

The Effects Of Students' Predispositions Toward Communication, Learning Styles, And Sex On Academic Achievement

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ABSTRACT

Females are more apprehensive when talking in class, but more nonverbally immediate, and prefer a collaborative learning style. Males prefer independent and avoidant learning styles, and report learning less than females.

INTRODUCTION

*A*n increasing body of research is concerned with the centrality of communication variables in the learning process.

Learning, particularly that which takes place in the traditional classroom setting, is an interactional process. While curricular decisions, materials development, the organization of lectures and the like focus primarily on the teacher's transmission of content—and student evaluation on comprehension and retention of that content—there is little disagreement that interpersonal perceptions and communicative relationships between teachers and students are crucial to the teacher-learning process (Richmond, Gorham, & McCroskey, 1987, p.574).

Studies have examined the impact of communication on instructors' affinity with students (Frymier & Wanzer, 2006), compliance-gaining strategies (Paulsel & Chory-Assad, 2004; Plax & Kearney, 1992), communication style and clarity (Andersen, Norton, Nussbaum; Chesebro, 2002), interpersonal attractiveness and caring (Teven & McCroskey, 1997), nonverbal immediacy (Andersen, 1979; O'Mara, Allen, Long, & Judd, 1996; Richmond, Gorman, & McCroskey, 1987; Richmond, Lane, & McCroskey, 2006). Researchers have reported on the relationship of instructors' communication and students' motivation to learn (Christensen & Menzel, 1998; Christophel, 1990; Richmond, 1990), and a myriad of related variables related to student and teacher interactions at all educational levels—elementary, secondary, undergraduate, graduate, adult, and applied (Mottet, Richmond, & McCroskey, 2006). Most of this research is concerned with either the teacher's communication behavior or his/her perception of students' communication behaviors. A few attempts, largely concerned with communication apprehension, have been made to examine the contributions that students' communication competencies, skills, and behaviors make to the learning equation, but the effects of student communication behaviors on the learning process have not been saliently studied (McCroskey, Richmond, & McCroskey, 2006).

Research indicates that learning is jeopardized because students are not appropriately engaged in the learning process (Pascarella & Terenzini, 1991). Results of a national survey reported that less than 58 percent of first-year college students reported asking questions in class or contributing to class discussions. Only fifty percent of the students said they had an above average or good relationship with at least one of their instructors, while forty-five percent reported that they never discuss ideas from classes or readings with instructors (National Survey of Student Engagement, 2000). These are engagement behaviors that have been found to lead to more learning (Astin, 1993; Martin, Mottet, & Meyers, 2000; Pascarella & Terenzini, 1991). Yet, for over thirty years, researchers have investigated teaching and learning as a communication process with the goal of enhancing teacher effectiveness and student learning. Much of this research has been focused in one direction—how teachers influence student learning. As Sorensen and Christophel (1992) stated, "...[E]ffective instructional communication is a delicate balance of using strategies that

control perceptions, that control behavior, and that ultimately maximize students' potential to learn" (p. 35). This emphasis on instructor strategies and communication behaviors views the student as "object." Moreover, educators have traditionally subscribed to a view of the learning process operating similarly for all students with an emphasis on the amount of contact, quantity of information, persuasion, and situational variables, as opposed to individual differences, interpersonalness, and the quality of interaction (Chesebro & McCroskey, 2000; Frymier & Houser, 2000). Such a one-directional approach ignores students' influence in the instructional process, and their influence on teachers and their teaching. If effective communication in the classroom is, as instructional communication theorists purport, precursor to learning (Martin et al., 2000), it is imperative to examine the classroom as a communicative transactional process in which teachers and students mutually influence each other with their verbal and nonverbal messages (Mottet et al., 2006).

Viewing communication as a transactional process not only addresses student learning, compliance, and motivation, but also acknowledges teacher self-efficacy, compliance, and satisfaction. All individuals involved in the learning process, not just teachers, have an impact upon learning (Mottet et al, 2006, p. 5).

A few researchers have investigated how students' predispositions toward communication and learning style preferences shape educational outcomes (Dwyer, 1998; Johnson, 2003), but researchers have not examined the transactional influences of communication predispositions, students' learning styles, and instructors' reciprocal responses. The purpose of the study reported here was to examine the relationships among students' biological sex, communication avoidance behaviors, individual learning styles, and classroom achievement. Additionally, the relationship of instructors' gender to students' perceptions of immediacy and learning outcomes was examined.

