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**A comparison of reading attainment in two first grade classes in a state and  
a Montessori school in Switzerland**

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## **ABSTRACT**

The main purpose of this study is to examine whether the age at which children start to learn to read affects their later progress - specifically, whether an earlier start at reading gives children an advantage when they enter first grade at the age of six years. The study was conducted in Zürich, Switzerland, and compared a first grade class in a local school with two first grade classes in a Montessori school. There were 42 participants aged between six and seven years, 22 girls and 20 boys. The children were given a series of alphabet knowledge, reading and phoneme tests at the beginning and end of the year to measure the reading progress of each group. It was found that although the Montessori children who had already attended the Montessori kindergarten had an advantage over the local children, this advantage was only significant for alphabet knowledge, and was not translated into a significant advantage in either phonemic awareness or reading ability. Reasons for this were considered including the relative efficiency with which children learned to read in German at the local school, possible failings in the Montessori instruction, and the fact that many of the local children had already learned to read at home before starting school something that may be related to the high socioeconomic status (SES) and home literacy environment (HLE) of both groups.

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# **A comparison of reading attainment in two first grade classes in a state and a Montessori school in Switzerland**

## **Literature Review**

*“The individual, all by himself, can put himself into communication not only with human beings actually alive on the earth, but also with those who lived centuries and centuries ago down to the dawn of history. Such communication is made possible not by sound but by the written symbol.”*  
(Montessori, *The Advanced Montessori Method - II*, 1916, p. 174)

A fundamental and largely unresolved question is when children should be taught to read. This chapter will provide a review of the literature concerning literacy. Firstly, it will discuss the importance of literacy for both the individual and society. Following that is an examination of what exactly is meant by literacy, and what research has to say about the most effective ways to teach children to read.

We will look more closely at how and when literacy is taught in Switzerland in the state system, and contrast that with the methods used in Montessori schools. Then we will look more closely at what the literature has to say about when children should learn to read. Because the study compares two groups of children learning to read in German, we will discuss the role orthography plays in learning to read. This chapter will also look at the powerful influence families' social and economic position has on children's early acquisition of reading skills. Finally, we will look at how all these factors are reflected in literacy in Switzerland.

### **The Importance of Literacy**

The importance of literacy in today's world cannot be understated, both for individuals, and for the society in which we all engage. There is barely an activity that is not mediated or regulated, at least to some extent, by an ability to read and write. Reading is not only important for academic success, but also for negotiating our way through all aspects of

life in an increasingly bureaucratic society (Kirsch, de Jong, LaFontaine, McQueen, Mendelovits, & Monseur, 2002). To a great extent, our level of literacy competency dictates the degree to which we may participate in the social, practical, economic and political spheres of our lives. In as much as it helps us to represent our world, to communicate it, to remember and to learn vital information, reading literacy is also an integral part of cultural literacy (Baumert, et al., 2001).

Further, the overall social and economic success of a group of people, whether it is a community or a country, is also dependent on the overall literacy skills of that group. There is evidence that national literacy levels have a direct impact on that country's GDP, and that an overall improvement in literacy can and does lead to an improvement in the country's economic welfare (Coulombe & Tremblay, 2004).

Viewed in this light, it is no surprise that literacy has assumed such importance for both researchers and in political agendas – the OECD Programme for International Student Assessment (PISA) regards reading literacy as one of the core indicators of educational competence, along with mathematical literacy and scientific literacy (Baumert, et al., 2001). The International Adult Literacy Survey (IALS) has shown that after controlling for educational qualifications, literacy has an effect on health, income, employment, and on participation in continued education (Kirsch, et al., 2002). So, for instance, people with lower levels of literacy are more likely to depend on welfare, or be involved in crime, especially as the labour force shifts to a demand from lower to higher skill levels.

It has become apparent that there are many different factors that influence literacy success, and schooling is only one of them. There are also socio-cultural factors such as the education and economic status of parents – although even more important than both of these is parents' engagement with their children's reading (Kirsch, et al., 2002); the immigration status of families can play a role, particularly if the home language differs from the language of instruction; students' own motivation to learn may play a greater part than previously suspected (Artlet, Baumert, Julius-McElvany, & Peschar, 2003); and government policies can affect, at a macro level, the resources allocated to schools for reading instruction and interventions and the methods of teaching them.

## **What is Literacy?**

There are several stages to learning to read, but at its heart literacy can be viewed as an interaction between two distinct but complementary domains - decoding and comprehension skills (Gough & Tunmer, 1986). These two aspects develop interdependently, and are the manifestation of skills that have already started to develop before a child actually starts to read. Decoding can be viewed as a combination of letter knowledge and phonemic awareness (Suggate, Schaughency, & Reese, 2011), but there has been debate as to whether phonemic awareness - the conscious awareness of phonemic units and an ability to manipulate them - may start to develop before children are formally introduced to letter sounds and names. For instance, it has been suggested that the origin of phonemic awareness lies in the rapidly expanding vocabulary of very young children. As their vocabulary expands, words become represented as sublexical units such as phonemes and rimes (Whiteley, Smith, & Connors, 2007). Näslund and Schneider (1996) point out that there are gradations of phonological processing skills, the more basic of which are a sensitivity to aspects of language like rhyme, and at a more refined level include the ability to manipulate and segment phonemes. So what does the increasing refinement of phonological skills have to do with learning to read?

In all likelihood, the acquisition of alphabetic skills and the development of phonemic skills develop concurrently, and influence each other (Schneider, 1993). Research by Burgess (2002) has shown that preschool measures of phonological ability have successfully predicted subsequent decoding and spelling ability. But although a relationship between phonological awareness and subsequent reading success may be widely accepted, Castles and Coltheart (2004) argue that phonological awareness, in all probability, reflects an underlying mental information-processing system that is responsible for both the acquisition of phonemic and of reading skills. Further, they argue that current research has been unable to show, conclusively, that phonemic awareness can develop in the absence of graphemic knowledge, and posit that phonemic awareness develops only in conjunction with learning to read.

So although phonological awareness is a necessary component of reading, it is not sufficient on its own. The knowledge of letter-sound correspondences is of fundamental importance in learning to read. It is the ability to recode, to translate written letters and words into their phonological equivalent, that marks the first step into reading (Tunmer &

Nicholson, 2011), and children who can recognize letters and the sounds they represent with speed and accuracy will be able to learn to read more easily (Kamhi & Catts, 2012), as this represents a fundamental connection between phonemes and their orthography (Stage, Sheppard, Davidson, & Browning, 2001). To this end, learning the relationship between letters and their sounds is more important than phonological awareness in isolation of print (Castles & Coltheart, 2004).

Working memory is also an important component of phonemic awareness, as it is used to store initial sounds, whilst subsequent sounds are being manipulated, in order to decode or recode words (Schneider, 1993). As children gain experience with decoding, the process becomes more automatic, and phonological information – letters, syllables and whole words - accrue in the long-term memory where it can be accessed efficiently. This access to phonological information predicts, therefore, how well children will read (Hecht, Burgess, Wagner, & Rashotte, 2000). It is also important to note that although the correlation between working memory and phonological awareness is strong, it is not clear what the exact relationship is – it may well be that it is bidirectional. Näslund & Schneider, (1996) imply that memory capacity may mediate the development and accessibility of phonological recoding skills, and view it as a separate but necessary component of early reading development. On the other hand the process of learning to read, and specifically the act of phonological decoding, creates connections in the memory between written words and their phonological counterparts (Tunmer & Nicholson, 2011).

The other main contributing factor to literacy is linguistic comprehension, which Tunmer and Chapman (2012) argue is as crucial to reading ability as word recognition. One of the early predictors of later reading comprehension is the development of oral narrative skill (Suggate, Schaughency, & Reese, 2011). In the early stages of reading, decoding skills seem to be more important for reading comprehension, but as the level of reading increases, and the complexity of what is being read also increases, linguistic comprehension plays a stronger role in reading comprehension (Hoover & Tunmer, 1993).

## **Teaching Literacy**

There are two main approaches to teaching literacy – the phonological recoding approach and the natural language approach. Dr Clay developed the natural language approach in the 1970s in New Zealand. It is a constructivist approach that places little

emphasis on the mechanics of decoding or alphabetic knowledge, but instead requires that children use cues from the context of the word within the sentence (Clay, 1998). There is some controversy as to the effectiveness of this method, with critics arguing that it does not recognize the primacy of phonological decoding in learning to read, and does not provide enough explicit instruction in these important skills (Tunmer, Chapman, & Prochnow, 2006).

In Switzerland, as in most other European countries, schools take the phonological recoding approach. Literacy teaching in the first one or two years at primary school focuses on the basics of reading – learning the orthographic-phonemic structure of the language, decoding, and creating an expanding pool of sight words. Gradually, beginning readers gain in confidence and fluency as they no longer invest all their cognitive resources in decoding individual words, and when these structures are more or less in place, the focus moves increasingly towards reading for meaning. Effective reading instruction should be explicit, especially for children who are less proficient at learning to read, and should cover five areas – phonemic awareness, phonics skills, vocabulary, fluency and comprehension (Odegard, Ring, Smith, Biggan, & Black, 2008).

Even before children begin learning about the alphabetic principle it's possible to make them more aware of the way words are divided into sublexical units like phonemes and rimes. (Whiteley, Smith, & Connors, 2007). Teachers can help them to hear the sounds that make up words with simple games like “I Spy”, or with games, verses and songs that concentrate on words that rhyme. Once children demonstrate an understanding of rhyme they can be introduced to activities where they compare the first, middle or ending sounds of words (Al Otaiba, Kosanovich, & Torgesen, 2012).

This nascent phonological awareness can then be built upon by the introduction of letter names and sounds, starting with those letters that are used most frequently. The task of developing and understanding letter-sound and sound-letter relationships is one that is quicker and easier in a language with consistent spelling rules and fewer phonemes, such as German (Anthony & Francis, 2005). English has a much less transparent orthography, so the process of understanding all the possible alternative spellings for each sound (for example, ay/ey/a-e/eigh/ai) will take longer.

Pupils need to be given enough time to practice reading. With practice comes fluency, as children expand their internal bank of instantly recognized “sight words”. Fluency is important for comprehension, as the reader can concentrate on the meaning of the text rather

than the decoding of each individual word. High-frequency words can be taught separately in drill fashion, especially those that are not easily decodable (for example, the, was, of) (Al Otaiba, Kosanovich, & Torgesen, 2012). Research has also shown that flashcards may also be used with older struggling readers to improve not only reading speed, but also reading comprehension (Tan & Nicholson, 1997).

Pupils' vocabulary can be improved by a combination of strategies: through oral language, whether that is in conversation, or through songs, poems, plays and story telling; through shared reading, where the child is reading to the teacher (or another adult), or the teacher is reading to the child; or through individual reading, where the child can draw the meaning of the unfamiliar word from the context. Any of these strategies can and should be employed concurrently with phonemic awareness and decoding instruction. Creating a literate environment provides a context and a reason for learning to read.

Indeed, one aspect of learning to read that is crucial, is giving children the “why” of learning to read – not that they will need to read to get a job, but that reading is the key to an infinite number of other worlds, and that there is great pleasure to be had in losing yourself in a good book. Children who have spent a lot of time being read to or visiting the library with their family may have an intrinsic appreciation for books and reading, whereas children who enter school without this advantage will need more inspiration from their teachers. This will be reflected in the teachers' own attitudes to reading, in the books that are on display in the classroom, in time spent reading to pupils, and in scheduled visits to a library with the pupils.

### **How is literacy taught in Switzerland?**

Switzerland is a country that has traditionally had a decentralised education system, with each of the 26 cantons deciding on their own system of schooling (Hega, 2001). Cantons decide, individually, on many important aspects of school education – on when compulsory schooling starts, for example; on the length of the school year; on the main language or languages of instruction; on how many languages are taught, and at what stage other languages are introduced; on teacher education and accreditation; and on the length and form of secondary education. This makes it difficult to make generalisations about Swiss education per se – for the purposes of this research the focus will be on the canton of Zürich, the most populous German-speaking canton.



The canton of Zürich has almost 1.5 million residents. A quarter of them are foreigners, predominantly Germans, Italians and Portuguese. The standard of living is high, as the main industry is banking. Although 42% of the land is used for agriculture, only 0.4% of the population are involved in farming. Most of the population is focused in the city of Zürich. There is a sharp political divide between the city and the country, with city residents usually voting in favour of liberal policies, whilst those in the country are more likely to hold conservative views.

In Zürich, compulsory education starts with kindergarten when children are 4½ -5 years of age. Kindergarten lasts for two years, during which the emphasis is on socialisation. Children start first grade when they are 6½-7 years old. Only then do they start with formal schooling, such as learning to read and count. The Bildungsdirektion (Education Department) of Zürich determines the curriculum. It is fairly broad in its focus, leaving the choice of teaching methods to the teachers – and they are able to choose from a range of materials that have been selected by the department. Children do not begin to learn formally to read until they start first grade, and alphabetic instruction has been frowned upon, if not outright banned at the Kindergarten level. When they do start school instruction switches from Swiss-German, which is the language that is spoken in the German cantons of Switzerland, to High German, the language of books. So effectively, pupils are not only learning to read, they are doing it in a new dialect.

At the kindergarten level, teachers are expected to provide opportunities for verbal and non-verbal communication with children, and children should be able to tell a simple story by the time they leave kindergarten. Articulation and phonological awareness are fostered with games and exercises that improve oral motor control and breathing, and through tongue twisters, rhymes and speaking in a chorus. Children learn about the signs around them in their environment, like flags and advertising signs and the fact that symbols convey meaning. They should be able to recognise their own name, and write it, by the time they start school. They will also learn that written words are used to convey meaning, and will be shown examples of where they are used (Bildungsdirektion Kanton Zürich, 2008).

The Education Department argues in its school curriculum statement that because learning to read is such an individual process, the department will refrain from providing a reading curriculum for the first two years of school, but it does expect that children will at least be able to read aloud individual words by the end of the first school year (Bildungsdirektion Kanton Zürich, 2010). There are other guidelines – regular class trips to

the library should be planned into the school timetable, and reading aloud to the class is also considered very important. What is also prescribed is the number of hours a year that must be dedicated to German language and literacy (Deutsch und Schrift) - in the first school year 240 hours (or six hours per week), in the second year 160 hours, and in the third year 200 hours.

Two local first grade teachers were interviewed for this study in order to gain a fuller picture of how literacy is taught in the first year of school. They explained that they took a systematic approach to teaching the letters of the alphabet, teaching two or three new graphemes each week with the aid of approved workbooks, giving both the letter names and their most common iteration. This is more straightforward in German than in English, because most letters are always pronounced the same way, regardless of context or their position in a word. Phonograms, such as “au”, “ei” or “sch” are taught in the same way. The least frequently used letters were kept till last, but the teachers expected most of their students to have mastered the grapheme-phoneme correspondence of most of the letters by the end of the first school term, and to be able to read and write short, uncomplicated sentences by the end of the first year. They supplemented the workbooks with material they made themselves, because they felt that it enriched and varied the learning experience for the children, and because it provided an opportunity for differentiated learning – they could provide more scaffolded activities for the struggling learners, and extension work for the most advanced learners – in what was a quite heterogeneous classroom.

The average class size for primary schools in Zürich is 20 pupils, but the timetables at the local school in the study are organised so that for much of the time the class teacher has half the class whilst the other half is with a subject teacher for crafts, music or sport. This enables class teachers to give more individualised attention to their students on a regular basis. Teachers have the same class for three years. So a teacher will guide children through the entire 1<sup>st</sup> to 3<sup>rd</sup> grade curriculum, or 4<sup>th</sup> to 6<sup>th</sup> grade. This provides for continuity and should ensure that teachers know the children in their class very well.

