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# The Relationship Between Stress, Anxiety, and Forms of Content Learning

June C. Taylor  
*University of North Florida*

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The Relationship Between Stress,  
Anxiety, and Forms of Content Learning

A Masters Project

Submitted in Partial Fulfillment of  
The Requirements for the Degree of  
Master of English Education

June C. Taylor

July, 1979

University of North Florida

VITA

Education:

A.B., Hood College, 1964.

Experience:

Teacher, Grade 6, St. Johns County,  
Florida, 1976-1978.  
Teacher, Junior High Language Arts,  
St. Johns County, Florida, 1978-  
present.

Field of Concentration:

Secondary Education with Specialization  
in English.

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## Introduction

There is little doubt that anxiety is prevalent in today's world, and that students in school experience and are affected by anxiety. School is an evaluative experience and, as such, provides a wide variety of situations in which students are pressured to meet certain standards. Junior high school students, specifically, face an almost constant barrage of personal, social and academic situations new to them but with which they are expected to cope. Some students are able and willing to express their feelings of anxiety verbally to guidance counselors and others; some students exhibit these feelings physically in such activities as fidgeting, daydreaming or direct confrontation with the perceived threat. Still other students refuse to acknowledge their anxieties and either mentally or physically "drop out" of school. And, there are some students who appear to thrive on the daily challenges presented to them.

While there is much discussion, and even argument, relating to the purposes of education today, there does appear to be agreement that transmission of knowledge is and should be a major goal of education. Our school systems are judged on their ability to transmit knowledge primarily in terms of the academic achievement of their students. Academic achievement is primarily determined by the ability to perform, most often in the form of a written test. Many decisions affecting students are based on such performance; honors, program placements, career opportunities, college selection all reflect a student's achievement, as exhibited by his performance. Thus, if achievement is an important goal and if anxiety does exist, a further understanding of the relationship between these factors would be of value to educators in order to enhance the learning process.

In addition to their concern about performance levels, educators must also consider what kind of achievement is being measured. Marton and Säljö (1976) conclude that learning should be described in terms of content because there is great diversity in what is learned or how different students apprehend the same information. Fransson (1976) states that for instructional purposes and for greater understanding of the learning process, a description of what a student learns is preferable to a description of how much he learns. In order to formulate such a description, one must consider the content of the learning. In addition, our society is becoming increasingly concerned with the school's ability to develop students who can comprehend and think in more than a literal fashion. Students who have been trained to acquire knowledge through analysis of data gathered from their environment appear to be better equipped to meet the challenges of our technological, rapidly-changing world than are those without this capability.

One area of recent research in both psychology and education has focused on the relationship between anxiety and performance. The subjects in most of this research have been college students. Ninth grade students are quite different from college undergraduates in their developmental maturity. We need to know whether anxiety is as important a factor in performance with this age group as it is with older, more mature students.

The purpose of this study is to examine the relationship between anxiety and the ability of ninth grade students to process information found in differing content forms. Specifically, two differing anxiety levels were induced with two randomly assigned groups of ninth grade students at Julington Creek School through external stress stimuli presented by the researcher. Academic achievement was measured by student performance in a written test designed to measure ability to acquire facts, concepts, and generalizations

after reading a passage of material of general interest.

List of Terms\*

Academic Achievement - ability of student to perform, usually on a written test, so as to indicate mastery of some form of content.

Anxiety - (A) state anxiety (A-State) - transitory emotional state, varying in intensity and over time, which leads to tension, apprehension and activation of the autonomic nervous system.

(B) trait anxiety (A-Trait) - relatively stable tendency or disposition to perceive threat and respond with A-state reactions.

Concept - content formed from the categorization of a number of observations following which members of a category are grouped and similarities are noted and differences ignored.

Content - knowledge, information.

Fact - content formed from observation which is singular in occurrence and has no predictive value.

Generalization - content which expresses a relationship between two or more concepts, applies to more than a single event, and has predictive and explanatory value.

Inference - process skill with which one extends and interprets observations in order to generalize, explain and predict.

Information Processing - procedure within the cognitive domain of educational goals in which one acquires knowledge through analysis of data from the surrounding world.

Observation - process skill in which senses are used to gather information directly or indirectly.

Processes - skills or capabilities which enable one to gather and analyze information.



Stress - external stimulus which may provoke anxiety.

Threat - individuals's perception of danger, real or imaginary, which follows stress stimulus and provokes anxiety.

\*Note: Sources of definitions for each term are found in the "Review of the Literature" section of this paper.

## Review of the Literature

### The Concept of Anxiety

Anxiety has been defined in many ways. Averill (1970) describes it as a state of cognitive disintegration. He views anxiety not as a particular emotional response but rather a formal property involving threat to one's personal identification and including a number of quite different and defensive reactions. The source of anxiety may be any condition which affects one's ability to process information and to interpret his environment meaningfully.

Wolff (1969) emphasizes that whether a situation creates anxiety in a child is dependent not upon the event itself, but on the child's perception of that event. Anxiety is described here as a changing phenomenon, one which depends on the developmental level of the individual. Lazarus (1966) agrees, although he uses the term "stress" interchangeably with anxiety. He defines stress (anxiety) in terms of transactions between individuals and situations. The capacity of any situation to produce stress reactions (anxiety) depends upon the characteristics of the individual in the situation.

McReynolds (1976) differentiates between primary and secondary anxiety. He views primary anxiety as that which arises when items are not assimilated as the cognitive system processes experiences. Secondary anxiety is that which arises from a situational association of previously neutral cues with a state of primary anxiety. Thus, he determines primary anxiety to be inevitable due to the make-up of the individual, while secondary anxiety is conditional.

