Anxiety and Second-Language Learning: Toward a Theoretical Clarification*

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Reviews of the literature on foreign-language anxiety show a considerable amount of ambiguity arising from the conflicting results of past studies. This study attempts to show that these difficulties can be resolved given an awareness of the theoretical perspective from which this research has developed. Specifically, it was predicted that anxiety based in the language environment would be associated with language learning whereas other types of anxiety would not show consistent relationships to performance. Eleven anxiety scales were factor analyzed yielding two orthogonal dimensions of anxiety which were labelled *General Anxiety* and *Communicative Anxiety*. It was found that only Communicative Anxiety is a factor in both the acquisition and production of French vocabulary. Analyses of the correlations between the anxiety scales and the measures of achievement show that scales of foreign-language anxiety and state anxiety are associated with performance. Scales of test anxiety, audience sensitivity, trait anxiety, and other types of anxiety did not correlate with any of the production measures. Finally, a model is proposed which describes the development of foreign-language anxiety.

In his review of the literature on the role of anxiety in second-language learning, Scovel (1978) discusses four studies, each of which had somewhat inconsistent results. He points out, for example, that Swain and Burnaby (1976) found a negative correlation between language-class anxiety and one measure of children's ability to speak French but no significant correlations with other measures of proficiency. Similarly, Tucker, Hamayan and Genesee (1976) found one index of performance to be significantly negatively related to French-Class anxiety, but reported three other indices that were not correlated significantly with this type of anxiety. Also, while Chastain (1975) found that test anxiety correlated negatively with proficiency in an audiolingual French course it showed no relationship to proficiency in regular French or German courses. Further complicating the issue was the positive correlation between test anxiety and grades in Spanish and the lack of any relationship between Manifest Anxiety and grades in any of the courses. The final study cited by Scovel (Kleinmann, 1977) considered two types of anxiety, facilitating and debilitating (see Alpert & Haber, 1960). Facilitating anxiety is considered to be an asset to performance and showed the predicted positive correlations with Arabic students' willingness to attempt difficult linguistic structures in English. Debilitating anxiety, which is the more common interpretation of *anxiety*, is considered to be detrimental to performance, but did not show the expected negative correlations with performance. In summary, Scovel (1978) stated that foreign-language-anxiety research suffered from several ambiguities.

Horwitz, Horwitz, and Cope (1986) make a similar statement almost a decade after Scovel's review. As a remedy, they outline a theoretical framework from which to begin. Horwitz et al. (1986) describe three components of foreign-language anxiety. The first is *communication apprehension*. They propose that the language student has mature thoughts and ideas but an immature second-language vocabulary with which to express them. The inability either to express oneself or to

comprehend another person leads to frustration and apprehension. The second component, closely related to the first, is *fear of negative social evaluation*. Because students are unsure of themselves and what they are saying, they may feel that they are not able to make the proper social impression. The third component is *test anxiety*, namely, apprehension over academic evaluation. The pedagogical requirements of the school and teacher require that the student continually be assessed on aspects of proficiency while that proficiency is being acquired. These three components then, communication apprehension, fear of social evaluation, and test anxiety, are viewed by Horwitz et al. to have a deleterious effect on second-language acquisition.

The concept of second-language anxiety has also been investigated in the context of attitudes and motivation and their relationship to proficiency. Because the primary focus is on attitudes and motivation, detailed information is not always given about the relationship of anxiety to proficiency. The Attitudes and Motivation Test Battery (AMTB) contains the French Class Anxiety scale (Gardner, 1985). This scale measures the degree to which students report feeling embarrassed or anxious in language class. It has shown strong reliability (Gardner, Smythe, & Lalonde, 1984) but the role assigned it in the language-acquisition process has been debated (Lalonde & Gardner, 1984). The concern of most studies that use the AMTB has been with larger issues of attitudes and motivation, rather than the more specific role of any single construct such as anxiety. However, both the global and the specific issues deserve attention and it is worthwhile to look more closely at the results of some of these studies to gain some insight into the specific role of foreign-language anxiety in the language-learning process.

