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Are parents' and teachers' mindsets about abilities and failure related to children's mindsets and self-regulated learning?

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Abstract
Children's beliefs about abilities shape their learning. Although a growing body of research has examined whether parents' and teachers' beliefs are related to children's beliefs and learning, very few studies have considered parents, teachers, and children simultaneously. Moreover, existing studies present mixed findings. Addressing this gap can clarify whether parents' and teachers' beliefs relate differently to children's beliefs and learning. This study used structural equation modeling to analyze data from 757 children, their parents and teachers. Results showed that parents' mindsets about abilities predicted children's mindsets about abilities, while teachers' mindsets about abilities did not. However, children's perceptions of parents' and teachers' failure mindsets were linked to children's beliefs and self-regulated learning. Although these findings highlight that adults' beliefs relate differently to children's beliefs and learning, they underscore the importance of cultivating growth-oriented environments both at home and school, where failure is framed as a valuable opportunity for learning.

Keywords Mindsets about abilities · Failure mindset · Self-regulated learning · Parents · Teachers · Students

1 Introduction

The beliefs of parents and teachers are generally considered crucial in shaping children's beliefs and influencing their learning. For example, parents' beliefs about their child's potential are often passed down to their children (Friedel et al., 2007; Pomerantz et al., 2007). Similar patterns exist for teacher beliefs (Turner et al., 2009). One

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specific set of beliefs studied extensively in recent years is mindsets about abilities (also referred to as growth and fixed mindsets). Mindsets about abilities refer to subjective beliefs about the malleability of one's own abilities (Dweck, 2002) and are important determinants of cognition, motivation, and learning behavior (Burnette et al., 2013).

Despite extensive research on mindsets, associations between parents' and teachers' mindsets about abilities and those of primary school children have only been marginally explored (Laine & Tirri, 2023; Matthes & Stöger, 2022). The few existing studies demonstrate inconsistent findings for parents and children (Chen & Liu, 2023; Gunderson et al., 2013; Haimovitz & Dweck, 2016; Matthes & Stöger, 2018), and for teachers and students (MacDonnell Mesler et al., 2021; Park et al., 2016; Yu et al., 2022; Gutshall, 2016). Nevertheless, a recent meta-analysis by Fong et al. (2025), which examined studies assessing mindsets about abilities or intelligence, highlighted the relevance of socializers' mindsets by showing that teachers' and parents' mindsets are associated with students' mindsets. At the same time, the meta-analysis emphasized the scarcity of evidence at the primary-school level as it identified only one study that examined the associations between teachers' and students' mindsets in this age group.

To date, only one study has simultaneously examined mindsets about intelligence among primary school children, their teachers, and their parents (Kim et al., 2026). However, because this study relied on a single-item measure of participants' mindsets, the authors highlighted the need for more accurate assessments using multi-item measures. Their results indicated that both parents' and teachers' mindsets about intelligence predicted children's mindsets, although the association between students' and teachers' mindsets was generally weak. Based on this finding and given the differing relational dynamics experienced by children at home and school, such as differences in emotional closeness and frequency of interaction, it can be assumed that parents' and teachers' mindsets about abilities might be differently associated with children's beliefs.

Moreover, some studies suggest that teachers' and parents' growth mindsets are associated with children's learning behavior (Laine & Tirri, 2023; Matthes & Stöger, 2022). However, no studies to date have examined this relationship in the more specific context of self-regulated learning (SRL). SRL refers to an active, cyclical process in which learners set goals, monitor their progress, and regulate their motivation, cognition, and behavior in line with their objectives and the environmental context (Pintrich, 2000). This research gap is surprising, given that learners' own mindsets are strongly related to their SRL (Burnette et al., 2013). This raises the question of the extent to which children's SRL is related to teachers' and parents' mindsets about abilities, with children's mindsets about abilities acting as a mediator.

Haimovitz and Dweck (2016) suggest that adults' growth mindsets may not be directly observable by children. Instead, they propose that a related concept - failure mindset (i.e., whether failure is perceived as enhancing or debilitating) - may be more apparent in behavior. Research shows that adults' mindsets about abilities are related to their failure mindsets (Noskeau et al., 2021). Additionally, prior research has shown that children's perceptions of parents' failure mindsets are significantly related to parents' self-reported failure mindsets (Haimovitz & Dweck, 2016). There-

fore, in the present study, adults' failure mindsets were assessed based on children's perceptions of their parents' and teachers' failure mindsets. Moreover, Haimovitz and Dweck (2016) provide evidence that parents' failure mindsets are linked to children's mindsets about abilities, supporting a possible mediation. However, evidence regarding this mediation remains scarce, and existing research has focused solely on parents, leaving these associations regarding teachers unexamined. Hence, there is a clear need to investigate whether parents' and teachers' mindsets about abilities, mediated by children's perceptions of parents' and teachers' failure mindsets, are associated with children's beliefs and SRL.

Building upon previous research, the present study had four objectives. First, given that only very few studies have simultaneously involved teachers and parents, this study examined whether parents' and teachers' mindsets about abilities predicted children's mindsets about abilities. Second, while previous studies have considered the impact of adults' mindsets about abilities on children's learning behavior, studies on SRL are lacking. To address this research gap, the associations of teachers' and parents' mindsets about abilities with children's SRL, mediated by children's mindsets about abilities, were examined. Third, children's perceptions of adults' failure mindsets were investigated to explore whether parents' and teachers' mindsets about abilities are potentially mediated by children's perceptions of parents' and teachers' failure mindsets and subsequently related to children's mindsets about abilities. Finally, it was explored whether children's perceptions of parents' and teachers' failure mindsets were linked to children's SRL, mediated by children's mindsets about abilities.

1.1 Mindsets about abilities

Mindsets describe individuals' core beliefs about the nature and malleability of human abilities and traits. These beliefs, which are often held implicitly, vary among individuals and shape various aspects of their lives, including perceptions and behaviors (Ryan & Mercer, 2012). Most studies on mindsets refer to a concept introduced by Dweck (2002) which is based on mindsets about intelligence. Mindsets about intelligence are based on the assumption that one's own intelligence is either mainly fixed (fixed mindset) or malleable (growth mindset) (Dweck & Leggett, 1988). They have an important effect on academic outcomes, motivation and learning behavior (Blackwell et al., 2007; Costa & Faria, 2018). These mindsets are generally conceptualized as two opposite ends of a continuum (Lüftenegger & Chen, 2017); this implies that individuals holding a fixed mindset believe that intelligence is mostly fixed, while individuals holding a growth mindset assume that intelligence can be changed and enhanced (Dweck & Master, 2008). Therefore, individuals holding a fixed mindset are more likely to attribute difficulties to a lack of intelligence, leading to negative emotions, such as shame or helplessness (Smiley et al., 2016). Consequently, they may avoid challenges as they believe that neither increasing their effort nor using (additional) learning strategies can improve their abilities or outcomes (Dweck & Master, 2008). In contrast, individuals holding a growth mindset view challenges as opportunities for growth and attribute setbacks to insufficient effort or the need for alternative approaches (Blackwell et al., 2007). Thus, they experience fewer negative

emotions and are more likely to employ strategies such as trying new approaches or devoting more effort (Bråten & Olaussen, 1998). Individuals holding a growth mindset embrace challenges and demonstrate more resilience when they encounter difficulties, which can lead to increased achievement (Chen & Pajares, 2010).

While some studies on mindsets about intelligence focus on beliefs about the malleability of knowledge (MacDonnell Mesler et al., 2021), others examine beliefs about the malleability of abilities (Matthes & Stöger, 2018). In line with this distinction, Limeri et al. (2020) demonstrated that individuals defining intelligence as knowledge tend to agree more strongly with growth mindset items and less with fixed mindset items. In contrast, individuals associating intelligence with abilities displayed a broader range of responses across the fixed-to-growth mindset scale. Because of this greater variability, Limeri et al. (2020) suggest that the term 'abilities' offers more psychometric utility than 'intelligence'. Given these findings, the term 'abilities' was adopted in the present study.

1.2 Transmission of teachers' and parents' mindsets about abilities to children

Parents and teachers generally play a crucial role in shaping children's beliefs and learning (Fong et al., 2025). Parental education is the most fundamental and basic source of a child's learning because it represents the first educational experience in life (Hoover-Dempsey & Sandler, 1997). Children's emergent skills and beliefs are developed as parents familiarize them with daily learning and social opportunities (Fuertes et al., 2018). Children acquire beliefs and behaviors through observation, imitation or training within their families; therefore, parental beliefs and behavior have a profound impact on children's development (Hellmich & Hoya, 2017).

However, when looking at specific beliefs such as mindsets about abilities, evidence for a direct transmission from parents to children remains scarce and mixed. While two studies with small sample sizes found no evidence of direct transmission of parental mindsets to children (Gunderson et al., 2013; Haimovitz & Dweck, 2016), three more recent studies with larger sample sizes demonstrated evidence for direct transmission (Chen & Liu, 2023; Li et al., 2023; Matthes & Stöger, 2018). Not only differences in sample size but also methodological differences across these studies may partly explain these inconsistent findings. For instance, Li et al. (2023) assessed parents' mindsets through children's reports, whereas Chen and Liu (2023), Gunderson et al. (2013), and Haimovitz and Dweck (2016) measured parents' self-reported general mindsets. Matthes and Stöger (2018), in contrast, examined parents' child-specific mindsets. The differentiation between child-specific and general mindsets is important because parents may think differently about their own children than about children in general. This assumption is supported by research showing that parents' general and child-specific mindsets about the malleability of abilities do not completely overlap; they are, however, substantially related and show moderate to strong positive associations (Muenks et al., 2015). Additionally, Muenks et al. (2015) demonstrated that parents' child-specific fixedness beliefs proved to be a better predictor of their self-reported parenting behavior than their general beliefs.

Moreover, Matthes and Stöger (2018) emphasize that the findings on the direct transmission of mindsets about abilities from parents to children align with research

on the transmission of other parental beliefs such as educational aspirations (Jodl et al., 2001) or parents' and children's perceptions of the child's abilities (Frome & Eccles, 1998). Taken together, this study assessed parents' child-specific growth mindset.

