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## Self-image and Reading Development - the Effect of Self-Image on Reading Development among Pupils in Grade 2\*

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### Abstract

The overall purpose of the present study was to examine the relationship between self-image and different reading abilities among pupils with reading difficulties in grade 2. The purpose was also to examine whether there were any differences between typical readers and pupils with reading difficulties with regard to self-image. The empirical material consists of 130 pupils who were tested at five different test sessions with different reading-related tests. Their self-image was tested twice at an interval of nearly a school year

The results showed that there were differences between pupils with reading difficulties and typical readers with regard to the self-image level, where pupils with reading disabilities had a significantly lower self-image than typical readers. Among pupils with reading disabilities those with a low self-image showed significantly less improvement in word decoding and reading comprehension than students with a typical self-image.

**Keywords:** children, computer-assisted intervention, reading disability, self-image

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## Introduction

Early experience of reading influences the future of literacy and the acquisition of knowledge but also the development of students' self-image linked to reading (Chapman et al., 2000; Stanovich, 1986). Negative Matthew effects (Stanovich, 1986) for students who initially experience difficulty with reading, may make those with reading difficulties less interested in reading and avoid practising their reading skills as much as they should. A negative perception of their own reading ability may result in a vicious circle in which the individuals are not motivated or interested in developing their reading to the same extent as students who consider themselves good readers (Stanovich, 1986). According to Stanovich (1986), this can lead to a gap between pupils with reading difficulties and typical readers, where typical readers practise extensively and improve, while students with reading disabilities practise less and therefore do not develop their reading skills as much. The relationship between reading ability and self-image affects the student's entire school situation and is therefore important to study (Chapman & Tunmer, 2003). In the present study, the focus is on the relationship between self-image and different reading abilities among pupils with reading difficulties in grade 2. Previous studies in the field have often explored the relationship between self-concept and academic achievement (Helmke & van Aken, 1995; Skaalvik & Hagtvet, 1990). There are also several studies that have examined the relationship between reading and self-image (Aunola, Leskinen, Onatsu-Arvilommi & Nurmi, 2002; Chapman & Tunmer, 1997), often with focus not on the population of students with reading difficulties, but on a wider population (Chapman & Tunmer, 2003).

In recent times, research has shown the importance of a positive self-concept in order to achieve good results at school (Schunk, 2003). It has also been shown that students with various degrees of self-conception also exhibit different cognitive, social and emotional behaviour in schools (Bong & Skaalvik, 2003). Self-image includes an individual's perception in a variety of areas (Shavelson, Hubner & Stanton, 1976). Instead of viewing an individual's self-image as a constant overall perception, it may vary in different areas and over time. The self-image is considered to have great influence over individual behaviour and can therefore be used to understand and explain behaviour of different kinds (Shavelson et al., 1976). The social context of the child is considered to have the greatest influence on the development of its self-image (Bandura, Barbaranelli, Caprara & Pastorelli, 1996; Shavelson et al., 1976; Swalander 2009). The self-image is built up of the pupil's experience and learning history and is particularly influenced by important people close to the child (Nalavany & Carawan, 2012;

Shavelson et al., 1976). Some researchers argue that it is the parents who have the primary influence over the child's self-concept development (Emler, 2001), while others argue that friends and teachers have a greater impact on the individual student's self-image development (Burnett & Demnar, 1996; Burns, 1982; Glazzard, 2010; Humphrey, 2003; Troia, Shankland & Wolbers, 2012).

