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ANALYTIC AND PRAGMATIC FACTORS IN COLLEGE STUDENTS' METACOGNITIVE READING STRATEGIES

ROMAN TARABAN
Texas Tech University, Lubbock, Texas, USA
MARCEL KERR and KIMBERLY RYNEARSON
Tarleton State University, Stephenville, Texas, USA

*The present study describes the development and validation of a self-report instrument that is designed to measure college students' use of reading strategies for comprehension and for studying while reading school-related materials. Principal components analysis (PCA) of an initial sample (*n = *575) of college students showed that the Metacognitive Reading Strategies Questionnaire (MRSQ) measured two constructs:* analytic *cognitions aimed at reading comprehension, and* pragmatic *behaviors aimed at studying and academic performance. Cross-validation of the constructs with a second sample (*n = *574) revealed that the MRSQ demonstrates high validity and internal reliability, simple and stable structure, and meaningful interpretability.*

Our current understanding of reading strategies has been shaped significantly by research on what expert readers do (e.g., Bazerman, 1985; Pressley & Afflerbach, 1995; Wyatt et al., 1993). These studies demonstrated that successful comprehension does not occur automatically. Rather, it depends on directed cognitive effort, referred to as metacognitive processing, which consists of knowledge about and regulation of cognitive processing (Baker & Brown, 1984). During reading, metacognitive processing is expressed through strategies, which are "procedural, purposeful, effortful, willful, essential, and facilitative in nature" (Alexander & Jetton, 2000, p. 295). "[T]he reader must purposefully or intentionally or willfully invoke strategies" (Alexander & Jetton, 2000, p. 295), and does so to regulate and enhance learning from text. Through metacognitive strategies, a reader allocates significant attention to controlling, monitoring, and evaluating the reading

Address correspondence to Roman Taraban, Department of Psychology, Texas Tech University, Lubbock, TX 79409-2051. E-mail: roman.taraban@ttu.edu

process (Pressley, 2000; Pressley, Brown, El-Dinary, & Afflerbach, 1995). The metacognitive reader plans the reading task, monitors whether a coherent representation of the text is being maintained, and adopts different processing strategies related to the goals and outcomes of ongoing reading.

Besides requiring complex cognitive and linguistic processing, reading is a situated task—it takes place in a context with specific task demands (Alexander & Jetton, 2000). Strategy use varies not only with the processing skills of the reader, but also with the knowledge domain (Nist & Holschuh, 2000), and with the tasks involved (Weinstein & Hume, 1998). To understand individuals' reading behaviors, it is necessary to consider the specific situations in which reading occurs, and the reading tasks that the individuals confront. As noted in the think-aloud protocols of expert academics, one of their goals was to obtain more information about research problems. For a high-school or college student, the assigned tasks and associated goals would be different, and therefore we would expect to observe differences in what individuals in these respective groups did when reading.

Our premise is that college students, who are the focus of this paper, have a distinct set of academic goals related to typical academic tasks, and that their knowledge and use of strategies will reflect those factors. College students are responsible for a variety of assignments, from answering questions at the end of a chapter to writing summaries of course topics. The successful completion of these tasks depends on reading, but reading is not the end-goal of these tasks. Students devote considerable effort to collecting information and organizing it in a form that can be accessed later, as well as taking actions to remember information from the text in order to succeed in class and on tests. Strategies of the successful student often involve physical actions and include annotating text, taking notes, and drawing diagrams (Locke, 1975; Nist & Holschuh, 2000; Nist & Simpson, 1996, 2000; Weinstein & Hume, 1998; Weinstein & Meyer, 1991).

Prior research supports our view that college students select and use reading strategies that are oriented toward success in academic tasks. Wade, Trathen, and Schraw (1990) recruited 67 college volunteers who read a 15-page passage at the 11th-grade level followed by a recall test. This type of task, involving extensive reading and subsequent recall, is typical of many college assignments.

