



Motivational-emotional vulnerability and difficulties in learning to read and spell

Elisa Poskiparta^{1*}, Pekka Niemi^{1,2}, Janne Lepola¹,
Annarilla Ahtola¹ and Piialiisa Laine¹

¹University of Turku, Finland

²Stavanger University College, Norway

Background. Although the relationship between motivation and learning problems has been studied in older children, little is known about how these factors interact during the first years of schooling or even earlier.

Aims. To compare the development of motivational-emotional profiles from preschool to grade 2 between groups classified as poor readers, good decoders and good readers in grade 2. To study the possibility that diverging motivational-emotional paths occur concomitantly with school experience.

Sample. A total of 127 children were followed longitudinally from preschool up to the second grade. In preschool, their mean age was 6 years 8 months.

Method. Two different methods tapping motivational-emotional vulnerability were used. Firstly, researchers at preschool age and classroom teachers in grades 1 and 2 rated children's task, ego-defensive and social dependence orientations. Secondly, an experimental situation was arranged each year where children's play behaviour with LEGO® bricks was observed in free play vs. in induced pressure situations, and their motivational orientations were scored.

Results. In preschool, the motivational-emotional profiles were almost the same among the three prospective reading-level groups, but in grades 1 and 2, classroom teachers rated poor readers as less task-oriented and more ego-defensive and socially dependent compared to good decoders and good readers. The ratings were corroborated by observational data on play behaviour in induced pressure situations.

Conclusions. Early problems in learning to read and spell are related to motivational-emotional vulnerability in learning situations in the school context.

* Requests for reprints should be addressed Elisa Poskiparta, Department of Psychology, University of Turku, FIN-20014, Finland (e-mail: elipos@utu.fi).

Motivation is a component of beginning reading that is more often than not neglected, perhaps because of its elusive nature. However, learning disabilities have been associated with differences in children's control-related (e.g., Butkowsky & Willows, 1980) and competence beliefs (e.g., Chapman & Tunmer, 1997), as well as their multiple achievement goals (e.g., Galloway, Leo, Rogers, & Armstrong, 1995). Personal interest in various academic tasks has been shown to affect the quality of learning (Sweet, Guthrie, & Ng, 1998). However, constructs such as these are problematic in the context of beginning reading for at least two reasons. First, relevant data are essentially based on self-reports, a method that is difficult to use with young children. Such measures also fail to capture children's experiences while in the midst of an activity. Second, constructs such as personal interest hardly tap the process of learning to read notwithstanding their relevance to achievement motivation. The question thus arises of whether there are aspects of motivation that are directly relevant to learning to read.

One component of motivation of obvious relevance to beginning reading is the ability to maintain focused attention. The child is expected to master feats of phonological awareness, in other words, turning his/her attention to the form of a word instead of its meaning. Successful word decoding and text comprehension demand sustained concentration. What is more, school entrance exposes the child to potential stressors uncommon in their previous milieu. Prior to school, children are seldom confronted by situations where their learning achievements are subject to systematic social comparison. Butler (1999) proposes that children under 7 years, in fact, have not yet reached a normative concept of ability and, consequently, they do not understand that normative outcomes are diagnostic of their current ability. At school, learning becomes more intentional and social comparison is salient, for instance, in reading-aloud situations. Learning to read is highly valued by both teachers and parents in most countries. If the child makes slower progress than his/her classmates, s/he becomes easily exposed to a cycle of repeated failure experiences which increases vulnerability. We suggest that early reading experiences in school may involve considerable stress to some children. The child may be overtaxed due to deficits and difficulties in some cognitive prerequisites or subskills of reading. Additionally, the child may encounter negative adult prejudices, social comparison, and evaluative pressures that are often characteristic of public classroom reading performance.

These considerations lead directly to behavioural consequences. Maintaining focused attention, in other words, concentration, is observationally equivalent to on-task behaviour. Yielding to distraction caused, for example, by a stressor can be characterised as off-task behaviour. According to Lazarus (1991), a common response to a stressful situation is the use of various coping strategies. These are elicited especially when the situational demands tax or even exceed the resources of the child.

As a response to the above considerations, Olkinuora, Salonen, and Lehtinen (1984) developed a theoretical model that describes typical patterns of coping strategies that children use in school situations. On the basis of the coping approach (Lazarus & Launier, 1978), as well as the distinctions between the intrinsic vs. extrinsic (Harter, 1981) and the task vs. ego-involved (Nichols, 1984) motivational approach, they conceptualised three types of coping strategies, one of them encompassing on-task performance and the other two tapping typical forms of off-task behaviour: (1) *Task orientation*, i.e., the child's intrinsically motivated tendency to approach, explore and master the challenging aspects of a learning task; (2) *Ego-defensive orientation*, i.e., the child's tendency to reduce negative feelings and motivational-emotional conflict or tension caused by the threat of failure; (3) *Social dependence orientation*, i.e., the

child's tendency to please the teacher, and to seek her or his help and approval. The behavioural content of these orientation types is described in more detail in the Appendix (Salonen, 1987). In the model, the use of maladaptive coping strategies, i.e., ego-defensive and social dependence orientations in stressful situations, indicates motivational-emotional vulnerability, while the use of task-orientation suggests motivational-emotional resilience. The model has been tested in several longitudinal studies of reading (Lepola, Salonen, & Vauras, 2000; Salonen, Lepola, & Niemi, 1998; Vauras, Salonen, Lehtinen, & Lepola, 2001).

In the present study, we followed up children from preschool to the end of second grade in terms of reading-related skills and motivational orientations. The priority of reading development as a target was motivated by the fact that it has been cherished in the Finnish culture since the end of the 1600s after reading became a compulsory prerequisite for a marriage licence in Finland and Sweden (see, e.g., Lundberg & Nilsson, 1986). Reading is still viewed as the main goal of primary education. In grade 2, a cluster analysis was performed on measures of decoding (speed and accuracy), spelling and reading comprehension. It classified children into distinct groups of poor readers, good decoders and good readers.

The main questions of the present study were whether these groups of different readers showed similar or dissimilar proportions of on-task vs. off-task behaviour in preschool, when performing with and without stress? If similar, did the group developments diverge in the course of grades 1 and 2, concomitantly with the formation of different reading careers?

