What is teachers' belief in the virtues of student retention founded on?

Cosa rende gli insegnanti convinti dei benefici della ripetenza?

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The aim of this research is to try to explain beliefs of teachers in favour of student retention, beginning with their psycho-pedagogical beliefs in other areas: learning, intelligence, assessment, principle of justice. A questionnaire was administered to 112 primary teachers of the Belgium French. The responses have been processed through factor analysis to construct and validate metric scales. Then, using regression equations, we have tried to predict beliefs about student retention using other categories of beliefs. Finally, we conducted cluster analyses in order to identify groups of teachers, distinguishable by the nature of their beliefs. Two major results emerge from these analyses. On the one hand, it appears that the awareness of research on the effects of repetition influences teachers' beliefs about this practice. On the other hand, contrary to our assumptions, the other categories of beliefs do not seem to affect teachers' beliefs about student retention. These results are discussed in relation to the classical theories postulating that beliefs and social representations are organized into a system.

La presente ricerca ha lo scopo di tentare di spiegare la credenza degli insegnanti a favore della ripetenza a partire dalle loro credenze psico-pedagogiche in altri campi: apprendimento, intelligenza, valutazione, principio di giustizia. Un questionario è stato sottoposto a 112 insegnanti primari della CFWB [Communauté Française Wallonie-Bruxelles, N.d.T.]. Le risposte ottenute sono state trattate attraverso analisi fattoriali al fine di costruite e validare delle scale metriche. In seguito, utilizzando delle equazioni di regressione, abbiamo tentato di predire le credenze relative alla ripetenza usando le altre categorie di credenze. Infine, abbiamo proceduto a delle analisi tipologiche con lo scopo di identificare dei gruppi d'insegnanti distinguibili per la natura delle loro conoscenze. Due risultati principali risultano da queste analisi: da una parte, sembra che la conoscenza delle ricerche sugli effetti della ripetenza influenzi le credenze degli insegnanti a proposito di tale pratica; dall'altra, contrariamente alla nostra ipotesi, le altre categorie di credenze non sembrano influenzare la credenza degli insegnanti a proposito della ripetenza. Tali risultati sono discussi in relazione con le teorie classiche, che postulano che le credenze e le rappresentazioni sociali sono organizzate in un sistema.

Key words: experiential learning, teaching experience, resource, novice teacher

Parole chiave: Ripetenza, credenze degli insegnanti, rappresentazione sociale

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Introduction

The problem of repetition is an exemplary case of the opposition which may be encountered between teachers' beliefs and research results. Indeed, in many countries (especially in French-speaking countries, but also in Southern Europe), student retention is in use with the strong approval of teachers (and parents) while many studies have demonstrated the inefficiency of this practice, and even its negative effects (see Crahay, 2005, 2007). This paradox challenges us as researchers, surprised that teachers' beliefs and practices apparently resist scienctic evidence in the field, as well as attempts to introduce reform (see in particular on this subject Crahay & Donnay, 2001, 2002). This leads to the question: "Why do they carry on with student retention? "(Marcoux & Crahay, 2008). And therefore, they follow in Mannoni's footsteps (1998) to question "the psychological mechanisms which support the constituent representations of beliefs [...] which can be identified" (p. 31).

Certainly repetition is rooted in a traditional notion of school because, as pointed by Pouliot and Potvin (2000), "student retention is used since school as a social institution exists, that is to say, since students are grouped by levels constituting barriers which hold back students who do not achieve the fixed objectives"(p. 49). Moreover, this social practice is compatible with a series of arguments and perceptions about students, the way they learn and their "intelligence" which support teachers in their use of repetition against those who struggle. Thus, noting that some students have not managed, at the end of the school year, to learn some notions judged fundamental to take up those of the following year, many teachers consider it reasonable to make them repeat the school year in order to "solidify the foundations". In such cases, teachers use a metaphorical reasoning: scholastic learning is assimilated to the construction of a house and it is known that it must be based on solid foundations. This way of reasoning seems to confirm the observation of students who repeat; it is common, in fact, for teachers to see progress in repeaters and ascribe them – erroneously, from the point of view of researchers – to the fact that they are repe**a**ting the school year. Other times, teachers use arguments based on "maturity", "citing age, size or girth of the child" (Marcoux & Crahay, 2008, p. 508) or arguments referring to aspects of the nature and development of cognitive abilities, such as the lack of understanding (Desombre, Delelis, Antoine, Lachal, Cleavers & Urban, 2010; Do, 2007). In short, like many beliefs about education, those concerning student retention seem to fit in some sort of personal theory or implicit theory (Vause, 2009) of teaching, learning and development. The impermeability

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of this belief to researchers' findings could be explained then by its integration into a network of ideas, beliefs and/or representations.

The assumption that beliefs (or representations) are structured in a network or a system is classic. It is common to different theories: that of Rokeach (1976), who postulates the centrality of certain beliefs over others, that of Green (1971), who suggests that beliefs are organized in clusters (sets of beliefs) more or less isolated the one from the other, or even totally free of relations amongst them, or that of Abric (1989), according to whom the social representations are structured around organizing elements, forming the stable core, and involve peripheral elements, which can fluctuate depending on the circumstances and thereby exert a buffer role towards reality data which would otherwise undermine its foundations. This general assumption, mainly stemming from social psychology, has established itself amongst educational researchers. It is notably what leads Marcoux and Crahay (2008, 6) to undertake the investigation of "the structure of beliefs by trying to understand which configuration(s) of belief(s) give(s) account – at least partially – of certain practices". This line of research is equally recommended in the overview of Crahay, Wanlin, Issaieva and Laduron (2010) on the psycho-pedagogical beliefs of teachers. It is within this conceptual line that this research falls.

