ABSTRACT
This study examined whether nursing students experience an unusual amount of debilitating anxiety in academic achievement, compared to general university students, and provided senior psychiatric nursing students with a hands-on experience in research. A nonprobability convenience sample of 225 students was drawn from a university in the eastern United States. Alpert and Haber’s Achievement Anxiety Test was administered to 94 nursing students and 131 general university students. Results indicated that nursing students do not have a statistically significantly higher debilitating anxiety than the general student population. However, all students experienced significantly higher levels of debilitating anxiety than were found by Alpert and Haber. Implications for academic nursing are discussed.
When students expressed concern about the level and intensity of their test-taking anxiety, the author reported that test anxiety has been a subject of previous research, which indicated that such anxiety can interfere with academic success, and that McEwan and Goldenberg (1999) was an example of a good research report on this subject. During this discussion, the author noted that debilitating test anxiety has been studied for decades (Hudesman & Wiesner, 1978) and is defined as anxiety that interferes with one's test-taking performance.

Many students report feeling anxiety so intense they "freeze" or perform badly, although other methods of evaluation prove they are not deficient. Research increasingly recognizes as an important part of the nursing profession. The author's institution supports the goal that "for nursing to advance as a scientific discipline, students at all educational levels must be exposed to basic concepts of the scientific process" (Radinovic & Chally, 1998, p. 26). At the same time, to possess the self-esteem and insight critical to working in mental health, nurses require such understanding of their own mental health as possible (Meadows, 1998; Meisenhelder, 1985). Therefore, a learning-research experience is incorporated to introduce students to a research approach for identifying certain mental health issues in nursing and university students. In this case, students selected achievement anxiety as manifested in performance anxiety related to test-taking, as the problem they considered relevant and wished to research.

The research questions the students devised were related to whether their level and incidence of debilitating anxiety was different from other university students and whether their level of anxiety was unusual for their generation. The design and selection of participants was discussed among the author and students during the first group meeting. During the semester, students learned about recruitment of participants; ethics in research, including informed consent; use of psychological inventories; data analysis; and implications of the collective findings for nursing and general university students. Therefore, students came away from the experience with an introductory knowledge of research processes, as well as some insights into their own and general university students' mental health.

After the author conducted a literature review, the instrument selected for the study was Alpert and Haber's (1960) Achievement Anxiety Test (AAT), which measures test anxiety. The AAT's history of use since the 1960s was a positive feature. In addition, the test's construct was ideal—a paper and pencil instrument that provides for the measurement of anxiety as it affects academic achievement performance" (Alpert & Haber, 1960, p. 207). Finally, Alpert and Haber's construct of debilitating anxiety seemed most related to students' expressed concerns about test taking.

Students noted that anxiety can be defined simply as an unpleasant internal state of fear or concern, in this case about test performance. What students experience is debilitating anxiety, which can be defined as anxiety that interferes with performance during examinations and tests. This definition was the one used by Alpert and Haber (1960) for the AAT.
RESEARCH QUESTIONS
The research questions for this study were:
• Is the level of debilitative anxiety in nursing students different from the level of debilitative anxiety in the general university population?
• Is the level of debilitative anxiety significantly different between the current sample of university students and/or nursing students and the normative values established by the authors of the AAT?

LITERATURE REVIEW
Current literature on undergraduate nursing students and test-taking anxiety yielded no study using the AAT. However, McEwan and Goldenberg (1999) reported trait anxiety as a valid predictor of academic success. They found that, although achievement motivation was not a significant predictor of academic success, participants with high trait anxiety demonstrated significantly higher academic success ($r = .35, p = .054$). However, this level of probability, coupled with the small sample ($N = 41$), would require replication to validate these results. In addition, trait anxiety and achievement anxiety are likely different constructs or domains of cognitive functioning, and the study sample was composed of master’s level, rather than undergraduate, students.

More current instruments addressing test anxiety exist (e.g., Elliot & McGregor, 1999; McIlroy, Bunting, & Adamson, 2000). However, the constructs in these studies did not involve the nursing students’ area of interest (i.e., test-taking anxiety that interfered with test-taking performance in nursing students, compared to other university students). In addition, no study was found in the nursing literature that reported on academic anxiety and debilitative test-taking anxiety among undergraduate nursing students and how that anxiety may predict academic performance.

