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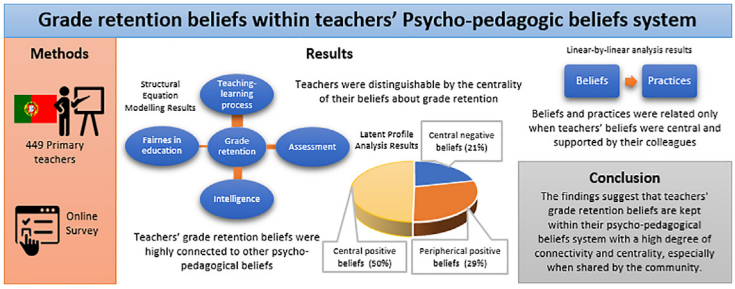
Research paper

Analysing grade retention beliefs within teachers' psycho-pedagogic beliefs system

Natalie Nóbrega Santos*, Joana Pipa, Vera Monteiro

Centro de Investigação em Educação, ISPA – Instituto Universitário, CIE-ISPA, Rua Jardim do Tabaco, 34, 1149-041, Lisbon, Portugal

GRAPHICAL ABSTRACT



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ABSTRACT

Teachers have a complex and multidimensional system of socially constructed beliefs that influence their professional practice. Based on self-reported beliefs of 449 Portuguese primary teachers we explored the connectivity between grade retention beliefs and other psycho-pedagogical beliefs using a structural equation model. We also studied the psychological centrality of grade retention beliefs using a latent profile analysis. The results indicated that teachers' grade retention beliefs are maintained within their beliefs system with a high degree of connectivity and centrality, especially when shared by their community. These findings may have implications to the educational policies that aim to reduce retention rates.

1. Introduction

Grade retention, also known as grade repetition or non-promotion, is the practice in which the student, for various reasons, is not promoted to the next grade with their peers, remaining in the same grade for an extra school year (European Commission – EC., 2020). This is a controversial practice due to the results found in international research indicating that grade retention does not improve long-term student achievement or social-affective functioning (Goos et al., 2021; Valbuena et al., 2020), although there are occasionally minor improvements of short duration (e.g., Allen et al., 2009). Furthermore, prior research has shown that, among students with similar performance, grade retention affects more social and economically disadvantaged children (EC, 2020). These

* Corresponding author.
E-mail addresses: nsantos@ispa.pt (N.N. Santos), jpipa@ispa.pt (J. Pipa), veram@ispa.pt (Vera Monteiro).

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results suggest that grade retention threatens equity in the right to education (EC, 2020; OECD, 2011, 2012).

Consistently with these findings, reducing grade retention has been a key policy area in most European countries (EC, 2020). But despite those policies, grade retention continues to be a relatively common practice in several countries. One of these countries is Portugal. Since 1992, the Portuguese legislation has recommended the use of grade retention only in exceptional circumstances (Grilo, 2019). Still, in 2018, nearly 27% of fifteen-year-old students had repeated at least once during primary or middle education (EC, 2020). Some studies suggested that the high retention rates observed in countries such as Portugal might result from strong societal beliefs of its positive effects (Goos et al., 2013). In this sense, researchers identified beliefs as precursors of teachers' behaviour (e.g., the Theory of Planned Behaviour, by Ajzen [1991]) and significant contributors to teachers' decision making in the classroom (e.g., Shavelson & Stern's Theory of Teacher Decision-Making Framework [Borko et al., 2008]).

Several studies have tried to describe and understand teachers' beliefs about grade retention (Bonvin, 2003; Crahay et al., 2013, 2014; Range et al., 2011, 2012; Tomchin & Impara, 1992; Walton, 2018; Young et al., 2019). At the same time, theoretical and empirical studies have recognised that teachers' beliefs are part of a complex multidimensional system where several beliefs are interconnected (Buehl & Beck, 2015; Fives & Buehl, 2012; Rokeach, 1968). However, it is unclear how grade retention beliefs are held in teachers' beliefs system since they have only recently begun to be studied simultaneously with other beliefs about education (e.g., Crahay et al., 2014). In the present study, we aim to understand primary teachers' grade retention beliefs within their psychopedagogical beliefs system by exploring: a) the relationship between grade retention beliefs and general beliefs about learning, intelligence, assessment, and fairness in education; b) the centrality of teachers' beliefs about grade retention; and c) the dynamic interaction between teachers' beliefs about grade retention and their retention practices. The study was based on a sample of primary teachers from Portugal, one of the European countries with the highest rate of grade retention (EC, 2020). We used questionnaires with validated factor structure to assess teachers' beliefs and analyse our data using structural equation modelling and latent profile analysis to overcome previous studies weaknesses and produce validated knowledge in the area. This knowledge would help design more adequate training programs for teachers that aim to reduce grade retention in the schools.

1.1. Teachers' grade retention beliefs

The term belief used in this study is defined by Philipp (2007) as the 'understanding, premises, or propositions about the world that are thought to be true' (Philipp, 2007, p. 259). Beliefs differ from knowledge in that they are not consensual and depend more on evaluative and affective components, including a great deal of episodic material from personal experiences or the individual's culture (Skott, 2015). Studies about grade retention beliefs have identified that many teachers, particularly those who teach in the first years of schooling, believe that repeating a grade brings several benefits to students in terms of learning and competence development, having positive beliefs about their effectiveness (Bonvin, 2003; Crahay et al., 2013, 2014; Range et al., 2012; Ribeiro et al., 2018; Tomchin & Impara, 1992; Witmer et al., 2004). Likewise, studies developed by Rodrigues et al. (2017), Santana (2019), and Santos and Monteiro (2021) observed that most Portuguese teachers consider that grade retention has more advantages than disadvantages.

The persistence of positive beliefs regarding the effectiveness of grade retention has intrigued many theorists and researchers (Crahay et al., 2013), given the common negative or non-significant effects found in many studies (Goos et al., 2021). In general, most investigations associated the persistence of these beliefs to the lack of teachers' knowledge regarding the effects of grade retention, acquired through formal documents of scientific origin or training (Barrett-Tatum et al., 2019; Boraita, 2015; Crahay et al., 2013; Ribeiro et al., 2018; Witmer et al., 2004). However, little is known about how grade retention beliefs develop or how they are related to other constructs or teachers' sociodemographic and professional characteristics.

This gap in the literature is in part explained by the instruments used by most studies to assess teachers' beliefs about grade retention, composed of items of different nature and unknown inter-relational structure. For example, most researches used adaptations of the Teachers' Perception about Retention Survey (TPRS), developed by Tomchin and Impara (1992) (e.g., Barrett-Tatum et al., 2019; Bonvin, 2003; Range et al., 2011, 2012; Santana, 2019; Young et al., 2019; Witmer et al., 2004). However, the questionnaire was not subjected to factor analysis in any of the abovementioned studies, so its inter-relational structure is still unknown. Consequently, it is impossible to create summed scales that represent the multiple aspects assessed by the items in a single measure. As a consequence, these studies present results item-by-item, increasing measurement error and making the estimation of multivariate models more difficult due to the redundancy of items associated with the same concept, masking possible relationships in correlation coefficients and in-group comparisons (Hair et al., 2014). Therefore, only descriptive and bivariate analyses were carried out with this type of questionnaire, limiting the study of the relationship between grade retention beliefs and other variables.