At eight separate points during reading, participants were asked to provide a retrospective report of their reading strategies. The authors identified 14 strategies from the data, which they called "tactics." These were separated into three types, by consensus. One type was *text-noting tactics*, and included highlighting, underlining, circling, copying key words, phrases or sentences, paraphrasing in notes, outlining and diagramming. The second type was *mental-learning tactics* and included rote learning of specific information, mental integration, relating information to background knowledge, imaging, visualizing, self-questioning and self-testing. The third type was *reading tactics*, which included reading only, skimming, reading slowly, and re-reading selected text. These data revealed that reading strategies are directed toward comprehension, but also toward studying and remembering. Other researchers have drawn similar conclusions about the importance of extracting meaning from texts but also taking explicit steps, like underlining or writing annotations in the text margins, in order to succeed academically (Baker & Brown, 1984; Locke, 1975; Nist & Holschuh, 2000; Nist & Simpson, 2000; Weinstein & Hume, 1998; Weinstein & Meyer, 1991).

The goal of the present research was to develop an assessment tool for measuring students' use of metacognitive strategies for comprehension and studying at the college level. Currently, this type of instrument is not available. Mokhtari and Reichard (2002) developed a related assessment tool. They used published studies to identify 100 reading strategies and then applied factor analysis to reduce the list to 30 strategies. Because their instrument was normed using students in Grades 6–12, it is not clear that it would apply to college students. Importantly, only two of the thirty strategies were explicitly concerned with studying as opposed to comprehension (i.e., "I underline or circle information in the text to help me remember it," and "I try to picture or visualize information to help remember what I read"). Therefore, their instrument would not be useful in assessing students' use of strategies related to the practical aspects of college study.

Other instruments, like the Learning and Study Strategies Inventory (LASSI; Weinstein, Schulte, & Palmer, 1987) and the Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich, Smith, Garcia, and McKeachie, 1991, 1993), assess a broad array of motivational and learning factors related to college learning

and study. They were not meant to measure reading strategies per se. Many questions in the LASSI and MSLQ do not clearly separate reading strategies from other (e.g., listening) strategies (e.g., "Whenever I read or hear an assertion or conclusion in this class, I think about possible alternatives"; Pintrich et al., 1991). In both instruments, questions about reading strategies occur in several scales and are mixed in with items that are not about reading (e.g., "When they are available, I attend group review sessions"; Weinstein et al., 1987). Thus, neither of these instruments can be used to characterize the dimensions or constructs in college students' reading strategies.

Questionnaire Study

The goal of this research was to validate a self-report instrument that was designed to assess college students' use of comprehension and study strategies for reading. A list of reading and study strategies was generated from the research literature and subjected to scale reduction procedures (Principal Components Analysis, PCA). The primary source for strategies was a questionnaire developed by Taraban, Rynearson, and Kerr (2000), which was composed to reflect the major comprehension strategies reported by expert readers and strategies taught at the elementary and secondary school levels (Pressley & Afflerbach, 1995; Wyatt et al., 1993). The strategies were primarily about comprehension, as described earlier. Since the publication of Taraban et al.'s findings, the strategies measured on that instrument were extended by drawing on the work of Nist and Simpson (1996) and Nist and Holschuh (2000) to include a better representation of study strategies that are oriented toward academic performance in contexts like test-taking. The revised reading strategy measure—henceforth referred to as the Metacognitive Reading Strategies Questionnaire (MRSQ)—will be discussed in more detail in the Method section.

Method

Participants

The participants were drawn from 74 sections of Freshman Seminar (IS1100) taught in the fall semester at Texas Tech University,

with 15–20 students in each section. Participants consented to the use of their responses for research purposes and completed the questionnaire anonymously. A total of 1,560 students completed the Freshman Seminar, and of these, 1,239 completed the questionnaire. Ninety cases were discarded because of incomplete data. Therefore, data from 74% of the total student cohort were used. Based on demographic questions that were part of the questionnaire, participants reported a median response of 1–5 completed college credits, indicating that the average participant was a student in his or her freshman year. Participants also responded to the question "I predict that my average grade for this coming school year will be ___." The median response was *B*, which is 3.00 on a 4-point scale. This response was close to Freshman Seminar students' actual grade-point average (GPA) at the end of the first semester (see next paragraph).

Because the data were collected anonymously, we describe the population of students who completed the Freshman Seminar during the term the data were collected. The students represented 91 distinct college majors. Nearly all (97.7%) of the participants were 19 or 20 years old. Their mean GPA at the end of the semester was 3.12 ($SD = 0.72$), on a 4-point scale. Their ethnic distribution was 89% Caucasian, 5% Hispanic, 3% African American, and 3% other ethnicities.