When the above studies and others (see MacIntyre & Gardner, 1988) are examined in detail, the consistency of the findings is noteworthy. Studies have reported significant correlations of French-Class anxiety with course grades (see

for example, Gardner, Lalonde, Moorcroft, & Evers, 1987). One large study of more than 1,000 students in Grades 7 through 11 (Gardner, Smythe, Clément, & Gliksman, 1976) found that French-Class anxiety correlated more strongly with proficiency as the students entered higher grade levels. In fact, the highest single correlation between any AMTB scale and proficiency in Grade 11 was the anxiety measure ($r=-.43$, $p<.001$). Also, factor analyses consistently report loadings of French-Class Anxiety on a proficiency factor (Clément & Kruidenier, 1985; Clément, 1987; Gardner, Moorcroft, & MacIntyre, 1987). Using regression procedures, both Gliksman (1981) and Trylong (1987) found that the addition of French Class Anxiety scores to an equation already containing attitude and motivation indices resulted in a significant improvement in prediction. Trylong (1987) concluded that aptitude, attitudes, and anxiety "interact in unique and powerful ways as they relate to achievement" (p. 65).

While the results of these latter studies in particular show that foreign-language anxiety is a predictor of success in language class, the problems noted by Scovel (1978) and Horwitz, et al. (1986) cannot be ignored. The difficulty may be traced to the instruments chosen to measure anxiety in some of the studies. Relevant to this point is Endler's (1980) argument for a multidimensional view of anxiety. He proposes that to study anxiety is to study the interaction of the person in the situation producing that anxiety. Some situations arouse anxiety while others do not, so both the individual and the context must be taken into consideration. Instruments such as the Taylor (1953) Manifest Anxiety scale or Spielberger's (1983) State-Trait Anxiety Inventory attempt to define a personality trait of anxiety applicable across several situations, but this may not be the best way to measure anxiety in a language-learning context. Gardner (1985) has proposed that scales directly concerned with foreign-language anxiety are more appropriate for studying language anxiety than are general anxiety scales.

While the instruments used to measure language anxiety should be specific to the language area, theoretical links to the more general anxiety literature can be strengthened. For example, Tobias (1979, 1980, 1986) has proposed a model of the effects of anxiety on learning from instruction. He suggests that anxious persons tend to engage in self-directed, derogatory cognition rather than focussing on the task itself. These task-irrelevant thoughts compete with task-relevant ones for limited cognitive resources. Nonanxious individuals tend not to engage in such self-preoccupations, giving them an advantage when the task at hand is taxing. This theory helps to explain the often cited finding of an interaction between anxiety, task difficulty, and ability (Spielberger, 1983; Hunsley, 1985; Sarason, 1986).

According to Tobias (1986), interference may occur at three levels: input, processing, and output. At input, anxiety may cause attention deficits and poor initial processing of information. In short, not as much information is registered. For example, people with higher anxiety seem easily distracted from the task because time is divided between the processing of emotion-related and task-related cognition. If the task is relatively simple, anxiety may have little effect on processing. The more difficult the task becomes, relative to ability, the greater the effect of anxiety on processing. Interference with the rehearsal of new information would be an example of this type of effect. At output, anxiety may interfere with the retrieval of previously learned information. The experience of "freezing" on a test can be attributed to the influence of anxiety at the time of retrieval.

The present study has two major goals. First, the Horwitz et al. (1986) theory will be evaluated as a theoretical framework from which foreign-language-anxiety research can proceed. Several relevant anxiety scales will be factor analyzed to determine the dimensionality that underlies them. Second, the theory of Tobias (1986) will be used to propose the mechanism by which foreign-language anxiety may operate. A

suggestion for explaining the initial development of such apprehension will be offered. To examine such relationships, the present study employed a paired associate task in which subjects were taught the English equivalents of 38 French words. In addition, three measures of vocabulary production were taken and the level of anxiety experienced during production was manipulated by placing time limits on the interval between responses. The relationship between the dimensions of anxiety and the various measures of learning and production was then examined.

METHOD

This study involved three phases. In the first phase, a questionnaire containing a series of anxiety scales was administered. In the second part, subjects were given four trials to learn 38 English-French pairs administered by computer and were tested prior to each trial. Spielberger's (1983) State-Anxiety scale was administered after three of these tests. The final phase involved French vocabulary production and free recall of the paired associates.

SUBJECTS

Fifty-two male and 52 female subjects were tested individually during sessions lasting approximately one hour. All subjects were introductory psychology students who received course credit in exchange for their participation. Only individuals between the ages of 18 and 25, with English as their native language, were recruited.

MATERIALS

Nine anxiety scales were administered to all participants. Each of these measures is shown below. Item keying was

balanced between positively and negatively worded items in all cases except the Test anxiety scale which contains only items indicative of anxiety. Cronbach's alpha reliability coefficients (α) for the present sample are presented with each scale, along with a sample item.

