MODEL OF READING COMPREHENSION FOR 5TH GRADE STUDENTS

Sonja PEČJAK, Anja PODLESEK, Tina PIRC

Department of Psychology, Faculty of Arts, University of Ljubljana
Aškerčeva 2, 1000 Ljubljana, Slovenia
E-mail: sonja.pecjak@ff.uni-lj.si; sonja.pecjak@gmail.com

Abstract: Reading comprehension is one of the components of reading literacy, and also bears on the learning process and student outcomes overall. There are different (meta)cognitive, motivational and emotional factors which contribute to reading comprehension. Our study included 470 5th grade primary school students. In this paper we are proposing a confirmatory model of reading comprehension. The following factors are included in the model: (meta)cognitive factors (vocabulary, reading speed, summarizing, and metacognitive reading knowledge), motivational factors (reading interest and reading competency), and emotional factors (feelings during recreational reading and academic reading). The model shows the direct and indirect effects of the evaluated factors on students' reading comprehension. These effects have important implications for future educational practice.

Key words: model of reading comprehension, (meta)cognitive, motivational and emotional factors

INTRODUCTION

Investigating Reading Literacy / Reading Comprehension

Investigating reading comprehension has a long research tradition in psychology. Its importance, however, has grown even more within the frame of international reading literacy studies, e.g. PIRLS (Mullis et al., 2003) and PISA (Štraus, Repež, Štigl, 2007). Reading skills and abilities have always been important in the educational context, especially nowadays, in the era of information society. These skills represent an effective means for acceptance, organization, and usage of information in different areas. Thus, reading skills and the ability to comprehend written material have become an important cross-curriculum competence, which influences one's educational achievement, since the vast majority of information in educational situations is transferred through written materials.

The two key factors of a person's achievement in reading literacy, which is measured through reading comprehension, are: a) various environmental characteristics and features, especially school environment (e.g., reading and writing instructions, the teacher's classroom text processing and reading motivation methods) and family environment (e.g., the number of books a family owns, frequency of parents' reading to children, parents' reading habits in general), and b) psychological characteristics of the students (cognitive, metacognitive, motivational, and emotional). The aim of our study was to develop a model of reading comprehension which would include different psychological characteristics of the students. First, we examined which

(meta)cognitive and motivational-emotional factors determine reading comprehension of Slovenian 5th grade students and then we proposed a model of reading comprehension for students in general.

Cognitive Factors of Reading Comprehension

Reading comprehension is a result of an interactional process between text, background knowledge (contents knowledge and text characteristics knowledge), reading context, motives, and goals, which a reader has during a reading process. Kintsch (1998) defines reading comprehension as a combination of processes which arise from text and integrational processes of that text in reader's knowledge structure, which is indicated in interrelated net of concepts. Most of these processes are automated. Conscious control is necessary only when the information in the text interferes with reader's background knowledge or when the reader does not possess enough knowledge to form a mental representation of the text.

Moreover, researchers report of numerous factors which are significantly connected with reading comprehension and an individual's reading literacy. Many studies examined the connection between partial individual's reading comprehension variables, such as summarizing (Van den Broek et al., 2001), use of cognitive and metacognitive strategies (Meyer, Brandt, Bluth, 1980), vocabulary (Nagy, Diadikoy, Andersen, 1993) or decoding ability (Hood, Dubert, 1983) and reading comprehension. Each of these variables highly correlates with reading comprehension of younger and older students. Even more important are the findings of the studies that try to determine the relation between different variables and reading comprehension, using regression analysis procedures. A relation of reading comprehension to metacognition, learning strategies, background knowledge, and decoding speed was found by Ehrlich, Kurz-Costes, and Loridant (1993) for elementary school students. Guthrie, Wigfield, Metsala, and Cox (1999) found a connection between students' background knowledge, vocabulary and reading comprehension.

The following is a more detailed presentation of the (meta)cognitive factors included in our model: students' decoding speed, vocabulary, metacognitive knowledge of reading, and summarizing strategy.

Decoding speed is an important cognitive factor which affects reading comprehension. Readers with automated decoding ability read almost two times faster than poor readers without this ability. As Perfetti (1985) emphasized, the automated decoding ability, which is manifested in reading speed, is important because it releases a certain amount of mental energy from the working memory for higher mental processes, which are necessary to deduce the meaning from the text. Therefore, faster readers, compared to slower ones facing difficulties in decoding, can model a more accurate and coherent mental representation of the text. Decoding speed has been a subject of numerous studies, especially in relation to reading comprehension (e.g., Jenkins et al., 2003; Kuhn, Stahl, 2003). Studies of the relation between decoding speed and reading comprehension show high positive correlations between these two variables (Daane et al., 2005; Yovanoff et al., 2005; Klauda, Guthrie, 2008). It is therefore understandable that interventional studies for improving decoding speed do not only result in a better reading technique but also

in significantly better reading comprehension (e.g., Kuhn, Stahl, 2003; National Reading Panel, 2000).

Students' vocabulary is one of the most powerful predictors of reading comprehension, as evident from empirical studies (Cain et al., 2004; Dixon et al., 1988; Pečjak, 1989). There are numerous studies emphasizing child's vocabulary size in preschool as the most powerful predictor of reading comprehension in early period of schooling (Share, Leiken, 2004). Similarly, in their longitudinal study, Aarnoutse and van Leeuwe (1998) established that students' vocabulary, measured in 3rd and 6th grade, is the most powerful predictor of their sixth-grade reading comprehension. Several other authors also found high correlations between vocabulary and reading comprehension (Pečjak, 1989; Sternberg, 1987; Thorndike, 1973). Some authors (e.g., Beck, McKeown, 1991; Perfetti, 1994) believe that vocabulary directly influences comprehension, whereas others point out that limited vocabulary does not necessarily lead to comprehension difficulties (e.g., Pany, Jenkins, Schreck, 1982), or, as Cain et al. (2004) stressed, poor reading comprehension is a consequence of the interaction between poor vocabulary and poor summarizing ability.