It is evident that these definitions have several factors in common. They all describe a situation involving an individual and his environment,

and they all include the notion that the crucial factor in determining anxiety is the individual's interpretation of that environment. None of these definitions, however, offer operational guidelines for the researcher in terms of measurement, duration, or components of the concept.

Spielberger (1972) seems to clarify much of the semantic confusion. He first distinguishes between two types of anxiety. Trait anxiety (A-Trait) is conceptualized as a general personality trait. It refers to relatively stable individual differences in one's disposition to perceive threat or danger and in the tendency to respond with A-State reactions. State anxiety (A-State) is a transitory emotional state which varies in intensity and over time. Subjective, consciously perceived feelings of tension and apprehension lead to activation of the autonomic nervous system. Spielberger likens trait anxiety to the concept of potential energy and state anxiety to that of kinetic energy in the field of physics. In order for state anxiety to occur, there must be a stimulus.

Spielberger also differentiates between stress, threat, and anxiety. Stress is the external stimulus. Threat is one's perception of danger. Anxiety is the emotional reaction (A-State) evoked when stress is perceived as threat. The appraisal of threat is based on one's aptitude, ability and prior experience as well as one's A-Trait level and the objective danger present. Thus, the intensity of the A-State reaction will be proportional to the amount of threat perceived, and the duration of the reaction will depend upon the persistence of the stimulus and one's previous experience in dealing with similar circumstances.

Anxiety then clearly may be caused by an infinite number of factors, or stresses. Research (Atkinson, 1964; Izard, 1972; McReynolds, 1976; Spielberger, 1972) indicates that fear is a component or contributor to

anxiety but is not the same thing. A major research finding (Spielberger, 1972; USA Today, 1978; Gaudry & Spielberger, 1971) has been that the major discriminator of anxiety is perceived threat to self-esteem, ego, or personal adequacy.

### Measurement of Anxiety

In order to investigate the relationship between anxiety and any other factor, it is necessary to be able to measure anxiety. Two primary forms of measurement are currently utilized: the introspective, verbal self-report and the physiological measurement of bodily changes such as heart rate and skin temperature. Because such physiological measurement requires sophisticated technology and because self-report measures have proved to be valid, most research on anxiety has utilized one of several available self-report measures. Lazarus (1966) comments that self-reports are regarded as indispensable and are perhaps the best single source of inference about the effects of anxiety.

Spielberger, Gorsuch and Lushene (1969) developed the State-Trait Anxiety Inventory (STAI) to provide reliable, brief self-report measures of both A-State and A-Trait anxiety. The validity of this, as well as other self-report measures, assumes that the subject is capable and willing to assess and report his feelings honestly. In the case of the STAI, the subject must be able and willing to report his feelings at the moment (A-State) and his feelings in general (A-Trait). A-State qualities measured include the presence of feelings of tension, nervousness, worry and apprehension and the absence of feelings of calmness, security and contentedness. A-Trait qualities are much the same, but as Zuckerman (1976) notes, trait measurements ignore specificities of individual responses and situations and are thus stable over time. Levitt (1967) believes the STAI to be

the most carefully developed instrument available in both a theoretical and methodological sense. He finds the test construction measures to be both highly sophisticated and rigorous.

Forms of Content

It is important not only to determine the amount of anxiety a student feels, but also to determine if such anxiety affects his ability to perform in school. Performance is based on learning. There are many ways to view learning. This review is limited to the model suggested by Eggen, Kauchak and Harder (1979) because it presents a concise, usable description of what is learned. The model is based on the belief that knowledge is acquired from surrounding data through information processing. Data to be processed is collected through application of process skills; observation and inference. Through information processing, the student converts the data to another, more useful form. To the extent that a student is able to use inference to explain, generalize, and predict, he is able to simplify and structure data.

Content is derived from information processing. Eggen, et al, organize content into three primary forms: facts, concepts, and generalizations. Facts are acquired only through observation, are singular in occurrence, and have no predictive value. Concepts result from the categorization of a number of observations; members of a category are grouped, similarities are noted and differences are ignored. Generalizations express a relationship between two or more concepts, apply to more than a single event, and have predictive and explanatory value. Thus, the three forms of content are presented in a hierarchy, from least useful to most useful. As a student learns to process information and form concepts and generalizations from facts, he develops useful skills with which to comprehend our complex

society.

### Studies Related to Anxiety and Performance

Many studies have been undertaken to demonstrate a relationship between anxiety and performance. Some studies have focused on a particular academic discipline, some have included additional situational factors, and some have focused on the outcomes of performance. Because of the wide variety of purposes in these studies, there has been an equally wide variety of research results. In general, however, results do appear to indicate that there is a relationship between anxiety and performance.

Feinberg and Halperin (1978) found a negative correlation between situational anxiety (A-State) and student performance in an introductory statistics course. They found no correlation between general anxiety (A-Trait) and performance. The STAI was administered to students during the first class period of the course because the focus of the study was on the entire course, not just on a single test. Sepie and Keeling (1978) found that under-achievers in math are more clearly differentiated from achieving and over-achieving math students in measures of math-specific anxiety than in general or test anxiety. In a study based on regular examinations rather than on a special test, Deffenbacher and Deitz (1978) reported that highly test anxious students consistently performed less well and reported more worry and emotionality than did those in the low test anxious group. Some exams included directions for relaxation techniques, but this was ineffective in lowering anxiety and did not affect exam performance. Gaudry and Bradshaw (1971) found that students with high test anxiety performed relatively better under the less stressful condition of progressive examining than under terminal examining when compared with students with low anxiety in the same class.