Besides parents, teachers play a crucial role in children's learning given that children spend a large part of their day at school (Hattie, 2009). Several studies have revealed that teachers' beliefs are related to children's beliefs. For example, Muis and Foy (2010) demonstrated that teachers' beliefs about effort predicted children's beliefs about effort. Similarly, Siems-Muntoni et al. (2024) found that teachers' beliefs about their students' potential performance were related to students' beliefs about their competence. When examining the transmission of mindsets about abilities or intelligence from teacher to student, findings are mixed; while some studies suggest a direct transmission (Gutshall, 2016; MacDonnell Mesler et al., 2021), others found no such associations (Park et al., 2016; Yu et al., 2022). These inconsistent results might be due to multiple limitations of these studies, leading to concerns about the reliability of the data: Gutshall (2016) did not specify the age of the students, and their sample included only seven teachers. Similarly, although Yu et al. (2022) examined a large sample, the distribution of students per teacher was relatively limited, with only six students per class.

While earlier studies with small sample sizes found no evidence of direct transmission of parents' mindsets about abilities to children's mindsets about abilities (Gunderson et al., 2013; Haimovitz & Dweck, 2016), several more recent studies with larger samples have reported such associations (Chen & Liu, 2023; Kim et al., 2026; Li et al., 2023; Matthes & Stöger, 2018). Evidence regarding the association between teachers' mindsets about abilities and children's mindsets about abilities remains mixed: While three studies reported significant associations (Gutshall, 2016; Kim et al., 2026; MacDonnell Mesler et al., 2021), two others found no such relationship (Park et al., 2016; Yu et al., 2022). Nevertheless, a meta-analysis by Fong et al. (2025) found that both parent–student and teacher–student mindset associations were significant and similar in size. However, this meta-analysis included only one study examining the teacher–student association at the primary-school level (Fong et al., 2025). Kim et al. (2026), using a large sample including parents, teachers, and students, found that both parents' and teachers' mindsets predicted students' mindsets, although the prediction coefficients associated with teachers' mindsets were generally weaker. Taken together, previous research suggests that both parents' and teachers' mindsets about abilities may be associated with children's mindsets about abilities, although the teacher–child association may be weaker. Accordingly, the present study hypothesizes that parents' mindsets about abilities are associated with children's mindsets about abilities, and that teachers' mindsets about abilities are also associated with children's mindsets about abilities, albeit potentially weaker.

Given the limited number of studies simultaneously examining parents', teachers', and students' mindsets, further research is needed to clarify the associations between parents' and teachers' mindsets about abilities and children's mindsets about abilities.

1.3 Association of parents' and teachers' mindsets about abilities with children's mindsets about abilities and SRL

Several studies have examined the influence of mindsets on SRL among college or university students, with most reporting a positive association. For example, holding a growth mindset has been shown to be strongly associated with mastery goals (Hertel et al., 2024; Lee & Seo, 2019), less procrastination (Mouratidis et al., 2017), and more cognitive and metacognitive knowledge (Hertel & Karlen, 2021; Karlen & Compagnoni, 2017; Hertel et al., 2024). These findings align with a meta-analysis conducted by Burnette et al. (2013) which indicated that individuals holding a growth mindset are more likely to apply efficient learning strategies, set goals, and self-monitor their learning, showing a higher level of metacognitive engagement.

Although the impact of mindsets on SRL is well documented among older learners, there is only limited research investigating this relationship in primary school students (Matthes & Stöger, 2021). However, exploring this association in younger learners is particularly important because this is a critical period during which children develop cognitive and metacognitive skills and attitudes (e.g., mindsets) toward learning (Dignath & Büttner, 2008). The few studies that have focused on primary school children confirm the association between mindsets and SRL observed in older learners: Matthes and Stöger (2021) found that primary school students' mindsets about abilities predicted their self-reported use of metacognitive strategies (but not cognitive strategies). Stipek and Gralinski (1996) and Law (2009) reported that primary school students with a stronger tendency toward a growth mindset scored higher on self-reports of their use of metacognitive and cognitive strategies.

While these studies explored the association of children's mindsets and their SRL, less is known about whether parents' and teachers' mindsets about abilities relate to children's SRL, mediated by children's mindsets about abilities. This is surprising given the evidence suggesting that parents' and teachers' mindsets can shape children's learning behaviors. For example, children with parents who hold a growth mindset display more learning and solution-oriented behavior than helpless behavior (Đurović et al., 2019), less helplessness when failures occur (Jose & Bellamy, 2012), and a preference for challenging tasks (Pomerantz & Dong, 2006). When considering SRL specifically, Stern and Hertel (2020) reported that parents holding a fixed mindset rated their children's self-regulatory abilities lower than parents who endorsed a growth mindset. However, to date no studies have investigated whether parents' mindsets about abilities are related to children's SRL, possibly mediated by children's own mindsets about abilities.

Regarding teachers, there are numerous studies that have investigated the influence of teachers' beliefs on their pedagogical behavior (Backers et al., 2024; Hamilton, 2006; Rattan et al., 2012). However, only a few studies have explored the relationship between teachers' mindsets and their students' learning behavior. For example, Bostwick et al. (2020) found that students in the classroom of a teacher holding a growth mindset exhibited more adaptive learning engagement, such as improved task management, than students in classrooms with teachers holding a fixed mindset. However, the relationship between teachers' mindsets about abilities and their students' SRL has not yet been investigated. This is noteworthy because the literature suggests

that teachers holding a growth mindset are more convinced that learners can improve their SRL (Karlen et al., 2020, 2023). Therefore, an association between teachers' mindsets about abilities and students' SRL, mediated by the student's own mindsets about abilities, is likely, given that several studies have demonstrated that teachers' expectations shape students' learning behavior and achievement (Wang et al., 2018).

In summary, prior research has shown that children's own mindsets about abilities are related to their SRL (Law, 2009; Matthes & Stöger, 2021). Moreover, there is evidence that parents' and teachers' mindsets are related to children's learning behavior (e.g., Bostwick et al., 2020; Đurović et al., 2019). This is also relevant for SRL, as from a social cognitive perspective, self-regulatory skills develop through social processes such as observation, imitation, and modeling (Bandura, 1986; Schunk & Zimmerman, 1997; Zimmerman, 2000). During these social interactions, parents and teachers communicate their beliefs about the malleability of abilities through the ways they support learning or respond to difficulties, thereby shaping children's mindsets and learning. Accordingly, parents' and teachers' mindsets about abilities can also be expected to be relevant for children's SRL. However, to date, this relationship has not been explicitly investigated.

1.4 Failure mindset as a mediator between parents' and teachers' mindsets about abilities and children's mindsets about abilities and SRL

Haimovitz and Dweck (2016) proposed that mindsets about abilities may not be clearly manifested in behavior or verbal expressions. Instead, an individual's view on failure (failure mindset) might be more observable, particularly in response to setbacks. The concept of failure mindset refers to the belief that failure is either debilitating or enhancing (Haimovitz & Dweck, 2016). Failure mindsets are closely linked to mindsets about abilities; individuals who endorse a growth mindset view setbacks as valuable opportunities for learning (Smiley et al., 2016; Tao et al., 2022a). In contrast, individuals with a fixed mindset view failures as threats, as they interpret failure as an indication of a stable (ability) deficit and associate the necessity for effort with low ability (Martin et al., 2001; Tempelaar et al., 2015). Similarly, Noskeau et al. (2021) found that believing that abilities are malleable leads to less fear of failure. Consistent with these findings, longitudinal data from Tao et al. (2022b) demonstrated that students' growth mindsets predicted their failure mindsets over time.

Although the link between individuals' mindsets about abilities and failure mindsets is well supported, relatively little research has explored whether children's perceptions of parents' and teachers' failure mindsets relate to children's mindsets about abilities, despite their central role in a child's development. Prior research has shown that children's perceptions of parents' and teachers' failure mindsets are associated with adults' self-reported failure mindsets and are meaningfully related to children's own beliefs (Haimovitz & Dweck, 2016). To date, only a small number of studies have explored the association between parents' failure mindsets (perceived by children) and children's mindsets about abilities, providing initial evidence for this transmission (Haimovitz & Dweck, 2016; Tao et al., 2022a). Notably, even less is known about whether teachers' failure mindsets similarly shape students' mindsets about abilities. Preliminary evidence suggests that teachers' failure mindsets can affect stu-

dents. For example, Muenks and Yan (2022) demonstrated that students of teachers who viewed failure as debilitating reported less perceived learning and described their classroom environment more negatively. Although this study did not explicitly address the relationship between teachers' failure mindsets and students' mindsets about abilities, it highlighted that teachers' failure mindsets are related to how students perceive learning. Hence, through feedback, explanations, emotional reactions, and classroom norms, teachers communicate explicitly and implicitly whether failure should be interpreted as evidence of limited ability or as an opportunity for learning. From a social cognitive perspective, such messages and social interactions can shape children's learning and beliefs over time (Bandura, 1986; Dweck, 2002). Consequently, it is plausible to assume that students' perceptions of teachers' failure mindsets are associated with students' mindsets about abilities, similar to findings from studies focusing on parents.

Beyond mindsets about abilities, failure mindsets are also related to learning behavior. For instance, individuals with a failure-is-enhancing mindset showed more persistence and challenge-seeking than individuals who viewed failure as debilitating (Burnette et al., 2013). However, whether failure mindsets are associated with other learning behaviors, such as SRL, remains largely unexplored. Ford et al. (2023) provided some initial insights: elementary students with a failure-is-enhancing mindset reported more frequently that SRL raised their confidence in their abilities, compared to students with a failure-is-debilitating mindset. However, the role of children's perceptions of parents' and teachers' failure mindsets in shaping children's SRL remains mostly unstudied (Matthes & Stöger, 2022; Siems-Muntoni et al., 2024).

Taken together, these findings imply that adults' mindsets about abilities are related to their failure mindsets (Smiley et al., 2016; Tao et al., 2022a), which in turn may be linked to children's mindsets about abilities, suggesting that children's perceptions of parents' and teachers' failure mindsets could act as a potential mediator. However, such a mediation model has not yet been tested. Moreover, no research has directly examined whether children's perceptions of their parents' and teachers' failure mindsets are associated with children's SRL, despite evidence that adults' beliefs are linked to children's learning-related beliefs and learning behavior (e.g., Bostwick et al., 2020; Đurović et al., 2019). Together, this highlights the need to investigate whether children's perceptions of parents' and teachers' failure mindsets may be indirectly associated with children's SRL through children's mindsets about abilities.

