

COMPUTER ANXIETY LEVELS OF SOUTHERN REGION COOPERATIVE EXTENSION AGENTS

Myra N. Smith, Doctoral Student
Joe W. Kotrlík, Associate Professor
Louisiana State University

The advent of computers into the Cooperative Extension System (CES) has created a state in agents' lives that has been termed "computer anxiety." Oetting (1983) defined computer anxiety as "the anxiety that people feel they will experience when they are interacting with computers—the anxiety associated with the concept of computers" (p. 1). Maurer and Simonson (1984) had a similar definition. "the irrational fear or apprehension felt by an individual when using computers or when considering the possibility of computer utilization" (p. 2).

Computer anxiety levels of Extension professionals are an important consideration in the process of incorporating computers into their daily routine. Further adoption of computer technology must be handled carefully if anticipated computer anxiety is to be reduced. The introduction of computers into most aspects of the CES seems to have created mixed reactions. Studies dealing with Extension personnel suggest that computers are being used on an increasing scale (Baker, 1985; Cantrell, 1982; Richardson, 1984). Computer anxiety of Extension agents was a concern in at two of these studies (Baker, 1985; Cantrell, 1982).

The literature shows that computer anxiety in varying degrees, rather than the expected math anxiety, is being experienced. Just as the learning of mathematics has been affected by math anxiety, it is very likely that computer anxiety affects both choosing to learn about computers and the mastery of computer skills (Oetting, 1983). Cantrell (1982) was one researcher who termed the anxiety associated with use of computers as "computerphobia."

Oetting (1983) has shown that levels of computer anxiety can be assessed by using a computer anxiety scale, COMPAS. These studies showed there is a relationship between computer anxiety and math anxiety. Worden (1984) used COMPAS to conduct a national survey of "extension workers involved in home economics programming" (p. 1) from the four CES regions and the District of Columbia home economics staff. Of these, 20 respondents were state home economics leaders. The results showed that 36% of the participants were generally comfortable with computers. Worden used COMPAS in an effort to assess attitudes even though it had been developed to measure computer anxiety.

Bellando and Winer (1985) determined there was some validity to classifying people according to "Holland types" in an effort to determine computer anxiety. They reported that Holland's artistic and social types revealed significantly higher computer anxiety as measured by COMPAS than the other types—realistic, investigative, conventional, and enterprising.

With the introduction of computers into the lives of Extension professional staff members, mixed reactions and behaviors have resulted. Maurer and Simonson (1984) listed some behaviors that are associated with acceptance of computer technology: avoidance of computers and the area in which they are located, excessive caution, negative remarks, and attempts to cut short the necessary use of computers.

Another problem associated with computer technology is employee acceptance. The literature shows that the use of computers will increase; however, the path to employee acceptance will not be easy (Richardson, 1984).

The study of computer anxiety is a new research area. Computer anxiety among educators has been investigated in few studies. Also, no comprehensive studies of computer anxiety among Extension agents have been conducted.

Significance of the Study

Since the early 1980s, the number of computers in county/parish Extension offices within the Southern Region has increased dramatically. In 1985 and 1986 CES showed growth and progress in technology adoption. These results were surprising because 1986 was a year of budget and personnel cuts (Travieso, Dik, Russo, & Curtin, 1987).

As a result of recent dramatic increases in the number of computers and Extension personnel being expected to use them, it is possible that computer anxiety is being experienced by many in Extension. This state, computer anxiety, may result in the agents choosing not to learn about or use computers and may affect their mastery level of computer skills (Campbell, 1986).

No study addressing computer anxiety of Extension agents had been conducted on a regional or national scale. Only one limited study with home economics professionals focused on attitudes. A study of computer anxiety was needed to provide knowledge about factors that may impact on the agents' readiness to use computers. This information will allow Extension administrators an opportunity to improve the effectiveness of computer skills training. In addition, with more Extension personnel being afforded the opportunity to develop their computer skills, it was important to determine if agents were experiencing computer anxiety so that, if needed, appropriate educational interventions could be implemented. For these reasons, it was imperative to determine Extension professionals' level of computer anxiety.