Studies related to anxiety and computer-assisted instruction show slightly different results. When O'Neil, Spielberger and Hansen (1969) investigated performance on a computer-assisted task, they found that students exhibiting high state anxiety made more errors on difficult materials and fewer errors on easy materials when compared to students with low A-State. Kight and Sassenrath (1966) considered the factor of motivation as well as anxiety; their results indicated that students with high achievement motivation or high test anxiety required less time to complete programmed learning materials, made fewer overt errors, and received higher scores on short-term retention measures than did either low achievement motivated or low test anxious groups.

Some researchers have attempted to account for student ability or intelligence while examining the relationship between anxiety and performance. Spielberger (1971) found that highly anxious college students in the mid-range of ability received lower grades and had a higher percentage of failure than did low anxious students of comparable ability. Students of low ability received poor grades regardless of their anxiety level, but a higher percentage of those with high anxiety were failures than were those with low anxiety. For students with very high ability, it appears that anxiety facilitated performance. Gaudry and Fitzgerald (1971) also report similar results; high anxiety facilitated performance of the most able group of twelve Australian seventh grade classes but lowered performance for the remainder when compared to students with low anxiety. The greatest performance deficit was found in high anxiety students in the second highest of five levels of ability.

Deffenbacher (1978) based his study on attentional theory which states that as evaluative stress increases, anxiety-related interference of the

highly test anxious should increase, and time on-task and performance should decrease. His subjects, students from the upper and lower 30% on a test anxiety scale, were asked to solve difficult anagrams under two different evaluative conditions, one of high stress and one of low stress. His findings showed that the high anxiety/high stress group: (1) reported more anxiety during testing, (2) rated self, ability and task more negatively, (3) solved fewer anagrams, (4) estimated spending less time on task, (5) experienced more interference from anxiety, and (6) reported greater distraction of attention due to worry, emotionality and task generated interference. In most ways, the high anxiety/low stress and the low anxiety/high stress groups were similar to each other. The low anxiety/low stress group reported more time on task and less interference, but their performance did not significantly differ from any of the other three groups. Deffenbacher attempts to explain this disparity from attentional theory by suggesting that there may have been a source of interference that was not measured or that the motivation of the group may have been very low due to instructions not to worry. Deffenbacher also suggests the possibility that high stress may be facilitating for the less anxious.

Wrightsmann (1962) reported results which support the conclusion that statements by authority figures which emphasize the importance of good performance work to the disadvantage of highly anxious students, especially on difficult tests. There was little difference in performance of those students with low anxiety under the two conditions, but the highly anxious under stress scored almost one standard deviation lower than the highly anxious in the non-stressful condition.

Caron (1963) gave two groups of high school students a 1700 word passage on psychological theory to read. One group studied and was tested



under examination conditions; the second group was led to believe that they were studying simply to interpret data on their own personalities. He took measures of rote learning (reproduction of definitions and formulas) and comprehension (application of psychological principles). His results found no difference in rote learning between the highly anxious and low anxious students in either condition. On measures of comprehension, there was no difference in the curiosity condition, but those with low anxiety did much better in the exam condition. Again, there is the suggestion that stress may facilitate performance for those with low anxiety.

Spielberger (1966) reports on a series of five related experiments concerned with the influence of anxiety on learning concept formation and academic achievement. In an experiment designed to measure the effects of anxiety on a laboratory learning-recall task similar to a classroom test he found the performance of highly anxious students superior to those with low anxiety on the easy questions, but inferior on the more difficult questions. The second experiment found there to be an essentially zero correlation between measures of anxiety and intelligence for a large sample of males and females. The third experiment indicated that low anxiety students in the mid-range of academic aptitude performed better than those with high anxiety. The level of anxiety had no demonstrable effect on students of low aptitude, but high anxiety tended to facilitate performance of the very brightest students. In the fourth experiment, designed to measure the effects of anxiety on serial rote learning, the performance of highly anxious students was inferior early in the learning and superior later in the learning. The fifth experiment was a study of the effect of anxiety and intelligence on concept formation. Results show the performance of

students with high anxiety and low intelligence to be inferior to those with low anxiety and low intelligence. The performance of students with high anxiety and high intelligence was superior, however, to those with low anxiety and high intelligence. Again, stress appears to be an important factor in determining anxiety level and performance level.

Meyers and Martin (1974) randomly assigned sixty-one undergraduate students to groups of high or low ego involving (stress) conditions. All students performed concept learning tasks and used self-reports to determine levels of both state anxiety and trait anxiety. Performance of students with high A-State was significantly inferior to those with low A-State. There were no differences between high and low A-Trait subjects.

Sinclair (1971) used a factual learning test and a reasoning test under conditions of high and low stress with 173 Australian high school males. Three levels of anxiety were also used for each performance measure. On the factual learning test, for students under low stress there was no significant difference in performance. For students under high stress, the performance of those with low anxiety was superior to those with moderate or high anxiety; there was no difference between the latter two groups. In addition, the performance of those with high stress and low anxiety was superior to those with low stress and low anxiety. On the reasoning test, there was a general superiority in performance for those under high stress. There were no significant differences between the anxiety groups in either condition. Sinclair had expected the highly anxious to do less well; however, his test allowed continued access to the passage which may have reduced their anxiety.

Fransson (1977) conducted a rather complex study in which eighty-one students were asked to read an article under differing conditions of motivation

and stress. He used self-reports on trait and state anxieties and attempted to investigate both qualitative differences in learning process and outcomes and quantitative differences in fact recall. He found that lack of interest, efforts to adapt to test demands, and high test anxiety increased the tendency toward surface processing and ineffective reproductive attempts at recall. A follow-up adaptive approach with strong interest and low anxiety produced a high proportion of deep level approaches with good fact recall.

Fransson found that the level of test anxiety was negatively related to the performance of students with strong motivation, but not those with weak motivation. The pattern of results was more pronounced when state anxiety was substituted for trait anxiety. Thus, the assumption of a close connection between motivation and state anxiety was found to be incorrect.