Method

Participants

Finnish children start primary school in the middle of August in the year they reach the age of 7. The majority of them, however, have had one year of preschool not featuring the teaching of literacy. The school district knows the identity of their forthcoming first graders in January. The relationship between preschool and primary school is based on geography, and there is no administrative overlap. Four urban primary schools (in a town with 160,000 inhabitants) were selected for study. The parents and prospective teachers were contacted upon the formal inscription of the children in January, 7 months before the schools were to receive the next cohort of first graders. All 12 first grade teachers agreed to participate and very few parents refused. All but one teacher had taught for at least 9 years. The youngest teacher had 2 years' work experience. Ten out of the 12 teachers worked both with grades 1 and 2. In the Finnish primary school, each class has one teacher who carries out most of the teaching. Almost all schools use phonics in beginning reading instruction with the emphasis on letters and their adjoining sounds. In Finnish, each of the 28 letters corresponds to only one single phoneme.

There were 199 Finnish-speaking first graders in the 12 classes with a continuous data record from preschool to grade 2. Preschool readers (17%) were excluded from the sample as were pupils who later participated in reading and spelling interventions in grades 1 and/or 2. The remaining sample consisted of 127 pupils, 53 girls and 74 boys. At the beginning of the study, the mean age of the children was 6 years 8 months.

Design and procedure

Children were tested on an extensive range of measures, including motivational tendencies in task performance and reading skills, at preschool and whilst in grades 1 and 2. The testing was always conducted in the spring term. Comparison was made between groups of children classified according to their reading and spelling level in grade 2.

Measurement of cognitive-linguistic prerequisites in preschool

The test of phonological awareness consisted of four subscales each having 10 items (Poskiparta, Niemi, & Lepola, 1994). *Syllable deletion*. The examiner deleted one syllable from the word and the child was asked to say aloud the remaining part which also formed a word. The deleted syllables were at the end, at the beginning or in the middle of the original word. *Phoneme blending*. Two- to four-letter words were presented phoneme-by-phoneme and the child was asked to say aloud the resulting word. *Single phoneme isolation*. The child was asked to say aloud the first phoneme/letter of the word. *Phoneme deletion*. The child was asked to delete the initial phoneme and to say aloud the remaining part which formed a word.

Letter naming. Letter naming was measured with 19 letters (those of foreign origin were not used), presented visually one at a time by the experimenter (Poskiparta *et al.*, 1994). The child was asked to name the letter.

Invented spelling. Invented spelling was measured with 10 words depicted as pictures and presented one at a time (Poskiparta *et al.*, 1994). The words had 2-3 syllables and 4-5 letters, totalling 47 letters altogether. The child was asked to write down as much as possible of the names of the pictures. The score was the total number of written letters belonging to the words irrespective of the within-word order.

Memory span. Working memory was measured with digits, words, and sentences (see Dufva, Niemi, & Voeten, 2001). All span measures were constructed so that the set size increased systematically from three to seven words. The child was given two trials with each set size. The score was the number of items in the last set successfully recalled in at least one trial. The total working memory span score was the mean of digit, word, and sentence spans.

Listening comprehension. Listening comprehension was assessed by two expository (95- and 135-word) and two narrative (95- and 135-word) texts, each describing the behaviour of an animal (Vauras, Mäki, Dufva, & Hämäläinen, 1995). Main idea questions were asked after the text had been read twice to the child. His/her oral answers were scored on a 3-point scale, or on a 4-point scale for questions demanding a more complex answer according to the accuracy of understanding a specific main idea. A relative score (percentage of the maximum score) was calculated for each text. The mean score of the four texts indicated the level of listening comprehension.

Two trained researchers rated all data. Intra-rater and inter-rater reliabilities, expressed as product-moment correlations, varied from .80 to .98. Intra-rater reliability was assessed by a rater re-scoring part of the data after the interval of about one month, without knowing the scores from the first round.

Intelligence. Verbal and non-verbal IQ were assessed by the Wechsler Intelligence Scale for Children-Revised (WISC-R) (Wechsler, 1984).

Measurement of decoding, spelling and reading comprehension skills in grades 1 to 2

Decoding was assessed with two reading-aloud tasks: word reading in grade 1 and story reading in grade 2. Parallel tasks of sentence spelling were presented in grades 1 and 2. A silent reading comprehension task was presented in grade 2.

Word reading. The child was asked to read aloud 36 computer-presented *short* (2-5 letters with 1-3 syllables) words presented one at a time on the screen (Kinnunen, Poskiparta, & Niemi, 1994). Both speed and accuracy were emphasised in the instruction. First, a warning signal (an asterisk accompanied by a beep) appeared on the screen: after 1 second, the word appeared in the same location. The experimenter pressed down the left mouse when the child finished naming the word. The computer recorded the time from the onset of the word until the release of the mouse button. The mean time of correctly named words presented the level of *word-reading speed*. The number of decoding errors was also recorded by the experimenter. The total number of errors presented the level of *word-reading accuracy*. The first six items served as practice trials. Before computing the final mean for each participant, the out-of-range values ($2.25 \times SD$) and the values of incorrectly named items were removed. The test was interrupted for six children because they were unable to read the words.

Story reading. The child was given a narrative 95-word story printed on a paper sheet and asked to read it in the way s/he usually does in a reading situation. Reading comprehension was also emphasised in the instruction. The experimenter recorded the time the child spent on the story and the number of incorrectly read words. If the child spontaneously corrected a misreading, the word was scored as correct. Some readers showed a tendency to skip over individual words or a even whole row. When their reading speed score was computed, these words were subtracted from the total number of words, and the total reading time was divided by the number of remaining words. The average reading time per word indicated the reading speed, and the total number of reading errors indicated the reading accuracy.

Spelling. The spelling test consisted of 10 sentences in grade 1 and 12 sentences in grade 2, 2 to 6 words long, each read aloud by the experimenter. Parallel versions of 10 sentences were prepared for grades 1 and 2. Two long sentences were included in grade 2 to guard against a possible ceiling effect. The score was equal to the number of correctly written sentences.

Reading comprehension. Reading comprehension was assessed in grade 2 by using an expository (135-word) text, describing parachute jumping. The child was asked to read the text carefully at his/her own pace so that he or she would be able answer questions about its message. After it had been read, the text was taken away and the child wrote down the answers instead of saying them aloud. The motive was to approximate a typical reading comprehension exercise in Finnish schools. The recall questions on the main ideas of the text and the rating procedures were similar to those in the listening comprehension tasks. Intra-rater and inter-rater reliabilities varied from 0.80 to 0.97.

Measurement of motivational-emotional vulnerability from preschool to grade 2

Researchers' and teachers' ratings of children's motivational orientations

At preschool, trained experimenters and, in grades and 1 to 2, classroom teachers assessed the pupils' task, social dependence, and ego-defensive orientations on 5-point Likert-type subscales (Salonen *et al.*, 1994). The experimenter acted as follows. The

orientation ratings were based on several individual diagnostic sessions with the pupil. They were made immediately after the last session. Similarly, the classroom teachers were asked to think about and recall how a certain child typically behaves in various learning situations during the school day.