In many nursing schools, at least two examinations are given per semester, either of which can determine whether students will continue in their studies, need to repeat the course, or even drop out of the school. Therefore, it is reasonable to believe that if students perform poorly (or less well than they expected) on the first examination, their anxiety level would increase when facing subsequent examinations. It also is logical that undergraduate students would benefit from knowing whether they have a significant level of debilitative anxiety in test situations because educational guidance or counseling programs are available and effective for this type of academic-emotional difficulty. As Alpert and Haber (1960) indicated, higher anxiety can result in a poorer learning experience for students. However, programs for reducing debilitative test anxiety can be developed, and often educational consultative services already have helpful programs available. Therefore, once identified, debilitative test-taking anxiety can be remedied.

METHOD
Subjects and Setting
Participants were obtained from three sources. First, senior undergraduate nursing students were asked to participate in completing the inventories. Second, non-nursing students from a freshman class taking a first-year course entitled Human Motivation were asked to complete the research study inventories as part of their learning about motivational structures. Third, the research students solicited participation from university students in general on campus.

All participants were briefed on the nature of the study and the instruments involved and were asked to sign an informed consent form. Internal Review Board approval was obtained. Nursing students participated in testing and data collection from the fall semester of 1999 to the spring semester of 2000, drawing samples from this same time frame. All testing was conducted under the author’s supervision. Participants were identified by a code number known only to them to maintain confidentiality and anonymity.

Several inventories were provided to study participants. The pertinent instrument for this study is the AAT, a 19-item instrument that has two scales. The facilitative scale assesses anxiety as a motivator in test taking. Students decided not to examine this factor for this study, but data on the scale were collected and included in the analysis. The debilitative scale assesses the degree to which anxiety interferes with test performance. The two scales are intermingled in the instrument but are scored separately. As indicated in the literature review, the AAT predicts academic performance.
Instrument
The AAT (Alpert & Haber, 1960) was designed "as part of the effort to define and measure the variables [involved in achievement anxiety] of which test performance is a function" (p. 207). In other words, the AAT was designed to examine anxiety in test taking where test-taking is an anxiety-laden situation that can interfere with achievement in general. In their discussion of general versus specific scales, Alpert and Haber (1960) presented convincing evidence for the validity of the specific tool approach. Tools that have "specific anxiety scales are more often significantly correlat-
ed with academic performance measures than are the general anxiety scales" (Alpert & Haber, 1960, p. 209). Incorporating the two scales into one instrument has produced a predictive correlation as high as .50 for grade-point average (GPA), with a significance level of .001 (Alpert & Haber, 1960).

Alpert and Haber (1960) reported that the "debilitating scale of the AAT adds significantly, over and above aptitude, to the prediction of the grade-point average (GPA)...and the facilitating scale of the AAT adds significantly, over and above aptitude, to the prediction of GPA" (p. 213). Of the samples reported, a representative one from 1955 involved 96 freshman students at Stanford University. At the end of students' first year, the correlation between stu-
dents' GPAs and the AAT facilitating scale was .42, with the debilitating scale, the correlation was -.29. Both are significant at the p < .01 level. This suggests the tool has validity for measuring the constructs of the two forms of anxiety that either help or hinder test performance, where GPA is acknowledged to be a reflection of academic performance. Because many samples were involved, these data also reflect the reliability of the AAT. Alpert and Haber (1960) reported test-retest reliabilities for a 10-week interval of .83 and .87, and test-retest reliability for an 8-month period was .75 for the facilitative scale and .76 for the debilitating scale. From these samples, the average means and standard deviations for the AAT were reported as "AAT facilitating mean score = 27.28, SD = 4.27 and debilitating mean score, 26.33, SD = 5.33" (Alpert & Haber, 1960, p. 214).

Christensen (1979) further supported the validity of the AAT in a study of 94 high school seniors. One group was selected from accelerated classes and was considered to include high achievers. The other group consisted of students considered to be low achievers. If the AAT was correlated in terms of facilitative anxiety aiding test performance, then the high-achieving students should show significantly lower debilitating test anxiety scores than the low-achieving students. In fact, high-achieving students showed significantly lower debilitating test-taking anxiety than low-achieving students ($F = 13.74, df = 1/90, p < .01$). Notably, women in general exhibited higher levels of debilitative test anxiety than men ($p < .01$).

