

The relationship between reading ability and self-perception among African-American postgraduate students

Kathleen M.T. Collins

University of Arkansas at Fayetteville, USA

Anthony J. Onwuegbuzie

Sam Houston State University, Texas, USA

Qun G. Jiao

City University of New York, USA

gerry.jiao@baruch.cuny.edu

Abstract

This study investigated the relationship between two components of reading ability (ie reading comprehension and reading vocabulary) and six dimensions of self-perception (ie perceived scholastic competence, perceived intellectual ability, perceived creativity, perceived job competence, perceived social acceptance, and perceived global self-worth) as factors impacting academic performance. The sample comprised 101 African-American postgraduate students. A canonical correlation analysis revealed that African-American postgraduate students with the highest levels of perceived scholastic competence, perceived intellectual ability, perceived creativity, and perceived self-worth tended to have the highest levels of reading comprehension, in particular, and reading vocabulary, to a lesser degree. Implications of the results are discussed.

Keywords:

Reading Ability, Reading Comprehension, Self-Perception, African-American Postgraduate Student, Academic Performance

Introduction

The ability to read is the traditional criterion of beginning school achievement and later academic success (Perfetti 1985). An individual's initial experiences in learning to read influence both subsequent accomplishment in reading and the development of reading-related self-perceptions (Chapman & Tunmer 1995). At the college level, students' levels of reading ability as a composite factor may influence their overall academic experiences. Du Boulay (1999), who assessed undergraduates' reading and writing skills, reported that undergraduates often experience problems developing a critique of an argument presented in scholarly articles or textbooks. Bray et al (2004) noted that college students' literacy, which includes reading

comprehension and attitude toward literacy activities, fluctuated depending on the background variables such as race, gender, and prior literacy activities. Collins (2006) found that freshman undergraduates who reported the highest levels of writing apprehension and overall library anxiety tended to have the poorest study habits and the lowest levels of reading comprehension.

Research conducted at the postgraduate level also has documented the relationship between students' reading abilities and their performance outcomes in the context of research methodology courses. Onwuegbuzie and Collins (2002) found that students' reading comprehension, as measured by a standardized test, was a mediating factor impacting their understanding of research concepts, methodologies, and applications. Other researchers also reported that postgraduate students' reading comprehension and reading vocabulary were significant predictors of these students' performance levels in research methodology courses (Onwuegbuzie et al 2001).

Recently, researchers have examined the reading ability of African-American postgraduate students and the degree that reading ability predicts their achievement levels in research methodology courses. For example, Onwuegbuzie et al (2004) found that African-American postgraduate students' scores on the Nelson-Denny Reading Test (NDRT) (Brown, Fishco & Hanna 1993) were statistically significantly higher than the reading comprehension scores of a normative sample of undergraduate students. In another study, Collins and Onwuegbuzie (2002-2003) found a statistically significant and practically significant relationship between African-American postgraduate students' reading comprehension and reading vocabulary scores, as measured by the NDRT (1993) and their achievement outcomes in education research methodology courses.

Researchers have operationalized the construct of comprehension monitoring as comprising two dimensions: evaluation of comprehension (ie self-awareness of the meaning of the written text) and regulation of comprehension (ie efficient selection and execution of metacognitive monitoring strategies) (Baker 1985; Brown 1980, 1987; Hacker 1998; Otero 1998; Zabrocky & Ratner 1992). When reading text, the self-regulated reader identifies and rectifies inconsistencies in text construction (Sitko 1992) and, therefore, facilitates his/her understanding of the written text (Brown 1987). While considerable research attention has been devoted to the cognitive aspects of reading difficulties (Juel 1988; Stanovich 2000), relatively less attention has been focused on the role of motivational beliefs in reading and learning. Bandura (1993) noted that competence in learning requires not only cognitive skills, but also motivational beliefs to use skills effectively. In the context of reading, the motivational influence of positive self-perceptions may determine whether opportunities to read would be pursued by students, and may also impact students' comprehension of material read in terms of expending the effort and persistence necessary to understand complex material (Henk & Melnick 1992).

Self-perceptions are impressions that a person has of his/her competency in various domains or contexts (Harter 1986). An individual's self-perceived competence in a domain is a critical component of self-esteem (Bong & Skaalvik 2003), or global self-worth, which is formulated through life experiences and shaped by environmental and personal relationships. A person's global self-worth is individual specific, namely, changes in self-esteem occur for some individuals but not for others. Individuals' levels of self-esteem also impact their experiences and

quality of social relationships, and promote self regulation in pursuing standards of behavior and self-selected goals (Harter & Whitesell 2003).