Purpose and Objectives

The purpose of this study was to measure computer anxiety of Extension county/parish agents within the CES Southern Region. The objectives were to:

1. Determine the computer anxiety levels of Extension agents as measured by Oetting's Computer Anxiety Scale (COMPAS).
2. Describe agents concerning: (a) their level of computer use and current computer skill levels; (b) the availability and use of an office computer; (c) the amount and type of formal computer training completed; and (d) their perceptions of administrative support for computer use.
3. Determine the variance in the Extension agents' computer anxiety levels that could be explained by selected variables: level of education, years of Extension employment, age, gender, perceived typing skills, computer skill level, hours of weekly computer use, formal computer training, county/parish administrative support, area or district administrative support, state administrative support, and perceived mathematical ability.

Instrumentation

The instrument used to gather data was a two-part questionnaire: Oetting's COMPAS and a closed-form question section designed to obtain information about the agents and their computer usage. The long form of COMPAS contains 48 five point Likert-type items with seven subscales (hand calculator, trust, general attitude, data entry, word processing, business operations, and computer science). The overall computer anxiety scale range was 40 to 200. The respective ranges and classification were 40-79, very relaxed/confident; 80-104, generally relaxed/comfortable; 105-129, some mild anxiety present; 130-149, anxious/tense; and 150-200, very anxious. The subscales had a range of 4 to 20. The numerical ranges were different because there were only four items in each subscale. The ranges and categories were: 4-8, very relaxed/confident; 9-10, generally relaxed/comfortable; 11-12, some mild anxiety present; 13-14, anxious/tense; and 15-20, very anxious (Oetting, 1983).

The correlation between COMPAS and various types of test anxieties showed that computer anxiety is highly related to test anxiety ($r = .70$) when using a computer to take a test. Oetting showed that COMPAS and math anxiety had a moderately high correlation ($r = .40$). Based on these correlation coefficients, Oetting concluded that computer anxiety and math anxiety appeared to be related; however, COMPAS does not purport to measure math anxiety.

Oetting stated there are three types of anxieties: trait, state, and concept-specific anxiety. Oetting defined trait anxiety as "anxiety experienced by a person over the entire range of life experiences. State anxiety...is an anxiety that a person is experiencing right now, at this time" (p. 1). Concept-specific anxieties, on which COMPAS is based, "fill the...range between general trait anxiety and state anxiety. They are the anxieties that people associate with specific situations" (P. 1).

COMPAS was reviewed by psychologists, Benjamin Kleinmuntz and Steven Wise. Even though Kleinmuntz questioned the importance of measuring computer anxiety, both reviewers indicated that if one wishes to measure computer anxiety, COMPAS is the test to use (Mental Measurements Yearbook, 1985).

Using Cronbach's alpha, Oetting (1983) showed the overall internal consistency reliability as $\alpha = .96$ for the long form. With the same formula, a reliability of .97 resulted from this study. The subscale reliabilities were similar—.71 to .86 in Oetting's study and .70 to .87 in this study.

Content validity of the instrument was evaluated by university Vocational Education faculty, Extension and Vocational Education doctoral students and a graduate advisory committee. The instrument was field tested with two agents who were randomly selected from each of the 13 Southern Region states.

Population and Sample

The target population was the county/parish level agents in the Southern Region of the CES. Extension agents with district/area or state administrative responsibilities were excluded. The accessible population included 11 of the 13 states within the Region: Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, Oklahoma, South Carolina, Tennessee, Texas, and Virginia. When contacted via a letter and a follow up telephone call, the directors in two states, Kentucky and North Carolina, did not wish to have their agents participate.