1.5 The present study

This study aimed to extend prior knowledge by investigating whether parents' and teachers' mindsets about abilities and children's perceptions of their failure mindsets are associated with children's mindsets about abilities and SRL. Accordingly, four research questions (RQ) were addressed. First, although some studies have examined the relationship between parents' and teachers' mindsets about abilities and children's mindsets about abilities, the findings are mixed. Moreover, only very few studies have simultaneously considered parents and teachers, despite both being important agents on the educational path of a child. Second, this study investigated whether parents' and teachers' mindsets about abilities were indirectly associated with children's

SRL, with children's own mindsets about abilities as a potential mediator. Third, a potential mediation pathway was explored, in which adults' mindsets about abilities were linked to children's perceptions of parents' and teachers' failure mindsets, which were in turn related to children's mindsets about abilities. Fourth, while previous research has emphasized the importance of children's mindsets about abilities for their SRL, this study is the first to examine whether parents' and teachers' mindsets about abilities, mediated by children's perceptions of parents' and teachers' failure mindsets, affect children's SRL through children's mindsets about abilities.

The present study explored the following questions and hypotheses:

1. To what extent do parents' and teachers' mindsets about abilities predict children's mindsets about abilities?

Hypothesis 1 *Parents' and teachers' mindsets about abilities predict children's mindsets about abilities (Chen & Liu, 2023; Matthes & Stöger, 2018). However, the association between teachers' and children's mindsets about abilities is weaker than the association between parents' and children's mindsets about abilities (Kim et al., 2026).*

2. To what extent do parents' and teachers' mindsets about abilities predict children's SRL, mediated by children's mindsets about abilities?

Hypothesis 2 *Parents' and teachers' mindsets about abilities are related to children's SRL, with children's own mindsets about abilities as a mediator (Bostwick et al., 2020; Đurović et al., 2019).*

3. To what extent do parents' and teachers' mindsets about abilities, mediated by children's perceptions of parents' and teachers' failure mindsets, predict children's mindsets about abilities?

Hypothesis 3 *Current findings (Smiley et al., 2016; Tao et al., 2022a) support the assumption that parents' and teachers' mindsets about abilities are related to their failure mindsets, which in turn are associated with children's mindsets about abilities, suggesting a mediating pathway from adults' mindsets about abilities to children's mindsets about abilities via children's perceptions of parents' and teachers' failure mindsets.*

4. To what extent do parents' and teachers' mindsets about abilities, mediated by children's perceptions of parents' and teachers' failure mindsets, predict children's mindsets about abilities, and to what extent do these perceived failure mindsets, mediated by children's mindsets about abilities, predict children's SRL?

Hypothesis 4 *Parents' and teachers' growth mindsets, expressed in supportive behavior regarding failure, are associated with children's mindsets about abilities and, subsequently, with children's SRL (Bostwick et al., 2020; Đurović et al., 2019; Haimovitz & Dweck, 2016). By observing adults who view setbacks as learning opportunities, children are more likely to hold a growth mindset themselves. As a result, children holding a growth mindset engage more frequently in SRL activities, such as goal setting, strategy use or self-monitoring (Ford et al., 2023; Law, 2009).*

2 Method

2.1 Participants

Participants were 757 5th and 6th graders (5th grade: $n=502$, 66.3%), one of their parents ($N=706$; 76.3% mother, 21.8% father, 1.9% not indicated), and their teachers ($N=40$). All children attended public schools in the German-speaking part of Switzerland. On average, students were 11.29 years old ($SD=0.71$). The gender distribution was equal (51.9% girls). Most children (75.2%) spoke German as their first language. Among the 706 parents who returned the questionnaire (response rate: 93.3%), 77.7% were female. Of the 40 teachers, 75.2% were female. Teachers had an average teaching experience of 22.30 years ($SD=12.22$) and worked, on average, at 92% ($SD=11.78$) of a full-time position. Students in Swiss primary schools typically have one main class teacher. Accordingly, children were instructed to complete the questionnaire with reference to their main teacher, and teachers were asked to respond with regard to the corresponding class. To enable data matching across participants, each student was assigned a class code and an individual identification code, allowing student data to be linked with the corresponding teacher and parent data.

Data was collected in September 2021 by staff trained by the project team. Parents received the questionnaire through their child, completed it at home, and returned it through their child to the teacher in a sealed envelope. Missing data ranged from 2.6% to 4.4% for children, up to 2.5% for teachers, and 0.3% to 2.4% for parents. The data was missing at random (Little, 1988).

2.2 Measurements

2.2.1 Mindsets about abilities

2.2.1.1 Children To assess children's mindsets about abilities, a scale from Matthes and Stöger (2018) was used. This six-item scale refers to children's beliefs about the malleability of their general academic abilities (e.g., "What I am capable of in school is not fixed. I can learn new things and expand my abilities."). A four-point Likert-type response scale was applied (*1 = strongly disagree*, *2 = disagree*, *3 = agree*,

4 = strongly agree). The scale showed acceptable internal consistency (ordinal Cronbach's alpha = 0.72).

2.2.1.2 Parents Parents' mindsets about abilities were assessed using the same scale developed by Matthes and Stöger (2018), adapted to measure parents' beliefs about the malleability of their child's general academic abilities (e.g., "What my child is capable of is not fixed. He or she can learn new things and expand his or her abilities."). The same four-point Likert-type response scale was used as for the children's scale. Internal consistency for the scale was acceptable (ordinal Cronbach's alpha = 0.76).

2.2.1.3 Teachers The same scale developed by Matthes and Stöger (2018) was used to assess teachers' mindsets about abilities. The items were slightly reformulated to fit the context of a teacher (e.g., "What my students are capable of in school is not fixed. They can learn new things and expand their abilities"). Cronbach's alpha for the scale was acceptable (ordinal Cronbach's alpha = 0.73).

2.2.2 Perceived failure mindset

2.2.2.1 Parents Children's perceptions of their parents' failure mindsets were assessed using a four-item scale originally developed by Haimovitz and Dweck (2016), translated into German by Stern and Hertel (2020). A sample item is "My parents think failure can help me learn.". A four-point Likert-type response scale was applied (*1 = strongly disagree*, *2 = disagree*, *3 = agree*, *4 = strongly agree*). Cronbach's alpha for ordinal data was at the limit of acceptability with a value of 0.65.

2.2.2.2 Teachers Children's perceptions of their teachers' failure mindsets were assessed with the same four-item scale (Haimovitz & Dweck, 2016; Stern & Hertel, 2020), adapted to the teacher context (e.g., "My teacher thinks failure can help me learn."). The same four-point Likert-type response scale was used as for the parent version. Cronbach's alpha for ordinal data of the scale was acceptable with a value of 0.76.

2.2.3 Self-regulated learning

Children's SRL was measured with a 24-item questionnaire (Schuler et al., 2024). This instrument consists of eight first-order scales, each containing three items, which were conceptualized as a second-order SRL factor. The scales assess eight components of SRL, which include self-assessment, goal setting, time planning, strategy planning, strategy implementation, strategy monitoring, strategy adjustment, and outcome evaluation. Responses were given on a four-point Likert-type response

scale (*1 = strongly disagree*, *2 = disagree*, *3 = agree*, *4 = strongly agree*). Higher values indicate a higher amount of self-reported SRL activities. However, it should be noted that this instrument does not assess SRL competences. Overall internal consistency of the scale was good (Cronbach's alpha = 0.88).

2.2.4 Control variable

There are ambiguous findings regarding the factors (e.g., age, teaching experience) that shape teachers' mindsets about abilities (Bostwick et al., 2022; Matteucci et al., 2017). In view of this inconsistency, no control variables were included for teachers. In contrast, for parents, several studies suggest that mindsets about abilities are related to parental educational level (Jiang et al., 2019; Muenks et al., 2015; Pomerantz & Dong, 2006). Therefore, parents' education level was used as a control variable. Given the mostly uniform level of education among teachers, the variable was only used for parents.

Parents selected their highest level of education completed from the following options: 'none', 'compulsory school', 'vocational apprenticeship', 'vocational baccalaureate', 'baccalaureate', 'higher specialized education' (e.g., federal diploma), and 'university of applied sciences'/'university'. For the analysis, the responses were categorized into 'low' (no education, compulsory school, vocational apprenticeship), 'medium' (vocational baccalaureate, baccalaureate, higher specialized education), and 'high' (university of applied sciences/university). The distribution across the three categories was 31.6% ($n = 223$) for low, 29.6% ($n = 209$) for medium, and 38.4% ($n = 271$) for high, with three missing responses (0.4%). For the analyses, the three categories were recoded into two dummy variables, with 'medium' serving as the reference category.

2.3 Statistical analyses

Given that the data comprised students nested within classes, intra-class correlation coefficients (ICC) were analyzed to determine whether within-class similarity needed to be considered. In the present study, ICC values ranged between 0.03 and 0.08, which can be considered small to medium (LeBreton & Senter, 2007). To control for the nested structure of the data, "type = complex" option in Mplus was used during the analyses. All analyses were conducted with the software 'Mplus 8.11' (Muthén & Muthén, 2017).

To examine the association of parents' and teachers' beliefs (mindsets about abilities and perceived failure mindset) with children's mindsets about abilities and SRL, structural equation models (SEM) were conducted. Before conducting these SEM, all underlying measurement models were tested individually (Table 1). Mindsets about abilities and perceived failure mindsets were modeled as latent variables to explicitly model measurement errors. As an estimator for ordinal data, the WLSMV (robust weighted least squares estimator) was used (Byrne, 2012).

Due to the complexity of the SEM when involving SRL, a first-order measurement model comprising the eight subscales was conducted. The factor scores of these eight first-order factors were subsequently used as indicators for a general SRL latent fac-

Table 1 Model Fits of the Underlying Measurement Models

	χ2 value (df)	CFI	TLI	RMSEA	SRMR
Children's mindsets about abilities	21.422* (8)	0.982	0.966	0.048	0.025
Parents' mindsets about abilities	38.986** (8)	0.966	0.937	0.074	0.034
Teachers' mindsets about abilities	5.329 (8)	1.000	1.000	0.000	0.064
Perceived parental failure mindsets	0.493 (1)	1.000	1.000	0.000	0.003
Perceived teacher failure mindsets	0.073 (1)	1.000	1.000	0.000	0.001
SRL children	523.205** (201)	0.960	0.954	0.047	0.043

df = degrees of freedom. CFI = Comparative fit index. TLI = Tucker–Lewis index. RMSEA = root mean square error of approximation. SRMR = root mean square residual. SRL = self-regulated learning

tor, thereby reducing the complexity of the measurement model for the subsequent analyses (Schuler et al., 2024). Although factor scores do not explicitly account for measurement errors, they indirectly control for them by assigning greater weight to items with lower measurement errors, thus partially controlling for measurement errors (Gagné et al., 2020).

