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Subtypes of Readers and Spellers in Second Grade Children

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Abstract

In primary school classrooms, teachers face a tremendous diversity concerning reading and spelling abilities. In the present study, decoding, reading comprehension and spelling abilities at the beginning of second grade (377 children) served as a basis for a clustering process. 5 different subtypes of readers and spellers were revealed (outliers were excluded). Further analyses showed that the 5 clusters also differed in other abilities (active and passive vocabulary, grammar, cognitive abilities) and demographic variables (age, children's first language). Furthermore, the distribution of the clusters was examined and 18 out of the 21 studied classrooms showed all clusters. The results are discussed in the light of the challenges that such heterogeneity means for teachers.

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Keywords: reading; spelling; primary school; heterogeneity; subtyping children; cluster analysis

1 Introduction

In our society, reading and spelling are competencies needed to master most challenges in everyday life. Reading competence refers to the ability to analyze and comprehend written words and texts (Klicpera, Schabmann, & Gasteiger-Klicpera, 2010). For an efficient reading process, different subordinated skills have to be synchronized. According to the simple view of reading (e.g., Hoover & Gough, 1990), two different abilities are necessary for effective reading comprehension: *decoding* and *linguistic comprehension*. For grasping the meaning of texts, both abilities are needed. The simple view of reading claims that in the first years of school, decoding and linguistic

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comprehension are only weakly related, whereas later on, linguistic comprehension has a greater impact on reading comprehension than decoding. During the first school years, decoding is the first skill to develop. This is the ability to transform printed letters (graphemes) and letter strings into a phonetic code (phonemes) (Perfetti, 1985). This decoding process, which becomes increasingly automatized, is referred to as the non-lexical route. As a parallel cognitive process, the direct lexical route develops: At the beginning of reading acquisition, only some small words and parts of words are stored in an orthographic mental lexicon and therefore can be looked up fast. Later on, the number of words in the lexicon increases and more complex and longer words can be decoded at a glance. These two routes (lexical and non-lexical) are necessary for a successful reading process (Coltheart, 1981). The growing use of the lexical route gradually increases reading speed and fluency (Klicpera, Schabmann, & Gasteiger-Klicpera, 2010). The fast lexical word reading is a prerequisite for reading comprehension. This ability provides readers with the opportunity to understand written words and texts and to gain information from texts.

Models of reading and writing development assume a close interdependence between the development of reading and spelling skills (e.g., Frith, 1985). Spelling is the ability to convert spoken language (phonemes) into graphemes. It is assumed that especially in the first grades, spelling and reading skills are closely related (Cunningham & Stanovich, 1993). This close interdependence is obvious when looking at the definition of dyslexia. Developmental dyslexia is often described as an overall impairment of reading and spelling abilities independent of and unrelated to other cognitive abilities (International Dyslexia Association, USA: Lyon, Shaywitz, & Shaywitz, 2003; Rose Review, Great Britain: Rose, 2009). Nevertheless, research (e.g., Moll & Landerl, 2009; Schabmann & Schmidt, 2010) shows that reading and spelling abilities can be impaired independently of each other. The same is true for the different skills necessary for reading competence: Impairments can be restricted to reading comprehension alone (poor comprehenders) or decoding deficits alone (poor decoders) (e.g., Nation, 2005; Stothard & Hulme, 1992; Yuill & Oakhill, 1991). As such, each child might show distinct ability levels for all three different skills (decoding, reading comprehension, and spelling).

From the beginning of the first grade, children start their reading acquisition with very different preconditions. While some children show nearly comparable ability levels in reading and spelling during the development of reading and spelling skills, many children are better in one ability but lag behind in the other abilities. When failing to meet the basic requirements in one of the reading and spelling abilities, children can easily fall behind. Once children are at risk concerning these reading and spelling abilities, general failure in all academic subjects may result since these two abilities are fundamental for nearly all subjects. Such insufficient reading skills represent a significant problem in Austria: About 16% of fourth graders are identified to be at risk (e.g., Schabmann, Landerl, Bruneforth, & Schmidt, 2012). Besides this at-risk group, it can be assumed that there is also a big diversity in reading and spelling abilities in unimpaired children.