SEX DIFFERENCES, LEARNING, AND ACADEMIC ACHIEVEMENT

Female/Male Differences

Studies across disciplines have linked students' sex to learning outcomes (Baron-Cohen, 2003; Benbow & Stanley, 1980; Geary, 1998; Hulbert, 2005; Martin & Valencic, 2001). For example, two decades of research reveals that boys consistently outscore girls on the math portions of the SAT (Benbow & Stanley, 1980), and math anxiety, which is experienced more by female than male students, has been linked to lower test scores and grades (Parsons, Adler, & Kaczala, 1982). Interestingly, evidence from communication classes indicate that speeches by female students are evaluated or commented on more positively (Barker, 1966; Pearson, 1982); women receive higher grades whether the basic communication course emphasis is performance-oriented or theoretical, interpersonal or public speaking (Allen, 1984; Anderson, 1998; Pearson, 1982, Wood, 1993). Roberts and Pearson (1984) conclude that females' communication competence and superior decoding skills are better explanations of grade differences between males and females than prior academic evaluation, aptitudes measured by standardized tests, or psychological sex characteristics. Hughey (1984) reports that female students have a more flexible response modes, and found competence to be slightly better than compliance in explaining the favorable evaluations received by female students in communication classes. The fact that female students tend to receive paradoxical grades in math and communication classes, and the indication of ties to response modes suggest that some learning differences may be due to certain sex related characteristics of learning styles. Recent studies have provided evidence of differences in the brains or hormones of males and females (Baron-Cohen, 2003; Brizendia, 2006; Cahill, 2005; Geary, 1998; Pinker, 2002) as explanations of differences in behavior. However, credible researchers also emphasize that biology is not destiny and that there are significant environmental influences on behavior (Anderson, 1998; Ehrlich, 2000; Harris, 1998).

Learning Style Differences

Because individual learning styles differ and mediate the learning process, it has been persuasively argued that more exposure to the classroom does not necessarily result in greater learning (Schnucker, Heun, & Heun, 1977), and studies have indicated that classroom instruction could be enhanced by considering individual student characteristics (Garner, 2000; Gorham, 1985b; Johnson, 2003). Most approaches assess learning styles along similar lines. For example, Riechmann & Grasha (1974) factored six student learning styles: independent, dependent, avoidant, participant, collaborative, and competitive. Others report such dimensions as concrete experience, abstract conceptualization, active experimentation, reflective observation (Kolb, 1976); analytic, relational, mixed, and conflicting cognitive styles (Cawley, Miller, & Milligan, 1976); convergent, divergent, accommodative, and assimilative (Kolb, 1984); and active experimentation, reflective observation, abstract conceptualization, and

concrete experience (Cornwell & Manfred, 1994). Kolb (1984) makes a persuasive case that heredity, past experience and environmental demands are involved in individuals developing different learning styles. As has been pointed out, there is credible evidence that students' sex is linked to classroom achievement (Geary, 1998; Harris, 1998; Hulbert, 2005), that variations in male and female learning are related to the nature of disciplines (e.g., men outperform women in math; women outperform men in communication classes) (Anderson, 1998; Benbow & Stanley, 1980; Hulbert, 2005; Hughey, 1984), and that variance in female and male behaviors are substantially related to brain, hormonal, experiential and environmental interactions (Brizendine, 2006; Ehrlich, 2000; Harris, 1998; Pinker, 2000). Therefore, it would seem logical that men and women would prefer different learning styles. It would be propitious to good classroom management to obtain concrete knowledge of differences in learning styles and learning related to sex, therefore, the following hypotheses was studied:

H1: Female and male students prefer different learning styles.

H2: Sex of students will be predictive of differences in affective and cognitive learning.

COMMUNICATION AVOIDANCE AND ACADEMIC ACHIEVEMENT

Some studies have investigated relationships of communication and learning styles. Riechmann and Grasha (1974) found that the learning style dimensions of collaborative, dependent, and competitive relate to an interpersonal orientation. Andersen and Bell-Daquilante (1980) found concrete dimensions of communication styles are associated with preferences for more concrete learning experiences, while nonverbal immediacy (direct, involved, friendly) and active communication styles (open, friendly, responsive) are associated with more active learning styles (active experimentation, innovative exploration). They found that reflective learners have a less open communication style and report being less nonverbally immediate. Others report that communication predispositions are related to different learning styles (Bourhis and Berquist, 1990; Dwyer, 1998; Johnson, 2003; Smilowitz & Phelps, 1989). These outcomes suggest a link between communication predispositions and learning styles.