The model fit of the SEM was evaluated using commonly applied reference values: the Satorra–Bentler scaled chi-square test (Satorra & Bentler, 2010), the comparative fit index (CFI), the Tucker–Lewis index (TLI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR). CFI/TLI ≥ 0.95 and RMSEA ≤ 0.06 and SRMR ≤ 0.08 were used as a benchmark, indicating a good model fit (Hu & Bentler, 1999). CFI/TLI values ≥ 0.90 and RMSEA values ≤ 0.08 were interpreted as acceptable (Bentler, 1992; Byrne, 2012; MacCallum et al., 1996). As a significance level for the analyses, $p < .05$ was used.

To examine the association of parents' and teachers' mindsets about abilities with children's mindsets about abilities, parents' and teachers' mindsets about abilities were used in the same model to predict children's mindsets about abilities (RQ 1). In a next step, children's SRL was added (RQ 2). To test research questions 3 and 4, children's perceptions of parents' and teachers' failure mindsets were added simultaneously. However, this model did not converge. Therefore, to reduce the complexity of the model, two separate models were calculated, one combining children's and parents' data, and another combining children's and teachers' data. Moreover, indirect effects were calculated using bias-corrected bootstrapping with 10,000 bootstrap samples (Hayes, 2017). Namely, the indirect effect of parents' and teachers' mindsets about abilities via children's mindsets about abilities on children's SRL was analyzed. Additionally, the indirect effect of parents' and teachers' mindsets about abilities via children's perceptions of their failure mindsets on children's mindsets about abilities was examined, and finally, the indirect effect of children's perceptions of parents' and teachers' failure mindsets via children's mindsets about abilities on children's SRL. All analyses controlled for parental education level. Furthermore, inverted items within a scale were allowed to correlate. Figure 1 presents an overview of all calculated models.

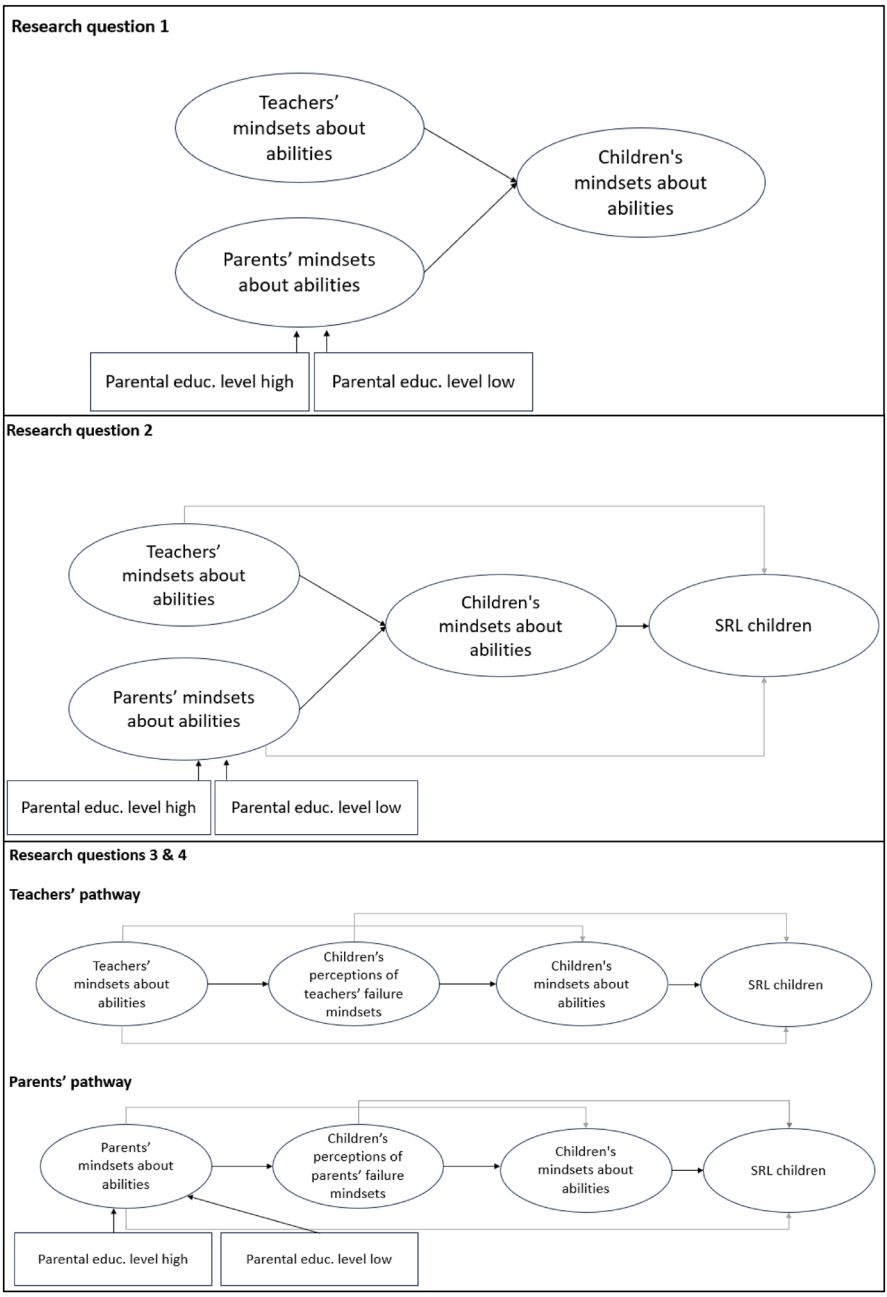

Fig. 1 Proposed models for all hypotheses. Parental educ. level = parental educational level. SRL = self-regulated learning. Latent variables are represented with ovals, manifest variables with rectangles

3 Results

3.1 Descriptive statistics

Table 2 shows an overview of the means, standard deviations, and correlations for parents', teachers', and children's mindsets about abilities, children's SRL, children's perceptions of parents' and teachers' failure mindsets, and the control variable (parental educational level). Children's mindsets about abilities were positively correlated with their SRL. Furthermore, parents' mindsets about abilities correlated positively with children's mindsets about abilities, whereas teachers' mindsets about abilities did not correlate with students' mindsets about abilities. Parents' and teachers' failure mindsets perceived by children correlated positively with children's mindsets about abilities. Children's perceptions of parents' and teachers' failure mindsets correlated significantly. Parental educational level was significantly related to their own mindsets about abilities: parents with higher levels of education were more likely to hold a growth mindset, whereas parents with lower education levels tended to endorse a fixed mindset.

Table 2 Means, Standard Deviations, and Zero-Order Correlations of the Variables

	N	M/%	SD	1	2	3	4	5	6	7
1. Children's mindsets about abilities	731	3.33	0.43	-						
2. Parents' mindsets about abilities	706	3.41	0.38	0.27**	-					
3. Teachers' mindsets about abilities	40	3.40	0.35	0.03	0.05	-				
4. Children's perceptions of parents' failure mindsets	735	3.13	0.61	0.24**	0.11**	0.07	-			
5. Children's perceptions of teachers' failure mindsets	731	3.10	0.61	0.25**	0.11**	0.06	0.57**	-		
6. SRL children	736	3.05	0.45	0.32**	0.08*	−0.01	0.04	0.09*	-	
7. Parental Education (low)	703	32%	-	−0.12**	−0.20**	−0.01	−0.02	−0.03	0.08*	-
8. Parental Education (high)	703	39%	-	0.11**	0.21**	0.01	0.09*	0.09*	−0.08*	−0.54**

SRL = self-regulated learning. SRL was calculated with manifest values. For parental education (dichotomous variable), the percentages of the specified category are reported in the column *M*/%. ** $p < .01$, * $p < .05$. Pearson correlation coefficients were used to calculate correlations between ordinal variables, while point-biserial correlation coefficients were used for correlations between ordinal and dichotomous variables

3.2 Association of parents' and teachers' mindsets about abilities with children's mindsets about abilities (RQ 1)

The SEM corresponding to hypothesis 1 demonstrated acceptable fit indices ($\chi^2(164)=231.44$, $p<.01$, CFI = 0.93, TLI = 0.92, RMSEA = 0.02, SRMR = 0.06). Parents' mindsets about abilities were a significant predictor of children's mindsets about abilities (Fig. 2). Teachers' mindsets about abilities did not significantly predict children's mindsets about abilities. Consistent with the zero-order correlations, the SEM showed that parental educational level significantly predicted parents' mindsets about abilities.

3.3 Association of parents' and teachers' mindsets about abilities with children's SRL (RQ 2)

The SEM for hypothesis 2 showed good fit indices ($\chi^2(341)=438.49$, $p<.01$, CFI = 0.97, TLI = 0.97, RMSEA = 0.02, SRMR = 0.06). Again, parental mindsets about abilities predicted children's mindsets about abilities, while teachers' mindsets about abilities did not (Fig. 3). A small negative direct effect was observed from parental mindsets about abilities to children's SRL, while the direct path from teachers' mindsets about abilities to children's SRL was non-significant. Children's mindsets about abilities were strongly related to their SRL. Additionally, parents' mindsets about abilities had a significant indirect effect (i.e.) on children's SRL through children's mindsets about abilities (i.e. = 0.23; 95% CI: [0.17, 0.32]). The indirect effect of teachers' mindsets about abilities on children's SRL was not significant (i.e. = 0.05; 95% CI: [−0.03, 0.11]).