Diversity in ability levels of reading and spelling skills is often quite challenging in the classroom. On the one hand, teachers should identify the above mentioned at-risk students as early as possible and provide individual learning support to ensure that they are able to catch up with the other students in class (e.g., Helf & Cooke, 2011; Rose, 2006; Swanson, 1999; Torgesen, 2005). On the other hand, teachers also need to create the best learning conditions for children with average and above average abilities. In addition to the different levels in reading and spelling abilities, teachers encounter two more challenges: For the last few years, based on the UN Convention on the Rights of Persons with Disabilities, inclusion of children with special educational needs within regular school settings has become a declared objective (United Nations, 2006). Therefore, the heterogeneity in classrooms is rising (Statistik Austria, 2014). Further factors that increase classroom diversity are differences in cultural and linguistic background (Herzog-Punzenberger & Schnell, 2012; Schwab et al., 2013). Nowadays, nearly one in 4 children in Austrian primary schools does not speak German as first language (school year 2012/13; Statistik Austria, 2014). If the classroom consists of many children whose first language is different from the language of instruction, teachers often have to deal with deficits in vocabulary, too. The aim to promote all children in the classroom and respond to all children's needs becomes more difficult to reach when, besides the challenges already mentioned, language deficits have to be addressed as well. In addition, children with a different first language are not the only ones who show a lack in language abilities concerning the language of instruction (Schabmann et al., 2010).

The purpose of the present study is to examine this heterogeneity through revealing different subtypes of readers and spellers in second grade classrooms.

2 Method

2.1 Participants

The data used in the present study was collected at the beginning of the second grade as part of a larger intervention study (LARS - Language And Reading Skills, see also Schwab & Gasteiger-Klicpera, 2013; Schwab, Seifert, & Gasteiger-Klicpera, 2013; Schwab, Seifert, & Gasteiger-Klicpera, submitted; Seifert, Schwab, & Gasteiger-Klicpera, 2014). Only classes with a higher percentage (30% or more) of students with German as a second language (GL2) were included. The resulting sample consisted of 377 children (180 boys and 197 girls) from 21 classes in 8 primary schools in Styria, a federal state of Austria. The children were between 7 and 9 years old (M = 7.78; SD = 0.44). About half of the children (51.2%) were native German speakers (i.e., German as a first language – GL1). The remaining children (48.8%) spoke German as a second language (GL2). These GL2 students spoke about 21 different L1 languages (most frequent languages: Albanian, Chechen, Bosnian, Croatian, and Turkish).

2.2 Instruments

To examine the reading (decoding, reading comprehension) and spelling abilities, three standardized tests were used. The assessment of the language abilities was conducted via a vocabulary and a grammar test. In addition, overall cognitive abilities were tested with the German version of the Cultural Fair Intelligence Test (CFT-1; Cattell, Weiß, & Osterland, 1997). Demographical data included information about the children's age, gender, first language, and status of special educational needs (SEN) and was collected through teacher questionnaires.

The *Salzburg Reading and Spelling Test* (SLRT II: Moll & Landerl, 2010) consists of a Reading Decoding Test and a Spelling Test. For the purpose of the present study, only the Decoding Test of the SLRT was used. It is an individual reading test that assesses decoding with the subscales Word Decoding (read words aloud) and Non-word Decoding (read non-words aloud). According to the manual, the retest reliability for the Decoding Test ranges from .90 to .98.

Reading comprehension was tested with the *Reading Comprehension Test for First to Sixth Graders* (ELFE 1-6: Lenhard & Schneider, 2006). This test assesses reading comprehension with three subscales: Word, Sentence and Text Comprehension. The internal consistency of the subscales ranges from .92 to .97. In the present study, only the subscales Word Comprehension (underlining one of four words that matches a picture) and Sentence Comprehension (underlining one of five words that fits in the sentence) were used.

Spelling skills were tested with the *Hamburg Spelling Test* (HSP 1-9: May, 2002). This test assesses the spelling of words and small sentences after verbal presentation and provides the interpretation on word level (number of correctly spelled words) as well as grapheme level (number of correctly spelled graphemes). For the present study, the number of correct graphemes was used for further analyses because they offer more precise information.

Vocabulary knowledge was measured with the short form of the *Vocabulary and Word Finding Test for 6 to 10 Year Olds* (WWT 6-10: Glück, 2007; α = .84) with two subscales: Active and Passive Vocabulary. For the Active Vocabulary subscale, single pictures have to be named. Due to the assumption that a word that is actively known is also known passively, only those words which were not known when testing with the Active Vocabulary subscale were tested afterwards with the Passive Vocabulary subscale (pointing to one of four pictures that fits the word announced by the tester).