Trait anxiety appeared to affect students in several ways. It seemed to be an important factor in how the student perceived the experimental situation. It also seemed to increase the probability for surface level processing (rote learning) rather than deep level processing (attempts to comprehend the author's message). Thus, Fransson believes that the level of trait anxiety is shown to be an important variable influencing the student's receptivity to situational cues. His expectations, based on prior experience, may be a more important factor determining perception of the learning situation than is the actual situation.

### Conclusions

In general, then, it appears that there tends to be a negative relationship between anxiety and performance, with the exception of the very brightest students. In addition, it appears that the effects of anxiety are strongest on more difficult tasks and on those requiring higher levels of thinking. Some writers have suggested that the lower performance levels of the highly

anxious are simply factors of intelligence. Research results, however, seem to point more strongly to stress as the factor which causes interference in the performance of those with high anxiety. The findings from studies in non-stressful situations in which those with high anxiety performed equally well as those with low anxiety (of comparable ability) tend to support the theory that stress is a critical factor in determining performance of people with different anxiety levels.

This study, described more fully in the following section, has focused on the effects of stress and anxiety as they relate to student ability to process information in the content forms of facts, concepts and generalizations.

## Procedures

Subjects participating in the study were randomly assigned to a high stress situation or a low stress situation. The subjects were the entire ninth grade population at Julington Creek School (N = 55). This public school contains grades K-9 and is located in the northwest corner of St. Johns County, Florida. The area has been predominately rural, but is growing rapidly and is becoming a suburban community to the city of Jacksonville. A wide range of both socio-economic status and of student ability are represented in the all-white student population of the school.

The procedures for the study have been designed to avoid some major criticisms of basic research in learning. Gaudry and Spielberger (1971) cite the following practices which they believe often cause research results to have little practical application in schools today. Subjects are often animals or university students. Learning tasks are often simple and of brief duration, measuring only low level learning. The tasks often presuppose a lack of any prior learning while in the classroom certain prerequisite skills are generally assumed. Learning often takes place on a one-to-one basis rather than in a group as would be expected in the classroom.

Procedures developed for this study which should avoid these problems to some degree and more accurately reflect usual learning conditions in schools include the following. Subjects included an entire grade level in a public school. While the learning task was of relatively brief duration, it measured several forms of content. The ability to read a given passage and answer questions within a time limit was assumed. The learning took place in a group situation within the normal school day.

Some assignment of students led to the formation of two groups. Those assigned to the high stress situation (N = 23) were told that their performance

would affect their class placement next year in high school. Because anxiety appears to increase in ego-involving situations, these students were led to believe that it was their basic intelligence or ability that was being measured through their performance on the test. Students assigned to the low stress situation (N = 22) were told that the material, not the student, was being evaluated for appropriate grade leveling. Thus, in this situation there was no ego-involving threat presented.

Following presentation of the experimental treatment, both groups followed the same procedure. Each student completed Spielberger's State-Trait Anxiety Inventory in order to measure both their specific level of anxiety at the moment (A-State) and their general disposition to perceive anxiety (A-Trait). (See Appendix A.)

All subjects were given a 617 word story to read ("The Two Kings" by Helen Pierce Jacob, found in Cricket, vol. 6, no. 7, March 1979, pp. 53-55). The story was selected for general interest and for lack of prior knowledge of specific content which could have served as advantage to some students in their initial comprehension of the material. The readability level of the story, computed with the Fry Readability Formula, is 4th grade level, sufficiently low to eliminate reading ability as an interfering factor in the study. All students were given three minutes to read the first page of the story and three minutes to read the second page; all students were able to complete the story within the time limit. The stories were then collected.

Students were given twenty multiple choice questions to answer in six minutes; all students again were able to complete the assignment within the time limit. Questions were formulated so as to measure learning of facts (10 questions), concepts (5 questions), and generalizations (5 questions) contained in or inferred from the story. The questions were designed to

include the characteristics of each of these forms of content discussed earlier in this paper. (See Appendix B for story and questions.)

Data were analyzed using a t test in order to attempt to reject the following null hypotheses:

1. There is no significant difference between the performance on a test of facts of ninth grade students under high stress and ninth grade students under low stress.

2. There is no significant difference between the performance on a test of concepts of ninth grade students under high stress and ninth grade students under low stress.

3. There is no significant difference between the performance on a test of generalizations of ninth grade students under high stress and ninth grade students under low stress.

In order to determine whether there was a relationship between level of stress and level of anxiety, the following null hypothesis was also considered:

4. There is no significant difference between the level of state anxiety of ninth grade students under high stress and ninth grade students under low stress.

Finally, because trait anxiety, as discussed earlier, is the general disposition to perceive threat and respond with increased state anxiety reactions, it was necessary to determine if there was any difference between the two

randomly selected groups in this characteristic:

5. There is no significant difference between the level of trait anxiety of ninth grade students under high stress and ninth grade students under low stress.



## Results

Scores were tabulated for all students on the following measures: number of fact questions answered correctly, number of concept questions answered correctly, number of generalization questions answered correctly, total questions answered correctly, level of state anxiety, and level of trait anxiety. (See Appendix C for raw score tabulation.)

In order to determine if there is a significant difference between the scores of the two groups, a t test was utilized for each group of measures. It should be noted that the data gathered represent two different scales of measurement. The scores on the content test are interval data; the scores on the anxiety scales are ordinal. While there has been debate concerning the use of parametric procedures (such as the t test) with ordinal data, Popham (1967) reports that the conclusion of leading statisticians is generally in favor of using parametric procedures with both types of data.

Table 1 reports the results of t test analysis on the data, as well as measures of central tendency and variability for the two groups according to induced level of stress. (See Table 1 on next page.)