Additionally, each school has a special education teacher who spends several hours a week working in each classroom and who will, at the class teacher’s discretion, provide pull-out tuition for students who need it, in order that they receive help before they fall too far behind. The teachers in the study said that within two months of the children entering 1<sup>st</sup> grade they have a good idea of which children are struggling. At this point they will arrange to meet with their parents and a school psychologist to discuss what the best option is for their

child. According to the teachers, this usually results in the child obtaining individual pull-out sessions with the reading specialist.

### **The Montessori Approach to Literacy**

*“How absurd it would seem to suggest a study of phonology and morphology in a nursery with four-year-old children as investigators. Yet our children have accomplished this very thing! The analysis was the means of attaining the word.”*

*(Montessori, The Advanced Montessori Method - II, 1916, p.7)*

Maria Montessori was at the forefront of a wave of scientists and educationalists, over a century ago, who started to take an active interest in children’s development and sought to create an educational system that was built around children’s evolving needs. She spent decades observing children and refining her method to take into account each stage of a child’s physical, intellectual, emotional and social growth.

She perceived that young children go through “sensitive periods” – for language, movement, order, socialisation, and the refinement of the senses – during which they are particularly attentive to that domain. So, for instance, during the sensitive period for language, which spans the first six years of a child’s life, children are particularly attentive to language, and are able to master their mother tongue with its syntax and nuances of accent and dialect (Lawrence, 1998). Montessori argued that during this period, once spoken language is mastered, children show a natural inclination to explore written language – usually at around the age of four years.

Another vital aspect of the Montessori approach is the belief that young children are striving to become themselves – social, independent beings who are passionately interested in the world around them, and in all the tools – including written language – that will enable them to realise this goal. Montessori took a constructivist approach to early education, and stated that “education is not what the teacher gives: education is a natural process spontaneously carried out by the human individual” (Montessori M. , 2012).

In a traditional Montessori kindergarten there is an absence of toys considered “normal” for children of that age – there is no dressing-up corner, or dolls or toy cars, or Lego. The emphasis is instead on what is real and concrete, to support children in their quest for self-actualisation. For instance, Montessori believed that if a child were given a choice

between pretending to cook and actually cooking, he would choose to cook for real. So in the Montessori kindergarten children learn to make tea or cook pasta for a friend.

**Figure 1** A typical room in a Montessori kindergarten



There are five main areas in the kindergarten curriculum – Exercises in Practical Life, sensorial education, mathematics, language, and cultural studies. All the material is laid out carefully on the shelves in order of increasing complexity. It is the teacher's job to invite a child to work with a material, which she then presents carefully and precisely to the child. Once an activity has been presented to a child she is free to use it as often as she chooses until she has gained mastery in it. The materials are designed to be attractive and inviting to the children, and to provide as much hands-on experience as possible. This is also true of the language materials, many of which have small objects and letter or word cards that the children can manipulate.

The earliest formal language activities are intrinsically linked to all the other areas of the curriculum. The teacher teaches a child the words she needs to discuss the activity she is engaged with. So if the activity is pouring water through a funnel, the teacher will introduce her to the words “narrow”, “funnel”, “lip of the jug”, and what ever other words she may not have. Or a child working with the geometric solids will learn the names of all the solids –

“sphere”, “rectangular prism”, and “ellipsoid”. Children seem to have an innate love of the richness and the preciseness of language from a very young age (Lawrence, 1998).

There is a strong emphasis on phonemic awareness and phonic decoding in the Montessori approach, which gives it a good theoretical basis for children’s literacy success (Tunmer & Chapman, 2012). In order to foster phonemic awareness “I Spy” is played with baskets of small objects, with the child listening for the first, middle or end phoneme, depending on their confidence and experience. At around the same time, from the age of three or four years, children may start to learn the grapheme-phoneme correspondences with the help of sandpaper letters.

The sandpaper letters are fundamental to the way letter sounds (and eventually their names) are taught in a Montessori kindergarten. The letter-sounds are taught, usually three at a time, using the Three Period Lesson. The teacher will invite a child to work with her, and will choose three letters to work with. If it is the child’s first experience with the sandpaper letters, the teacher will probably choose letters in the child’s name. On subsequent occasions, the teacher will review the letters already taught, and then choose letters that are dissimilar in form and in pronunciation (for instance, “b” and “p” would be taught on separate occasions, as would “i” and “e”). The teacher then introduces each letter by its most common sound – this is the first period. Then the teacher will ask the child to “point to “m””, or to “pass me the “a”” until she is confident that the child recognises all three letters easily – this is the second period. If the child is still engaged, and the teacher is confident that the child will succeed, she will move on to the third period where she asks directly what sound each letter makes.

Once a child has learned a chunk of the letters (the letter sound is always taught before the letter name), he is encouraged to encode familiar words, like “mama” or “cat,” and using a large tray of letters, to “write” them down. Decoding printed words follows later (Lawrence, 1998). Gradually, children are introduced to more and more complex words – first three-letter phonic words, then longer decodable words with consonant blends and finally, words with consonant or vowel digraphs. Each phonogram is also taught individually – a less protracted job in German than in English.

Parallel to this work, which is all part of the kindergarten (3-6 years) curriculum, children will start learning about the parts of speech. This is done in a playful way. For instance, there may be a box of simple verb cards with words like “run”, “skip” or “kiss”. A small group of children will take it in turns to read a word silently and then act out the verb

for the other children to guess. As the children learn about more parts of speech, they can use sets of colour-coded cards to create phrases and sentences, usually in conjunction with a set of themed objects, like a farm. So they progress from nouns and articles (a duck), to verbs (a duck sits) and adjectives (a wet duck sits), and on to prepositions (a wet duck sits on the pond). This method calls for direct instruction from the teachers, but also allows the children the freedom to practice reading on their own in a creative and meaningful way.

Because the work is carried out with individual or small groups of children, it calls for careful observation and detailed record keeping by the teachers, but it does create an intrinsically differentiated working environment. Working groups of children are organised not according to age necessarily, but by interest and stage of progress. It is a cooperative environment, where children who have already mastered a concept are encouraged to teach colleagues who still need help. The aim is to prevent children from feeling discouraged because they are not keeping up with their peers – there is never a time when the whole class is doing the same reading or writing activity (unless everyone is listening to a story at circle time). Nevertheless, there is an expectation that most children who have completed the three years of kindergarten will be reading sentences and, if they are reading in German that they will have learned most if not all of the German phonograms.

The school curriculum for literacy develops from Montessori's belief that writing precedes reading (Montessori M. , 1916), that is to say that young children encode and then decode what they have just written. She differentiated this process from reading, which she defined as the interpretation of "an idea from a written sign" (Montessori, 1912/1964, p.296). So if the groundwork has been laid at the kindergarten stage, then children who enter primary school should already start reading for meaning.

Some research has been carried out regarding the efficacy of the Montessori approach to literacy. Results have been mixed – qualitative studies have expressed approval at the literacy enrichment of the Montessori environment (Soundy, 2003), but a comparative study with 543 students by Lapota, Wallace and Finn (2005) between Montessori and traditional schools found that not only was there no benefit found at the Montessori school at the 4<sup>th</sup> or 8<sup>th</sup> grade level, but actually students at the Montessori school did worse in Language Arts at the 8<sup>th</sup> grade level. The students were from an urban, predominantly low-income area. The researchers were unable to randomly assign participants to the different programmes, but did seek to match the groups according to gender, ethnicity and SES, and also statistically during the analysis of the results.



Lillard (2013) disputes these findings on the grounds that the Montessori school was not operated with fidelity to the Montessori programme as laid down by the Association Montessori Internationale (AMI). In support of that view was a study she conducted which compared gains made in literacy by preschool children in three different settings. Included in the study were 36 children from three classes in a classic Montessori programme, 95 children from nine classes in a supplemented Montessori programme, and 41 children from six classes in a traditional programme. The study showed that the children in the classic Montessori programme made significant educational gains compared with children in the other two programmes (Lillard, 2012). The students in this study could also not be randomly assigned, but were all from well educated and middle-class families.

In other research conducted by Lillard, 12-year-olds in a Montessori school outperformed the control for the creativity and sophistication of their essay writing, but not in measures of grammar, spelling or punctuation – these earlier specific reading gains made by children in a Montessori preschool at the age of five years had disappeared by the time they were 12 years old (Lillard & Else-Quest, Evaluating Montessori education, 2006). The participants for this study were recruited on the basis of their parents applying for a place in a public Montessori school by lottery – the 59 Montessori children had obtained a place, and the 53 control children had not. The parents were also matched for income, and were predominantly from low-income families.

But even if literacy gains have disappeared, that does not mean that there may not be other benefits to be had from learning to read earlier. Children who learn to read earlier benefit from exposure to more content, and are therefore likely to learn more in other curriculum areas. A longitudinal study conducted by Cunningham and Stanovich (1997) followed the progress of 56, predominantly middle-class 1<sup>st</sup> graders, after ten years of education. There was attrition – only 27 11<sup>th</sup> graders remained in the district for follow-up testing - but the researchers could still draw some interesting conclusions. They found that the speed of reading acquisition in the 1<sup>st</sup> grade was predictive of vocabulary, comprehension and general knowledge in the 11<sup>th</sup> grade, and they also concluded that children who had a good start to reading maintained their interest in reading when they were older.

A study in Texas compared a bilingual Montessori preschool programme with a state bilingual programme. It took children from Hispanic, low SES families, all of whom attended primary school in the same school district. Out of a pool of 450 2<sup>nd</sup> graders, 50 children who had attended the Montessori preschool, and 50 children who had attended a non-Montessori

preschool were randomly selected, and tested on their reading ability in Spanish and in English. It was found that the children from the Montessori programme performed significantly higher as second-graders in both Spanish and English (Rodriguez, Irby, Brown, & Galloway, 2003).

Another small study was carried out in Turkey comparing pre-schoolers in a state and Montessori preschool for predictors of school readiness, like ability to concentrate and social skills (Kayili & Ari, 2011). It found that the Montessori children rated higher on both measures, although both these skills are only tangentially related to reading success. The study included 50 5-6 year-olds, but unfortunately there was no indication given in the study as to how the children were chosen or the groups matched, so the results must be viewed with some degree of caution.

### **When should children be taught to read?**

When children should be taught to read has been a matter of long-standing debate (Coltheart, 1979; McLachlan, Nicholson, Fielding-Barnsley, Mercer, & Ohi, 2013), and there is conflicting evidence as to whether the age at which reading is taught even matters. The arguments for starting earlier or later are often as much politically or socially motivated as they are philosophically or pedagogically oriented. The age at which children are expected to learn to read is often synonymous with the age at which they start primary school. Internationally, the most common school-starting age is six years. English-speaking countries tend to start earlier, with children attending school at five years old, or even as young as four years old in parts of Britain. At the other extreme are the Scandinavian countries, where children start when they are seven years old. In Switzerland, children generally start primary school at the age of six years.

A large-scale comparison study undertaken by the International Association for the Evaluation of Educational Achievement (IEA) in the early nineties reviewed the literacy abilities of 9-year-olds and 14-year-olds in 32 countries. It is difficult to compare countries fairly when the educational resources available differ so widely, but the researchers came to the tentative conclusion that whilst children did not necessarily suffer from starting school later, once economic and social factors were taken into consideration, children were advantaged by an earlier start (Elley W. , 1992). When comparing countries with similar



educational and economic resources, however, children who started school later had largely caught up by the age of nine years.

Suggate (2009) reasoned that by comparing 9-year old students, those who had started schooling later were disadvantaged by only having had two years of schooling, whereas children who had started school at five years of age had twice as much schooling when the testing took place. It was decided that analysing the results of the PISA 2006, when the students are 15 years old, would provide a more accurate assessment of whether children benefited from starting to read earlier, or indeed, later. After taking into account the different social and economic conditions in different countries, the school starting age turned out not to be a significant predictor of reading success.

New Zealand was taken as an example of a country with a relatively early school entry age (five years), which has great variability in achievement (Tunmer, Chapman, & Prochnow, 2006). There are a large number of children who fall behind in spite of generous government spending and support for students who fall behind (e.g., the Reading Recovery programme for 6-year-olds). Suggate (2009) suggests that the age that children start their schooling may be linked to this large gap in achievement between the top and bottom learners, possibly because some immature learners may be frustrated and discouraged by early failures, leading to a cycle of further failure. An alternative view to this hypothesis is given by Tunmer, Chapman, Greaney, Prochnow and Arrow (2013), which lays the blame for the failure of many children to read on the whole-word approach taught in New Zealand schools. They argue that the children who succeed under this system would succeed anyway thanks to the support and instruction they receive at home. Children who do not come to school with alphabetic and literacy knowledge will suffer disproportionately, as the systematic phonological instruction that they would require to catch up to their peers is not available.

In a later study Suggate, Schaughency, and Reese (2013) considered the possibility that it may be necessary for children in English-speaking countries to start school earlier in order to compensate for the complex orthography of English. They set out to compare two groups of English-speaking children, one of which started reading instruction at the age of five years, and the other that, unusually for an English-speaking country, started at seven years. The study took place in New Zealand, with 287 children. The children who started reading at the age of five attended local schools, whilst the children who started at the age of seven attended Steiner schools. The Steiner schools were state-funded, or partially state-funded, and the schools (both state and Steiner) were all drawn from the same decile band.

The researchers also factored the children's home literacy environment and maternal education into the analysis of their results. They found that any advantages enjoyed by the group that had started earlier had disappeared by the time they were 10 years old. Their study also underscored the importance of developing strong oral language skills and phonemic awareness skills before children start reading.

An interesting aspect of the study is that neither the Steiner nor the New Zealand state system take a systematic phonic approach to reading, and the researchers pondered the possibility that the results may have been different had a phonological recoding approach been taken to teaching the children to read. In a British study by Cunningham and Carroll (2011), where the younger children who attended a state school had been taught using a synthetic phonic approach and the older children attended a Steiner school, the results were different. The younger children made similar, if not better progress than the older children – a result which would appear to vindicate the use of a phonic approach, and certainly suggests that younger children are not disadvantaged by learning to read at a younger age.

Whilst Suggate does not specifically argue that learning to read later is advantageous, he does seriously call in to question whether learning to read earlier provides any significant long-term benefits. He cites several studies, including one from Germany in 1970 that found that two groups of children, one of which had received literacy instruction a year earlier than the other, during the second year of kindergarten, were both at the same level by the time they reached second grade (Schmerkotte, 1978).

There is evidence that preschool education can be advantageous, especially for children who come from disadvantaged backgrounds, if language and pre-reading skills are emphasised, and if the institution is of a high quality (Sylva, et al., 2004). Elements that have been identified as contributing to high-quality preschool provision include: careful planning and implementation of a curriculum according to children's developmental needs; a curriculum that focuses on literacy, maths, environmental and cultural subjects; low child-to-staff ratios; a high level of staff education and support; adequate parental involvement; child-initiated learning; and warm and responsive care from adults (Sylva, et al., 2004; West & Varlaam, 1990).

West and Varlaam (1990) are careful to make the point that overtly academic, teacher-directed learning may not be appropriate for young children in a preschool setting, and that children benefit more, even on a cognitive level, when the emphasis is on learning through

play. Too much academic instruction at a young age has been linked to anxiety, loss of motivation and a loss of self-esteem, without any compensating long-term academic benefits (Sharp, 2002). It is important, however, not to conflate learning literacy skills with being forced to learn in a strict, academic environment. Learning can be playful and natural and arise from children's natural curiosity and desire to be competent.