Our goal here is to investigate the beliefs of primary teachers in the CFWB for what concerns student retention. The aim is to identify some of the determinants of the belief of teachers with regard to the positive effects of repetition. This is also our first hypothesis; indeed, on the basis of previous research (Crahay, 2007), we assume that the majority of the teachers we interviewed were in favour of this practice. Then we will try to identify parameters which affect this belief. More exactly, our investigation starts from the assumption that even within the teaching system in the CFWB, where the decision to make a student repeat a year is commonplace, a certain variability of beliefs can be observed: even if the majority of teachers believe in the effectiveness of this practice, others are sceptical. It is on this variability of beliefs that our methodology is based. In this research, we seek precisely to identify some parameters which characterize teachers who believe in student retention versus those which characterize teachers who do not believe in it. More precisely, we assume that the belief in the benefits of repetition is nourished by other beliefs about learning, intelligence, assessment and the principle of justice which must reign in school.

With regard to research on the effects of repetition, it does not seem realistic to assume that all teachers ignore it, considering how much it was advertised in the CFWB both by the media and by the researchers. How do those who are aware of the researchers' conclusions deal with this knowledge? This is a central question of this research. Referring to Smith's survey (1990) on a small number of teachers from the USA, which showed that the belief in the benefits of repetition was related to the conception of development those teachers have, we formulate the hypothesis that teachers aware of research in the field are more inclined to hold back their results than those who have a conception based on pupils' maturity. In contrast, those who believe that development is a matter of social interactions and educational influences are likely to integrate this knowledge into their pedagogic theory.

In detail, here are the assumptions we made on the basis of our previous work (Crahay & Donnay, 2001 & 2002; Marcoux & Crahay, 2008), to submit it to empirical verification. Assuming that teachers' beliefs regarding repetition are influenced by their beliefs about learning, intelligence, assessment and justice, we make the following specific assumptions:

- H1 – The majority of primary teachers in the CFWB remain favourable to the practice of repetition, which they think offers a second chance to pupils in difficulty.

- H2 – The beliefs of teachers concerning repetition are influenced by the concept of learning they develop.
  a. The more they are constructivist, the less they are likely to make a student repeat a year - disruption and trial and error reflecting their mode of operating.
  b. In contrast, the more teachers look at learning as something mechanical ("the trigger"), the more they will tend towards student retention.
- H3 – The beliefs of teachers regarding repetition are influenced by their conception of intelligence.
  a. Thus, teachers who have a progressive conception of intelligence – through interaction with the environment and the positive climate that is established – are less likely to believe in the efficacy of repetition.
  b. Conversely, teachers who consider intelligence as innate and think less intelligent students need more time to understand, are inclined to believe in the efficacy of repetition.
  c. We equally assume that teachers who consider the existence of different types of intelligence believe less in the usefulness of repetition than those who do not have the same conception of intelligence.
- H4 – Teachers who assign to student assessment a regulatory or formative function are less likely to believe in the utility of student retention. They thus consider evaluation as a means in the service of learning and not as a tool of punishment. Conversely, teachers who envision evaluation as normative, allowing to classify students, are more favourable to the practice of repetition.
- H5 – Teachers inclined to adhere to the ideology of equality of treatment, and therefore to consider the educational relationship as having to be identical for all students, are likely to use the practice of repetition.

It is important to note that the hypotheses H2, H3, H4 and H5 presuppose a precise structuring of teachers' beliefs. Thus, hypothesis 2 supposes that some teachers have a constructivist view of learning and others have a "trigger" theory. Hypothesis 3 is based on the idea that some teachers have an evolutionary conception of intelligence while others are nativist and others yet follow Gardner's theory of multiple intelligences. As for hypothesis 4, it counts on the distinction between teachers who emphasize formative assessment and others who prefer a normative approach. Finally, hypothesis 5 assumes a division of teachers into two groups: some adhere to the ideology of equality of treatment, while others adhere to the equality of achievement. To test these four hypotheses, we will have to confirm this structuring of beliefs by factor analysis.

With regard to the influence of knowledge of this research on beliefs, we are in doubt, considering the research mentioned above. Findings suggest that teachers know little or nothing of such research; in particular, the older ones who, having left teachers' college long time ago, have not been trained on this subject. This will be our hypothesis 6, which we formulate as follows:

- H6 – The majority of primary teachers are not aware of research on the effects of repetition. This is especially the case for teachers who have several years of service.

Moreover, some researchers suggest that, even when they know the research, teachers do not actually change their beliefs (Crahay & Donnay, 2001, 2002). It is mainly on this point that we are in doubt. We will accordingly produce a seventh hypothesis:

- H7 – Even when they are aware of research on repetition, teachers continue to believe in the usefulness of this practice.

Finally, making the general hypothesis that teachers' beliefs are likely to be articulated in personal "theories", we will try to identify patterns of beliefs using cluster analysis. Thus, it would seem logical that teachers who adhere to a corrective conception of justice (equality of achievement), adhere as well to a formative conception of evaluation, have a progressive conception of intelligence and a constructivist view of learning, and, consequently, do not believe in the virtues of repetition, especially if they were made aware of the research on the subject. As for teachers convinced of the effects of student retention, it seems plausible to assume that they are characterized by a profile of opposite beliefs.

1. The research method

The sample of teachers surveyed

A questionnaire was presented to a sample of 112 primary school teachers in the region of Liège in Belgium. To ensure maximum diversity to this convenience sample, recruitment has been conceived according to two axes: (1) the number of years of service and (2) the class taught (the level of schooling taken in charge by the teacher). The resulting sample is presented in Table 1.