The following three items were used to assess *task orientation*. (1) Child performs a task from beginning to end in a way not interrupted or retarded by external disturbing factors. (2) Child's verbal behaviour indicates task-involvement, i.e., expressions indicating of what he or she is doing or planning, and willingness to think and experiment in problem-solving situations. (3) Child displays persistent effort and willingness to complete the task.

The three *social dependence orientation* items were as follows. (1) Child easily, without thinking, asks for help with the task either verbally or by looking helpless. (2) Child imitates peers' and teacher's performance or changes his or her behaviour in order to comply with other persons' wishes. (3) Child focuses on task performance only when asked to do so or is guided.

Ego-defensive orientation items were: (1) Child avoids the task or is doing something else, for example, fooling around, chattering with peers, playing with pencils, etc. (2) Child's task performance is characterised by passivity and inhibition of action such as 'freezing'. (3) Child's verbal expressions indicate anticipation of failure or unwillingness to perform the task. Expressions may vary from anxiety-related emotions to anger.

The internal-consistency reliability was computed for each orientation type. Cronbach's alpha coefficients (α) for task, social dependence, and ego defensive orientations were 0.69, 0.71, and 0.71, respectively.

Observation of motivational orientations in free play and pressure situations

To assess manifestation of task, ego-defensive, and social dependence orientations while in the midst of an activity, the children were observed in play-like situations. At preschool age, they were given LEGO® bricks for the construction of a castle ('Build any kind of castle you like, where someone like you could live'). The children, divided into groups of three to four, worked individually but they could observe each other's work. During the process, three pressure episodes were arranged by the experimenter, one being a competition with an experienced builder and two obstacle situations with impossible tasks (Salonen *et al.*, 1994). In preschool, after 8 minutes of free construction, the children were instructed to build a high, round tower. Although there were only two round components available, the impossibility of the task was not obvious because at the start each child was given a mixed selection of about 100 pieces varying in form and colour. After 5 minutes, the experimenter said that the task was quite difficult, and the children continued the free construction for 5 minutes more.

After this, the children were asked to participate in a tower-building speed competition with the experimenter. The experimenter gave each child, and took him/herself, 22 new LEGO® pieces and a model tower with layered colours. The experimenter, who was predetermined to always win, asked after the game 'Who won? Who was second?' The free construction of the castle continued again for 5 minutes. The second obstacle was then introduced. The experimenter now asked the children to build a room with two LEGO® windows while only one transparent piece was available in the selection. After 5 minutes' trying, the experimenter said that the children could continue working on the castle if they wished. The final phase lasted about 7 minutes. The total mean performance time was 37 minutes. In grade 1, the

procedure was identical but the construction objects were changed to stairs and a bridge. In grade 2, the children were asked to build a school playground. Pressure episodes included only one obstacle situation where the children built a see-saw and, in a competition episode, a tower.

The entire play-like construction process with intermittent pressure episodes, i.e., the obstacle and competition sub-tasks, was videotaped. Children's non-verbal and verbal behaviours were transcribed from the videotapes. The smallest unit used in the time analysis was a 3-second episode of the same kind of behaviour. Task-oriented, ego-defensive, and social dependence type coping strategies were classified according to a pre-described category system (Salonen, 1987, see Appendix). The duration of task-oriented, ego-defensive and social dependence coping behaviour episodes was computed across the free-play situation as well as across the pressure episodes. One of the present authors coded 90 % of all instances. Thirty percent of transcribed episodes were cross-checked by another trained rater. A rather strict criterion was used, based on continuous time-sampling and the congruence between raters in detecting brief episodes of task, social dependence, and ego defensive orientation. The obtained inter-rater reliability was a somewhat modest 0.70. However, it can be considered satisfactory given the fact that the shortest time windows were about 3 seconds in duration. Because of time limits, the task was given only to a sample of children in each year. At preschool age, all ($n = 70$) participants who were attending a day-care centre were tested. In grades 1 and 2, the task was given to a representative sample of children in order to ensure that the most relevant variables were equally represented among the children. In grade 1, the sampling was based on both cognitive-linguistic prerequisites for reading and researchers' ratings of motivational orientation at preschool age. In grade 2, the sampling was based on children's actual reading ability and teacher ratings of motivational orientations in grade 1. A person not familiar with the scores of the LEGO® construction task performed the participant selection. The sample included 46 children in grade 1 and 48 children in grade 2. Because the subgroups were formed using different selection criteria in each year, a possibility emerges that they may differ in terms of the target measures, i.e. reading and spelling competence in grade 2. *T* tests for independent groups performed on a yearly basis showed no differences between those who participated in the LEGO® task and those who did not. The only exception among the 12 *t* tests was story-reading errors among first-grade subsamples, showing an advantage for those who did not participate in the LEGO® task ($p=.022$). However, an ANOVA showed no interaction involving the reading group structure in grade 2.

Results

Formation of reading ability groups in grade 2

A K-means cluster analysis was carried out with all 127 children in grade 2. The aim was to categorise children according to their level of decoding and spelling and their ability to use these skills in a learning situation, i.e., read and comprehend written texts and present what they had learned in writing. The raw scores of story-reading speed (decoding) and errors (accuracy), sentence-spelling ability, and silent-reading comprehension were standardised and used in the analysis. Our purpose was to try to form three groups with varying skill. Hence, a three-cluster analysis was performed.

Figure 1 presents the three-cluster solution. For all reading-level measures, the z