Communication Apprehension

The focus in this study is on the relationship between learning styles and certain communication avoidance behaviors—specifically communication apprehension (CA) and nonverbal immediacy (NIMM). A substantial body of research supports that CA, “an individual’s level of fear or anxiety associated with either real or anticipated communication with another person or persons” (McCroskey, 1977b, p. 78), is a major problem for approximately 20 percent of the population of the continental United States, and that those highly apprehensive individuals avoid oral communication even if they are penalized in personal relationships, educational environments, career attainments, professional relationships, and social interactions (Richmond & McCroskey, 1998). A possible explanation for this pervasiveness may be found in the trait-based etiology of CA. In a recent refinement of this phenomenon, labeled “communibiology,” it is contended that enduring personality traits arise from genetic predispositions (Beatty, McCroskey, with Valencic, 2001). This conceptualization relies primarily on the temperament perspective of Eysenck (1990), who views traits as “essentially dispositional factors that regularly and persistently determine our conduct in many types of situations” (Eysenck & Eysenck, 1985, p. 17), and individual differences in CA are conceptualized to reflect corresponding individual differences in thresholds for triggering activation in the brain. Many people inherit a neurotic, introverted temperament and possess lower thresholds for activation, and when confronted with novel stimuli, perceived threat of punishment or cessation of reward, such individuals have a predisposition toward anxiety proneness that is likely to be manifested as CA (Beatty et al., 2001).

Personality traits have also been studied as predictors of individual learner characteristics (Kolb, 1984, Cornwell & Manfred, 1994; Garner, 2000), and Kolb (1984) advocates that an experiential approach to learning assumes that individuals develop learning styles based on heredity, past experience, and environmental demands. Therefore, knowledge of the relationship between CA and learning styles may help teachers to understand more about how individual students approach the learning environment, and assist in classroom innovations appropriate to students' learning needs.

A study conducted over thirty years ago concluded that instructors' awareness of students' personality characteristics and learning needs are related to levels of general anxiety experienced by students (Dowly & Schumer, 1971), and Smilowitz and Phelps (1989) reported that teacher and student social styles interact with learning styles to influence course evaluations. More specific to the study reported here, Andersen and Bell-Daquilante found that students high in CA preferred a more passive learning

style. Lower CA and greater desire to be involved in communication were positively associated with an active experimentation learning style and negatively associated with a reflective observation style. Dwyer (1998) found that students high in CA prefer reflective thought while low apprehensives prefer active experimentation and innovative exploration. Bourhis and Berquist (1990) found that high CAs manifest a reflective learning style and low CAs manifest an active style. Johnson (2003) reported that changes in scores on communication competency as the result of taking a hybrid basic communication course were not related to learning styles, but that students high in CA reported a preference for less active experimentation.

Not surprisingly, the behaviors of high and low CAs have been found to differ markedly in the classroom environment. Even though no meaningful relationship has been found between CA and intelligence (Bashore, McCroskey, & Andersen, 1976; McCroskey, Daly, Martin, & Beatty, 1998), on average, students who are highly apprehensive score lower on standardized achievement tests, achieve less than their aptitudes would justify, participate less frequently in class, and are evaluated lower by instructors than are more talkative students (Richmond & McCroskey, 1998).

While there is some evidence that differences in student achievement related to the effects of CA may not be as acute in non-traditional (e.g., personalized instruction) or communication restricted (large lecture) modes (Chesebro & McCroskey, 2000; Richmond & McCroskey, 1998), there is general agreement that students who are high in CA suffer academically (Richmond & McCroskey, 1998). In performance-oriented classes, regardless of type (e.g., discussion, interpersonal, public speaking), students with high CA are consistently evaluated lower (Powers & Smythe, 1980; O'Mara et al., 1996). Furthermore, research into the mediation effects of other variables has served to increase the generalizability of a relationship between CA and academic achievement. Davis and Scott (1978) found the amount of verbal activity to be a less compelling explanation. Andriate and Allen (1984) found that language proficiency was not a mediating factor in students' levels of CA and academic achievement, and Johnson (2003) found that CA was more predictive of learning in a basic communication course than a measure of communication competency. Yet, those who are high CAs are likely to be perceived as lacking in communication skills and be evaluated lower by instructors (Martin & Valencic, 2002).