Note that we wanted to have an identical number in each cell, but it was not possible. Nevertheless, it will be possible to test the effect of age on the knowledge of research on the effects of repetition (hypothesis 6)

Years of service	Class taught				Total
	1P – 2P	3P – 4P	5P – 6P	Other	
Between 0 and 10 years	6	10	9	5	30
Between 11 and 20 years	11	8	7	5	31
More than 21 years	22	11	15	3	51
Total	39	29	31	13	112

Tab. 1: The sample obtained

The structure of the questionnaire presented to teachers

The questionnaire results from the assembly of different questionnaires developed by members of our research team. The set comprises 153 items, divided into six categories, which correspond to the different variables involved in our assumptions:

1. Beliefs related to repetition, its effects and conditions of success, the reasons to opt for it (Source: Boraita & Marcoux, submitted): 47 items;
2. Knowledge of research on repetition and their results (Source: Boraita & Marcoux, submitted): 8 items;
3. Conceptions of intelligence (Source: Issaieva & Crahay, submitted, a): 41 items;
4. Beliefs about learning (Source: Issaieva & Crahay, submitted, b): 28 items;

5. Conceptions of assessment (Issaieva & Crahay, 2010): 14 items;
6. Principles of justice (Crahay, unpublished): 15 items.

The items are presented in the form of a Likert scale ranging six points from the pole "totally disagree" to the pole "strongly agree". As a result, the more the average of responses to an item tends to 6, the more teachers voted in agreement with the proposition.

The questionnaire on teachers' beliefs is completed by a series of dichotomous questions, multiple choice, semi-open and open, designed to gather information on the situation, both "personal" (gender, age, education, etc.) and professional (training followed, number of years experience, style of classroom management), of each teacher. These questions are placed at the end of the questionnaire.

2. Results

Construction and validation of scales by factor analysis

The whole questionnaire contains 153 items (plus those known as identification questions) for which we have responses from 112 teachers. To obtain metric scales structured according to the patterns of teachers' responses, we conducted as many exploratory factor analyses as the categories distinguished in the development of the questionnaire (Table 2). As a reminder, the exploratory factor analysis (EFA) has the function of gathering the items according to the similarity of the responses which the subjects interviewed gave. More precisely, it is a statistical technique which enables variables that are not directly observable (latent) to be analysed, defined in turn by various observable and inter-correlated combinations of parameters (items). The objective, by applying this analysis to our data, is to identify and name these latent variables, also called common factors, by examining the manifest (hence measurable) parameters that comprise them. Note that from these analyses results the suppression of a certain number of items (with factor loading lower than 0.30), and thus the reduction of the total number of those taken into account (N = 84 remaining items).

Exploratory factor analyses have all been successful in the sense that, for all the questionnaires, it was possible to extract a certain number of robust and coherent factors. In addition, all scales formed by the EFA have good indicators of internal consistency (Cronbach's alpha).

Questionnaire	Factors selected	% of variation explained	Number of items	Cronbach Alphas
Repetition	Repetition has negative effects (F1)	16,920	6	0,853
	The practice of repetition is beneficial (F2)	33,632	7	0,783
	Repetition seen as a source of motivation for the student (F3)	11,327	2	0,775
Learning	Learning is developed around a constructivist conception (F4)	23,930	5	0,797
	Learning takes place through repetition (F5)	11,929	5	0,806
	Learning is transmitted through an implicit approach (F6)	9,401	4	0,695
	Learning requires the "trigger" (F7)	5,695	3	0,659
Intelligence	Intelligence is developed through interaction with the environment (F8)	18,762	8	0,801
	Intelligence is seen as innate with regard to the speed of understanding (F9)	14,647	9	0,93
	Intelligence is seen as innate with regard to the different styles of intelligence (F10)	8,480	9	0,857
	Intelligence is developed by the cumulative contribution of knowledge and culture (F11)	6,787	6	0,761
	Intelligence is multiple (F12)	4,339	3	0,754
Assessment	Assessment is in the service of school regulation (F13)	26,835	3	0,720
	Assessment is seen as a normative tool (F14)	22,021	3	0,680
Justice	Equality of treatment (F15)	23,368	4	0,727
	Equality of achievement	27,308	2	0,768
Knowledge of research on the effects of student retention	Knowledge of the ineffectiveness of student retention (F17)	30,813	3	0,732
	Asserted knowledge of the effectiveness of student retention (F18)	14,652	3	0,454

Tab. 2: Construction and validation of scales by exploratory factor analysis

All exploratory factor analysis have been attested by confirmatory factor analysis; as shown by the data given in Table 3, the fit indices are satisfactory every time.

CFA related	Fit indices
Beliefs about repetition	***Chi-square (dl =24) = 39,2 ; RMSEA = 0,08 ; CFI = 0, 95***[2]
Knowledge of research on the effects of repetition	***Chi-square (dl =5) = 8,3 ; RMSEA = 0,08 ; CFI = 0, 96***
Conceptions of intelligence	***Chi-square (dl=170) = 242,0 ; RMSEA= 0, 06 ; CFI = 0,91***
Beliefs about learning	***Chi-square (dl=72) = 110,8 ; RMSEA= 0, 07 ; CFI = 0,91***
Conceptions of assessment	***Chi-square (dl=8) = 15,071 ; RMSEA = 0, 09 ; CFI = 0,95***
For the principles of justice	***Chi-square (dl=9) = 17,254 ; RMSEA = 0, 09 ; CFI = 0,94***