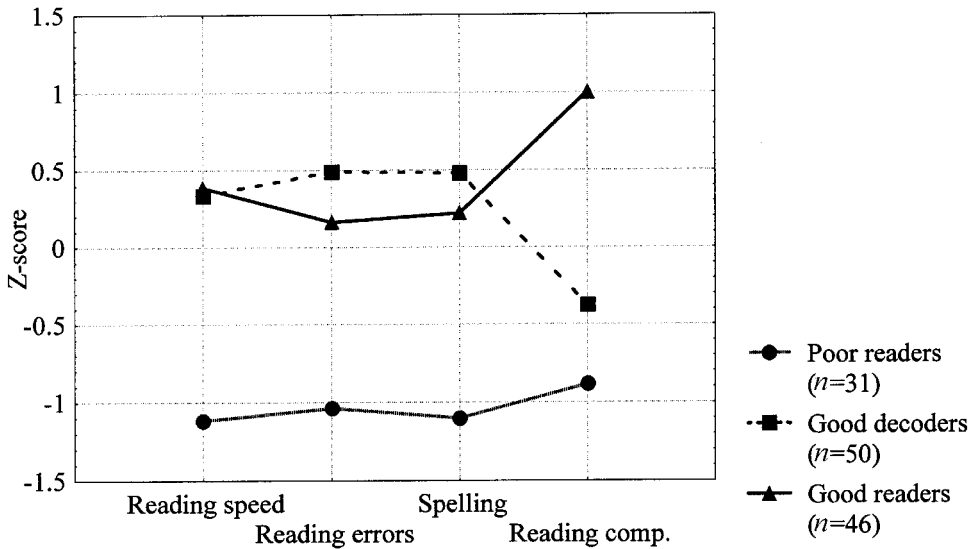


Figure 1. Classifying children into reading level groups in grade 2

scores of the poorly reading group were at least one standard deviation below the mean, while the good readers' z scores were clearly above the mean. The third cluster consisted of children whose basic skills (decoding and spelling) were at least average but who had difficulties with text learning. We labelled this cluster good decoders. Consequently, the good reading group consisted of 46 children (21 girls and 25 boys), the good decoders' group of 50 children (22 girls and 28 boys), and the poor reading group of 31 children (10 girls and 21 boys).

A MANOVA was performed on reading measures in grade 2 in order to confirm the results of the cluster analysis (see Table 1). F values were based on Wilks's Lambda, $F(8, 242) = 39.33, p < .001, \eta^2 = .57$. Table 1 presents the means and standard deviation for individual reading and spelling measures as well as the associated univariate ANOVAs. Group comparisons were performed by means of LSD post hoc test with Bonferroni corrections for multiple comparisons. The poor readers' performance was consistently below that of the good readers and good decoders. The good readers' reading comprehension was above that of the good decoders, while the other three measures were equal. Additional confirmation of appropriate group separation can be derived from the means and standard deviations in Table 1. All decoding and spelling comparisons involving poor readers result in effect sizes greater than 1. Due to the almost perfect grapheme-to-phoneme correspondence of the Finnish language, spelling develops with little effort concomitantly with decoding, resulting in satisfactory levels for most pupils already by the end of grade 1. Reading comprehension presents a different developmental pattern as the overlap between poor readers and good decoders at this point suggests.

Do prospective poor readers, good decoders, and good readers have different cognitive-linguistic prerequisites at preschool age ?

A MANOVA was performed on preschool cognitive-linguistic prerequisites in order to test whether there were any differences between the prospective reading groups (see

Table 1. Development of word recognition, spelling, and reading comprehension skills from grade 1 to grade 2 by group, and univariate ANOVA results

Time Task	Poor reader		Good decoder		Good reader		ANOVA	LSD test
	M	SD	M	SD	M	SD		
Grade 1 ^a								
Word-reading speed	3.90	0.92	2.85	1.90	2.72	1.16	$F(2, 118) = 6.16, p = .003$	$P < GD = G$
Word-reading errors	2.56	2.75	1.46	2.60	0.94	1.39	$F(2, 118) = 4.40, p = .014$	$P < G$
Sentence spelling	2.57	2.79	6.71	2.89	6.54	3.28	$F(2, 121) = 20.61, p = .000$	$P < GD = G$
Grade 2 ^b								
Story-reading speed	2.11	0.82	1.15	0.32	1.12	0.40	$F(2, 124) = 42.30, p = .000$	$P < GD = G$
Story-reading errors	10.90	6.40	3.26	2.75	4.91	2.92	$F(2, 133) = 36.42, p = .000$	$P < GD = G$
Sentence spelling	7.43	2.03	10.22	1.13	9.80	1.06	$F(2, 133) = 41.39, p = .000$	$P < GD = G$
Reading comprehension	22.29	17.70	32.36	10.42	59.88	9.88	$F(2, 133) = 100.03, p = .000$	$P < GD < G$

Note. Bonferroni corrections were used in the LSD post hoc testing, where P = poor readers; GD = good decoders; G = good readers; < refers to lower level performance, = refers to equal level performance. ^aWord-reading speed = reaction time in seconds; word-reading errors max = 30; sentence spelling max = 10; word reading task was too difficult for 6 children of the poor reading group. ^bStory-reading speed in seconds per word; story-reading errors = total number of errors; sentence spelling max = 12; Reading comprehension percentage correct. The absence of a group label in the LSD test means that the group did not differ significantly from the other two groups.

Table 2). F values were based on Wilks's Lambda, $F(14, 222) = 3.69$, $p < .001$, $\eta^2 = .19$. To test for eventual skill differences involving the groups, univariate ANOVAs were performed on the sum scores of phonological awareness, letter naming, invented spelling, working memory, listening comprehension, and the WISC-R verbal and non-verbal scale. The between-subjects variable was group (poor readers, good decoders, good readers). The group means and the results of ANOVAs, together with Bonferroni corrected LSD tests, are given in Table 2.

At preschool age, prospective poor readers' performance was consistently inferior to that of prospective good readers. Prospective poor readers and good decoders differed from each other in letter naming, listening comprehension and verbal IQ. For prospective good decoders and good readers, significant differences were found only in phonological awareness, in favour of the prospective good readers.

Did prospective poor readers encounter difficulties in reading-related skills already in grade 1 ?

In February, following 6 months of schooling, the children's word-reading and spelling skills were tested. A MANOVA was performed on word-reading speed and accuracy, as well as on sentence spelling, $F(6,226) = 6.76$, $p < .001$, $\eta^2 = .15$. The group means and the results of univariate ANOVAs, together with Bonferroni corrected LSD tests, are given in Table 1.

Already in grade 1, poor readers were distinguished from the other two groups. Poor readers' word-reading speed and sentence-spelling accuracy were significantly lower than those of good decoders and good readers, whose performance was similar. Furthermore, poor readers made more errors in word reading compared to good readers.

To what extent do differences in vulnerability between the prospective poor readers, good decoders, and good readers exist before school? Is vulnerability a by-product of school ?

Researchers' and teachers' ratings of children's motivational orientations

To examine the question of whether researchers at preschool age and classroom teachers in grades 1 and 2 observed differences in the children's coping behaviour in performance situations, we investigated their ratings of prospective poor and good readers' as well as good decoders' task, ego-defensive, and social dependence orientations. The analysis targeted an eventual change in motivation, predicted to result in an interaction involving reading group and grade level. Separate 3×3 (group \times grade) ANOVAs with repeated measures were performed for task, ego-defensive, and social dependence orientations, with Bonferroni corrections used for post hoc comparisons. The overall MANOVA was omitted because the resulting $3 \times 3 \times 3$ design considerably complicates the analysis. In fact, the use of MANOVA is not recommended in the presence of added complexity and ambiguity of analysis and the likelihood that the multiple dependent variables may be redundant (Tabachnick & Fidell, 2001, p. 323) which is precisely the case here. Table 3 shows the group means and the results and the ANOVAs from preschool to grade 2.

