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The association between cognitive style and accounting students' preference for cooperative learning: an empirical investigation

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Abstract

This paper investigates the use of cooperative learning in accounting education, in particular, the issue of whether an individual's cognitive style impacts upon their preference for cooperative learning techniques. The study extends the existing literature by using the Myers-Briggs Type Indicator to examine the association between all four dimensions of cognitive style and accounting students' preference for cooperative learning. Results show that preference for cooperative learning is significantly associated with the extroversion/introversion dimension [a result which extends the findings of Hutchinson, M., & Gul, F. (1997). The interactive effects of extroversion/introversion traits and collectivism/individualism cultural beliefs on student group learning preferences, *Journal of Accounting Education*, 15, 95–107.], and with the thinking/feeling dimension, which is a new result in the literature. © 2001 Elsevier Science Ltd. All rights reserved.

1. Introduction

The need for accountants to enhance their team-based skills in order to be effective in a working environment has been well documented. Peek, Winking, and Peek (1995) argued that for accountants to be successful, they must practice and improve

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their team and interpersonal skills. Accounting educators can play a key role by providing their students with the necessary attributes to function as a team member. Various professional statements have called for more innovative teaching approaches, designed, in part, to develop students' ability to work as part of a team (AECC, 1990; Mathews Report, 1988). Cooperative learning techniques have been advocated as one way of providing an environment conducive to the development of team skills (Cottell & Millis, 1992; Peek et al, 1995; Ravenscroft, Buckless, McCombs, & Zuckerman, 1995).

Cooperative learning is a way of obtaining greater student involvement in the learning process while at the same time enhancing communication and team-building skills. However, the effect of this innovative teaching method has been insufficiently studied. As Stout and Rebele (1996, p. 11) note, "... the literature is virtually silent regarding the impact of this teaching approach on important variables such as student attitudes."

The purpose of this research is to establish whether aspects of an accounting student's personality, specifically dimensions of cognitive style, are associated with a greater preference for cooperative learning techniques. Cognitive style refers to an individual's "...distinctive ways of acquiring, storing, retrieving, and transforming information" (Ho & Rodgers, 1993, p. 103).

Our research is concerned with the relationship between cognitive style and teaching methods in accounting education. Ott, Mann, and Moores (1990) studied the interactive effects of primary teaching method [lecture versus computer-aided instruction (CAI)] and cognitive style on student exam performance in an introductory accounting module. Our research focuses specifically on cooperative learning, whereas in Ott et al. (1990), the teaching methods considered were lectures and CAI. Further, our research considers the direct effect of cognitive style on student preference for a specific teaching method, whereas Ott et al. (1990) were concerned with the interactive effect of teaching method and cognitive style on student exam performance.

Hutchinson and Gul (1997) examined accounting students' preference for cooperative learning, and found a positive association between the interaction of extroversion (measured using the Keirsey Temperament Sorter) and a cultural variable, collectivism, and preference for cooperative learning.¹ We build on the work of Hutchinson and Gul by examining the association between the four dimensions of cognitive style (extroversion/introversion, sensing/intuition, thinking/feeling, and judging/perceiving) and preference for cooperative learning.

The remainder of the paper is structured as follows. The next section provides a review of the relevant literature, leading to the formulation of a testable hypothesis. The research methodology employed in this study is then described. The results of the study are then presented and discussed, while conclusions and implications are presented in the final section.

¹ Hutchinson and Gul (1997) use the terms 'group learning' and 'cooperative learning' interchangeably. No specific group project was identified in their paper.

2. Theory development and hypothesis formulation

2.1. Cooperative learning

Cooperative learning refers to “instructional methods in which students of all performance levels work together in small groups towards a group goal” (Slavin, 1987, p. 8). Johnson, Johnson, and Smith (1991) identified the following essential components of cooperative learning:²

Positive or group interdependence — each group member is dependent on the other members to successfully complete the group task.

Individual accountability — each member of the group must be held accountable for completing the group task.

Heterogeneous grouping — each group encompasses varied learning abilities, gender, and ethnic backgrounds.

Group processing — both students and teachers are responsible for monitoring the group’s performance, and comparing it to a set of established standards.

Social skills — appropriate use of social and interpersonal skills.

Face-to-face promotive interaction — group members helping each other and exchanging resources.