Tab. 3: Results of confirmatory factor analyses

The results of these analyses combined with the examination of averages and standard deviations calculated for the 84 items selected and the calculation of correlations between factors (see Appendix 1 for the correlation matrix) make it possible to draw a first series of observations:

- Regarding the effects of repetition, it appears that teachers do not express marked belief. The averages calculated for each of the items in this category vary between 2.54 and 4.26, that is to say between slightly negative opinions (between 2.54 and 3) and slightly positive ones (between 3 and 4.26)[3]. In short, the trends are less marked. Neither are the standard deviations very high (between 1.26 and 1.49). In other words, these trends express either moderate agreement or moderate disagreement. This is a first cause of astonishment, given what earlier surveys reveal (see Crahay, 2007). Furthermore, factor analysis highlights two clearly opposite factors (r = -0.49): the first (F1), which we call

2 Chi-square allows to estimate the importance of the difference between the anticipated theoretical model and the observed one. Its fit is the better the more 2 decreases to 0 without being significant at 0.05; the ratio of 2 and the degree of freedom must also not exceed the value of 2. The CFI ("Comparative Fit Index") evaluates the fit of the hypothetical model for null models. It varies from 0 to 1 and shows a good fit when it reaches at least 0.90. The parsimonious fit index, RMSEA ("Root Mean Square Error of Approximation"), evaluates the incurred risk that the models are little adequate to data. Until it does not exceed 0.09, it can be considered an acceptable fit.

3 Remember that, the scale ranging between 1 and 6, the average is 3,5.

"repetition has negative effects" and the second (F2), called "the practice of school retention is beneficial". This result suggests that the sample is divided into two groups of teachers with quite antagonistic conceptions. The third factor isolated by the factor analysis reveals a third belief: repetition would be a source of motivation for the student. Logically, this third factor (F3) is negatively correlated to the first (r = - .24). In other words, teachers who assign negative effects to repetition doubt that it can be a source of motivation for students who are subject to it.

- Factor analysis related to the knowledge of research on the effects of repetition highlights two opposing factors: one (F17) which includes responses attesting the knowledge of the ineffectiveness of this measure and the other (F18) revealing a false understanding of research results. It is thus clear that in the CFWB there are teachers who have a correct knowledge of research related to repetition; we shall see later that they are not a majority, which will confirm our hypothesis 6.

Other observations relate to other categories of beliefs.

- With regard to learning, it appears that the majority of teachers agree with several learning theories: namely constructivism (F4), learning by repetition (F5), a conception that can be termed behaviorist, learning "by trigger" (F7). The correlations between these three factors are positive (the r vary between 0.39 and 0.45) (see Appendix). On the other hand, they seem to be less favourable to the concept of implicit learning (F6): this factor is also negatively correlated with the other three. It can be noted that the emergence of factors 4 and 7 will allow to test hypotheses 2a and b; the appearance of factors 5 and 6 will possibly allow to formulate new ones.
- Factor analysis highlights five conceptions of intelligence. The first conception (F8), according to which intelligence develops through interaction with the environment, can be described as constructivist with regards to items which saturate the first factor. The progressive nature of intelligence would equally appears in factor 11, which is characterized by the importance attributed to the accumulation of knowledge. These two factors come into play as for the possibility to test hypothesis 3a. Factors 9 and 10 reveal two forms of nativism. The first (F9) emphasizes the speed and ease of some when it comes to learning: it is the intelligent one who learns and understands quickly, almost effortlessly. The second (F10) is partly inspired by Howard Gardner and his theory of multiple intelligences: intelligence is innate, but it can take different forms; in short, we are born with different potentials and different forms of intelligence. These two factors are important in view of our hypothesis which assumes a relation between the beliefs of the innateness of intelligence and those in favour of student retention (hypothesis 3b). The last factor (F12) covers only 4.34% of the total variance and is saturated with only three items, items that relate to intelligence styles. A look at the averages related to the items indicates that the conceptions revealed by factors 8 and 9 are dominant. These reflect two antagonist conceptions: a malleable and progressive one and, in contrast, an innate and fixed idea of intelligence. Surprisingly, the correlation between them is not negative: r = 0.17. More generally, the correlation matrix does not show any negative correlation between the various factors related to intelligence (see Appendix). On the other side, it shows a positive correlation between factors 8 and 11 (r = 0.36) and another between the factors 9 and 10 (r = 0.64); these correlations show links between, on the one hand, the two progressive conceptions and, on the other hand, between the two nativist ones.

- With regard to the assessment, teachers' beliefs are structured into two sets: (1) assessment serves the school regulation (F13); (2) assessment is used to classify students (F14). These two factors, which come into play with regard to hypothesis 4, are not correlated to one another (r = -0.07).
- With regard to questions regarding the principle of justice, two factors emerged: F15, comprising four items related to equality of treatment, and F16, gathering two items regarding the equality of achievement. These two factors, which are not correlated with each other, come into play with regard to hypothesis 5.

In general, the examination of the various averages and standard deviations suggests that the idea that there are clear-cut beliefs amongst the teaching staff should be excluded.

Exploring the links between beliefs by calculating correlations

The main purpose of this research is to find an explanation for teachers' beliefs in the benefits of repetition, moving from the theories in the field which posit that beliefs or representations of individuals are connected, in one way or another (see above). One way to explore our different assumptions on this subject is to calculate the correlations between the different scales identified by the factor analyses we made. This first analysis leads to timid results (see the correlation matrix in the Appendix); some correlations are consistent with some of our assumptions. Thus the belief in the benefits of repetition (F2) is correlated with the belief that intelligence is innate in relation to the speed of understanding (F9) (r = 0.23) and in relation to the difference of style of intelligence (F10) (r = 0.23), which is consistent with hypothesis 3b. The belief in the benefits of repetition is also correlated to a normative conception of assessment (F14) (r = 0.23), which is predicted by hypothesis 4.