The main effects of group were significant for each of the three motivational orientations. Poor readers displayed less task-oriented and more ego-defensive and

Table 2. Cognitive performance of prospective poor readers, good decoders, and good readers at preschool age, and univariate ANOVA results

Task	Poor reader		Good decoder		Good reader		ANOVA	LSD test
	M	SD	M	SD	M	SD		
Phonological awareness	5.94	5.74	8.47	6.78	13.72	9.14	$F(2,121)=11.05, p=.000$	$P=GD<G$
Letter naming	12.53	5.47	15.27	4.77	16.96	3.29	$F(2,120)=8.64, p=.000$	$P<GD=G$
Invented spelling	10.32	12.57	14.16	13.81	20.67	14.99	$F(2,124)=5.51, p=.005$	$P<G$
Memory span	3.20	0.48	3.42	0.50	3.57	0.35	$F(2,122)=6.26, p=.003$	$P<G$
Listening comprehension	35.05	13.85	43.68	11.88	48.72	15.35	$F(2,123)=9.21, p=.000$	$P<GD=G$
WISC-R verbal	86.32	9.83	91.79	9.16	94.43	8.95	$F(2,122)=7.18, p=.001$	$P<GD=G$
WISC-R non-verbal	88.55	10.51	93.33	9.17	98.41	11.12	$F(2,122)=8.74, p=.000$	$P<G$

Note. Phonological awareness max = 40; letter naming max = 19; invented spelling max = 47; listening comprehension = percentage correct. Bonferroni corrections for multiple comparisons were used in the LSD post hoc testing, where P = poor readers, A = good decoders; G = good readers; < refers to lower level performance, = refers to equal level performance. The absence of a group label in the LSD test means that the group did not differ significantly from the other two groups.

Table 3. Researchers' (at preschool age) and classroom teachers' (in grades 1 to 2) ratings of children's motivational orientations by group, and analyses of variance (ANOVA) results

Orientation/ Time	Poor reader		Good decoder		Good reader		ANOVA
	M	SD	M	SD	M	SD	
TO							
Preschool	2.73	0.46	2.95	0.65	3.23	0.82	$F(2,123)=14.47, p=.000$
Grade 1	2.48	0.61	3.27	0.75	3.15	0.76	$F(2,246)=2.43, p=.090$
Grade 2	2.36	0.64	3.07	0.66	3.07	0.77	$F(4,246)=3.35, p=.011$
ED							
Preschool	2.11	0.69	2.00	0.66	2.00	0.54	$F(2,123)=8.87, p=.000$
Grade 1	2.61	0.77	1.80	0.87	1.79	0.82	$F(2,246)=0.29, p=ns$
Grade 2	2.42	1.08	1.88	0.95	1.71	0.78	$F(4,246)=4.04, p=.003$
SD							
Preschool	2.27	0.67	2.34	0.65	2.31	0.50	$F(2,122)=8.02, p=.001$
Grade 1	2.83	0.78	2.23	0.62	2.05	0.82	$F(2,244)=2.62, p=.075$
Grade 2	2.58	0.88	2.16	0.75	1.85	0.74	$F(4,244)=5.96, p=.000$

Note. The scale of ratings of motivational orientations varied from 1 to 5. TO = task orientation; ED = ego-defensive orientation; SD = social dependence orientation.

social-dependence oriented behaviour compared to good decoders and good readers, whose performance was similar. The non-significant main effects of time suggest stability in orientation behaviour over time. However, the most important outcomes were the significant interactions of Group \times Time in all three orientation types, suggesting that there were developmental differences in orientation behaviour between reading-level groups. Researchers' observations at preschool age indicated that prospective poor readers showed less task-oriented behaviour compared to prospective good readers ($p = .001$). However, no differences were found in ego-defensive or in socially-dependent behaviour among the three prospective reading groups. In school, classroom teachers observed clear differences in orientations among the groups. Already in grade 1, when poor readers started to have difficulties in learning to read and write, their teachers rated them as less task-oriented than good decoders ($p = .001$) and good readers ($p = .001$). Similar differences were found for social dependence ($p = .001$; $p = .001$) and ego-defensiveness ($p = .001$; $p = .001$), respectively. Classroom teachers found no differences in orientations between good decoders and good readers in grade 1. The entire pattern was repeated in grade 2.

Observation of motivational orientations in free-play and pressure situations

We computed separate 2×3 (free-play situation vs. pressure situation \times group) ANOVAs for task-oriented, ego-defensive and social-dependence coping behaviour. Moreover, separate ANOVAs were used for each year instead of repeated measures because the LEGO® construction task was given only to a representative sample of children each year and the participation varied to some extent from year to year. Table 4 shows the percentages of task and ego-defensive oriented coping behaviours of groups in free-play situations and in pressure situations with the relevant ANOVAs. The results of social-dependence oriented coping behaviour are not included in Table 4 because there were no significant differences in this type of orientation between the groups from preschool to grade 2.

Both ratings of long-term behaviour and observational data on the LEGO® construction task yielded rather similar motivational profiles for children in different reading-level groups. At preschool age, no differences were found in motivational-emotional vulnerability between the groups. The main effects of situation indicated that children's task-oriented coping behaviour decreased and ego-defensive coping behaviour increased when under pressure. The non-significant main effect of groups, together with the non-significant interactions of Group \times Situation, suggest that the effect was similar for prospective poor readers, good decoders and good readers at preschool age.

However, after 6 months of schooling, group differences begin to enter the picture. LSD tests revealed that poor readers spent significantly less time on task-oriented behaviour ($p = .012$) and more time on ego-defensive oriented behaviour ($p = .001$), compared to good readers, and symptomatically more time on ego-defensive ($p = .057$) oriented behaviour compared to good decoders. The good readers' progressive school career, in contrast to the poor readers' regressive one, shows clearly in the significant interactions between group and situation. Interestingly, in the free-play situation, no differences in coping behaviour were found among the three prospective reading groups whereas the differences were marked in the pressure situation. Poor readers were significantly less task-oriented and more ego-defensive oriented compared to good decoders ($p = .006$, $p = .005$) and to good readers ($p = .001$, $p = .001$), respectively. Among good readers, there was neither a decrease in task-oriented behaviour nor an

Table 4. Development of coping behaviour from preschool to grade 2 by group, and analyses of variance (ANOVA) results