Table 1. Post Test Results of Ninth Grade  
Students in Varying Conditions of Stress

	Facts			Concepts			Generalizations			Total		
	Mean	SD	t	Mean	SD	t	Mean	SD	t	Mean	SD	t
Low Stress	9.32	1.09	.97	4.32	.75	.40	4.27	.87	.88	17.91	1.89	.78
High Stress	9.61	.86		4.22	.87		4.48	.71		18.30	1.42	

	State Anxiety			Trait Anxiety		
	Mean	SD	t	Mean	SD	t
Low Stress	52.36	13.83	1.27	54.46	10.98	2.28*
High Stress	47.57	11.66		47.61	8.05	

\*significant beyond the 0.05 level

$$T = 2.021$$

$$df = 23 + 22 - 2 = 43$$

Results indicate a significant difference only in the level of trait anxiety in the two groups.

### Discussion

Results from data analysis indicate that there is no significant difference in the scores on the content test in terms of the total test or on any of the specific forms of content questions. Whether students performed under high stress or low stress did not significantly affect ability to perform on this test. There was also no significant difference in A-State level between the high stress group and low stress groups. However, results do indicate a significant difference between the two groups in A-Trait level. Each of these findings is contrary to the expected results of the research hypothesis.

There are several possible explanations for the results. It is difficult to show differences when all scores are so high. While the story was selected deliberately with a comparatively low readability level in order to eliminate reading level as a factor in the study, it appears that it may have been too easy to allow any potential differences to emerge. The multiple-choice format was selected for the test in order to provide answers that were clearly right or wrong, but may also have assisted students in that they had only to make a choice; they were not required to formulate their own answer.

The study was conducted in mid-May, 1979. At this point in the school year, students have completed a large number of tests including local and national aptitude, essential skills, and achievement tests. The importance of these tests is always emphasized in schools. It may be that such testing has become so commonplace that students have become "immune" to induced stress when faced with still another test. It is also possible that the high stress level was not perceived as truly threatening to that group of students or that the low stress situation did appear threatening to the

other group.

A final consideration is the level of trait anxiety found in both groups. With random assignment of students, it was expected that there would be no difference in A-Trait levels between the groups. However, data analysis indicates a significant difference; students assigned to the low stress group exhibited a considerably higher level of A-Trait than did the students assigned to the high stress group. In other words, students assigned to the low stress condition appear, in general, to be more disposed to perceive threat and exhibit A-State reactions than do students assigned to the high stress condition. In this circumstance, then, it is unlikely that the independent variable (stress level) could be sufficiently strong enough to overcome the basic trait.

The fact that no other measures showed a significant difference, however, does seem to imply that induced stress may make a difference in the ability of students to perform. The students in the low stress group showed a much greater tendency to exhibit A-State reactions and to have their performance level affected. It is possible that the condition of low stress allowed them to perform with less anxiety interference than might have been possible under other conditions.

Future research to examine the relationships between stress, anxiety, and forms of content should be conducted. A study utilizing groups of subjects paired for equivalent trait anxiety levels might answer some of the questions raised by this study. Another possibility would be to conduct a study including pre and post testing of subjects for state and trait anxiety. More difficult or lengthier selections might indicate differences not apparent in this study. Most importantly, as teachers, we need to know if stress and anxiety do affect the performance of our students and

in what ways. We need to know also if they affect performance with all forms of content in the same way or in different ways so that we might modify our teaching methods to suit the needs of our students.

SELF-EVALUATION QUESTIONNAIRE  
STAI FORM Y-1

Developed by Charles D. Spielberger in collaboration with  
R.L. Gorsuch and R. Lushene

NAME \_\_\_\_\_ DATE \_\_\_\_\_

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then blacken the appropriate space on your answer sheet to indicate how you *feel* right now, that is, *at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

NOT AT ALL  
SOMEWHAT  
MODERATELY SO  
VERY MUCH SO

1. I feel calm . . . . .	1	2	3	4
2. I feel secure . . . . .	1	2	3	4
3. I am tense . . . . .	1	2	3	4
4. I am regretful . . . . .	1	2	3	4
5. I feel at ease . . . . .	1	2	3	4
6. I feel upset . . . . .	1	2	3	4
7. I am presently worrying over possible misfortunes. . . . .	1	2	3	4
8. I feel rested . . . . .	1	2	3	4
9. I feel anxious . . . . .	1	2	3	4
10. I feel comfortable . . . . .	1	2	3	4
11. I feel self-confident . . . . .	1	2	3	4
12. I feel nervous . . . . .	1	2	3	4
13. I am jittery. . . . .	1	2	3	4
14. I feel "high strung" . . . . .	1	2	3	4
15. I am relaxed . . . . .	1	2	3	4
16. I feel content . . . . .	1	2	3	4
17. I am worried . . . . .	1	2	3	4
18. I feel over-excited and "rattled" . . . . .	1	2	3	4
19. I feel joyful . . . . .	1	2	3	4
20. I feel pleasant . . . . .	1	2	3	4
21. I feel frightened . . . . .	1	2	3	4
22. I feel confused . . . . .	1	2	3	4
23. I feel steady . . . . .	1	2	3	4
24. I feel strained . . . . .	1	2	3	4
25. I feel indecisive . . . . .	1	2	3	4
26. I feel satisfied . . . . .	1	2	3	4

SELF-EVALUATION QUESTIONNAIRE  
STAI FORM Y-2

NAME \_\_\_\_\_ DATE \_\_\_\_\_

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then blacken the appropriate space on the answer sheet to indicate how you *generally* feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you *generally* feel.