Scales were grouped by response format with items from each scale mixed together randomly. Section 1 contained the French Class anxiety, English Class anxiety, and Mathematics Class anxiety scales which were answered on six-point Likert scales. Section 2 contained the French Use anxiety, Trait anxiety, and Computer anxiety scales also using a six-point Likert response format. In Section 3 were the measures of Test anxiety and Audience anxiety which required True/False responses.

Classroom Anxieties: This scale was administered so that each item appeared above three separate six-point Likert response scales corresponding to French (α=.90), Mathematics (α=.89), and English (α=.87) classes. Eight items were adapted from Gardner's (1985) French Class anxiety scale to assess anxiety experienced in any classroom, and each item was presented so that anxiety in each class was assessed separately. A sample item is "I was generally tense whenever participating in 'French Class'; 'Math Class'; 'English Class'."

French Use Anxiety (α=.86). This scale contains the same eight items used by Gliksman (1981) and was designed to measure the amount of anxiety experienced when using French in interpersonal situations. A sample item is "It would bother me if I had to speak French on the telephone."

Trait Anxiety (α=.68). A general measure of anxiety was obtained using ten items chosen from the 20-item scale contained in the Jackson Personality Inventory (Jackson, 1978). A sample item is "I sometimes feel jittery."

Computer Anxiety (α=.89). This eight-item scale was developed to assess the effect of a respondent's reaction to the use of a computer. A sample item is "It bothers me to have anything to do with a computer." The scale items are contained in MacIntyre (1988).

Test Anxiety (α=.65). This scale contains ten of the items used by Sarason & Mandler (1952) to assess the degree to which the respondent feels anxious in formal testing situations. A sample item is "I dread courses where the instructor has the habit of giving 'pop' quizzes."

Audience Sensitivity (α=.72). Ten items were chosen from the scale developed by Paivio (1965) to measure the degree of apprehension experienced in situations in which the respondent encounters a group of people. A sample item is "If I came late to a meeting, I'd rather stand than take a front seat."

State Anxiety. Spielberger's (1983) 20-item scale was used as a measure of anxiety at the particular moment when the computer tests were being completed. It was administered three times during the learning phase, following the first (α_1=.91), third (α_2=.92), and fifth (α_3=.91) test trials. A sample item is "I feel calm."

Paired Associates. In addition to these anxiety scales, subjects were presented with a paired-associates learning task. Thirty-eight French-English noun pairs were administered by computer. These pairs were considered equivalent in image-evoking potential. The mean translation probability reported by Desrochers (1980) for this group of pairs is .02, with a median of 0. An example of a pair is "Le phare=headlight."

Vocabulary Test. Subjects were also given a vocabulary production test. Six items were administered orally by the experimenter in random order. Three of the items required the subject to respond orally and three required written responses. For each subject, it was randomly determined which of the six items would be answered orally and which would be answered in writing. Each item required a list of single word responses appropriate to a given category. An example from this test is "List, in French, all the items that would be put in a refrigerator."

PROCEDURE

Upon arrival at the testing room, each subject was pre-

sented with a questionnaire that requested information on the number of years he or she had studied French in school, the number of years since his or her last French course, the title of the last course, and his or her final mark in that course. The remainder of the questionnaire contained the anxiety scales as described above.

Subjects then began the learning task. To establish a base level, subjects were presented first with a 38-item multiple-choice test containing the pairs to be learned. In this test, a French noun, with article, was presented on the screen along with five randomly chosen, numbered, English alternatives. Subjects indicated their response by typing the number corresponding to their choice. Each subject was given a unique random order of the French nouns. As well, the correct English noun was randomly positioned among the alternatives. The 37 remaining English nouns each had an equal probability of being selected as an incorrect alternative for each of the 38 French nouns for each trial. No English word was presented twice within the same set of options.

Following this first test, subjects were presented with a learning trial in which the 38 paired associates were presented one at a time. Each pair was presented for 2.5 seconds and consisted of the French noun and article, an equals sign (=), and the English translation. The presentation of the 38 pairs was followed by another test phase, and another learning phase, until five tests and four learning trials had been completed. Subjects were presented with the State Anxiety scale immediately after the first, third, and fifth tests.

Following the learning phase, each subject's knowledge of previous vocabulary was tested. It was randomly predetermined that the first three questions from the vocabulary test would be answered in either the oral or written mode and subjects were given the appropriate materials. At this point, they were also randomly assigned to either a *high-pressure* or *low-pressure* condition. All subjects were given two minutes to give as many responses as possible, however, subjects in the

high-pressure condition were told that if they stopped speaking or writing for more than 15 seconds at a time they would be given the next item. When switching response modalities the experimenter reminded the subject that the next three questions were similar to the ones just answered and that the same time limits applied. Following this, the experimenter administered the Free Recall test. Subjects were asked to recall orally the pairs they had learned previously. A maximum of four minutes was allotted with a fifteen-second time limit between responses for those in the high-pressure condition.