Materials

METACOGNITIVE READING STRATEGIES QUESTIONNAIRE (MRSQ)

The questionnaire was constructed from the original 35 Likert items used in Taraban et al. (2000) and an additional eight items, for a total of 43 strategies, which are described in turn. The questions in Taraban et al. were generated as follows. Pressley and Afflerbach (1995, p. 105; Pressley et al., 1995, p. 217) summarized the major strategies that they identified in an analysis of over 38 published reports examining reading comprehension. The reports primarily described reading strategies used by adult skilled readers, although several described strategies taught at the elementary and secondary school levels. The summary was broken down into discrete strategies and these were used to generate two-thirds of the 35 items. The remaining strategies were from Wyatt et al. (1993), as summarized by Pressley et al. (1995, p. 217). The

Wyatt et al. study examined adult expert readers. Eight additional strategies were included in the current study. These additional strategies assessed active learning behaviors (see Nist & Holschuh, 2000; and Nist & Simpson, 1996), and included questions on writing notes in the margins, drawing sketches and diagrams, underlining and highlighting, and drawing on personal information-processing strengths. Participants rated how frequently they used the strategies using a five-point Likert scale (Never Use, Rarely Use, Sometimes Use, Often Use, Always Use).

Procedures

Participants completed the questionnaires individually using a personal computer with access to the World Wide Web. Data were collected using WebCT™, an online course management system. Instructions for completing the questionnaire were provided within WebCT™. The questionnaire was introduced to participants as part of a "Getting to Know You" warm-up activity in which they were asked to reflect on topics that would be covered later in the course. The instructions encouraged students to think about the coming school year and imagine that they were reading material for school. Then they were instructed to think about the typical things they do to help them comprehend text, while they rated each strategy. The strategies were presented in random order.

Results

Factor analysis is used to reduce a large number of observed variables to a smaller number of factors and is the appropriate scale-reduction technique to use when researchers postulate latent (unmeasured) factors that have causal influence—namely, those that cause participants to respond in the way they do. Because we had no strong theoretical basis for postulating latent factors, we chose to use PCA instead of factor analysis to analyze the data. To determine the appropriateness of using PCA, two tests of factorability were performed—the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, which tests whether the partial correlations among variables are small, and Bartlett's test of sphericity, which tests whether the correlation matrix is an identity matrix. An identify matrix would indicate that the factor model is inappropriate. The KMO

coefficient was .920—a value of .60 or greater is considered good. A chi-square statistic associated with Bartlett's test was significant ($\chi^2[903] = 14158.66$, $p < .001$). Although a significant result for Bartlett's test is undesirable, Tabachnick and Fidell (2001) state that a significant finding is not uncommon for large sample sizes, such as is the case in the present study. Overall, PCA was considered appropriate for these data.

Prior to analyzing the data, the participants in each section were randomly assigned to one of two samples. The data were analyzed in two major steps: 1) One sample of 575 participants was used in exploratory analyses using PCA in order to extract interpretable scales from the Likert-type responses and to obtain internal-consistency reliability estimates; and 2) a second sample of 574 participants was used in a single PCA to cross-validate the final outcomes of the exploratory analyses.

Exploratory Analyses

In the exploratory analyses, responses to the 43-item questionnaire were analyzed. The principal components method was used to form uncorrelated linear combinations of the observed variables. In PCA, the first extracted component has maximum variance. Successive components explain progressively smaller portions of the variance and are uncorrelated with each other. Decisions about the number of components to retain were based on the use of multiple criteria, as advocated by Thompson and Daniel (1996): retained components had to have an eigenvalue greater than one, they had to account for a significant proportion of variance, and they had to be on the curvilinear portion of the scree plot. The initial component solution was followed by varimax rotation with Kaiser Normalization, which is an orthogonal rotation method that simplifies the interpretation of the components and is commonly used for data like these (Tabachnick & Fidell, 2001). The rotated solution was examined, applying two criteria to the item loadings and an overall criterion related to interpretability. First, items had to have at least one factor loading greater than 0.40. Whereas many have employed a factor loading criteria of 0.30–0.35, a higher criterion is common in situations like this one with a large number of participants (Tabachnick & Fidell, 2001). Second, the items had to load high on one component

and low on the other components to meet the solution goal of simple structure. A loading less than 0.20 was adopted as the criterion on other components. Third, the components had to be interpretable. This criterion is the most important because it relates to a solution's *comprehensibility* (Garson, 2003). Specifically, items that were retained for a component had to be conceptually coherent and uniformly related to the same construct.