Specific basic literacy skills like rhymes, writing a child's own name, and learning letter sounds or names may be taught at the preschool level, in a manner that is engaging and that prepares children for later, more formal literacy instruction. These are not skills that are intuitive – they must be taught (Tunmer & Nicholson, 2011), therefore teaching them could help to level the playing field for children who will not receive that instruction at home (Sharp, 2002). This is especially important when we consider that the gap between children who enter school with reading knowledge and those who enter without is prone to widen without specific intervention (Stanovich, 1986). Al Otaiba, Kosanovich and Torgesen (2012) are adamant that children who may be at risk of having reading problems should be identified as early as possible in order to provide the support they need before they fall too far behind, and research by Roberts (2011) has also shown that instruction in alphabet knowledge at preschool can enhance later literacy learning.

The EDK-Ost 4bis8 study spent seven years carrying out a pilot study in 10 German-speaking cantons (Erziehungsdirektorenkonferenz Ostschweiz und Fürstentum Lichtenstein, 2010). They trialled a new early years programme that combined the first two years of kindergarten with either one or two years of primary school, in a mixed-age group not too dissimilar to the Montessori structure. The aim was to provide an environment that provided both playful learning and more academic learning, according to the needs of the individual children. It was recognised that by the time children start kindergarten, 30% already know some letters, and some children can already read syllables or words. It was hoped that disparities between higher and lower SES groups, and between German and non-German speaking children could be reduced by providing earlier instruction in phonological concepts and alphabetic knowledge.

What was discovered was that the children in the pilot classes outperformed their colleagues attending kindergarten and primary school by a significant margin at the end of the first two years (the traditional kindergarten period) in phonological awareness, reading and writing. But this advantage had mostly disappeared by the end of first grade, and had completely disappeared by the end of second grade. Starting their “formal” education earlier

also did not socially disadvantage the children in the pilot group – they were just as self-confident and socially orientated as their peers.

Unfortunately, children with a non-German home language remained significantly disadvantaged in both the traditional and pilot settings, as were children from low SES groups. Children who happened to be both non-German speaking and socially disadvantaged were doubly penalised. SES and language had the greatest negative impact on children's vocabulary, and phonological awareness was least impacted. Reading and writing were also less of a problem than vocabulary, as these are skills that can be explicitly taught in the school setting.

### **Does orthography play a role in how children learn to read?**

It is important to ask whether learning to read differs for children depending on the grapheme-phoneme relationship of the language they are learning. For example, there are fewer spoken variants of vowels in German than there are in English, and their pronunciation is more regular. This may mean that beginning German readers do not need to rely much on lexical information to help them read (Näslund, Schneider, & Van den Broek, 1997), but instead can successfully rely on decoding words once they have learned the phoneme-grapheme patterns specific to their language. Will they learn to read more quickly and easily?

Mann and Wimmer (2002) suggest that the transparent orthography of German, and the systematic way in which children are taught in German speaking countries with an emphasis on synthetic phonics, explains why second graders are already such successful decoders in comparison to their English speaking counterparts despite starting to read a year or two later. When they compared a group of 60 American children with a group of 100 German children, all of whom came from middle-class, middle to high SES neighbourhoods, the American kindergarten students had a much greater knowledge of letter names and phonemic awareness. But by the end of the first grade the German students had caught up. Even without a greater phonemic awareness than their American counterparts, they appeared to be better decoders.

But in order to ascertain whether the children's swift mastery of decoding was really due to the orthography of the language, or whether it was actually a result of the children's maturity when they started to learn to read, Hanley, et al. (2004) decided to compare Welsh

and English-speaking children starting school at the same time, and with the same methods of instruction. Welsh also has a more transparent orthography than English, so they believed that any differences would be due to this feature rather than the age at which children learn to read. The sample consisted of 52 English-speaking children and 46 Welsh-speaking children. They were matched for age, but not necessarily for SES or HLE. Initially the Welsh-speaking children were better at reading real words and pseudowords, but the English children had largely caught up by the age of 10 years. The English-speaking children needed time to build up a large sight word vocabulary for all the words that are not orthographically regular. Interestingly, the poorest English readers had worse decoding skills than their Welsh counterparts, suggesting that poor readers are helped by having an orthography that is readily decodable.

There is a correlation between children's vocabulary and their ability to read in any language, because children can call upon their vocabulary to decode – and more importantly, to recode – what they have read. A recent study set out to examine whether, in comparing English with German learners, vocabulary knowledge would play a more important role for English students (Suggate, Reese, Lenhard, & Schneider, 2014). As with the Welsh students, the German students acquired word-reading and decoding skills more quickly than their English counterparts, and as hypothesised, the English students used their vocabulary knowledge more than the German students did to support their decoding skills, especially in the case of words that were irregular.

By the same token, children reading in German may rely almost entirely on a strategy of decoding at the phonemic level, or fine “grain-size” in order to read successfully, whereas English readers will supplement that fine level decoding with decoding that takes place at the level of rimes or even whole words (Goswami, Ziegler, Dalton, & Schneider, 2001). This, apparently, happens regardless of the methods used to teach reading, although there is still a wealth of evidence that supports teaching children to read using a phonological rather than a whole-word approach (Chapman, Tunmer, & Prochnow, 2001).

## **Cultural and Social Aspects of Reading Acquisition**

It is essential to remember that regardless of when children enter the educational system, they do not enter as clean slates. The home environment provides a wealth of emergent literacy experiences, of course, as children learn to speak and engage with their

families and the environment around them. But there is a great range in what parents can offer their children, and all of this has a bearing on what children bring with them when they first start to read.

In a meta-analysis of shared reading studies, it was found that parents' reading to their preschool children was as strong a predictor of children's later reading ability as phonemic awareness (Bus, IJzendoorn, & Pellegrini, 1995). There may be several reasons for this – not only are children introduced to the concept of the written word, and the relationship between phonemes and graphemes, but they also become familiarised with the more formal structure of written language, with its more complex syntax and with a wider vocabulary. There will be individual differences in the frequency with which parents read to their children, but there may be group differences as well. Parents who enjoy reading to their children are more likely to enjoy reading themselves, and to have more books at home or make more frequent trips to the library. Socioeconomic status may play a role here - from the number of books in the home, to parental expectations and ability to read successfully with their children (Hecht, Burgess, Wagner, & Rashotte, 2000).

It is important to differentiate between socioeconomic status (SES) and the home literacy environment (HLE), although there may be some correlation between the two. Children are exposed to different levels of print exposure, language use, rhymes and word games, and shared reading, and some, but not all of this variation may have to do with the SES of their parents (Burgess, 2002). The HLE, through formal literacy practices like teaching children the letter-names, or through informal activities like making trips to the library, is a significant predictor of reading achievement (Manolitsis, Georgiou, & Tziraki, 2013), and the quality and quantity of these activities may vary according to SES, which could explain why SES is moderately related to phonological sensitivity in preschool children (Burgess, 2002).

HLE also plays an important role in the development of linguistic competencies in a German-language context (Niklas & Schneider, 2013). Families who provide a strong literacy environment for their children help them to start well at kindergarten, as well as advantages in early phonological awareness, vocabulary and early reading and writing. These advantages apply even though German-speaking parents show less of a tendency to teach their children letter names before they start school, once again reflecting the likely benefits of learning a language with a transparent orthography. As Niklas and Schneider (2013) point out, it is

easier to improve the HLE of a family than it is to change its SES, for instance by encouraging families to visit their local library, or to provide them with books.

### **How well do children read in Switzerland?**

Certainly the popular view in Switzerland seems to be that children learn to read quickly and easily once they start school (Stamm, 2010), but despite the apparent economic and social stability of Switzerland – in the OECD (Organisation for Economic Coordination and Development) it has one of the highest expenditures per capita on education (Meunier, 2011) - there are a large number of children who are failing to learn to read. This was brought starkly to the attention of Swiss political and educational experts when the results of the PISA 2000 survey showed a wide disparity between students' reading scores in the highest and lowest quartiles. Many of the children who struggle are from economically disadvantaged and/or migrant families.

PISA results from 2000 have highlighted that although Switzerland performs relatively highly in terms of literacy, 20% of the population are considered to be very weak readers (Frederiksson, Holzer, McCluskey-Cavin, & Taube, 2009; Moser, 2000). This particularly large discrepancy of student reading attainment in Switzerland seems to be largely dependent on the socioeconomic status of the students (Willms, 2006), but is also more apparent in cantons that intensively track students into more and less academic high schools. That is to say, tracking students not only tends to sort students out by SES, but impacts negatively on the overall performance of students in those cantons (Willms, 2006). The German cantons performed worse than either the French or the Italian cantons, and only slightly better than students in Germany, where the SES gradient – the correlation between SES and literacy – is even steeper.

One study tried to unpack, based on the results of the PISA survey, the fact that immigrants seem to be disproportionately represented at the bottom end of the literacy scale, and to understand why there is such a gap between Swiss natives and first and second-generation immigrants (Meunier, 2011). Switzerland has one of the highest proportions of immigrants in the OECD – almost 23% in 2000, compared with around 10% in France and Germany. Three possible explanations were considered: that immigrant students are doing worse because they receive their education in a language other than the one they speak at home; that immigrant families have lower SES than Swiss families; or that immigrant



students are not attending the same educational environment – they are more likely to attend large, urban schools where the teachers are less qualified. The study came to the conclusion that language, in the Swiss situation, does not appear to be causing the discrepancy. Immigrant students do not seem to have more of a problem learning in another language than Swiss students do. The gap seems to be almost entirely accounted for by a difference in the families' SES, and in parental educational levels and language skills, and the gap is much wider for the weakest students.

An earlier start to formal education would provide an opportunity for more schooling, and with it more time to help students who are otherwise falling behind (Moser, 2000). Within the public education sector, children start to learn to read when they enter school at the age of 6½-7 years old, thereby missing an opportunity to support the early literacy development of children at risk, particularly those children who are economically or culturally disadvantaged. Some cantons are trying to rectify this with an early immersion programme that specifically targets young immigrant children (Stamm, 2010). As the EDK-Ost study showed, it is not sufficient to have children learning to read in kindergarten (EDK-Ost, 2010). The support for disadvantaged families needs to start earlier, and include ways of helping parents to teach literacy skills to their children (Haney & Hill, 2004).

Partially in response to the sobering results of PISA 2000, Swiss German cantons are moving towards a more centralised and unified curriculum that should be introduced over the next few years. Zürich will start with the new curriculum in 2017/18, at the earliest. The curriculum is more explicit about what is expected in the early years of school, and kindergarten teachers will be allowed to start the process of teaching children about letters. For example, children in the first “learning cycle” (which will include kindergarten and the first two years of school) will “experience pictograms and letters as carriers of meaning”, “develop an interest in writing letters, numbers and words” and “recognize individual letters” (Deutschschweizer Erziehungsdirektoren-Konferenz, 2013).

## **Conclusion**

Learning to read is one of the most important things children need to accomplish in order to grow to be competent, successful adults in a demanding, complex world. There is divided opinion on how children should learn to read, and when. We have seen that in Switzerland, and specifically in Zürich, children learn to read at six or seven years of age



when they enter first grade, whereas children in Montessori schools learn to read at four or five years of age. Because both the state and Montessori schools in Switzerland take a phonological approach to teaching literacy, it should be possible to make a comparison between the two to see whether there is a difference in reading outcomes between the two groups. Hence the research question: do children benefit from learning to read earlier compared to children who learn to read later?

## Methodology

In this chapter the methodology used in the study is described. The sections of the method chapter occur in this order: participants, school setting, measures, design, procedure, and data analysis. The research question that the methodology of the study was designed to address was whether there was a difference in relative reading and language progress of first grade children enrolled in a State school or a Montessori school. Children in Montessori schools make a start on learning to read in kindergarten whereas this does not happen in State schools until first grade. The present study aimed to find out if it was advantageous for Montessori schools to make a start on teaching children to read at an earlier age than normal.

### Participants

The participants were 42 pupils from a first grade class in a local State school, and from two mixed lower elementary classes in a local Montessori school in Switzerland. The participants were in three groups. First, the Old Montessori children who had attended Montessori school since kindergarten. Second there were the New Montessori children who had only just started Montessori first grade. Third, there were children from the local state school who were starting first grade 1. The total group of pupils were aged between 6½ and 7 years at the beginning of the school year ( $M = 6.75$ ,  $SD = 0.36$ ). The class from the state school had 21 pupils, and of those pupils 18 were allowed by their parents to participate in the study. The two classes from the Montessori school had a combined total of 24 students all of whom were granted permission to participate. The ages for the three groups of children were: Old Montessori  $M = 6.84$ ,  $SD = .32$ , New Montessori  $M = 6.61$ ,  $SD = .32$ , Local school  $M = 6.70$ ,  $SD = .37$ . There was no statistical difference among the three groups in age,  $F(2,39) = 1.23$ ,  $p = .305$ .

The 18 children (5 girls, 13 boys) at the state school were previously enrolled at the local kindergartens. Ten of the children only spoke German at home, one child spoke German and another language, and seven children only spoke another language at home.

Of the 24 children at the Montessori school, 17 had attended the Montessori kindergarten that belonged to the school for a year or more, two had attended an unaffiliated

Montessori kindergarten, one had attended a private non-Montessori kindergarten, and four had attended local kindergartens. In short, 17 (11 girls, 6 boys) had attended the Montessori kindergarten and had reading instruction and 7 children had not (6 girls, 1 boy). There were seventeen girls and seven boys in total. Eight of the children only spoke German at home, six spoke German and another language, and ten of the children only spoke another language at home.

A chi square comparison among the three groups for gender showed a significant difference between the Old Montessori, New Montessori, and State school children with more girls in the Montessori groups,  $\chi^2(4, N = 42) = 8.52, p = .014$ . A chi square comparison among the three groups for languages showed no difference,  $\chi^2(4, N = 42) = 5.90, p = .207$ .

## **Setting**

### **Local school**

The local school follows a traditional model of education. The first grade class in this study had 21 students, which is typical for a primary school in Zürich. They follow a curriculum laid down by the canton, and the timetable, including the number of hours set aside for literacy, is also planned in accordance with cantonal requirements – 240 hours in the first grade, of which 40 hours are for visits to the library. The children in the first grade come from the local catchment area and have attended two years at one of the local feeder kindergartens. The local council decides where children are placed based on the families' location, and class sizes. At this school there are two classes of approximately 20 children for each grade between 1<sup>st</sup> and 6<sup>th</sup> grade – so about 250 children in total.

There are 20 instructional hours in a school week, and a school day typically starts at 8.10 am and ends at 3.20 pm, with a two-hour long lunch break when the children either go home for lunch or attend a lunch club organised by the school. The instructional time is broken up into lessons that last for 45 minutes. The children in each class are divided into two arbitrary groups and for much of the time these groups are taught separately, with one group attending music, or gym, or craft lessons whilst the other group remains in the classroom with the class teacher. In the study class there are two class teachers who each teach 50 percent of the time, and who coordinate their lessons accordingly. Both teachers are fully qualified in Zürich as primary school teachers.

The classroom has a main room where the desks, each accommodating two children, are arranged in rows to face the blackboard and overhead projector the teachers use for group instruction. Large windows run the length of one wall, and the opposite wall is covered in the children's artwork. Behind the main room is a smaller room separated by a sliding glass door, with a shelf of picture and reading books, and a couple of desks that have been pushed together to allow group work or individual instruction.