RESULTS

The results of this study fall into two general categories. The first deals with the relationships among the anxiety measures and is primarily concerned with the dimensionality underlying the anxiety measures. The second set of analyses examines the relationship between anxiety and both the learning and production of French vocabulary.

A preliminary analysis of variance was performed to determine whether subjects report experiencing different levels of anxiety in French, Mathematics, and English classes. A significant effect was obtained [$F(2, 206)=9.79, p<.001$] and post hoc comparisons of the means showed that the mean French Class anxiety score ($\bar{x}=17.79$) was significantly higher than the mean for both the English Class ($\bar{x}=12.58$) and Mathematics Class ($\bar{x}=13.90$) anxiety, which did not differ significantly between themselves. This analysis indicates that the French class is the most anxiety provoking of the three examined.

DIMENSIONALITY OF ANXIETY

To determine the dimensionality underlying the various measures of anxiety, the intercorrelations of all of the anxiety scales were subjected to a Principal Components analysis and

Varimax rotation. Three factors were obtained with eigen-values greater than 1.0, however, application of the scree test (Cattell, 1966) indicated that a two-factor solution was most appropriate. The two extracted factors (see Table 1) accounted for 48% of the total variance.

Factor I obtained high (greater than ±.50) loadings from seven measures and appears to define a dimension of General Anxiety. The Trait anxiety scale, all three of the administrations of the Spielberger State anxiety scale, the Test anxiety scale, the Computer anxiety scale, and the Mathematics Class anxiety scale produced appreciable factor loadings. Because of the wide range and generic nature of situations referred to in the scales defining this factor, it seems best identified as a General Anxiety factor.

Factor II appears to identify a dimension of Communicative Anxiety. This factor obtained appreciable loadings from French Class anxiety, French Use anxiety, English Class anxiety, and the Audience sensitivity scale. This factor will be referred to as Communicative Anxiety, because each of these measures involves, to some extent, anxiety reactions in oral communication situations.

ANXIETY AND LEARNING

To control the Type 1 error rate, Hummel and Sligo's (1971) recommendations were followed and the initial analysis was conducted using a 2×2×5 split plot factorial design MANOVA. The number of pairs correctly identified per learning trial and the latency of each trial were entered as dependent variables with General Anxiety (high vs. low), Communicative Anxiety (high vs. low), and Trials 1–5 as the factors. The General Anxiety and Communicative Anxiety groups were defined in terms of a median split of factor scores based on the preceding principal components analysis. Significant multivariate effects were found for Communicative Anxiety (Wilks Lambda=.828, $p<.001$), Trials (Wilks Lambda=.112, $p<.001$),

Table 1
Varimax Rotated Factor Matrix

	Factor 1 General Anxiety	Factor 2 Communicative Anxiety
French Class	−.02	.78
French Use	.01	.64
English Class	.09	.58
Audience	.25	.60
Math Class	.63	−.12
Computer	.59	−.23
Trait	.51	.28
Test	.75	.08
State 1	.68	.30
State 2	.70	.29
State 3	.60	.37

and for the Communicative Anxiety by Trials interaction (Wilks Lambda=.956, $p<$ .05). Following the suggestion of Hummel and Sligo (1971), attention is directed to significant univariate tests for these factors. Significant effects were obtained for Communicative Anxiety [$F(1, 100)=19.15, p<.001$], Trials [$F(4, 400)=673.02$, $p<$ .001] and the Communicative Anxiety by Trials interaction [$F(4, 400) = 2.49, p<.05$] for the number correct. In the case of latency, only the univariate effect for Trials was significant [$F(4, 400)=224.36, p<.001$].