Only recently the *Développement Apprentissage et Intervention en Situation Scolaire* team (DAISS), from the University of Geneva (Boraita, 2015; Boraita & Marcoux, 2016; Crahay et al., 2013, 2014; Ribeiro et al., 2018), developed instruments to assess teachers' beliefs about grade retention with validated factor structures. Despite the different number of factors found in different countries (three factors in Belgium [Crahay et al., 2014], five in France and Switzerland [Boraita, 2015; Boraita & Marcoux, 2016] and three in Brazil [Ribeiro et al., 2018]), three components of teachers' beliefs about the effectiveness of grade retention have been consistently identified. One dimension includes items about the effectiveness of grade retention as an external regulator of students' motivation and behaviour by setting standards and enforcing negative consequences if educational goals are not reached. A second dimension assesses teachers' beliefs about the effectiveness of grade retention for preventing further academic failure, especially when applied early, by granting students more time to learn and improving teachers' instruction through more academically homogenous classes. The third dimension assesses the socio-affective consequences of grade retention in students' self-image and self-competence. These three factors were also identified in a shortened version of DAISS's questionnaire used in a sample of Portuguese teachers (Santos & Monteiro, 2021). In Santos and Monteiro's study, 86.1% of teachers agreed that grade retention was adequate for preventing failure, 65.7% agreed that it was effective as an external regulator, and 53% agreed that retention had no adverse consequence for students.

1.2. Teachers' beliefs system

Theorists recognise teachers' beliefs for existing as a system (Fives & Buehl, 2012). A system is a metaphor used 'for describing the manner in which one's beliefs are organised in a cluster' (Philipp, 2007, p. 259). This idea is based upon the work of Green

(1971, cited by Philipp, 2007) and Rokeach (1968), who considered that a particular belief is never held in total isolation from other beliefs. According to Green (cited by Philipp, 2007), there are three dimensions of belief systems: their structure (primary or derivative), their connectivity with other beliefs (more connected or isolated), and their psychological centrality (central or peripheral). Following, we describe each of these dimensions and highlight the evidence encountered about the grade retention beliefs.

In the first dimension the author distinguishes between primary and subordinate (derived) beliefs. Primary beliefs serve as a foundation for other derivative beliefs in a quasi-logical hierarchical structure (Green, 1971; cited by Philipp, 2007). Based on previous qualitative research (e.g., Cameron-Minard, 1993; Pouliot, 1999), the DAISS team suggested that grade retention beliefs are derivative, grounded on primary psychopedagogical beliefs about the teaching-learning process, assessment, intelligence and fairness in education (Crahay et al., 2014).

Teachers' general beliefs about the teaching-learning process may explain other more specific psycho-pedagogical beliefs (Berger et al., 2018; Hermans et al., 2008), such as grade retention beliefs. When teachers defend grade retention effectiveness because classes become more academically homogeneous (Pouliot, 1999; Santana, 2019), facilitating the transmission of knowledge of a single program to all students, they support their beliefs in a direct transmission or transmissive model of learning (OECD, 2009). In the transmissive model of learning, 'teachers' role is to communicate knowledge clearly and structure, explain the correct solution, give students clear and resolvable problems, and ensure calm and concentration in the classroom' (OECD, 2009, p. 92). Contrarily, the constructivist model emphasises students' active participation in the process of acquiring knowledge and the importance of developing thinking processes instead of the acquisition of specific knowledge through repetition (Crahay et al., 2014; OECD, 2009). Therefore, teachers following this model tend to recognise that students benefit more from age-appropriate academic challenges than a mere repetition of related academic competencies (OECD, 2009). Thus, they would present more negative beliefs regarding the effectiveness of grade retention (Crahay et al., 2014).

Teachers' beliefs about grade retention may also be derivative from their beliefs about the summative and formative purpose of assessment (Crahay et al., 2014). The summative purpose of assessment is to certify students' learning, determining if students meet qualification standards (Brown & Remesal, 2017). Teachers who believe more in this purpose will be more favourable to retention as a form of selection: If students do not achieve the instructional goals, they must be retained (Pouliot, 1999). On the contrary, the formative purpose is to provide information to teachers and students to improve the teaching-learning process (Brown & Remesal, 2017; Kippers et al., 2018). The DAISS team suggested that teachers who believe more in this purpose will believe less in the benefits of grade retention (Boraita, 2015; Crahay et al., 2013, 2014). Still, they do not justify why they expect this relationship.

Differences in beliefs about the malleability of human attributes such as intelligence also have far-reaching effects on other psycho-pedagogical beliefs (De Kraker-Pauw et al., 2017; Patterson et al., 2016), including grade retention beliefs. Teachers who believe that intelligence is fixed —innate and cannot be changed (De Kraker-Pauw et al., 2017) — may perceive themselves as unable to impact students' immaturity or lack of ability. Hence, all they can do for the student is give them extra time through grade retention, as observed by Cameron-Minard (1993) and Goffin and Monseur (2013). On the other hand, teachers who believe that intelligence is malleable, controllable, and improved through effort and positive interactions will be less likely to believe in the efficacy of repetition (De Kraker-Pauw et al., 2017). These teachers might believe that retention could lead to feelings of failure and shame, incompatible with the favourable affective environment necessary for developing intelligence and future success (Goffin & Monseur, 2013).

The DAISS team also suggest that teachers' grade retention beliefs could be grounded on their beliefs about the principles of justice and fairness in education (Crahay et al., 2013; 2014, Ribeiro et al., 2018). The more teachers believe in the equality of treatment — that every student must have equal access to education and the same treatment (Ribeiro et al., 2018), the more they are convinced of the effectiveness of retention (Boraita, 2015). These teachers believe that retention decisions must be based solely on academic results (Boraita, 2015), so all students who do not reach the academic goals should be treated equally and be retained. Conversely, teachers who believe in a differential treatment to correct inequalities at school and enhance students' competencies will believe less in the effectiveness of grade retention, a practice that may not consider the individual circumstances of each student (Ribeiro et al., 2018).

Green's second dimension refers to the connectivity between beliefs suggesting that beliefs systems vary in the degree to which the beliefs are interrelated (Philipp, 2007). Systems could be clusters of primary and derivative beliefs strongly connected or clusters of beliefs more isolated and unrelated to other beliefs (Philipp, 2007). The presence of isolated clusters could explain the presence of incompatible and inconsistent beliefs to coexist. As long a person can avoid the confrontation of contradictory beliefs and their examination for inconsistencies, the incompatibility may remain (Richardson, 1996).

Apart from some studies carried out with qualitative data (e.g., Pouliot, 1999), only the DAISS team (Boraita, 2015; Boraita & Marcoux, 2016; Crahay et al., 2013, 2014; Ribeiro et al., 2018) have focused their research on how grade retention beliefs are related with teachers' psycho-pedagogical beliefs. They started with the hypothesis that grade retention beliefs are derivative beliefs and could be predicted by their primary beliefs about the teaching-learning process, assessment, intelligence, and fairness in education, as described in the previous section. Using bivariate correlation or multiple regression analyses, the relationships found between grade retention beliefs and psycho-pedagogical beliefs were weak, explaining only between 3 and 23% of the variability of grade retention beliefs (Boraita, 2015; Crahay et al., 2013, 2014). Sometimes inconsistent and incongruent beliefs were found, as observed by Ribeiro et al. (2018) and Crahay et al. (2014). In these studies, both summative and formative assessments were positively associated with beliefs in the effectiveness of grade retention. Beliefs in the differential treatment to correct justice were also positively associated with beliefs in grade retention effectiveness, although they were expected to correlate negatively. In addition, no relationship between grade retention beliefs and teachers' beliefs about the equality of treatment or the constructivist learning model were found. The authors concluded that beliefs about grade retention were poorly connected to other psycho-pedagogical beliefs.