At the college level, research suggests that self-perception is a multidimensional construct that can be classified as falling into one of the two main categories: competencies or abilities (eg scholastic competence, job competence) and social relationships (eg perceived physical appearance, perceived peer acceptance) (Harter, 1986; Neemann & Harter 1986; Rosenberg 1986). These categories are based upon Harter's (1986) identification of the dimensions of college students' self-perceptions that include the following: close relationships, parent relationships, romantic relationships, social acceptance, intellectual ability, creativity, job competence, scholastic competence, athletic competence, physical appearance, self-worth, humor, and morality.

Onwuegbuzie (2000) examined the role of self-perception as a factor impacting postgraduate students' levels of statistics anxiety (ie student's level of apprehension when encountering statistics in any context or format; Onwuegbuzie et al 1997) while enrolled in research methodology courses. He found a statistically significant relationship between seven dimensions of self-perceptions and students' levels of statistics anxiety. Specifically, Onwuegbuzie (2000) found that postgraduate students' levels of statistics anxiety, as measured by their perceptions of the worth of statistics, were inversely related to dimensions of self-perceptions (ie perceived creativity, perceived intellectual ability, perceived scholastic competence, perceived global self worth). Other researchers have found that global self-worth is related to postgraduate students' levels of anxiety in the context of research methodology courses—namely, writing anxiety (Onwuegbuzie 1999) and library anxiety (Jiao & Onwuegbuzie 1999).

Findings from the reviewed studies in the area of self-perception suggest that students' self-perceptions are an important component of their success in college at both the undergraduate and postgraduate levels. As such, it is important to determine potential antecedent correlates of self-perception. One potential antecedent of self-perception that has received little or no attention at the college level is reading ability. This is surprising, bearing in mind that levels of reading ability have been found to be extremely variable among both undergraduate and postgraduate students and, also, have been found to be a significant predictor of academic performance for both of these groups (eg Bray et al 2004; Onwuegbuzie & Collins 2002). Results of the reviewed studies in the area of self-perception also indicate that an individual's perceived competency associated with performing a task plays a pivotal role in promoting self-regulation—a key factor of reading ability. Therefore, the goal of the present study is to investigate the potential relationship between reading abilities and self perception as factors impacting academic performance, and simultaneously to contribute to the literature in the areas of reading ability, self-perception, and African-American postgraduate students. Specifically, we investigate the relationship between two components of reading ability (ie reading comprehension and reading vocabulary) and six dimensions of self-perception (ie perceived scholastic competence, perceived intellectual ability, perceived creativity, perceived job competence, perceived social acceptance, and perceived global self-worth) among African-American postgraduate students enrolled in a large university in the eastern United States of America.

Method

Participants

Participants were 101 African-American postgraduate students enrolled in several sections of a statistics course at a Historically Black College and University (HBCU) located in the eastern region of the United States of America. To participate in the study, students were required to sign an informed consent document that was given during the first class session of the semester. For participating in the study, students received three percentage points that formed part of their final course grade averages. No student declined to participate. The majority of the participants (84.63 percent) was female. Ages of the participants ranged from 22 to 65 years ($M = 29.56$, $SD = 7.63$).

The number of research methodology courses taken by the sample members ranged from 0 to 9 ($M = 2.12$, $SD = 1.86$), with 16.2 percent of the participants never having taken a research methodology course. Similarly, the number of statistics courses taken by these individuals ranged from 0 to 5 ($M = 1.46$, $SD = 1.12$), with only 19.2 percent of the sample members never having taken a statistics course. Also, the number of college-level mathematics courses taken by these individuals ranged from 0 to 9 ($M = 3.13$, $SD = 2.01$). Final grades predicted by students ranged from 73 to 100 on a 100-point scale ($M = 91.20$, $SD = 6.27$).