Summarizing represents one of the most important after-reading cognitive strategies. While summarizing, a reader must be able to identify main ideas in the text, assess the importance of particular information and incorporate relevant information into a coherent entity – an abstract. In skilled readers, the process of summarizing from texts is automated, whereas with more demanding texts their summarizing requires the use of a conscious strategy. Younger students and poor readers frequently demonstrate difficulties with a summarizing strategy. Therefore, they are in need of learning such a strategy. The correlation coefficients between reading comprehension and the ability to summarize are in the range from .20 to .30 for elementary school students, and around .31 for secondary school students (Kolić Vehovec, Bajšanski, 2003).

Metacognitive knowledge is the knowledge of reading and use of different (meta)cognitive reading strategies that help students to understand texts effectively. In order to understand effectively, a student must activate his background knowledge, which helps him understand new texts. Sometimes a student does not know how to relate his background knowledge to the new information which does not allow comprehension or at least interferes with the understanding of the text. The knowledge of reading/learning strategies, which contribute to the attainment of a reading/learning goal and conscious use of these strategies, helps to identify relevant information from the text, recall long-term knowledge, monitor and direct the use of these strategies to model comprehension. Interventional studies about metacognitive knowledge show that planned training can improve students' reading comprehension. Cromley and Azevedo (2007) reported that 51 interventional studies showed positive results. Kolić Vehovec and Bajšanski (2003) established that metacognitive knowledge is a significant predictor of elementary school students' reading comprehension at different developmental stages.

Motivational-Emotional Factors of Reading Comprehension

Being familiar with reading comprehension strategies does not guarantee the

actual use of these strategies when reading.

This depends upon motivational factors (Paris, Wasik, Turner, 1991). In studies of factors connected with reading comprehension, motivational factors are consistently recognized as being important. They influence the intensity, perseverance, and direction of one's reading behavior. There are different motivational factors affecting reading comprehension, extrinsic as well as intrinsic, such as interest, competency and emotions during reading.

Reading interest is commonly mentioned among motivational factors connected with reading comprehension. Researchers established a positive correlation of reading comprehension with reading interest and intrinsic motivation for reading (Deci, 1998; Wigfield, Guthrie, 1997). Usually researchers distinguish between personal/content and situational interest (e.g., Hidi, Renninger, 2006; Schiefele, 2001). Personal or content interest is defined as a content specific motivational variable, which is determined by emotional and value beliefs in connection with the content of reading. In this manner, emotional beliefs are associated with enjoyment while reading certain contents, and value beliefs with one's estimation of importance of reading. Schiefele and Krapp (1996) established that content interest is connected with deeper learning approaches/strategies, which include the recall of main ideas and the coherence of the recalled ideas. In her metaanalytical studies, Hidi (2001) showed that reading interest had an important effect on reading comprehension at the level of cognitive organization of reading material as well as being important for memorizing and recall. Others suggest that this connection is probably due to the fact that interest prolongs learning time and stimulates the use of deeper comprehension strategies (e.g., Alexander et al., 1997). Interest is the activator of the strategies which influence deeper processing. In contrast with these findings, Köller, Baumert, and Schnabel (2000) did not find significant correlation between interest and reading achievement at background knowledge control.

Competency has been one of the most investigated elements among motivational factors in the last decade. Bandura (1997) defined competency in general as an individual's belief that one is capable of performing in a certain manner to attain certain goals. Congruent with this definition, reading competency is a person's belief in their own reading capacities or belief to solve reading tasks and attain goals by reading. It is, thus, a reader's belief that one has better odds to achieve a reading goal than not to achieve it, and trust that one is capable of reading and comprehending the text. Reading competency is positively related to: a) the task choice - the more one feels competent, the higher the challenge of the reading tasks and so one tends to choose more difficult tasks and uses deeper learning strategies (Dweck, 1999; Eccles, Wigfield, 2002); b) effort and perseverance - the more one is confident, the greater the amount of effort one is willing to invest into reading comprehension and will do it with more perseverance; and c) achievement - higher competency is directly related to better reading achievement/comprehension (Conlon et al., 2006; Gambrell et al., 1996; Pečjak et al., 2006).

Reading comprehension is also affected by *emotions* and mood, even though their impact is probably indirect through their influence on different (meta)cognitive factors. In this manner, emotions would result in reading comprehension through their effect on

working memory (Ellis, Moore, 2000). Negative emotions preoccupy working memory in such a manner that an individual is more concerned with his own negative emotions than cognitive task demands (Seibert, Ellis, 1991). The attitude towards reading is an important factor of reading achievements (McKenna, 2001; McKenna, Kear, 1990; McKenna, Kear, Ellsworth, 1995). It is however emphasized that attitudes are a very complex factor – they have an emotional connotation as well as cognitive components and are experience-based.

The Aim of the Study

We tried to ascertain how (meta)cognitive, motivational and emotional factors affect reading comprehension of 5th grade students. We chose these students because they have just finished a four-year obligatory education period, during which there was an emphasis on the development of cognitive dimensions, especially automatization of reading technique, vocabulary development and the use of simple reading strategies.