During the first term of school – between August and December - the children are introduced, as a class, to the names and sounds of the letters of the alphabet, starting with those letters most frequently used in German. After a couple of weeks they learn to decode words that use the letters they have already been introduced to, and the ability to decode grows parallel to their expanding knowledge of the alphabet. By the end of the school year they expect the children to have encountered most of the phonograms in German, and to be able to read short, decodable reading books.

The teachers have selected a workbook from the range made available by the Zürich education board, which they find effective and appropriate for the first grade. This is their primary teaching material, but they also supplement it with material they make themselves, such as word-picture cards. Most of the instruction involves whole (or half) class teaching, with the teachers checking the children's work afterwards to ensure that everyone has understood.

A special needs teacher also works in the class with small groups twice a week for an hour each time, and is able to offer support to children who appear to be struggling. All the first grade classes receive this support from the beginning of the school year. If it is insufficient the children may, after consultation with their parents, be offered more intensive pull-out support.

## **Montessori School**

The Montessori school follows the traditional Montessori pedagogy, and is accredited by the Swiss Montessori Association, which regulates whether institutions are upholding Montessori's pedagogical standards. It is a private non-profit school, funded entirely by school fees, and donations from the school's founder. There are three kindergarten classes that take children from the age of three years, two lower elementary and two upper

elementary classes. Altogether there are approximately 200 children at the school. The children enter the first grade at the same age as their peers at the local school.

The two lower elementary classes encompass the first to third grade. One of the classes has 36 pupils, of which 14 are first graders, and the other has 32 pupils, 10 of whom are first graders. Although the school is also bound by the canton to certain curriculum requirements (for example, the number of hours of physical education per week), the fact that the school is entirely privately funded grants it a certain level of autonomy. So although the teachers must meet the targets laid down in the curriculum for their students at the end of the third and sixth grade, the teaching methods used to reach them are left to the school's discretion.

More than half of the kindergarten children stay on at the school for first grade, but many leave to attend regular local schools. Because it is a day school many working parents choose to send their children for pragmatic as well as ideological reasons – lunch is provided at the school, and the children can stay until 6.00 pm every day. On the other hand, most of the children who enter the first grade have already attended at least a year of kindergarten at the school first, and their parents have invested in the Montessori pedagogy. Children who enter the school without any prior Montessori experience are rare, and are obliged to spend a trial week at the school to ensure that they feel comfortable at the school, and understand the expectation to be able to work independently. Occasionally children are turned away, but for behavioural rather than academic reasons.

The timetable reflects Montessori's belief that children are capable of long stretches of concentrated work if they are given several hours of uninterrupted time in which to do it. So instead of the morning programme being divided up by subject, with a communal break half-way through the morning, the children start at 8.00 am and work for the next three hours on whatever projects they have chosen in consultation with their teachers. The pupils also decide when they need to take their morning break, and will take it with one or two friends for fifteen minutes. All the other subject lessons, like music, crafts and physical education take place in the afternoon. All the children stay until lessons finish at 3.30 pm, and some stay for the after-school programme until 6.00 pm.

Both of the lower elementary classes have three class teachers – two who teach in German and one who teaches in English. Several of the teachers have the Zürich teaching diploma and the Montessori elementary teaching diploma, and the others have Montessori

diplomas. There are also teachers' aides in each classroom to support children with learning difficulties, and to help out in the classroom more generally. There is a specialist German teacher who offers individual support to struggling readers if the class teachers recommend this, but the parents need to pay separately for this help.

Each pupil, from first grade, has a weekly meeting with one of the teachers to decide what she or he will do that week. This will include both work that the teachers present to small groups, and individual assignments that the pupil will work on during the week. Sometimes the pupils will be split up by grade if the teachers want to give a lesson to a particular grade, but often presentations will be given to a small group based on their interest in the topic, or on their previous knowledge. Teachers will also give individual presentations. In this sense, the Montessori classrooms provide a differentiated learning environment that caters to children of differing abilities regardless of age or grade level. Because of time constraints, the teachers are likely to give only one individual reading or literacy-related presentation to each child during the week, and for the rest of the time they will be working individually or with a friend.

The school is housed in a villa, and each of the classes takes up a whole floor. Each "classroom" is actually three rooms that are organised according to subject area – the mathematics materials are arranged on shelves in one section, language materials in another, and "cosmic education" (science, geography, history and social studies) in another. Within each of these sections the material is organised very carefully so that one work follows on from the next in a logical sequence. It can appear overwhelming on first entering a Montessori classroom, with so much material on display, but pupils know that they may work with material that has already been presented to them. By the end of three years they should be familiar with almost all the material in the classroom.

There are desks, but these are arranged in small groups around the classroom. Space is left for children to take large mats to work on the floor, which is often necessary when the materials they are working with require space to be laid out and manipulated. The pupils are free to move around as they wish (as long as they are not disturbing their classmates) and they may work where they choose. As presentations are given to small groups, and usually with specific Montessori materials, there are no blackboards.

The Montessori literacy curriculum for the first grade is based on the assumption that the pupils have already learned basic decoding and encoding at kindergarten. The emphasis is

instead on learning grammar: deconstructing how sentences work, and learning about verb forms, adjectives, pronouns and tenses. Most of this work is done with manipulative materials, but the pupils also keep a written record of the work they've done. There is weekly dictation for the whole class, and workbooks to practice writing. The teachers encourage the pupils to write stories, either based on real events or using "story starters". There is a series of graded readers that the pupils can work through, and they are encouraged to read daily.

## Measures

**BAKO 1-4.** The BAKO 1-4 (Stock, Marx, & Schneider, 2003) is an individual listening test (in German) that measures phonological awareness, and is divided into seven sub-tests that measure different aspects of phonological awareness. It was designed in Germany for children in the first to fourth grade.

The first subtest is Pseudo Word Segmentation (see Appendix 8), which focuses on separating words into their phonemic components – the child must use counters to mark each phoneme heard in made-up words. It comes first in the battery in order to draw the children's attention to the phonemic units that make up each word.

The second subtest is Vowel Substitution (see Appendix 8), in which each [a] needs to be said by the child as an [i]. The child not only needs to hear each [a] and be able to change it, but also to recognise those vowels in the word that should be left unchanged. The child hears a mixture of real and pseudo words.

The third subtest is Phoneme Deletion (see Appendix 9), in which the first phoneme in each word must be dropped. A mixture of real and pseudo words is used. Some of the words begin with a vowel, some with a single consonant, and the trickiest words start with a consonant cluster.

The fourth subtest is Phoneme Reversal (see Appendix 9), in which the first two phonemes are swapped around, but the rest of the word remains as it was. The words are a mixture of real and pseudo words. Because the test requires the child to manipulate the first two phonemes and then add them to the rest of the unchanged word, it places demands on the child's working memory.

The fifth subtest is Phoneme Categorisation (see Appendix 9), in which one of four words will have a different initial or last phoneme. It is based on an English test devised by Bradley and Bryant (1985) and includes groups of both real and pseudo words. It forces the child to differentiate between similar sounding phonemes (between, for instance, [m] and [n], or [oh] and [au]).

The sixth subtest is Vowel-length Differentiation (see Appendix 10), in which the vowel length of one of four words is slightly different (shorter or longer) than the others. The differences are subtle. For example, in one group of pseudo words the words are “liem”, “sief”, “minn” and “nier” – the difference between the short and longer [i] is very slight.

The final subtest is Word Reversal (see Appendix 10), in which the entire word has to be said back to front. This test also places strong demands on the child’s working memory, and the words in the test (once again, a combination of pseudo and real words) get progressively longer.

To standardise the test, 900 school children were tested in 2002 between May and July (the end of the school year in Germany and Switzerland) in five regions in Germany. The children were 1<sup>st</sup> to 4<sup>th</sup> graders, and were selected from both rural and urban schools. Although girls tended to perform slightly better than boys, the difference was only significant in the 2<sup>nd</sup> grade sample.

The test itself can be considered relatively objective, as the test items are played back from a CD. All the children get to hear exactly the same pronunciation of the test items, and there is no risk of a tester giving an unclear pronunciation. The tester’s instructions for each subtest are written to be repeated verbatim, so each child should get to hear the same instructions for the tests. The answers must be graded according to a strict schedule of what may be considered a correct or incorrect answer, so the grading of the tests also remains objective.

The reliability of each subtest was measured for internal consistency using Cronbach’s alpha, and for split-test reliability with the Spearman-Brown formula. The internal consistency for the first grade ranged between .68 and .91 for the individual subtests, with an overall coefficient of .94. The split-test reliability for the first grade ranged between .61 and .85 for the subtests, with a coefficient of .92 for the test as a whole.



The BAKO 1-4 is specifically designed to measure children's phonological competence – their ability to hear and manipulate phonemes – and to the extent that it does this, it can be said to have content validity. In order to test whether it also has criterion validity, that is, whether it accurately predicts or measures children's reading ability, 280 children's scores were matched against their scores in a standardised reading test (WLLP) and spelling test (DRT 1-4). There was a correlation of .48 with the WLLP and of -.54 with the DRT 1-4, both of which were significant to the .001 level. Therefore it can be understood as a valid measure of children's phonological and reading ability.

**ELFE 1-6.** The ELFE 1-6 (Lenhard & Schneider, 2006) is a written German test that measures the students' reading comprehension. There are three subtests, which become progressively more challenging – word comprehension, sentence comprehension and text comprehension. The first section has several pages with 28 illustrations on each page and a choice of four words next to each picture (see Appendix 5). The words are all phonemically and visually similar, and the children have to underline the word that matches the picture. There is a time limit for each section, so the children are tested not only on their word decoding ability, but also on how quickly they can read. The words become increasingly complex.

The second section provides the children with sentences in which one word is missing (see Appendix 6). They must underline the word that would complete the sentence. There is a choice of five similar words, but only one word in each case that would make sense and be grammatically correct. Different parts of speech have been chosen for the missing word – nouns, verbs, prepositions, and conjunctions – so that the children's grammatical competence is also tested.

The third section requires the children to read a short text and then answer one or two questions about it (see Appendix 7). They are given a choice of four answers, only one of which is correct. It is important for the children not only to be able to read the text quickly and correctly, but also to draw inferences and conclusions from the text. The texts, and the questions become increasingly difficult.

The test was designed so that the children would not have to write their answers down, which might otherwise disadvantage pupils whose orthographic skills are less advanced. Almost all the words used in the test (98%) are found in the written German primary school vocabulary, although it is probable that some of these words are less frequently used in

Switzerland. Non-German speaking children could be disadvantaged in this test because they do not have the requisite receptive vocabulary.

In order for the test to be carried out as objectively as possible a script is provided for the tester to read verbatim to the children at the beginning of the test and at the beginning of each section. The tester is not permitted to give the children any help specific to the test. Depending on the size of the classroom, and the placement of desks, it may be possible for children to copy each other's answers. A timer was used to make sure that each class has exactly the same length of time for each section. The marking of the tests is very objective, as a specific marking schedule is provided, and there can only be one correct answer to each question. If a child checks more than one answer the answer is marked as incorrect.

In order to standardise the ELFE 1-6, nearly 5,000 children from different regions in Germany were tested. Just over half of the children tested were boys, and 23% of the children were bilingual or non-native German speakers. The reliability of the ELFE 1-6 was measured with a group of 280 2<sup>nd</sup> - 4<sup>th</sup> graders for internal consistency using Cronbach's alpha, and for split-half reliability using the Spearman-Brown formula. For the 2<sup>nd</sup> graders an internal consistency of between .77 and .94 was found for the three subtests and the split-half reliability was between .93 and .94. Test-retest reliability was also checked for 1<sup>st</sup> graders and was found to have values between .82 and .89 for the subtests, and .92 for the test overall, which makes it very reliable.

The ELFE 1-6 is designed to test reading comprehension, and each of the subtests in word, sentence and text comprehension measures exactly that, giving it content validity. Reading comprehension is a vital aspect of reading ability, so the ELFE 1-6 is also a theoretically sound measure of reading ability. It was also correlated with the WLLP, and with a teachers' rating of the children's reading ability. A correlation of .52 was found with the WLLP, which is significant at the .05 level, and a correlation of .70 was found with the teachers' rating, which is also significant at the .05 level.

**Letter recognition.** A test of letter recognition was conducted individually in which students had to name the letter sounds of all the letters in both upper and lower case with the letters presented in a random order (see Appendix 11 (Nicholson, 2005)). The children were asked to name the letter sounds, rather than the letter names, because children in the Montessori school are taught the sounds before the names, and at the local school they learn both the sound and the name, but concentrate predominantly on the letter sound. If a child is

unable to give the letter sound, they are asked if they know the name. If a child mixes the letter sounds with the letter names these are still marked as correct as long as they give the correct letter name.

The test has face validity – that is, it measures what it purports to. It also has predictive validity. Letter-name knowledge has been found to be one of the best predictors of reading success, and letter sound may be at least as important as a predictor, as it demonstrates the child's understanding of the grapheme-phoneme relationship (Speece, Mills, Ritchey, & Hillman, 2003). In one study, letter-sound knowledge was found to have contributed unique variance to first-graders reading growth, and may be used as an independent predictor of word-reading growth (Compton, 2000).

**Teacher interviews.** The researcher interviewed the teachers at both schools about their approaches to teaching literacy. The teachers at the local school were interviewed in their classroom in November during the first period of testing. They were asked about the curriculum they followed, what methods and materials they used to teach alphabetic and early reading skills, and how much flexibility they were allowed in deciding how to teach their students to read. They were also asked how they managed the disparities in their students' reading abilities, and whether support was available for struggling learners both within the classroom and from outside help. They were able to give a general outline for the year, and what milestones they expected to reach with the majority of the class by the end of the school year.

The Montessori teachers were interviewed much later, after the testing was completed. They were asked about how they taught literacy, and also about the extent to which they were bound by the cantonal curriculum. They were also asked about how struggling readers were identified and supported. Some of the questions sought to clarify the way in which a Montessori classroom is structured both in physical and in organisational terms. Because the interview took place after the testing, the researcher was also able to ask questions that had arisen from the results and that begged further clarification.

The purpose of interviewing the teachers from both schools was to gain a fuller picture of the two separate learning environments. It is important to understand both the similarities and the differences between the two systems, and to be able to interpret the results of the testing in light of the different methods and philosophies of each school.

**Parent questionnaire.** The class teachers distributed questionnaires to their students' families at the beginning of the study, with a stamped, addressed envelope included so that the parents could return the questionnaire directly to the researcher (see Appendix 4). A cover letter was also included to explain the purpose of the study, and with an assurance that all details would be kept strictly confidential (see Appendices 2&3). During the second round of testing, the children whose parents had not already filled in the questionnaire were sent home with another copy of the survey. Out of the 42 families who were involved in the study 33 returned the questionnaire. This was a relatively high return rate, although inferences will still need to be made cautiously as almost a quarter of the families did not respond.

The questionnaire asked basic questions such as the child's gender and the languages spoken at home. Then there were questions relating to literacy habits, such as the number of books at home; how often parents read to their children; how often the family visited the library; how many books their child owned; and to what extent their child could already read by the time they entered first grade. Finally, the parents were asked about their own education and occupation. The information was designed to address some of the factors that influence children's reading success other than the school environment - the parents SES as reflected by their level of education and occupational status, whether the language/s spoken at home were the same as at school, and the home literacy environment.

## **Design**

The design of the study was a pretest-posttest comparison of reading progress made by grade 1 children in a Montessori school with grade 1 children in a state school. The children in the Montessori school had received some reading related instruction in kindergarten especially learning of letter sounds. In contrast, the state school had not received such instruction in kindergarten. The aim was to assess relative progress of the two classes from the beginning to end of the year.