Grammar skills (active, not passive knowledge) were measured with a modified version of the Grammar Subtest of the *Potsdam-Illinois Test for Psycholinguistic Abilities* (P-ITPA: Esser, Wyschkon, Ballaschk, & Hansch, 2010). The reliability was .89. Within this Grammar Test, children had to answer questions regarding pictures that ought to evoke different grammar structures.

3.3 Statistical Analyses

Subtypes of readers and spellers in second grade were identified through a hierarchical cluster analysis using Ward's method with squared Euclidean distance measure. Decoding, reading comprehension and spelling were included in the cluster analysis. To make the metric of all variables comparable, raw scores were converted to T-scores (M = 50, SD = 10). Due to the high correlation (see Table 1 in bold) between the two subscales for reading

comprehension as well as the two subscales for decoding, only one subscale per ability was included. Because of their lower correlation to the other tests (see Table 1), the subscales Non-word Decoding and Word Comprehension were chosen. ANOVAs were conducted to reveal differences between the clusters in the variables that were not included in the cluster analysis (i.e., language and cognitive abilities). For identifying differences in demographic variables, Chi-square tests were conducted. All statistical analyses were conducted with SPSS 20.0 for Windows (IBM Corp., Armonk, NY).

Table 1. Inter-correlations of decoding, reading comprehension, and spelling abilities.

	Decoding		Reading Comprehension		
	Word Decoding	Non-word Decoding	Word Comprehension	Sentence Comprehension	Spelling
Decoding					
Word Decoding		**.89****	.73**	.77**	.51**
Non-word Decoding			.65**	.67**	.49**
Reading Comprehension					
Word Comprehension				**.79****	.44**
Sentence Comprehension					.46**
Spelling					

**p<.01
Bold: correlations between the subscales within a test

3 Results

The dendrogram of the hierarchical cluster analysis revealed six distinguishable clusters. Five big clusters consisted of 55 to 97 children, whereas one small cluster contained only eight children (2.1% of the sample). By taking a closer look, it became obvious that this small cluster consisted of a group of outliers. The children in this cluster had special educational needs (SEN), showed insufficient language skills, or their cognitive abilities were below average (IQ<70). As the tests were not constructed and evaluated for students with such impairments, it is unclear if their test results are valid. All of the children in this cluster showed very weak abilities in decoding (T=26.7), reading comprehension (T=34.55) and in spelling abilities (T=5.07) compared to the rest of the sample (with average T-values). Therefore, this cluster was not included in any further analyses.

Table 2 shows the distribution of the remaining five clusters within each class. In each class, at least four of the five clusters exist. Only three classes (Classes 6, 16 and 17) have just four clusters, all the other 18 classes consist of the five clusters. However, in three classes (Classes 1, 3 and 16), one Cluster is overrepresented (see Table 2 in bold).

Figure 1 shows the profiles of the other five clusters for the three abilities used in the cluster analysis (decoding, reading comprehension and spelling). Mean T-values (calculated within the present sample) are shown for each cluster separately. Cluster 2 shows the group with the highest reading abilities (both in decoding and reading comprehension) and their spelling abilities are in the upper average. Clusters 5 and 1 partly resemble each other: Children in those two clusters all achieved average scores in all tests. However, by looking closer, differences in the specific abilities can be found. The main difference between these two clusters is found with regard to spelling, where Cluster 5 children reached upper-average scores and outperform Cluster 1 children. In decoding and reading comprehension, another difference is found. While Cluster 5 shows better decoding abilities, Cluster 1 shows better reading comprehension skills. Moreover, the upper-average scores in reading comprehension skills in Cluster 1 represent the best ability in this group. Cluster 4 reveals a group of children with lower-average abilities in decoding and even worse performance in reading comprehension. In addition, Cluster 4 is the group with the lowest spelling abilities. In comparison to Cluster 4, Cluster 3 shows better spelling abilities (average range) but represents the group with the lowest scores for decoding and reading comprehension (see also Table 3).