Questionnaires were mailed to a systematic random sample of 544 agents drawn from personnel lists secured from Extension directors in the 11 accessible states. Of the 544 questionnaires mailed, 532 (97.8%) were returned after two mailings and two post card follow ups. Of the returns, 522 (96.0%) questionnaires were usable. Because of the high response rate, a planned telephone follow up of nonrespondents was not conducted since a 97.8% response rate was considered adequate (Borg & Gall, 1983).

Data Analysis

The alpha level was set at .05 a priori. Descriptive statistics were used to describe the data. Correlation coefficients were calculated between computer anxiety and each independent variable. Stepwise multiple regression (Borg & Gall, 1983) was used to determine the amount of variance in the agents' computer anxiety levels that could be explained by selected variables.

Findings

Objective 1: The scores for the COMPAS scale and subscales are presented in Table 1. The COMPAS score for the sample was 110.86 (SD = 32.47). This score is higher than the level reported in other studies: college students, 109.8 (Bellando & Winer, 1985); vocational teachers, 104.4 (Kotlík & Smith, 1988); and Extension home economists, 92.6 (Worden, 1984). The distribution of scores suggests that some of the agents may be experiencing some computer anxiety. The COMPAS manual indicates that "some mild anxiety" was present in college students commencing at a score of 105 on the overall scale. Almost 55% of the agents indicated they were experiencing some computer anxiety.

Table 1 summarizes the COMPAS scores for the sample. Anxiety scores on three subscales showed fewer than one-fourth of the agents experienced anxiety with a hand calculator, trust of computers, and general attitude toward computers. Fewer than one-half of the respondents indicated they were anxious with data entry, word processing, and business operations work. More than three-fourths (77.04%) of the agents revealed that they experienced anxiety with the computer science subscale section activities.

Objective 2: Over two-thirds of the agents responded that they use a computer. More than one-third of these agents think of themselves as novices. No agents considered themselves very knowledgeable. Almost 85% of the respondents indicated they had an office computer available. Of the available computers, over one-third (35.68%) were in a central office. Only 8% (37) of the agents had a computer in their personal office.

Over 41% of the agents revealed they did not use an office computer even though they had access. Agents with a computer in their personal office reported using it almost 6 1/2 hours weekly, whereas agents who did not have a computer in their personal office used it about 1 3/4 hours each week.

Two-thirds of the agents had completed some formal computer training. The most reported type was an in-service training workshop. Ninety percent of the agents had participated in this type of activity. Almost half of the responding agents had completed more than eight clock hours of classes.

Table 1
COMPAS Scores for Extension Agents

Scale	<u>M</u>	<u>SD</u>	% experiencing anxiety ^a
Overall computer anxiety ^b	110.86	32.47	54.98
Subscales ^c			
Hand calculator	5.51	2.33	4.22
Trust	6.76	3.11	12.45
General attitude	8.36	3.44	24.33
Data entry	10.08	3.98	43.49
Word processing	9.61	4.00	40.04
Business operations	10.07	4.13	41.95
Computer science	13.85	4.01	77.40

Note. ^aN = 522. ^bThe percentages in this column were derived from comparing the agents scores to the COMPAS manual. ^cRange = 40-200. The ranges and categories for the overall computer anxiety scale were: 40-79, very relaxed/confident; 80-104, generally relaxed/comfortable; 105-129, some mild anxiety present; 130-149, anxious/tense; and 150-200, very anxious (Oetting, 1983). ^dRange = 4-20. The ranges and categories for the subscales were: 4-8, very relaxed/confident; 9-10, generally relaxed/comfortable; 11-12, some mild anxiety present; 13-14, anxious/tense; and 15-20, very anxious (Oetting, 1983).

Agents perceived their administrators at the county/parish, area or district, and state levels to be supportive of computer use with state administrators being perceived as most supportive.