Self-image is also a complex phenomenon due to changes in character as individuals develop cognitively (Harter, 1999; Marsh, Craven & Debus, 1998; Wigfield & Karpathian, 1991) and is thus not stable over time. Children of preschool age tend to describe themselves in concrete and observable terms and the production is often unrealistically positive (Harter, 1999; Humphrey, 2004; Marsh, 1990). Marsh (1990) argues that there is no correlation at that age between the high positive self-image and the observable characteristics that the child possesses. However, at early school age, pupils begin to develop a more realistic view of themselves as they learn more about their relative strengths and weaknesses (Guay, Marsh & Boivin, 2003). As the child gets older the differentiation of various self-image domains increases and the correlation between observable characteristics and student self-image increases (Marsh, 1990). Research suggests that the self-image is often low in reading-disabled populations, with children and young people reporting lower global self-worth, lower perceived competence in scholastic domains and more depressive symptomatology than normal achievers (Alexander-Passe, 2006; Chapman & Tunmer, 1997; Humphrey, 2002; Snowling, Muter & Carrol, 2007). Several studies have in various ways examined the relationships between self-concept and reading difficulties related to reading ability (Chapman & Tunmer, 1997; Guay et al., 2003; Glazzard, 2010; Terras, Thompson & Minnis, 2009). According to Burden (2008), there is a clear negative correlation between illiteracy and self-image implying that students with reading difficulties have a more negative self-image than typical readers. Although a large body of research indicates that self-esteem is often low, it is important to note that this is not always the case. Studies done on children at younger ages have shown that the correlation between self-image and reading ability is relatively weak (Chapman & Tunmer, 1997; Helmke & van Aken, 1995; Skaalvik & Hagtvet, 1990). However, according to Chapman and Tunmer (1997), it seems that the correlation between self-image and reading skills becomes stronger and more stable the longer students attend school. The correlation between academic self-concept and reading skills during the first school year was only .15, while the correlation for the second year in school was .36 when Chapman and Tunmer (1997) studied students between 5 and 7 years old.

There are also studies that have examined the causal relationship between self-image and academic achievement (Chapman & Tunmer, 1997; Helmke & van Aken, 1995; Marsh & Koller, 2004; Skaalvik & Hagtvet, 1990). In one study by Chapman and Tunmer (1997) researchers found some evidence that academic self-concept was a consequence of academic achievement. The study was performed with three repeated measurements at the ages of five, six and seven years. The researchers found that between the six- and seven-year measurement points the relationship between academic achievement and self-image indicated that school performance preceded the self-image development. Between the five- and six-year measurements it seemed, however, that academic achievement and self-image operated relatively independently. Helmke and van Aken (1995) in a study of middle-school students came up with similar results indicating that academic self-image was a consequence of success or failure in school. They also argued that the self-image level did not significantly affect students' subsequent performance in school (Helmke & van Aken, 1995).

The purpose of this study was to analyze the relationship between self-image and different reading abilities among pupils with reading disabilities in grade two. The intention was to identify pupils with reading difficulties whose self-image at the beginning of grade 2 in school was low, typical or high and examine whether the reading abilities in these three groups differed with regard to word decoding, phonological awareness and reading comprehension. Another aim was to analyze whether there were any differences between pupils with reading difficulties and typical readers regarding self-image level. Since few studies have been conducted taking into account different levels of reading difficulties related to self-esteem, there is consequently little knowledge about how the relationships between self-esteem and reading difficulties appear in this group.