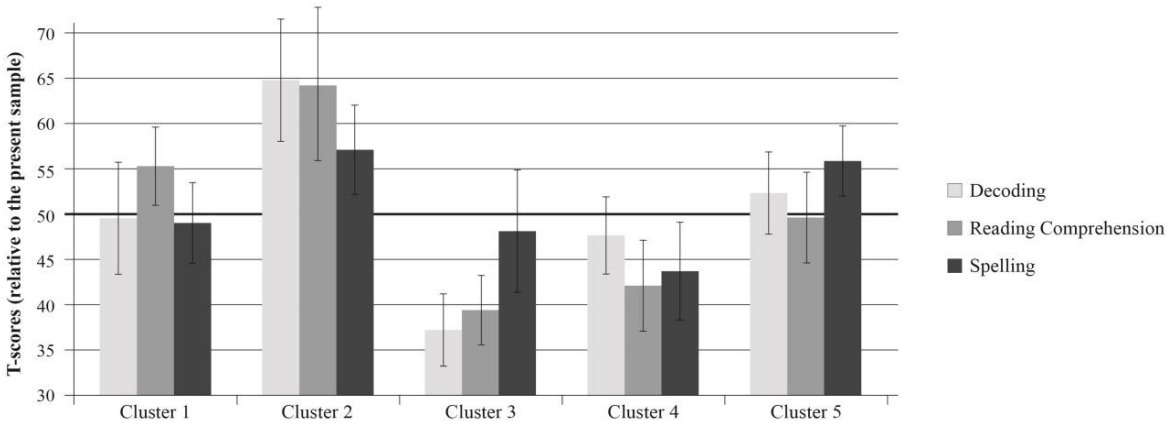

Figure 1. Mean T-scores and standard deviations of decoding (subscale Non-word Decoding), reading comprehension (subscale Word Comprehension) and spelling for the five clusters. T-scores: M=50, SD=10 (Standardized within the present sample). Average abilities are defined as within one standard deviation above or below the mean (40<T<60).

Table 2. Distribution of children in classes by cluster.

Class	Cluster 1 (percentage)	Cluster 2 (percentage)	Cluster 3 (percentage)	Cluster 4 (percentage)	Cluster 5 (percentage)	Class Size (n)
1	6.3%	6.3%	18.8 %	6.3%	**62.5%**	16
2	26.7%	13.3%	6.7%	13.3%	40%	15
3	**50%**	16.7%	16.7%	11.1%	5.6%	18
4	10.5%	10.5%	26.3%	36.8%	15.8%	19
5	36.8%	10.5%	10.5%	26.3%	15.8%	19
6	38.5%	15.4%	15.4%	30.8%	-	13
7	14.3%	21.4%	14.3%	7.1%	42.9%	14
8	22.7%	9.1%	13.6%	18.2%	36.4%	22
9	13%	4.3%	17.4%	26.1%	39.1%	23
10	33.3%	14.3%	23.8%	19%	9.5%	21
11	17.6%	17.6%	17.6%	41.2%	5.9%	17
12	37.5%	12.5%	18.8%	12.5%	18.8%	16
13	22.2%	22.2%	11.1%	11.1%	33.3%	18
14	15.4%	15.4%	23.1%	23.1%	23.1%	13
15	27.3%	16.7%	5.6%	16.7%	33.3%	18
16	18.8%	**50%**	-	6.3%	25%	16
17	30.8%	15.4%	15.4%	-	38.5%	13
18	12.5%	12.5%	31.3%	6.3%	37.5%	16
19	23.8%	9.5%	9.5%	33.3%	23.8%	21
20	10%	30%	5%	25%	30%	20
21	33.3%	14.3%	14.3%	19%	19%	21
Cluster Sizes (n / percentage)						**N**
	88 / 23.8%	58 / 15.7%	55 / 14.9%	71 / 19.2%	97 / 26.3%	369

Bold: more than 50% of the children in class in one cluster

After clustering, variance analyses were conducted to test if the five clusters also differ in variables not used in the cluster analysis, namely, language skills (active and passive vocabulary, grammar), cognitive abilities, and age. The clusters differ significantly in their language abilities ($F_{4,368}$=13.699, p<.001, η^2=.131). As can be seen in Table 3, Cluster 4 always showed the poorest language skills (both in active/ passive vocabulary and in grammar). Cluster 2 always showed the best language skills. Clusters 1, 3 and 5 are nearly comparable in their language abilities. Similar results were found for cognitive abilities ($F_{4,368}$=8.546, p<.001, η^2=.088) Cluster 2 shows significantly higher cognitive abilities than all other clusters whereas the others do not differ from each other. Figure 2 visualizes the differences between the clusters in language and cognitive abilities. Age differences ($F_{4,368}$=4.109, p<.01, η^2=.043) were significant only between Cluster 5 and Cluster 1. Cluster 5 children are significantly younger than their Cluster 1 peers.