This was a quasi-experimental study in that the children were not randomly assigned to classes. The two classes were in two different schools and the researcher had no input into their allocation to classes. The aim was to compare the reading progress made by children who have had formal reading instruction before they entered school with those who have not.

Children's reading attainment was assessed at the beginning of the school year to check for any differences between the groups. The children were also assessed at the end of the year to see if gains in reading were similar or different.

## **Procedure**

There were two testing periods for the BAKO 1-4 and the ELFE 1-6 at each school, and each testing period took about a week for each class. The first testing period was in November 2014, three months into the school year, and the second testing period took place in May 2015, six months later. The ELFE 1-6 was conducted as a group test and took approximately half an hour to complete. Each class was tested separately in their own classroom, and although on each occasion the respective class teacher was present, the researcher read out the instructions to the pupils. The teacher helped to administer the test – ensuring that the children had understood the instructions, that they were all working on the correct page of the test, and that they were not copying their neighbours' answers.

The BAKO 1-4 is a listening test that was conducted individually, with the test taking between 30 and 40 minutes to complete. The test itself was played from a computer, but the researcher read out the instructions. Before each subtest, the child was given a chance to practice with examples included in the testing manual. Once the testing started the researcher could smile and acknowledge the answers given, but could not give any further help or tell the child whether or not the answers given were correct.

The letter recognition test was administered in November in conjunction with the BAKO 1-4. As it is a more straightforward assessment than the phonological test, it was given first to the children to help them ease in to the testing process, and took less than five minutes to complete. At the local school the individual testing took place in a room at the back of the classroom. It was separated by a glass sliding door and was relatively soundproof, although testing did have to be put on hold when the bell rang for a change of class. At the Montessori school a meeting room was made available for the testing.

Before each test, the researcher thanked the child or children for their time. It was stressed to them that they were not going to be judged on the results of the test - that they were helping the researcher with her study on how first-graders learn to read. It was also important to point out to the children that because the BAKO 1-4 and ELFE 1-6 tests were designed for children up until the fourth and sixth grades respectively, that some of the questions might seem very

difficult, but that they were not expected to be able to answer them all. At the end of the study each class was given a gift of books and bookmarks to thank them for the help they had given.

Apart from the data collected during the two periods of testing, a more complete picture of the children's home and school literacy environments was obtained by interviewing the teachers and by sending questionnaires home to the parents along with the information sheets.

## **Data analysis**

The pretest and posttest data were analysed using ANOVA repeated measures to compare the pretest-posttest changes in reading scores of the Montessori class with the State school class. The dependent measures were the phonological awareness assessment, the reading assessment, and letter recognition test. For the phonological awareness assessment, an independent assessor marked 10 of the tests with the researcher – the interobserver reliability was .94.

The questionnaire data were analysed by comparing responses of parents from the two schools. This was done by reporting descriptive statistics such as frequencies and percentages, the chi square statistic, and Fisher's Exact Test.

## **Ethical Considerations**

Massey University Research Ethics Office evaluated the study as low risk (see Appendix 1). Informed written consent was obtained from the school principals, and the caregivers of the participants in the study were given the option to opt out of the study at any point. The children in the study were between six and seven years of age. The reading assessments used in the study were from standardised, published assessments that were appropriate for this age group. Confidentiality was assured in that names of the children and the schools were not to be identified in the reporting of the study.

The researcher had a potential ethical conflict in that she was a teacher at the Montessori school. This was controlled for in that she was not a teacher of either of the classes assessed for the study. Her child was also enrolled at the local school, but not in the class that was being assessed and she did not know any of the pupils before she started the assessments.

## **Summary**

The methodology of the study involved a pretest-posttest comparison of the relative reading progress of first grade children in a Montessori school and in a State school in Switzerland. The study involved 18 children from the State school and 24 children from the Montessori school. The children were assessed at the start of the school year and after six months of school for reading, phonological awareness, and letter knowledge. Teachers of the children were also interviewed. A questionnaire was given to parents to ask about home literacy and parent education. The statistical analysis focused on possible differences in reading and language progress made during the school year by children in the State and Montessori classrooms.

## Results

The goal of the study was to discover if there were differences between children attending the Montessori school and the Local school in first grade. One question was whether the Montessori children were different to the Local children in terms of parent backgrounds and home literacy environments. Another question was whether the Montessori children were ahead of the Local school children in alphabet knowledge on entry to first grade, and if they were ahead, whether this gave them an advantage over the Local children in terms of reading progress in the first year of school. Whether any differences might be due to home language or gender was also of interest. The results are reported in five sections: parent education and occupation, home literacy environment, literacy assessments, home language, and gender.

### Parent education

Table 1 provides a breakdown of parents' education. Both the local and the Montessori parents have a majority of parents, both mothers and fathers, who have either a polytechnic or university degree. Chi square comparisons showed no difference among the three groups of children in terms of parent education.

**Table 1 Parents' Education**

	<b>Montessori mother</b>	<b>Local mother</b>	<b>Total mother</b>	<b>Montessori father</b>	<b>Local father</b>	<b>Total father</b>
<b>School certificate</b>					1	1
<b>Higher school certificate</b>				1		1
<b>Apprenticeship</b>	2	2	4	2	1	3
<b>Master in trade</b>	2		2	2		2
<b>Polytechnic</b>	3	4	7	1	1	2
<b>University</b>	14	6	20	15	9	24
<b>Total</b>	<b>21</b>	<b>12</b>	<b>33</b>	<b>21</b>	<b>12</b>	<b>33</b>

NB. In Switzerland, the polytechnics provide a degree equivalent to a university degree



## Parent occupation

The parents were asked to state their occupation. This was then coded according to the Elley-Irving Socio-Economic Index, which was designed to provide an objective index of occupational status, taking into account the educational and income levels for workers in each group (Elley & Irving, 2003). There are six categories, with Group 1 including doctors, barristers, architects, mathematicians and economists; Group 2 includes authors, primary school teachers and bank officers; Group 3 has museum curators and music teachers; Group 5 has nurse aides, housekeepers, gardeners and seamstresses; and Group 6 includes a kitchen hand. Although this code was developed for the New Zealand context, the categories seem to broadly hold for the Swiss context too. When occupation was correlated with education, there was a correlation of .616 for fathers' education and occupation and .683 for mothers' occupation and education.

Table 2 provides a breakdown of occupations by school. With the exception of the two local fathers working in Group 5 and 6, the proportion of parents working in each group is very similar for both groups. Chi square comparisons showed no differences.

Table 2 Parents' occupation

	Montessori mother	Local mother	Total mother	Montessori father	Local father	Total father
Group 1	12	5	17	19	10	29
Group 2	3	4	7	1		1
Group 3	2	1	3	1		1
Group 5	4	2	6		1	1
Group 6					1	1
Total	21	12	33	21	12	33

## Home literacy environment

**Visits to the library.** Table 3 shows the number of visits parents made with their children to the library. It seems that local parents visit the library more often than Montessori parents.

**Table 3 Family Library Visits**

Library visits	Montessori		Local	
	Frequency	Percent	Frequency	Percent
Once a week	1	4.8	4	33.4
Once a fortnight	2	9.5	4	33.4
Once a month	1	4.8	1	8.3
3-4 times a year	6	28.6	2	16.6
Never	11	52.3	1	8.3

These results in Table 3 were simplified so that visits to the library were either Often (weekly or fortnightly), sometimes (monthly or 3-4 times a year) or never. As a result the simplified results were:

**Table 4 Library visits, simplified**

	Often	Sometimes	Never
Local	8	3	1
New Montessori	1	3	2
Old Montessori	2	4	9

A crosstabs analysis showed a significant difference among the schools in library visits,  $\chi^2 = 12.16$ ,  $p=.02$ . The difference appears to be that the Local parents visited the library often; the New and Old Montessori parents much less often. A possible explanation is that the local school parents were more likely to make regular visits to the library with their children than the Montessori parents because the local library is directly across the road from the primary school, with opening hours that reflect when parents pick their children up from school. This makes it convenient to establish a regular pattern of returning and choosing new books every week or fortnight. The Montessori parents had to rely on their local libraries, which may be inconvenient, as many of the families commute from some distance to get to school.

Language is another possible explanation for the frequency of library visits – some of the Montessori parents have said that they do not visit their local library because they only feel comfortable reading to their children in their native language. Local libraries will certainly have children's books in German, French and Italian, and also a few in English, but it is unlikely that Spanish, Chinese or Swedish parents will find books in their languages.

**Number of children's books at home.** As can be seen in Table 5, Montessori parents had more books at home than did Local parents. It may be that instead of visiting the library, some of the non-German parents compensate by buying books instead. Five of the children had more than 100 books at home and four of these were Montessori children – the maximum was 400 books. Three of the four Montessori children with more than 100 books speak languages apart from German at home, and the one child at the local school who has more than 100 books at home also speaks a language other than German at home.

Only two of the parents who completed the questionnaire said that they had fewer than 10 books at home – both said that their children have five books, but in this instance the paucity of books did not appear to be compensated by trips to the library. One family said that they visited the library once a month, but the other family never visited. The mean scores of the different parent groups were quite different but an ANOVA showed, however, there was no statistical difference between the number of books at home of Local parents ( $M = 53.33$ ,  $SD = 52.76$ ), New Montessori ( $M = 88.33$ ,  $SD = 63.06$ ) and the Old Montessori parents ( $M = 120.67$ ,  $SD = 118.11$ ),  $F(2,30) = 1.85$ ,  $p = .18$ .

**Table 5 Number of children's books at home**

Number of books	Montessori		Local	
	Frequency	Percent	Frequency	Percent
<10	0	0	2	16.7
10-50	7	33.3	3	25
50-100	10	47.6	6	50
>100	4	19.1	1	8.3

**Reading to children.** How often do parents read to their children? As can be seen in Table 6, at both schools, an overwhelming majority of parents said that they read to their children at least three or four times a week, with about two thirds saying they read to their children every day. Only one family from each group said that they read to their children “every so often.” One Montessori mother added that she had stopped reading so often to her daughter now that she was reading more books on her own. A chi square comparison showed no statistical difference between the Montessori and Local children.

Table 6 Parents reading to children

Reading to children	Montessori		Local	
	Frequency	Percent	Frequency	Percent
Daily	13	61.9	8	66.7
3-4 times a week	7	33.3	3	25
Every so often	1	4.8	1	8.3

**Children reading on their own.** Another question asked of parents was how often they observe their children “reading” books at home. It was not specified what level of books they read, nor whether they read each word, or look mostly at the pictures. Of more interest was whether the children are in the habit of picking up a book for their own enjoyment. In comparing the two schools, there were more children at the Montessori school who read each day but a Fisher’s Exact Test p-value of .773 showed that this difference was not statistically significant.

Table 7 Children reading on their own, by school

Children reading	Montessori		Local	
	Frequency	Percent	Frequency	Percent
Daily	10	47.6	4	33.3
Often	6	28.5	5	41.7
Now and again	4	19.1	3	25
Never	1	4.8	0	0

**Gender differences in children reading on their own.** Was there a difference between boys and girls reading habits? As can be seen in Table 8, the two groups were pretty evenly matched, with approximately 75% of both boys and girls reading either often or daily. A chi square comparison showed no difference.

**Table 8 Children reading on their own, by gender**

Children reading	Girls		Boys	
	Frequency	Percent	Frequency	Percent
<b>Daily</b>	9	47.4	5	35.7
<b>Often</b>	5	26.3	6	42.9
<b>Now and again</b>	5	26.3	2	14.3
<b>Never</b>			1	7.1
<b>Total</b>	<b>19</b>	<b>100</b>	<b>14</b>	<b>100</b>

**Number of alphabet letters known.** Finally, in order to ascertain from the parents the extent to which their children were already reading when they entered first grade, parents were asked to estimate how many letters their children already recognised when they started school, and whether they could already read words, sentences or books. As can be seen in Table 9, all but one of the children in the Montessori sample knew most or all of their letters by the time they started first grade –one child who did not know any letters had not been to the Montessori kindergarten, but had come from outside the school. In the local sample half of the children already knew all their letters, and a quarter knew no letters or “only the letters in his name.” The correlation between the parents’ assessment of their children’s alphabetic knowledge and the Letter Recognition test was .666, which was significant at the .01 level, which suggests that the parent estimates were fairly similar to children’s actual knowledge.

An ANOVA showed parents’ estimates of the number of letters known by their children was significantly higher for the Old Montessori children ( $M = 25.47$ ,  $SD = 1.60$ ,  $N = 15$ ) than the New Montessori ( $M = 19.67$ ,  $SD = 10.07$ ,  $N = 6$ ), and the Local children ( $M = 16.75$ ,  $SD = 10.93$ ,  $N = 12$ ),  $F(2,30) = 4.24$ ,  $p = .02$ . Contrasts showed that the significant difference was between the Old Montessori children and the Local children. Other contrasts were not significant.

**Table 9 Number of letters known at entry to first grade**

Number of letters known	Montessori		Local	
	Frequency	Percent	Frequency	Percent
0	1	4.8	2	16.7
5			1	8.3
10			2	16.7
20	3	14.3	1	8.3
24	1	4.8		
26	16	76.2	6	50

**Children's reading ability prior to first grade.** As can be seen in Table 10, all the children who had attended the Montessori kindergarten started the first grade able to read at least one or two words, according to their parents. The two children from the Montessori sample who were not able to read came from another kindergarten to start at the school in first grade. The three children from the local school who could already read sentences or books had actually learnt to read in a language other than German. This was either because their parents had sent them to a language course in their home language that also emphasized reading and writing, or because they had taught them at home. A correlation of .495 was found between parents' assessment of their children's reading level and their performance in the Letter Recognition test, which was significant to the .01 level. Fisher's Exact Test found no significant difference between the boys and girls' reading levels.

**Table 10 Children's reading level at entry to first grade**

Reading level	Montessori		Local	
	Frequency	Percent	Frequency	Percent
Not reading	2	9.5	4	33.3
One or two words	4	19	4	33.3
Quite a few words	5	23.8	1	8.3
Sentences	3	14.3	1	8.3
Books	7	33.3	2	16.7

These results in Table 10 were simplified so that reading level at entry was low (not reading or one or two words), medium (quite a few words) or high (sentences or books). As a result the simplified results were:

**Table 11 Reading level, simplified**

	<b>Low</b>	<b>Medium</b>	<b>High</b>
<b>Local</b>	8	1	3
<b>New Montessori</b>	4	1	0
<b>Old Montessori</b>	1	4	10

A crosstabs analysis showed a significant difference among the schools in terms of reading levels at school entry (according to parents),  $\chi^2 = 15.62$ ,  $p = .004$ , with Old Montessori children more likely to be reading at a high level (sentences and books) and Local children more likely to be reading at a low level (not at all or one or two words).

Regardless of where and how children learned to read there was a correlation between their reading level at school entry and the phoneme pre- and posttests (.641 and .506 respectively), and the reading pre- and posttests (.613 and .448) that was significant at the .01 level.

## **Literacy assessments**

For the phoneme, reading, and letter recognition tests there was a 100% completion rate. There is a small but significant sub-group in the Montessori sample, of children who have just joined the school, and have therefore not had the literacy teaching at kindergarten level that their classmates have had. For the purposes of analysis they will be treated as a separate group – so the Montessori children will be designated as either “Montessori New”, or “Montessori Old” to differentiate between the two groups. There were 17 Montessori Old children, 7 Montessori New children, and 18 Local children.