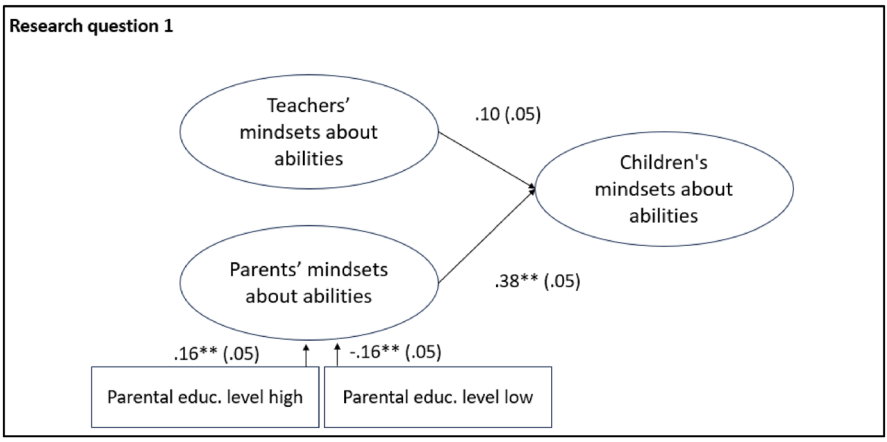

Fig. 2 Structural equation model for research question 1. Standardized coefficients are presented. Standard errors are in parentheses. *$p < 0.05$, **$p < 0.01$

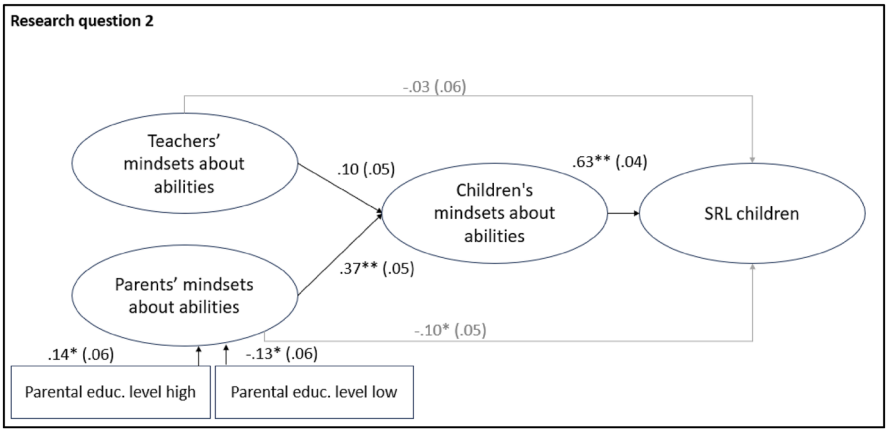

Fig. 3 Structural equation model for research question 2. Standardized coefficients are presented. Standard errors are in parentheses. *$p < 0.05$, **$p < 0.01$

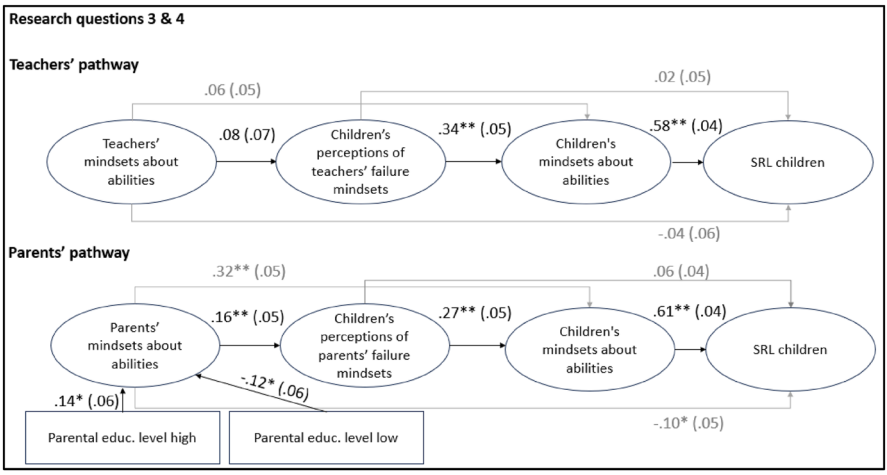

Fig. 4 Structural equation model for research questions 3 and 4. Standardized coefficients are presented. Standard errors are in parentheses. *$p < 0.05$, **$p < 0.01$

3.4 Association of parents' and teachers' mindsets about abilities, mediated by failure mindset, with children's mindsets about abilities and their SRL (RQ 3 and 4)

The analyses addressing research questions 3 and 4 were conducted separately for parents and teachers alongside children. The model fits for the two SEM (Fig. 4) were acceptable for parents and children ($\chi^2(289) = 539.26$, $p < .01$, CFI = 0.93, TLI = 0.92, RMSEA = 0.04, SRMR = 0.07), and teachers and students ($\chi^2(243) = 463.98$, $p < .01$, CFI = 0.94, TLI = 0.94, RMSEA = 0.04, SRMR = 0.06).

Parents' mindsets about abilities predicted children's perceptions of parents' failure mindsets. Moreover, children's perceptions of parents' failure mindsets were associated with children's mindsets about abilities. Additionally, parents' mindsets about abilities predicted children's mindsets about abilities directly as well as indirectly (via children's perceptions of parents' failure mindsets) (i.e. = 0.04; 95% CI: [0.01, 0.08]).

Teachers' mindsets about abilities did not predict children's perceptions of teachers' failure mindsets. However, children's perceptions of teachers' failure mindsets predicted children's mindsets about abilities. Teachers' mindsets about abilities neither predicted children's mindsets about abilities directly nor indirectly (via children's perceptions of teachers' failure mindsets) (i.e. = 0.02; 95% CI: [−0.04, 0.07]).

Children's mindsets about abilities were a significant predictor of their SRL, both in the model with parents and with teachers. Parents' mindsets about abilities were a weak, significant negative direct predictor of children's SRL. Neither children's perceptions of parents' failure mindsets nor children's perceptions of teachers' failure mindsets directly predicted children's SRL. However, there was an indirect effect of children's perceptions of parents' failure mindsets via children's mindsets about abilities on children's SRL (i.e. = 0.16; 95% CI: [0.07, 0.24]). A similar effect was found for children's perceptions of teachers' failure mindsets via children's mindsets about abilities on children's SRL (i.e. = 0.20; 95% CI: [0.14, 0.28]).

4 Discussion

This study provided new insights into how parents' and teachers' beliefs are related to children's mindsets about abilities and SRL. Parents' mindsets about abilities predicted children's mindsets about abilities, whereas teachers' mindsets about abilities did not. Furthermore, parents' mindsets about abilities were positively related to children's SRL via children's mindsets about abilities, whereas teachers' mindsets about abilities showed no direct or indirect association with children's SRL. This finding is noteworthy, as it highlights that parents' and teachers' mindsets about abilities relate differently to children's mindsets and SRL.

Moreover, this study emphasized the relevance of children's perceptions of parents' and teachers' failure mindsets, as these perceptions were related to children's mindsets about abilities. In addition, there was an indirect effect of these perceived failure mindsets on children's SRL via children's mindsets about abilities. Importantly, these results suggest that children's perceptions of both parents' and teachers' failure mindsets are not only relevant to children's own mindsets about abilities, but also indirectly to their SRL.

4.1 To what extent do parents' and teachers' mindsets about abilities predict children's mindsets about abilities?

Consistent with previous studies, parents' growth mindsets significantly and positively predicted children's growth mindsets (Chen & Liu, 2023; Matthes & Stöger, 2018). In contrast to parents, teachers' mindsets about abilities did not predict chil-

dren's mindsets about abilities. This difference may be explained by the context and frequency of interactions. Children typically spend more time in close contact with parents, observing (non)-verbal behavior in a broader range of situations, including day-to-day setbacks or parental learning support (Chen & Liu, 2023). This close relationship may allow children to better perceive parents' mindsets than teachers' mindsets (Matthes & Stöger, 2018). Moreover, Muenks et al. (2024) highlighted that teachers' beliefs do not always guide their pedagogical practices; this could also explain why teachers' mindsets about abilities did not predict children's mindsets about abilities as children were not able to observe explicit teacher behavior related to growth mindset.

4.2 To what extent do parents' and teachers' mindsets about abilities predict children's SRL, mediated by children's mindsets about abilities?

While teachers' mindsets about abilities did not relate either directly or indirectly (via children's mindsets about abilities) to children's SRL, parents' growth mindset had a weak, negative direct effect and a positive indirect effect on children's SRL. This unexpected result suggests a more complex association between parental beliefs and children's SRL: the positive indirect pathway through children's mindsets about abilities indicates that when children internalize their parents' growth mindset, they indeed engage in more (self-reported) SRL. This aligns with previous research underlining the importance of children's mindsets about abilities to their SRL (Matthes & Stöger, 2021).

The unexpected negative direct effect of parents' growth mindset on children's SRL should be interpreted with caution, as the effect was weak and may have reached statistical significance partly due to the relatively large sample size. Additional caution is warranted because SRL was assessed through children's self-reports, which allowed an assessment of several SRL components across a large sample but did not capture the effectiveness or adaptiveness of the strategies used. Moreover, more frequent use of SRL strategies is not necessarily associated with higher achievement if these strategies are used inefficiently (Wirth & Leutner, 2008). Hence, parents with a growth mindset (associated with higher parental educational level) may foster environments where children engage in fewer, but more effective SRL activities. However, this interpretation remains speculative, as the present data do not allow conclusions about the quality of children's strategy use.

An alternative, complementary explanation relates to the specific behaviors parents encourage. Research suggests that parents who endorse growth-oriented beliefs often emphasize persistence and effort in the face of difficulty (Song et al., 2022). When such encouragement is not accompanied by concrete guidance on how to improve learning, it may fail to promote the use of SRL strategies (Amemiya & Wang, 2018).

4.3 To what extent do parents' and teachers' mindsets about abilities, mediated by children's perceptions of parents' and teachers' failure mindsets, predict children's mindsets about abilities?

Parents' mindsets about abilities predicted children's mindsets about abilities via children's perceptions of parental failure mindset. Also, children's perceptions of teachers' failure mindsets were significantly linked to children's mindsets about abilities: Children who perceived their teachers as viewing failure as a learning opportunity were more likely to hold a growth mindset.

Unlike those of parents, teachers' mindsets about abilities did not predict their failure mindsets (perceived by children). One important consideration is that this study measured children's perceptions of parents' and teachers' failure mindsets, rather than parents' or teachers' self-reported failure mindsets. This emphasis on the children's perspective may explain why teachers' self-reported mindsets about abilities did not show a significant association with their perceived failure mindsets compared to parents. Children are more likely to interact with parents across a variety of informal settings, where they might notice more nuanced cues about how their parents react to setbacks compared to their teachers.

