

Reading, metacognition and motivation: A follow-up study of German students in Grades 7 and 8

Annette Roeschl-Heils
Wolfgang Schneider
University of Würzburg, Germany

Christina E. van Kraayenoord
The University of Queensland, Australia

This follow-up study to van Kraayenoord and Schneider (1999) examined the performance in reading, metacognition and motivation related to reading of students in Grades 7 and 8. Results showed significant correlations between all of the variables. A multivariate analysis of variance showed that "good" and "poor" readers differed in reading self-concept and metacognitive measures related to reading and memory. A stepwise regression analysis suggested that the metacognitive variables were the best predictors of reading. Furthermore, a comparison of the results of the previous study with those of the current investigation revealed that the findings were stable over time. Since the period between the two studies is the time during which students make important decisions related to enrolment in one of three distinct school-types in Germany, we examined the results of various groups of students: those in "Gymnasium" (high educational track), "Realschule" (middle educational track), and "Hauptschule" (low educational track). Students in the Gymnasium scored significantly better than students in the other two groups on almost all variables related to reading. A re-analysis of the data from our first investigation found that the results of the Gymnasium students in the second study could be predicted from their results obtained during elementary school.

Introduction

Reading is one of the most important predictors of academic achievement (Boland, 1993; Taraban, Rynearson, & Kerr, 2000). Reading should not exclusively be regarded as an ability acquired only in elementary school, but rather as knowledge, skills and attitudes which develop in an ongoing manner through out life.

Correspondence concerning this article should be sent to Wolfgang Schneider, Department of Psychology, University of Würzburg, Wirtelsbacherplatz 1, D-97074 Würzburg, Germany.

Central to the understanding of reading as knowledge skills and attitudes is the idea that successful participants are active, motivated and self-regulated learners who understand and use literacy for a variety of purposes (Alexander & Jetton, 2000; Guthrie & Wigfield, 2000; Pressley, Borkowski, & Schneider, 1987, 1989). This particular view of successful literacy learners has led to a number of studies that have investigated the roles of various metacognitive and motivational aspects of reading, such as metacognitive knowledge about reading, metacognitive strategy use, reading self-concept, attributions for success and failure, and attitudes towards and interest in reading (Chan, 1994; Guthrie & Wigfield, 2000; Morrow & Young, 1997; Paris, Wasik, & Turner, 1991; Pintrich, Anderman, & Klobucar, 1994; Schneider, Körkel, & Weinert, 1989; Weinert, Helmke, & Schneider, 1989; Wigfield & Guthrie, 1997).

Metacognition comprises knowledge and control of cognition and is an important factor in academic achievement (Baker & Brown, 1984; Brown, Bransford, Ferrara, & Campione, 1983; Flavell, 1979; Schneider, 1999). With regard to reading, metacognitive knowledge of reading strategies is important to comprehension and recall of texts. Metacognition related to memory includes knowledge about an individual's cognitive capacities, the nature of the memory task and of strategies for remembering and recalling information (Paris, Lipson, & Wixson, 1983; Paris & Oka, 1986; Schneider & Pressley, 1997; Weinstein & Mayer, 1986).

In the area of motivation, research supports the conclusion that interest in reading and reading self-concept influence reading achievement (Chan, 1994; Morrow & Young, 1997; Pintrich et al. 1994; Wigfield & Guthrie, 1997). Studies concerned with memory tasks have shown that metacognitive and motivational aspects such as causal attributions for success and failure, self-efficacy and feelings of control are correlated with each other (Borkowski, Carr, Rellinger, & Pressley, 1990; Kurtz & Borkowski, 1984). Thus, metacognitive knowledge and skills as well as motivational aspects are important in influencing reading achievement.

In the study by van Kraayenoord and Schneider (1999), we investigated metacognitive knowledge about memory and reading, reading achievement, and motivational aspects related to reading in 140 German students in Grades 3 and 4. We found significant correlations between the metacognitive variables, motivational variables and reading achievement. We also demonstrated that the motivational factors and metacognitive skills we examined affected reading achievement in different ways. By investigating "good" and "poor" readers we were able to show significant differences in their respective metacognitive knowledge of reading and memory, as well as significant differences in their reading self-concept and interest in reading. These findings were in line with earlier studies which have reported cognitive and motivational determinants as good predictors of reading comprehension (Ehrlich, Kurtz-Costes, & Loridant, 1993).

The current study was designed to investigate the original population after a period of three years and to re-evaluate our earlier findings. In addition, the design of our study allowed us to test the hypothesis that individual differences in reading as well as the correlations among the motivational and metacognitive variables remained stable over time. Therefore, the following research hypotheses were specified:

- 1) There are significant correlations among the motivational and metacognitive variables and reading achievement.
- 2) The motivational and metacognitive variables can distinguish between "good" and "poor" readers.
- 3) The motivational and metacognitive variables are good predictors of reading.
- 4) The relationship between the different constructs remains stable over time.