However, it should be noted that these studies were methodologically flawed, challenging the understanding of the complexity of teachers' beliefs system. These studies estimated one multiple regression equation for each belief about grade retention separately, and they did not incorporate latent variables to account for measurement errors in the estimation process (Hair et al., 2014). Studies using structural equation models are necessary to address these limitations and better understand the complex relationship between teachers' beliefs.

Green's third dimension of the belief system is its centrality in psychological significance (Philipp, 2007; Skott, 2015) referring to

the belief's strength and the number of connections with other beliefs. Central or core beliefs are strongly held and more stable, while peripheral beliefs are endorsed with less conviction and are more susceptible to change (Green, 1971; cited by Philipp, 2007). Beliefs strongly connected to other beliefs are also considered central (Rokeach, 1968). According to Rokeach (1968), 'the more a given belief is functionally connected or in communication with other beliefs the more implications and consequences it has for other beliefs and, therefore, the more central the belief' (Rokeach, 1968, p. 5). The more central a belief is, the more it will resist change. The reason for this resistance is that changes in a central belief could create dissonance, contradiction, and chaos (Eisenhart et al., 1988).

Using cluster analyses, the DAISS team observed that grade retention beliefs were central for some teachers, and they firmly held beliefs in favour or against the practice (Crahay et al., 2013; Ribeiro et al., 2018). For other teachers, grade retention beliefs were peripheral: they held mixed feelings about it, neither against nor in favour (Ribeiro et al., 2018). In some cases, it was observed that beliefs about grade retention benefits and risks, despite being negatively correlated, showed some independence from each other. Some participants considered grade retention beneficial for learning despite believing in its negative socio-affective consequences (Boraita, 2015; Boraita & Marcoux, 2016; Crahay et al., 2014). Boraita (2015), Boraita and Marcoux (2016) and Crahay et al. (2014) suggested that these results could indicate that teachers could hold incompatible beliefs about grade retention in isolated clusters, protected from other clusters.

Although these results have contributed to the comprehension of teachers' grade retention beliefs, only Ribeiro et al. (2018) used latent profile analyses (LPA). According to Spurk et al. (2020), LPA offers a superior model-based cluster solution than the traditional cluster analysis used by Crahay et al. (2013), Boraita (2015), and Boraita and Marcoux (2016). On the other hand, little is known about the consequences of teachers' beliefs centrality in their grade retention practices.

1.3. Teachers' grade retention beliefs and their practices

Although the study of teachers' beliefs is justified by the possible relationship between beliefs and practices (Borko et al., 2008), there is evidence that teachers' beliefs are often disconnected, misaligned, or inconsistent with their classroom practices (Buehl & Beck, 2015). However, Buehl and Beck (2015) contend that this lack of congruence is no reason to discount the power of beliefs. Still, it is necessary to understand the potential relationship between beliefs and practice and the possible internal and external factors that may support or hinder this connection. One of the internal factors that may support or hinder the connection between beliefs and practice is the type of beliefs under consideration and their position within a teacher's beliefs system (Fives & Buehl, 2012). If core or central beliefs are more strongly held and have more connections with other beliefs, then this type of belief may be more strongly related to teachers' practices than peripheral beliefs (Fives & Buehl, 2012). On the other hand, if beliefs are peripheral and held in isolated clusters, coexisting with other incompatible beliefs, practices will be more inconsistent. Conflicting beliefs may exist within a teacher and be differentially related to the teacher's practice depending on the context (Buehl & Beck, 2015).

Another factor that can affect the relationship between teachers' beliefs and practices is their perception of colleagues' agreement with their own beliefs. According to Rokeach (1968), beliefs shared with others are assumed to have more functional connections and consequences for other beliefs than beliefs not shared with others. A previous study with Portuguese teachers observed that the more teachers think their peers have a favourable opinion about retention, the more positive their own beliefs about retention were (Santos & Monteiro, 2021). Furthermore, Ajzen theory of planned behaviour (1991) also suggests that teachers' behaviour is influenced by societal beliefs and pressures. Therefore, social experiences could significantly impact teachers' beliefs and practices (Skott, 2015).

1.4. Present study

In the present study, we intended to expand the existing research by studying the relationship between primary school teachers' grade retention beliefs and their psycho-pedagogical beliefs about the teaching and learning process, assessment purposes, intelligence malleability and fairness in education. We used structural equation modelling to estimate the explanatory relationship between multiple dimensions of grade retention beliefs more accurately and account for measurement errors (Hair et al., 2014). We also assessed the centrality of teachers' grade retention beliefs using latent profile analyses. Additionally, we also examined relationships between teachers' grade retention beliefs and their grade retention practices. Three research questions guided this study: Are grade retention beliefs integrated within a broader psycho-pedagogical beliefs system or organised in isolated clusters? Are grade retention beliefs central (strongly held) or peripheral? Is there a relationship between teachers' beliefs and their practices?

The study of how grade retention beliefs are held within teachers' beliefs system is crucial and, at the same time, largely underexplored (Crahay et al., 2016). Grade retention research is still focused on determining if the practice is effective for specific circumstances or outcomes (see Goos et al., 2021 and Valbuena et al., 2020 for an overview). However, considering the lack of definitive evidence of grade retention's long-term effectivity, several authors consider that the onus should shift as to why practitioners continue to recommend the use of retention (e.g., Biegler, 2000; Crahay et al., 2013; Range et al., 2012). Still, the most recent research in this area continues to study teachers' beliefs about grade retention in isolation from other beliefs (e.g., Barrett-Tatum et al., 2019; Cipriano & Da Cruz Martins, 2021; Kyereko et al., 2022; Young et al., 2019). Validate knowledge about the relationship between teachers' grade retention beliefs and other beliefs would help design training programs, interpret the research results about the relationship between beliefs and practices, and understand the results of studies that tried to prompt a change in beliefs (Crahay et al., 2016; Richardson, 1996). Deeply integrated and central beliefs will be more stable and more likely to be enacted in teachers' practices, while more isolated and peripheral beliefs will be more unstable and less expressed in teachers' practices (Buehl & Beck, 2015; Philipp, 2007). Therefore, training programs aiming at changing deeply integrated and central beliefs should encounter more resistance through the process, but the effects, once generated, should be maintained in the long term and have repercussions on other beliefs and teachers' practices. If, on the contrary, teachers' beliefs are held in isolated clusters, the transformation of these beliefs should be more easily achieved by considering only the beliefs that come together in clusters (Crahay et al., 2016).

