross-sectional nature of our data. Yet, cultural beliefs might need some time to make an impact. Future research should be carried out to explore this possibility.

Although we examined different indicators of school adaptation, our research was limited to outcomes in German language classes and mathematics classes. These subjects are crucial for future participation in society, and immigrant students often reach lower achievement levels than their non-immigrant peers. Hence, it is important to study what helps and hinders immigrant students to perform well in these subjects. However, whether or not teachers endorse multicultural beliefs in particular might have a greater impact and make more of a difference in other subjects, namely, subjects in which these teacher beliefs can be more easily converted into actual practices. For instance, it may be easier to integrate content relevant to immigrant students' cultural backgrounds and immigration histories into a history class or to encourage discussions about ethnicity to reduce ethnic prejudices and stereotypes in an ethics class. Although culturally responsive teaching accounts emphasize that culture affects learning and instruction in a general fashion (e.g., Civitillo et al., 2019), future research should investigate whether different results are found for student outcomes in other subjects.

8 Conclusion

Despite its limitations, our research extends the existing literature on teachers' cultural beliefs and their role in students' adaptation to school. The two studies are the first to investigate potential links between teachers' cultural beliefs and various indicators of students' school adaptation using data from two large-scale studies in Germany. Revealing very similar findings for both datasets, our analyses provide new evidence that neither teachers' multicultural nor egalitarian nor assimilationist beliefs seem to be linked to students' school adaptation in a meaningful fashion. The findings hold across different student outcomes (academic achievement and psychological school adjustment) and across different student populations. Moreover, our results have practical implications: while teacher training and professional development targeting cultural beliefs may support teachers' motivation and self-efficacy to teach in diverse classrooms, our findings question expectations that they will also automatically promote student outcomes. Advancing student outcomes requires an

effective conversion of these beliefs into actual teaching practices that will affect student outcomes in a meaningful way. Future research should therefore examine whether and how cultural beliefs translate into actual teaching practices and what practices effectively support student learning in culturally diverse classrooms.

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Declarations

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Code availability/Software application We prepared and analyzed the data using the following software: Stata (Version 16, StataCorp, 2019), SPSS (Version 22, IBM Corp, 2013) and Mplus (Version 8.4; Muthén & Muthén, 1998–2019). Codes are available from the first author upon request.

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