Methods

Participants

The study was conducted between October 1999 and May 2000. All participants were recruited from the earlier sample (van Kraayenoord & Schneider, 1999). The students were

now in Grades 7 and 8 and attended different schools within the region of Würzburg, Germany. Some of the students from the original sample had moved to different places, and we either failed to locate them at their current address or they were unwilling to participate in the study. A total of 80 students were contacted by mail and a follow-up phone call in cases in which the parents had responded to our first or second information letter. If the parents did not respond to our letters no further information was sought. Finally, 59 students (42%) of the previous study sample ($n=140$) were willing to participate in our follow-up study.

Thirty-two students were in Grade 7 (17 female) and 27 students were in Grade 8 (19 female). Students attended one of three different school-types, namely the low educational track (*Hauptschule*; $N=17$), the middle educational track (*Realschule*, $N=8$), and the high educational track (*Gymnasium*, $N=34$). Students attending the *Hauptschule* and *Realschule* were combined into one group in subsequent analyses, and their scores were compared with those attending the *Gymnasium*.

Test instruments

A number of test instruments were used to assess reading and metacognitive competences related to reading as well as the motivational variables of reading self-concept and interest in reading. Only some of the instruments used were identical to those used in our previous investigation (van Kraayenoord & Schneider, 1999). The majority of the tests needed to be modified to suit the age and Grade levels of the participants. Therefore, the following test instruments were used:

Allgemeiner Deutscher Sprachtest (ADST; Steinert, 1978). The ADST is a well-established instrument used to assess an individual's verbal skills. In this study, we first used Part A, Test 1 of the ADST, which assesses an individual's ability to understand text. Students were asked to read a short story within a time limit and then rate statements related to the text as either "true" or "false". The maximum score was 10 points. In addition, we used Part A, Test 2 of the ADST, in which sentences in a text are interspersed with groups of three alternative words. The participants were asked to select the single word from the three which had the best "fit" in the context. The maximum score was 10 points. For further analyses we combined scores on both subtests. The reliability of this aggregated test score was sufficient (Cronbach's $\alpha=.82$).

The following three instruments were selected from the "field trial" of the international OECD/PISA study (OECD PISA, 2000):

"*Brot und Rosenkohl* [Bread and Brussels Sprouts]". This test of reading speed and comprehension is based on a text comprising a total of 486 words. Participants were instructed to read through the text as quickly as possible. As they did so they were asked to try to memorise as much information from the text as possible. After 3 minutes of reading, they were asked to indicate by marking on the text the last line of the text that they had read. In order to prevent students from skipping text lines while reading, the text contained several sentences that had to be completed by the reader. Each sentence required the participant to complete the sentence by choosing among three alternative words offered in parentheses. Students were asked to select and underline the word from the alternative words which fit best into the context of the story. The participants completed as many sentences as they could during their reading of the text up to the point where they finished reading within the 3 minute timeframe. Therefore, this test instrument assessed both reading comprehension and reading speed. Given the high correlations between these two variables, reading comprehension scores were used for the present purpose. Scores ranged between 0 and 7 points. Cronbach's α was .79, indicating sufficient reliability for this test.

"*Brüder mit Kanu in Seenot* [Brothers in Canoes in Distress]". This instrument assesses reading and text comprehension (*KANUCOMP*) as well as the use of metacognitive strategies (*KANUSTRAT*). The text presented in this test describes the experience of two brothers who

got lost in a small boat on the Caribbean Sea, and who were attacked by sharks. Participants were given 8 minutes to read the text. They were told that during the test they should do everything necessary in order for them to recall the text. Directly after reading the text, 12 different memory strategies were presented, and students had to rate each of these on a six-point Likert scale regarding the frequency of use (*KANUSTRAT*). Thereafter, 12 questions related to comprehending the text were presented (*KANUCOMP*). Both scores were sufficiently reliable (Cronbach's $\alpha=.72$ for *KANUSTRAT* and $.76$ for *KANUCOMP*, respectively).

Metacognitive Strategies (MSTRAT; Schlagmüller & Schneider, 1999). This test examines students ability to evaluate metacognitive strategies related to text recall. The variable used in this study comprised six tasks. Each of these tasks referred to a different text recall or comprehension problem, and students were asked to evaluate five given strategies with regard to their respective efficacy (Cronbach's $\alpha=.89$).

Würzburg Metamemory Test (WMMT; Schlagmüller, Visé & Schneider, 2001). The test comprises three subscales of which only the second subscale was chosen for this study. This subscale includes 18 items specifically assessing metacognitive strategies related to text processing and recall. For example, one of the items related to text recall was: "When you read a story in order to recall it, what can you do in order to perform well?" Possible scores ranged from 0 to 36 (Cronbach's $\alpha=.74$).

Self-Perception of Reading (FACES; Nicholls, 1978). This test assesses students self-perception of different individual reading skills by comparing these with those of their classmates. Students had to indicate their individual position on a vertical column of 30 faces. The reading skills rated were as follows: *FACES 1* refers to the performance in reading aloud text passages. *FACES 2* assesses students self-perception in reading a text and comprehending questions. *FACES 3* refers to the ability to retell a text after reading, while *FACES 4* assesses students overall self-perception of reading achievement. For further analyses we combined the results of all subtests as a single score called *FACES* (Cronbach's $\alpha=.85$).