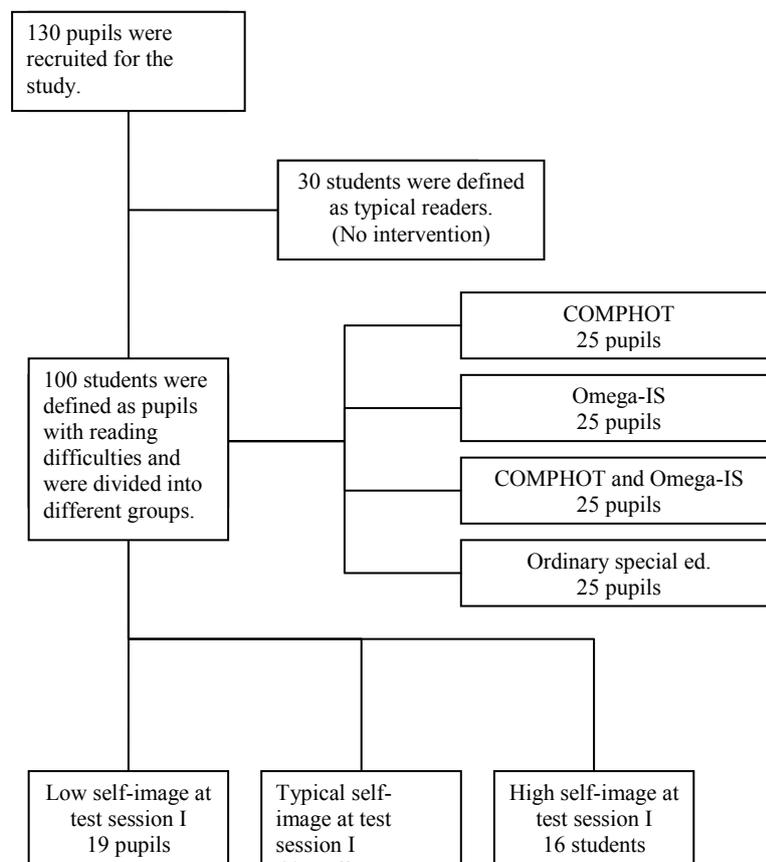
## Method

### *Participants*

A total of 130 students participated in the study. One hundred students who were identified as pupils in need of special education in the Swedish language by their teachers were included in the experimental group. The remaining 30 students formed a control group representing "typical readers". The experimental group was randomly divided into four groups with 25 students in each. These groups received different types of intervention for 25 sessions. Both control and experimental students were all assessed by means of a battery

containing various tests of reading and writing and of self-concept on five different occasions. Two test sessions were carried out before and three after the intervention. The interventions consisted of two different computer-based reading training programs. The first group was given a program focusing on orthographic training, the second group a phonologically related program and the third group a combination of the above. The fourth group received ordinary special education individualized by a special education teacher (i.e., a treatment as usual condition) (for details see Fälth, Gustafson, Tjus, Heimann & Svensson, 2013; Gustafson, Fälth, Svensson, Tjus & Heimann, 2011). However, in this article all pupils with reading disabilities were considered together as one group (see Figure 3).

There occurred some attrition due to pupils' illness or change of schools before all test sessions had been concluded. However, the drop-outs were viewed as relatively few since as many as 115 out of 130 pupils participated in all tests at all five test sessions. At the initial self-image measurement 129 out of 130 participated.



**Figure 1.** Flow diagram of the selection process in the intervention study.

Pupils with reading disabilities were divided into three different groups depending on their self-image level at test session I. The distribution of participants in the three different self-image groups (low, typical and high) with regard to the intervention group is shown in Table 1. A Chi-square test showed that there was no significant difference between the intervention groups in the distribution of participants across self-image groups:  $\chi^2(6.55) = .37$   $p > .05$ . This analysis showed that pupils with a high self-image were not over-represented in the group that received the most effective intervention, which in this case could have been a potential confounding variable in the further analysis. In this case, the three self-concept groups were approximately matched for intervention method.

<i>Table 1</i> The frequency of the number of pupils in the three different self-image groups across the four different intervention groups.				
<b>Self-Image group:</b>	<b>Low</b>	<b>Typical</b>	<b>High</b>	<b>Total</b>
Type of intervention:				
<b>Omega-IS</b>	7	15	3	25
<b>Comphot</b>	4	18	3	25
<b>Omega-IS + Comphot</b>	6	16	3	25
<b>Ordinary Instruction</b>	2	15	7	24

### *Design*

This study was based on a mixed design with a within-group variable consisting of different test sessions, and a between-group variable, the self-image level. The independent variable, the self-image level, was divided into three groups according to the pupils' scores on the self-image test administered at test session 1. The pupils who received results from 1 to 14 points were considered as pupils with a low self-image. Pupils who had between 15 and 19 points were considered as having a typical self-image. Those who got 20 points on the test were considered as pupils with a high self-image. The arbitrary grouping boundaries were created by starting with 15 % of the pupils with the highest and lowest scores on the self-concept test at test session 1. The same percentiles have been used in previous studies as cut-off limits (Chapman & Tunmer, 2000).

### *Materials*

One measure of the pupils' self-image and four measures of different reading abilities were used in this study.

*Self-image* was measured by a test called "Ballongbarnet och Flaggbarnet" (in English 'The balloon child and the flag child') included in the UMESOL test battery (Taube, Torn us & Lundberg, 1984). The test was adapted to pupils in grades 1-3 and intended to measure four types of self-image: total self-image, self-image associated with school in general, self-image related to schoolwork, and self-image related to peer relationships. The test was composed of 20 tasks, each task consisting of two propositions, for example, "Balloon Boy thinks it is fun to learn to read" but "Flag Boy does not think we need to learn to read." The pupils' task was to choose which of the two statements they felt most like. The test-retest reliability was, for the overall self-image,  $r = .49$  when repetitive measurements were conducted between grades 1 and 2. Between grades 2 and 3 the correlation was  $r = .58$ .