This highlights differences in how adults' beliefs predict children's mindsets about abilities: whereas parents' mindsets about abilities predicted children's mindsets about abilities directly and indirectly (via parents' failure mindsets), teachers' mindsets about abilities appear to be less visible to children. Ultimately, parents' mindsets about abilities as well as children's perceptions of their failure mindsets were relevant predictors of children's mindsets about abilities, thereby challenging Haimovitz and Dweck's (2016) finding that parents' mindsets about abilities are not related to children's mindsets.

4.4 To what extent do children's perceptions of parents' and teachers' failure mindsets predict children's SRL via children's mindsets about abilities?

Neither parents' nor teachers' failure mindsets, as perceived by children, predicted children's SRL directly. However, children's perceptions of parents' and teachers' failure mindsets were indirectly related to children's SRL through children's mindsets about abilities. This underscores the importance of children's mindsets about abilities for their SRL (Burnette et al., 2013) and demonstrates that while adults' failure mindsets might not directly affect children's SRL, they can indirectly relate to children's SRL. This suggests that when children internalize adults' failure beliefs, these beliefs can be linked to children's SRL. Conversely, if adults' failure beliefs remain uninternalized or fail to manifest in adults' behavior, they may not be directly associated with children's SRL.

4.5 Limitations and future directions

Although this study offers valuable insights into the association of parents' and teachers' beliefs with children's beliefs and SRL, several limitations should be acknowledged. The first major limitation is the cross-sectional design, which restricts causal

interpretation — an issue which is especially relevant when examining mediation models (Maxwell & Cole, 2007). At the same time, the present study advances previous research by being one of few studies to investigate these associations while bringing together parents', teachers', and children's mindsets. Thus, although causal conclusions cannot be drawn, the study provides an important foundation for future research. Future longitudinal or experimental studies involving parents, teachers, and children could build on these findings and provide deeper insights into how parents' and teachers' mindsets shape children's mindsets about abilities over time.

A second limitation is that the data is mostly based on self-reports. Even though well-established instruments were used, the findings should be interpreted with caution due to potential social desirability biases or inaccuracies in self-perception (Schellings & Van Hout-Wolters, 2011). Moreover, the potential discrepancies between self-reported beliefs and actual behaviors (Muenks et al., 2024) underscore the necessity for additional measures, such as observational data. However, observational methods present other disadvantages as they are time-consuming and may not consistently capture behaviors across different settings or times (Dowdy et al., 2013).

Third, this study examined teachers', parents', and children's beliefs about the malleability of abilities in general. Nonetheless, individuals may hold a growth mindset for one attribute or domain (e.g., SRL) but a fixed mindset for another (e.g., intelligence) (Dweck & Molden, 2017). Although mindsets can correlate across domains, they are generally considered independent constructs (Jonsson et al., 2012; Haimovitz & Dweck, 2016).

Fourth, the present study measured mindsets about abilities on a bipolar continuum. This approach has been debated, given that studies have repeatedly failed to demonstrate the strong negative correlation anticipated between growth and fixed mindset (Lüftenegger & Chen, 2017).

Fifth, the mindsets about abilities scales for parents and teachers assessed their beliefs about whether they view their children's or students' abilities as malleable or fixed. In contrast, Dweck's widely used scale (Hong et al., 1999) measures individuals' beliefs about the general malleability or fixedness of intelligence. Nevertheless, mindsets are considered as fundamental beliefs that shape a broader system of related beliefs (Molden & Dweck, 2006). Therefore, individuals' mindsets are likely to be consistent with their beliefs about their own abilities and those of others. This assumption is supported by Muenks et al. (2015), who found a substantial correlation between parents' general mindsets about malleability and their beliefs about the malleability of their child's abilities. However, for teachers in particular, mindsets about abilities were assessed at a general classroom level rather than with reference to individual students. This more generalized assessment may have been less closely related to individual students' mindsets, potentially contributing to the lack of a direct association. Given that general and child-specific mindsets may capture partially distinct aspects of beliefs, future research might benefit from comparing these measurement approaches to further clarify their particular roles.

Finally, this study only controlled for parental educational level; other potential control variables were not included due to a lack of conclusive evidence regarding their influence.

Future research could build on the findings of this study by exploring in greater depth the differing associations of teachers' and parents' beliefs with children's beliefs and learning. For instance, observational studies could provide more detailed insights into how adults' beliefs are communicated and expressed in their behavior when interacting with children. In particular, the discrepancy between the direct and indirect effects of parental mindsets about abilities on children's SRL highlights the need to better understand how parental beliefs are communicated and interpreted by children. Additionally, it would be beneficial to assess mindsets about abilities in more domain-specific contexts, as mindsets often vary across different areas (Hertel & Karlen, 2021). Future studies may also benefit from using separate scales to assess fixed mindset and growth mindset. This could provide more precise insights into the distinct dimensions of these beliefs (Scherer & Campos, 2022). Finally, exploring the association of the mindsets of parents, teachers, and peers could provide valuable insights, given the influence of peers' beliefs on children's mindsets about abilities (King, 2019).

5 Conclusion and practical implications

This study offers new insights into how children's SRL and their mindsets about abilities are related to parents' and teachers' beliefs about abilities and failure. The findings showed that parents' mindsets about abilities significantly predicted children's mindsets about abilities, directly and indirectly through parents' failure mindsets perceived by children. These results align with prior research emphasizing the importance of parents' beliefs in shaping children's beliefs (Chen & Liu, 2023). In contrast, teachers' mindsets about abilities did not predict children's mindsets about abilities; however, children's perceptions of teachers' failure mindsets predicted children's mindsets about abilities (Haimovitz & Dweck, 2016). A possible explanation for these mixed findings is that the transmission of certain beliefs depends on children's perceptions of adults' behavior and their relational closeness. Hence, these findings underscore the relevance of parents' beliefs for children's learning and beliefs, highlighting the importance of collaboration between teachers and parents when addressing topics such as beliefs about abilities or failure.

Furthermore, these findings emphasize the central role of children's mindsets about abilities relating to their SRL. Although children's perceptions of parents' and teachers' failure mindsets did not predict children's SRL directly, the indirect effect via children's mindsets about abilities suggests that adults' beliefs and attitudes toward failure may affect children's learning by influencing how children see their own potential to learn, and in turn how actively they regulate and manage their own learning processes.

Taken together, the findings underscore the relevance of teachers' and parents' failure mindsets in shaping the beliefs and learning of children, encouraging adults to foster a growth-oriented environment where failure is framed as a valuable opportunity for learning. In summary, while this study offered valuable new insights by including parents, teachers, and children, it lays the foundation for future research to

investigate the different pathways through which parents' and teachers' beliefs might shape children's mindsets about abilities and SRL.

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Data availability The datasets analyzed in this study can be provided upon request.

Declarations

Conflict of interest The author declares no conflicts of interest.

Ethical approval The study was conducted in accordance with the Declaration of Helsinki and approved by the Institutional Review Board (or Ethics Committee) of University of Teacher Education Bern (protocol code 8311301, 27.02.2024).

Informed consent Informed consent was obtained from all participants involved in the study. Parental consent was obtained for children to participate in this study.

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References

Amemiya, J., & Wang, M. T. (2018). Why effort praise can backfire in adolescence. *Child Development Perspectives*, *12*(3), 199–203. https://doi.org/10.1111/cdep.12284

Backers, L., De Smedt, F., & Van Keer, H. (2024). Teachers as agents of self-regulated learning (SRL): Studying the relations between teachers' knowledge, beliefs, and SRL implementation across educational levels. *Unterrichtswissenschaft, 52*, 15–38. https://doi.org/10.1007/s42010-023-00190-1

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Prentice-Hall.

Bentler, P. M. (1992). On the fit of models to covariances and methodology to the Bulletin. *Psychological Bulletin*, *112*(3), 400–404. https://doi.org/10.1037/0033-2909.112.3.400

Blackwell, L. S., Trzesniewski, K. H., & Dweck, C. S. (2007). Implicit theories of intelligence predict achievement across an adolescent transition: A longitudinal study and an intervention. *Child Development*, *78*, 246–263. https://doi.org/10.1111/j.1467-8624.2007.00995.x

Bostwick, K. C., Collie, R. J., Martin, A. J., & Durksen, T. L. (2020). Teacher, classroom, and student growth orientation in mathematics: A multilevel examination of growth goals, growth mindset, engagement, and achievement. *Teaching and Teacher Education, 94*, Article 103100. https://doi.org/10.1016/j.tate.2020.103100

Bostwick, K. C., Martin, A. J., Collie, R. J., & Durksen, T. L. (2022). Motivation in context: A multilevel examination of growth orientation across one year. *Journal of Applied Developmental Psychology, 81*, Article 101435. https://doi.org/10.1016/j.appdev.2022.101435

Bråten, I., & Olaussen, B. S. (1998). The relationship between motivational beliefs and learning strategy use among Norwegian college students. *Contemporary Educational Psychology*, *23*, 182–194. https://doi.org/10.1006/ceps.1997.0963

Burnette, J. L., O'Boyle, E. H., VanEpps, E. M., Pollack, J. M., & Finkel, E. J. (2013). Mind-sets matter: A meta-analytic review of implicit theories and self-regulation. *Psychological Bulletin*, *139*(3), 655–701. https://doi.org/10.1037/a0029531

Byrne, B. M. (2012). *Structural equation modeling with Mplus: Basic concepts, applications, and programming.* Routledge/Taylor & Francis Group.