Following different theoretical findings and empirical evidence from studies which investigated the role of specific factors in reading comprehension (see the Introduction section), we proposed a model of an indirect effect of motivational and emotional variables (reading interest, incompetency and reading emotions) on reading comprehension through (meta)cognitive variables. This was based on the finding that motivated readers wish to comprehend the text (Taboada et al., 2009), and this wish enhances the use of metacognitive knowledge and strategies (summarizing) and activation of the existent vocabulary to form the representation of the text. We anticipated a direct effect of cognitive variables (decoding speed, vocabulary and summarizing) and metacognitive variable (metacognitive knowledge about reading) on reading comprehension.

We proposed a direct effect on reading comprehension only for incompetency, based on empirical evidence of different studies (Chapman, Tunmer, 1995; Eccles, Wigfield, 2002). The model included variables with great educational potential, which could also be named pedagogical-psychological variables. Those variables can be significantly developed in students by the teacher systematically training them, thereby improving their reading comprehension. Intelligence, working memory capacity and inference competence, as typically psychological variables, were not included in the model because they cannot be influenced to any great extent.

METHOD

Participants

205 fifth grade students from five Slovenian primary schools participated in the study. The sample included 105 boys (51.2%) and 100 girls (48.8%). The mean age of the students was 10.6 years (SD = 0.6). No statistically significant differences were found in reading comprehension between boys and girls (for boys M = 9.9, SD = 2.23; for girls M = 10.0, SD = 2.45, $t(468) = -0.837$, $p = .403$).

Instruments

We measured reading comprehension and cognitive, metacognitive, motivational and emotional processes in reading and reading comprehension.

Reading comprehension of the students was measured by an exploratory text. The

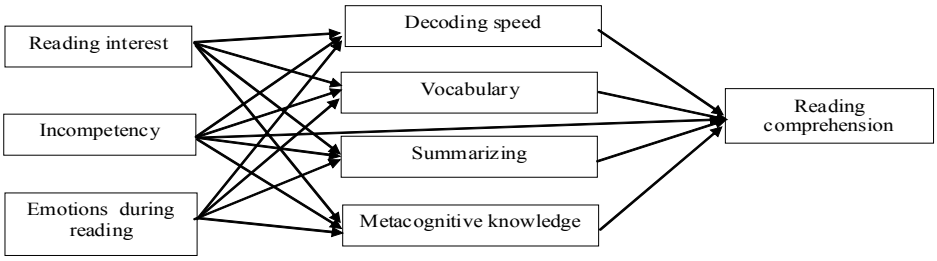

Figure 1. General model of reading comprehension, including motivational, emotional and (meta)cognitive factors

text Antarctica was taken from the PIRLS 2001 study. The students had to answer 12 questions regarding the text, six multiple choice questions and six questions which demanded a written answer. The maximum score for reading comprehension of the text was 17 points.

One Minute Decoding Speed Test was used to measure the students' reading speed, i.e. the degree to which they have already automated their reading technique. Students read a narrative text for one minute. Following the tester's instructions, the students started reading and after one minute they marked the spot where they had finished, counted the number of words and wrote down the number of words under the text.

Vocabulary test was adapted from Herschel's (1963) Test of Reading (Level 3 – Elementary Form) which measures the size of students' vocabulary. It is suitable for students from third to fifth grade and comprises 40 tasks. The students have to answer the questions by choosing the appropriate word from the pool of five choices. The following is a sample item: "The opposite from near is: A – here, B – beneath, C – now, D – far, E – inside". Time is limited to 10 minutes. Each correct answer brings 1 point (for a maximum of 40 points). The test was translated and adapted for Slovenian language by Zorman and Žagar (1974, in Toličič, Zorman, 1977). The internal consistency coefficient alpha was .86.

Summarizing was assessed with three short texts: Water Pollution (120 words), Traffic (99 words), and Healthy Food (110 words). After reading, the students were asked to summarize the main ideas from the texts. The criteria for the answers were adapted from Kozminsky and Graetz (1986) and Friend (2001). Three semantic units, which represented the main ideas of the text, were identified in each text. The maximum score was 9 points. The number of points received for each text equaled the number of correctly summarized units. Two independent raters assessed the students' abstracts. If their scores differed, it became necessary for them to reach consent. Internal consistency for this test was .86.

Metacognitive Knowledge Questionnaire was constructed according to Gunning's questionnaire (1996) and Schmitt's questionnaire of metacognitive knowledge (1990) for the purposes of this study. It measures students' metacognitive knowledge about reading in general and academic reading in particular, especially the awareness of using different reading comprehension monitoring strategies. The questionnaire has 14 items with multiple choice questions. Students have to choose an answer which in their opinion best describes the main purpose of reading, and they have to display knowledge of different reading and learning strategies. The maximum possible score was 14 points.

Reading Motivation was measured using the Reading Motivation Questionnaire for Young Students – RMQYS (Peklaj, Bucik, 2005). It comprises 28 items (e.g., I enjoy reading, or, I read only if I have to). The students assess on a 3-point pictorial scale how valid the statement is for them (L – not at all true for me; K – sometimes true for me; J – always true for me). An exploratory factor analysis revealed three factors: a) interest (Cronbach alpha = .81), b) (in)competence (Cronbach alpha = .72), and c) self-efficiency in oral reading (Cronbach alpha = .63). The items are scored according to the manual, with higher scores implying a more expressed motivational factor. Only the first two factors were included in the model due to a lower reliability of the third one.

Elementary Reading Attitude Survey (ERAS) by McKenna and Kear (1990) measured the emotional dimension of reading. The questionnaire had 20 items yielding two scores: a) a recreational reading score (Cronbach alpha = .87), and b) an academic reading score (Cronbach alpha = .86). The students used a 4-point scale (1 – very bad, 2 – bad, 3 – good, 4 – very good) on items like "How do you feel, when you read in your spare time?" In our study we only included a total reading score - the sum of the recreational and the academic reading scores, which represents emotions during reading.