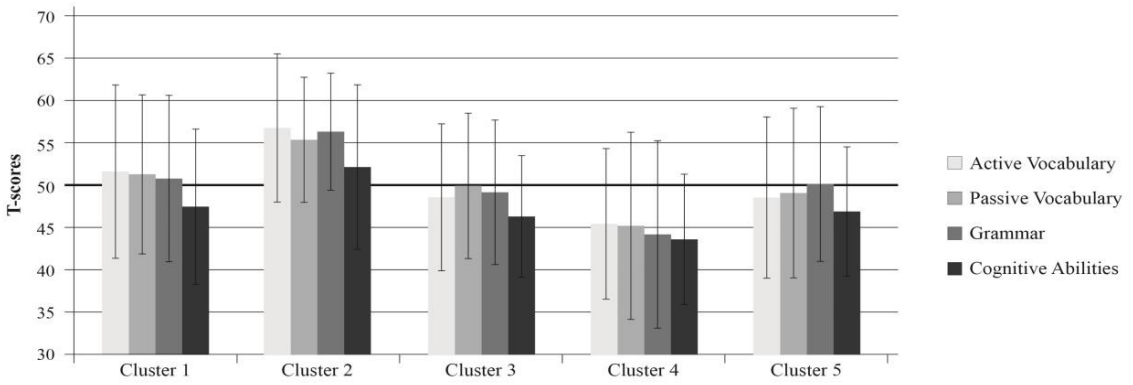

Figure 2. Mean T-scores and standard deviations of language abilities (subscales Active and Passive Vocabulary, Grammar) and cognitive abilities for the five clusters. Cognitive abilities are age-normed; all other abilities are standardized within the present sample.

Table 3. Means, standard deviations and Scheffé tests between the five clusters for decoding, reading comprehension, spelling, active and passive vocabulary, grammar and cognitive abilities.

Scale	Subscale	Cluster 1 *M (SD)*	Cluster 2 *M (SD)*	Cluster 3 *M (SD)*	Cluster 4 *M (SD)*	Cluster 5 M (SD)	Scheffé significant differences (p<.05)
Decoding (T-scores)	Non-word Decoding[a]	49.58 (6.23)	64.82 (6.79)	37.25 (4.03)	47.69 (4.30)	52.37 (4.58)	[c]
	Word Decoding [b]	48.96 (5.69)	66.4 (8.74)	38.9 (4.36)	44.59 (5.06)	51.39 (4.66)	[c]
Reading Comprehension (T-scores)	Word Comprehension[a]	55.33 (4.36)	64.24 (8.5)	39.44 (3.87)	42.14 (5.07)	49.66 (5.05)	[c]
	Sentence Comprehension [b]	50.71 (7.24)	65.46 (8.44)	40.57 (4.1)	43.43 (4.87)	50.27 (6.25)	[c]
Spelling[a] (T-scores)		49.07 (4.49)	57.14 (4.97)	48.16 (6.8)	43.74 (5.45)	55.9 (3.91)	[c]
Vocabulary (T-scores)	Active Vocabulary	51.64 (10.29)	56.79 (8.8)	48.6 (8.72)	45.46 (8.94)	48.57 (9.57)	4<1<2 (5=3)<2
	Passive Vocabulary	51.31 (9.44)	55.39 (7.44)	49.95 (8.63)	45.23 (11.1)	49.1 (10.06)	4<(1=2) (5=3)<2
Grammar (T-scores)		50.81 (9.88)	56.35 (6.96)	49.19 (8.58)	44.21 (11.12)	50.17 (9.18)	4<(3=5=1)<2
Cognitive Abilities (IQ age norm)		95.49 (14.4)	102.81 (15.59)	92.95 (11.24)	89.37 (12.6)	93.44 (12.27)	(4=3=5=1)<2

[a]Variables used for cluster analysis.
[b]Due to their high inter-correlations, only one subscale of each test was included in the clustering process.
[c]Due to the inclusion in the clustering process or the high correlation to variables included, no variance analyses and no Scheffé tests were conducted.