2.2. Cognitive style

Early accounting research (e.g. Benbasat & Dexter, 1979; Gul, 1984) used several different measures of cognitive style. However, a criticism of these measures has been that they were not based on validated psychological theories (Ho & Rodgers, 1993). The Myers-Briggs Type Indicator (MBTI), which is based on Jung’s (1923) personality typology, has become very popular in both research and the business world as a measure of cognitive style (Ruble & Cosier, 1990). The MBTI measures cognitive style in four dimensions — extroversion/introversion (EI), sensing/intuition (SN), thinking/feeling (TF), and judging/perceiving (JP).

2.3. EI

Jung’s typology characterises the introvert as someone who prefers the inner world of ideas and may find socialising very tiring. In contrast, the extrovert prefers the outer world of people and socialising. This suggests that extroverts will prefer cooperative learning in light of the social benefits it provides. Smith and Irey (1974) found that extroverts preferred a learning environment which encouraged interaction with other students. Hutchinson and Gul (1997) investigated preference for group learning and found a significant interaction only between EI and the collectivism/individualism cultural dimension. The main effect of EI was insignificant in all three regressions reported by Hutchinson and Gul.

² Cottell and Millis (1992) and Peek et al. (1995) identify only the first four components as essential for cooperative learning.

2.4. *SN*

Sensation and intuition are alternative ways of perceiving data. Sensing occurs when data are absorbed by the five senses, namely sight, hearing, touch, taste, and smell. A sensing type, or sensate, is said to prefer the real, solid facts of experience (Kleiner, 1983). Conversely, intuitive types prefer to consider the ‘broad picture’ of events. Intuition indicates a preference to perceive the possibilities that arise from a situation, rather than just the hard facts revealed (Kleiner, 1983). Sensing types tend to be more participative in terms of their decision making than intuitives (Schweiger & Jago, 1982), which suggests that they may prefer cooperative learning.

2.5. *TF*

Thinking and feeling are alternative ways of evaluating, or judging, data. Thinking can be described as the logical reasoning process of reaching a decision. Thinking types prefer to make decisions objectively and impersonally, and tend to make decisions based on the facts of the situation (Kleiner, 1983). Feeling types, on the other hand, tend to make decisions by attaching subjective, personal values to the situation being considered. Feeling types tend to be very aware of other people and their feelings.

Given this, it is suggested that feeling types are more suited to a cooperative learning environment than thinking types. Feeling types are more likely to cooperate with others, and be more accommodating to others, than thinking types (Kilmann & Thomas, 1975). Slocum (1982) found that feeling types gain satisfaction through interpersonal contact, a fundamental characteristic of cooperative learning. Ott et al. (1990) investigated the relationship between students’ cognitive style and instructional methods (lecture versus CAI) in introductory accounting. In the discussion of their results, Ott et al. (1990, p. 30) claimed that small group assignments were a method of assessment that feeling types prefer. However, this observation was not tested empirically in their study, nor was it attributed to any specific prior research.

2.6. *JP*

The fourth dimension of cognitive style as measured by the MBTI is the JP dimension, which relates to a person’s attitude towards the outer world. Judgers like to plan their work and finalise issues so they can move on to the next task. In contrast, perceivers are seen as being spontaneous and flexible. Perceivers like to keep their options open for as long as possible. Perceivers may be more suited to the cooperative learning environment, as there is likely to be a greater number of thoughts and ideas exchanged within a group setting than would be the case for individual work (Chickering & Gamson, 1987).

The existing theoretical literature provides varying degrees of support for possible relationships between the MBTI dimensions and preference for cooperative learning. The limited empirical literature, thus far, has found no evidence of a direct association between the MBTI dimensions and preference for cooperative learning. We propose the following null hypothesis:

Hypothesis: there is no association between accounting students' scores on each of the four dimensions of the MBTI and students' preference for cooperative learning.

3. Method

3.1. *The cooperative learning environment*

In order to improve student communication skills, and increase student involvement in the learning process, senior faculty at Monash University, Clayton campus, decided to incorporate cooperative learning activities into tutorials in the first and second accounting subjects. At the beginning of the semester, the tutorial instructor divided each tutorial class, comprising approximately 25 students, into six groups. Students were allocated to these groups at random, thus satisfying the requirement for heterogeneous grouping in cooperative learning.