Results have been inconclusive as to whether males or females tend to be more anxious when communicating. Little difference in generalized levels of CA seems to exist; however, females have been found to be slightly more apprehensive in formal communication contexts—meetings and public speaking, while males have been found to be more apprehensive in interpersonal contexts (Greenblatt, Hasenauer, & Freimuth, 1980; Talley & Richmond, 1980; McCroskey, Simpson, & Richmond, 1982; Andriate & Allen, 1984). The meeting construct, as measured by the PRCA-24, is thought to assess behaviors isomorphic with classroom communication (Richmond & McCroskey, 1998). The question of whether CA interacts with sex, personalized learning styles, and learning outcomes has not been as yet addressed. However, Allen (1984) found that females who are high CAs receive lower grades in both interpersonal and public speaking basic courses than those females who report either moderate or low levels of CA, but females who are high CAs receive higher grades than males who are high CAs. Leary (1983) has theorized that since there is general agreement that women are socialized to convey impressions of sensitivity, tenderness, and nurturance, these "traditionally" socialized "feminine" women are probably be apprehensive in communication situations calling for assertive behaviors. This traditional socialization may interact with CA and learning styles in positive or negative ways in the classroom. Because research has been inconclusive, or at best, mixed as to differences in CA between men and women, the following hypothesis was examined:

H3: Female and male students will differ in levels of communication apprehension experienced generally and in generalized contexts.

The "learned helplessness" explanation of the development of CA suggests that individuals learn to feel anxious in situations when they perceive little control over their fate. Communicating in such contexts—and sometimes the classroom may be such a context—may result in lowered thresholds culminating in heightened anxiety, withdrawal, and a willingness to suffer the negative consequences of not communicating (Richmond & McCroskey, 1998; 2006). This avoidance behavior of those who are highly apprehensive about communicating results from negative attitudes that individuals have toward engaging in communication activities. Avoidance behaviors may also be a negative manifestation of a more global communication construct labeled "nonverbal immediacy (NIMM)," the degree of perceived physical or psychological closeness between communicators (Andersen, 1979).

Nonverbal Immediacy

Behaviorally, immediacy is the actual approach behaviors of a person toward another person or situation, while nonimmediacy is the actual avoidance of a person or situation (e.g., communication). Affectively, people are nonverbally immediate with things, people, and situations they like, while being nonverbally nonimmediate with things, people, and situations they don't like (e.g., communication) (Mehrabian, 1971). Hence, the high CA might be expected to be less behaviorally immediate in the classroom because of his/her dislike and fear of communication situations.

Those who are less immediate are perceived by others as less likeable, less friendly, and generally less attractive (Richmond, & McCroskey, 2006). Likewise, students who are high CAs are viewed as less attractive (Richmond & McCroskey, 1998), and evidence indicates that students who are perceived as less attractive are evaluated lower (O'Mara et al., 1996). Recent evidence indicates that trait-like personality predispositions are likely to be pervasive across situations Cole (2000) found a strong relationship between NIMM and trait-based indices of temperament, and concluded that nonverbal immediacy is an inherited, trait-based, "personality driven pattern of behavior that may not be as easily modified as a behavior which has no deep-rooted source" (p. 93.). Another study found that shyness strongly correlates with the genetically determined predispositions of extraversion and neuroticism, suggesting that shy people are biologically presupposed to avoid social interaction (Heisel, McCroskey, & Richmond, 1999). Thus, there is evidence that nonverbal immediacy, like CA, is related to the neurobiological system and is therefore trait-based.

Students' perceptions of instructors' NIMM has been a strong predictor of affective, and to a lesser extent cognitive learning (Christophel, 1990; Gorham, 1988; Richmond et al., 1987), and a recent study by Baringer and McCroskey (2000) found that teachers express more positive affect for students perceived to be more nonverbally immediate.

Generally, positive correlations have been found between a person's degree of CA and his/her perception of self-immediacy (Allen, Richmond, & McCroskey, 1984; Richmond, McCroskey, Baldwin, & Berger, 1984), O'Mara and her colleagues (1996) report that high CAs who are low in NIMM perceive that they have more communication problems and suffer more negative consequences when communicating. While most previous studies of NIMM and learning have examined the affect of teacher NIMM as perceived by students, the study reported here investigated students' perceptions of their own NIMM and its affect on their learning. Mehrabian (1981) indicates that immediacy is the interaction between two people, and "includes greater physical proximity and/or more perceptual stimulation of the two by one another" (p. 14). It is necessary, therefore, to consider, in addition to the effects of teachers' NIMM, the effects of students' general and contextual nonverbal immediacy in the learning environment by studying the third hypothesis.

H4: Female and male students differ in terms of perceptions of nonverbal immediacy experienced generally and varying classroom contexts.