Instruments and procedure

Participants were administered the NDRT (Form G) and the Self-Perception Profile for College Students (SPPCS; Neemann & Harter 1986) on the first day of class. The NDRT was utilized in this investigation to measure reading vocabulary and reading comprehension. This instrument, developed by Brown et al (1993), is a 118-item test divided into two subtests, Vocabulary, which consists of 80 items, and Comprehension, which consists of 38 items and seven reading passages. Each item on the NDRT contains a five-choice response option. The NDRT assesses reading vocabulary, reading comprehension, and the reading rate of test takers. Through a series of revisions, content and statistical data have been made more current, although the format of the test has remained unchanged over the years (Brown et al 1993). This test was selected because of its widespread use among researchers, adequate score reliability and score validity that have been reported in the literature, and the fact that normative data are available on very large samples of high school and undergraduate students. For the present investigation, score reliability, as measured by KR-20, was .93 (95 percent CI = .91, .95) for the reading vocabulary test and .80 (95 percent CI = .74, .85) for the reading comprehension test.

The SPPCS is a 54-item scale (Neemann & Harter 1986). For each item, students are asked first to indicate which of the two types of students they are most like (eg “Some students do very well at their studies” versus “Other students don’t do very well at their studies”). The student then decides whether the chosen description is “sort of true” or “really true” for him or her. According to the authors, “The effectiveness of this question format lies in the implication that half of the students in the world (or in one’s reference group) view themselves in one way, whereas the other half view themselves in the opposite manner; either choice is legitimized” (Neemann & Harter 1986, p 4). The SPPCS comprises 13 subscales. For every subscale, half of the items are worded with negative statements. Each item is scored from 1 to 4, such that a “1” indicates low self-perception and a score of “4” reflects high self-perception. Seven of the subscales were not deemed relevant for this study (ie perceived athletic competence, perceived appearance,

perceived romantic relationships, perceived close relationships, perceived parent relationships, and perceived morality). Thus, the following six subscales were used: (a) perceived creativity; (b) perceived intellectual ability; (c) perceived scholastic competence; (d) perceived job competence; (e) perceived social acceptance; and (f) perceived global self-worth.

Neemann and Harter (1986) reported score reliability coefficients for these subscales, as assessed by coefficient alpha, that ranged from .76 to .92, with the score reliabilities of all but one subscale (ie job competence) exceeding .80. For the present study, the score reliabilities of the selected subscales were as follows: perceived creativity (.76; 95 percent confidence interval [CI] = .67, .83), perceived intellectual ability (.73; 95 percent CI = .63, .81), perceived scholastic competence (.73; 95 percent CI = .63, .81), perceived job competence (.74; 95 percent CI = .65, .81), perceived social acceptance (.71; 95 percent CI = .61, .79), and perceived global self-worth (.80; 95 percent CI = .73, .85).

Results

Table 1 presents the means and standard deviations pertaining to the reading ability scores (ie reading comprehension and reading vocabulary) and the self-perception dimension scores (ie perceived creativity, perceived intellectual ability, perceived scholastic competence, perceived job competence, perceived social acceptance, and perceived global self-worth). A series of dependent samples t-tests, applying the Bonferroni adjustment, revealed no statistically significant differences among all the self-perception measures. Thus, the sample members had similar levels of self-perceptions across all the dimensions.

Table 1: Means and standard deviations for all outcome measures

Measure	M	SD
Reading Comprehension	66.18	7.98
Reading Vocabulary	65.26	9.43
Perceived Scholastic Competence	11.08	3.19
Perceived Intellectual Ability	11.50	3.68
Perceived Creativity	10.60	2.76
Perceived Job Competence	11.74	2.89
Perceived Social Acceptance	11.03	2.99
Perceived Global Self-Worth	16.74	4.35

A series of independent samples t-tests, after applying the Bonferroni adjustment, revealed that the sample members obtained statistically significantly higher ($t = 3.84$, $p < .01$) scores on the reading comprehension portion of the NDRT than did a normative sample of 5,000 undergraduate students from 38 institutions ($M = 61.60$, $SD = 11.94$) studied by Brown et al (1993). The effect size associated with this difference was .39 (Hedges & Olkin's [1985] z-based 95 percent Confidence Interval [CI] = .19, .59), which, using Cohen's (1988) criteria, was small to moderate. (According to Hess & Kromrey [2002], Hedges & Olkin's [1985] z-based confidence interval procedure compares favorably with all other methods of constructing confidence bands, including Steiger & Fouladi's [1992, 1997] interval inversion approach.) On the other hand, no statistically significant difference ($t = 0.64$, $p > .05$) was found between

reading vocabulary scores of the present sample and those pertaining to the normative undergraduate sample ($M = 64.52$, $SD = 11.46$).