	ALMOST NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS
41. I feel pleasant . . . . .	1	2	3	4
42. I tire quickly . . . . .	1	2	3	4
43. I feel like crying . . . . .	1	2	3	4
44. I wish I could be as happy as others seem to be. . . . .	1	2	3	4
45. I am losing out on things because I can't make up my mind soon enough . . . . .	1	2	3	4
46. I feel rested. . . . .	1	2	3	4
47. I am "calm, cool, and collected" . . . . .	1	2	3	4
48. I feel that difficulties are piling up so that I cannot overcome them . . . . .	1	2	3	4
49. I worry too much over something that really doesn't matter . . . . .	1	2	3	4
50. I am happy . . . . .	1	2	3	4
51. I am inclined to take things hard . . . . .	1	2	3	4
52. I lack self-confidence . . . . .	1	2	3	4
53. I feel secure . . . . .	1	2	3	4
54. I try to avoid facing a crisis or difficulty . . . . .	1	2	3	4
55. I feel blue . . . . .	1	2	3	4
56. I am content . . . . .	1	2	3	4
57. Some unimportant thought runs through my mind and bothers me . . . . .	1	2	3	4
58. I take disappointments so keenly that I can't put them out of my mind . . . . .	1	2	3	4
59. I am a steady person . . . . .	1	2	3	4
60. I get in a state of tension or turmoil as I think over my recent concerns and interests . . . . .	1	2	3	4
61. I feel satisfied with myself . . . . .	1	2	3	4
62. I feel nervous and restless. . . . .	1	2	3	4
63. I feel like a failure . . . . .	1	2	3	4
64. I am easily frightened . . . . .	1	2	3	4
65. I make decisions easily . . . . .	1	2	3	4
66. I have disturbing thoughts . . . . .	1	2	3	4
67. I feel inadequate . . . . .	1	2	3	4

In the dense Burmese jungle there lived a huge white tiger. He was king of the beasts. When he went hunting, the whole jungle trembled -- for he was swift and cunning. He preyed on deer and buffalo and other large beasts. He held all small things in contempt.

One fine evening he was resting after having eaten, when something tickled him. He reached up with a mighty paw and swept an ant from his nose. He held the ant carelessly between two claws and roared, "Impudent ant, how dare you crawl on the nose of the King of the Jungle? Prepare to die."

The ant, half-crushed by the tiger's great paw, replied, "I am small, but I am also a king, just as you are."

"A king?" scoffed the white tiger. "You are too small to have a brain."

"I am King of the Ants." The ant bowed as best he could.

"Prove you are a king by pleasing me with one wise statement," said the white tiger.

"Though small, ants are many; and though big, tigers are few."

"A fair start," said the white tiger. He twitched his claws a little, and the King of the Ants breathed a bit easier. "Please me with another wise statement."

"The powerful can be merciful; the small can be powerful."

"You have pleased me again," said the white tiger. He moved his paw again and held the King of the Ants by just two legs. "Say one more thing that pleases me, and you shall go free."

"Better to spare the life of another than to owe your life to another." The white tiger roared his approval. "You speak like a true king. Go. But remember that you owe your life to me."



The King of the Ants dropped to the ground, bowed, and walked away with great dignity.

The tiger slept well. The next day he went hunting. He had pursued his prey into a deep cave when an earthquake shook the land, and the roof of the cave fell in. The tiger was trapped. He roared his anger, and all the beasts of the jungle gathered around.

First the elephants tried to free the tiger king, but they were too big to enter the cave. The water buffalo tried, but their horns were too wide to enter the cave. The monkeys tried, but they were too weak to remove the tons of dirt. The smaller beasts were afraid of the tiger king and would not enter the cave to try to free him. The animals sadly shook their heads. They could do nothing to help their king. At last they went away.

The King of the Ants heard of the tiger king's peril. He called for all his subjects. The jungle turned black as the ants gathered to hear their king.

"We must free the tiger king," said the King of the Ants. He sped into the cave and took one grain of dirt, turned, raced to the entrance of the cave, and dropped his grain outside. Instantly the walls, the sides, and the floor of the cave were covered with scurrying ants. Grain by grain they labored till morning. Then the wall of dirt was gone, and the great white tiger came out blinking his eyes.

At the cave entrance, on top of a mountain of dirt, sat the King of the Ants. The tiger saw the mound of dirt and knew that the King of the Ants had saved his life.

"I shall never scoff at anything small again. I once gave you your life; now you have given me mine. We are equal kings."