Interest in Reading Scale (IRS; van Kraayenoord, 1996). The *IRS* comprises 16 items seeking information about the students reading habits and their attitude towards reading. Items like "I like to read stories" are associated with the attitude towards reading, while those like "I borrow books from friends" are associated with students reading habits and behaviours. Students had to decide whether any of the different items presented was true for them by indicating the frequency associated with each of these items as "always", "sometimes", "rarely" or "never" (Cronbach's $\alpha=.66$).

Self-Description-Questionnaire II (SDQ II; Marsh, 1990; translated into German by first author). The original version of the *SDQ II* comprises 102 items representing 11 different scales which include variables of self-perception related to physical skills, physical attractiveness, social competences as well as academic skills including mathematics and reading achievement. The *SDQ II* has been developed for students in Grades 7 to 12. To obtain domain-specific information about the self-perception of reading, only items representing verbal and reading skills were used and translated into German. The scale comprises 10 items leading to a minimum score of 10 and a maximum score of 60 points. Items included: "I look forward to German classes", "German is one of my best subjects" or "I hate reading". Students were asked to decide whether any of these items was true for them by indicating "false", "mostly false", "more false than true", "more true than false", "mostly true" or "true" (Cronbach's $\alpha=.89$).

Procedure

Data were collected by the first author. Since students were distributed among different schools they were invited to the University of Würzburg for test administration. This was

undertaken in groups consisting of 2 to 15 participants in a quiet room in the Department of Psychology. The students were seated at tables with sufficient room for independent work. The purpose of the study was explained to each group prior to test administration, and the students were assured of the confidentiality of their data.

The total test procedure took two hours per group with a 10 minute break. The tests were presented in the following order: Session 1 began with the reading interest and self concept variables (*IRS*, *FACES*, and *SDQ II*), followed by the combined reading speed and comprehension test ("*Brot und Rosenkohl*"). At the end of the session the two subtests of the general language test (*ADST*) were given. After a 10 minute break, session 2 started with the "*Brüder mit Kanu in Seenot*" text, followed by the two instruments assessing metacognitive knowledge (*WMMT* and *MSTRAT*).

Results

Since we were only able to recruit 42% of the original study sample, we first attempted to exclude a systematic selection bias by testing for group differences between the participants of this study and the dropouts. Therefore, we compared the results of these two groups by performing *t*-tests including all relevant variables. A significance level of $p=.05$ was chosen to guard against Type I error for group differences. However, we found no significant group differences for any of the variables investigated, and so we concluded that our study population was representative of the original sample.

Due to the significant correlations among the three variables assessing reading ["*Brot und Rosenkohl*", *ADST 1*, "*Brüder mit Kanu in Seenot*" (*KANUCOMP*)] we combined these variables into a single variable, designated "reading" (RL).

The results of this follow-up study are presented according to the research hypotheses presented above.

Interrelations among the motivational and metacognitive variables and the variables of reading

Intercorrelations among the various variables are presented in Table 1. Because of the reduced sample size we did not split the sample into the two Grade levels for further analyses. The variables of reading correlated significantly with reading interest (*IRS*), the self-description questionnaire (*SDQ II*) and the two metacognitive variables, *MSTRAT* and *WMMT*, indicating that reading is associated with motivational and metacognitive variables for this sample of students at Grade levels 7 and 8.

Scores on the two self-concept variables related to reading (*SDQ II* and *FACES*) correlated significantly with each other, and scores on the interest in reading scale (*IRS*) correlated significantly with the *SDQ II*, indicating that these variables of motivation are related. Despite weak correlations between scores on the "*Brüder mit Kanu in Seenot*" (*KANUSTRAT*) (a metacognitive strategy variable) with other metacognitive variables we found a highly significant correlation between the variables *WMMT* and *MSTRAT*, suggesting that these variables are related and probably tap similar constructs (cf. Table 1). The student-self-perception of reading variable (*FACES*) correlated significantly with the scores of *SDQ II*. The subtests of the *SDQ II* correlated significantly with *IRS* showing that a positive self-concept related to reading is associated with students' interest in reading. However, these findings were not reflected in the correlation between *IRS* and *FACES*, which was in the expected direction but turned out to be non-significant.

First, we divided the study sample into two groups: "good" and "poor" readers, based on their skills in reading (median split). A multivariate analysis of variance was carried out with reading level ("good" vs. "poor" readers) and Grade level (Grades 7 and 8) as the independent variables. The *SDQ II* and *MSTRAT* variables were designated as dependent variables. These were chosen because they had the highest alpha reliabilities compared with those of the other motivational and metacognitive variables (Cronbach's α : *SDQ II* = .89; *MSTRAT* = .89).