Six group presentations were scheduled across the semester. Each group was required to prepare and present one problem to their tutorial class, then answer questions from the instructor and other student groups. All group members were required to participate in the group presentation. Assigned problems were multi-part questions requiring, in most cases, both theoretical and numerical analysis.

The group presentation was graded on both presentation skills and academic content using criteria developed by senior faculty and distributed to all instructors. Students were given instruction on presentation techniques during class, thus promoting social skills. The presenting group was required to meet with the instructor prior to their presentation to discuss their progress on the problem, both individually and for the group as a whole. After the presentation, the presenting group met with their instructor to receive further feedback.

Each group member was normally given the same mark for the presentation, which promoted group interdependence. However, to encourage individual accountability, and to attempt to reduce 'free-rider' problems, it was possible for groups to specify an unequal allocation of marks. Some groups took this option. Groups not presenting in a given tutorial were required to prepare a group solution to the problem, which was collected by the instructor and assessed. These activities can be seen to satisfy the essential components of cooperative learning outlined previously.

3.2. *Model specification*

Our hypothesis is concerned with a possible association between the four dimensions of the MBTI and preference for cooperative learning. The model for testing the hypothesis is of the form:³

³ Given the objectives of the paper, it was decided to keep the model specification as parsimonious as possible. Variables such as age, gender, and academic ability are not included in Eq. (1). A discussion of the effects of including these additional variables is provided in Section 4.

$$P = a_1 + b_1EI + b_2SN + b_3TF + b_4JP \quad (1)$$

where P = preference for cooperative learning, a_1 = constant, EI = score on the EI section of the MBTI, SN = score on the SN section of the MBTI, TF = score on the TF section of the MBTI, JP = score on the JP section of the MBTI.

3.3. Variable measurement

3.3.1. Preference for cooperative learning

We measured students' preference for cooperative learning using an instrument consisting of five questions scored from 1–7 for a maximum possible score of 35. Low scores indicate a preference for cooperative learning. We modified a three-item instrument originally developed by Hutchinson and Gul (1997). In the original instrument, all questions were framed in the positive and responses to each question were used as separate independent variables.⁴ To enhance the reliability of Hutchinson and Gul's instrument, two questions were added, one of which was framed in the negative to reduce the potential for injudicious completion of the instrument (Appendix). The revised instrument was pilot tested on two tutorial groups comprising approximately 50 students in total (who did not form part of the final sample), and a Cronbach alpha of 0.73 was obtained. A Cronbach alpha of 0.79 was obtained for the instrument in the final study. Factor analysis demonstrated that the items in the instrument loaded on a single factor.

3.3.2. Cognitive style

Form G of the MBTI was administered to students by a registered psychologist. The measure includes 94 forced-choice items, relating to the four dimensions of an individual's cognitive style.⁵ Continuous scores were used, based on the findings of Carlson (1985) and Carlyn (1977) who both reported higher estimates of reliability when continuous scores were utilised. This differs from Hutchinson and Gul (1997) who converted their EI scores into a dummy variable. A criticism of the MBTI is

⁴ Hutchinson and Gul (1997, p. 99) report that their subjects were asked to state the extent to which they agreed with three statements. These three statements formed the basis for our instrument. However, the appendix to their paper includes two additional questions which are not referred to in the text, nor in the results. These two statements were not included in our instrument. Although not explicitly stated in their paper, Hutchinson and Gul (1997) ran separate regressions for each of the three items on their cooperative learning instrument, rather than summing the scores for each item to get a total 'preference for cooperative learning' score.

⁵ By comparison, although Hutchinson and Gul (1997) labelled their measure of cognitive style the MBTI, the instrument used in their study is actually the Keirsey Temperament Sorter (KTS; Keirsey & Bates, 1978). These instruments are similar [correlations from between 0.68 to 0.86 have been reported (Tucker & Gillespie, 1993)], but should not be used as substitutes, a point confirmed through personal correspondence with the author of the instrument, Dr. David Keirsey. A further difference between the instruments is that the MBTI is a professional instrument that can only be administered by a registered psychologist, whereas there is no such requirement for the KTS. Finally, the MBTI has been extensively validated in research spanning a period exceeding 20 years, while at this stage, only a small body of literature using the KTS exists.

that it assumes that people are bipolar and extreme rather than being normally distributed (Pittenger, 1993). However, the use of continuous scores avoids this problem.