Time	Orientation/Situation	Poor reader		Good decoder		Good reader		ANOVA	
		M	SD	M	SD	M	SD		
Preschool	TO Free play Pressure	n=18		n=27		n=25		Group Situation Group x Situation $F(2,67)=0.19, p=ns$ $F(1,67)=43.77, p=.000$ $F(2,67)=0.94, p=ns$ $F(2,67)=0.95, p=ns$ $F(1,67)=37.52, p=.000$ $F(2,67)=0.62, p=ns$	
		89.06 76.95	7.96 12.07	87.91 79.79	17.42 15.91	91.76 78.63	7.15 15.66		
	ED Free play Pressure	n=14		n=17		n=15		Group Situation Group x Situation $F(2,43)=4.63, p=.015$ $F(1,43)=32.00, p=.000$ $F(2,43)=7.37, p=.002$ $F(2,43)=8.19, p=.001$ $F(1,43)=38.71, p=.000$ $F(2,39)=8.59, p=.001$	
		4.40 12.88	5.66 10.56	2.70 8.34	5.98 11.26	1.97 10.32	2.85 13.51		
	Grade 1	TO Free play Pressure	n=14		n=17		n=15		Group Situation Group x Situation $F(2,45)=1.02, p=ns$ $F(1,45)=9.61, p=.003$ $F(2,45)=3.54, p=.038$ $F(2,45)=1.05, p=ns$ $F(1,45)=23.94, p=.000$ $F(2,45)=1.58, p=ns$
			90.99 72.26	9.02 15.73	89.26 82.90	12.98 9.76	93.27 89.82	5.83 5.73	
Grade 2	ED Free play Pressure	n=14		n=19		n=15		Group Situation Group x Situation $F(2,45)=1.02, p=ns$ $F(1,45)=9.61, p=.003$ $F(2,45)=3.54, p=.038$ $F(2,45)=1.05, p=ns$ $F(1,45)=23.94, p=.000$ $F(2,45)=1.58, p=ns$	
		3.82 20.16	4.31 16.18	2.05 10.94	3.52 8.91	1.91 3.37	3.19 2.60		
Grade 2	TO Free play Pressure	n=14		n=19		n=15		Group Situation Group x Situation $F(2,45)=1.02, p=ns$ $F(1,45)=9.61, p=.003$ $F(2,45)=3.54, p=.038$ $F(2,45)=1.05, p=ns$ $F(1,45)=23.94, p=.000$ $F(2,45)=1.58, p=ns$	
		91.96 83.01	8.63 13.02	92.21 88.98	7.31 9.44	91.44 91.33	7.42 7.60		
Grade 2	ED Free play Pressure	n=14		n=19		n=15		Group Situation Group x Situation $F(2,45)=1.02, p=ns$ $F(1,45)=9.61, p=.003$ $F(2,45)=3.54, p=.038$ $F(2,45)=1.05, p=ns$ $F(1,45)=23.94, p=.000$ $F(2,45)=1.58, p=ns$	
		3.06 8.68	5.97 8.55	1.98 5.60	3.32 4.81	2.25 4.37	4.99 6.47		

Note. TO = task-oriented coping behaviour; ED = ego-defensive coping behaviour; free play = percentage of coping behaviour in the free-play LEGO® construction situation; pressure = percentage of coping behaviour in pressure situation

increase in ego-defensive coping behaviour in pressure situations. In contrast, poor readers' ego-defensive coping behaviour increased manifold when they encountered pressure ($p = .001$) and, consequently, they spent less time on task-oriented behaviour ($p = .001$). The good decoders' ego-defensive behaviour also increased in pressure situations ($p = .004$) but the total amount of it was only half that of poor readers.

In grade 2, the total amount of task-oriented behaviour was reasonably high for all groups, and only poor readers showed signs of vulnerability. With regard to task orientation, the main effect of group proved non-significant, indicating that, on the whole, poor readers were similar to the other two groups. However, the significant interaction Group \times Situation revealed that only poor readers' task-oriented behaviour decreased ($p = .003$) in pressure situations compared to the free-play situation. This was also seen as a significant difference in pressure situation between poor readers and good readers ($p = .005$) and a symptomatic one relative to good decoders ($p = .056$). Group \times Situation interaction failed to reach significance for both social dependency and ego-defensive orientations. An inspection of Table 4 suggests that this was due to the fact that increase in off-task behaviour was evenly distributed over these orientation types.

Discussion

In the present study, our aim was to examine the developmental changes in motivational-emotional vulnerability among former preschool non-readers belonging to three reading-level groups in grade 2. Poor readers showed clear-cut problems in decoding, spelling and reading comprehension. Good readers excelled in each of these measures. Good decoders had comparable decoding and spelling skills, while their reading comprehension was at an intermediate level. Naturally, the first issue concerns the validity of the separation of the groups. First, the differences in decoding and spelling existed also in the spring term of grade 1, and second, several variables known as precursors of reading differentiated the groups in preschool.

Motivational-emotional vulnerability was defined as a deterioration in performance under stressful conditions such as competition and performance obstacles. Our former preschool non-readers differed markedly in terms of their reading and spelling skills in grade 2. Were the poor readers also fragile in terms of performance-related motivation? Of particular interest was the question of whether the poorest readers already showed vulnerability before the start of school or whether signs of increased vulnerability debuted concomitantly with difficulties in learning to read in grades 1 and 2. Two converging methods were used to tap the vulnerability. The level of task orientation, social dependence and ego-defensiveness was rated longitudinally from preschool through grades 1 and 2, on the basis of a long-term acquaintance with the child. What is more, an ecologically valid experimental LEGO® construction task was annually employed to guard against the obvious possibility that long-term teacher ratings may confound assessments of academic skills and perceived motivation.

As it turned out, the ratings and the experimental observational data on prospective poor readers', good decoders', and good readers' motivational orientations yielded rather similar results. On the basis of researchers' ratings at preschool age, no differences in vulnerability between the prospective reading-level groups were found, that is, the groups showed an equal amount of social dependence and ego-defensiveness. Prospective good readers were more task-oriented than prospective

poor readers, but the latter group and prospective good decoders were equally task-oriented. An interesting finding was the high correspondence between classroom teachers' orientation ratings and children's basic skills in reading and writing. The teachers saw a connection between decoding and spelling difficulties and sub-optimal behaviour in learning situations. Differences in text comprehension between good decoders and good readers were not associated with their motivational tendencies. Concerning decoding, our results are in line with those of Alexander, Entwisle, and Dauber (1993), who found that children's high degree of interest and participation in classroom work, together with good concentration as rated by their classroom teachers, correlated positively with reading marks in grades 1, 2 and 4.