*Word decoding.* Word decoding was assessed by the Wordchains test (Jacobson, 1993). The task for the children was to silently read chains of words where the blank space between words has been removed and then mark each word boundary with a pencil. Each chain consisted of three semantically unrelated words. The Wordchains test had at an interval of 12 months between measurements test-retest correlations of  $r = .80 - .90$  in different groups of children in grades 1-6 (Jacobson, 1993). Test-retest correlations between T1 and T2 in the present study were  $r = .88$ .

*Pseudo-word reading.* The task was to read in one minute as many pseudo-words as possible from a list. The words were not real Swedish words, but they could be pronounced as if they were. Reading pseudo-words is thought to be done mainly via phonological processing. Since the child has never seen the words before, the straightforward orthographic way cannot be used (Jacobson, Svensson & af Trampe, unpublished data). The test-retest correlation between T1 and T2 in the present study was  $r=.90$ . The maximum score was 84.

*Reading comprehension.* A Swedish translation of a subtest from Woodcock Reading Mastery Test - Revised (Woodcock, 1987) was used. The students read a passage of text with a blank line and the task was to fill in the blank verbally with a single word that fit the passage. The level of difficulty increased with the number of items and the test ended when the participant failed on six consecutive passages. The maximum score was 68.

### *Statistical methods*

One-way ANOVA was used to examine whether there were differences between typical readers and pupils with reading difficulties as regards self-image, word decoding, phonological awareness and reading comprehension. Before the interventions, at test point 1 or 2, a Chi -square test was conducted to examine whether significant differences in terms of self-image group existed between the different intervention groups. This analysis was also performed to verify that the three self-concept groups were matched with each other. One-way ANOVA was used to ascertain whether there were significant differences between the various self-image groups with regard to the dependent variables at the initial testing. A variance analysis with repeated measures was used to examine whether there were any differences between the three self-concept groups (low, typical and high) with regard to the dependent variables, by using a 3 (group) x 5 (test occasion) ANOVA and 3 (group) x 3 (test time) ANOVA. Cohen's  $d$  (Cohen, 1988) was used in comparing the mean values of the difference scores to the standard deviation of the typical readers in the pre-test. Cohen's  $d$  was calculated as  $[M \text{ at T5 or T3} - (M \text{ at T1} + M \text{ at T2})/2]/\text{pooled SD for T1, T2 and T3 or T5}$  (Dunlop, Cortina, Vaslow & Burke, 1996).

## Findings

### *Initial differences between pupils with reading difficulties and typical readers*

Five one-way ANOVAs were performed to compare the mean values among students with reading difficulties and typical readers with regard to self-image, word decoding, pseudo-word decoding, reading comprehension and phonological awareness (see Table 2). All five comparisons showed significant differences (all  $p < .05$ ) between groups. Typical readers performed significantly better than students with reading disabilities in all analyses. That word decoding, pseudo-word reading and reading comprehension differed significantly between the two main groups, pupils with reading difficulties and typical readers, was of course expected. There was also a significant difference between groups with regard to self-image level.

*Table 2*

Mean values and standard deviations for pupils with reading difficulties and typical readers on the dependent variables. The test results were registered before the intervention, at test session 1.

	Pupils with reading disabilities		Typical readers	
	M	SD	M	SD
<b>Self-image</b>	16.59	(2.99)	17.83	(1.62)
<b>Word decoding</b>	6.19	(3.07)	14.10	(5.81)
<b>Pseudo word reading</b>	8.58	(4.61)	19.93	(7.05)
<b>Reading comprehension</b>	8.14	(5.58)	20.03	(6.74)
<b>Phonological awareness</b>	4.71	(2.56)	7.83	(2.69)

Five one-way ANOVAs showed that there were no significant differences before the intervention between the three different self-image groups concerning word decoding, pseudo-word reading and reading comprehension.

*Primary analysis of the three different self-image groups with regard to reading ability development*

A variance analysis with repeated measures was performed for the three different self-image groups (low, typical and high) on word decoding, pseudo-word reading and reading comprehension (see Table 3).