While the validity of the MBTI has been questioned by some researchers (e.g. Ruble & Cosier, 1990), many studies have attested to its validity (e.g. Carlson, 1985; Carlyn, 1977). In a review, Murray (1990) noted that studies have generally shown satisfactory split-half and test-retest reliabilities for Form G (Carlson, 1985; DeVito, 1985). Other studies have also demonstrated that the four scales of the MBTI measure important dimensions of personality that approximate those contained in Jung's typology (e.g. Thompson & Borrello, 1986; Wiggins, 1989). Pittenger (1993), however, offered a contrary view, claiming that a review of the literature suggests that there is insufficient evidence to support claims about the utility of the test.

3.4. *Data collection*

Students enrolled in AAF1031/2 (first year) Accounting at Monash University, Clayton campus, Victoria, Australia were asked to participate in the study.⁶ The subject in which students were enrolled was the second accounting subject in a two-subject grouping. As explained previously, all tutorial classes in AAF1031/2 were divided into six groups, and each group was required to complete cooperative learning activities.

A total of 141 students completed a questionnaire at the end of a normal tutorial session.⁷ Students were informed as to the purpose of the study, and were given the opportunity to decline to participate if they wished. However, all students in the tutorial groups sampled agreed to participate. Missing data resulted in a sample of 132 students (58 males and 74 females).

4. Results and discussion

4.1. *Descriptive results*

The students' scores on the MBTI are summarised in Table 1. Panel A shows the split between the four dimensions of cognitive style. Subjects were almost evenly split between EI categories but were clear sensate, thinking and judging types. Panel B classifies each subject in the sample according to their scores on each of the four MBTI dimensions. Thus, a subject with a positive score on the EI dimension is classified as E. This process is continued for the other three dimensions — in each case, a positive score results in the subject being classified into the first-named category. The results in Panel B seem reasonably consistent with those previously

⁶ The subject is divided into two sequences — AAF1031, for students who have completed high school accounting and AAF1032 for all other students. Both sequences have the same final assessment.

⁷ The questionnaire was distributed late in the semester by which time all students had considerable exposure to cooperative learning techniques. These techniques were also used in the first semester subject.

reported for accounting students by Booth and Winzar (1993), as the MBTI profile in this study was similarly biased towards the two STJ types (comprising 36.3% of the total sample).

Table 2 supports the results in Panel A of Table 1, in demonstrating that, on average, students’ scores indicated a predilection for sensing, as opposed to intuition (SN mean = 11.55), and for thinking, as opposed to feeling (TF mean = 14.27). Means were closer to the mid-point for the other two dimensions. In the case of EI, this is not unexpected given that the number of students in each category is approximately equal. In the case of JP, the result is perhaps surprising, given the number of subjects in each category (Panel A of Table 1). Furthermore, Table 2 shows that the standard deviations and actual range of scores indicate a substantial spread of responses on all four dimensions of the MBTI.

Table 1
Sample split by each of the four Myers-Briggs Type Indicator (MBTI) dimensions (*n* = 132) and classification by MBTI type

Panel A — dimensions (<i>n</i> = 132)							
EI		SN		TF		JP	
Extrovert	Introvert	Sensation	Intuition	Thinking	Feeling	Judging	Perceiving
64	68	95	37	91	41	83	49
Panel B — type							
		Sensing		Intuitive			
		Thinking	Feeling	Feeling	Thinking		
Judging		ISTJ <i>n</i> = 25 (18.9%)	ISFJ <i>n</i> = 13 (9.9%)	INFJ <i>n</i> = 5 (3.8%)	INTJ <i>n</i> = 1 (0.8%)	Introversion	
Perceiving		ISTP <i>n</i> = 11 (8.3%)	ISFP <i>n</i> = 1 (0.8%)	INFP <i>n</i> = 4 (3.0%)	INTP <i>n</i> = 8 (6.1%)		
Perceiving		ESTP <i>n</i> = 9 (6.8%)	ESFP <i>n</i> = 4 (3.0%)	ENFP <i>n</i> = 4 (3.0%)	ENTP <i>n</i> = 8 (6.1%)	Extroversion	
Judging		ESTJ <i>n</i> = 23 (17.4%)	ESFJ <i>n</i> = 9 (6.8%)	ENFJ <i>n</i> = 1 (0.8%)	ENTJ <i>n</i> = 6 (4.5%)		