The significant main effects found for Trials simply indicate that learning had taken place and that responses were made increasingly rapidly, as expected. The Communicative Anxiety by Trials interaction is presented in Figure 1. The difference between the communicative anxiety groups widened for the second, third, and fourth trials as compared to the first and last trials indicating that the low Communicative Anxiety group was learning more rapidly between the second and fourth trials. Inspection of the means and standard deviations
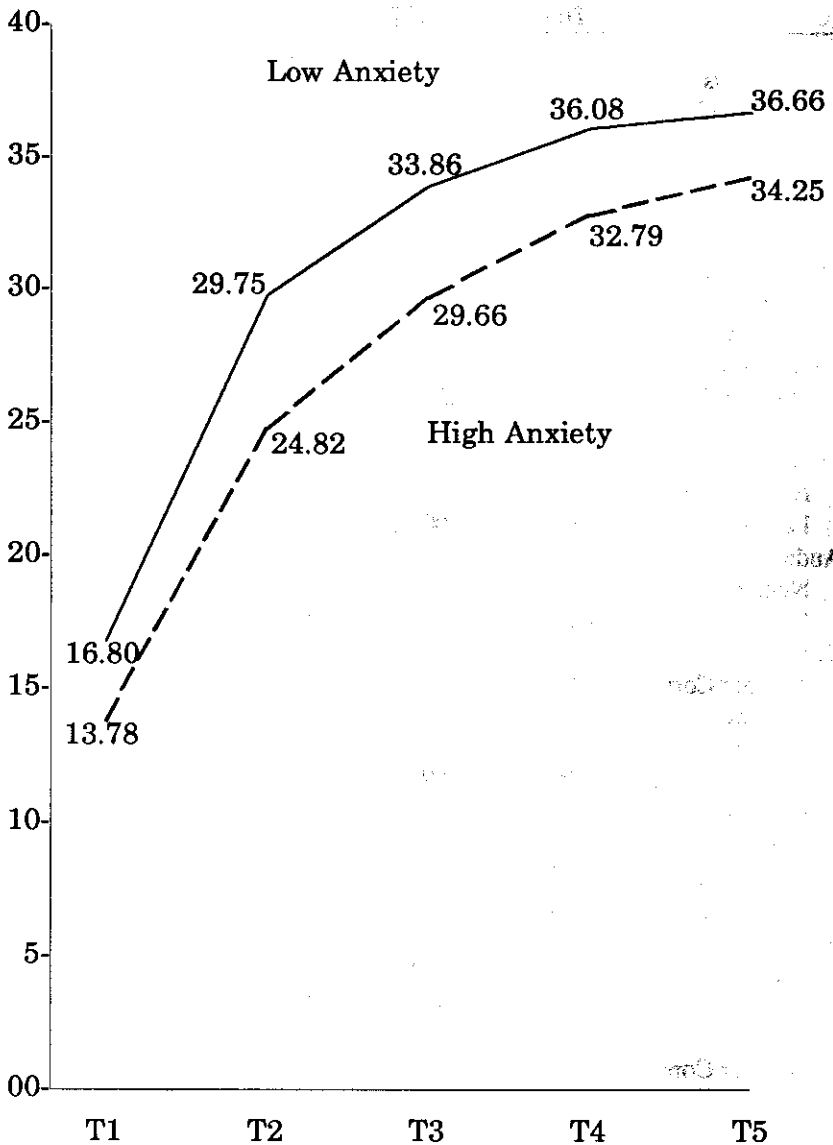
Figure 1. Communicative anxiety by trials interaction

Table 2
The Relationship of Individual Anxiety Scales to the
Number of Correctly Identified Pairs and Latency per Trial

	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
French Class					
Number Correct	−.30*	−.37**	−.37**	−.42**	−.34**
Latency	.05	.12	.22	.28*	.25*
French Use					
Number Correct	−.50**	−.42**	−.32**	−.22	−.19
Latency	.10	.10	.14	.16	.13
English Class					
Number Correct	.00	−.15	−.09	−.21	−.14
Latency	.02	.03	.06	.07	.11
Math Class					
Number Correct	.12	.22	.12	.09	.09
Latency	.01	−.02	−.11	−.09	−.10
Trait					
Number Correct	−.09	−.03	.01	.00	.00
Latency	.04	.00	−.02	.05	.00
Audience					
Number Correct	.05	−.02	−.04	−.15	−.14
Latency	−.22	−.16	−.20	−.12	−.05
Test					
Number Correct	−.03	−.20	−.14	−.02	−.04
Latency	.16	.21	.20	.23	.16
Computer					
Number Correct	.00	.07	.06	−.02	.00
Latency	.08	.06	−.02	.01	.00
State 1					
Number Correct	−.16	−.16	−.05	.02	.06
Latency	.20	.24	.19	.18	.09
State 2					
Number Correct	−.17	−.33**	−.28*	−.16	−.07
Latency	.03	.20	.28*	.29*	.21
State 3					
Number Correct	−.10	−.24	−.26*	−.26*	−.19
Latency	−.11	.00	.11	.18	.17

*=$p<.01$; **=$p<.001$; two-tailed

suggests that a ceiling effect was responsible for the narrowing of the gap between groups for the fifth trial.