Applying the three criteria for retaining components yielded three components equal to 9.72, 2.68, and 2.22, respectively, and an inflection point in the scree plot between the third and fourth components (fourth component eigenvalue = 1.70). The solution was rotated and the remaining three criteria were applied. With three components, 33 out of 43 items (77%) had loadings greater than 0.40 on at least one component, but 24 of these 33 items (73%) had loadings greater than 0.20 on other components and thereby failed on the second criterion. Because the majority of the items failed the test of simple structure, the analysis also failed to meet the third criterion of interpretability.

Next, a two-component solution was attempted. In the rotated solution, 23 items had loadings greater than 0.40 on one component and less than 0.20 on the other component, thereby fulfilling the first two criteria. The remaining items that failed these criteria were eliminated from the questionnaire. The retained items were then examined for interpretability. One additional item was dropped because it was difficult to interpret it in a way consistent with the other items associated with the component. The items that were retained are displayed in Table 1, and their loadings are shown in Table 2. The first component was labeled Analytic Strategies, which relate to cognitions aimed at reading comprehension. The second component was labeled Pragmatic Strategies, which relate to behaviors aimed at studying and academic performance.

In order to obtain estimates of internal-consistency reliability, Cronbach's alpha coefficients were computed for the entire set of 22 variables ($\alpha = .84$), for Component 1 ($\alpha = .85$), and for Component 2 ($\alpha = .75$). These results indicated that the overall scale and subscales had high internal consistency.

Confirmatory Analysis

Due to the absence of a strong theoretical basis for the MRSQ items, confirmatory factor analysis using structural equation

TABLE 1. Analytic and Pragmatic Strategies.

Component 1 Strategies: Analytic
Evaluate: As I am reading, I evaluate the text to determine whether it contributes to my knowledge/understanding of the subject.
Anticipate: After I have read a text, I anticipate how I will use the knowledge that I have gained from reading the text.
Draw: I try to draw on my knowledge of the topic to help me understand what I am reading.
Back: While I am reading, I reconsider and revise my background knowledge about the topic, based on the text's content.
Revise: While I am reading, I reconsider and revise my prior questions about the topic, based on the text's content.
Consider: After I read a text, I consider other possible interpretations to determine whether I understood the text.
Distinguish: As I am reading, I distinguish between information that I already know and new information.
Infer: When information critical to my understanding of the text is not directly stated, I try to infer that information from the text.
Reading goals: I evaluate whether what I am reading is relevant to my reading goals.
Search: I search out information relevant to my reading goals.
Present later: I anticipate information that will be presented later in the text.
Meaning: While I am reading, I try to determine the meaning of unknown words that seem critical to the meaning of the text.
Current information: As I read along, I check whether I had anticipated the current information.
Strengths: While reading, I exploit my personal strengths in order to better understand the text. If I am a good reader, I focus on the text; if I am good with figures and diagrams, I focus on that information.
Visualize descriptions: While reading, I visualize descriptions in order to better understand the text.
Hard: I note how hard or easy a text is to read.
Component 2 Strategies: Pragmatic
Notes: I make notes when reading in order to remember the information.
Highlight: While reading, I underline and highlight important information in order to find it more easily later on.
Margin: While reading, I write questions and notes in the margin in order to better understand the text.
Underline: I try to underline when reading in order to remember the information.
Read more: I read material more than once in order to remember the information.
Re-read: When I am having difficulty comprehending a text, I re-read the text.

TABLE 2. Mean Ratings (*SD*), Component Loadings and Communalities for Rotated Two-Component Exploratory and Confirmatory Solutions.