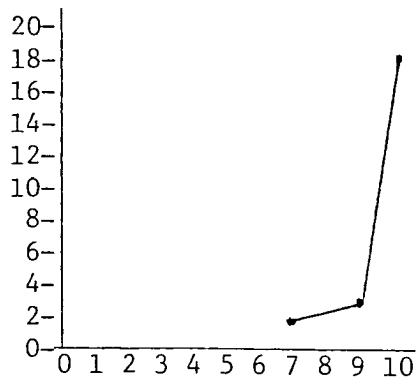
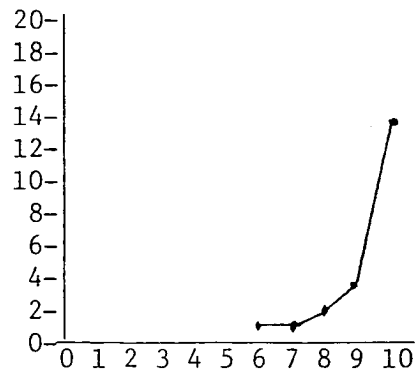
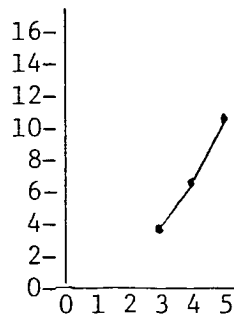
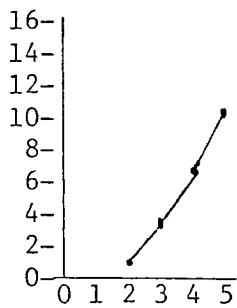
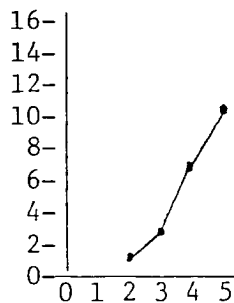
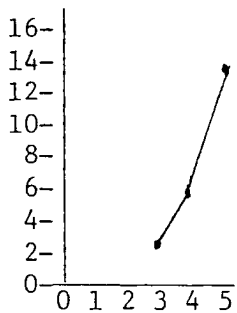
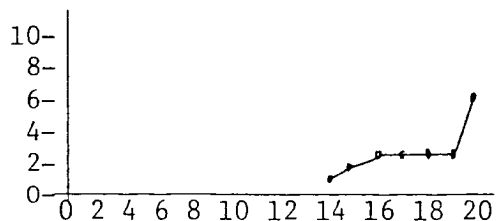
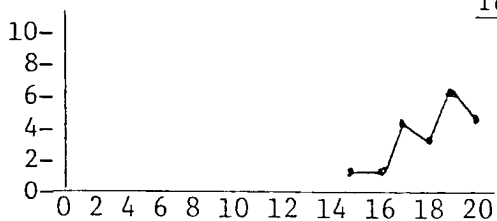
And the two kings bowed again and went their ways.

1. What color was the tiger?
  - a. yellow
  - b. white
  - c. black
2. How many wise statements did the ant make to the tiger?
  - a. 3
  - b. 2
  - c. 4
3. What caused the roof of the cave to fall in on the tiger?
  - a. earthquake
  - b. rainstorm
  - c. typhoon
4. One kind of animal that tried to free the tiger was:
  - a. lion
  - b. giraffe
  - c. elephant
5. The tiger knew the ants had saved him because:
  - a. they told him
  - b. he saw the dirt mound
  - c. the monkeys reported it
6. In what country did this story take place?
  - a. Pakistan
  - b. Rwanda
  - c. Burma
7. On what part of the tiger's body did the ant crawl?
  - a. nose
  - b. paw
  - c. tail
8. Why did the tiger go into the cave?
  - a. to sleep
  - b. to hunt
  - c. to cool off
9. The monkeys could not help the tiger because they were:
  - a. too small
  - b. too few
  - c. too weak
10. How long did it take the ants to free the tiger?
  - a. all night
  - b. an hour
  - c. all week
11. The ant was:
  - a. clever
  - b. strong
  - c. intellectual
12. The tiger was:
  - a. clever
  - b. weak
  - c. merciful
13. At the end of the story, how did the tiger feel about the ant?
  - a. superior
  - b. respectful
  - c. afraid
14. In this story, power depends upon:
  - a. size
  - b. the situation
  - c. strength
15. To be a "king," one must:
  - a. have the desire and ability to help others
  - b. save a life of someone different than you are
  - c. want to help somebody out of trouble

16. The best title for this story would be:
- a. Jungle Animals
  - b. Life Saving Techniques
  - c. The Two Kings
17. Which saying best fits this story?
- a. Good things come in small packages
  - b. A stitch in time saves nine
  - c. You must crawl before you can walk
18. If you rewrote this story using birds as characters, which bird would you choose for the role of the ants?
- a. eagle
  - b. crow
  - c. hummingbird
19. Which statement is the best summary of the story?
- a. Ants and tigers do not like each other
  - b. Friends help each other
  - c. It is better to be little
20. Which sports event is most like the situation in this story?
- a. Relay race where people help each other
  - b. Pro football game where the quarterback throws the ball to the end
  - c. Tennis doubles championship where both partners are at the net

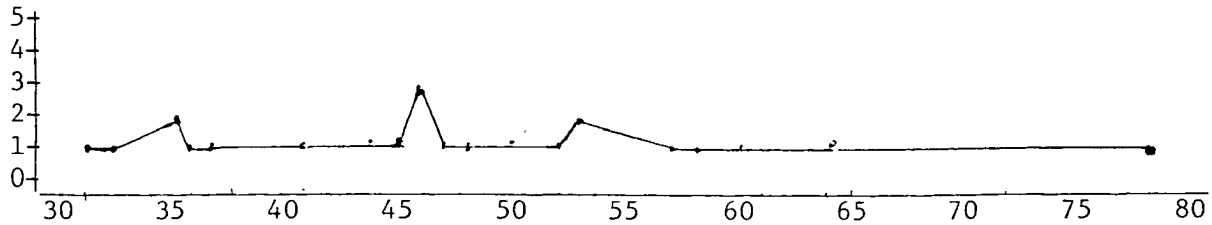
APPENDIX C

Frequency Polygon Based on Post Test Results of Ninth  
Grade Students in Varying Conditions of Stress

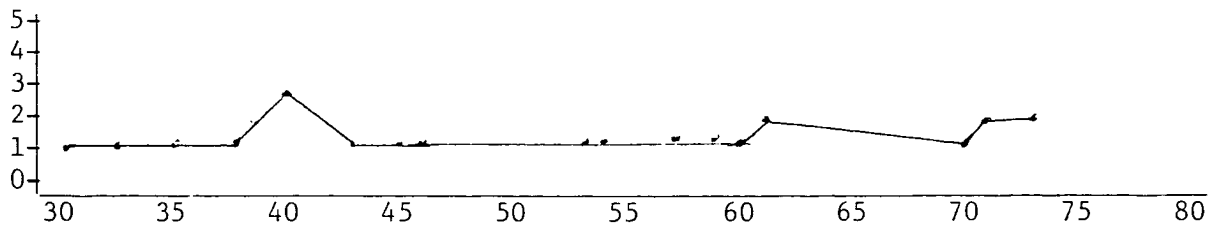
FactsHigh Stress N = 23Low Stress N = 22ConceptsGeneralizationsTotal Questions