2. Materials and methods

2.1. Research context and participants

In Portugal, primary and secondary education is compulsory and free. The primary education level is divided into three cycles: first (1st to 4th grade), second (5th to 6th grade), and third cycle (7th to

9th grade) (EC, 2021). The decision of students' progression or retention in the first cycle is primarily based on the assessment of a single teacher (Portaria N° 233, 2018). Still, the teachers' council opinion must be consulted in this decision (*Decreto-Lei* N° 55 2018).

Our target population included all teachers from primary and secondary public schools of Continental Portugal (811 schools), Azores (66 schools), and Madeira (25 schools). Madeira's first cycle schools were not included because they were part of another study. After the study's approval by Portugal's Directorate-General for Education (*Direção-Geral da Educação*, n° 0091900022) and the Ethics Committee of the ISPA - Instituto Superior (n° D/020/11/2019), an email was sent to all the school's principals requesting the dissemination of an online survey to the teacher community. Participation was voluntary, and confidentiality was guaranteed. Four hundred and forty-nine participants currently teaching in the first cycle of education agreed to respond to the survey. In Table 1, we present the characteristics of the participants. Our comparison of this sample and the census population for the academic year of 2019–2020 (*Direção-Geral de Estatísticas da Educação e Ciência*, DGEEC, 2021) indicated similar patterns of distribution considering gender, age, and qualification (see the supplementary material). Still, Azores was over-represented, and the North Region and Madeira were underrepresented. Therefore, the reported result should be interpreted with caution and should not be generalised to the Portuguese population.

2.2. Instruments and procedures

Teachers responded to an online survey based on the Portuguese translation of the questionnaire developed by the DAISS team (Ribeiro et al., 2018) and the TALIS questionnaire (Teaching and Learning International Survey, OECD, 2009). The questionnaire included a first section intended to measure teachers' beliefs about teaching and learning, assessment, intelligence, and fairness in education; a second section focused on teachers' beliefs about grade retention; and a third section assessed the school culture (not presented in this article). Teachers answered these sections using a six-point Likert scale (1 = strongly disagree to 6 = Strongly agree). The questionnaire included questions about teachers experience with grade retention and a demographic section. The structural validity and reliability of the measures were assessed (see supplementary material).

2.3. Teachers' teaching and assessment beliefs

Nine items were used to assess teachers' beliefs about the transmissive and constructivist models of the teaching-learning process and the summative and formative purpose of assessment. The four dimensions presented adequate structural validity for the study sample. Levels of reliability, replicability, and convergent validity were within the minimum acceptable. There were good indicators of discriminant validity.

2.4. Teachers' intelligence beliefs

This scale used six items to assess two fundamental beliefs regarding the malleability of intelligence: fixed and malleable. These two dimensions presented adequate structural validity and adequate levels of reliability, construct replicability, convergent and divergent validity.

2.5. Teachers' educational fairness beliefs

To assess teachers' beliefs about the principles of fairness in education, we used eight items. Two dimensions were assessed: equality of treatment and differential treatment. Although the two-dimensional model presented an adequate structural validity for the study sample, the differential treatment dimension presented a poor level of reliability, construct replicability and convergent validity. Therefore, only the equality of treatment dimension was used in the study.

2.6. Teachers' grade retention beliefs

This scale had 14 items and assessed teachers' beliefs about the effectiveness of grade retention to prevent failure, teachers' beliefs about its effectiveness for external regulation of students' motivation and behaviour, and teachers' beliefs about grade retention socio-affective risks. The three dimensions presented a valid structure and adequate levels of reliability, construct replicability, convergent and discriminant validity.

2.7. Teachers' experience about grade retention

Teachers were asked about their current level of knowledge of

Table 1
Sample characterisation.

Variable	Category	n	%	M	SD
Age	Total	446	99.3	49.76	7.62
	Missing	3	0.7		
Years of experience	Total	437	97.3	25.28	8.364
	Missing	12	2.7		
Gender	Female	367	81.7		
	Male	82	18.3		
Qualification	Bachelor and graduate	334	74.4		
	Postgraduate	47	10.5		
	Master	61	13.6		
	PhD	5	1.1		
	Missing	2	0.4		
Location of the school	Urban – densely populated	70	15.6		
	Medium-sized city	111	24.7		
	Suburban	82	18.3		
	Small town or village	177	39.4		
	Remote countryside	9	2.0		
Number of students by class	0–9	26	5.8		
	10–19	157	35.0		
	20–29	258	57.5		
	More than 30	5	1.1		
	Missing	3	0.7		

research about grade retention effects (from 1 = very low to 5 = very high) and how many students were retained in the last school year in their classes (0 = none, 1 = one or more). Teachers were also asked if colleagues have the same opinion about the effectiveness of grade retention to promote academic success (1 = strongly disagree to 6 = strongly agree); whether they were retained during their school career (0 = no; 1 = yes); and whether they had read about the effects of grade retention in scientific articles or magazines (0 = no; 1 = yes).

2.8. Data analysis

After confirming the measures' structural validity and reliability, we employed structural equation modelling (SEM) to test our theoretical model using Mplus 8.4 with the weighted least square mean and variance adjusted (WLSMV) estimator. In our theoretical model, teachers' beliefs about teaching and learning, assessment, intelligence, and educational fairness were specified as predictors of the three dimensions of teachers' grade retention beliefs. We also included as predictor teachers' experiences about grade retention (teachers' knowledge about research, reading to scientific articles and magazines, experience as retained students, their perception of colleagues' agreement with their own belief). Teachers professional and sociodemographic characteristics (gender, qualification, years of professional experience, school location, and the number of students in their class) were also included as control variables. The default Mplus procedure handled missing data, i.e., missingness (0.2% in the present study) was allowed to be a function of the observed covariates but not the observed outcomes (Muthén & Muthén, 2017). Model fit was assessed using the following indices and minimum criterion for an acceptable level of fit: chi-square (χ^2) small (relative to the degrees of freedom) or non-significant *p*-value; comparative fit index (CFI) and Tucker-Lewis index (TLI) higher than .90; and root mean square error of approximation (RMSEA) and standardised root mean residual (SRMR) lower than 0.08 (Hair et al., 2014). The significance of the structural coefficients was evaluated with a Z-test produced by the Mplus software.

To identify different profiles or groups of teachers with different beliefs patterns, we conducted a latent profile analysis (LPA) using the average of each dimension of teachers' grade retention beliefs and the psycho-pedagogical beliefs associated with them. Next, we assessed whether the beliefs observed in each profile were central or peripheral. We considered that beliefs were central or strongly held when presenting average values low (close to 1) or high (close to 6), indicating strong disagreement or agreement with the beliefs studied. Contrarily, beliefs were considered peripheral or less firmly held when presented average values closer to the mean point of the scale (close to 3.5).