Other correlations express trends opposite to our assumptions. Thus, we see that the belief in favour of student retention is negatively correlated (r = -0.28) with the knowledge of research in the field. This suggests an effect of knowledge of research on beliefs, which is reinforced by the finding of a strong positive correlation (r = 0.82) between the same factor 17 and the belief in the negative effects of repetition (F1). Table 4 shows all the correlations between factors 1 and 2 related to beliefs about repetition and factors 17 and 18 on the knowledge of research on the effects of repetition.

It can also be noted that the correlation between factors 17 and 18 is negative (r = -0.26). The same goes for factors 1 and 2 (r = -0.49).

	Belief in the negative effects of repetition (F1)	Belief in the benefits of repetition (F2)
Knowledge of the ineffectiveness of repetition (F17)	,817**	-0,280**
Asserted knowledge of the effectiveness of repetition (F18)	-,341**	0,237*

Tab. 4: Correlations between beliefs about the effects of repetition and knowledge of research in the field

What variables are useful to "explain" the belief in the benefits versus the dangers of repetition?

In order to consolidate these first results, we conducted two multiple regression analyses, one to "explain" the belief in the benefits of repetition (F2) and the other to "explain" (in the statistical sense) the opposite belief (F1). For the first regression analysis, we identified five factors significantly correlated (F9, F10, F14, F17 and F18) with the belief in favour of student retention and for the second two significantly correlated (F17 and F18) to the belief against this practice.

With regard to the belief in the benefits of repetition, we have proceeded in successive analyses using the backward regression method (the initial model includes all supposed variations to explain the belief of repetition and highlights those with the lowest input). In the first analysis, we have introduced the five factors mentioned above; the regression equation thus calculated explains only the 17.8% of the variance of the variable to predict (F2). A more economical and satisfactory model is obtained by using only two predictors: intelligence is innate in relation to the speed of understanding (F9) and ignorance of research (F18). By themselves, these two predictors explain the 15.7% of the variance of the belief in the benefits of repetition (Table 5). The presence of factor 9 in the regression equation goes in the direction of a relation between the belief that intelligence is innate and the belief in the benefits of repetition, which is consistent with hypothesis 3b. Nevertheless, the result produced is low, which we interpret as a sign that psycho-pedagogical beliefs scarcely explain the belief in the utility of repetition.

R	R2	R2 adjusted	Standard error of estimation	Variation of R2	Variation of F	ddl1	ddl2	Sig. Variation of F
0,397	0,157	0,127	0,988	- 0,011	1,048	1	83	0,309

Tab. 5: Results of regression analysis aimed to "explain" the belief in the benefits of repetition

R	R2	R2 adjusted	Standard error of estimation	Variation of R2	Variation of F	ddl1	ddl2	Sig. Variation of F
0,828	0,686	0,679	0,585	- 0,008	2,260	1	91	0,136

Tab. 6: Results of regression analysis aimed to "explain" the belief in the negative effects of repetition

Two teacher profiles: the pros and cons of repetition

To identify the position of teachers with regard to repetition, we have conducted cluster analyses by introducing five variables: the three factors related to beliefs with regard to repetition and the two factors on the knowledge of research. First, we have conducted a hierarchical cluster analysis to highlight contrasting profiles whose cutting is the most appropriate. This suggests the existence of two groups of teachers: some, knowing of the research showing the

ineffectiveness of repetition, no longer believe in its benefits, while others continue to believe in it, ignoring the research. In order to confirm the existence of these two groups of teachers, we have conducted a cluster analysis using the method of K-average. It clearly confirms this interpretation of our results. Two groups of teachers emerge (see Figure 1), gathering 96 subjects, while the other 16 could not be included in either of the two profiles: on one side, there are 39 teachers (Cluster B) who know the research on the effects of repetition (index = 0.76) and who, at the same time, believe that repetition has a negative impact (index = 0.89); on the other hand, there are the majority of those (N = 57, cluster A) who (1) believe that repetition is a tool for the disciplinary control of students (index = 0.36), (2) believe in the benefits of repetition (index = 0.36), (3) do not know the research (index = - 0.51) or (4) claim false knowledge about the research (index = .19). The analysis of variance confirms that these two groups of teachers differ for each of the five parameters considered. These results confirm our hypothesis 6, that a majority of teachers are unaware of the research on the effects of repetition. However, contrary to our hypothesis 7, it is possible to identify a minority of teachers who, knowing the research, no longer believe in the benefits of repetition.

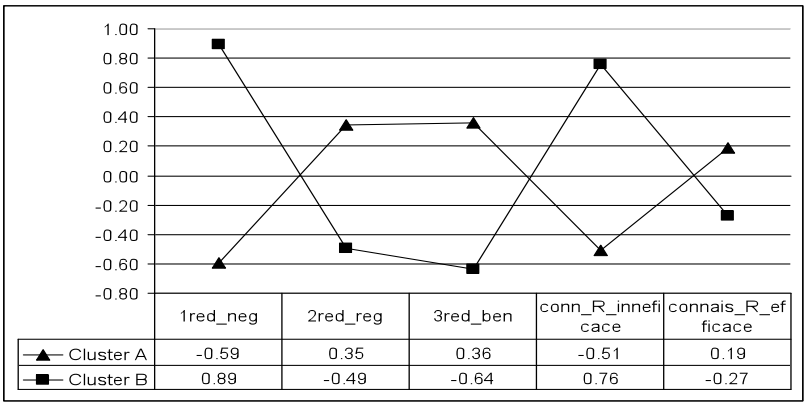


Fig. 1: Profiles of the two categories of teachers towards student retention and the knowledge of scientific research