Item	Mean (*SD*) ($N = 1149$)	Exploratory ($n = 575$)			Confirmatory ($n = 574$)		
		C1	C2	CM	C1	C2	CM
Evaluate	3.33 (0.93)	**.60**	.17	.39	**.57**	.10	.33
Anticipate	3.02 (0.99)	**.59**	.15	.37	**.60**	−.00	.36
Draw	3.70 (0.92)	**.58**	.11	.35	**.63**	−.03	.40
Back	3.12 (0.93)	**.58**	.09	.34	**.62**	−.02	.38
Revise	2.86 (0.96)	**.57**	.18	.36	**.55**	.25	.37
Consider	2.90 (0.96)	**.57**	.17	.35	**.49**	.23	.29
Distinguish	3.67 (0.94)	**.56**	.06	.32	**.57**	.01	.33
Infer	3.54 (0.88)	**.56**	.14	.33	**.56**	.01	.31
Reading goals	3.13 (1.07)	**.53**	.08	.29	**.54**	−.01	.29
Search	3.08 (1.05)	**.51**	.12	.27	**.52**	.05	.27
Present later	2.96 (1.01)	**.49**	.16	.27	**.52**	.00	.27
Meaning	3.70 (0.92)	**.49**	.19	.28	**.46**	.18	.24
Current information	2.51 (1.04)	**.48**	.12	.24	**.47**	.09	.23
Strengths	3.60 (1.00)	**.46**	.13	.23	**.48**	.23	.28
Visualize descriptions	3.69 (0.99)	**.46**	.07	.22	.36	.24	.19
Hard	3.38 (1.25)	**.41**	−.09	.25	.27	.04	.07
Notes	3.32 (1.09)	−.01	**.74**	.55	.00	**.74**	.55
Highlight	3.65 (1.20)	−.07	**.67**	.45	−.05	**.83**	.69
Margin	2.79 (1.14)	.07	**.67**	.45	.11	**.73**	.55
Underline	3.39 (1.20)	−.06	**.63**	.40	−.06	**.82**	.68
Read more	3.52 (0.95)	.04	**.52**	.27	.14	**.58**	.36
Re-read	4.20 (083)	.14	**.41**	.19	.24	.37	.19

Notes. C1 = Component 1 loadings. C2 = Component 2 loadings. CM = Communalities. Loadings > 0.40 are presented in bold.

modeling was not appropriate. Instead, a solution comparison from one sample to another was employed (cf., Kronenberger & Thompson, 1990). The remaining sample of 574 participants was used in this second analysis, which forced a two-component solution. This analysis was conducted in order to cross-validate the outcome of the exploratory analyses.

The eigenvalues for the two components were 4.834 and 2.811. Together, the two components accounted for 34.75% of the variance. The component loadings for this analysis are displayed in Table 2. A comparison of the confirmatory solution with the final two-component exploratory solution showed that 19 out

of 22 strategies (86%) met the first criterion set earlier (at least one factor loading >0.40). Seventeen out of 22 variables (77%) fulfilled the second criterion of simple structure (loadings <0.20 on the other component). In most cases, criteria were missed by only .03 or .04. Importantly, the same items that loaded on Component 1 and Component 2 in the exploratory two-component solution, loaded on the same two components in the confirmatory analysis. The communalities in Table 2 provide an estimate of the variance accounted for by each item in the rotated solution. A Pearson correlation between the communalities for the final-exploratory and confirmatory two-component solutions was high and significantly different from zero [$r(20) = .85$, $p < .001$]. Cronbach's alpha coefficients were computed for the entire set of 22 variables ($\alpha = .82$), for Component 1 ($\alpha = .82$), and for Component 2 ($\alpha = .80$), and confirmed that the overall scale and subscales had high internal consistency.

Internal and External Scale Correlations

Table 3 summarizes interscale correlations for the combined samples, and the correlations of the scales to students' expected grades for the coming school year. The purpose of examining the correlations between the scale scores was to determine how much overlap there was between the analytic and pragmatic dimensions of reading. The item ratings for each participant on each component were summed and then correlated. It was expected that there would be some overlap between scales because each measures different aspects of reading in an academic setting. The correlation between analytic strategies and expected grade was significant, and indicated that higher use of analytic strategies was associated with expectations for higher grades. The correlation of pragmatic strategies with expected grade was close to zero and not significant.

TABLE 3. Internal and External Scale Correlations.

	Pragmatic	Expected Grade
Analytic	.25***	.18***
Pragmatic		.03

Note. $N = 1149$. *** $p < .001$.

Discussion

We constructed a 22-item questionnaire called the MRSQ that measures college students' metacognitive reading strategies. This instrument is based upon exploratory and confirmatory analyses and selection criteria for the items that favored simple structure. The two-dimensional structure of the MRSQ revealed an analytic-cognitive component and a pragmatic-behavioral component. The structure is simple, with only moderate overlap between components, and is stable across samples of respondents. Using Cronbach's test of internal consistency, we found that the scales and the instrument as a whole had good internal-consistency reliability.