Table 2. Canonical solution for first function: relationship between reading ability scores and self-perception dimension scores

Variable	Standardized Coefficient	Structure Coefficient	Structure Coefficient ² (Percent)
Reading Ability Dimension:			
Reading Comprehension	0.86*	0.94*	88.36
Reading Vocabulary	0.33*	0.56*	31.36
Self-Perception Dimension:			
Perceived Scholastic Competence	0.44*	0.92*	84.64
Perceived Intellectual Ability	0.30*	0.87*	75.69
Perceived Creativity	0.34*	0.49*	24.01
Perceived Job Competence	0.21	0.71*	50.41
Perceived Social Acceptance	0.24	0.58*	33.64
Perceived Global Self-Worth	0.36*	0.84*	70.56

*Coefficients with effect sizes larger than .3 (Lambert & Durand, 1975).

Table 2 presents the results of the canonical correlation analysis. This analysis was used to determine the degree to which the reading ability variables were related to the self-perception dimensions. Canonical correlation analyses provide indices of both statistical significance and practical significance. The statistical significance of the canonical roots was tested via the F-statistic, which is based on Rao's approximation (Rao 1952).

The canonical analysis revealed that both canonical correlations combined were statistically significant ($p < .05$). However, when the first canonical root was excluded, the remaining canonical root was not statistically significant. Together, these results suggested that the first canonical function was statistically significant, but the second canonical root was not statistically significant. Indeed, the first canonical correlation ($R_{c1} = .88$) was extremely educationally significant, contributing 77.4 percent (ie R_{c1}^2) to the shared variance. However, the second canonical correlation ($R_{c2} = .26$) did not appear to be educationally significant. Consequently, only the first canonical correlation was interpreted.

Data pertaining to the first canonical root are presented in Table 2. This table provides both standardized function coefficients and structure coefficients, as recommended by several statisticians (eg Onwuegbuzie & Daniel 2003; Thompson 1990). The standardized canonical function coefficients revealed that, using a cutoff correlation of 0.3 recommended by Lambert and Durand (1975) as an acceptable minimum coefficient value, both reading comprehension and reading vocabulary made significant contributions to the self-perception composite, with reading comprehension making by far the greater contribution. With respect to the self-perception set, perceived scholastic competence, perceived intellectual ability, perceived creativity, and perceived global self worth made important contributions to the composite set,

with perceived scholastic competence and perceived global self-worth making slightly higher contributions.

The structure coefficients (Table 2) indicated that both reading ability dimensions made important contributions to the first canonical variate. The square of the structure coefficient (Table 2) indicated that reading comprehension made a very large contribution, explaining 88.36 percent of the variance. Reading vocabulary explained 31.36 percent of the variance. With respect to the self-perception set, all six measures made noteworthy contributions, with perceived scholastic competence (84.64 percent explained) making the largest contribution, followed by perceived intellectual ability (75.69 percent explained) and perceived global self-worth (70.56 percent explained), respectively.

Comparing the standardized and structure coefficients showed that perceived job competence and perceived social acceptance appeared to be collinear with at least one of the other self-perception variables because their standardized coefficients were small but their structure coefficients were somewhat significant.

Discussion

The purpose of this study was to investigate the relationship between two components of reading ability and six dimensions of self-perception using multivariate statistics. A canonical correlation analysis revealed that both reading comprehension and reading vocabulary were related to the self-perception composite, with reading comprehension making by far the greater contribution. Specifically, African-American postgraduate students with the highest levels of perceived scholastic competence, perceived intellectual ability, perceived creativity, and perceived self-worth tended to have the highest levels of reading ability as measured by reading comprehension, in particular, and reading vocabulary, to a lesser degree. Given the societal importance placed on one's ability to read, it is likely that a student who has a proficient level of reading ability is more likely to have concomitant levels of perceived competency in areas related to the intellect and perceived global self-worth. Conversely, a student who has low reading ability is more likely to experience a debilitating effect on perceived competency in areas related to the intellect and to self-esteem due to implications associated with low reading ability.

The current investigation indicates that for African-American postgraduate students, in general, and at the very least, African-American female postgraduate students, in particular, reading ability may play an important role in the formation of self-perception. Moreover, the fact that reading comprehension and reading vocabulary scores predict self-perception suggests that poor reading ability can place an African-American postgraduate student at risk for low self-perception. As such, future research should determine whether interventions designed at improving reading ability will increase African-American postgraduate students' levels of self-perception.