Table 1

Intercorrelations among the various variables including the new variable reading (RL) which comprises the variables: "Brot und Rosenkohl", ADST I, "Brüder mit Kanu in Seenot" (KANUCOMP)

	RL	IRS	FACES	SDQII	MSTRAT	WMMT	KANU-STRAT
RL	-	.40**	.23	.46**	.48**	.38**	.13
IRS		-	.13	.39**	.62**	.50**	.33*
FACES			-	.62**	.09	.11	.06
SDQII				-	.45**	.28*	.12
MSTRAT					-	.73**	.26*
WMMT						-	.11
KANU-STRAT							-

Distinction between "good" and "poor" readers based on the various motivational and metacognitive variables

An important prerequisite for the multivariate analysis of variance was the homogeneity of the dependent variables, which was assessed by the Boxes *M*-test. The findings indicated homogeneity of variance of the dependent variables (Boxes $M=15.90$, $F(9,30217)=1.65$, $p>.05$). Means and standard deviations obtained are presented in Table 2.

The analysis yielded significant main effects for both Grade level, $F(2,54)=5.22$, and Reading level, $F(2,54)=4.53$, both $p's<.05$). No significant interaction effects were found. Subsequent univariate analyses of variance showed that students in Grade 8 were more likely to have a higher self-concept related to reading, $F(1,54)=8.06$, $p<.05$, and that they scored higher on the variables assessing metacognitive strategies than seventh graders, $F(1,54)=5.78$, $p<.05$. Furthermore, good readers had better self-concepts related to reading, $F(1,54)=5.08$, $p<.05$, and they knew more about metacognitive strategies than poor readers $F(1,54)=6.96$, $p<.05$. Taken together, both the motivational and metacognitive variables were able to differentiate between "good" and "poor" readers.

Table 2

Means and (standard deviations) for reading, metacognition and motivation variables, as a function of reading competency and Grade level

	Grade 7		Grade 8	
	"good"	"poor"	"good"	"poor"
Reading				
Self-Description Questionnaire	4.59 (.73)	3.68 (1.1)	4.79 (.77)	4.72 (.67)
Metacognitive Strategies	13.02 (1.47)	11.09 (2.81)	13.94 (1.74)	12.89 (2.36)

Prediction of reading based on motivational and metacognitive variables

A stepwise multiple regression analysis was conducted for the study sample. Scores on reading were chosen as the dependent variable. The independent variables comprised those assessing *reading self-concept* ($RSC=SDQ II$ and *FACES*), the interest of reading scale (*IRS*), two metacognitive strategy variables (the *MSTRAT* and the metacognitive strategy score obtained from "Brüder mit Kanu in Seenot" (*KANUSTRAT*), and Grade level. Results of the regression procedure showed that metacognitive strategy knowledge (*MSTRAT*) and reading self concept (*RSC*) contributed most to the prediction of reading, explaining 25.3% (*MSTRAT*) and a further 5.4% (*RSC*) of the variance in the dependent variable. Thus, in

combination these two concepts accounted for 30.7% of the variance of reading in this model. The beta coefficients obtained for *MSTRAT* and *RSC* were .44 and .24, respectively. In comparison, the remaining predictor variables did not make a significant contribution. Taken together, variables of metacognitive strategies were the best predictors of reading, followed by those tapping reading self-concept.

Long-term stability of relationships among the different variables

To test the assumption that individual differences in the variables included in this study are stable over time we compared scores on variables tapping the same constructs by correlating the results obtained in the original study (van Kraayenoord & Schneider, 1999) with those from the present follow-up investigation. Results are presented in Table 3. Variables of reading as well as variables of motivation related to reading, including interest in reading and reading self-concept each correlated positively at the .01 significance level. As can be seen from Table 3, significant correlations among the metacognitive variables were obtained only for those variables that measured the same aspects of metacognitive strategies. Variables which did not tap the same constructs showed weak and nonsignificant correlations. Overall, core variables of reading, interest in reading and reading self-concept were found to be stable over a period of three years.

Table 3

Correlations among variables of the first study and the follow-up study showing the stability of the results over a period of three years

Variables from First Study (van Kraayenoord & Schneider, 1999)	Variables from Follow-up study	
Reading		
Knuspels Reading Exercises	"Brot und Rosenkohl"	.43**
	Allgemeiner Deutscher	.42**
	Sprachtest (ADST) KANUCOMP	.62**
Motivation		
Interest in Reading Scale	Interest in Reading Scale	.45**
Self-Perception of Reading Scale	Self-Perception of Reading Scale	.38**
Reading Self-Concept Scale	Self-Description Questionnaire	.70**
Metacognition		
Seal (WMMT)	Metacognitive Strategies	.50**
Think Aloud Passages	Metacognitive Strategies	-.13
	KANUSTRAT	.00
Index of Reading	Metacognitive Strategies	.54**
Awareness	KANUSTRAT	.15

This finding of overall high stability prompted us to investigate the impact of gender and school type on findings from this assessment period as well as for the first assessment when students were in Grades 3 and 4. We divided the sample into two groups of students: those who were enrolled in a *Gymnasium* (high educational track) and those enrolled in a *Hauptschule* or *Realschule* (low or middle educational track) from Grade 5 on.