Taraban et al. (2000) based their initial questionnaire on several comprehensive reviews of metacognitive reading strategies (Pressley & Afflerbach, 1995; Pressley et al., 1995; Wyatt et al., 1993). Additional strategies from study-oriented sources (Nist & Holschuh, 2000; Nist & Simpson, 1996) were added for the current study. Because the questions for the MRSQ are representative of the universe of strategies used by readers for academic goals, this instrument has content validity.

Some evidence for the construct validity of the MRSQ can be found in the correlations between the two scales and expected grades. The correlations showed that the use of analytic strategies was associated with higher grade expectations, but that the use of pragmatic strategies was not. This is consistent with Taraban et al. (2000), who tested strategy use against grade-point average (GPA), scores on the American College Testing (ACT) Reading and English tests, and scores on the Scholastic Aptitude Test (SAT) Verbal test. Three strategies in Taraban et al. are among the pragmatic strategies in the MRSQ. In 15 separate *t*-tests involving GPA, ACT scores, and SAT scores, only one of the tests was significant, and that test showed that students with higher SAT scores reported less strategy use (NOTES), not more. On the other hand, many of the tests associated with analytic strategies were significant and indicated that higher use of those strategies was associated with better academic performance and higher aptitudes.

The analytic-cognitive and pragmatic-behavioral components are consistent with the existing literature and research on reading strategies. That research indicates that students read to comprehend and to remember (Baker & Brown, 1984). One application

of reading strategies like underlining, highlighting, and annotating text, is to isolate key information, which reduces the amount of information that a student must remember (Nist & Holschuh, 2000). These overt behaviors help students to review important information and create further opportunities to learn and move information into long-term memory (Weinstein & Meyer, 1991). Remembering information is a major part of college study, therefore we believe that the pragmatic strategies represent a unique component of reading when it occurs in the context of college assignments and tests (Alexander & Jetton, 2000; Nist & Holschuh, 2000; Weinstein & Hume, 1998).

The MRSQ can be used to advance our understanding of reading in college. The findings in Taraban et al. (2000) did not favor pragmatic strategies. The correlations in the present study between analytic strategies, pragmatic strategies, and expected grade showed that higher use of analytic strategies was associated with higher expected grades, but that higher use of pragmatic strategies was not. This leads to the following question: What is the role of pragmatic strategies in academic success? In the future, the MRSQ will allow researchers to distinguish between readers on these two dimensions and to conduct experiments that address this question. Nist and Holschuh (2000) suggested that strategies like highlighting and underlining—strategies that fit the pragmatic-behavioral component—may provide a beginning point for learning deeper, more demanding strategies, like annotating text. Thus these strategies may be more appropriate for less-sophisticated readers. In contrast, Weinstein and Meyer (1991) characterized strategies like highlighting and underlining as repetition strategies that could be important to any reader in terms of the information-processing function of getting information into long-term memory. On either one of these accounts, we might not find much difference in the overt mechanics when skilled and less-skilled readers apply pragmatic strategies. Skilled and less-skilled readers may go through the same motions implied in the pragmatic strategies of highlighting, annotating, and re-reading, but they may use these with different underlying cognitive goals and products. Available research methodologies, like the think-aloud method, in conjunction with the MRSQ, can be used to explore these differences.

The present findings also raise questions about instruction. Direct instruction of strategies benefits students (Nist & Holschuh,

2000). However, the present results raise questions about which strategies to teach, when, and to whom. It may be important to teach and model the relation of comprehension strategies to "remember" strategies. Baker and Brown (1984) suggested that it may be necessary to comprehend a text before one could effectively apply "remember" strategies, like those in the pragmatic-behavioral component. As indicated in Taraban et al. (2000) and the present correlations with expected grade, all students may use the pragmatic strategies, but all students might not use them in conjunction with analytic strategies. It may be that academic performance is enhanced only when the two kinds of strategies are coordinated effectively.

The current study is not without limitations. The participants consisted of college students from a traditional southern university. With increased diversity in higher education and the emergence of online learning, the generalizability of these findings to other university students and the general population of readers is limited. Future research on the MRSQ should select participants who are more diverse in regards to age, ethnicity, occupation, and geographical location.

References

Alexander, P. A., & Jetton, T. L. (2000). Learning from text: A multidimensional and developmental perspective. In M. Kamil, P. B. Mosenthal, P. D. Pearson, and R. Barr (Eds.), *Handbook of reading research, Vol. III* (pp. 285–310). Mahwah, NJ: Erlbaum.