To perform the LPA, we used the procedures recommended by Ferguson et al. (2020), in which multiple models are fit, varying the number of classes or profiles. Each model is compared against the previous model to decide the adequate number of latent profiles that share a meaningful and interpretable pattern of responses on the grade retention beliefs' dimensions. We used the following indexing to decide on model retention: Bayesian Information Criterion (BIC), Sample-Adjusted BIC (SABIC), and Akaike's Information Criterion (AIC). Lower values in these indicators suggest a better fit. We also used entropy to support our decision as a measure of uncertainty. Values of 0.80 or greater indicate that profile classification of the individuals occurs with minimal uncertainty (Ferguson et al., 2020). We also report the average posterior classification probabilities (ALCP), which indicates the probability that cases are correctly classified into the correct profile, with a recommended threshold level of 0.80 (Ferguson et al., 2020). We used Lo, Mendell, and Rubin (LMR) and bootstrap likelihood ratio tests (BLRT) to compare the models. A non-significant LMR or BLRT tests suggest that the more parsimonious model has the better fitting model. Significant tests indicate that the current assessed model is better than the more parsimonious model (Ferguson et al., 2020). Finally, we also considered the theoretical support regarding the model with better fit and the interpretability of the emerged profiles. Once the better model was selected, we analysed the linear-by-linear association between teachers' beliefs profile and the number of retained students in their classroom using chi-square analysis and Kendall's tau-b, using the SPSS (v. 27) software.

3. Results

In Table 2, we present the descriptive statistics of teachers' experiences about grade retention, and in Table 3, the descriptive statistics of each dimension of teachers' beliefs. We can notice that more than a third of the teachers was retained during their school trajectory, and almost the same number of teachers indicated that at least one student was retained in their classrooms.

3.1. Grade retention beliefs' connectivity

The theoretical model tested presented good levels of fit – $\chi^2(754) = 1050.53$, $p < .001$; CFI = 0.978; TLI = 0.975; RMSEA = 0.030, IC 90% [0.026, 0.035], $p = .999$, SRMR = 0.067 – which indicates that the model correctly explained our data. Nevertheless, to provide a more parsimonious model, we removed all non-significant paths that did not affect the model's fit or predictive power. Therefore, teachers' perceived knowledge about grade retention, school location, and the number of students in the classroom were removed from the model. Although teachers' beliefs about equality of treatment did not significantly predict teachers' beliefs about grade retention, it was maintained in the model since the exclusion of the variable affected the model's fit, probably because of the significant correlation between this variable and teachers' beliefs about learning, assessment, and

Table 2
Descriptive statistics about teachers experience with retention.

Variable	Category	n	%
Number of students retained in your class in the last school year	Did not retain students	309	68.8
	Retain one or more students	135	30.1
	Missing	5	1.1
I was retained during my school years	No	277	61.7
	Yes	169	37.6
	Missing	3	0.7
I have read articles in scientific magazines about the effects of grade retention	No	68	15.1
	Yes	378	84.2
	Missing	3	0.7

Table 3
Descriptive statistics and correlations between variables.

Dimensions	1	2	3	4	5	6	7	8	9	10	11	Min.	Max.	M	SD
1. Socio-affective risks	–											1.00	6.00	3.24	1.20
2. Prevention of failure	−.51***	–										1.00	6.00	4.08	1.24
3. External regulation	−.37***	.62***	–									1.00	6.00	3.05	1.07
4. Transmissive	−.02	.18***	.25***	–								1.00	6.00	4.21	1.05
5. Constructivist	.17***	−.01	−.04	.31***	–							2.67	6.00	4.99	0.75
6. Summative	.11*	.15**	.19***	.15**	.25***	–						1.00	6.00	4.42	1.06
7. Formative	.02	.22***	.20***	.16***	.19***	.67***	–					1.00	6.00	4.50	1.10
8. Fixed	.03	.19***	.25***	.22***	.08	.17***	.13**	–				1.00	6.00	3.05	1.08
9. Malleable	.29***	−.05	−.01	.25***	.28***	.26***	.27***	.06	–			2.33	6.00	4.87	0.77
10. Equality of treatment	−.05	.09	.03	.31***	.30***	.18***	.14**	.03	.11*	–		1.00	6.00	4.91	1.03
11. Knowledge	.10*	−.06	−.04	.01	.07	.09	.04	−.02	.08	.09		1.00	5.00	3.03	0.76
12. Colleagues agreement	−.16**	.33***	.26***	.14**	.01	.09	.09	.10*	.03	.12*	−.08	1.00	5.00	3.76	1.30

*$p < .050$.
**$p < .010$.
***$p < .001$.

intelligence. The final model presented an excellent fit – $\chi^2(644) = 916.12$, $p < .001$, CFI = 0.980, TLI = 0.978, RMSEA = 0.031, IC 90% [0.027, 0.036], $p = .999$; SRMR = 0.054. The standardised coefficients are presented in Fig. 1. The model predicts 32.7% of the variability in the dimension socio-affective risk, 35.5% of the prevention of failure, and 38.6% of the external regulation of learning dimensions. In the supplementary material, we present the unstandardised coefficients and the covariance between the model predictors.

The best predictor of teachers' beliefs about the socio-affective risk of retention was their beliefs about the malleability of intelligence, with a moderate effect. Teachers who believed more that intelligence could be changed believed more that retention could have risk in students' socio-affective characteristics. Additionally, teachers that believed more in intelligence as a fixed trait and teachers with more experience and qualifications believed more in the socio-affective risk. In contrast, teachers who believed more in the transmissive teaching-learning model and the formative assessment purpose, teachers who were ever retained and teachers who perceived that their colleagues agree with their own beliefs believed less in the socio-affective risk of grade retention.

Regarding grade retention effectiveness in preventing failure, the best predictors were teachers' beliefs in the direct transmission view of the teaching-learning process and teachers' perception of colleagues' agreement with their own beliefs. Teachers who believed more in the transmissive teaching-learning model and perceived that their colleagues share their same beliefs regarding retention believed more in the effectiveness of retention to prevent failure. Also, teachers who believed more in the summative and formative purpose of assessment believed more in grade retention effectiveness. On the other hand, teachers who believed in the constructivism model and in the malleability of intelligence, male teachers and more experienced teachers believed less that retention effectively prevented failure.

Finally, the best predictors of teachers' beliefs about the effectiveness of retention for external regulation were their beliefs about the teaching-learning process and the summative assessment purposes. Teachers who believed more in the transmissive model and in the summative purpose believed that grade retention could effectively regulate students' motivation and behaviour. On the other hand, more experienced teachers and teachers who believed more in the constructivist model believed less in its effectiveness for external regulation. Additionally, teachers' perception of colleagues' agreement with their own beliefs was positively associated with their beliefs in grade retention effectiveness (See Fig. 1).