In addition, regarding validity, Hudesman and Wiesner (1978) investigated whether facilitative or debilitating anxiety were higher in college students who had volunteered for test anxiety desensitization workshops than in other students. They tested 54 students who had volunteered for a desensitization workshop, as well as 182 students from the general college population. $T$ tests were conducted between the groups to determine whether facilitative or debilitating scores were different between identified highly anxious students and general college students. The $t$ test for the facilitative scale was significant, as was the $t$ test for the debilitating scale. These data suggest the tool is sensitive to individuals who perceive themselves to be experiencing test anxiety.

In 1982, Tuck analyzed the effects on the reliability and validity of the original instrument by comparing six different versions of the AAT against the original instrument in test subjects. Tuck (1982) noted that many studies were conducted that claimed to use the AAT. Therefore, it appears the instrument was popular in the 1960s and 1970s. However, literature searches for use of the instrument after the 1970s suggest the AAT has since been abandoned for indiscernible reasons.

Procedure
After the completed inventories were gathered, the nursing students scored the inventories according to master scoring sheets. The data were entered into an SPSS program, after which random cases were selected and reviewed to further ensure the data were entered without error. Two hundred
twenty-five inventories were completed and analyzed. Of these, 94 were nursing students, and the remainder were non-nursing university students.

RESULTS
For the first research question (i.e., Is the level of debilitative anxiety in nursing students different from the level of debilitative anxiety in the general university population?), a univariate analysis of variance was performed for the groups of general university students, freshman students, and senior nursing students. Analysis revealed nursing students’ level of debilitative anxiety did not differ significantly from the general university population ($F(2, 227) = .754, p = .472$). Although facilitative scores were not included in the research questions, the data was analyzed, and the facilitative scores proved to be significantly different ($F(2, 227) = 9.95, p = .000$), with the freshman students’ facilitative scores being the highest of all groups (freshman students’ mean = 30.21, SD = 4.42; nursing students’ mean = 26.38, SD = 4.97).

For the second research question (i.e., Is the level of debilitative anxiety significantly different between the current sample of university students and/or nursing students and the normative values established by the authors of the AAT?), one sample t tests were used to compare the whole sample to normative values provided by Alpert and Haber (1960). Debilitative scores between the sample and Alpert and Haber’s normative sample were significantly different ($t(219) = 16.345, p = .000$), with the current sample’s debilitative scores significantly higher than Alpert and Haber’s normative values ($t(91) = 10.63, p = .000$). Therefore, nursing students had significantly higher levels of anxiety that interfere with test-taking performance than Alpert and Haber’s sample. For university students in general, debilitative levels were significantly higher than those of Alpert and Haber’s sample ($t(127) = 12.38, p = .000$). All students in this sample experienced significantly higher levels of debilitative anxiety than the normative sample in the early 1960s.

DISCUSSION
Although it is possible the construct of debilitative (or facilitative, for that matter) anxiety may have changed since the 1960s, it does not seem likely. Therefore, these results suggest students in general, and nursing students in particular, are experiencing more debilitative anxiety than students in the 1960s. It is intriguing to wonder why. One possibility is the increasing complexity of technology students must master. Finding ways to help students achieve the necessary skills challenges current educational systems.

It is not unusual for researchers to be interested solely in the debilitative scale of the AAT (Tuck, 1982), and evidence exists that the two scales are not necessarily correlated (Hudesman & Wiesner, 1978). However, Alpert and Haber (1960) noted that facilitative anxiety scores added significantly to the prediction of GPA in their samples. Both Tuck (1982) and Alpert and Haber (1960) indicated that participants may score high on both scales, but neither suggest a definitive explanation for the effect of both scores being elevated.

In this sample, facilitative and debilitative anxiety scores were elevated in the freshman and general university students, and facilitative anxiety scores were unremarkable among nursing students, with some elevation of debilitative scores. Given the limitations of the study, it can only be concluded that the nursing students seemed to experience less facilitative anxiety than the university students in general.

One limitation of this study was the inability to obtain GPA or test averages for the sample. However, the author knows anecdotally that grades for nursing students are high, whatever their level of anxiety. Several factors may account for this. One possibility is the assumption that people with a severe impairment in test-taking performance simply will not pass the freshman year. Only the best performers tend to "make the grade" into the last 2 years of nursing school. Within nursing school, another possible explanation for success in the face of significant debilitative anxiety is the willingness of faculty to provide considerable extra time and effort to ensure students perform well on examinations.