A multivariate analysis of variance using Gender and School Type as independent factors and reading comprehension, reading self-concept (*FACES*), metacognitive knowledge (*WMMT*), and interest in reading (*IRS*) as dependent variables was carried out to assess performance

differences between girls and boys as well as between *Gymnasium* and *Hauptschule/Realschule* students. School type turned out to have main effects on all of the four dependent variables (all p 's < .05). *Gymnasium* students outperformed the rest of the sample on all of these measures. In addition, gender showed significant effects on self-concept, $F(1,153)=5.78$, $p < .05$, with boys scoring higher than girls. Although there was a tendency for girls to perform better on the remaining measures, these differences were not statistically significant. There were no school type \times gender interactions.

Preliminary analyses showed that gender did not have any impact on the same constructs measured at the first assessment when students were in Grades 3 and 4. Thus analyses of variance using only school type as independent factor and reading self-concept, reading comprehension, metacognitive knowledge, and interest in reading as dependent variables were carried out next. With the exception of reading comprehension, significant effects of school type were found for all of the dependent variables (all p 's < .05). Although those students who attended *Gymnasium* from Grade 5 on tended to be better in reading comprehension than the rest of the sample, the mean difference was just short of being statistically significant ($p < .06$).

Discussion

In this study we re-examined the complex interactions of reading, metacognitive knowledge and motivational variables related to reading in students in Grades 7 and 8 who had participated in a similar study when they were in elementary school (van Kraayenoord & Schneider, 1999). First, this study design allowed us to test whether the results obtained in elementary school remained stable over time and second, to find out the extent to which variables like gender or specific school-types influence or account for long-term interactions between reading and the various constructs related to reading.

According to our first research hypothesis we were again able to demonstrate that students with better metacognitive knowledge about memory and reading performed better in tests assessing reading. The same was found to be true for motivational variables. Students with higher interest in reading and better reading self-concepts outperformed those students who scored lower on metacognitive and motivational variables. These results are in line with our previous findings (van Kraayenoord & Schneider, 1999) but also with studies which have shown that metacognitive strategies as well as motivational components influence academic achievement not only in reading but also in more general terms (Borkowski et al., 1990; Paris & Oka, 1986; Paris et al., 1983; Pintrich & De Groot, 1990; Pintrich, Roeser, & De Groot, 1994; Schneider & Pressley, 1997).

When we investigated students at Grades 3 and 4 (van Kraayenoord & Schneider, 1999), we found that variables related to word decoding, metacognitive knowledge about reading and memory, motivational variables related to reading and teacher evaluations of reading were significantly different for "good" and "poor" readers. In this follow-up study we did not measure word decoding skills, because it is widely accepted that the latter is fully developed in students at Grades 7 and 8 and therefore will not contribute to the differentiation between "good" and "poor" readers.

The results of our multivariate analysis of variance identified both variables measuring metacognitive knowledge related to reading and those which record interest and self-concept in reading as variables which can distinguish between "good" and "poor" readers. The first is consistent with the finding of differences in knowledge about memory and reading in "good" and "poor" learners (Garner, 1987; Schneider & Pressley, 1997). Furthermore, differences in different aspects of self-concept have been reported in children with learning difficulties and normally achieving children (Chapman, 1988). Thus, we conclude that our domain-specific findings related to "good" and "poor" readers are in line with previous research findings which investigated academic achievement, metacognition and motivation in a more general sense.

According to our third hypothesis we were interested to find out which variables best predicted reading. The results of the stepwise regression analysis showed that reading was accounted for by a combination of reading self-concept (which comprised the variables *FACES* and *SDQ II*) and metacognitive strategies (*MSTRAT*). These findings again highlight the important role of metacognitive strategies and motivational components in reading, and as we found almost the same relation among the different variables and reading, we were able to confirm the findings of the previous study which had been undertaken three years earlier.

The re-examination of variables related to reading, interest in reading and reading self-concept as well as variables reflecting individual metacognitive skills and knowledge related to reading and memory in one and the same study population offered a unique chance to evaluate the stability of these variables over time, at least over a period of three years. As can be seen in Table 3, motivational variables especially, and those related to reading remained stable at a high level of significance.

Our results clearly show that students with less interest in reading did have weak metacognitive skills and performed poorly in tests assessing reading. When we traced these results back to the earlier study we were able to show that these findings were already true for those children in Grades 3 and 4. The stability of our findings over time was associated with the school type. In particular, students enrolled in the *Gymnasium* (high educational track) outperformed those in the *Hauptschule* and *Realschule* on almost all variables. However, we were able to show that those students who attended the *Gymnasium* were already performing better on almost all of our variables in elementary school. This means that interest in reading develops early and should be encouraged in schools. In addition, teachers should foster positive self-concepts and attitudes towards reading so that reading achievement is enhanced. In turn high achievement in reading may influence a wide range of other academic achievements.