Because subjects had varying degrees of prior experience with French, several Analyses of Covariance were performed to control for the effects of the initial differences among subjects. For the first analysis, the number correct on the first trial was entered as a covariate for each of the other four trials. Analyses of covariance were also performed removing the effects of years of study and marks in French. All three of these analyses show results that are equivalent to the analysis just presented. Inspection of the adjusted means showed that, as in the above analysis, the significant Communicative Anxiety by Trials interaction was accounted for by the narrowing of the gap between the high- and low-anxiety groups on the fifth trial.

Table 2 presents the correlations between each of the anxiety scales and the Number Correct and Latency for each trial. To reduce the Type I error rate in experiments, only those with a Type I probability level less than (.01) are reported. Only four correlations between anxiety and Latency are significant, two involving State anxiety and two involving French Class anxiety. These correlations show that high scores on these measures tend to be associated with longer latencies only on the later trials.

In terms of learning, French Class anxiety was significantly negatively correlated with Number Correct over all five trials, while French Use anxiety correlated significantly with the Number Correct for the first three trials. The only other scale to be associated with vocabulary acquisition was Spielberger's State anxiety scale. As can be seen in Table 2, State anxiety correlates significantly negatively with number correct only on those trials that precede its administration.

Two cross-lagged panel analyses (Kenney, 1975) of the correlations between State anxiety and proficiency were performed to evaluate the direction of "causation" between anxiety and performance on the learning task. For the first analysis, Time 1 includes the Number Correct on the second trial paired

with the first State scale and Time 2 is Number Correct on the third trial paired with the second State scale. Using the formula presented by Marascuilo and Levin (1983, p. 71) to test for the difference between correlated correlations, a significant Z score indicates that one of the diagonal correlations is greater than the other. The diagonal paths for this analysis are significantly different (Z=3.59, $p<.001$) indicating that the correlation between Number Correct at Trial 2 and State anxiety 2 (r=−.33) is significantly greater than the correlation between State anxiety 1 and Number Correct at Trial 3 (r=−.05). A similar analysis was conducted in which Time 1 represents Number Correct on trial four and the second State anxiety, Time 2 represents Number Correct on trial five and the third State anxiety scale. This analysis also indicates (Z=3.23, $p<.001$) that the correlation between Number Correct at Trial 4 and State anxiety 3 (r=−.26) is stronger than the correlation between State anxiety 2 with Number Correct at Trial 5 (r=−.07). Both tests suggest that it is more likely that poor performance leads to State anxiety than it is that State anxiety leads to poor performance.

RECALL OF THE PAIRS

A 2×2×2 analysis of variance was performed to compare the effects of General Anxiety, Communicative Anxiety, and Pressure Condition on the free recall of the pairs. Significant main effects were found for Communicative Anxiety [$F(1, 96)=$ 9.58, $p<.01$] and pressure condition [$F(1, 96)=6.29$, $p<.01$]. Those with high Communicative Anxiety tended to have lower scores ($\overline{X}=31.87$) than their less-anxious counterparts ($\overline{X}=44.65$). Also, the high-pressure condition seems to have restricted the scores of those in that group ($\overline{X}=32.87$) as compared to the subjects under low pressure ($\overline{X}=43.65$). None of the interactions was significant.

When each of the 11 correlations between the anxiety scale scores and the free recall scores are examined, only two

coefficients were significant at the .01 level; French Class anxiety (r=−.30) and the second administration of the State Anxiety scale (r=−.28).

VOCABULARY TASKS

A 2×2×2 MANOVA was performed using the Oral and Written Proficiency scores as the dependent measures with General Anxiety, Communicative Anxiety, and Pressure Condition as the independent variables. Significant multivariate effects were obtained only for Communicative Anxiety (Wilks λ=.79, p<.001) and this was reflected in the significant univariate effects for both oral and written scores. Those subjects with high Communicative Anxiety had lower scores on both the oral ($\overline{X}$=15.06) and written ($\overline{X}$=17.40) measures, than did those in the low Communicative Anxiety group ($\overline{X}$=27.04 and $\overline{X}$=23.81, respectively).

When the correlations of the individual anxiety scales with the Written Proficiency scores are examined, only French Class anxiety (r=−.34, p<.001) and French Use anxiety (r=−.42, p<.001) display a significant relationship to proficiency. Similar results are obtained for the Oral Proficiency scores. Again, only French Class anxiety (r=−.40, p<.001) and French Use anxiety (r=−.54, p<.001) are significantly related to oral proficiency scores.