Table 2
Descriptive statistics

Variable	Mean	S.D.	Median	Actual range		Possible Range	
				Max.	Min.	Max.	Min.
EI	−0.85	25.56	−1.0	45	−53	51	−57
SN	11.55	24.80	13.0	63	−47	67	−51
TF	14.27	24.56	12.0	63	−31	65	−43
JP	4.24	27.89	9.0	49	−57	55	−65
Preference	16.67	5.89	16.0	31	5	35	5

4.2. Hypothesis testing

Our hypothesis was tested by running a multiple regression of Eq. (1) on the sample of 132 students. Results of the multiple regression are shown in Table 3.

Table 3 shows that the overall model is significant ($F=4.986$, significant at 0.1%) and that the variables in the model explain 10.9% of the variation in students' preference for cooperative learning.

The results in Table 3 show that the null hypothesis of no association between the EI dimension of the MBTI and student preference for cooperative learning can be rejected (t statistic is significant at the 1% level). A high score on the EI scale indicates extroversion, while a low score on preference for cooperative learning indicates a high preference for this form of learning. Thus, there is support for the view that a negative association exists between the EI dimension of cognitive style, and preference for cooperative learning. That is, introversion (low score on the EI dimension) is associated with low preference for cooperative learning (high score on the instrument), while extroversion (high score on the EI dimension) is associated with high preference for cooperative learning (low score on the instrument).

Table 3 indicates a significant positive association between students' scores on the TF dimension of the MBTI and preference for cooperative learning at the 5% level (two-tailed). This is consistent with the arguments put forward in the literature that feelers (low score on TF dimension) prefer cooperative learning (low score on preference for cooperative learning). However, our results represent the first empirical support for this assertion.

Table 3 indicates no significant association between either of the SN and JP dimensions of cognitive style, and preference for cooperative learning. Suggestions from the literature that there would be a significant negative coefficient on SN (sensates prefer cooperative learning), and a significant positive coefficient on JP (perceivers prefer cooperative learning) were not supported.

Table 3
Association between preference for cooperative learning and cognitive style

Variable	Coefficient	T statistic (two tailed significance) ^a
a_1	16.046	27.295***
EI	−0.075	−3.891***
SN	0.006	0.283
TF	0.041	2.019**
JP	−0.021	−1.074

^a Multicollinearity was tested for and was found not to affect the model. The largest correlations between the independent variables were 0.425 between SN and JP (significant at 1%), and 0.198 between SN and TF (significant at 5%). Variance inflation factors (VIFs) for the independent variables ranged from 1.02 to 1.318. VIF values over 10 are normally considered to indicate a high degree of collinearity between variables (Hair, Anderson, Tatham, & Black, 1998). $F=4.986$, significance=0.001. Adjusted $R^2=0.109$

**Significant at 5% level

***Significant at 1% level

The overall model and two of the four explanatory variables are significant. Using rules of thumb supplied by Cohen (1988), the overall effect size of all four dimensions of cognitive style on preference for cooperative learning in this sample is medium ($F^2 = 0.1223$). However, if it is likely that the effect size being investigated for individual dimensions is small, the tests will have low power and research design issues become critical — “the use of measures of low reliability or failure to control or eliminate extraneous ‘third’ variables will decrease effect size due to inflated error variance” (Lindsay, 1993, p. 213).

In general, there is considerable evidence that the MBTI provides reliable measures of cognitive style. The reliability of the independent variable, preference for cooperative learning, is supported by acceptable Cronbach alphas (Nunnally, 1978) and factor analysis results. However, the instrument used in this study is new, and further research is needed to demonstrate that it reliably captures students’ preferences for cooperative learning.

4.3. Additional explanatory variables

The model specified in Eq. (1) is limited to the MBTI dimensions as explanatory variables for preference for cooperative learning. The low R^2 and the significance of the intercept term indicate the existence of omitted variables. Below, we consider the effect of including possible additional explanatory variables.