Procedure

In a classroom setting, the participants completed reading tasks and questionnaires during three school hours at two different times in May and June 2007. The testers were given precise written instructions regarding the administration and procedure of tasks and questionnaires and a prior written consent was obtained from parents of all participating students. During the first school hour, students read the exploratory text, answered questions and filled out the Reading Motivation Questionnaire. During the second hour, students filled in the Vocabulary test, the Elementary Reading Attitude Survey, the One Minute Decoding Speed Test, and summarized three short texts.

To analyze the relations between the variables and to examine if our data fit the proposed model, we performed a path analysis, using then LISREL 8.8. Because most of the variables were not normally distributed, we carried out calculations using their normal scores. After eliminating those students with missing data on one or more variables from the samples, data from 169 fifth-grade students were analyzed separately. Covariances between the variables were entered into a model, and the maximum likelihood method was used for estimating the parameters. We allowed for the correlation between the exogeneous variables and for

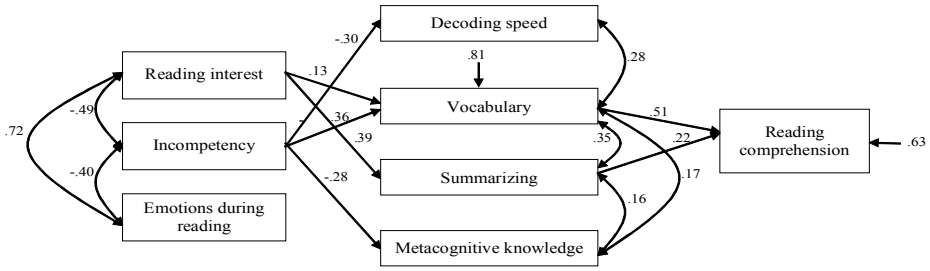

Figure 2. A model of reading comprehension for 5th grade students

the correlated errors in the intermediary variables.

RESULTS

The aim of our study was to determine which cognitive, metacognitive, motivational and emotional factors affect reading comprehension of 5th grade students. A model of direct and indirect effects of these factors on reading comprehension was proposed (see Figure 1). The accuracy of the proposed model was examined. After the first analysis which assessed all path coefficients in the model, we removed those paths for which the coefficients turned out to be low and statistically insignificant ($p > .05$) – those path coefficients were set to zero. The final results of path analyses represent one parsimonious model (see Figure 2). The arrows show the direction of the effect between variables. The values on the arrows correspond to standardized regression coefficients, showing the power of each predictor, assuming the participants' equality in terms of other variables. The regression coefficient indicates the amount of change in the standard deviation of a criterion variable, if the value of the effecting variable increases for one standard deviation. The arrow, aiming at the endogeneous variable, represents residuals or the variance which is not explained by the affecting variables. The bent arrows between endogenous variables represent correlations between the residuals (the parts which are not explained by exogenous variables).

Figure 2 presents the final model of the metacognitive, cognitive, motivational, and emotional variables affecting reading comprehension of 5th grade students. All standardized regression coefficients are statistically significant at the level of $p < .05$. The coefficients show a satisfactory fit of the proposed model to the data, $\chi^2(15) = 25.89$, $p = .39$; RMSEA = .066, 90% confidence interval for RMSEA = .015 – .11; AGFI = .91; NNFI = .95.

The factors included in this model explained 37% of variance of reading comprehension among students. The direct effects of two (meta)cognitive factors on reading comprehension appeared important – vocabulary (.51) and summarizing (.22). This means that students with richer vocabulary and those capable of finding a summarizing the main ideas of the text are better at text comprehension. Metacognitive knowledge was not directly related to reading compre-

hension, but its effect was probably indirect through the correlations with students' vocabulary and summarizing – the correlations were low but statistically significant (.16 with summarizing and .17 with vocabulary).

We also found that the effects of motivational and emotional factors of reading comprehension are indirect, manifested in the effect on (meta)cognitive factors. We confirmed the direct connections of reading interest and competency with (meta)cognitive factors, whereas emotional dimensions of reading did not correlate with (meta)cognitive factors. Because the intercorrelations between emotions during reading, reading interest and incompetency were medium to high (.72 and .40 respectively), we can assume that emotions during reading do not function as an independent unit but in the frame of other motivational variables. Therefore, it seems worthwhile to speak of motivational-emotional variables together, not separately.

Reading interest had a relatively strong connection with summarizing (path coefficient was .39) and somewhat weaker with vocabulary (.13). This means that students with greater reading interest use deeper (cognitive) strategies to study the text (they summarize the main ideas from the text better) and have a broader vocabulary, which (then) has a direct effect on better reading comprehension.

Incompetency as a motivational factor was not directly related to reading comprehension, but its relation was indirect through three (meta)cognitive variables: vocabulary (–.36), decoding speed (–.30) and metacognitive knowledge (–.28). All correlation coefficients are moderate to high which shows that students who feel less competent while reading have a poorer vocabulary, read more slowly and have lesser knowledge of different reading strategies.

DISCUSSION

The aim of our study was to examine if the proposed model of the effects of (meta)cognitive, motivational, and emotional factors on reading comprehension in 5th grade students is valid. First, we will discuss the model of reading comprehension and at the end we will outline pedagogical implications, which can be derived from our findings.