Chen, J., & Liu, C. (2023). The longitudinal association between children's growth mindset in senior primary school and their parents' growth mindset. *Frontiers in Psychology*. https://doi.org/10.3389/fpsyg.2023.1110944

Chen, J. A., & Pajares, F. (2010). Implicit theories of ability of grade 6 science students: Relation to epistemological beliefs and academic motivation and achievement in science. *Contemporary Educational Psychology, 35*, 75–87. https://doi.org/10.1016/j.cedpsych.2009.10.003

Costa, A., & Faria, L. (2018). Implicit theories of intelligence and academic achievement: A meta-analytic review. *Frontiers in Psychology*, *9*, 829. https://doi.org/10.3389/fpsyg.2018.00829

Dignath, C., & Büttner, G. (2008). Components of fostering self-regulated learning among students. A meta-analysis on intervention studies at primary and secondary school level. *Metacognition and Learning*, *3*, 231–264. https://doi.org/10.1007/s11409-008-9029-x

Dowdy, E., Twyford, J., & Sharkey, J. D. (2013). Methods of assessing behavior: Observations and rating scales. In D. H. Saklofske, C. R. Reynolds, & V. Schwean (Eds.), *The Oxford handbook of child psychological assessment* (pp. 623–650). Oxford Library of Psychology. https://doi.org/10.1093/oxfordhb/9780199796304.013.0026

Đurović, A., Protić, S., & Dimitrijević, A. A. (2019). Reexamining the association of parental implicit theories of intelligence with children's mastery orientation and actual aptitude. *German Journal of Developmental and Educational Psychology*, *51*(3), 123–134. https://doi.org/10.1026/0049-8637/a000216

Dweck, C. S. (2002). The development of ability conceptions. In J. S. Eccles, & A. Wigfield (Eds.), *Development of achievement motivation* (pp. 57–88). Academic.

Dweck, C. S., & Leggett, E. L. (1988). A social-cognitive approach to motivation and personality. *Psychological Review*, *95*(2), 256–273. https://doi.org/10.1037/0033-295X.95.2.256

Dweck, C. S., & Master, A. (2008). Self-theories motivate self-regulated learning. In D. H. Schunk, & B. J. Zimmerman (Eds.), *Motivation and self-regulated learning: Theory, research, and applications* (pp. 31–51). Routledge.

Dweck, C. S., & Molden, D. C. (2017). Mindsets: Their impact on competence motivation and acquisition. In A. J. Elliot, C. S. Dweck, & D. S. Yeager (Eds.), *Handbook of competence and motivation: Theory and application* (pp. 135–154). The Guilford Press.

Fong, C. J., Muenks, K., Fathi, Z., Adelugba, S. F., O'Grady, M. C., Lin, S., & Goldstein, M. G. (2025). Do socializers' mindset beliefs matter for student mindset and achievement? A meta-analysis. *Learning and Individual Differences, 121*, Article 102709. https://doi.org/10.1016/j.lindif.2025.102709

Ford, C. J., Mohr-Schroeder, M. J., & Usher, E. L. (2023). I fail; therefore, I can: Failure mindset and robotics self-efficacy in early adolescence. *Education Sciences, 13*(10), Article 1038. https://doi.org/10.3390/educsci13101038

Friedel, J. M., Cortina, K. S., Turner, J. C., & Midgley, C. (2007). Achievement goals, efficacy beliefs and coping strategies in mathematics: The roles of perceived parent and teacher goal emphases. *Contemporary Educational Psychology, 32*(3), 434–458. https://doi.org/10.1016/j.cedpsych.2006.10.009

Frome, P. M., & Eccles, J. S. (1998). Parents' influence on children's achievement-related perceptions. *Journal of Personality and Social Psychology, 74*(2), 435–452. https://doi.org/10.1037/0022-3514.74.2.435

Fuertes, M., Sousa, O., Łockiewicz, M., Nunes, C., & Lino, D. (2018). How different are parents and educators? A comparative study of interactive differences between parents and educators in a collaborative adult-child activity. *PLoS One*. https://doi.org/10.1371/journal.pone.0205991

Gagné, M., Morin, A. J. S., Schabram, K., Wang, Z. N., Chemolli, E., & Briand, M. (2020). Uncovering relations between leadership perceptions and motivation under different organizational contexts: A multilevel cross-lagged analysis. *Journal of Business and Psychology, 35*(6), 713–732. https://doi.org/10.1007/s10869-019-09649-4

Gunderson, E. A., Gripshover, S. J., Romero, C., Dweck, C. S., Goldin-Meadow, S., & Levine, S. C. (2013). Parent praise to 1- to 3-year-olds predicts children's motivational frameworks 5 years later. *Child Development, 84*, 1526–1541. https://doi.org/10.1111/cdev.12064

Gutshall, C. A. (2016). Student perceptions of teachers' mindset beliefs in the classroom setting. *Journal of Educational and Developmental Psychology, 6*(2), Article 135. https://doi.org/10.5539/jedp.v6n2p135

Haimovitz, K., & Dweck, C. S. (2016). Parents' views of failure predict children's fixed and growth intelligence mind-sets. *Psychological Science*, *27*, 859–869. https://doi.org/10.1177/0956797616639727

Hamilton, L. (2006). Implicit theories of ability: Teacher constructs and classroom consequences. *Scottish Educational Review*, *38*(2), 201–212. https://doi.org/10.1163/27730840-03802007

Hattie, J. (2009). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. Taylor & Francis.

Hayes, A. F. (2017). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach* (2nd ed.). Guilford Press.

Hellmich, F., & Hoya, F. (2017). Primary school students' implicit theories and their reading motivation. *Zeitschrift für Psychologie*, *225*(2), 117–126. https://doi.org/10.1027/2151-2604/a000288

Hertel, S., & Karlen, Y. (2021). Implicit theories of self-regulated learning: Interplay with students' achievement goals, learning strategies, and metacognition. *British Journal of Educational Psychology, 91*(3), 972–996. https://doi.org/10.1111/bjep.12402

Hertel, S., Reschke, K., & Karlen, Y. (2024). Are profiles of self-regulated learning and intelligence mindsets related to students' self-regulated learning and achievement? *Learning and Instruction, 90*, Article 101850. https://doi.org/10.1016/j.learninstruc.2023.101850

Hong, Y., Chiu, C., Dweck, C. S., Lin, D. M. S., & Wan, W. (1999). Implicit theories, attributions, and coping: A meaning system approach. *Journal of Personality and Social Psychology*, *77*(3), 588–599. https://doi.org/10.1037/0022-3514.77.3.588

Hoover-Dempsey, K. V., & Sandler, H. M. (1997). Why do parents become involved in their children's education? *Review of Educational Research*, *67*(1), 3–42. https://doi.org/10.3102/00346543067001003

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, *6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Jiang, K., Liu, J., Liu, C., Guo, X., Zhou, H., Lv, B., Liu, Z., & Luo, L. (2019). The discrepancy of parents' theories of intelligence and parental involvement. *Frontiers in Psychology*. https://doi.org/10.3389/fpsyg.2019.01231

Jodl, K. M., Michael, A., Malanchuk, O., Eccles, J. S., & Sameroff, A. (2001). Parents' roles in shaping early adolescents' occupational aspirations. *Child Development, 72*(4), 1247–1265. https://doi.org/10.1111/1467-8624.00345

Jonsson, A. C., Beach, D., Korp, H., & Erlandson, P. (2012). Teachers' implicit theories of intelligence: Influences from different disciplines and scientific theories. *European Journal of Teacher Education, 35*(4), 387–400. https://doi.org/10.1080/02619768.2012.662636

Jose, P. E., & Bellamy, M. A. (2012). Relationships of parents' theories of intelligence with children's persistence/learned helplessness: A cross-cultural comparison. *Journal of Cross-Cultural Psychology*, *43*(6), 999–1018. https://doi.org/10.1177/0022022111421633

Karlen, Y., & Compagnoni, M. (2017). Implicit theory of writing ability: Relationship to metacognitive strategy knowledge and strategy use in academic writing. *Psychology Learning & Teaching*, *16*(1), 47–63. https://doi.org/10.1177/1475725716682887

Karlen, Y., Hertel, S., & Hirt, C. N. (2020). Teachers' professional competences in self-regulated learning: An approach to integrate teachers' competences as self-regulated learners and as agents of self-regulated learning in a holistic manner. *Frontiers in Education*. https://doi.org/10.3389/feduc.2020.00159

Karlen, Y., Hirt, C. N., Jud, J., Rosenthal, A., & Eberli, T. D. (2023). Teachers as learners and agents of self-regulated learning: The importance of different teachers competence aspects for promoting metacognition. *Teaching and Teacher Education*. https://doi.org/10.1016/j.tate.2023.104055

Kim, S., Jeong, D., Nagengast, B., & Bong, M. (2026). Socializers' mindsets predict students' mindsets and learning outcomes: Evidence from nine countries. *European Journal of Psychology of Education, 41*, Article 36. https://doi.org/10.1007/s10212-026-01067-4

King, R. B. (2019). Mindsets are contagious: The social contagion of implicit theories of intelligence among classmates. *British Journal of Educational Psychology, 90*(2), 349–363. https://doi.org/10.1111/bjep.12285

Laine, S., & Tirri, K. (2023). Literature review on teachers' mindsets, growth-oriented practices and why they matter. *Frontiers in Education*. https://doi.org/10.3389/feduc.2023.1275126

Law, Y. (2009). The role of attribution beliefs, motivation and strategy use in Chinese fifth-graders' reading comprehension. *Educational Research*, *51*(1), 77–95. https://doi.org/10.1080/00131880802704764

LeBreton, J. M., & Senter, J. L. (2007). Answers to 20 questions about interrater reliability and interrater agreement. *Organizational Research Methods, 11*, 815–852. https://doi.org/10.1177/1094428106296642

Lee, Y., & Seo, E. (2019). Trajectories of implicit theories and their relations to scholastic aptitude: A mediational role of achievement goals. *Contemporary Educational Psychology, 59*, Article 101800. https://doi.org/10.1016/j.cedpsych.2019.101800

Li, C. (2015). Confirmatory factor analysis with ordinal data: Comparing robust maximum likelihood and diagonally weighted least squares. *Behavior Research Methods*, *48*(3), 936–949. https://doi.org/10.3758/s13428-015-0619-7

Li, K., Zhang, J., Wu, Z., & Zheng, Y. (2023). Intelligence mindset in Chinese children: The role of parental praise and autonomy support. *Journal of Applied Developmental Psychology, 87*, Article 101555. https://doi.org/10.1016/j.appdev.2023.101555

Limeri, L. B., Choe, J., Harper, H. G., Martin, H. R., Benton, A., & Dolan, E. L. (2020). Knowledge or abilities? How undergraduates define intelligence. *CBE Life Sciences Education*. https://doi.org/10.1187/cbe.19-09-0169

Little, R. J. A. (1988). A test of missing completely at random for multivariate data with missing values. *Journal of the American Statistical Association*, *83*(404), 1198–1202. https://doi.org/10.1080/01621459.1988.10478722

Lüftenegger, M., & Chen, J. A. (2017). Conceptual issues and assessment of implicit theories. *Zeitschrift für Psychologie*, *225*(2), 99–106. https://doi.org/10.1027/2151-2604/a000286

MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods, 1*(2), 130–149. https://doi.org/10.1037/1082-989X.1.2.130

MacDonnell Mesler, R. M., Corbin, C. M., & Martin, B. H. (2021). Teacher mindset is associated with development of students' growth mindset. *Journal of Applied Developmental Psychology, 76*,. https://doi.org/10.1016/j.appdev.2021.101299

Martin, A. J., Marsh, H. W., & Debus, R. L. (2001). Self-handicapping and defensive pessimism: Exploring a model of predictors and outcomes from a self-protection perspective. *Journal of Educational Psychology*, *93*(1), 87–102. https://doi.org/10.1037/0022-0663.93.1.87

Matteucci, M. C., Guglielmi, D., & Lauermann, F. (2017). Teachers' sense of responsibility for educational outcomes and its associations with teachers' instructional approaches and professional wellbeing. *Social Psychology of Education, 20*(2), 275–298. https://doi.org/10.1007/s11218-017-9369-y

Matthes, B., & Stöger, H. (2018). Influence of parents' implicit theories about ability on parents' learning-related behaviors, children's implicit theories, and children's academic achievement. *Contemporary Educational Psychology*, *54*, 271–280. https://doi.org/10.1016/j.cedpsych.2018.07.001

Matthes, B., & Stöger, H. (2021). Do implicit theories about ability predict self-reports and behavior-proximal measures of primary school students' in-class cognitive and metacognitive learning strategy use? *Frontiers in Psychology, 12*,. https://doi.org/10.3389/fpsyg.2021.690271

Matthes, B., & Stöger, H. (2022). Implizite Theorien von Eltern und deren Zusammenhänge mit elterlichem lernbezogenen Verhalten sowie den impliziten Theorien und dem Lern- und Leistungsverhalten ihrer Kinder: Ein Literaturüberblick [Implicit theories of parents and their relationship to parental learning-related behavior as well as the implicit theories and learning and performance behavior of their children: A literature review]. *Unterrichtswissenschaft*. https://doi.org/10.1007/s42010-022-00157-8

Maxwell, S. E., & Cole, D. A. (2007). Bias in cross-sectional analyses of longitudinal mediation. *Psychological Methods, 12*(1), 23–44. https://doi.org/10.1037/1082-989X.12.1.23

Molden, D. C., & Dweck, C. S. (2006). Finding meaning in psychology: A lay theories approach to self-regulation, social perception, and social development. *American Psychologist*, *61*(3), 192–203. https://doi.org/10.1037/0003-066X.61.3.192

Mouratidis, A., Michou, A., & Vassiou, A. (2017). Adolescents' autonomous functioning and implicit theories of ability as predictors of their school achievement and week-to-week study regulation and well-being. *Contemporary Educational Psychology, 48*, 56–66. https://doi.org/10.1016/j.cedpsych.2016.09.001

Muenks, K., Kroeper, K. M., Canning, E. A., & Murphy, M. C. (2024). Instructor mindset beliefs and behaviors: How do students and instructors perceive them? *Social Psychology of Education*. https://doi.org/10.1007/s11218-024-09948-6

Muenks, K., Miele, D. B., Ramani, G. B., Stapleton, L. M., & Rowe, M. L. (2015). Parental beliefs about the fixedness of ability. *Journal of Applied Developmental Psychology*, *41*, 78–89. https://doi.org/10.1016/j.appdev.2015.08.002

Muenks, K., & Yan, V. X. (2022). University STEM instructors with stronger failure-as-debilitating mindsets are perceived to engage in fewer mastery-oriented teaching practices by their students: An exploratory study. *Social Psychology of Education: An International Journal*, *25*(5), 1205–1219. https://doi.org/10.1007/s11218-022-09718-2

Muis, K. R., & Foy, M. J. (2010). The effects of teachers' beliefs on elementary students' beliefs, motivation, and achievement in mathematics. In L. D. Bendixen, & F. C. Feucht (Eds.), *Personal epistemology in the classroom: Theory, research, and implications for practice* (pp. 435–469). Cambridge University Press. https://doi.org/10.1017/CBO9780511691904.014

Muthén, L. K., & Muthén, B. O. (2017). *Mplus* (Version 8). Muthén & Muthén.

Noskeau, R., Santos, A., & Wang, W. (2021). Connecting the dots between mindset and impostor phenomenon, via fear of failure and goal orientation, in working adults. *Frontiers in Psychology*. https://doi.org/10.3389/fpsyg.2021.588438

Park, D., Gunderson, E. A., Tsukayama, E., Levine, S. C., & Beilock, S. L. (2016). Young children's motivational frameworks and math achievement: Relation to teacher-reported instructional practices, but not teacher theory of intelligence. *Journal of Educational Psychology*. https://doi.org/10.1037/edu0000064

Pintrich, P. R. (2000). The role of goal orientation in self-regulated learning. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 402–451). Academic.

Pomerantz, E. M., & Dong, W. (2006). Effects of mothers' perceptions of children's competence: The moderating role of mothers' theories of competence. *Developmental Psychology*, *42*(5), 950–961. https://doi.org/10.1037/0012-1649.42.5.950

Pomerantz, E. M., Moorman, E. A., & Litwack, S. D. (2007). The how, whom, and why of parents' involvement in children's academic lives: More is not always better. *Review of Educational Research, 77*, 373–410. https://doi.org/10.3102/003465430305567

Rattan, A., Good, C., & Dweck, C. S. (2012). It's ok—not everyone can be good at math: Instructors with an entity theory comfort (and demotivate) students. *Journal of Experimental Social Psychology*, *48*(3), 731–737. https://doi.org/10.1016/j.jesp.2011.12.012

Ryan, S., & Mercer, S. (2012). Implicit theories: Language learning mindsets. In S. Mercer, S. Ryan, & M. Williams (Eds.), *Psychology for language learning* (pp. 74–89). Palgrave Macmillan. https://doi.org/10.1057/9781137032829_6

Satorra, A., & Bentler, P. M. (2010). Ensuring positiveness of the scaled difference chi-square test statistic. *Psychometrika, 75*(2), 243–248. https://doi.org/10.1007/s11336-009-9135-y

Schellings, G., & Van Hout-Wolters, B. (2011). Measuring strategy use with self-report instruments: Theoretical and empirical considerations. *Metacognition and Learning, 6*(2), 83–90. https://doi.org/10.1007/s11409-011-9081-9

Scherer, R., & Campos, D. G. (2022). Measuring those who have their minds set: An item-level meta-analysis of the implicit theories of intelligence scale in education. *Educational Research Review, 37*, Article 100479. https://doi.org/10.1016/j.edurev.2022.100479

Schuler, N., Villiger, C., & Krauß, E. (2024). Effects of a teacher-led intervention fostering self-regulated learning and reading among 5th and 6th graders — Treatment integrity matters. *Education Sciences, 14*(7), Article 778. https://doi.org/10.3390/educsci14070778

Schunk, D. H., & Zimmerman, B. J. (1997). Social origins of self-regulatory competence. *Educational Psychologist*, *32*, 195–208.

Siems-Muntoni, F., Dunekacke, S., Heinze, A., & Retelsdorf, J. (2024). Teacher expectation effects on the development of elementary school students' mathematics-related competence beliefs and intrinsic task values. *Contemporary Educational Psychology, 76*, Article 102255. https://doi.org/10.1016/j.cedpsych.2023.102255

Smiley, P. A., Buttitta, K. V., Chung, S. Y., Dubon, V. X., & Chang, L. K. (2016). Mediation models of implicit theories and achievement goals predict planning and withdrawal after failure. *Motivation and Emotion, 40*(6), 878–894. https://doi.org/10.1007/s11031-016-9575-5

Song, Y., Barger, M. M., & Bub, K. L. (2022). The association between parents' growth mindset and children's persistence and academic skills. *Frontiers in Education, 6*, Article 791652. https://doi.org/10.3389/feduc.2021.791652

Stern, M., & Hertel, S. (2020). Profiles of parents' beliefs about their child's intelligence and self-regulation: A latent profile analysis. *Frontiers in Psychology*. https://doi.org/10.3389/fpsyg.2020.610262

Stipek, D., & Gralinski, J. H. (1996). Children's beliefs about intelligence and school performance. *Journal of Educational Psychology, 88*(3), 397–407. https://doi.org/10.1037/0022-0663.88.3.397

Tao, V. Y. K., Li, Y., & Wu, A. M. S. (2022a). Do not despise failures: Students' failure mindset, perception of parents' failure mindset, and implicit theory of intelligence. *European Journal of Psychology of Education, 37*(2), 375–389. https://doi.org/10.1007/s10212-020-00524-y

Tao, V. Y. K., Li, Y., & Wu, A. M. S. (2022b). Incremental intelligence mindset, fear of failure, and academic coping. *Journal of Pacific Rim Psychology*. https://doi.org/10.1177/18344909221144703

Tempelaar, D. T., Rienties, B., Giesbers, B., & Gijselaers, W. H. (2015). The pivotal role of effort beliefs in mediating implicit theories of intelligence and achievement goals and academic motivations. *Social Psychology of Education, 18*(1), 101–120. https://doi.org/10.1007/s11218-014-9281-7

Turner, J. C., Christensen, A., & Meyer, D. K. (2009). Teachers' beliefs about student learning and motivation. In L. J. Saha, & A. G. Dworkin (Eds.), *International handbook of research on teachers and teaching* (pp. 361–371). Springer. https://doi.org/10.1007/978-0-387-73317-3_23

Wang, S., Rubie-Davies, C. M., & Meissel, K. (2018). A systematic review of the teacher expectation literature over the past 30 years. *Educational Research and Evaluation*, *24*(3–5), 124–179. https://doi.org/10.1080/13803611.2018.1548798

Wirth, J., & Leutner, D. (2008). Self-regulated learning as a competence. *Zeitschrift für Psychologie / Journal of Psychology*, *216*(2), 102–110. https://doi.org/10.1027/0044-3409.216.2.102

Yu, J., Kreijkes, P., & Salmela-Aro, K. (2022). Students' growth mindset: Relation to teacher beliefs, teaching practices, and school climate. *Learning and Instruction*. https://doi.org/10.1016/j.learninstruc.2022.101616

Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 13–40). Academic Press. https://doi.org/10.1016/B978-012109890-2/50031-7

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