*Table 3*

Mean values and standard deviations for the three different self-image groups (low, typical and high) on the various test sessions for four different tests. The table also shows the main effect of group and within-group effect sizes.

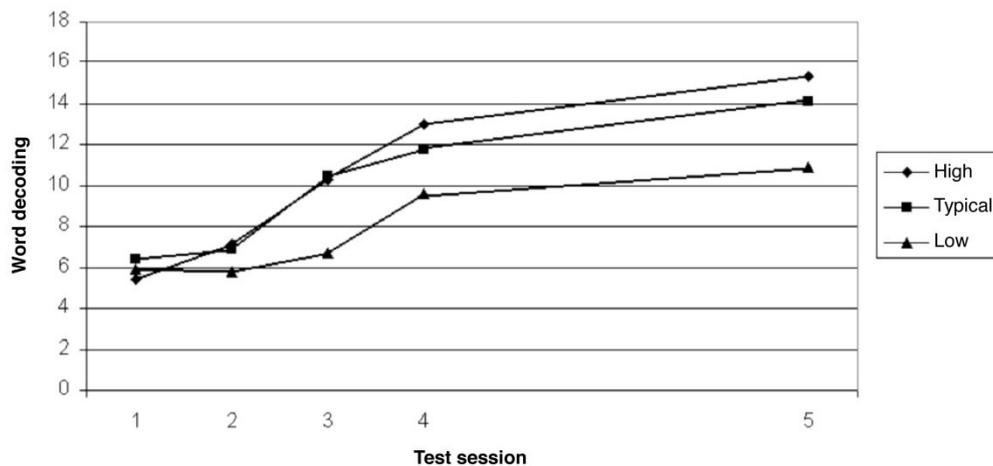
Self-image-group	Low		Typical		High		Main effect of group
	M	SD	M	SD	M	SD	
<b>Word decoding</b>							
Test session 1	5.87	(3.11)	6.43	(2.93)	5.43	(3.25)	$F(2,87) = 3.33^*$
Test session 2	5.80	(2.65)	6.87	(2.82)	7.07	(2.43)	
Test session 3	6.73	(5.08)	10.51	(3.50)	10.29	(2.56)	
Test session 4	9.60	(5.33)	11.85	(3.73)	13.00	(4.13)	
Test session 5	10.87	(4.90)	14.11	(5.14)	15.29	(6.29)	
Cohen's d	1.22		1.75		1.97		
<b>Pseudo word reading</b>							
Test session 1	9.27	(5.57)	8.34	(4.59)	9.62	(3.78)	$F(2,80) = 0.09$
Test session 2	10.82	(4.71)	9.85	(4.52)	10.85	(3.31)	
Test session 3	13.36	(5.28)	13.19	(5.21)	13.85	(3.58)	
Test session 4	14.18	(5.04)	14.37	(5.37)	14.15	(4.02)	
Test session 5	16.00	(5.14)	16.66	(7.12)	16.69	(5.72)	
Cohen's d	1.26		1.39		1.46		
<b>Reading comprehension</b>							
Test session 2	5.24	(4.86)	8.87	(5.75)	8.14	(4.96)	$F(2,89) = 4.37^*$
Test session 3	8.47	(5.60)	13.82	(6.25)	13.14	(6.46)	
Test session 5	13.35	(5.06)	16.93	(6.03)	18.71	(5.76)	
Cohen's d	1.63		1.37		1.97		
<b>Phonological awareness</b>							
Test session 1	4.23	(2.65)	4.85	(2.71)	5.00	(1.83)	$F(2,78) = 1.48$
Test session 2	4.54	(2.30)	5.22	(2.62)	5.08	(1.66)	
Test session 3	4.77	(3.14)	6.16	(3.20)	7.08	(2.18)	
Test session 4	5.77	(3.03)	7.18	(2.81)	8.00	(1.87)	
Test session 5	5.85	(3.26)	7.29	(2.81)	7.77	(2.68)	
Cohen's d	0.55		0.88		1.21		

\* =  $p < .05$

*Word decoding*

A significant main effect of time ( $p < .001$ ) was found on the word decoding variable. The three groups improved their self-image gradually over time (see Figure 2). There was also a significant main effect of group  $F(2.87) = 3.33$  ( $p < .05$ ), demonstrating that there was an overall significant difference in the ability to decode words between the three self-concept groups over the five test sessions. The Bonferroni post hoc test showed that the group with a low self-image performed significantly lower on the word decoding test than the typical self-image group. No other differences were found.