Some studies have found differences in evaluation and teacher/student relationships related to teacher sex (Martin-Reynolds & Reynolds, 1983; Rosenfeld, 1983). Rosenfeld & Jarrard (1985) report that the classes liked by students are described as more involving and supportive, and that communication climate in the classroom affects the coping behaviors of students. Andersen and Bell-Daquilante (1980) found that high levels of NIMM are associated with active as opposed to passive learning styles. Martin and Valencid (2001) report that, regardless of teachers' sex, male students rate the teachers higher in competence, character, and caring;; and that, regardless of teachers' sex, male students rate the teachers higher in affect and conversational appropriateness. Previous research into NIMM and learning has been mostly concerned with students' perceptions of their instructors' NIMM, and there has not been an attempt to examine students' perceptions of instructor NIMM in relationship to the sex of the instructor, therefore the following provocative hypotheses was investigated:

H5: Differences in students' perceptions of instructor nonverbal immediacy and reports of cognitive and affective learning will differ depending on the sex of the instructor.

Affects Of Communication Apprehension

As stated above, a preponderance of research has shown that one in five persons in the United States is high in CA, and that this trait-like predisposition is a significant problem in personal, work-related, and educational endeavors (Richmond & McCroskey, 1998). While studies have explicated problems that high CAs have in the classroom (Mottet et al., 2006), there has not been an investigation of differences in learning styles related to high, moderate and low levels of CA. It would be expected that those high in CA would prefer less active styles of learning, therefore, hypothesis six was constructed to investigate that possibility.

- H6:** Students who are high in CA will differ from other students in terms of
- nonverbal immediacy—generally, and in specific contexts.
 - preferred learning styles
 - affective and cognitive learning experienced in the classroom.

Finally, since it is likely students' individual learning styles, and communication avoidance tendencies affect their perception of that climate and ultimately learning, the following research questions was examined:

RQ1: Are there relationships among communication apprehension, immediacy, learning styles, and cognitive and affective learning regardless of students' sex?

METHOD

Participants

Communication apprehension and nonverbal immediacy instruments were administered to 389 (females = 180, males = 209) undergraduate students enrolled in the twenty-four sections (female instructors = 14, male instructors = 10) required basic communication skills course at a medium-sized private university in New England. All sections had the syllabus, texts, midterm and final examination questions, most written and oral assignments, and the weighting of various components in determining the final grade in common. Grading was done by individual instructors, but similar evaluation procedures and norms were used.

Measurement

Communication Apprehension (CA). Communication apprehension was conceptualized as trait-like anxiety associated with four separate oral communication contexts—groups, meetings, dyads (interpersonal), and public speaking, and operationally defined as the score received on the 24 item Personal Report of Communication. Participants responded to each of the items on a five-point Likert-type scale ranging from *strongly agree* to *strongly disagree*. Previous studies have produced a mean of 65.6 and a standard deviation of 15.3, and high reliability and predictive validity (McCroskey, 1984; Richmond & McCroskey, 1998). In this study the reliability coefficient for the total PRCA was .92.

Nonverbal immediacy (NIMM). Four Likert-type scales measured nonverbal immediacy. After reading a definition of nonverbal immediacy, students were asked to indicate on scales from one to seven (1 = *highly immediate*, 7 = *lowly immediate*) the extent of their NIMM generally, with fellow students, with university instructors generally, and with the instructor of their communication course. The inter-item reliability estimate was .87.

Learning Styles. Individual student learning styles were measured using the Grasha-Reichmann Student Style Scale (Reichmann & Grasha, 1974). The instrument consists of 90 statements, with 15 items measuring each of six learning styles (e.g., I have a difficult time paying attention during class sessions; If I do not understand the course material, I just forget it.) measured by Likert-type scales ranging from 1 *strongly disagree* to 5 *strongly agree*. A test-retest correlation of .80 has been reported across scales for the measure (Gorham, 1985a). This study produced reliability coefficients of .89 for independent, .81 for dependent, .83 for avoidant, .88 for participant, .90 for collaborative, and .81 for competitive.

Learning. Affective learning was measured by semantic differential scales, with a range from one to seven spaces. The scales were designed to measure student affect toward the communication practices suggested in the course, toward the content of the course, toward the course instructor, and toward the course in general. These scales have yielded high reliability in previous

studies (Andersen, 1979; Andersen, et al., 1981; Kearney, et al., 1985). Alpha coefficients in this study were .86 for communication practices, .84 for content, .85 for instructor, and .82 for the course in general.

Final grades assigned by the instructors were used as a measure of cognitive learning. However, it should be pointed out that such grades have been criticized as an index of cognitive learning. There is the possibility of a degree of subjectivity in such ratings, but certainly the gestalt is important in terms of the influences that students' communication behaviors may have on teachers' evaluations. As a check on this criticism, it was decided to also use students' predictions of their final grade as a criterion variable of cognitive learning. It was reasoned that students will make such a prediction mostly on feelings about what they have learned. Of course, there is always the possibility that some of the students' selective perception of their instructors' behavior toward them may be weighted into their predicted grades. Nevertheless, it was felt that students' predicted grades were more likely to approximate their perception of what they had learned in the course. The idea of using test scores as a measure of cognitive learning was rejected because of the possibility of bias in terms of learning styles.