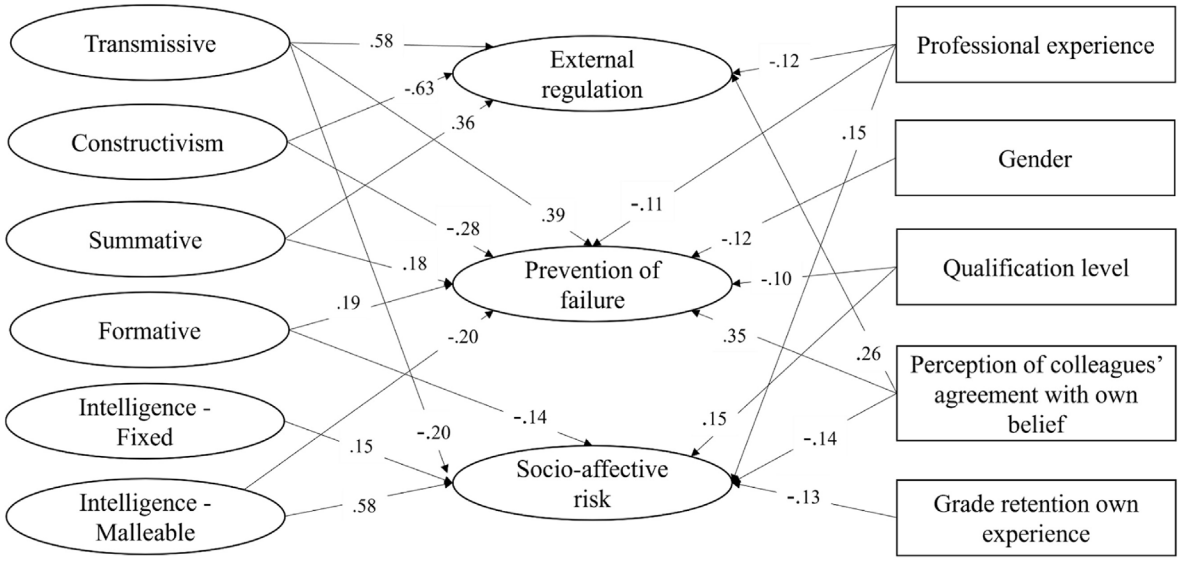

Fig. 1. Standardize Coefficients of the Structural Equation Model Tested.

3.2. Grade retention beliefs' psychological centrality

To identify groups of teachers that differentiated in their patterns of beliefs about grade retention and their related psycho-pedagogical beliefs (teaching and learning, assessment, and intelligence), we estimated a series of LPA models with between 1 through 8 profiles (Models 1 through 8). Model 3 was retained as the best model. The fit statistics of each model and the selection process of the best fitting profile solution are provided in the supplementary material.

What most differentiated each group was the strength by which they believed in grade retention risk and benefits. Therefore, we organise the profiles accordingly to the strength and direction of these beliefs (see Fig. 2). Hence, Profile 1 group teachers that, on average, believed more in the risk of retention and less in its benefits. Their negative beliefs about the effectiveness of retention for the external regulation and their positive beliefs in its socio-affective risk were more central and firmly held (closer to the top and bottom of the scale) than their negative beliefs about grade retention effectiveness to prevent failure. Only a small group of teachers presented these characteristics (21.6%).

Most of the teachers were in Profile 3 (49.7%). This profile contains the teachers that believed less in the risk of grade retention and more in its benefits. But only their beliefs about grade retention effectiveness for failure prevention were central. Their beliefs about the socio-affective risk and its effectiveness for external regulation were closer to the mean point of the scale (see Fig. 2), indicating that these beliefs were less firmly held.

Finally, teachers in Profile 2 held less firm beliefs about grade retention. Their beliefs were closer to the mean point of the scale. For these teachers, grade retention beliefs seem to be peripheral.

For all three groups, beliefs about constructivism and the malleability of intelligence were central (in a positive direction). But these beliefs were more central for the teachers in the group against retention (Profile 1). Beliefs about the transmissive model were more central for teachers in Profile 3 and peripheral for teachers in Profile 2. Beliefs in the summative and formative purpose of assessment were also central for teachers in Profiles 1 and 3 but were more strongly held by the teachers in favour of retention (Profile 3). For teachers in Profile 2, the beliefs about assessment were peripheral. Beliefs about intelligence as a fixed trait were closer to the average for all profiles, but teachers in Profiles 1 and 2 were more against this belief than the group of teachers in favour of grade retention (see Fig. 2). The supplementary material presents each construct's average score and standard deviation by teachers' profiles.

3.3. Teachers' grade retention beliefs and their practices

Chi-square analyses indicated that there was no relation

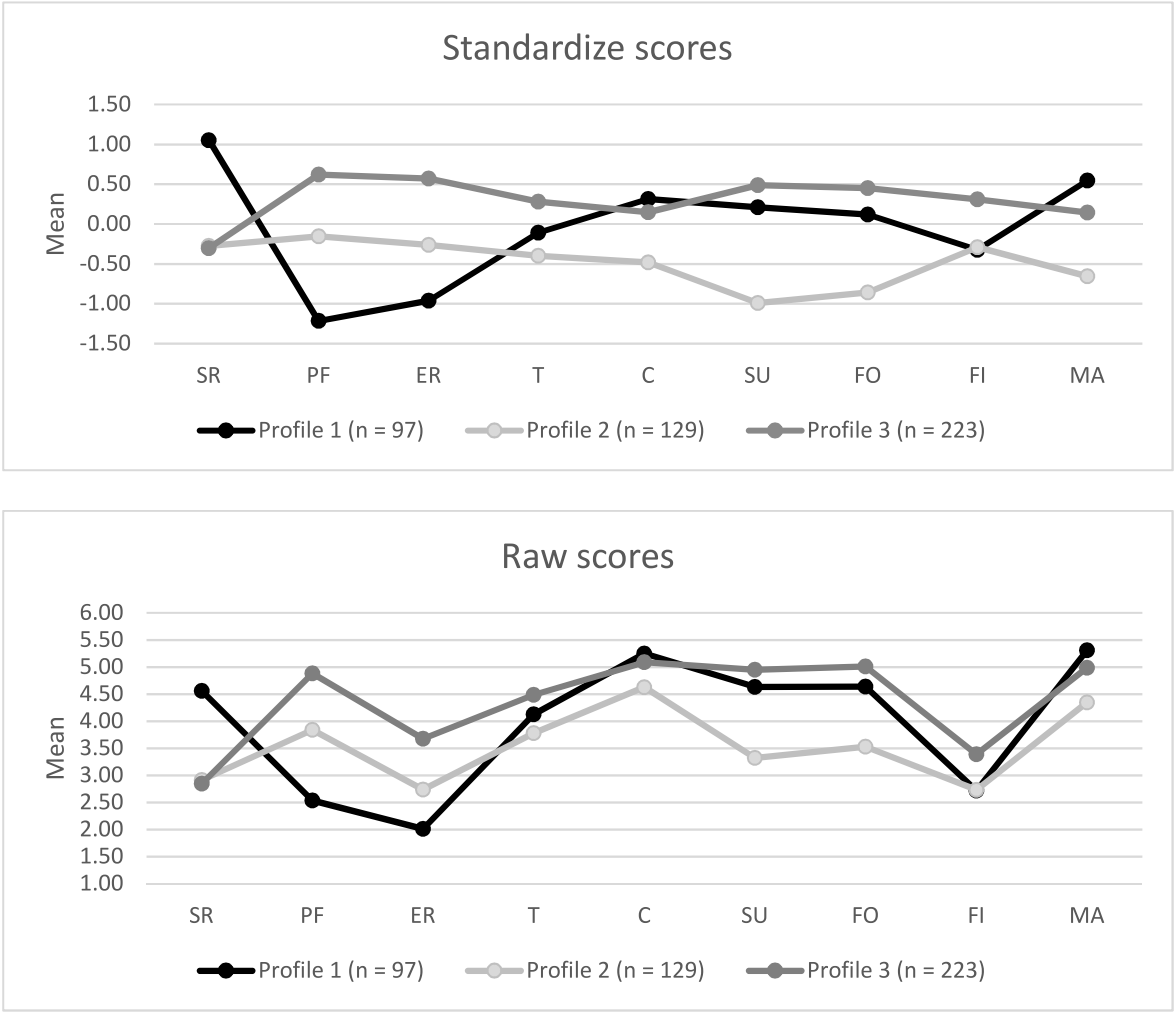

Fig. 2. Mean standardize and raw scores for each beliefs' profile identified.