	Cluster A (n=57)		Cluster B (n=39)		F	Probability
	Average	Standard deviation	Average	Standard deviation		
Belief in the dangers of R (F1)	- 0,60	0,568	0,89	0,771	117,574	<0,0001
Beliefs in the benefits of R (F2)	0,36	0,936	- 0,64	0,913	26,704	<0,0001
Repetition is a source of motivation for the student (F3)	0,35	1,014	- 0,49	0,790	18,876	<0,0001
Knowledge of research R = ineffective (F17)	- 0,51	0,656	0,76	0,63	88,388	<0,0001
Knowledge of research R = effective (F18)	0,19	0,749	- 0,27	0,80	8,328	<0,0001

Tab. 7: Averages, standard deviations and significance of beliefs and knowledge about student retention (R) in the two different clusters

	Total job tenure			Total
	Between 0 and 10 years	Between 11 and 20 years	Over 21 years	
Repetition is beneficial (cluster A)	16	18	23	57
Repetition has negative effects (cluster B)	8	9	22	39

Tab. 8: Cross-tabulation between the two clusters regarding beliefs about repetition and teachers' years of service

Is it possible to identify teacher profiles according to their psycho-pedagogical beliefs?

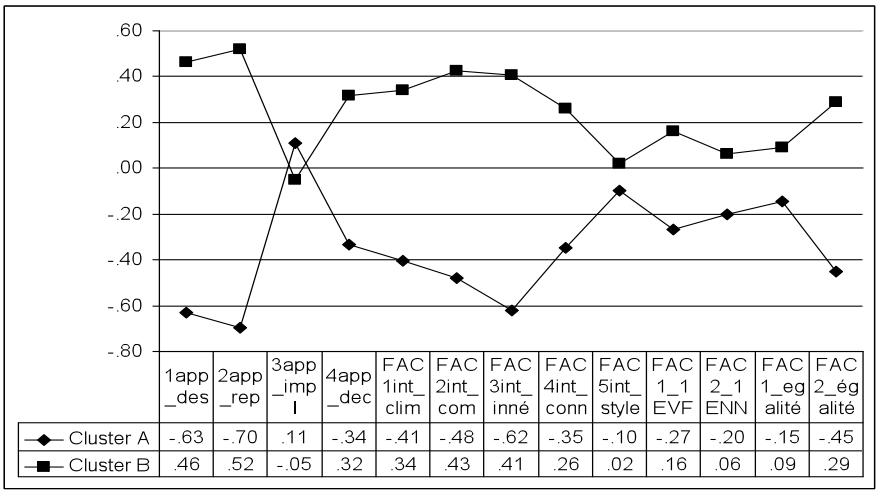
With regard to learning, intelligence, assessment and the principles of justice, the results of factor analyses confirm the existence amongst the teachers interviewed of distinct beliefs (see Table 2). However, the results of the correlational analysis and regression equations do not support our hypotheses 2, 3, 4 and 5. Furthermore, the results of the correlational analyses suggest that on average, teachers tend to agree with everything. To overcome this perception, we have conducted cluster analyses (using the hierarchical method first and then the method of K-average) on the base of the 4 beliefs related to learning (F4, F5, F6 and F7), the 5 beliefs about intelligence (F8, F9, F10, F11 and F12), the 2 conceptions of assessment (F13 and F14) and the 2 principles of justice (F15 and F16). This analysis reveals two clearly distinct teacher profiles (Table 9).

Cluster analysis on the psycho-pedagogical beliefs of teachers gathers 43 of them in a first cluster, and 57 in a second. Twelve teachers are not included in any of the two profiles. The clustering opposes the teachers who are characterized by high values on most scales (Cluster B) to those with low values on these same scales (Cluster A). Figure 2 clearly highlights this phenomenon.

	Cluster A (n=43)		Cluster B (n=57)		F	Probability
	Average	Standard deviation	Average	Standard deviation		
Learning is developed around a constructivist conception	- 0,628	0,881	0,463	0,641	51,343	<0,0001
Learning takes place through repetition	- 0,696	0,841	0,518	0,643	67,002	<0,0001
Learning is transmitted through an implicit approach	0,112	0,819	-0,051	0,877	,889	0,348
Learning requires the "trigger"	-0,335	0,837	0,317	0,781	16,057	<0,0001
Intelligence is developed through interaction with the environment	- 0,405	0,853	0,339	0,780	20,594	<0,0001
Intelligence is seen as innate with regard to the speed of understanding	- 0,480	0,817	0,426	0,772	32,124	<0,0001
Intelligence is seen as innate with regard to the different styles of intelligence	- 0,621	0,885	0,408	0,671	43,723	<0,0001
Intelligence is developed by the cumulative contribution of knowledge and culture	- 0,349	0,801	0,262	0,840	13,510	<0,0001
Intelligence is multiple	- 0,098	0,923	0,019	0,898	,406	0,526
Assessment is in the service of school regulation	- 0,268	,915	0,162	1,014	4,808	0,031
Assessment is seen as a normative tool	- 0,199	0,907	0,062	0,953	1,916	0,169
Equality of treatment	- 0,146	0,987	0,062	0,953	1,812	0,181
Equality of achievement	- 0,453	0,871	0,093	0,788	19,470	<0,0001

Tab. 9: Averages, standard deviations and significance of beliefs and knowledge about learning, intelligence, assessment and the principles of justice in the two clusters isolated by cluster analysis