As in many previous studies (e.g., Aarnoutse, van Leeuwe, 1998; Beck, McKeown, 1991; Pečjak, 1989; Perfetti, 1994), in our study the extent of vocabulary was also confirmed to be the most powerful predictor of reading comprehension. These results show the need for paying special attention to the learning of (new) words and the development of (general and specific) vocabulary. A teacher can therefore systematically develop the vocabulary in a certain domain on a specific developmental stage or he/she can teach the students which strategies to use when explaining the meaning of unknown words (McKeown, Beck, 2004; Curtis, Longo, 2001).

Somewhat weaker was the direct relation between reading comprehension and the ability to summarize (.22), which is similar to the results of other studies (e.g., Kolić Vehovec, Bajšanski, 2001). The results therefore show the direct effect of summarizing on reading comprehension. This is understandable, because mastering the strategies of summarizing gives students the ability to recognize important information within a great quantity of information at the micro level and unite it into a meaning (information at the macro level). This represents the key

process of reading comprehension (Kintsch, van Dijk, 1978). On the other hand, the moderate correlation between summarizing and vocabulary (.35) supports the finding that poor reading comprehension is the consequence of the interaction between poor vocabulary and poor summarizing ability (Cain et al., 2004).

We found no significant relation between metacognitive knowledge and reading comprehension. Metacognitive knowledge is the reader's awareness of the importance of searching for meaning, activating background knowledge by skimming the reading material, and having knowledge of different strategies before, during and after reading. It is also important to monitor one's comprehension during reading. Our finding that this concept was not related to reading comprehension is not unexpected, because the reader's knowledge of the importance of dealing with reading material does not in itself increase comprehension. The connection seems possible only when a reader transfers his/her knowledge into the real use of different reading strategies, that is, knowing how to identify the meaning and combine it into an abstract concept or being aware of the fact that good comprehension requires looking up new and unknown words. Namely, it is imperative for a student to know as well as use different reading strategies. Although the correlations between metacognitive knowledge and cognitive variables were found to be significant, they were low (with summarizing .16, with vocabulary .17). We may attribute these results to the fact that 5th grade students have relatively little experience with different texts requiring independent processing. They usually come across such exploratory texts in different school books which are relatively short and less complex. This means that students can comprehend them without using any specific strategies.

One other interesting finding was the fact that no significant relation was found between decoding speed and reading comprehension, although some studies confirmed that increasing word reading fluency affected reading comprehension (e.g., Breznitz, 1997; Bourassa et al., 1998; Hasselbring, Goin, 2004). Perhaps this discrepancy is due to the fact that those studies included younger students than our study (7 and 8 year olds, while the average age of our students was 10 years) or perhaps the students in our sample were more homogeneous regarding reading fluency.

The connection between fluency of reading and vocabulary in our study leads to the hypothesis that fluency of reading significantly contributes to expanding of vocabulary, which directly affects reading comprehension. Similar results on a similar sample of students were also established by Buly and Valencia (2002) and Leach, Scarborough, and Rescorla (2003).

Among motivational variables we found a connection between reading interest and summarizing and between reading interest and vocabulary. Summarizing is a complex cognitive reading strategy, which includes omitting unimportant information from the text, generalizing the retained information and integrating that information into a smaller number of main ideas. This complex cognitive process can therefore be performed only by those readers who show a strong reading interest. Greater reading interest leads to more frequent reading, and such readers come across a greater amount and diversity of reading material, which they want to comprehend. To understand different reading materials, the readers need different strate-

gies, particularly summarizing strategy. This strategy is essential if they wish to tell someone concisely what they had read. In addition, when reading different reading materials, the readers also expand their (at least receptive) vocabulary.

Furthermore, we discovered that among motivational factors incompetency was not directly connected to reading comprehension, although we anticipated this relation in our model. Incompetency had negative correlations with three (meta)cognitive variables: vocabulary, decoding speed, and metacognitive knowledge. These connections are probably reciprocal as the feeling of (in)competency is created on the basis of prior reading achievement and on the basis of comparisons with other students/readers in the classroom. Therefore, poor readers (readers who read slow, make a lot of mistakes, have a poor vocabulary, do not know how to handle the reading material and do not summarize effectively) are not confident, do not trust themselves and their feeling of incompetency decreases their desire to read. The resulting poor reading achievements further reinforce their feeling of inadequacy. There was no significant connection between incompetency and summarizing as one of the deeper text studying strategies, which was reported in other studies (Alexander et al., 1997; Schiefele, Krapp, 1996). This might be the consequence of the reading (in)competency measurement and of the ability of the student to summarize in general, not only in association with the specific text read by the students.

Some important conclusions and pedagogical implications can be derived from our study.

We confirmed the model of motivational-emotional and (meta)cognitive factors of reading comprehension. Had we also included other factors (e.g., intelligence, background knowledge, inference, working memory capacity) or more specific (e.g., situational interest) valid measures, the percentage of explained variance would probably have increased.

We established that motivational and emotional factors are strongly interconnected, therefore, it seems one should not divide these factors in practice artificially, but rather treat them as an entity.

A greater predictive power of reading comprehension was established for the set of cognitive and metacognitive factors than for motivational-emotional factors. According to our model, vocabulary had the strongest effect among the cognitive factors. According to these findings, we believe that increasing students' vocabulary may lead to greater reading comprehension. It is therefore important for teachers to enable students to expand their active and receptive vocabulary (general and more specific), which is important for comprehension of written materials in different courses. Teachers can also systematically promote the acquisition of vocabulary to help students at risk, for example students who come from socially unprivileged environments. Studies show that vocabulary is a factor which prevents such students from comprehending written material (Dickinson et al., 2003). It is also important for teachers and school psychologists to stress the importance of different reading strategies to achieve better reading comprehension and improve academic achievement. Moreover, it is even more important to model the use of these strategies and to create such learning situations, in which the students benefit from the use of these strategies.