Table 2
Multiple Regression Analysis of COMPAS Scores (N = 456)

Source of Variation	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	Prob.
Regression	176960	4	44240	66.5	.0001
Residual	300450	451	666		
Total	477410	455	44906		

Variables in the equation

Variables	<u>R²</u>	Cum. <u>R²</u>	<u>F</u>	Prob.
Computer skill level	.309	.309	203.3	.0001
Perceived typing skills	.022	.331	112.1	.0001
Perceived mathematical ability	.020	.351	81.6	.0001
Hours of computer use per week	.019	.370	66.4	.0001

Variables not in the equation

Variables	<u>t</u>	Sign. <u>t</u>
Level of education	-1.068	.2859
Years of employment with CES	1.767	.0779
Age	0.506	.6130
Sex	-0.086	.9312
Formal computer training	-0.654	.5136
County/parish administrative support	-1.270	.2047
Area or district administrative support	-0.770	.4419
State administrative support	0.551	.5820

Objective 3: Correlation coefficients for variables used in the regression analysis were calculated and interpreted using the set of descriptors by Hinkle, Wiersma and Jurs (1979). Moderate correlation (-.556) was found between computer anxiety and computer skill level. A low correlation (-.433) existed between computer anxiety and hours of computer use per week. Little, if any correlation was found between computer anxiety and the other variables.

Table 2 displays the results of the multiple regression analysis. Computer skill level was the best predictor of computer anxiety. Considered alone, this variable explained 31% of the variance in the overall COMPAS score.

Three other variables (perceived typing skills, perceived mathematical ability, and hours of computer use per week) explained an additional 6% of the variance. Agents with no or low levels of computer skills, agents who indicated they had poor typing skills, agents who perceived they had low math ability, and agents who did not use a computer or used a computer fewer than four hours weekly, were more likely to have higher computer anxiety scores.

Even though all 12 variables included in the stepwise multiple regression analysis were based on research or a theoretical/conceptual framework, only four variables accounted for a significant proportion of the variance.

Conclusions

Extension agents are experiencing mild computer anxiety; however, it does not appear that they are experiencing higher than normal computer anxiety levels. County/parish field agents are experiencing much higher levels of anxiety than state and national home economics personnel. More agents are experiencing anxiety with computer science functions than when involved with other subscale related activities.

The most common location for office computers is in a central office. Some agents do not use an office computer even though they have access to one. Agents with a computer located in their personal office use it more than the agents who do not have a computer in their personal office.

Many agents have completed some type of formal computer training even though minimal. The most frequent type was in-service training workshop(s). The majority of agents perceived they have administrative support for computer use at all levels.

Four variables: computer skill level, perceived typing skills, perceived mathematical ability, and hours of computer use per week explained a substantial proportion of the variance in agents' overall COMPAS scores.

Recommendations and Implications

Extension administrators should provide agents with more opportunities to use computers. Relief time should be available for learning to use computers. Hiring agents with computer expertise would be advantageous.

Formal training in Extension sponsored computer classes or college courses should be afforded agents. Administrators at all levels should devise incentives that would encourage agents to use computers.

Additional computer related assistance should be made available by state computer specialists. These state staff professionals should be provided to consult with local agents in computer sessions in the agents' office using the computer equipment with which the agents work daily.

Administrative support should be continued and strengthened. Efforts should be made to enhance the perception of administrative support among Extension agents. Administrators should demonstrate their support of computer use by rewarding agents with tangible rewards and written and verbal praise.

The four significant explanatory variables of computer anxiety should be considered and incorporated into the planning for agent training and in-service activities. This action by itself holds the most realistic promise for reducing computer anxiety levels of Cooperative Extension System agents.

Additional research should be conducted to identify other variables that relate or contribute to the computer anxiety levels of CES agents. Similar studies should be conducted in the other four regions of the CES or nationally.

The regression model developed here may be a suitable foundation on which to develop activities to alleviate computer anxiety; however, additional research is needed to further investigate computer anxiety. When other variables are identified, an improved understanding of computer anxiety will enable administrators and state specialists to provide additional remedies.

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