The Snedecor F indicates high values and a P of less than 0.05 for most scales, except the one corresponding to the belief in implicit learning, the one which refers to the idea of different learning styles, the one which echoes the normative assessment and the one referring to equality of treatment. Regarding the factor "Assessment is at the service of school regulation", the F obtained corresponds to a probability threshold below 0.05 but above 0.01. Nearly half of teachers (43 of 112) has thus provided "lukewarm" answers to most items, as if they could not take a clear position in relation to most of the propositions. The other half (57 of 112) took a clear position in relation to most of the propositions. In short, contrary to what the theoretical debates lead us to expect, cluster analysis does not place constructivist teachers in opposition to others who are behaviourist. Neither does it oppose teachers who have a nativist conception of intelligence to those who have an evolutionary idea of it. The results presented in Table 9 do not show a divide between teachers based on the base of psycho-pedagogical theories. We will return on this topic in the discussion.



	1app_des	2app_rep	3app_impl	4app_dec	FAC 1int_clim	FAC 2int_com	FAC 3int_inné	FAC 4int_conn	FAC 5int_style	FAC 1_1 EVF	FAC 2_1 ENN	FAC 1_égalité	FAC 2_égalité
Cluster A	-.63	-.70	.11	-.34	-.41	-.48	-.62	-.35	-.10	-.27	-.20	-.15	-.45
Cluster B	.46	.52	-.05	.32	.34	.43	.41	.26	.02	.16	.06	.09	.29

Fig. 2: Profiles of the two categories of teachers with regard to their beliefs about learning, intelligence, assessment and the principles of justice

What relation exists between the beliefs about repetition and those relating to learning, intelligence, assessment and principles of justice?

With two cluster analyses on the same data, it is logical to cross their results. In this case, it has even more sense, since this crossing can help us better understand how the different types of beliefs considered in the context of our research interact. The results of this crossing are shown in Table 10.

		Clusters related to R		Total
		In favour of R	Against R	
Beliefs about learning, intelligence, etc.	A	29	21	50
	B	23	15	38
	Total	52	36	88

Tab. 10: Crossing of the results of cluster analyses

3. Discussion and conclusion

The objective of our work was to try to explain the beliefs of teachers regarding the practice of student retention by their psycho-pedagogical beliefs about learning, intelligence, assessment and the principles of justice. Moving from the premise that the majority of teachers expressed to various degrees a favourable opinion towards the practice of repetition, we made the hypothesis that this degree of variability could be put in relation to a more or less strong adhesion of these teachers to various theories of learning and intelligence, as well as various ideas of assessment and justice. From there, we made a series of hypotheses. The statistical analyses we made led us to reject all the hypotheses concerning a possible link between psycho-pedagog-

ical beliefs of teachers and their faith in student retention (hypotheses 2, 3, 4 and 5). More precisely, it turns out that the psycho-pedagogical beliefs on learning, intelligence and assessment, as well as the conceptions of justice measured through various questionnaires where psychometric qualities could be shown, are not reliable predictors of beliefs with regard to repetition. More specifically, when we introduce in a regression equation psycho-pedagogical beliefs which have a (even small) correlation with beliefs about repetition (these being the variable to predict), they account for only a tiny percentage of the variance thereof. On the contrary, knowledge of research on the effects of repetition has a strong impact on teachers' beliefs on the subject. Correlational and regression analyses helped to highlight neatly the phenomenon that teachers who think that scientific research shows the negative effects of repetition are likely to abandon this belief and thus to negatively perceive it. This result seems new to us; we have not found a trace of it in our literature review.

It must be noted that in the first analysis, the results of the present study converge with those of previous research on teachers' beliefs in the CFWB with regard to repetition: in accordance with our hypothesis 1, the majority of teachers expresses a favourable opinion towards the practice of repetition (Crahay, 2007). Nevertheless, a cluster analysis nuances this statement. This is valid for a majority of teachers (in our case, certainly 57 teachers), but it is not true for a certain number of them (39 in our cluster analysis) who have been informed of the results of research on the effects of repetition. Thus, it appears that teachers who can demonstrate a good knowledge of scientific research on the effects of repetition tend not to believe anymore in its benefits. This seems to us an important and promising result in terms of changing things. From this result, we can deduce the hypothesis of action that if more teachers were well informed of the research on repetition, they would be more likely to question its benefits. We write "well informed" because our data show that some teachers claim to know the research, but attribute the opposite results to what they really are.

The second analysis which we processed led to equally questioning results. It focuses on beliefs about learning, intelligence, assessment and the principles of justice in education. Two groups of teachers can be distinguished, but what opposes them are not antagonistic beliefs. Cluster analysis does not put constructivist teachers in opposition to behaviourists. Neither does it oppose teachers who have a nativist conception of intelligence to those who have a progressive idea of it. The results presented in Table 8 above do not show a divide between teachers based on theoretically opposing psycho-pedagogical trends. We obtain a typology which does not differentiate according to the nature of beliefs, but according to the intensity of their agreement with different conceptions. Thus, the analysis shows firstly that nearly half of the teachers have responded lukewarmly to most theoretical propositions that were presented to them, as if they had no opinion about them. The analysis reveals a second group of teachers, slightly in the majority, who expressed clearly in favour of almost all theoretical propositions which were submitted to them. This finding goes against much research which posits, and sometimes observes, a gap between constructivist teachers, also referred to as progressive, and others described as traditionalist and/or behaviourist (Kember & Kwan, 2000; Trigwell , Prosser & Waterhouse, 1999). Teachers who express strongly fixed beliefs consider, consistently with constructivism, that learning requires disequilibrium in situations-problems and, at times, "trigger" operations, but this belief does not stop them from thinking (in accordance with behaviourism) that student retention is necessary. Regarding intelligence, they believe that it develops thanks to the interaction with the environment and the cumulative contribution of knowledge and cultural elements, but they also believe that intelligence is innate with regard to the speed of understanding and some