As to the LEGO® construction, no differences were found at preschool age in induced pressure episodes versus free-play situations between the reading groups. However, already in grade 1, poor readers showed clear tendencies towards increased vulnerability in situations where competition and performance obstacles were present. Their task-oriented behaviour (working on the task, attending to instructions, verbal and non-verbal positive task-related emotional expressions) decreased, while their ego-defensive coping behaviour increased simultaneously (physical or mental avoidance behaviour, negative utterances on self or performance). Most importantly, their free-play behaviour was similar to that of the other two groups. Good decoders showed some vulnerability in grade 1, but their behaviour under stress was clearly more task-oriented and less ego-involved compared with that of poor readers. In contrast, good readers were highly task-oriented even in pressure situations. It is worth noting that vulnerability was observed in LEGO® construction situations which had nothing to do with reading or writing. The results are in line with those of Stipek and Gralinski (1996) who found that children's goal orientation appears to generalise across different subject areas. In the future, it would be interesting to investigate whether poor readers' greater vulnerability also manifests itself in situations outside school and with a reference group other than their classmates.

Vulnerability was manifested as increased ego-defensiveness in pressure situations. No such effect was found for social dependence which, in turn, clearly differentiated the reading groups in classroom teachers' ratings in grades 1 and 2. This discrepancy may be due to the fact that the acquaintance between the pupil and researcher was very brief, not enough to elicit the binding necessary for social dependence. On the other hand, a stranger may well be perceived as threatening, thus triggering an ego-defensive reaction.

The school entrance of Finnish children (at age 7) is late compared to many other countries. Could it be that Finnish children begin school at an age when they are more susceptible to social comparison because of a developed normative conception of ability compared to younger children who have a more undifferentiated conception of ability (see Butler, 1999)? Also in Chapman and Tunmer's (1997) longitudinal study, at the age of 7½ (though after 2 years of schooling), but not before, reading performance started to contribute to children's reading concept. In our study, the good readers' decreasing vulnerability from preschool to grade 1 and the poor readers' opposite development could be partly explained by children's enhanced capacity to handle normative information for self-appraisal.

Our findings lead to the conclusion that there was something less favourable in the classroom context for children with problems in learning to read and write. Skinner and Belmont's (1993) study with 3rd - 5th graders revealed reciprocal effects of children's motivation on teacher behaviour (see also Lehtinen, Vauras, Salonen, Olkinuora, &

Kinnunen, 1995). In other words, teachers modified their behaviour toward individual children on the basis of their perception of the child's behavioural and emotional engagement. Teachers responded to children who were passive and showed negative emotion by being less involved, structured, or autonomy-supporting compared to children with positive initial engagement to teacher behaviour. Because the maladaptive motivational tendencies of children in Skinner and Belmont's study resemble those of our poor readers, it is possible that, also in our study, teachers responded to poor readers' performance in a way that enhances the initial motivational pattern. Teacher anger after academic failure is not an effective way to enhance subsequent effort in younger children. Butler (1994) found that teacher anger after failure was directly and negatively correlated with younger (grade 3) children's predictions of subsequent effort, but enhanced the effort of older (grade 6) children. Future efforts were most positive at both ages in a situation where the teacher offered an opportunity for a guided second attempt. Furthermore, Turner's (1995) findings of the effects of instructional contexts on children's motivation for literacy in grade 1 revealed that so-called open tasks in which children had opportunities for challenge, for pupil control, for satisfying interests and for collaboration, were the strongest predictors of motivation. Turner, however, stressed that the applicability of her results should be studied in other populations, especially among low-achieving readers.

We now know that early problems in learning to read and write may pose a serious risk for future academic performance. One shortcoming of the present study was the small number of subjects in the LEGO® construction task and the somewhat varying participation from year to year, which prevented us from investigating the development of motivational-emotional vulnerability strictly longitudinally in a time-lagged design. Therefore, no causal inferences are warranted on the basis of the present data. The question thus remains of why some children become emotionally and motivationally vulnerable in the school notwithstanding, for example, a fair level of phonological awareness known as a significant precursor of reading. One hint given by the present data is the prospective good decoders' more advanced level of letter naming, listening comprehension and verbal IQ in the preschool as compared to prospective poor readers. This suggests a richer literacy background for good decoders. An additional risk factor seems to be gender. As in many other studies, boys were over-represented in the group of poor readers. A future task would be to investigate in more detail the developmental factors that are causing increasing vulnerability, together with learning problems, in some children as soon as they start school.

Acknowledgements

The present study is based on a longitudinal research project (Decoding, Comprehension, and Motivation) conducted at the Centre for Learning Research and supported by Grants No. 1071265 and 4131 from the Council for Social Sciences Research, the Academy of Finland, to the second author and Marja Vauras. The data analysis was supported by grant No. 124811/541 from the Joint Committee of the Nordic Social Science Research Councils to the second author. We wish to thank the heads, teachers and students of 14 kindergartens and four primary schools in Turku, who unfortunately must remain anonymous. The authors also thank Mr. Lauri Nummenmaa and two anonymous referees for elucidatory comments.