There are several caveats to mention when interpreting our findings. First, our sample of African-American postgraduate students is a relatively small and homogeneous sample obtained from one private university—thereby limiting socioeconomic variation. Although racial/ethnic differences have been found in reading performance (Onwuegbuzie et al 2004), it is not clear whether the multivariate relationship found in this study can be generalized to postgraduate students who represent other racial and ethnic backgrounds. Second, our results may not be

representative of African-American postgraduate students, in general, because our sample represents postgraduate students who at the time of data collection were enrolled at a HBCU and, therefore, they were among the highest-achieving African-American postgraduate students. Finally, the external validity of the results is compromised because the sample was predominantly female. As such, replications of the study are needed utilizing (a) a larger sample, (b) an undergraduate sample, (c) a sample containing a greater proportion of male students, (d) a sample representing multiple ethnic groups, and (e) a sample representing a wider range of socioeconomic levels as a measure of students' environmental resources.

Nevertheless, this study contributes to the literature by exploring the relationship between reading ability and self-perception among African-American female postgraduate students. Subsequent studies utilizing interview techniques to obtain qualitative data exploring the reasons for participants' responses to items on the SPCCS will provide a broader perspective on this topic.

References

- Baker L (1985) How do we know when we don't understand? Standards for evaluating text comprehension. In D L Forrest-Pressley, F E MacKinnon and T G Waller (eds) *Metacognition, cognition, and human performance*. New York: Academic, pp 155-205.
- Bandura A (1993) Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist*, vol 28, pp 117-148.
- Bong M & Skaalvik E M (2003) Academic self-concept and self-efficacy: How different are they really? *Educational Psychology Review*, vol 15, pp 1-41.
- Bray G B, Pascarella, E T & Pierson C T (2004) Postsecondary education and some dimensions of literacy development: An exploration of longitudinal evidence. *Reading Research Quarterly*, vol 39, pp 302-330.
- Brown AL (1980) Metacognitive development and reading. In R J Spiro, B C Bruce & W F Brewer (eds) *Theoretical issues in reading comprehension*. Hillsdale, NJ: Lawrence Erlbaum, pp 453-481.
- Brown A (1987) Metacognition, executive control, self-regulation, and other more mysterious mechanisms. In F Weinert and R Kluwe (eds) *Metacognition, motivation, and understanding*. Hillsdale, NJ: Lawrence Erlbaum, pp. 65-116.
- Brown J I, Fishco V V & Hanna G (1993) *Nelson-Denny Reading Test--Manual for scoring and interpretation*, Forms G and H. Itasca, IL: Riverside Publishing.
- Chapman J W & Tunmer W E (1995) Development of young children's reading self-concepts: An examination of emerging subcomponents and their relationship with reading achievement. *Journal of Educational Psychology*, vol 87, pp 154-167.
- Cohen J (1988) *Statistical power analysis for the behavioral sciences*, 2nd ed. Hillsdale, NJ: Lawrence Erlbaum.
- Collins K M T (2006) The relationship between dimensions of anxiety and undergraduates' performance-based skills in a remedial reading course. Paper presented at the *annual meeting of the American Educational Research Association*, April 7-11, San Francisco, California, USA.
- Collins K M T & Onwuegbuzie A J (2002-2003) Reading ability and the performance of African American graduate students in research methodology courses. *The Journal of College Literacy and Learning*, vol 31, pp 39-52.
- Du Boulay D (1999) Argument in reading: What does it involve and how can students become better critical readers? *Teaching in Higher Education*, vol 4, pp 147-162.
- Hacker D J (1998) Self-regulated comprehension during normal reading. In D J Hacker, J Dunlosky and AC Gaesser (eds) *Metacognition in educational theory and practice*. Hillsdale, NJ: Lawrence Erlbaum, pp. 165-192.
- Harter S (1986) *The Self-Perception Profile for Adolescents*. Unpublished manuscript. University of Denver, Colorado.
- Harter S & Whitesell N R (2003) Beyond the debate: Why some adolescents report stable self-worth over time and situation, whereas others report changes in self-worth. *Journal of Personality*, vol 71, pp 1027-1058.
- Hedges L V & Olkin I (1985) *Statistical methods for meta-analysis*. New York: Academic Press.
- Henk WA & Melnick SA (1992) The initial development of a scale to measure perception of self as reader. In C K Kinzer and D J Leu (eds) *Literacy research, theory, and practice: Views from many perspectives*. Chicago, IL: The National Reading Conference, Inc., pp 111-117.