The five clusters also differed in demographic variables (see Table 4). Overall Chi-square tests were used to analyze the differences between the clusters concerning the number of girls/boys and GL1/GL2 children. If there was an overall difference, additional Chi-square tests with Bonferroni correction were conducted to find out which clusters differ from each other. With respect to gender, an overall difference ($\chi^2_{4, 369}$=11.582; p<.05) was found, but no significant differences between cluster pairs could be established after Bonferroni correction. With respect to GL1/GL2, a significant difference was found ($\chi^2_{4, 369}$=12.86, p<.05). Even after Bonferroni correction, significant differences were found between Cluster 2 and Cluster 4 ($\chi^2_{1, 129}$=11.617, p<.01) as well as between Cluster 2 and Cluster 5 ($\chi^2_{1, 155}$=6.82, p<.01). More specifically, there were more GL2 children in Cluster 4 and Cluster 5 than there were in Cluster 2.

Table 4. Means and standard deviations in the five clusters for age; distribution of gender and language (GL1/GL2) by cluster.

Variable	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	post-hoc significant differences
Age *M (SD)*	7.89 (0.44)	7.7 (0.39)	7.78 (0.42)	7.85 (0.51)	7.66 (0.37)	5<1[a] (5 younger)
Gender (Percentage of Girls)	42%	43.1%	63.6%	62%	55.7%	
Language (Percentage of GL2 children)	44.3%	31%	52.7%	60.6%	52.6%	2<4[b] 2<5[b]
Cluster Size (*n*)	88	58	55	71	97	

[a] Significant results for Scheffé test ($p<.05$).
[b] Significant results for Chi-square tests with Bonferroni correction ($p<.01$).

5 Discussion

The present study aimed to identify subtypes in a sample of 377 second graders, tested at the beginning of the school year. A cluster analysis of reading and spelling abilities was conducted and six different clusters were identified. As shown in the cluster analysis, developmental levels of decoding, reading comprehension and spelling differ between the children. After excluding an outlier cluster with eight children, five clusters remained. The remaining five clusters did show different profiles in the children's reading and spelling abilities. The three larger Clusters, 5, 1 and 4, showed average scores in all three abilities. Cluster 5 was the one with the most children (n=97). Those children's spelling abilities were better than their reading abilities (decoding and reading comprehension). However, their decoding was still better than their reading comprehension. In Cluster 1 (n=88), decoding and spelling were nearly comparable. However, their reading comprehension was better developed and represents the best ability. Cluster 4 (n=71) consisted of children whose decoding was better than their reading comprehension and spelling, respectively.

Above-average abilities and therefore remarkably good reading abilities were only shown by Cluster 2 (n=58). The means of decoding and reading comprehension scores were above average. Additionally, their spelling was also in the upper average range. Therefore, Cluster 2 was the best group in all three abilities. In contrast, Cluster 3, the smallest group (n=55), showed below-average reading comprehension and decoding skills. Surprisingly, Cluster 3 children's spelling was average and even higher than in Cluster 4 children. With Cluster 3, a group with particularly weak reading abilities (decoding and reading comprehension) was identified. Since spelling is not affected in this group, the impairment shown in these children is restricted to reading abilities. These findings support previous research results concerning the possibility of isolated impairments in either reading abilities or spelling abilities (e.g., Moll & Landerl, 2009; Schabmann & Schmidt, 2010).

Comparing the group of best readers (Cluster 2) to the group of poorest readers (Cluster 3), their mean in the decoding subscale Non-word Decoding was more than 2.5 standard deviations above the mean of Cluster 3. In the reading comprehension subscale Word Comprehension, the difference was nearly 2.5 standard deviations. However, in terms of spelling, no notable differences between all clusters could be found. Spelling was within the average in all clusters. Even comparing the best spellers (Cluster 2) to the poorest spellers (Cluster 4), the distance of their mean scores was less than 1.5 standard deviations. Therefore, the differences in reading abilities (both decoding and reading comprehension) are a lot higher than they are in spelling. As a conclusion, the children in our sample vary more distinctly in reading than in spelling abilities. Thus, teachers of the present sample probably encounter a bigger challenge when teaching reading than when teaching spelling. On the one hand, teachers have to deal with children that outperform others in reading, and on the other hand, there is a group of children who still struggle with basic reading acquisition.