When we searched for other independent variables that might have influenced our results we also found that gender had a significant effect. This finding is similar to a number of other studies including the OECD/PISA study (OECD, 2001). In our study sample we found significant differences in several variables related to reading, motivation and metacognition, with girls tending to perform better than boys of the same age. Although none of the results relating to gender differences remained significant after correction for the use of multiple tests, our results suggest that boys require special attention in terms of developing their motivational and metacognitive skills related to reading.

Taken together, the results of our study again emphasise the strong links between reading and motivational and metacognitive aspects related to reading. The development of "good" and "poor" readers begins early, probably even earlier than elementary school, but by showing that these traits remain stable over time, we have also shown that reading may have a considerable impact on individuals' ongoing academic achievement and later career prospects. Therefore, in terms of programs of intervention those involving explicit metacognitive strategy instruction in reading may prove useful for the acquisition of more effective reading strategies and the use of these strategies in a variety of contexts. In terms of motivational elements related to reading, educators should pay special attention to fostering positive self-beliefs and attitudes towards reading.

References

- Alexander, P.A., & Jetton, T.L. (2000). Learning from text: A multidimensional and developmental perspective. In M. L. Kamil, P.B. Mosenthal, P.D. Pearson, & R. Barr (Eds.), *Handbook of reading research* (vol. III, pp. 285-310). Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.
- Baker, L., & Brown, A.L. (1984). Metacognitive skills and reading. In P.D. Pearson, M. Kamil, R. Carr, & P. Mosenthal (Eds.), *Handbook of reading research* (vol. 1, pp. 353-394). New York: Longman.
- Boland, T. (1993). The importance of being literate: Reading development in primary school and its consequences for the school career in secondary education. *European Journal of Psychology of Education*, 8, 289-305.

- Borkowski, J.G., Carr, M., Rellinger, L., & Pressley, M. (1990). Self-regulated cognition: Interdependence of metacognition, attributions and self-esteem. In B. Jones & L. Idol (Eds.), *Dimensions of thinking and cognitive instruction* (vol. 1, pp. 53-92). Hillsdale, NJ: Erlbaum.
- Brown, A., Bransford, J., Ferrara, R., & Campione J. (1983). Learning, remembering and understanding. In J.H. Flavell & E.M. Markman (Eds.), *Handbook of child psychology: Vol. 3. Cognitive development* (pp. 77-166). New York: Wiley.
- Chan, L.K.S. (1994). Relationship of motivation, strategic learning, and reading achievement in Grades 5, 7, and 9. *Journal of Experimental Education*, 62, 319-339.
- Chapman, J.W. (1988). Learning disabled children's self-concepts. *Review of Educational Research*, 58, 347-371.
- Ehrlich, M.-F., Kurtz-Costes, B., & Loridant, C. (1993). Cognitive and motivational determinants of reading comprehension in good and poor readers. *Journal of Reading Behavior*, 25, 365-381.
- Flavell, J.H. (1979). Metacognition and cognitive monitoring: A new area of psychological inquiry. *American Psychologist*, 34, 906-911.
- Garner, R. (1987). *Metacognition and reading comprehension*. Norwood, NJ: Ablex.
- Guthrie, J.T., & Wigfield, A. (2000). Engagement and motivation in reading. In M.L. Kamil, P.B. Mosenthal, P.D. Pearson, & R. Barr (Eds.), *Handbook of reading research* (vol. III, pp. 403-422). Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.
- Kurtz, B.E., & Borkowski, J.G. (1984). Children's metacognition: Exploring relations among knowledge, process and motivational variables. *Journal of Experimental Child Psychology*, 37, 335-354.
- Marsh, H.W. (1990). *The Self-Description Questionnaire II: Manual and research monograph*. San Antonio, TX: The Psychological Corporation.
- Morrow, L.M., & Young, J. (1997). A collaborative family literacy program: The effects of children's motivation and literacy achievement. *Early Child Development and Care*, 127-128, 13-25.
- Nicholls, J.G. (1978). The development of the concepts of effort and ability, perception of academic attainment, and the understanding that difficult tasks require more ability. *Child Development*, 49, 800-814.
- Organisation for the Economic Co-operation and Development (OECD) (2000). *Measuring student knowledge and skills: A new framework for assessment*. Paris: OECD.
- Paris, S.G., & Oka, E. (1986). Children's reading strategies, metacognition and motivation. *Development Review*, 6, 25-56.
- Paris, S.G., Lipson, Y., & Wixson, K.K. (1983). Becoming a strategic reader. *Contemporary Educational Psychology*, 8, 293-316.
- Paris, S.G., Wasik, B.A., & Turner, J.C. (1991). The development of strategic readers. In R. Barr, M. Kamil, P.B. Mosenthal, & P.D. Pearson (Eds.), *Handbook of reading research* (vol. 2, pp. 815-860). New York: Longman.
- Pintrich, P.R., & De Groot, E.V. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology*, 82, 33-40.
- Pintrich, P.R., Anderman, E.M., & Klobucar, C. (1994). Intraindividual differences in motivation and cognition in students with and without learning disabilities. *Journal of Learning Disabilities*, 27, 360-370.
- Pintrich, R.P., Roeser, R.W., & De Groot, E.A.M. (1994). Classroom and individual differences in early adolescents' motivation and self-regulated learning. *Journal of Early Adolescence*, 14, 139, 161.
- Pressley, M., Borkowski, J.G., & Schneider, W. (1987). Cognitive strategies: Good strategy users coordinate metacognition and knowledge. In R. Vasta & G. Whitehurst (Eds.), *Annals of child development* (vol. 5, pp. 89-129) New York: JAI Press.
- Pressley, M., Borkowski, J.G., & Schneider, W. (1989). Good information processing: What is it and what education can do to promote it? *International Journal of Educational Research*, 13, 857-867.
- Schlagmüller, M., & Schneider W. (1999). Metacognitive knowledge about text processing: A questionnaire. Unpublished manuscript, University of Würzburg.
- Schlagmüller, M., Visé, M., & Schneider W. (2001). Zur Erfassung des Gedächtniswissens bei Grundschulkindern: Konstruktionsprinzipien und empirische Bewährung der Würzburger Testbatterie zum deklarativen Metagedächtnis. *Zeitschrift für Entwicklungspsychologie und Pädagogische Psychologie*, 33, 91-102.