individual differences in cognitive styles. These teachers also adhere to a corrective conception of justice and, therefore, to the equality of achievement as well as to a conception of assessment which focuses on its formative function. We immediately notice that this beliefs profile is close to the ideas that are taught in teacher training. From this to question the social desirability of this beliefs profile and the reasons for the lukewarm responses of the majority of teachers surveyed, there is only one step that should be taken. More specifically, we believe that, given its importance, this observation must be replicated, because it emerges from a survey of 112 teachers only.

It should be noted, however, that in two other studies conducted with French teachers, we obtained similar results (Issaieva & Crahay, a & b, submitted). In these studies as in the one presented here, the correlations between different beliefs are of low amplitude, if not nonexistent. This forces us to think that, amongst teachers, beliefs are isolates. In other words, contrary to the hypotheses of Rokeach (1976), Green (1971), or Abric (1989), the psychopedagogical beliefs do not work in a network. This leads us to refute both the theory of the centrality of Rokeach and Abric and that of the organization in clusters of Green. Our observations lead us to adopt the point of view of Schommer (1990 Schommer-Aikins, 2002, 2004) who, about the epistemic beliefs of adults, supports the thesis of the existence of beliefs that are more or less independent the one from the other. We must, however, point out that, contrary to conventional studies conducted on social representations (Abric, 1989; Mannoni, 1998), the beliefs investigated come from what was convenient to call common sense, but stay on the verge of the field of professional practice. It must be remembered that what was required from teachers was to position themselves in relation to theoretical propositions; as it is also the case, but on a different topic, in the research of Schommer. It may be this theoretical character of the propositions submitted to the opinion of the teachers which explains, on the one hand, the lack of network structure and, on the other, the impact that the knowledge of research has on beliefs about the effects of repetition. It must be noted in this regard that, in our sample, six teachers show a real knowledge of research on the effects of repetition[4] and, yet, maintain a belief in the benefits of this practice[5], so despite and against the results of the research. This leads us to recognize that the influence of the knowledge of scientific research on beliefs is not automatic. This means therefore that some teachers inflect their beliefs on the base of rational elements which are presented to them, and others do not. It is a phenomenon that further research should explore.

4 Their score on the F17 is higher than 0.50.
5 Their score on the F2 is higher than 0.

Appendix: Matrix of correlations calculated amongst the different factors as defined in Table 2

		F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14	F15	F16	F17
F1	Repetition has negative effects	1,00																
F2	The practice of repetition is beneficial	-0,49**	1,00															
F3	Repetition seen as a source of motivation for the student	0,24*	0,03	1,00														
F4	Learning is developed around a constructivist conception	-0,06	0,04	0,03	1,00													
F5	Learning takes place through repetition	-0,07	0,11	0,26**	0,45**	1,00												
F6	Learning is transmitted through an implicit approach	-0,02	0,06	-0,04	-0,25**	0,00	1,00											
F7	Learning requires the "trigger"	-0-06	0,14	0,14	0,39**	0,54**	-0,15	1,00										
F8	Intelligence is developed through interaction with the environment	0,19	-0,11	-0,03	0,35**	0,27**	-0,10	0,27**	1,00									
F9	Intelligence is seen as innate with regard to the speed of understanding	-0,08	0,23*	0,04	0,08	0,16	0,07	-0,05	0,17	1,00								
F10	Intelligence is seen as innate with regard to the different styles of intelligence	-0,13	0,23*	-0,09	0,22*	0,22*	-0,13	0,08	-0,06	0,64**	1,00							
F11	Intelligence is developed by the cumulative contribution of knowledge and culture	-0,19	0,17	0,19	0,04	0,31**	-0,03	0,27**	0,36**	0,18	0,12	1,00						
F12	Intelligence is multiple	0,11	0,08	0,02	0,09	0,06	0,20*	0,12	-0,03	0,07	0,10	0,05	1,00					
F13	Assessment is in the service of school regulation	0,10	0,17	-0,02	0,90	0,18	-0,08	0,13	0,30**	0,18	0,06	0,26**	-0,34**	1,00				
F14	Assessment is seen as a normative tool	-0,20	0,23*	0,29**	-0,04	0,27**	0,12	0,12	-0,18	0,13	0,12	0,29**	0,21*	-0,07	1,00			
F15	Equality of treatment	-0,12	0,04	0,01	0,10	0,10	-0,08	-0,07	0,06	0,14	0,19	0,17	-0,09	0,11	0,04	1,00		
F16	Equality of achievement	0,00	0,14	0,04	0,26**	0,19	-0,12	0,15	0,21*	0,37**	0,26**	0,13	0,09	0,14	0,21*	-0,05	1,00	
F17	Knowledge of the ineffectiveness of student retention	0,82**	-0,28	-0,36**	-0,14	-0,07	0,00	0,02	0,15	-0,06	-0,07	-0,16	0,10	0,08	-0,09	-0,19	0,06	1,00
F18	Asserted knowledge of the effectiveness of student retention	-0,34**	0,24*	0,31**	0,12	0,25*	-0,07	0,32**	-0,00	0,09	0,10	0,13	0,19	-0,13	0,36**	-0,04	0,20*	-0,26*

* Correlation is significant at the 0.05 level
** Correlation is significant at the 0.01 level

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