There is some support in the literature for including both age (Alutto & Acito, 1974) and gender (Steers, 1977) in Eq. (1). However, neither variable was significant when included in the model. Hutchinson and Gul (1997) reported significant results for age in two of their three regressions. The lack of significant results for the age variable in this study can be attributed to the age profile of our sample. Students at Monash University are typically full-time students who enter university immediately following secondary school. Thus, the average age of students in our sample is 19.6 years and the standard deviation is 2.78 years (compared to Hutchinson and Gul (1997) who reported an average of 25.9 years and a standard deviation of 5.0 years). The insignificant result for gender is consistent with that reported by Hutchinson and Gul (1997).

To test the argument that very bright students may not prefer cooperative learning because less able students will ‘free-ride’ on their ability, and hence pull down the marks of the brighter students, we included measures of academic ability in Eq. (1). One such measure was the student’s mark in the preceding accounting subject and another was the students’ score to gain University entrance (Tertiary Entrance Rank, TER). No significant results were found using the previous accounting mark, but a significant positive association was found between TER and preference for cooperative learning. That is, students with lower University entrance scores have a higher preference for cooperative learning. This sub-sample (TERs were available for only 73 of the 132 students) also showed a significant positive association (5% level) between preference for cooperative learning and the SN dimension of the MBTI. That is, intuitives prefer cooperative learning. This is contrary to the relationship suggested by a review of the literature.

5. Conclusions and implications

This study investigated the association between students' cognitive style (as measured by the MBTI) and preference for cooperative learning.

Results show that extroverts exhibited a preference for cooperative learning. This finding differs from the result obtained by Hutchinson and Gul (1997) who found EI only had a significant effect on preference for cooperative learning when interacting with collectivism/individualism. There was no significant main effect. However, as our study did not include a collectivism/individualism variable, the results are not directly comparable. This is a limitation of our study. Ott et al. (1990) found no direct or interaction effect for the EI dimension and student performance when students were taught by lecture versus CAI teaching methods.

Results also show that feeling types prefer cooperative learning. This result is new in the literature. Ott et al. (1990) did find main and interaction effects for the TF dimension, such that thinking students performed better under the lecture method of instruction, whereas feeling students performed better under CAI. Thus, prior research had established a relationship between the TF dimension and student performance under specific teaching methods. Our contribution is to extend this finding to show that feeling students prefer a different learning method — cooperative learning. For the SN and JP dimensions, no consistent significant relationships were found. However, when additional explanatory variables were introduced, a significant result on the SN dimension was observed, indicating the need for further research.

Results of this study add to the literature that indicates that students' cognitive style is associated with their preference for different learning approaches. Some authors (e.g. Hutchinson & Gul, 1997) have suggested that students should not be forced to use learning approaches that do not suit their cognitive style. The future of accounting education could be that institutions and staff provide a range of learning approaches (e.g. lectures, cooperative learning activities, multimedia), allowing students to choose learning opportunities that best suit their cognitive style. Research into the relationship between cognitive style and preference for other learning approaches, such as Internet-based learning, is therefore needed.

This research shows that cooperative learning appeals more to extroverts and feelers, dimensions of cognitive style that may be more suited to the accounting practitioner of the twenty-first century. Accounting firms may prefer to attract accounting graduates with different cognitive styles to those typically found at present, or at least, to attract students with a broader range of cognitive styles. Encouraging universities and staff to adopt cooperative learning approaches may be one way to make accounting more attractive to students with a particular cognitive style.