The effect size within the group with a low self-image from test session 1 to test session 5 was = 1.22. The effect size between test sessions 1 and 5 for the group with a typical self-image was = 1.75. For the group with a high self-image the effect size was = 1.97 between test sessions 1 and 5.



**Figure 2.** Development of word decoding divided among the three self-image groups at the five test sessions. The intervention took place between test sessions 2 and 3.

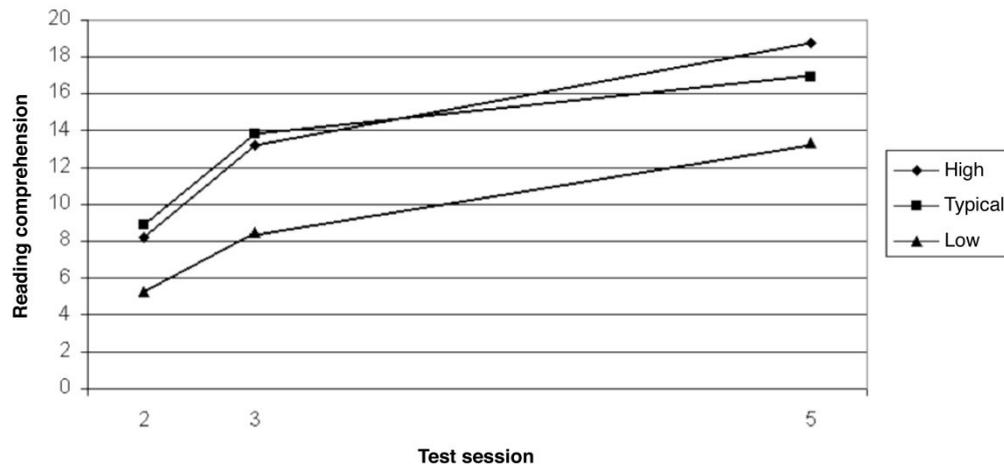
### *Pseudo-word reading*

For the pseudo-word reading variable there was a significant main effect of time ( $p < .001$ ), which meant that the overall improvement was significant for the five test sessions with regard to phonological decoding. No significant main effect of group was found and no significant interaction effect between group and time.

The effect size within the group with a low self-image from test session 1 to 5 was = 1.26. The effect for the group with a typical self-image over the same time was = 1.39. For the group with a high self-image the effect size was = 1.46. As the three groups had a similar development of their pseudo-word reading ability in terms of effect sizes, there was, as stated earlier, no significant overall difference between the three self-image groups for the five test sessions.

### *Reading comprehension*

For the reading comprehension variable the main effect of time  $F(2.89) = 137.71$  ( $p < .001$ ) was significant and so was the significant main effect of group  $F(2.89) = 4.37$  ( $p < .05$ ). This means that, for the three test sessions, there was an overall significant improvement in all three groups as well as a significant difference between them (see Figure 3). The Bonferroni post hoc test showed that there was a significant difference between the group with a low self-image and the typical self-image groups. The group with a low self-image performed significantly lower results on the variable than the group with a typical self-image. However, there was no significant difference between the low self-image and high self-image groups or between the typical and high self-image groups. The interaction effect between time and group was not significant. The effect size within the group with a low self-image from session 2 to session 5 was = 1.63. The effect size between test sessions 2 and 5 was 1.37 for the group with a typical and 1.97 for the group with a high self-image.



**Figure 3.** The development of reading comprehension for the three self-image groups at the three test sessions. The intervention was carried out between test sessions 2 and 3.

### Discussion and conclusion

One of the aims of the study was to examine whether there were any differences in reading development between pupils with reading difficulties who at test session 1 had a low, typical or high self-image. Judging by the complex answer, it seems that the self-image level affects certain reading abilities and their development but no other ones. In word decoding and reading comprehension pupils with a typical self-image improved significantly more than those with a low self-image. Significant interaction effects were found on the word decoding variable, which indicates that the self-image group which pupils belonged to influenced their word decoding development. The other results indicate that the self-image group to which the pupil belonged did not significantly affect the development of the pseudo-word decoding and phonological awareness variables.