Statistical Analysis

A *t*-test was used to determine if there are differences between females and males' preferred learning styles (H1), affective and cognitive learning (H2), levels of CA (H3), and perceptions of self-immediacy (H4). A *t*-test was also used to determine if perceptions of teacher NIMM and learning outcomes vary by teachers' sex (hypothesis 5). As has been the accepted norm in previous studies (Richmond & McCroskey, 1998), students who were one *standard deviation* below the mean were considered to be low in CA, while those who scored one *standard deviation* above the mean were considered as high in CA. *One way analysis of variance* was used to determine if students who are high in CA differ from students who are moderate or low in CA in NIMM, preferred learning styles, and affective and cognitive learning (hypothesis 6). *Student-Newman-Keuls post hoc analysis* was used to determine which of the three levels differed significantly. The *Pearson Correlational Coefficient* was used to determine the relationships among CA, NIMM, learning styles, and affective and cognitive learning.

RESULTS

Hypothesis one that predicted that females and males prefer different learning styles was accepted. A comparison of the means scores in Table 1 reveals that males are more independent ($t = 3.47, p < .05$) and more avoidant ($t = 3.67, p < .05$) in the classroom, and that females are more collaborative ($t = 3.76, p < .05$), however, females and males do not differ in their use of dependent, collaborative, competitive, and participant learning styles.

Hypothesis two which predicted that differences in learning would reflect students' sex was also accepted. An examination of the means reported in Table 1 reveals that female students report that they experience more affective and cognitive learning. Affectively, females find the communication practices in the course more helpful in their lives ($t = 4.10, p < .05$), and they like their communication course ($t = 3.78, p < .05$) and their instructor ($t = 3.69, p < .05$) more than the males. In terms of indices of cognitive learning, females predict that they will get higher grades ($t = 3.15, p < .05$), and in fact, they did receive higher grades than male students ($t = 6.10, p < .01$). Interestingly, both female and male students predicted they would receive an average grade of B. The females actually received an average grade of C+ and the males received an actual average grade of C.

Even though past research has produced mixed results, it was predicted that female and male students would differ in levels of CA experienced generally and in generalized contexts (H3). Females report experiencing significantly more CA than males overall ($t = 5.52, p < .02$), and in meeting/classroom ($t = 3.67, p < .05$) and public speaking contexts ($t = 29.92, p < .0001$) (Table 1); therefore, hypothesis three was accepted.

A means test of hypothesis four (Table 1), which predicted that female and male students differ in terms of perceptions of NIMM experienced generally and varying classroom contexts, revealed that female students are generally nonverbal immediate than males ($t = 7.50, p < .007$), but female and male students do not differ in perceptions of their NIMM with fellow students, university teachers generally, or their specific communication instructors.

As predicted by hypothesis five, instructor sex was definitely a factor in students' perceptions of the instructors' NIMM, and learning outcomes (Table 2). As was reported earlier, female and male students do not differ in terms of perceptions of instructor NIMM, but when it comes to the instructors' sex, students as a whole, regardless of gender, perceive definite differences.

Male instructors in communication classes are perceived as less immediate ($t = 3.99, p < .05$). Students like female instructors more ($t = 4.99, p < .03$). When it came to cognitive learning, students predict that female instructors will assign them higher grades ($t = 9.47, p < .002$), and that is actually the case ($t = 3.70, p < .05$). However, sex of the instructor does not differentiate two of the affective learning variables, the likelihood of using behaviors recommended in the course and the value of course content, but based on the significant differences in the influences of instructors' sex, hypothesis five was accepted.

Table 1: Students' Sex, Communication Apprehension, Nonverbal Immediacy, and Learning Styles

Comm. App., Immediacy, & Learning Styles	Female (n = 180)	Male (n = 209)
Communication Apprehension		
Group	14.78	14.49
Meeting	17.01	16.00 (<.05)
Dyad	14.48	14.76
Public	21.26	18.53 (<.0001)
Overall	67.47	63.78 (<.02)
Nonverbal Immediacy*		
General	2.75	3.11 (<.007)
Student	2.98	3.19
General Teacher	3.44	3.36
Communication Teacher	3.03	3.10
Learning Styles		
Independent	46.75	49.21 (<.05)
Dependent	50.63	50.38
Avoidant	30.85	34.89 (<.05)
Collaborative	53.45	48.32 (<.05)
Competitive	39.70	41.56
Participant	58.77	56.37
Affective Learning**		
Recommended Practices	1.90	2.17 (<.05)
Course	1.87	2.09 (<.05)
Instructor	1.74	1.95 (<.05)
Cognitive Learning		
Predicted Grade	3.38	3.23 (<.05)
Assigned Grade	2.93	2.49 (<.01)