- Schneider, W. (1999). The development of metamemory in children. In D. Gopher & A. Koriat (Eds.), *Attention and Performance XVII: Cognitive regulation of performance*. Cambridge, MA: MIT Press.
- Schneider, W., & Pressley, M. (1997). *Memory development between two and twenty* (2nd ed.). Mahwah, NJ: Erlbaum.
- Schneider, W., Kürkel, J., & Weinert, F.E. (1989). Domain-specific knowledge and memory performance: Comparison of high- and low-aptitude children. *Journal of Educational Psychology*, 81, 306-312.
- Steinert, J. (1978). *Allgemeiner Deutscher Sprachtest*. Göttingen: Hogrefe.
- Taraban, R., Rynearson, K., & Kerr, M. (2000). College students' academic performance and self-reports of comprehension strategy use. *Reading Psychology*, 21, 283-308.
- van Kraayenoord, C.E. (1996). *The Interest in Reading Scale*. Unpublished scale, The University of Queensland, Fred and Eleanor Schonell Special Education Research Centre, Brisbane, Australia.
- van Kraayenoord, C.E., & Schneider, W. (1999). Reading achievement, metacognition, reading self-concept and interest: A study of German students in Grades 3 and 4. *European Journal of Psychology of Education*, 14, 305-324.
- Weinert, F.E., Helmke, A., & Schneider, W. (1989). Individual differences in learning performance and school achievement: Plausible parallels and unexplained discrepancies. In H. Mandl, E. de Corte, N. Benett, & H.F. Friedrichs (Eds.), *Learning and instruction* (pp. 461-479). Oxford: Pergamon Press.
- Weinstein, C.E., & Mayer, R.E. (1986). The teaching of learning strategies. In M. Wittrock (Ed.), *Handbook of research on teaching* (pp. 315-327). New York: Macmillan.
- Wigfield, A., & Guthrie, J. (1997). Relations of children's motivation for reading to the amount and breadth of their reading. *Journal of Educational Psychology*, 89, 420-432.

Ce travail poursuit une étude de van Kraayenoord and Schneider (1999). Il examine les performances en lecture, les aptitudes métacognitives liées aux capacités de lecture et de mémoire et le niveau de motivation avec la fois une auto-évaluation des capacités de lecture et l'intérêt pour la lecture de 59 jeunes participants de niveau scolaire 7 et 8. Les résultats montrent une corrélation significative entre toutes les variables étudiées. Une analyse de variance multivariée montre que 'bons' et 'mauvais' lecteurs diffèrent dans l'évaluation qu'ils ont de leurs capacités de lecture et dans les mesures méta cognitives en rapport avec la lecture et la mémoire. Une analyse de régression suggère que les capacités de lecture peuvent être prédites par les variables métacognitives et, plus faiblement, par les mesures sur l'auto-évaluation de la lecture. De plus, une comparaison des résultats entre l'étude précédente et celle présentée ici montre une stabilité au cours du temps. En outre, ces deux travaux encadrent la période au cours de laquelle, en Allemagne, les étudiants doivent prendre des décisions importantes d'orientation et choisir entre trois différents types d'école: le 'Gymnasium' (haut niveau d'éducation), la 'Realschule' (moyen niveau d'éducation) et l'Hauptschule (faible niveau d'éducation). Il était alors intéressant d'examiner plus spécifiquement les données de ces trois différents groupes d'étudiants. Les résultats indiquent que les étudiants du Gymnasium présentent des scores significativement meilleurs que ceux des deux autres groupes sur presque toutes les variables liées à la lecture. Une analyse a posteriori des données de la première étude montrent que les résultats des étudiants du Gymnasium de la seconde étude pouvaient être prédits par leurs résultats obtenus durant l'école primaire. Par ailleurs, comme dans d'autres travaux, nous trouvons une différence de sexe, savoir que les filles obtiennent de meilleurs résultats que les garçons la fois sur le niveau de lecture et sur les mesures en rapport avec la motivation.