The results of the three tests were correlated to ensure that they were all testing aspects of the same construct. There was a Pearson correlation of .415 between the letter recognition

and the reading test, of .546 between the letter recognition and the phoneme test, and of .586 between the reading and the phoneme test. These were all significant at the .01 level.

**Letter recognition.** The results for letter recognition are shown in Table 12. An ANOVA for the letter recognition test gave  $F(2,39) = 3.91$ , which was significant  $p = .03$ . Follow up contrasts showed that the Old Montessori children scored significantly higher than the Local children. Contrasts showed no other differences.

**Table 12 Letter Recognition Test Means**

School	Mean	SD
Local	45.44	7.91
Montessori Old	50.59	1.58
Montessori New	48.57	3.21

**Reading.** The results for reading are shown in Table 13. The z-values ranged from -4.16 to 5.74, where 0.03 is a score in the 41.52 – 51.06 percentile band for the end of the 1<sup>st</sup> grade. Negative scores can be interpreted as being below the 50<sup>th</sup> percentile, and positive scores above the 50<sup>th</sup> percentile at the end of the 1<sup>st</sup> grade (the test has not been standardised for the first half of the school year for the 1<sup>st</sup> grade). The pretest scores were taken from the November testing period and the posttest from the May testing period.

An ANOVA for pretest scores showed no difference among the three groups,  $F(2,39) = 2.37$ ,  $p = .11$ . A t-test comparison of just the Old Montessori children and the Local children also showed no significant difference,  $t(33) = 1.78$ ,  $p = .09$ , though the result was approaching significance in that the Old Montessori children had relatively better scores.

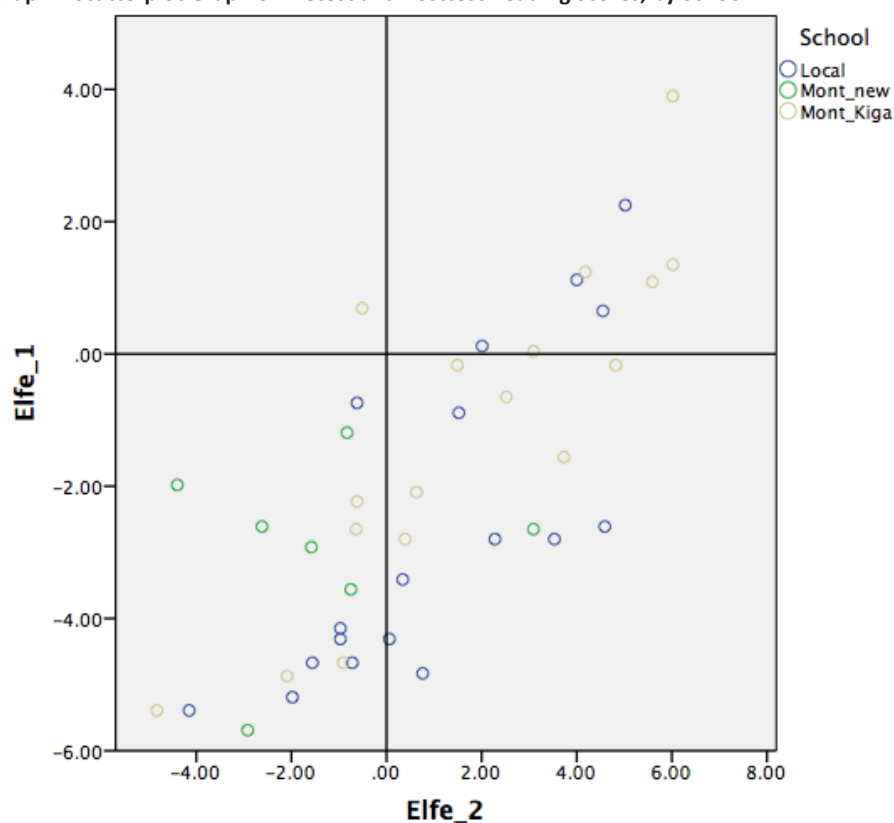
A repeated measures ANOVA showed that pre-post change in scores was significant,  $F(1,39) = 70.06$ ,  $p < .001$ . The time x school interaction was nearly significant,  $F(2,39) = 3.14$ ,  $p = .054$ . The school effect was not significant,  $F(2,39) = 2.75$ . Contrasts indicated that the Local children made significantly more progress in reading than the New Montessori children but similar progress to the Old Montessori children.



**Table 13 Reading Test Means**

School	Pretest		Posttest		Difference	
	Mean	SD	Mean	SD	Mean	SD
Local	-2.59	2.41	0.98	2.62	3.57	1.74
Montessori Old	-1.11	2.51	1.70	3.14	2.81	1.65
Montessori New	-2.94	1.42	-1.43	2.37	1.51	2.59
Standardised Mean			<b>0.35</b>	<b>0.62</b>		

**Graph 1 Scatterplot Graph of Pretest and Posttest Reading Scores, by School**



**Phonological knowledge.** Tables 14 and 15 show the results for phonological knowledge. For the Phoneme Test, there is a raw score (Table 14) and a percentage ranking (Table 15). An ANOVA for pretest scores showed a significant difference among the groups,  $F(2,33) = 4.08$ ,  $p = .03$  but follow up contrasts showed that this was due to a significant difference

between the Old Montessori children and the New Montessori children. There was no significant difference between Old Montessori children and Local children.

A repeated measures ANOVA for prepost change in phoneme scores for the overall group was significant,  $F(1,39) = 55.69$ ,  $p < .001$ . The school x time interaction was not significant,  $F(2,39) = .64$ ,  $p = .54$ . The school effect was not significant,  $F(2,39) = 3.03$ ,  $p = .06$ . Differences in raw scores for the three groups was not significant,  $F(2,39) = .64$ ,  $p = .54$ . A similar ANOVA for percentile scores showed exactly the same pattern of results.

**Table 14 Phoneme Test Means, Raw Score**

School	Pretest		Posttest	Difference	
	Mean	SD	Mean	Mean	SD
Local	24.94	15.54	38.78	13.83	11.32
Montessori Old	32.18	13.61	42.35	10.18	7.71
Montessori New	14.57	8.98	27.00	12.43	8.98

The percentile rankings were established on the basis of the pretest and posttest means by referring to the test norms table (Stock, Marx, & Schneider, 2003). The posttest mean of 74 put the Local group in the 64-83 percentile band, the posttest mean of 80 put the Old Montessori group in the 71-87 percentile band, and the posttest mean of 47 put the New Montessori group in the 36-61 percentile band.

**Table 15 Phonemes Test Means, Percentage Rankings**

School	Pretest		Posttest	
	Mean		Mean	Difference Mean
<b>Local</b>	44		74	30
<b>Montessori Old</b>	61		80	19
<b>Montessori New</b>	29		47	18

The local school children made the greatest gains in reading scores, but they were not significantly greater than those made by the Old Montessori children who had attended the kindergarten. The New Montessori children made the least gains. On the other hand, the new Montessori children made the greatest gains in their phoneme scores, and the Old Montessori children made the least progress, though none of these differences were statistically significant

## Home language

Scores were divided according to home language, to see whether this was having a significant effect on the children's performance. There were 18 children who spoke German, 7 who spoke German and another language, and 17 who did not speak German at home.

The results for letter recognition are shown in Table 16. An ANOVA yielded an F-value of  $F(2,39) = .98$ , which was not statistically different.

Table 16 Letter Recognition Means, by Home Language

Language	Mean	SD
German	46.78	6.34
German & Other	50.29	1.11
Other	48.47	6.34
Total Mean	48.05	5.84

The results for pre and post reading are shown in Table 17. The ANOVA on the pretest yielded  $F(2,39) = 2.13$  and on the posttest  $F(2,39) = 1.06$ , both of which were not statistically relevant.

Table 17 Reading Test Means, by Home Language

Language	Pretest		Posttest	
	Mean	SD	Mean	SD
German	-2.90	2.10	0.12	2.60
German & Other	-1.15	3.05	1.69	3.39
Other	-1.52	2.28	1.33	3.11
Total Mean	-2.05	2.41	0.87	2.95

The results for pre and post phoneme knowledge are shown in Table 18 according to home language. An ANOVA yielded F-values of  $F(2,39) = .631$  and  $F(2,39) = .417$  for the pretest and posttest respectively, neither of which were significant.

Table 18 Phoneme Test Means, by Home Language

Language	Pretest		Posttest	
	Mean	SD	Mean	SD
German	38.78	25.53	62.89	30.71
German & Other	53.71	33.96	75.71	29.66
Other	46.06	35.13	64.35	35.01
Total Mean	44.21	30.83	65.62	31.93

## Gender

Finally, data were analysed to see if there were significant differences for gender on the three tests. There were 22 girls and 20 boys. As can be seen in Table 19, results for boys and girls were similar. A t-test on each of the tests showed no statistically significant difference between either of the groups on any of the measures.

Table 19 Test Performances, by Gender

Gender	Letter	Reading	Reading	Phoneme	Phoneme
	recognition	Pretest	Posttest	Pretest	Posttest
Female Mean	48.95	-1.89	0.39	44.64	67.50
SD	5.42	2.47	3.21	40.48	33.39
Male Mean	47.05	-2.23	1.40	43.75	63.55
SD	6.26	2.39	2.62	32.01	30.98
Total Mean	<b>48.05</b>	<b>-2.05</b>	<b>0.87</b>	<b>44.21</b>	<b>65.62</b>
SD	<b>5.84</b>	<b>2.41</b>	<b>2.95</b>	<b>30.83</b>	<b>31.93</b>

## Summary

The results chapter started with a comparison of educational and occupational background for Montessori and Local parents, showing that these were similar. It then looked at home literacy environment. According to parent report, Local school children were more likely to visit the library than Montessori children but Old Montessori children were more likely to know the letters of the alphabet and to be showing advanced reading behaviours on

entry to school. There was no difference between Montessori and Local children in number of books at home, whether or not parents read to their children, or whether children read on their own.

At the start of first grade, results showed that Old Montessori children were ahead of Local children in alphabet knowledge. However, during the school year, from November to May, there was no difference in reading or phonemic awareness progress between Montessori children and Local children. The reading result approached significance but this was because of the low progress of the New Montessori children who had not attended Montessori kindergarten. The results chapter also looked at whether the findings might have been due to home language or whether there were gender differences but this was not the case.

Overall the results showed that Old Montessori children had a significant (but small) advantage over Local children in terms of alphabet knowledge at the start of the school year. Parent reports also indicated they knew more letters and had higher reading levels than did Local children. The only area where Local children had an advantage was in visits to the local library. Despite this initial advantage in alphabet knowledge the Old Montessori children in first grade made no more progress in reading than did Local children. The next chapter will discuss why this was the case.

## Discussion

### Introduction

The results of the study have thrown up many interesting points that are worthy of discussion, although it is worth remembering that the sample is small and specific, so it would be rash to generalise too far. Is there any value in teaching children to read earlier? Does SES play at least as significant a role as when children learn to read at school? Do Swiss primary schools need to revise their expectations of children's reading ability when they start primary school? What happens to children who are not already reading when they enter the Montessori primary school? What role does home language play in the acquisition of literacy?

The results did favour the Montessori children who had been to the Montessori kindergarten over the local children and the children who started the Montessori school in the first grade, which would suggest, at first glance, that there is a benefit in starting to read earlier. But the difference between the groups was not quite statistically significant, which means that any differences could have been down to chance. Further, the gap between the old Montessori children and the local children closed slightly (although, again, not significantly) in the reading and phoneme tests. This points towards the local children catching up to their Montessori counterparts within a year or two, which could also mean that any temporary benefits in learning to read earlier would be lost with time. What are the possible reasons for these results?

### Initial Advantages

The children who had attended the Montessori kindergarten had a significant initial advantage over the local school children in alphabet knowledge, and a smaller advantage in reading and phonemic awareness. This is to be expected given the differences between the local and Montessori kindergarten curricula. Whilst the cantonal curriculum places emphasis on verbal skills and vocabulary enrichment, and discourages kindergarten teachers from teaching children any alphabetic knowledge, the Montessori curriculum provides specific instruction in letter knowledge and phoneme-grapheme relationships. Children are not only encouraged to learn the letters of the alphabet from about the age of four years, but are given

opportunities to write, whether making a birthday card or writing stories with emergent spellings.

Language material is an integral part of the Montessori kindergarten set-up, and is always available for children to work with. There are also quite a few materials that have been developed especially to increase phonological awareness, such as trays of small objects that need to be sorted into three groups according to where a specific phoneme falls in the word (for instance, a lamb, a helmet and a mouse may be sorted according to where the phoneme “m” is heard).

### **The Role of SES and HLE**

In the sample studied, the children who had been to the Montessori kindergarten did have an initial advantage in their letter knowledge. Most of them could read at least a few words, and some were already reading sentences and books, although not necessarily in German. They also performed slightly better than the children at the local school in the initial phoneme and reading tests. But they did not perform significantly better than their peers at the local school. There are a couple of possible explanations for this.

It could be that the Montessori school does not provide as intensive literacy instruction for its first graders as the local school does. The teachers at the local school are required to provide six hours of literacy instruction per week, and this is planned in to the weekly curriculum. The Montessori teachers have 30-35 children in their classes, and give individual and small group presentations to their students. There is no specific time dedicated to literacy – each child makes a plan with a teacher at the beginning of the week to decide what work she will do, and to ensure that the goals from the previous week have been met. Although there are clear benefits to children being self-directed and able to work independently, there may be times when some children do not get as much direct instruction as they need. We will come back to this later.

Or it may be that the children at the local school, living in a predominantly middle class area, with well-educated parents, are not starting school with a clean slate either. The SES and HLE of both the Montessori and local parents were closely matched, and it may be that this influence – visits to the library, reading stories regularly together, informally teaching their children letter names, or sending their children to language courses – primed

the children for the direct instruction they received at school. In support of this argument is the fact that the four local children who scored in the top quartile in the reading pretest were all already reading at least some words at school entry. The post-test reading scores reflected a similar story – only one of the ten children in the top quartile had no reading experience before starting school.

There were four local children in the lowest quartile for the reading post-test, and the three parents who completed the survey said that their children had no reading experience before they started school. Two of these parents were in the lowest bracket for education and occupation, which does not provide strong evidence for a connection, but does further support the premise that there is a correlation between parents' SES and their children's performance.

Overall, both the local children and the children who had attended the Montessori kindergarten performed above the standardised norms for the phoneme and the reading tests. The posttest means for the phoneme test put the local and Montessori children in the 64<sup>th</sup> - 83<sup>rd</sup> percentile and the 71<sup>st</sup> - 87<sup>th</sup> percentile respectively. This means that both groups performed well above average for their grade – the scores, in fact, would have been average for second grade. Similarly, the reading post-test means were very high for the local and the Montessori kindergarten group – in the 79<sup>th</sup> - 86<sup>th</sup> percentile and the 92<sup>nd</sup> – 96<sup>th</sup> percentile respectively.

## **Home Language**

In both the phoneme and reading tests the group that performed best was the group of bi- or multilingual children. The group that performed least well in each case was the German-speaking children. Although the differences were not statistically relevant, they are interesting enough to warrant further consideration.

For a start, the results would tend to support Meunier's (2011) supposition that the limited success of children from immigrant families has less to do with the disadvantages of learning in a foreign language, and more to do with their social position. Parents who are well educated and who have financial resources at their disposal will ensure that their children do well, regardless of their home language. The foreign families in this study were predominantly well-educated and successful families that had either decided to send their



children to the private Montessori school, or to move to the catchment area of the well-resourced local school, which is an advantaged, middle-class neighbourhood.