between teachers' beliefs profile and the retention of students in their classroom in the previous year – $\chi^2(1) = 0.53$, $p = .465$, Kendall's tau-b = 0.028, $p = .641$. The proportion of students retained was similar in the three profiles (see Fig. 3). However, the teachers' council's opinion must be consulted during grade retention decisions (Portaria N° 233, 2018), and teachers' behaviour could be influenced by societal beliefs and pressures (Ajzen, 1991). Therefore, we explore the association between beliefs and practices separately for the teachers who felt their colleagues agreed with their beliefs about grade retention (n = 254) and those who did not (n = 194). Results indicated that when teachers feel that their colleagues agree with their own beliefs, the association between beliefs and practices becomes significant – $\chi^2(1) = 4.46$, $p = .035$; Kendall's tau-b = 0.13, $p = .027$. According to the adjusted residuals (AR), teachers in Profile 3, who favour retention, retained significantly more students than would be expected if beliefs and

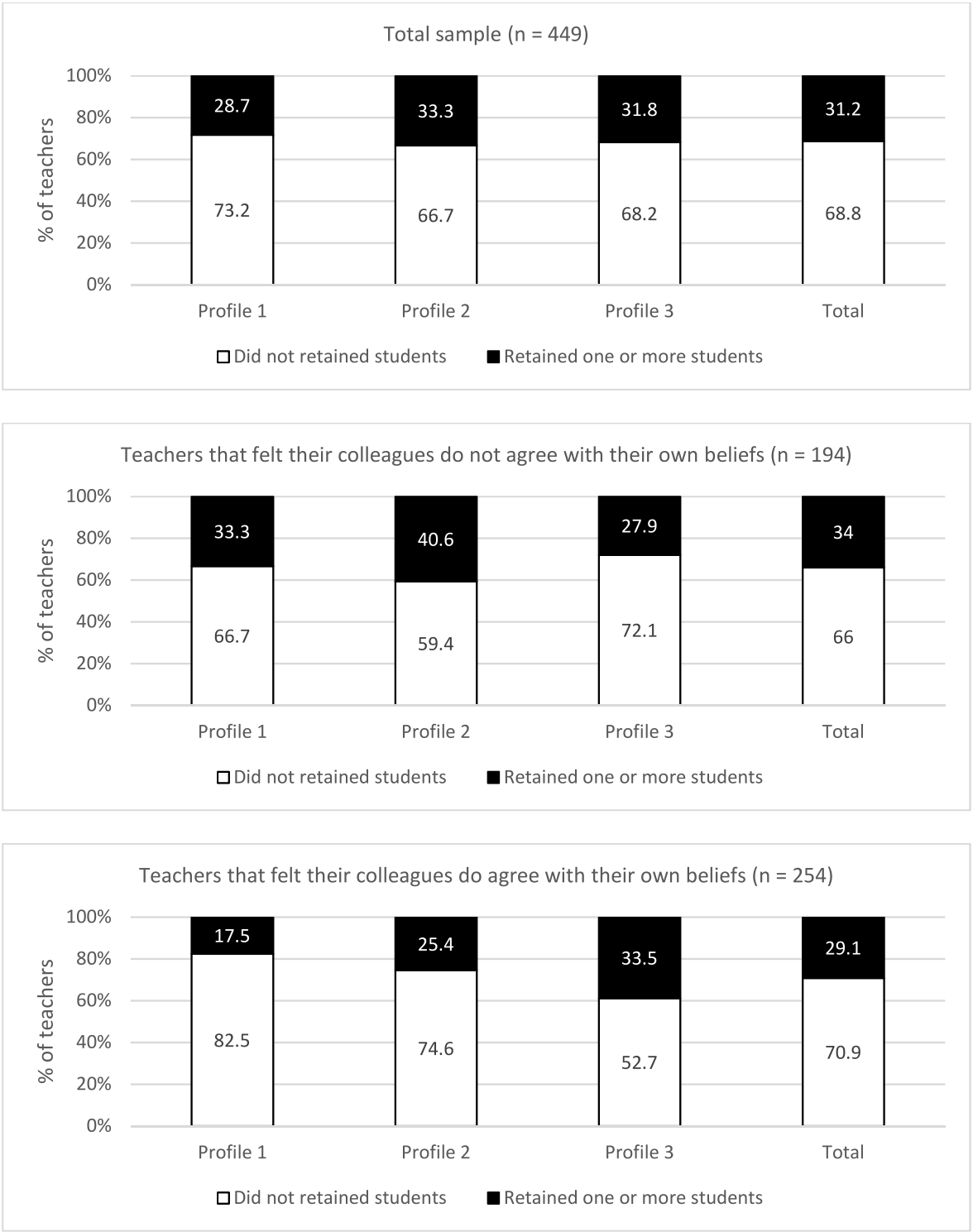

Fig. 3. Proportion of teachers that retained students by teachers' beliefs profile.

practices were unrelated (AR = 2.0, see Fig. 3). Teachers in Profile 1 retained fewer students than expected, but the adjusted residuals only suggest that these differences were marginally significant (AR = −1.8). The supplementary material presents the frequencies of students' retention by teachers' profiles.

4. Discussion

The present study aimed to understand grade retention beliefs position within the teachers' beliefs system by exploring: 1) the connection between teachers' grade retention beliefs and their general conceptions about the teaching-learning process, assessment, intelligence, and fairness in education; 2) the centrality of teachers' beliefs about grade retention; and 3) its relationship with teachers' grade retention practices.

Regarding grade retention beliefs' connectivity, results suggest that Portuguese teachers' beliefs about grade retention were related to their broader psycho-pedagogical beliefs system. The most robust connections were observed with teachers' beliefs about teaching and learning. Teachers' beliefs about grade retention were influenced by the conception of teaching and learning they held, following the logical structure suggested by previous studies (Crahay et al., 2013; 2014, Pouliot, 1999). The more teachers considered learning a mere knowledge transmission, the more they believed that grade retention was effective; the more teachers believed in the constructivist model, the less they believed in the retention benefits.

Our findings also indicated that the more teachers believed in the summative and formative purposes of assessment, the more they believed in the effectiveness of retention. An explanation for these results could be that, according to Serpa's study (2010), Portuguese teachers may consider grade retention both a selective and a formative practice. After all, Portuguese legislation considers grade retention a decision that 'is pedagogical in nature' (Portaria n° 233, 2018, p. 11).

Teachers' beliefs about the malleability of intelligence were also related to their belief about grade retention, as suggested by Goffin and Monseur (2013). As expected, teachers who believed that intelligence was malleable believed less in grade retentions effectiveness and believed retention could have detrimental consequences on students' socio-affective characteristics. Unexpectedly, we also observed that teachers who believed more that intelligence is a fixed trait also considered that grade retention could have risk in students' socio-affective characteristics. Individuals with fixed mindsets usually avoid attempting complex tasks because they view challenges as a sign of lacking intelligence (Yeager & Dweck, 2012). It is possible that teachers who believed more in intelligence as a fixed trait also believed that the students would see grade retention as confirming their lack of intelligence, with negative implications in their academic self-concept.