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- Booth, P., & Winzar, H. (1993). Personality biases of accounting students: some implications for learning style preferences. *Accounting and Finance*, 33, 109–120.
- Carlson, J. G. (1985). Recent assessments of the Myers-Briggs Type Indicator. *Journal of Personality Assessment*, 49(4), 356–365.
- Carlyn, M. (1977). An assessment of the Myers-Briggs Type Indicator. *Journal of Personality Assessment*, 41, 461–473.
- Chickering, A. W., & Gamson, Z. F. (1987). Seven principles for good practice in undergraduate education (Special insert). *The Wingspread Journal*, 9(2).
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Cottell, P. G., & Millis, B. J. (1992). Cooperative learning in accounting. *Journal of Accounting Education*, 10, 95–111.
- DeVito, A. J. (1985). Review of Myers-Briggs Type Indicator. In J. V. Mitchell, *The ninth mental measurements yearbook* (pp. 1029–1032). Lincoln: The University of Nebraska-Lincoln.
- Gul, F. A. (1984). The joint and moderating role of personality and cognitive style on decision making. *The Accounting Review*, 56, 264–277.
- Hair Jr., J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate data analysis* (3rd ed.). Upper Saddle River, NJ: Prentice-Hall International.
- Ho, J. L., & Rodgers, W. (1993). A review of accounting research on cognitive characteristics. *Journal of Accounting Literature*, 12, 101–130.
- Hutchinson, M., & Gul, F. (1997). The interactive effects of extroversion/introversion traits and collectivism/individualism cultural beliefs on student group learning preferences. *Journal of Accounting Education*, 15, 95–107.
- Johnson, D. W., Johnson, R. T., & Smith, K. A. (1991). *Cooperative learning: increasing college faculty instructional productivity*, ASHE-ERIC Higher Education Report No.4. Washington, D.C.: The George Washington University, School of Education and Human Development.
- Jung, C. G. (1923). *Psychological types*. London: Routledge and Kegan Paul.
- Keirsey, D., & Bates, M. (1978). *Please understand me* (3rd ed.). Del Mar, California: Prometheus Nemesis.
- Kilmann, R. H., & Thomas, K. W. (1975). Interpersonal conflict-handling as reflections of Jungian personality dimensions. *Psychological Reports*, 37, 971–980.
- Kleiner, B. H. (1983). The interrelationship of Jungian modes of mental functioning with organizational factors: implications for management development. *Human Relations*, 36(11), 997–1012.
- Lindsay, R. M. (1993). Incorporating statistical power into the test of significance procedure: a methodological and empirical inquiry. *Behavioural Research in Accounting*, 5, 211–236.
- Mathews Report (1988). *Report of Taskforce for Accounting Education in Australia*.
- Murray, J. B. (1990). Review of research on the Myers-Briggs Type Indicator. *Perceptual and Motor Skills*, 70, 1187–1202.
- Nunnally, J. C. (1978). *Psychometric theory*. New York: McGraw-Hill.
- Ott, R. L., Mann, M. H., & Moores, C. T. (1990). An empirical investigation into the interactive effects of student personality traits and method of instruction (lecture or CAI) on student performance in elementary accounting. *Journal of Accounting Education*, 8, 17–35.
- Peek, L. E., Winking, C., & Peek, G. S. (1995). Cooperative learning activities: managerial accounting. *Issues in Accounting Education*, 10(1), 111–125.
- Pittenger, D. J. (1993). The utility of the Myers-Briggs Type Indicator. *Review of Educational Research*, 63(4), 467–488.
- Ravenscroft, S. P., Buckless, F. A., McCombs, G. B., & Zuckerman, G. J. (1995). Incentives in student team learning: an experiment in cooperative group learning. *Issues in Accounting Education*, 10(1), 97–109.
- Ruble, T. L., & Cosier, R. A. (1990). Effects of cognitive styles and decision setting on performance. *Organizational Behavior and Human Decision Processes*, 46, 283–295.
- Schweiger, D. M., & Jago, A. (1982). Problem-solving styles and participative decision making. *Psychological Reports*, 50, 1311–1316.
- Slavin, R. E. (1987). *Cooperative learning: student teams* (2nd ed.). Washington, DC: National Education Association.

- Slocum, J. W. (1982). Cognitive style in learning and problem-solving, in D. T. Hall, D. D. Bowen, R. J. Lewicki, & Hall, F.S., *Experiences in management and organizational behavior*. New York: John Wiley and Sons.
- Smith, A. B., & Irey, R. K. (1974). Personality variables and the improvement of college teaching, Paper presented at American Educational Research Association meeting. Chicago.
- Steers, R. M. (1977). Individual differences in participative decision-making. *Human Relations*, 30(9), 837–847.
- Stout, D. E., & Rebele, J. E. (1996). Establishing a research agenda for accounting education. *Accounting Education*, 1(1), 1–18.
- Thompson, B., & Borrello, G. M. (1986). Construct validity of the Myers-Briggs Type Indicator. *Educational and Psychological Measurement*, 46, 745–752.
- Tucker, I. F., & Gillespie, B. V. (1993). Correlations among three measures of personality type. *Perceptual and Motor Skills*, 77(2), 650.
- Wiggins, J. S. (1989). Review of Myers-Briggs Type Indicator, in J. C. Conoley & J. J. Kramer (eds.), *Tenth mental measurements yearbook*. Lincoln: University of Nebraska Press, 537–538.