A student's achievement in reading cannot be explained by cognitive abilities alone, but also by environmental and psychological factors (Aaron, Joshi, Gooden & Bentum, 2008; Dudley-Marling, 2004). The results showed that there was a difference between pupils with reading difficulties and typical readers with regard to the self-image level, where typical readers had a significantly higher self-image than those with reading difficulties, as shown in Table 2. Furthermore, the analysis suggests that the self-image group to which the pupils with reading difficulties belonged influences the development of word decoding and reading comprehension, with the students who initially belonged to the high self-image group increasing the most on those tests. The difference in self-image between typical readers and

students with reading difficulties is confirmed by previous research (Guay et al., 2003). Differences between the three self-image groups were found on the word decoding and reading comprehension variables, where pupils with a low self-image had, cumulatively over the test sessions, significantly lower results than pupils with a typical self-image.

The variable where the self-image groups differed in their impact on the outcome was word decoding. As both interaction effects and the main effects of group were observed, it can be concluded that the pupils' self-image level influenced the development of their ability to decode words in this specific group. These results are in line with Chapman and Tunmer (2000), who conducted a similar longitudinal study in which they followed students from school start. Chapman and Tunmer (2000), who also divided the students into three different self-image groups, found significant differences between all three groups with regard to word decoding. In the present study, the significant differences that were observed only between students with a low and those with a typical self-image may be related to the obtained ceiling effects on the self-image test, which will be discussed later. An incipient tendency for differences between the groups for the word decoding variable shows that a low self-image can affect the development of the ability to decode words even relatively early on in the student's schooling. This result, together with the result that there was a difference in self-image after test session 1 between typical readers and students with reading difficulties, also appears in previous research (Guay et al., 2003; Marsh, 1990) indicating a correlation between academic achievement and self-image at an early school age. That students with reading disabilities have a significantly lower self-image than typical readers is in line with previous studies in the area (Burden, 2005; Swalander, 2009). There is a risk that children with reading difficulties, because of their low self-image, have negative feelings about reading and writing and therefore do not even make an effort. According to Swalander (2009), this may lead pupils to avoid tasks involving reading, which in turn can entail that they miss the support they require from their environment (Swalander, 2009; Troia, Shankland & Wolbers, 2012).

One limitation of the study is the ceiling effects that appeared on some self-image tests where 16 of 99 pupils after test session 1 received a maximum score. Such ceiling effects are regrettable but understandable from previous theories and research (Guay et al., 2003; Harter, 1999; Humphrey, 2004; Marsh, 1990), since pupils at younger ages tend to overestimate their self-image unrealistically. Another limitation of the study is that the number of individuals in the various groups differs when they are divided by self-image.

The purpose of the present study was to analyze the relationship between self-image and different reading abilities of pupils in grade 2 and to find out whether there were any differences between students with reading difficulties and typical readers regarding the self-image level. The main conclusions were that the self-image level affects the development of word decoding among pupils with reading difficulties and that pupils with reading disabilities have a lower self-image than typical readers. This connection should be highlighted and worked with actively at school. When students' reading ability is assessed, other factors than the cognitive that is important for the students' reading development should also be examined. According to a study by Aaron et al. (2008), reading and reading skills are not only part of the cognitive domain but also affect the psychological domain, including the self-image. To obtain a more complete picture of how the psychological domain affects reading ability, it would be interesting to explore more underlying factors by examining, for instance, what students do in their spare time, what their reading habits at home are like, their parents' education and what requirements their teachers have.

Since the results also indicate that the development of word decoding and reading comprehension is lower in pupils with a low self-image than in those with a typical self-image, priority should be given to efforts and initiatives in schools that raise students' self-image parallel with interventions focusing on raising their reading abilities. School interventions should focus on different forms of self-image in various fields and domains, since the results show that even a more general self-image has an influence on reading development. Ideally, schools should be able both to provide the necessary schooling knowledge and to promote student self-image. The challenge is to create an environment where the children can feel valued and secure while receiving an education from specially trained teachers who are prepared to meet the educational, social and emotional needs of students with reading disabilities.

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