Finally, although we expected a significant relationship between teachers' beliefs about educational fairness and grade retention beliefs, this relation was not found. Still, it is essential to notice that the most robust relationships observed by Ribeiro et al. (2018) and Crahay et al. (2014) were related to teachers' beliefs in a differential treatment to correct inequalities that we were unable to assess accurately in this study. Future studies must improve this measure to understand its relation to grade retention beliefs better.

Concerning grade retention beliefs' psychological centrality, our results seem to suggest that, for most teachers, the psycho-pedagogical and grade retention beliefs were firmly held. The large proportion of teachers classified in Profile 3 suggests that beliefs about the benefits of retention are widespread in Portuguese schools, regardless of the little empirical evidence of the effectiveness of the practice (Goos et al., 2021). The teachers strongly held only one of the dimensions of grade retention beliefs. Still, the equation modelling suggests that teachers with positive beliefs about grade retention effectiveness perceived their colleagues shared their beliefs. In contrast, teachers with negative beliefs about grade retention effectiveness perceive that their colleagues do not share their beliefs. Altogether, these findings suggest that for many teachers, positive beliefs about grade retention are central, strongly connected with other beliefs and strongly shared within the community.

Regarding the relationship between teachers' grade retention beliefs and their practices, our results also support Fives and Buehl (2012) hypothesis that core or central beliefs strongly connected within the beliefs system are more strongly related to teachers' practices than peripheral beliefs. Only the teachers who firmly held beliefs in favour of retention retained more students than expected but only when their colleagues shared their beliefs about grade retention. In other words, the evidence implies that teachers' beliefs were reflected in their practices only when their beliefs were strongly held and when they felt that their colleagues supported their beliefs.

If teachers' grade retention beliefs are central, strongly connected to other beliefs and shared by the community, they will be not only more easily expressed in teachers' practices, but they would also be more resistant to change than other beliefs (Buehl & Fives, 2015; Rokeach, 1968). According to several authors (Crahay et al., 2016; Richardson, 1996; Rokeach, 1968), having more connection with the beliefs system and being shared with others makes that a core belief requires more effort to evolve. Thus, according to this theoretical hypothesis, teachers training to transform central beliefs as grade retention beliefs should encounter more resistance throughout the process because more beliefs should be targeted (Crahay et al., 2016). If retention beliefs are associated with primary beliefs about the teaching-learning process, assessment and intelligence, training aiming only at changing retention beliefs may not be enough to achieve the goals. Training should focus on transforming the psycho-pedagogical system, affecting specific beliefs such as retention (Buehl & Beck, 2015; Crahay et al., 2016).

Furthermore, our results stress the need to consider the community's beliefs when examining teachers' beliefs, which have been neglected in previous studies. Since teachers are embedded in a social context that may advance or inhibit their beliefs and behaviours (Ashton, 2015), training must also involve changes in the school culture. Addressing beliefs and practices alone would not be as effective as considering broad changes in school culture.

It is crucial to note that our results seem to support that teachers' knowledge of scientific research about grade retention was not a very relevant predictor of their beliefs. As suggested by Crahay et al. (2016), their belief seems to form independently of this knowledge, and teachers do not regularly turn to research for knowledge (Fives & Buehl, 2012; Witmer et al., 2004). And even when showing actual knowledge of research on the effect of repetition, they can maintain beliefs in the benefits of this practice, as observed by Crahay et al. (2013) and Thomm et al. (2021). Therefore, changes in knowledge without changes in beliefs may not be particularly meaningful (Fives & Buehl, 2012). After all, grade retention proves to be very useful if the purpose is to create more academically homogeneous classes and when the tradition and the school culture support those beliefs (Serpa & da, 2010).

Our results also suggest that teaching experience and qualifications were relevant in the formation of teachers' beliefs about

grade retention. Teachers with more experience and qualifications believed less in the benefits of the practice. These results are similar to the ones encountered by Ribeiro et al. (2018), in Brazil, Santos and Monteiro (2021) in Portugal, and Walton (2018), in South Africa. Research suggests that teachers' knowledge about retention is attributed to their personal experience with retained students (Cameron-Minard, 1993; Witmer et al., 2004), so perhaps they do not believe in research results until they can link this knowledge to their own experience. Still, the study's cross-sectional design and correlational nature do not allow us to determine causal relationships or understand whether academic training of professional experience significantly affects teachers' beliefs and practices development. Longitudinal studies will be needed to analyse teachers' beliefs throughout their formative and professional paths.

In summary, our results suggest that grade retention beliefs are integrated within teachers' psycho-pedagogical beliefs system with a high degree of connectivity and intensity, especially when shared by the teachers' community. These characteristics may have implications for beliefs stability, making them more permanent, influencing teachers' practices and the integration of new educational policies to reduce the grade retention rates. Our findings hold specific implications for both research and practice.

For research, the complex nature of grade retention beliefs observed in this study highlights the need for investigators to consider a broader array of specific beliefs, as well as the cultural context when examining the mechanisms that explain the relationship between beliefs and practices. As Gill and Fives (2015) suggested, the evidence presented in this study indicates that theory needs to move away from an individual and topic-focused study of beliefs and examine beliefs as evoked in practice by the context. These would allow a better insight into individual and contextual factors influencing teachers' practices.

Our results also offer some practical implications. The lack of positive effects of grade retention (Goos et al., 2021) and the high retention rates observed in several countries (EC, 2020) suggest that this practice is used more often than would be recommended. Since the evidence in the present study indicates that teachers' grade retention beliefs influence their practices, especially when shared by their community, it is necessary to improve the training of teachers by promoting critical reflections on their grade retention beliefs and practices. We suggest, as Kagan (1992), a three-step intervention: 1) help teachers to be aware of their array of psycho-pedagogical beliefs; 2) help them to confront those beliefs between each other, highlighting their internal contradictions, inconsistencies and even inadequacies with their teaching goals and their specific context; and 3) allow them to integrate new scientific knowledge to replace the non-adapted beliefs. Policymakers and school leaders shall have to provide high-quality professional development for all teachers in their school system, developed by experience teachers from schools who have avoided using grade retention. The goal will be to create professional learning communities where teachers share and reflect on their day-to-day lived experiences as teachers. These learning communities should focus not only on educating teachers about the disadvantages of retention but also on using constructive strategies of learning and formative assessment and developing a growth mindset wherein intelligence is seen as malleable. Fostering an integrated system of beliefs through a coherent set of experiences will best support teachers in implementing formative research-based interventions (e.g., differentiated instruction, curricular accommodation, and small group intervention). If that is the case, these beliefs and practices will reduce grade retention, improve students learning, and boost teachers' satisfaction with their work (Buehl & Beck, 2015).

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Note. Estimator: WSVML. Latent constructs are represented as circles and observable variables are represented as squares. Non-significant path and covariance between independent variables are not represented; $\chi^2(644) = 916.12$, CFI = 0.980, TLI = 0.978, RMSEA = 0.031, SRMR = 0.054.

Note. SR = socioaffective risk; PF = prevention of failure; ER = external regulation; T = transmissive; C = constructivism; SU = summative; FO = Formative; FI = Fixed; MA = Malleable.

Data availability

Data will be made available on request.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.tate.2022.103939.

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