State Anxiety

Stress N = 23

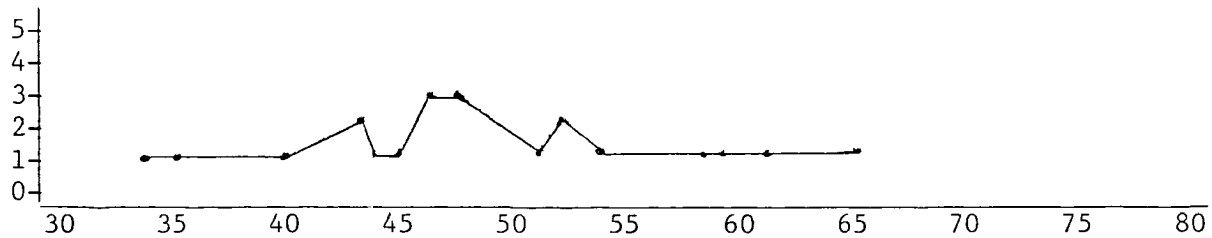


Non-Stress N = 22

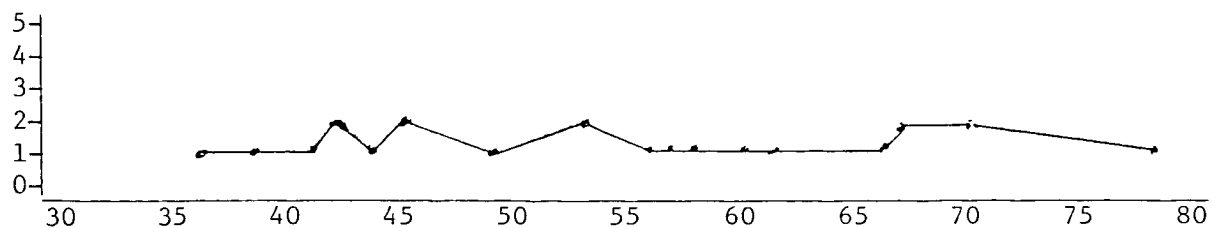


Trait Anxiety

Stress N = 23



Non-Stress N = 22



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## Abstract

June C. Taylor

THE RELATIONSHIP BETWEEN STRESS, ANXIETY, AND FORMS OF CONTENT LEARNING

Mary Grimes, Ph.D., and Paul Eggen, Ph.D., Advisors

July, 1979: University of North Florida

The prevalence of stress and anxiety in today's world, including our schools, is apparent. There are two types of anxiety: state anxiety (A-State) and trait anxiety (A-Trait). State anxiety is a transitory emotional state which varies in intensity and over time and leads to tension, apprehension, and activation of the autonomic nervous system. Trait anxiety is the relatively stable tendency or disposition to perceive threat and respond with A-State reactions. Stress is the external stimulus which may provoke anxiety.

While education has many purposes, the primary focus is on academic achievement. This is most often determined by the performance on a written test covering some particular content. One way to view content is by form; content may be separated into facts, concepts, and generalizations.

The purpose of this study is to examine the relationship between stress, anxiety, and the ability of ninth grade students to process information found in differing content forms. Specifically, it was attempted to induce two differing anxiety levels with two randomly assigned groups of ninth grade students through external stress stimuli presented by the researcher. One group was placed in a high stress situation; the second group in a low stress situation. Academic achievement was measured by

student performance on a written test designed to measure ability to acquire facts, concepts, and generalizations after reading a passage of material of general interest.

Data were analyzed using a t test in order to attempt to reject the following null hypotheses:

1. There is no significant difference between the performance on a test of facts of ninth grade students under high stress and ninth grade students under low stress.

2. There is no significant difference between the performance on a test of concepts of ninth grade students under high stress and ninth grade students under low stress.

3. There is no significant difference between the performance on a test of generalizations of ninth grade students under high stress and ninth grade students under low stress.

In order to determine whether there was a relationship between level of stress and level of anxiety, the following null hypothesis was also considered:

4. There is no significant difference between the level of state anxiety of ninth grade students under high stress and ninth grade students under low stress.

Finally, because trait anxiety, as discussed earlier, is the general disposition to perceive threat and respond with increased state anxiety reactions,

it was necessary to determine if there was any difference between the two randomly selected groups in this characteristic:

5. There is no significant difference between the level of trait anxiety of ninth grade students under high stress and ninth grade students under low stress.

Results from data analysis indicate no significant difference in the scores on the content test in terms of the total test or on any of the specific forms of content questions. There was also no significant difference in A-State level between the high stress group and low stress group. However, results do indicate a significant difference between the two groups in A-Trait level.

Each of these findings is contrary to the expected results of the research hypothesis. One possible explanation is that the test was too easy; all scores are quite high. Research was conducted in the month of May and students may have been "immune" to testing near the end of the school year. The induced stress levels may not have been strong enough to affect performance.

Students assigned to the low stress group exhibited a significantly higher level of A-Trait than did students assigned to the high stress group. This finding makes it highly unlikely that the brief experimental condition could overcome the basic trait. The fact that there was no difference in the other measures indicates that the low stress level probably did affect the A-State level and possibly the performance of these students.

Future research to examine the relationship between stress, anxiety, and forms of content should be conducted. Subjects might be paired for

equivalent trait anxiety or a pre-post testing of state and trait anxiety might answer some of the questions raised by this study. As teachers, we need to know the effects of stress and anxiety on student performance with different forms of content so that we might modify our teaching methods to suit the needs of our students.