On an equally anecdotal note, many students report severe anxiety in test taking (e.g., "going
blank" on questions) and frequently changing responses, which tend to be wrong and thus lowers their grade for the examination. This pattern has been identified in the research literature (Frederickson, 1999). Other students report engaging in more hours of study for an examination than the popular guideline of 2 hours of home effort for every hour of academic credit. One student stated:

My experience is like a person being led up to a cliff. The faculty teach us clusters of facts that we memorize, but then when the tests are given, the questions don't seem to call for recollection of facts, so over the edge we go.

Given the lack of correlation of performance to anxiety in this sample of senior nursing students, defining the nature of the test anxiety is important and intriguing (Neill, Lachat, & Taylor-Panek, 1997).

Given the lack of correlation of performance to anxiety in this sample of senior nursing students, defining the nature of the test anxiety is important and intriguing. The author is concerned that nursing students are having such negative experiences, while learning about their future profession. Part of the answer may lie in the findings of research such as that conducted by Schroeder (2000), who suggested that personality type and learning patterns, as developed by Jung (1921/1971), play an important role in education. In Schroeder's work, he notes that a pattern labeled ES (i.e., Extroverted/Sensing) is the most frequent combination found in high school seniors. The ES learner is action oriented, practical, and learns best when useful applications are obvious. The sample of senior nursing students in this study was 59% E and 63% S. Twenty-seven percent were ES, and 35.6% were IS combinations (i.e., Introverted/Sensing). This is a typical Myers Briggs-type personality preference profile, according to Barr (1997)*. The IS learner prefers to address the real and factual in a careful, unhurried way. These preferences are considered concrete in that facts and details are preferred.

According to Schroeder's (2000) research, IS students are the most pragmatic and least academic. It is reasonable to believe that nursing students tend to be concrete, active learners who come to class looking for direct, concrete experiences. They want to participate in hands-on care or clinical experiences, and desire considerable structure in presentation of material and prefer a linear approach. Both this study's and Schroeder's (2000) findings suggest nursing students prefer practical, factual material and lectures, with a focus on physical, rather than abstract, associative, or conceptual material. However, many teaching strategies do not support such an active learning environment. In addition, testing in nursing often uses the National Council Licensure Examination for Registered Nurses (NCLEX) approach, in which questions are based on the nursing process, which calls for associative thinking, comprehension, application, and analysis (Heofer, 1998).

Therefore, although test anxiety may not be correlated directly to test performance, perhaps nursing students are presented with concrete, factual, or information-based material in lectures and presentations, but are tested with associative-level questions. If this is the case, one could reasonably expect students to be discomforted in their early experiences and subsequently anxious about their performance in future testing.

Another possibility is that educators seem to prefer global, conceptual, and abstract ideas (Schroeder, 2000). In this case, students and faculty suffer a teaching-learning incongruity that leads to students' dissatisfac-

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* According to Jungian and Myers-Briggs theory, there are four preference pairs that form 16 possible personality types. The four pairs are: Extraversion or Introversion, which has to do with how one directs their energy and attention; Sensing or Intuition, which involves how one prefers to take in information; Thinking or Feeling, which concerns how one prefers to make decisions; and Judging or Perceiving, which involves how one orients to the outer world.
tion with the classroom experience. Their disappointment resulting from expecting concrete and teacher-centered experiences and receiving global material could become chronic. Again, only anecdotal evidence exists regarding these suppositions. However, if this were the case, it would clarify the reason many students who want to be nurses do not enjoy the nursing education experience.

**CONCLUSION**

This study has demonstrated that students in general, and nursing students in particular, at one university experience a significant level of debilitating test anxiety. Conclusions are limited by the small sample. An important next step will be to sample many nursing programs and university populations to determine how widespread this problem is in student populations. While GPA may be a problem in terms of how well it reflects impaired performance on tests, further studies should incorporate this variable.

At this university, a program is being offered to nursing students that combines techniques to develop associative learning skills and reduce stress. The program must be monitored carefully to examine its effect on test anxiety that is detrimental to students’ performance.

**REFERENCES**


*KEY POINTS*

1. Deblillitative test-taking anxiety interferes with test performance.

2. Senior psychiatric nursing students undertook this study to determine whether the level of deblillitative test-taking anxiety in nursing students differed from that of the general university population and whether current students experienced greater test-taking anxiety than students in the 1960s.

3. Although limited by a small sample, this study demonstrated that students at one university experienced a significant level of debilitating test anxiety. To help alleviate this anxiety, this university offers a program to nursing students that combines techniques to develop associative learning skills and reduce stress.


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The author would like to thank the nursing students from several semesters who made this study possible.

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