DISCUSSION

Two orthogonal factors were extracted from the intercorrelations of the 11 anxiety scales. The first factor, General Anxiety, was based largely on the loadings of Trait and the three State Anxiety scales. Although some authors argue that the distinction between State and Trait anxiety is meaningful (Spielberger, 1983), there is evidence that these concepts are not qualitatively different (Endler, 1980; Chrisjohn, 1981).

The results of this investigation would fall into the latter category. Each of the three administrations of the State Anxiety scale loaded on the same factor as Trait anxiety. In past studies, State anxiety has been correlated significantly with language proficiency in some investigations (e. g., Young, 1986) but not in others (e. g., Gardner et al., 1987). This pattern is similar to that shown by general trait anxiety measures and test anxiety measures (e. g., Chastain, 1975). The conclusion may be reached that this dimension of general anxiety and those scales that comprise it are not related to language behavior in a reliable manner.

The second factor, Communicative Anxiety, is independent of the first and was defined by French Class anxiety, French Use anxiety, English Class anxiety, and Audience sensitivity. Clearly the first three are language-related anxieties with Audience sensitivity suggesting that this dimension reflects the communicative aspects of language. The Communicative Anxiety construct, as defined by the scales used here, has a distinct foreign language component. Because the factors are independent of each other, they can be considered as two separate traits.

Horwitz, Horwitz, and Cope (1986) list communication apprehension, social-evaluative anxiety, and test anxiety as the three elements of foreign language classroom anxiety. The Communicative Anxiety dimension generated by the preceding analysis bears an obvious relationship to the communication apprehension component proposed by Horwitz et al. (1986). Communicative Anxiety is also conceptually related to Social-Evaluative anxiety as each involves apprehension surrounding social perceptions and self-consciousness when speaking or participating in a social context. The results of this study do not, however, support Horwitz et al.'s (1986) generalization concerning Test anxiety because the Test anxiety scale contributes to the General Anxiety factor and not to the Communicative Anxiety one. This suggests that Test anxiety is a general problem and not one that is specific to the language classroom.

In addition, Test anxiety has been shown to influence language course grades positively and negatively (Chastain, 1975; Horwitz, 1986); therefore, a closer examination of the role of Test anxiety in the foreign-language classroom seems warranted.

The second focus of this study was on the relationship between anxiety and both the learning and production of French vocabulary. Tobias (1979, 1986) has postulated three levels at which anxiety might influence learning: input, processing, and output. Each of the dependent measures can be related to one or more levels of this model, as each is primarily dependent on one phase of memory. In Tobias' formulation, anxiety prone people engage in self-related cognition about their reaction to a task rather than concentrating on the task at hand. The division of cognitive resources between task-irrelevant and task-relevant thoughts produces deficits in the performance of highly anxious individuals.

It is possible to evaluate the results of this study in terms of the predictions that would be generated by the Tobias model for each stage of processing. First, anxiety would likely have a relatively stable influence on the learning of the pairs, regardless of the stage of learning or the mode of production. According to Tobias (1986), for highly anxious subjects to improve, relative to those low in anxiety, they should be given the opportunity to compensate for their misdirected attention by reviewing the material to be learned. This was prohibited in the present study. A second prediction would be that those high in anxiety should require more time to respond if they were able to compensate for their anxiety. This would imply that an effect would be observed either in the number of words correctly recognized or in the latency of responses, but not both. A third prediction is that long term memory retrieval will suffer from the division of cognitive resources and that the vocabulary production scores will be lower for those high in anxiety.

The presence of a difference between the Communicative Anxiety groups on performance throughout the five trials indicates that anxiety has an effect on learning. The presence

of this effect even after controlling for scores on the first trial, for reported marks in French, and for years of study is evidence in favor of the stable, negative influence of this type of anxiety. Because scores on the scales that comprise this dimension could not have been influenced by performance on the learning task, it is reasonable to suggest that high Communicative anxiety "caused" performance deficits. More specifically, both of the French anxiety scales correlate with learning, suggesting that it is French-related anxiety that causes poor performance on the test of French vocabulary learning.

Generally speaking, few of the anxiety measures correlate with latency, with the exception of French Class anxiety and State anxiety. The State Anxiety scale shows an inconsistent pattern of correlations. The second administration correlated with the latency of both the trial preceding it and the following trial. However, neither of the other two administrations shows a similar pattern, neither State 1 nor State 3 correlates with the latency of any trial. This pattern is difficult to interpret and is analogous to the type of ambiguous result found when past studies have employed state-trait anxiety constructs. The French Class anxiety scale correlated significantly with the final two trials, possibly indicating that the subjects became more reminiscent of their French classroom experiences and those with higher French Class anxiety took longer to respond because of their self-concerns. In summary, the correlations of anxiety with trial latencies are weak and occur for later trials. This set of results is consistent with the predictions generated by the Tobias model.