Baker, L., & Brown, A. L. (1984). Metacognitive skills and reading. In P. D. Pearson, R. Barr, M. L. Kamil, & P. Mosenthal (Eds.), *Handbook of reading research, Vol. 1* (pp. 353–394). New York: Longman.

Bazerman, C. (1985). Physicists reading physics. *Written Communication*, *2*, 3–23.

Garson, G. D. (2003, March 3). Factor analysis. In PA 765 Statnotes: An online textbook. Retrieved from http://www2.chass.ncsu.edu/garson/pa765/statnote.htm.

Kronenberger, W. G., & Thompson, R. J. (1990). Dimensions of family functioning in families with chronically ill children: A higher order factor analysis of the Family Environment Scale. *Journal of Clinical Child Psychology*, *19*, 380–388.

Locke, E. A. (1975). *A guide to effective study.* New York: Springer.

Mokhtari, K., & Reichard, C. (2002). Assessing students' metacognitive awareness of reading strategies inventory. *Journal of Educational Psychology*, *94*, 249–259.

Nist, S. L., & Holschuh, J. L. (2000). Comprehension strategies at the college level. In R. Flippo & D. Caverly (Eds.), *Handbook of college reading and study strategy research* (pp. 75–104). Mahwah, NJ: Erlbaum.

Nist, S. L., & Simpson, M. L. (1996). *Developing textbook fluency.* Lexington, MA: D. C. Heath.

Nist, S. L., & Simpson, M. L. (2000). College studying. In M. Kamil, P. B. Mosenthal, P. D. Pearson, & R. Barr (Eds.), *Handbook of reading research, Vol. III* (pp. 645–666). Mahwah, NJ: Erlbaum.

Pintrich, P., Smith, D., Garcia, T., & McKeachie, W. (1991). A manual for the use of the motivated strategies for learning questionnaire (MSLQ), *Technical Report No. 91-B-004.* Ann Arbor, MI: The Regents of the University of Michigan.

Pintrich, P., Smith, D., Garcia, T., & McKeachie, W. (1993). Reliability and predictive validity of the motivated strategies for learning questionnaire (MSLQ). *Educational and Psychological Measurement, 53,* 801–813.

Pressley, M. (2000). What should reading instruction be the instruction of? In M. Kamil, P. B. Mosenthal, P. D. Pearson, & R. Barr (Eds.), *Handbook of reading research, Vol. III* (pp. 545–561). Mahwah, NJ: Erlbaum.

Pressley, M., & Afflerbach, P. (1995). *Verbal protocols of reading: The nature of constructively responsive reading.* Hillsdale, NJ: Erlbaum.

Pressley, M., Brown, R., El-Dinary, P. B., & Afflerbach, P. (1995). The comprehension instruction that students need: Instruction fostering constructively responsive reading. *Learning Disabilities Research and Practice, 10,* 215–224.

Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics,* 4th ed. Needham Heights, MA: Allyn & Bacon.

Taraban, R., Rynearson, K., & Kerr, M. (2000). College students' academic performance and self-reports of comprehension strategy use. *Reading Psychology, 21,* 283–308.

Thompson, B., & Daniel, L. G. (1996). Factor analytic evidence for the construct validity of scores: A historical overview and some guidelines. *Educational and Psychological Measurement, 56,* 197–208.

Wade, S. E., Trathen, W., & Schraw, G. (1990). An analysis of spontaneous study strategies. *Reading Research Quarterly, 25,* 147–166.

Weinstein, C. E., & Hume, L. M. (1998). *Study strategies for lifelong learning.* Washington, DC: American Psychological Association.

Weinstein, C. E., & Meyer, D. (1991). Cognitive learning strategies and college teaching. *New directions for teaching and learning, No. 45.* San Francisco: Jossey-Bass.

Weinstein, C. E., Schulte, A. C., & Palmer, D. R. (1987). *Learning and study strategies inventory.* Clearwater, FL: H & H Publishing.

Wyatt, D., Pressley, M., El-Dinary, P., Stein, S., Evans, P., & Brown, R. (1993). Comprehension strategies, worth and credibility monitoring, and evaluations: Cold and hot cognition when experts read professional articles that are important to them. *Learning and Individual Differences, 5,* 49–72.