Some of the foreign children in this study were sent to language courses before starting school, where they learned to read and write in their native language. The results of the tests would suggest that they have transferred these skills to learning to read in German without difficulty. This also held true for a child who had learned to read in Russian, which has a different script.

Children who attended the local kindergarten, and who did not have German as their native language, would automatically have received support from a German-language teacher on a regular basis. Although extra German-language instruction is also offered at the Montessori school, it is not compulsory and is charged separately – which may lead some parents to view it as an optional extra.

The children who have both German and another language appear to be most successful, and this was true for both the local and the Montessori children. Speaking German at home will of course help them to understand and efficiently decode words in German. But speaking another language may make them develop a deeper phonological awareness, and a greater mental flexibility than children who only speak one language (Tokuhamma-Espinosa, 2001).

## **Mind the Gap**

The results saw a slight narrowing of the performance gap between the Old Montessori and the Local children for both the phoneme and the reading tests. Although it was not significant, this narrowing indicates that the local children could catch up within a year or two. This is not entirely surprising – other studies show a similar trend, with early reading advantages disappearing after a few years of schooling. Maybe this trajectory should be expected, because early literacy teaching is concerned with the skills children need to be able to decode and read fluently. After a couple of years most children will reach a point where they can read relatively fluently, they will have a large repository of words they recognise automatically, and their decoding skills should help them decipher words they have not previously encountered. This is when the emphasis changes from learning to read, to reading to learn. The focus will then move towards comprehension of what has been read, and

for this the children's vocabulary and experience will play a greater role. Research suggests that this is the point at which oral language is more important for reading success, as it is related to reading comprehension and fluency.

What is more concerning is that in the testing period the gap between the New Montessori children and the other two groups grew for the reading test, even though it shrank for the phoneme test. It suggests that the phonological skills acquired during the year were not translated into reading success for at least some of these children. Why this is the case needs to be examined more closely.

### **Why did the New Montessori children not perform better?**

The Montessori kindergarten children performed slightly better than the local children, but both groups did well. The new Montessori children performed significantly worse than both of these groups. The very fact that they attended a private school means that SES can be ruled out as a possible contributing factor to this failure to progress. All the parents said that they read to their children regularly, if not daily, and all but one of the children liked to read books themselves.

There are two plausible reasons for the children's lack of progress – that the children had specific learning problems, and/or that the literacy instruction they were receiving was inadequate to their needs. Parents have many reasons for sending their children to a Montessori school, and one of them is to find an alternative school if their children are struggling at a local school. They may feel that a pedagogy that supports the individual progress of each child according to their strengths and weaknesses may offer an opportunity to children who may otherwise struggle to keep up in a class where the pupils are all expected to progress at more or less the same rate. If this is the case, particularly for children who are entering at the first grade level after they may already have encountered difficulties at their local kindergarten, then this will be reflected in their lower test scores. According to the Montessori teachers who were interviewed, it is very often the case that children who enter the school do have learning problems, and at least two of the children in the New Montessori group had already been referred to a specialist either before they arrived or during their first year at school.

The other possibility is that the teachers are not providing their new students with enough explicit reading instruction. The expectation of primary Montessori teachers is that the children have already started reading when they start first grade – and for the children coming from the Montessori kindergarten this is mostly the case. The first grade syllabus is designed to deepen the students’ understanding of grammar, to provide opportunities for children to read for meaning, and to start writing stories and creative texts. The teachers either need to adapt the kindergarten curriculum or draw on other resources to teach children how to read.

The two primary classes at the Montessori school adopted individual approaches to teaching children who are not yet reading. In one class the teacher said that the new children were just expected to “swim along,” suggesting that the needs of young students to receive explicit instruction were not fully appreciated. The methods used in her class included copying lists of words with a common phonogram, copying sentences, and a workbook that was designed to help children practice writing letters. Unfortunately, because children are expected to work individually without constant input from a teacher, there is a risk that children who are struggling could do this work without the teacher realising that they were not actually able to read what they had written.

But there is a further problem – the emphasis on having the children copy out words seems to stem from a misunderstanding of Montessori’s belief that children should “write” before they “read”, which is actually a directive to teach children to encode words before they decode them. This is achieved in a Montessori kindergarten with a large tray of letters that the children use to sound out and “write” words and phrases. This process is meant to facilitate children’s understanding of how words function so that they may then decode written words successfully. In the other primary class a more systematic approach was taken to teach the children the letter sounds, at an “accelerated pace” before showing them how to use them to encode words.

The students at the Montessori school each have a weekly conference with an allocated class teacher to plan the week’s work, and to check through the work from the previous week. In theory, this is an opportunity for the teacher to ensure that the students are on track, and that they are not facing difficulties, and it allows children to progress at their own pace. But it may be that this emphasis on children developing at their own pace is preventing teachers from recognising when a child is falling behind and needs extra support. This is where the local school is at an advantage – because all the children in the class are

learning the same thing at the same time the teachers can rapidly tell which students have a problem. After the first round of testing in November the local teachers could pinpoint exactly which students needed support, and this correlated with the results of the testing. More importantly, these children were already receiving extra support from the reading specialist who came to the classroom each week. They did not wait for the children to fail before providing them with support.

### **What support is available for children who are failing?**

The local school already has a three-tier system in place. That is, all the children in the class receive effective, explicit reading instruction that focuses on encoding and decoding in the first year. There is a specialist teacher who provides the second tier by supporting small groups of children within the classroom having quickly identified the children who are struggling. If this help is insufficient the children are given extra individual tutoring outside the classroom. Because the structure is in place the teachers are able to respond quickly to children's needs. They know where to go, and what procedures to follow.

There is not the same structure in place at the Montessori school. The teachers first need to recognise that a child is struggling, although this may be easier with children who have already attended the kindergarten, if the kindergarten teachers have communicated any concerns to their colleagues. One of the teachers also said that she relies on her experience and observation to determine, after a certain length of time, and opportunity to practice, whether her students are making the progress she feels they should be. If they are not, she looks for extra support.

It does not seem to be universally clear what steps should be taken if a child is falling behind, and each teacher acts on his or her initiative. One of the class teachers specifically mentioned taking more time to work individually with children who are struggling, and providing simplified material that the children can complete successfully, so that they remain motivated. But a teacher from the other class said that whilst they would be happy to consider using extra support materials in their class, they would need to be designed so that the children could use them on their own, as they don't have any more time available for concentrated individual support.

There also seems to be uncertainty as to how they should proceed if they think that a child needs more extensive, external help. There is a dyslexia specialist who works at the school who could be called in, but whilst one teacher said that she actively asks for help from this specialist when she suspects that a child is falling behind, the other teacher seemed to think that she was “just there for children who needed help with their German.” Teachers may also make recommendations to the parents to have their children seen by a specialist if they think there may be an underlying problem. Several of the teachers who were interviewed said that they had recommended a “Tomatis” therapy for children who were struggling to read, a treatment that is scientifically unproven but popular in parts of Switzerland. Research suggests that what would help these struggling readers the most would be a regular, phonological code-based intervention (Al Otaiba, Kosanovich, & Torgesen, 2012).

Clearly, the Montessori school would benefit from a more structured approach to supporting struggling learners. Firstly, there needs to be a more unified and thoughtful plan to teach first graders who are not reading how to read, that may include effective resources from the kindergarten curriculum, and from the main-stream curriculum. Secondly, teachers need to be able to recognise when children are falling behind and react quickly. This may mean providing more intensive and focused instruction within the classroom, or if that proves insufficient, calling in external help from the specialist they have available.

When it comes to funding support, the local school is at a distinct advantage. Switzerland has one of the highest per capita rates of spending on education in the world (Elley, 1992) and is able to provide teaching support teams to primary schools that include specialists for graphomotor skills, for German as a second language and for children with learning difficulties. The first grade class in the study had regular and sustained support from a literacy specialist who was available from the start of the school year. She was there to help all the students, and she could quickly gauge which children needed extra support. The Montessori school is funded entirely through school fees, and it may simply not be feasible to employ a full-time specialist who can offer support to the class teachers.

### **Earlier Introduction of reading into local schools**

Do the results of this study support the idea of children in the local school system starting to read earlier? In as far as it shows that children who have been exposed to letter knowledge and reading experience before they start school perform better, regardless of

where they learned to read, it does. The children who could read by the time they entered school were still ahead at the end of the school year. Of course, the study looks at correlations, not causation. It is possible that the children were already reading because they were bright and picked it up quickly, rather than that they had been exposed to more intensive instruction than children who were less successful.

Still, we have seen that middle class families tend to provide an environment that promotes literacy even when they are not actively pushing their children to read. PISA studies have shown up the wide gap in Switzerland between those children who can read and those who can't, and other studies have pointed out that much of this gap can be attributed to social and economic disparities. Tentatively, it can be said that whilst families with social and economic resources will ensure that their children succeed, regardless of where they go to school, poorer and less advantaged families may not have the resources to give their children the same opportunities. Introducing literacy activities, and specifically activities that improve letter knowledge may help, to some extent, to redress the balance.

This view may be overly optimistic however. As was seen in the EDK-Ost 4bis8 study, it was not enough to teach children how to read when they started kindergarten at the age of four years. It has been suggested by the authors of the study that measures may also need to be put into place that support families' home literacy environments where children are currently disadvantaged (Erziehungsdirektorenkonferenz Ostschweiz und Fürstentum Lichtenstein, 2010).

The EDK-Ost study highlighted the fact that children, when they are given the chance to learn to read, will seize it – and that to a large extent the decision about when to teach children to read is an arbitrary one, as much guided by political expedience or tradition as it is by research. Advocates from both sides of the divide could use the results to support their position. Those in favour of teaching children to read earlier could point out the gains children in the pilot group made during the kindergarten years, outstripping their peers, and not appearing to have suffered any social or emotional consequences for doing so. Those against children learning to read at kindergarten could argue that those earlier gains disappeared over the first two years of school, and that the reading gap between children from non-German and low-income families and more advantaged families was not reduced by teaching children to read earlier.

There are already changes afoot in Zürich and neighbouring cantons with the introduction of Intercantonal Agreement on Harmonisation of Compulsory Education HarmoS over the next few years. The HarmoS curriculum is due to be introduced in Zürich from 2017, and it should free up the kindergarten and primary curriculum to bring more flexibility about when reading can be taught – there will no longer be an injunction against teaching letter-knowledge in kindergarten, for example (Deutschschweizer Erziehungsdirektoren-Konferenz, 2013).

### **Limitations of this study**

This was a small study, and it would be unwise to generalise the results for two important reasons. Firstly, in order to obtain two comparable groups it was necessary to select families that were socially and economically well resourced. The sample was, therefore, not representative of the general population. Secondly, the results themselves were not statistically significant, particularly for the phoneme and reading tests. This means that the results could be down to chance, and should not be generalised to a wider population. For future studies it would be advantageous to draw upon a larger, more heterogeneous population to see if more robust conclusions could be drawn.

Not all the parents returned the questionnaire. This reduces the validity of some of the inferences that were made, particularly in relation to whether their children were already reading when they started school, the parents' education and occupational status, and their literacy practices at home. Nevertheless, enough questionnaires were returned that some inferences could be drawn. In light of some of the results, it would have been useful to ask the Montessori families why they had chosen that school for their children.

A further limitation of this study is that it did not ask the children about their attitudes towards reading. One of the criticisms levelled against teaching children to read at a young age is that they later develop a more negative attitude towards reading. It would have been enlightening to be able to compare the attitudes towards reading of both groups.

## Future areas for consideration

In Switzerland there is absolutely no debate over the approach that should be taken to teach reading – it is a given that a phonological approach is the most effective way to teach children to read, and this makes complete sense for a language with such a shallow orthography. In New Zealand however, which favours a constructivist approach, it may be useful to compare reading results for children who learn using a phonological approach versus those using the whole language approach. There are state schools that also incorporate classes that use the Montessori method, so a comparison at one of these schools would be feasible.

Another area for consideration would be to investigate the nature of reading interventions used in German-speaking countries, and to compare their efficacy. This could be used to inform a process for introducing effective interventions in to schools that lack them.

## Conclusion

The question of when children should start to read has still not been answered conclusively by this study. On one hand, the majority of the children in this study who started to read in the first grade at the local school do not appear to have been disadvantaged, although this is more true of the families from well-resourced families than for families further down the SES scale, and there is evidence that the gap between them and their Montessori peers was already starting to close by the end of the school year. But it can't be forgotten that not only were the children from both schools predominantly from advantaged, middle class families, but also that only a third of the local parents said that their children could not read at all when they started school.

Maybe the question of when children *should* start to read is the wrong question to ask. We have seen that they *can* learn to read successfully when they are four or five years old. Asking when a child should learn to read may make it sound as though it is a tedious obligation, rather than an empowering tool, a great step towards independence, and a key to unlocking worlds. From this viewpoint it would make as much sense to ask when children should learn to ride a bicycle.

This study has shown that both the local and the Montessori school have their advantages, and each could learn from the other. The Montessori school is proof that children can begin to learn to read at a younger age, and learn to do so in a positive environment.



There are many ideas and materials that could be transferred to the local school system, particularly at the kindergarten level. The local school provides a model for supporting children who are struggling to learn to read, and shows that it is possible to respond quickly and effectively to children who appear to be falling behind.

### **Concluding statement**

The research question for the present study asked whether children who begin learning to read earlier are advantaged over those who begin later. The results of this study indicated that the benefits of earlier learning were not sustained. After only six months of schooling, there was no difference in reading progress between children in the Montessori and school and children who attended the local school. It seems that getting off to an earlier start does not bring long term benefits in terms of reading achievement.

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# Appendices

## Appendix 1



### MASSEY UNIVERSITY ALBANY

3 July 2014

Judith Elben  
Forchstrasse 460  
8702 Zollikon  
Switzerland

Dear Judith

**Re: A comparison of two Swiss-German 1st Grade classes in a state and a Montessori school.**

Thank you for your Low Risk Notification which was received on 30 June 2014.

Your project has been recorded on the Low Risk Database which is reported in the Annual Report of the Massey University Human Ethics Committees.

You are reminded that staff researchers and supervisors are fully responsible for ensuring that the information in the low risk notification has met the requirements and guidelines for submission of a low risk notification.

The low risk notification for this project is valid for a maximum of three years.

Please notify me if situations subsequently occur which cause you to reconsider your initial ethical analysis that it is safe to proceed without approval by one of the University's Human Ethics Committees.

Please note that travel undertaken by students must be approved by the supervisor and the relevant Pro Vice-Chancellor and be in accordance with the Policy and Procedures for Course-Related Student Travel Overseas. In addition, the supervisor must advise the University's Insurance Officer.

**A reminder to include the following statement on all public documents:**

*"This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University's Human Ethics Committees. The researcher(s) named above are responsible for the ethical conduct of this research."*

*If you have any concerns about the conduct of this research that you wish to raise with someone other than the researcher(s), please contact Professor John O'Neill, Director (Research Ethics), telephone 06 350 5249, e-mail [humanethics@massey.ac.nz](mailto:humanethics@massey.ac.nz)."*

Please note that if a sponsoring organisation, funding authority or a journal in which you wish to publish requires evidence of committee approval (with an approval number), you will have to provide a full application to one of the University's Human Ethics Committees. You should also note that such an approval can only be provided prior to the commencement of the research.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'J. O'Neill'.