Among motivational factors, incompetency has the strongest effect on reading comprehension through metacognitive factors. Therefore, it is especially important for the teachers to be aware of this fact and to individualize their work with students who have reading problems. Teachers should help these students attain reading goals and strengthen their reading competency. Individualization can include adaptation of reading goals, choosing different reading materials and different teaching methods.

As a vast empirical evidence shows that boys and girls differ in factors which contribute to reading comprehension (Ainley, Hillman, Hidi, 2002; Oakhill, Petrides, 2007; White, 2007), further studies should also address gender differences in the model of reading comprehension.

Received September 8, 2009

REFERENCES

AARNOUTSE, C., VAN LEEUWE, J., 1998, Relation between reading comprehension, vocabulary, reading pleasure, and reading frequency. *Educational Research and Evaluation,* 4, 2, 143–166.

AINLEY, M., HILLMAN, K., HIDI, S., 2002, Gender and interest processes in response to literary texts: Situtational and individual interest. *Learning and Instruction,* 12, 411–428.

ALEXANDER, P.A., MURPHY, P.K., WOODS, B.S., DUHON, K.E., PARKER, D., 1997, College instruction and concomitant changes in students' knowledge, interest, and strategy use: A study of domain learning. *Contemporary Educational Psychology,* 22, 125–146.

BANDURA, A., 1997, *Self-efficacy: The exercise of control.* New York: Freeman.

BECK, I., MCKEOWN, M., 1991, Conditions of vocabulary acquisition. In: R. Bar, M.L. Kamil, P.B. Mosenthal, P.D. Pearson (Eds.), *Handbook of reading research: Vol 2* (pp. 789–814). White Plains, NY: Longman.

BOURASSA, D.C., LEVY, B.A., DOWIN, S., CASEY, A., 1998, Transfer effects across contextual and linguistic boundaries: Evidence from poor readers. *Journal of Experimental Child Psychology,* 71, 45–61.

BREZNITZ, Z., 1997, Reading rate acceleration: Developmental aspects. *Journal of Genetic Psychology,* 158, 428–441.

BULY, M.R., VALENCIA, S.W., 2002, Below the bar: Students who fail state reading assessment. *Educational Evaluation and Policy Analysis,* 24, 219–239.

CAIN, K., OAKHILL, J., LEMMON, K., 2004, Individual differences in the inference of word meanings from context: The influence on reading comprehension, vocabulary knowledge, and memory capacity. *Journal of Educational Psychology,* 94, 4, 671–681.

CHAPMAN, J., TUNMER, W., 1995, Development of young children's reading self-concepts: An examination of emergent subcomponents and their relationship with reading achievement. *Journal of Educational Psychology,* 87, 154–167.

CONLON, E.G., ZIMMMER-GEMBECK, M.J., CREED, P.A., TUCKER, M., 2006, Family history, self-perceptions, attitudes and cognitive abilities are associated with early adolescent reading skills. *Journal of Research in Reading,* 29, 1, 11–32.

CROMLEY, J.G., AZEVEDO, R., 2007, Testing and Refining the Direct and Inferential Mediation Model of Reading Comprehension. *Journal of Educational Psychology,* 99, 311–325.

CURTIS, M.E., LONGO, A.M., 2001, Teaching vocabulary to adolescents to improve comprehension. *Reading Online,* Retrived 16.7.2008 from: http://www.readingonline.org/articles/.

DAANE, M.C., CAMPBELL, J.R., GRIGG, W.S., GOODMAN, M.J., ORANJE, A., 2005, *Fourth grade students reading aloud: NAEP 2002 special study of oral reading. U.S. Department of Education. Institute of Education Sciences, National Center for Educational Statistics.* Washington, D.C.: Government Printing Office.

DECI, E.L., 1998, The relation of interest to motivation and human needs – The self-determination theory viewpoint. In: L. Hoffmann, A. Krapp, K.A. Renninger, J. Baumert (Eds.), *Interest and learning* (pp. 146–162). Kiel: Institute for Science Education, University of Kiel.

DICKINSON, D.K., MCCABE, A., ANASTASOPOULOS, L., PEISNER-FEINBERG, E.S., POE, M.D., 2003, The comprehensive language approach to early literacy: The interrelationships among vocabulary, phonological sensitivity, and print knowledge among preschool-aged

children. *Journal of Educational Psychology,* 95, 3, 465–481.

DIXON, P., LEFEVRE, J., TWILLEY, L.C., 1988, Word knowledge and working memory as predictors of reading skill. *Journal of Educational Psychology,* 80, 4, 465-472.

DWECK, C., 1999, *Self-theories: The role in motivation, personality, and development.* Philadelphia, PA: Psychology Press.

ECCLES, J.S., WIGFIELD, A., 2002, Motivational beliefs, values and goals. *Annual Review of Psychology,* 53, 109–132.

EHRLICH, M., KURZ-COSTES, B., AND LORIDANT, C., 1993, Cognitive and motivational determinants of reading comprehension in good and poor readers. *Journal of Reading Behaviour*, 25, 4, 365–381.

ELLIS, H.C., MOORE, B.A., 2000, Mode and memory. In: T. Daglesish, M. Power (Eds.), *The handbook of cognition and emotion* (pp. 34-46). Chichester, England: John Wiley and Sons, Ltd.

FRIEND, R., 2001, Effects of strategy instruction on summary writing of college students. *Contemporary Educational Psychology,* 26, 1, 3–24.

GAMBRELL, L.B., PALMER, B.M., CODLING, R.M., MAZZONI, S.A., 1996, Assessing motivation to read. *The Reading Teacher,* 49, 7, 518–533.