*Low score = higher nonverbal immediacy

**Low score = more affective learning

Table 2: Sex of Instructors, Perceptions of Instructors' Nonverbal Immediacy and Students' Learning

Nonverbal Immediacy & Learning	Female Instructors	Male Instructors
Communication Instructors Immediacy	3.00	3.34 (<.05)
Affect for Communication Practices	2.06	2.08
Affect for the Course	1.99	2.06
Affect for Instructors	1.80	2.09 (<.03)
Cognitive Learning-Predicted Grade	3.35	3.30 (<.003)
Cognitive Learning-Assigned Grade	2.73	2.43 (<.05)

Table 3 reveals that students who are high CAs are less immediate generally [$F(2, 233) = 20.88, p < .001$], with other students [$F(2, 233) = 15.02, p < .001$], with instructors generally [$F(2, 233) = 17.75, p < .001$], and with their communication instructors specifically [$F(2, 233) = 19.78, p < .001$] than those students who are moderate or low in CA (H6a). High CAs also report less affective and cognitive learning (H6b). In other words, high CAs are less likely to use the behaviors recommended in the course [$F(2, 233) = 3.25, p < .05$], find the subject matter less valuable [$F(2, 233) = 4.67, p < .05$], and like the instructor less [$F(2, 233) = 3.78, p < .05$]. On the measures of cognitive learning, high CAs are lower both in terms of predicted [$F(2, 233) =$

3.19, $p < .05$] and actual grades [$F(2, 233) = 3.01, p < .05$]. A test of the means for learning styles revealed that high CAs have more independent [$F(2, 233) = 3.15, p < .05$] and avoidant [$F(2, 233) = 3.49, p < .05$] learning styles than students who are moderate or low in CA. High, moderate, and low CAs do not differ significantly in terms of dependent, collaborative, competitive, and participative styles of learning (H6c). The three parts (a, b, c) of hypothesis 6 were accepted.

Table 3: Levels of C A and Students’ Nonverbal Immediacy, Learning Styles, and Learning Outcomes

Nonverbal Immediacy, Learning Styles, & Outcomes	Communication Apprehension Levels		
	High CA (n = 67) (PRCA > 79)	Moderate CA (n = 260) (PRCA > 51 & < 80)	Low CA (n = 62) (PRCA < 52)
General Nonverbal Immediacy	3.76 ^{ab}	2.91 ^{ac}	2.36 ^{bc}
Student Nonverbal Immediacy	3.79 ^{ab}	3.09 ^{ac}	2.55 ^{bc}
General Teacher Immediacy	4.15 ^{ab}	3.40 ^{ac}	2.76 ^{bc}
Communication Teacher Immediacy	3.97 ^{ab}	3.04 ^{ac}	2.46 ^{bc}
Independent Learning Style	45.81 ^{ab}	48.45 ^a	48.63 ^b
Dependent Learning Style	50.90	49.84	52.52
Avoidant Learning Style	50.19 ^{ab}	53.79 ^a	53.67 ^b
Collaborative Learning Style	52.73	53.22	53.72
Competitive Learning Style	41.10	40.40	41.74
Participative Learning Style	55.86	57.81	57.22
Affect for Communication Practices	2.41 ^{ab}	2.05 ^{ac}	1.79 ^{bc}
Affect for the Course	2.34 ^{ab}	2.03 ^{ac}	1.61 ^{bc}
Affect for the Instructor	2.16 ^{ab}	1.89 ^{ac}	1.49 ^{bc}
Predicted Grade	3.02 ^{ab}	3.29 ^{ac}	3.57 ^{bc}
Assigned Grade	2.67 ^{ab}	2.65 ^{ac}	2.81 ^{bc}

Matching letters in same row are significantly different at $p .05$.