John G O'Neill (Professor)  
**Chair, Human Ethics Chairs' Committee and  
Director (Research Ethics)**

cc Profs T Nicholson & Dr M Irwin  
Institute of Education  
Albany campus

A/Prof Sally Hansen HoS  
Institute of Education  
Manawatu campus

Ms R MacGillivray  
Inst of Education  
PN 500

Massey University Human Ethics Committee  
Accredited by the Health Research Council





**MASSEY UNIVERSITY**  
**INSTITUTE OF EDUCATION**  
**TE KURA O TE MATĀURANGA**

Appendix 2

**Ein Vergleich von zwei schweizerdeutschen ersten Klassen einer Volksschule und einer Montessori Schule**

**Informationsblatt für Eltern**

**Vorstellung der Studienleiterin**

Mein Name ist Frau Judy Elben und ich führe eine Studie durch, um herauszufinden, ob frühe Leseförderung (4-5-Jährige) in einer Montessori Schule den Kindern einen Vorteil im Bereich Lesen in der ersten Klasse verschafft. Die Studie begleitet den Leseprozess der Kinder einer Montessori Klasse, die früher in die Schule eintreten und Erstklässlern, die im üblichen Alter die Schule beginnen. Die Studie ist Teil meiner Masterarbeit in Erziehungspsychologie an der Massey Universität in Neuseeland. Ich habe einen Sohn in der dritten Klasse im Rüterwis.

**Projektbeschreibung und Einladung**

Der Zweck dieses Briefes ist es, Ihr Kind einzuladen, an dieser Studie teilzunehmen. Die Kinder erhalten von der Studienleiterin individuelle Lesetests, die etwa 45 Minuten in Anspruch nehmen. Die Tests werden zweimal während des Schuljahres durchgeführt. Die Eltern erhalten einen Fragebogen mit Fragen über sie selbst und zum Leseverhalten des Kindes zu Hause (liegt bei).

**Datenschutz**

Die Testdaten werden streng vertraulich behandelt und der Name Ihres Kindes wird nicht erwähnt. Die Abschlussarbeit wird im November 2015 beendet und eine Kopie der Ergebnisse wird den Schulen zugestellt sollten Sie Interesse an den Ergebnissen haben. Weder die Namen der teilnehmenden Kinder noch der teilnehmenden Schulen werden in der Abschlussarbeit verwendet. Zudem werden Details, die zur Identifikation der Schulen dienen könnten zwecks Datenschutz entfernt. Die Ergebnisse der Studie können an einer Konferenz oder in einer Forschungspublikation vorgestellt oder verwendet werden.

**Wenn Sie Fragen zur Studie haben oder wenn Sie NICHT möchten dass Ihr Kind an der Studie teilnimmt, kontaktieren Sie bitte die Studienleiterin oder Ihre Schule:**

Judy Elben (Studienleiterin) Telefon: 078 772 9695; E-Mail: [jelben@yahoo.com](mailto:jelben@yahoo.com)

Telefon der Schule: \_\_\_\_\_ E-Mail: \_\_\_\_\_

Weitere Kontakte sind: Tom Nicholson (Hauptsupervisor): [t.nicholson@massey.ac.nz](mailto:t.nicholson@massey.ac.nz) und Michael Irwin (Co-Supervisor): [m.r.irwin@massey.ac.nz](mailto:m.r.irwin@massey.ac.nz)

**Ethische Zulassung:**

Dieses Projekt wurde durch Peer-Review evaluiert und als Studie mit niedrigem Risiko bewertet. Deshalb wurde sie nicht durch eines der Ethik-Komitees der Universität begutachtet. Die oben erwähnten Studienleiter sind für die ethische Durchführung dieser Studie verantwortlich.

Sollten Sie Bedenken bezüglich der Durchführung dieser Studie haben, die Sie nicht mit der Studienleiterin besprechen möchten, kontaktieren Sie bitte Herrn Professor John O'Neill, Direktor, Forschungsethik, Telefon 0064 6 350 5249, E-Mail: [humanethics@massey.ac.nz](mailto:humanethics@massey.ac.nz)





## A Comparison Between Two First Grade Classes in a Local and a Montessori School

### Information sheet for parents

#### Researcher Introduction

My name is Mrs Judy Elben and I am conducting a study to find out whether an early start in reading (4-5 years of age) in a Montessori school gets children off to a better start in reading in 1<sup>st</sup> grade. This will be done by following the reading progress of a class of Montessori children who start school at an earlier age and a class of 1<sup>st</sup> grade children who start school at the usual age. The study is part of my Master's thesis in Educational Psychology at Massey University in New Zealand.

#### Project Description and Invitation

The purpose of this letter is to invite your child to participate in the study. Children in the study will be given individual reading assessments by the researcher that will take about 45 minutes. The assessments will be administered at three points during the school year. A questionnaire will also be given to parents to ask about themselves and their children's reading at home (copy attached).

#### Confidentiality

The assessment information will be kept strictly confidential so that your child's name will not be accessible. The thesis will be completed by November 2015, and a copy of the findings will be sent to the schools in case you are interested in the findings. Neither the names of the children nor the schools will be used in write-up of the research. Details that may be used to identify the schools will be removed in order to maintain confidentiality. The results of the study may be presented in a conference or for a research publication.

**If you have any questions about the study or if you do NOT want your child to participate in the study, please contact the researcher or your school:**

Judy Elben (researcher) phone \_\_\_\_\_; email: [jelben@yahoo.com](mailto:jelben@yahoo.com)

School phone: \_\_\_\_\_ email: \_\_\_\_\_

Other contacts are: Tom Nicholson (main supervisor): [t.nicholson@massey.ac.nz](mailto:t.nicholson@massey.ac.nz) and Micael Irwin (co-supervisor): [m.r.irwin@massey.ac.nz](mailto:m.r.irwin@massey.ac.nz)

#### Ethics approvals:

This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University's Human Ethics Committees. The researcher(s) named above are responsible for the ethical conduct of this research. If you have any concerns about the conduct of this research that you wish to raise with someone other than the researcher(s), please contact Professor John O'Neill, Director, Research Ethics, telephone 06 350 5249, email [humanethics@massey.ac.nz](mailto:humanethics@massey.ac.nz).



**Ein Vergleich von zwei schweizerdeutschen ersten Klassen einer Volksschule und einer Montessori Schule**

**Parent questionnaire**

Parent name: \_\_\_\_\_

Child name: \_\_\_\_\_

My child is a: Girl/Boy

What is your relationship to the child?

☐ Mother ☐ Father ☐ Guardian ☐

Other \_\_\_\_\_

1. What is your child's first/main language?

\_\_\_\_\_

2. What other languages are spoken at home?

\_\_\_\_\_

3. How many books does your child have (approximately)? \_\_\_\_\_

4. How often do you or your spouse read to your child?

\_\_\_\_\_

5. How often do you visit the library with your child?

\_\_\_\_\_

6. How many alphabet letters did your child know on the first day of school? \_\_\_\_\_

7. What things could your child read before she/he started 1<sup>st</sup> grade?

☐ No words ☐ A few words ☐ Quite a few words ☐ Phrases ☐ Whole Books

8. If your child was reading before 1<sup>st</sup> grade, what language was it? \_\_\_\_\_

9. Do your children see you reading at home?

☐ Never ☐ Occasionally ☐ Often ☐ Daily

10. Mother: What is your highest qualification to date?

☐ Three years of high school

☐ Company internal training



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TE KURA O TE MATĀURANGA

- ☐ Apprenticeship
- ☐ High school diploma
- ☐ Teaching diploma
- ☐ Professional diploma
- ☐ Polytechnic degree
- ☐ University degree

11. Father: What is your highest qualification to date?

- ☐ Three years of high school
- ☐ Company internal training
- ☐ Apprenticeship
- ☐ High school diploma
- ☐ Teaching diploma
- ☐ Professional diploma
- ☐ Polytechnic degree
- ☐ University degree

12. Mother: What is your occupation? \_\_\_\_\_

13. Father: What is your occupation? \_\_\_\_\_






















Do you have any other comments about your child's reading at home?

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Thank you for participating in this questionnaire. Please return this form to the class teacher.  
The results will be kept confidential.

	Hammer Hummel Himmel Semmel		Lamm Kamm Gramm Kampf		Büchertasche Hosentasche Bücherschränke Bilderbücher
22		23		24	
	Computer Reporter Dompfeur Columbus		Fragezeichen Manteltaschen Tragetaschen Taschenlampen		Blumenladen Blumensträuße Blumenvase Blumenwiese
25		26		27	
	Spiel Stiel Stier Sieb		Banane Fasane Barbara Ananas		Marssonde Marsmännchen Sandmännchen Maskottchen
28		29		30	
	Abendsonne Apfeltorte Astrologe Abfalltonne		Trampolin Trompete Tomate Tapete		Karawane Bademantel Badekappe Badewanne
31		32		33	
	Flüsse Fünfer Füller Flügel		Fieber Feder Leder Flieder		Sonnenblume Sonnenbräune Sonnenbrille Sonnenstühle
34		35		36	
	Pferdestärke Pferdekoppel Pferdeställe Pferdesattel		Hals Haar Haut Haus		April Apfel Ampel Amsel
37		38		39	
	Bilderrahmen Bilderrätsel Bilderbücher Kindergarten		Reiter Rillen Rippen Ritter		Wasserfall Wasserball Wasserhahn Wasserbahn
40		41		42	

Ein Auto kann	härter	fahren als ein Fahrrad.
	schneller	
	schief	
	heller	
	schärfer	
Eine	Wolle	hat sieben Tage.
	Tochter	
	Woche	
	Hose	
	Pommes	
Nachts, wenn es	runder	ist, schlafen Menschen und Tiere.
	jung	
	hundert	
	bunter	
	dunkel	
Aus jeder	Lupe	wird einmal ein Schmetterling.
	Katze	
	Raupe	
	Pflanze	
	Nase	
Andrea fährt mit dem	Fahrrad	zu ihrer Freundin Monika.
	Hubschrauber	
	Pferd	
	Flugzeug	
	Kamel	
Ein Ball ist	krank	
	gesund	
	böse	
	klug	
	rund	

6

Tim freut sich, wenn die Sonne scheint. Dann kann er mit seinen Freunden Fußball spielen.

Tim ...

- ☐ isst gerne Obst.
- ☐ macht seine Hausaufgaben.
- ☐ ärgert seine Schwester.
- ☐ spielt gerne Fußball.

1

Felix spielt mit seinem schönen neuen Ball. Felix sagt, dass Jan und Eva nicht mitspielen dürfen. Deshalb sind sie böse auf ihn.

Felix spielt ...

- ☐ nicht mit Jan und Eva.
- ☐ mit dem Ball von Jan und Eva.
- ☐ mit Jan und Eva.
- ☐ gern mit Jan und Eva.

2

Jan und Eva sind böse, weil ...

- ☐ er einen neuen Ball hat.
- ☐ er sie nicht mitspielen lässt.
- ☐ sie nicht gern spielen.
- ☐ er nicht mit dem Ball spielt.

3

Evi und ihr großer Bruder Stefan wollen fernsehen. Sie können sich aber nicht auf ein Programm einigen und fangen an zu streiten. Stefan nimmt Evi die Fernbedienung weg und schaltet auf seine Lieblingssendung. Evi sagt: „Das ist gemein! Immer machst du was du willst, nur weil du der Stärkere bist!“

Welcher Satz ist richtig?

- ☐ Evi ist stärker als ihr großer Bruder.
- ☐ Evi möchte etwas anderes anschauen als Stefan.
- ☐ Stefan und Evi möchten dieselbe Sendung anschauen.
- ☐ Evi und Stefan streiten sich nie.

4

Paula ist mit ihren Eltern in den Ferien ans Meer gefahren. Am Strand spielt sie im Sand und sammelt schöne, farbige Muscheln. Die findet sie so schön.

Paula ...

- ☐ ist mit ihren Eltern in die Berge gefahren.
- ☐ schwimmt gerne im Meer.
- ☐ hat Angst vor Krebsen.
- ☐ mag farbige Muscheln.

5



**1. Pseudowortsegmentierung**

Items		Antwort	1 = richtig 0 = falsch
3.	skop		
4.	breta		
5.	terso		
6.	blims		
7.	utkers		
8.	botgarn		
9.	drofgio		
10.	askletno		

Anzahl der richtigen Antworten: \_\_\_\_\_

**2. Vokalersetzung**

Items		Antwort	1 = richtig 0 = falsch
14.	Mittag		
15.	sugita		
16.	Ananas		
17.	Handballmannschaft		
18.	Namenstag		
19.	arast		
20.	Sandra		
21.	Mathematik		
22.	miranale		
23.	Marmelade		
24.	Januar		
25.	alemaka		

Anzahl der richtigen Antworten: \_\_\_\_\_

## 3. Restwortbestimmung

Items	Antwort	1 = richtig 0 = falsch
29. Ende		
30. Atlas		
31. Trick		
32. prasi		
33. egelup		
34. omta		
35. eksi		

Anzahl der richtigen Antworten: \_\_\_\_\_

## 4. Phonemvertauschung

Items	Lösung	Antwort	1 = richtig 0 = falsch
39. Masse	amsse		
40. ilma	lima		
41. elbi	lebi		
42. serog	esrog		
43. iftak	fitak		
44. Löwe	ölwe		
45. Ordnung	rodnung		
46. asfar	safar		
47. Tiger	itger		
48. Ente	nete		
49. Monat	omnat		

Anzahl der richtigen Antworten: \_\_\_\_\_

## 5. Lautkategorisierung

Items	Antwort	1 = richtig 0 = falsch
51. (A) Kopf – Turm – tief – Trick		
52. (A) mib – mad – nob – mot		
53. (A) pat – kut – pit – pal		
55. (E) grau – froh – Pfau – blau		
56. (E) Rock – Zeit – rot – statt		
57. (E) haum – laum – faun – gaum		
58. (E) res – basch – pos – fas		
59. (E) fük – mük – nüt – rük		

Anzahl der richtigen Antworten: \_\_\_\_\_



## 6. Vokallänge

Items		Antwort	1 = richtig 0 = falsch
62.	(M) maar – raas – <b>dack</b> – laat		
63.	(M) <b>deek</b> – kett – pesch – zenn		
64.	(M) roof – soof – pfoor – <b>jomm</b>		
65.	(M) reem – feer – <b>nell</b> – beef		
66.	(M) <b>wuul</b> – duck – tupp – pumm		
67.	(M) liem – sief – <b>minn</b> – nier		
68.	(M) bamm – <b>jaal</b> – rack – batz		
69.	(M) muur – suuk – ruul – <b>luch</b>		
70.	(M) iotz – <b>boos</b> – konn – goll		
71.	(M) <b>tiez</b> – lick – gipp – piff		

Anzahl der richtigen Antworten: \_\_\_\_\_

## 7. Wortumkehr

Items		Lösung	Antwort	1 = richtig 0 = falsch
74.	ral	lar		
75.	Boot	toob		
76.	eni	ine		
77.	pos	sop		
78.	iam	<i>Mai</i>		
79.	omel	lemo		
80.	Art	tra		
81.	Mark	kram		
82.	ligo	ogil		
83.	eman	<i>Name</i>		
84.	sabe	ebas		
85.	zruk	<i>kurz</i>		
86.	edne	<i>Ende</i>		
87.	Korb	brok		
88.	Mittag	gattim		
89.	Sagen	negas		
90.	Birne	enrib		
91.	Osten	netso		

Anzahl der richtigen Antworten: \_\_\_\_\_

**Pupil Copy**

B	A	I	S	C	
D	F	E	P	T	
L	M	R	Z	J	
U	H	G	W	X	
Q	K	V	Y	N	O
r	o	n	l	m	
y	t	v	k	p	
z	i	a	j	u	
s	h	b	c	g	
w	d	f	x	q	e

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