GUNNING, T.G., 1996, *Creating reading instruction for all children.* Boston: Allyn & Bacon.

GUTHRIE, J.T., WIGFIELD, A., METSALA, J.L., COX, K.E., 1999, Motivational and cognitive predictors of text comprehension and reading amount. *Scientific Studies of Reading,* 3, 3, 231–256.

HASSELBRING, T.S., GOIN, L.I., 2004, Literacy instruction for older struggling readers: What is the role of technology? *Reading and Writing Quarterly,* 20, 123–144.

HERSCHEL, T.M., 1963, Test of Reading Level 3 – Elementary Form. In: T.M. Herschel (Ed.), *The 20th Yearbook of the National Council on Measurement in Education.* Ann Arbor, MI: SGSR.

HIDI, S., 2001, Interest, reading, and learning: Theoretical and practical consideration. *Educational Psychology Review,* 13, 3, 191–209.

HIDI, S., 2006, Interest: A unique motivational variable. *Educational Research Review,* 1, 69–82.

HIDI, S., RENNINGER, K.A., 2006, The four phase model of interest development. *Educational Psychologist,* 41, 2, 111-127.

HOOD, J., DUBERT, L., 1983, Decoding as a component of reading comprehension among secondary students. *Journal of Reading Behavior,* 15, 4, 51–61.

JENKINS, J.R., FUCHS, L.S., VAN DEN BROEK, P., ESPIN, C., DENO, S.L., 2003, Sources of individual differences in reading comprehension and reading fluency. *Journal of Educational Psychology,* 95, 719–729.

KINTSCH, W., 1998, *Comprehension: A Paradigm for cognition*. Cambridge, UK: Cambridge University Press.

KINTSCH, W., VAN DIJK, T.A., 1978, Toward a Model of Text Comprehension and Production. *Psychological Review,* 85, 363–394.

KLAUDA, S.L., GUTHRIE, J.T., 2008, Relationships of three components of reading fluency to reading comprehension**.** *Journal of Educational Psychology,* 100, 2, 310-321.

KOLIĆ VEHOVEC, S., BAJŠANSKI, I., 2003, Children's metacognition as predictor of reading comprehension at different developmental levels. In: *Proceedings of the 12th European conference on Reading* (pp. 216–222). Dublin: Reading Association of Ireland.

KÖLLER, O., BAUMERT, J., SCHNABEL, K., 2000, Zum zusammenspiel von schulischen Interesse und lernen im Fach Mathematik: Längschnittanalysen in der Sekunadrstufen I und II. In: U. Schiefele, W.P. Wild (Eds.), *Interesse und Lernmotivation. Untersuchungen zur Entwicklung, Förderung und Wirkung* (pp. 163–181). Münster: Waxmann.

KOZMINSKY, E., GRAETZ, N., 1986, First vs. second language comprehension: Some evidence from text summarizing. *Journal of Research in Reading,* 9, 1, 3–21.

KUHN, M.R., STAHL, S.A., 2003, Fluency: A review of developmental and remedial practices. *Journal of Educational Psychology,* 95, 3–21.

LEACH, J.M., SCARBOROUGH, H.S., RESCORLA, L., 2003, Late-emerging reading disabilities. *Journal of Educational Psychology,* 95, 211–224.

MCKENNA, M.C., 2001, Development of reading attitude. In: L. Verhoeven, C.E. Snow (Eds.), *Literacy and motivation: Reading engagement in individuals and groups*. Mahwah: LEA, 135–158.

MCKENNA, M.C., KEAR, D.J., 1990, Measuring attitude toward reading: A new tool for teachers. *Journal of Reading,* 43, 626–639.

MCKENNA, M.C., KEAR, D.J., ELLSWORTH, R.A., 1995, Children's attitude toward reading: A national survey. *Reading Research Quarterly,* 30, 4, 934-956.

MCKEOWN, M.G., BECK, I.L., 2004, Direct and rich vocabulary instruction. In: J.F. Baumann, E.J. Kame'enui (Eds.), *Vocabulary Instruction* (pp. 13-27). New York: The Guilford Press.

MEYER, B.J.F., BRANDT, D.H., BLUTH, G.J., 1980, Use of top-level structure in text: Key for reading comprehension of nine grade students. *Reading Research Quartely,* 16, 1, 72–103.

MULLIS, I.V.S., MARTIN, M.O., GONZALEZ, E.J., KENNEDY, A.M., 2003, *PIRLS 2001 International report*. Chestnut Hill, MA: PIRLS International Study Center.

NAGY, W.E., DIADIKOY, L., ANDERSON, R., 1993, The acquisition of morphology: Learning the contribution of suffixes to the meanings of derivatives. *Journal of Reading Behavior,* 25, 155–170.

NATIONAL READING PANEL, 2000, *Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction*. Washington, DC: National Institute for Child Health and Human Development.

OAKHILL, J.V., PETRIDES, A., 2007, Sex differences in the effects of interest on boy's and girl's reading comprehension. *British Journal of Psychology,* 98, 223–235.

PANY, D., JENKINS, J.R., SCHRECK, J., 1982, Vocabulary instruction: Effects on word knowledge and reading comprehension. *Learning Disability Quarterly,* 5, 202–215.

PARIS, S.G., WASIK, B.A., TURNER, J.C., 1991, The development of strategic readers. In: R. Barr, M.L. Kamil, P.B. Mosenthal, P.D. Pearson (Eds.), *Handbook of Reading Research, Vol II* (pp. 609-639). Mahwah, NJ: LEA.