- Hess M R & Kromrey J D (2002) Interval estimates of effect size: An empirical comparison of methods for constructing confidence bands around standardized mean differences. Paper presented at the *annual meeting of the American Educational Research Association*, April 1-5, New Orleans, Louisiana, USA.
- Jiao Q G & Onwuegbuzie A J (1999) Self-perception and library anxiety: An empirical study. *Library Review*, vol 47, pp 140-147.
- Juel C (1988) Learning to read and write: A longitudinal study of fifty-four children from first through fourth grade. *Journal of Educational Psychology*, vol 80, pp 437-447.
- Lambert Z V & Durand R M (1975) Some precautions in using canonical analysis. *Journal of Marketing Research*, vol 12, pp 468-475.
- Neemann J & Harter S (1986) *Manual for the Self-perception Profile for College Students*. Unpublished manuscript, University of Denver, CO: University of Denver.
- Onwuegbuzie A J (1999) Writing apprehension among graduate students: Its relationship to self-perceptions. *Psychological Reports*, vol 84, pp 1034-1039.
- Onwuegbuzie A J (2000) Statistics anxiety and the role of self-perceptions. *The Journal of Educational Research*, vol 93, pp 323-335.
- Onwuegbuzie A J & Collins K M T (2002) Reading comprehension among graduate students. *Psychological Reports*, vol 90, pp 879-882.
- Onwuegbuzie A J & Daniel L G (2003, February 19). Typology of analytical and interpretational errors in quantitative and qualitative educational research. *Current Issues in Education* [online], vol 6, no. 2. Available online at: <http://cie.ed.asu.edu/volume6/number2/> (Accessed December 2, 2008).
- Onwuegbuzie A J, DaRos D & Ryan J (1997) The components of statistics anxiety: A phenomenological study. *Focus on Learning Problems in Mathematics*, vol 19, pp 11-35.
- Onwuegbuzie A J, Mayes R, Arthur L, Johnson J, Robinson V, Ashe S, Elbedour S & Collins, KMT. (2004) Reading comprehension among African American graduate students. *Journal of Negro Education*, vol 73, pp 443-457.
- Onwuegbuzie AJ, Slate JR & Schwartz RA (2001) The role of study skills in graduate-level educational research courses. *Journal of Educational Research*, vol 94, pp 238-246.
- Otero J (1998) Influence of knowledge activation and context on comprehension monitoring of science texts. In D J Hacker, J Dunlosky and AC Gaesser (eds) *Metacognition in educational theory and practice*. Hillsdale, NJ: Lawrence Erlbaum, pp 145-164.
- Perfetti CA (1985) *Reading ability*. New York: Oxford University Press.
- Rao C R (1952) *Advanced statistical methods in biometric research*. New York: Wiley.
- Rosenberg M (1986) Self-concept from middle childhood through adolescence. In J Suls and AG Greenwald (eds.) *Psychological perspectives on the self*. Hillsdale, NJ: Erlbaum, vol 3, pp 107-135.
- Stanovich K E (2000) *Progress in understanding reading: Scientific foundations and new frontiers*. New York: Guilford Press.
- Sitko B M (1992) Writers meet their readers in the classroom: Revision after feedback. In M Secor and D Charney (eds) *Constructing rhetorical education*. Carbondale: Southern Illinois University Press, pp 278-294.
- Steiger J H & Fouladi R T (1992) R2: A computer programme for interval estimation, power calculation, and hypothesis testing for the squared multiple correlation. *Behavior Research, Methods, Instruments, and Computers*, vol 4, pp 581-582.

- Steiger J H & Fouladi R T (1997) Noncentrality interval estimation and the evaluation of statistical models. In L L Harlow, S A Mulaik and J H Steiger (eds) *What if there were no significance tests?* Mahwah, NJ: Erlbaum, pp 221-257.
- Thompson B (1990) Variable importance in multiple regression and canonical correlation. Paper presented at the *annual meeting of the American Educational Research Association*, April 16-20, Boston, Massachusetts, USA.
- Zabrocky K & Ratner H H (1992) Effects of passage type on comprehension monitoring and recall in good and poor readers. *Journal of Reading Behavior*, vol 24, pp 373-391.