The research question asked if there relationships, regardless of students’ sex, among CA, NIMM, learning styles, and cognitive and affective learning? The correlational analyses presented in Table 4 reveal that CA correlates moderately, but significantly, with general NIMM ($r = .31$), NIMM with fellow students ($r = .31$), NIMM with teachers generally ($r = .32$), and NIMM with the instructor in the communication class ($r = .35$). Neither CA nor NIMM is strongly correlated with the learning styles studied; however, some interesting tendencies are revealed by those low to moderate correlations which are significant. There is a low negative correlation between CA — generally and contextually—and the collaborative learning style (general CA, $r = -.24$; group CA, $r = -.18$; meeting CA, $r = -.19$; dyadic CA, $r = -.16$; public speaking CA, $r = .25$). This suggests that the collaborative style is used more by those students who experience less CA. The contexts of NIMM are also low, but significantly correlated negatively with collaborative learning style (general NIMM, $r = -.16$; NIMM with fellow students, $r = -.20$; general instructor NIMM, $r = -.16$, communication instructor NIMM, $r = -.16$), suggesting that those higher in NIMM are more collaborative in the classroom. The contexts of general ($r = .17$) and student NIMM ($r = .16$) were low, but positively correlated with the avoidant style, while NIMM with instructors generally ($r = .25$) and NIMM with the communication course instructor ($r = .30$) correlated moderately, but positively, with the avoidant learning style. This suggests a tendency for less immediate students to be more avoidant in the classroom. The dependent learning style was slightly, but significantly, correlated with NIMM with instructors generally ($r = -.19$) and NIMM with the communication course instructor ($r = -.19$), and the participant learning style correlated with general instructor NIMM ($r = -.18$) and communication course instructor NIMM ($r = -.21$). The negative direction of these correlations suggests that those students who are higher in dependent and participant learning styles are also more NIMM.

Table 4: Correlations among Communication Apprehension, Nonverbal Immediacy, and Learning Styles

	Communication App.	General NIMM	Student NIMM	Gen. Inst. NIMM	Comm. Inst. NIMM
General NIMM	.31*	---	.56*	.35*	.41*
Student NIMM	.31*	.56*	---	.47*	.48*
General Teacher NIMM	.32*	.35*	.47*	---	.74*
Comm. Teacher NIMM	.35*	.41*	.48*	.74*	---
Independent Learning Style	-.17*	.02	.07	.06	.08
Dependent Learning Style	-.11	-.15	-.13	-.19*	-.19*
Avoidant Learning Style	.11	.17*	.16*	.25*	.25
Collaborative Learning Style	-.24*	-.16*	-.20*	-.16*	-.16*
Competitive Learning Style	.006	.06	.04	.003	.05
Participant Learning Style	.11	-.12	-.12	-.18*	-.21*

CONCLUSIONS

In this study, as has been the case in a few previous studies (Richmond & McCroskey, 1998), females were found to be more apprehensive overall because of higher CA scores in meeting and public speaking contexts. Females were more generally immediate, but were found not to express more NIMM than males in classroom contexts. In terms of learning styles, males were more independent and avoidant than females.

Because of higher levels of CA in formal contexts, especially in the meeting context, which is thought to be synonymous with classroom, it would be expected that females would learn less than males. Previous studies have shown that students who are high in CA perform less well and are evaluated lower in the classroom. However, in this study, female students, despite being more apprehensive, reported more affective and cognitive learning. Female students indicated that they would make more use of the behaviors recommended in their communication course, valued course content more, and liked the instructor more than did male students. Female students predicted that they would receive higher grades than male students, which they, in fact, did. It therefore seems that while students high in CA perform and are evaluated less highly, females who are high in CA out-perform, or at least are evaluated higher than males in communication classes.

Some previous studies have suggest that female students may receive higher grades in communication classes because they are more competent and responsive than male students in the communication classroom ((Roberts & Pearson, 1982; Hughey, 1984), but evidence relative to such explanations is still inconclusive and speculative. McCroskey and Beatty (1986) contend that motivation to achieve a grade may offset the effects of communication apprehension. Perhaps, the desire to achieve a particular grade may also make females more responsive, and cause them to appear more competent. It may also be that there is a strong correlation between immediacy and motivation. Future studies should explore these issues in depth.

This study indicates that communication variables are better predictors of learning than the so-called learning style variables. These results were surprising in light of the correlations of the learning variables with both CA and immediacy. Low CAs learned less, and felt less good about themselves in the classroom. These results would suggest that more emphasis in communication education generally and teacher training specifically should be put upon dealing with communication in the classroom. Moreover, the results of this study (if they hold up in future studies), indicate that there are gender differences for instructors which influence both perception of classroom learning and the actual grades received. Students feel better in classes taught by females and seem to learn more. However, these results need to be further investigated in terms of the research which has already been done relative to psychological gender (Bem, 1974; Wheelless & Dierks-Stewart, 19 81) since there is evidence that the stereotypical male communication style may be a hindrance to learning (Hubert, 2005).

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