PEČJAK, S., 1989, *Tehnike za izboljšanje bralne učinkovitosti: Eksperimentalni program hitrega branja. Magistrsko delo (neobjavljeno)*. [Techniques for improving reading efficacy: Experimental programme of quick reading]. Ljubljana: Filozofska fakulteta v Ljubljani.

PEKLAJ, C., BUCIK, N., 2005, Vprašalnik bralne motivacije za mlajše učence [Reading Motivation Questionnaire for Young Students]. In: S. Pečjak et al. (Eds.), *Bralna motivacija kot dejavnik učinkovitega izobraževanja* [Reading motivation as factor of effective education]. Final research report (pp. 20-29). Ljubljana: ZIFF.

PEČJAK, S., BUCIK, N., GRADIŠAR, A., PEKLAJ, C., 2006, *Bralna motivacija v šoli: merjenje in razvijanje [Reading motivation in school: measurement and development]*. Ljubljana: Zavod RS za šolstvo.

PEKLAJ, C., KALIN, J., PEČJAK, S., PUKLEK LEVPUŠČEK, M., VALENČIČ ZULJAN, M., AJDIŠEK, N., in press, *Učiteljske competence in doseganje vzgojno-izobraževalnih ciljev v šoli* [Teacher competencies and achievement of educational goals in schools]. Ljubljana: Filozofska fakulteta v Ljubljani.

PERFETTI, C.A., 1994, Psycholinguistics and reading ability. In: M.A. Gernsbacher (Ed.), *Handbook of psycholinguistics* (pp. 849-894). Orlando, FL: Academic Press.

PERFETTI, C.A., 1985, *Reading ability*. New York: Oxford University Press.

SCHIEFELE, U., 2001, The role of interest in motivation and learning. In: J.M. Collins, S. Messick (Eds.), *Intelligence and personality. Bridging the gap in theory and measurement* (pp. 163-194). Mahwah, NJ: LEA.

SCHIEFELE, U., KRAPP, A., 1996, Topic interest and free recall of expository test. *Learning and Individual Diffrerences,* 8, 141–160.

SCHMITT, M.C., 1990, A questionnaire to measure children's awareness of strategic reading processes. *The Reading Teacher,* 43, 454–461.

SEIBERT, P.S., ELLIS, H.C., 1991, Depression and implicit memory: A commentary. *Journal of Abnormal Psychology,* 101, 587–591.

SHARE, D.L., LEIKIN, M., 2004, Language impairment at school entry and later reading disability: Connections at lexical versus supralexical levels of reading. *Scientific Studies of Reading,* 8, 1, 87–110.

STERNBERG, R.J., 1987, Most vocabulary in learned from context. In: M.G. McKeown, M.E. Curtis (Eds.), *The nature of v ocabulary acquisition* (pp. 89–105). Hillsdale, NY: Lawrence Erlbaum.

ŠTRAUS, M., REPEŽ, M., ŠTIGL, S. (Eds.), 2007, *Nacionalno poročilo PISA 2006: Naravoslovni, matematični in bralni dosežki slovenskih učencev* [National PISA report 2006: Science, mathematical, and reading achievements of Slovenian students]. Ljubljana: Nacionalni center PISA, Pedagoški inštitut.

TABOADA, A., TONKS, S., WIGFIELD, A., GUTHRIE, J., 2009, Effects of motivational and cognitive variables on reading comprehension. *Reading and Writing: An Interdisciplinary Journal,* 22, 1, 85-106.

THORNDIKE, R.L., 1973, Reading as reasoning. *Reading Research Quarterly,* 2, 2, 135–147.

TOLIČIČ, I., ZORMAN, L., 1977, *Okolje in uspešnost učencev* [Environment and students' success]. Ljubljana: DZS.

VAN DEN BROEK, P., TZENG, Y., RISDEN, K., TRABASSO, T., BASCHE, P., 2001, Inferential questioning: Effects on comprehension of narrative texts as a function of grade and timing. *Journal of Educational Psychology,* 93, 3, 521–529.

WHITE, B., 2007, Are girls better readers than boys? Which boys? Which girls? *Canadian Journal of Education,* 30, 2, 554–581.

WIGFIELD, A., GUTHRIE, J.T., 1997, Relations of children's motivation for reading to the amount and breadth of their reading. *Journal of Educational Psychology,* 89, 3, 420-432.

YOVANOFF, P., DUESBERY, L., ALONSO, J., TINDAL, G., 2005, Grade-level invariance of a theoretical causal structure predicting reading comprehension with vocabulary and oral reading fluency. *Educational Measurement: Issues and Practice,* 24, 4–12.

MODEL ČÍTANIA S POROZUMENÍM PRE ŽIAKOV PIATEHO ROČNÍKA ZŠ

S. Pečjak, A. Podlesek, T. Pirc

Súhrn: Čítanie s porozumením je súčasťou gramotnosti a úzko súvisí s procesom učenia ako aj s celkovými výsledkami žiaka. Čítanie s porozumením ovplyvňujú rôzne (meta)kognitívne, motivačné a emočné faktory. Nášho výskumu sa zúčastnilo 470 žiakov piateho ročníka základnej školy. Včlánku predkladáme konfirmačný model čítania s porozumením. Tento model zahŕňa: (meta)kognitívne faktory (slovná zásoba, rýchlosť čítania, zhrnutie informácií a metakognitívne čítacie znalosti), motivačné faktory (záujem o čítanie a schopnosť čítať) a emočné faktory (pocity pri oddychovom čítaní a pri študijnom čítaní). Model ukazuje priame a nepriame vplyvy sledovaných faktorov na čítanie s porozumením u žiakov piateho ročníka. Výsledky majú dôležitý dopad na budúcu pedagogickú prax.