Key words: Metacognition, Motivation, Reading, Self-Concept, Text Memory.

Received: June 2002

Revision received: February 2003

Annette Röschl-Heils. Department of Psychology, University of Würzburg, Wittelsbacherplatz 1, D-97074 Würzburg, Germany. E-mail: a.roeschl-heils@ivr.de

Current theme of research:

Literacy. Especially reading. Metacognition. Motivation. Learning difficulties.

Most relevant publications in the field of Psychology of Education:

Röschl-Heils, A. Motivation, metacognition and reading in students of grades 7 and 8. Unpublished Masters Thesis, Department of Psychology, University of Würzburg, Germany.

Wolfgang Schneider. Department of Psychology, University of Würzburg, Wittelsbacherplatz 1, D-97074 Würzburg, Germany. E-mail: schneider@psychologie.uni-wuerzburg.de

Current theme of research:

Literacy. Especially reading. Metacognition. Motivation. Learning difficulties.

Most relevant publications in the field of Psychology of Education:

Schneider, W., Ennemoser, M., & Roth, E. (2000). Training phonological skills in children with at risk for dyslexia: A comparison of three kindergarten intervention programs. *Journal of Educational Psychology*, 92, 284-295.

Schneider, W., & Näsland, J.C. (1999). Impact of early phonological processing skills on reading and spelling in school: Evidence from the Munich Longitudinal Study. In F.E. Weinert & W. Schneider (Eds.), *Individual development from 3 to 12: Findings from the Munich Longitudinal Study* (pp. 126-147). Cambridge, UK: Cambridge University Press.

Schneider, W., Knopf, M., & Stefanek, J. (2002). The development of verbal memory in childhood and adolescence: Findings from the Munich Longitudinal Study. *Journal of Educational Psychology*, 94, 751-761.

Christina E. van Kraayenoord. Schonell Special Education Research Centre, The University of Queensland, Brisbane, Queensland, 4072, Australia. Web site: <http://www.uq.edu.au/education/centres/schonell/>

Current theme of research:

Literacy. Especially reading. Metacognition. Motivation. Learning difficulties.

Most relevant publications in the field of Psychology of Education:

van Kraayenoord, C.E., Elkins, J., Palmer, C., Rickards, F., Colbert, P., & others. (2000). *Literacy, numeracy and students with disabilities* (vols. 1-4). Canberra: Department of Education, Training and Youth Affairs.

van Kraayenoord, C.E. (2002). Focus on literacy. In A.F. Ashman & J. Elkins (Eds.), *Educating children with diverse abilities* (pp. 388-435). Frenchs Forest, NSW: Pearson Education Australia.

van Kraayenoord, C.E., Mori, K.B., Jobling, A., & Ziebarth, K. (2002). Broadening approaches to literacy education for young adults with Down syndrome. In M. Cuskelly, A. Jobling, & S. Buckley (Eds.), *Down syndrome: Into the new millennium*. London: Whurr Publishers.

L'ORIENTATION

SCOLAIRE ET PROFESSIONNELLE

revue de
l'Institut National d'Étude du Travail et d'Orientation Professionnelle

N° 1 - MARS 2003

Jean-Luc ROQUES

Effet du local sur les projets de jeunes
« Le cas de deux petites villes du Gard »

Sandrine BIEMAR, Marie-Christelle PHILIPPE et Marc ROMAINVILLE
L'injonction au projet : paradoxale et infondée ?
Approche longitudinale du choix d'études supérieures

Catherine AGULHON

Diplômes-expériences : complémentarité ou concurrence.
Le cas de l'hôtellerie

Pascale DESRUMAUX-ZAGRODNICKI et Czeslaw ZAGRODNICKI
Logiques économiques, subjectives et objectives de recrutement :
une analyse sur 313 candidats embauchés ou éliminés
dans une multinationale du secteur industriel

Michèle SAINT-JEAN, Christine MIAS et Michel BATAILLE
L'accompagnement de l'implication dans le projet
issu du bilan de compétences des salariés en activité

Véronique AMBROSINO

Aider les chômeurs à reconstruire leurs repères temporels :
une étude des stratégies mises en place pour mieux vivre le chômage

Thomas F. HARRINGTON et Odile DOSNON

Le système Harrington O'shea Pour un choix de carrière
et le Guide pour l'exploration des compétences :
deux outils d'aide à l'élaboration du projet professionnel

Abonnement (4 numéros par an) : 2003 France : 50 Euros
Étranger : 60 Euros - Vente au numéro : 16 Euros.

Adressez directement commande et paiement à :
Régisseur des recettes de l'I.N.E.T.O.P.
41, rue Gay-Lussac, 75005 Paris
Tél. : 01 44 10 78 33