In terms of the output side of Tobias' model, the oral proficiency and written proficiency tasks relied on long-term memory. Only French Class and French Use anxiety correlated significantly with scores on these measures. It can be assumed that respondents knew many more vocabulary items than were produced and that more effective retrieval would have increased their scores. The task then becomes a matter of locating appropriate items in memory. The significant effect

for Communicative Anxiety can be taken as evidence that this anxiety interferes with the retrieval of these items.

While the production tasks showed the expected effects, the anticipated difference between the two pressure conditions did not fully emerge. It was expected that subjects with high anxiety would perform poorly on all three tasks (oral, written, and recall) in the high-pressure condition, relative to those under low pressure. However, there was a significant effect for Pressure only for the free recall task. After the fact, it would seem that this may be related to the type of memory search required. For the oral and written vocabulary tests, the subjects were required to search through long-term, distant memory for appropriate responses. After the first 15-second lapse in responding, subjects in the high-pressure condition were stopped. The lapse would likely occur when the subject had "run out" of retrieval cues. For this reason, extending the time limit to the full two minutes did not result in significantly more responses. On the other hand, the free recall task required a search through much more recent memory. The contextual cues available during learning were still available during recall. In short, a 15-second lapse did not indicate that retrieval cues had been completely exhausted and subjects given the full two minutes were able to remember significantly more items.

MODEL OF CAUSALITY

The results presented above tend to indicate that anxiety leads to deficits in learning and performance. The cross-lagged panel analyses show that State anxiety is more likely to be a product than a predictor of the number of pairs being learned. It appears that the emotional state of the respondent is most closely associated with performance on the preceding test rather than on a following test. These results point to the effect of performance on State anxiety while the previous results point to the effects of anxiety on performance. Although not a point addressed by Tobias, the potential for some kind of

circularity of effect has been suggested (Levitt,1980).

While Communicative anxiety has an effect on learning and performance, performance can influence State anxiety. These two perspectives on the direction of causality are not mutually exclusive, and, in fact, can be combined into a single framework. The key is to note that each of the above interpretations concentrates on a different type of anxiety, the first on foreign language anxiety and the second on State anxiety. The model to be suggested is that foreign language anxiety causes poor performance in the foreign language which produces elevations in State anxiety. This mechanism can account for the findings related to the Communicative Anxiety dimension, as well as the individual correlations of the French Class, French Use, and State anxieties with performance.

This interpretation might indicate that when a student experiences repeated episodes of State anxiety within language contexts, it solidifies into a situation-specific anxiety, French Class anxiety for example. This anxiety is maintained and strengthened by the same sequence of poor performance leading to anxiety that created the French Class anxiety in the first place. Presumably, a differentiation between State anxiety and French anxiety develops because State anxiety and foreign language anxiety are associated with two different factors. This would happen as the student comes to associate anxiety with French class, as opposed to Mathematics class for example. Discrimination between the different types of anxiety develops and determines the source to which the anxiety is attributed.

GENERAL CONCLUSIONS

The inconsistencies of past work in the area of foreign-language anxiety are likely attributable to an inappropriate level of instrument specificity. This study has shown that a clear relationship exists between foreign-language anxiety and

foreign-language proficiency. The orthogonal factors generated in the analysis of the anxiety scales indicate that foreign-language anxiety is separable from general anxiety, which possibly accounts for the poor relationship of general anxiety and second-language proficiency. The factor analysis suggests that foreign-language anxiety is part of a more general Communicative Anxiety.

Both the theories of Horwitz et al. (1986) and Tobias (1986) were supported by the results of this study. Horwitz, et al. (1986) proposed a tripartite description of foreign-language anxiety with communication apprehension, fear of social evaluation, and test anxiety as the components. Only Test anxiety did not emerge as an important factor in the present study. Tobias' (1986) model of learning from instruction also received support. Clearly, anxiety was shown to influence both the learning (input) and production (output) of French vocabulary.

The model of the development of Foreign-Language anxiety which has been suggested here requires further testing, however, such a model is able to accommodate the results of the present study as well as explaining the inconsistent findings observed in past studies. Additional research is obviously needed, but the model proposed here would seem to be one that has promise for interpreting previous ambiguities and promoting a clearer understanding of the role of anxiety in both second-language learning and production.

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