References

- Alexander, K. L., Entwisle, D. R., & Dauber, S. L. (1993). First-grade classroom behavior: Its short- and long-term consequences for school performance. *Child Development, 64*, 801-814.
- Butkowsky, I. S., & Willows, D. M. (1980). Cognitive-motivational characteristics of children varying in reading ability: Evidence for learned helplessness in poor readers. *Journal of Educational Psychology, 72*, 408-422.
- Butler, R. (1994). Teacher communications and student interpretations: Effects of teacher responses to failing students on attributional inferences in two age groups. *British Journal of Educational Psychology, 64*, 277-294.
- Butler, R. (1999). Information seeking and achievement motivation in middle childhood and adolescence: The role of conceptions of ability. *Developmental Psychology, 35*, 146-163.
- Chapman, J. W., & Tunmer, W. E. (1997). A longitudinal study of beginning reading achievement and reading self-concept. *British Journal of Educational Psychology, 67*, 279-291.
- Dufva, M., Niemi, P., & Voeten, M. (2001). The role of phonological memory, decoding, and comprehension skills in reading development: From preschool to grade 2. *Reading and Writing: An Interdisciplinary Journal, 14*, 91-117.
- Galloway, D., Leo, E. L., Rogers, C., & Armstrong, D. (1995). Motivational styles in English and mathematics among children identified as having special educational needs. *British Journal of Educational Psychology, 65*, 477-487.
- Harter, S. (1981). A new self-report scale in intrinsic versus extrinsic orientation in the classroom: Motivational and informational components. *Developmental Psychology, 17*, 300-312.
- Kinnunen, R., Poskiparta, E., & Niemi, P. (1994). *Käyttäjän opas. Lumotest 3.0: Nimeäminen ja leksikaalinen päätös* [Handbook. Lumotest 3.0: Naming and lexical decision]. Centre for Learning Research, University of Turku.
- Lazarus, R. (1991). *Emotion and adaptation*. New York: Oxford University Press.
- Lazarus, R., & Launier, R. (1978). Stress-related transactions between person and environment. In L. Pervin & M. M. Lewis (Eds.), *Perspectives in interactional psychology* (pp. 287-327). New York: Plenum.
- Lehtinen, E., Vauras, M., Salonen, P., Olkinuora, E., & Kinnunen, R. (1995). Long-term development of learning activity: Motivational, cognitive, and social interaction. *Educational Psychologist, 30*, 21-35.
- Lepola, J., Salonen, P., & Vauras, M. (2000). The development of motivational orientations as a function of divergent reading careers from preschool to the second grade. *Learning and Instruction, 10*, 153-177.
- Lundberg, I., & Nilsson, L-G. (1986). What church examination records can tell us about the inheritance of reading disability. *Annals of Dyslexia, 36*, 217-236.
- Nichols, J. G. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance. *Psychological Review, 91*, 328-346.
- Olkinuora, E., Salonen, P., & Lehtinen, E. (1984). *Toward an interactionist theory of cognitive dysfunctions*. Research Monographs of the Faculty of Education, University of Turku, B10.
- Poskiparta, E., Niemi, P., & Lepola, J. (1994). *Diagnostiset testit 1. Lukeminen ja kirjoittaminen* [Diagnostic tests 1. Reading and writing]. University of Turku, Centre for Learning Research.
- Salonen, P. (1987). *A category system for children's coping strategies*. Unpublished manuscript, University of Turku, Centre for Learning Research.
- Salonen, P., Lepola, J., & Niemi, P. (1998). The development of first graders' reading skill as a function of preschool motivational orientation and phonemic awareness. *European Journal of Psychology of Education, 13*, 155-174.
- Salonen, P., Lepola, J., Vauras, M., Rauhanummi, T., Lehtinen, E., & Kinnunen, R. (1994). *Diagnostiset testit 3. Motivaatio, metakognitio ja matematiikka* [Diagnostic tests 3. Motivation, metacognition, and mathematics]. University of Turku, Centre for Learning Research.
- Skinner, E. A., & Belmont, M. J. (1993). Motivation in the classroom: Reciprocal effects of teacher

- behavior and student engagement across the school year. *Journal of Educational Psychology*, *85*, 571–581.
- Stipek, D., & Gralinski, J. H. (1996). Children's beliefs about intelligence and school performance. *Journal of Educational Psychology*, *88*, 397–407.
- Sweet, A. P., Guthrie, J. T., & Ng, M. M. (1998). Teacher perceptions and student reading motivation. *Journal of Educational Psychology*, *90*, 210–223.
- Tabachnick, B., & Fidell, L. (2001). *Using multivariate statistics*. Boston, MA: Allyn & Bacon.
- Turner, J. C. (1995). The influence of classroom contexts on young children's motivation for literacy. *Reading Research Quarterly*, *30*, 410–441.
- Vauras, M., Salonen, P., Lehtinen, E., & Lepola, J. (2001). Long-term development of motivation and cognition in family and school contexts. In S. Volet & S. Järvelä (Eds.), *Motivation in learning contexts: Theoretical advances and methodological implications* (pp. 295–315). London: Pergamon Press.
- Vauras, M., Mäki, H., Dufva, M., & Hämäläinen, S. (1995). *Diagnostiset testit 2. Kuullun ja luetun ymmärtäminen* [Diagnostic tests 2. Listening and reading comprehension]. University of Turku, Centre for Learning Research.
- Wechsler, D. (1984). *The Wechsler Intelligence Scale for Children—Revised*. Käsikirja [Handbook]. Helsinki: Psykologien kustannus Oy.

Received 1 December, 2000; revised version received 10 December, 2002

Appendix

A taxonomy of coping strategies and emotional behaviours on motivational orientations (Salonen, 1987)

A. TASK-ORIENTED COPING

A.1. *Concentrated on task activity*

Working on the task (e.g., concentrating on the construction with LEGO® pieces); Attending to the instructions (e.g., concentrating on the instructions); Persistence (e.g., asking for additional time in the face of difficulties).

A.2. *Positive verbal task-related emotional expressions indicating genuine interest or enthusiasm*

Verbal anticipation of success (e.g., 'I really can handle this'); Emotional expressions toward the task or activity: (e.g., 'this is an exciting task... you really have to use your brain'); Emotional reaction to the solution of problem, which does not indicate ego enhancement (e.g., 'hey! eight out of ten were correct').

A.3. *Positive non-verbal task-related expressions*

Enthusiasm and joy expressed in approaching the task: spontaneous exploring with LEGO® pieces, relaxed cheerfulness after performing a task)

B. EGO-DEFENSIVE COPING

B.1. *Negative verbal emotional expressions*

Anticipation of failure or defeat; Negative expressions toward the task elements or frustrated self-judgments: (e.g., 'this is too difficult, I know it, stupid LEGO®, I was last - again').

B.2. *Negative non-verbal emotional expressions*

Depressed-inhibited or active aggressive emotional behaviours (e.g., signs of depression like desperate, blocked staring or acting-out behaviours like banging the desk with blocks).

B.3. *Avoidance behaviour*

Physical, mental, symbolic or verbal avoidance (e.g., turning away, verbalising or gesticulating wishes to leave the task, verbal refusal, inhibition of action such as 'freezing').

B.4. *Substitute activities*

Organised activities without emotional tension (e.g., constructing the castle instead of participating in the competition, just playing with materials); Unorganised, stereotyped or coercive substitute activities (e.g., scratching with LEGO® or nervous handling of LEGO® pieces).

B.5. *Social manipulation of situation with the purpose of avoidance*

Threatening and aggression: 'I'm not doing this any more!' (intentional); Tantrums or expressing orders or threats to gain social control; Emotional appealing or amusement such as baby-like talk; Persuasion: 'Will you show me how to do this'. Changing roles through continuous asking of questions.

C. SOCIAL DEPENDENCE COPING

C.1. *Seeking or tracking of social cues as a means of socially accepted and rewarded behaviour*

Imitating mindlessly peers' performance, attending to the experimenter's facial and verbal cues to pilot one's own activity.

C.2. *Eliciting supportive cueing or immediate request for help*

Tactical waiting; help-seeking gestures; looking inquiringly or helplessly at the experimenter.

Salonen, P. (1987). *A category system for children's coping strategies*. Unpublished manuscript, Centre for Learning Research. University of Turku.