None of the examined school classes showed fewer than four clusters. Therefore, all classes can be described as being heterogeneous. In every class, there were children of Cluster 1 and Cluster 2. Only three classes (Classes 6, 16 and 17) contained only four clusters while one cluster was missing (Clusters 5, 3 and 4, respectively). In three classes (Classes 1, 3 and 16), one of the clusters was overrepresented (Clusters 5, 1 and 2, respectively). In Class 16, the overrepresentation of Cluster 2 children combined with the non-existence of Cluster 3 resulted in a rather homogeneous class with a lot of skilled readers and spellers. In all the other classes, no such homogeneous picture

was present. There, the variety of clusters results in great heterogeneity. This heterogeneity can not only be described as having good and poor readers or spellers in a classroom. It needs to be looked at in a more differentiated way. Some children are quite good at spelling but weak in reading at the same time. This pattern can also be found the other way round. In order to offer high quality support for each child, teachers have to individually define the child's challenges and then assist him or her in a tailored way.

The language (vocabulary and grammar) and cognitive abilities do not vary much between the five examined clusters. However, some interesting differences should be addressed: Cluster 2, the group with above-average reading abilities, outperformed all the other groups in language abilities. In addition, Cluster 2 was the only group that showed significantly higher cognitive abilities compared to all the other clusters. Cluster 4, one of the two worst-performing groups, also showed the lowest language abilities. Clusters 1, 3 and 5 do not differ from each other in their language abilities.

A lot of studies have shown that language skills are highly inter-connected with reading skills (e.g., Catts, Fey, Zhang & Tomblin, 1999; Muter, Hulme, Snowling, & Stevenson, 2004). Especially reading comprehension seems to be highly correlated with oral language skills, in particular when reading starts to develop (Storch & Whitehurst, 2002). Research has shown that both aspects of language skills, vocabulary (Oulette, 2006; Perfetti, 2010) and grammatical knowledge (Nation, Clarke, Marshall, & Durand, 2004), are related to reading. Therefore, it is not surprising that Cluster 2 children showed the best language abilities. Besides, the good test results in decoding and reading comprehension in Cluster 2 can also be explained by the higher cognitive abilities, as it is known that cognitive abilities in the first grades are highly correlated to reading and spelling (Bowey, 1995).

Concerning demographic variables, a difference was revealed in terms of the percentage of children with GL2 in the various clusters. Clusters 4 and 5 consisted of significantly more children with GL2 than there were in Cluster 2. Both clusters (4 and 5) showed better decoding compared to reading comprehension. This finding goes along with the results of a recently conducted meta-analysis (Melby-Lervag & Lervag, 2013). This study revealed that L2-learners in general show deficits in reading comprehension, but are nearly as good as L1-learners in decoding. Besides, Cluster 4 has the greatest number of children with GL2. This group also showed the lowest language abilities. These weak language abilities can probably be explained by the high proportion of children with GL2. Second language learners often struggle with the language of instruction (David, 2010). Furthermore, the group with the best reading and language abilities (Cluster 2) had few GL2 children. These findings highlight once more that children with a different first language than the language of instruction have a higher risk of struggling with reading problems than children who are taught in their mother tongue (EU High Level Group of Experts on Literacy, 2012).

In the present study, some limitations have to be addressed. First, our sample does not represent regular classroom composition as only classes with more than 30% of GL2 students were examined. This restriction also influences the representativeness of the socioeconomic background. Therefore, the results cannot be generalized to all classroom settings. Second, the students were nested in different classes that were nested in different schools. Hence, a multilevel approach would be advantageous for analyzing effects that are caused by class-related factors (e.g., teacher behavior, classroom composition) or school-related factors (e.g., urban vs. rural areas) rather than looking merely at different characteristics on the student level. Nevertheless, the present study demonstrates that teachers encounter a large variability in reading and spelling abilities in their classrooms.

6 Conclusion

This study has revealed that for reading, well-analyzed differentiation within the classroom is indispensable. In addition, not only good and weak readers should be addressed. On the contrary, in order to foster each child's development adequately, teachers really need to bear in mind the broad range of individual abilities that exist in the classroom. Thus, teachers need to be trained to adequately meet these challenges and consequently to react to and support students individually. A special focus should be put on second language learners, as these children in particular are at high risk of developing reading and spelling difficulties. Further investigations will have to be conducted to examine the linguistic situations of these children at home to better understand their development.

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