

SECONDARY AGRICULTURAL EDUCATION TEACHERS IN NORTH CAROLINA: FORECASTING UNDERLYING WORK-RELATED JOB-STRESS LEVELS

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Abstract

This study sought to explain and predict job stress levels among secondary agriculture teachers. The sample consisted of agriculture teachers (n = 201) in North Carolina. Data were collected using the Job Stress Survey. From the findings of the study it was concluded that the average teacher was married, male, and had over 13 years of experience. The majority of teachers reported working between 46-65 hours per week. The majority of these teachers also worked in a one or two teacher agriculture program. Overall agriculture teachers were not in a state of stress, however 48% of them were in the stressed category. Additionally, four percent of the variance in agriculture teachers' Job Stress Index score can be predicted by the teacher's sex, with females being more stressed.

Introduction and Theoretical Framework

Stress has become such a relatively normal part of the vocabulary that it's hard to believe the term stress was coined by Hans Selye a little over 50 years ago (Selye, 1973). Selye, largely considered the father of stress research defined stress as "the nonspecific response of the body to any demand made upon it" (p. 692). More recently, Humphrey and Humphrey (1986) defined stress as "any factor acting internally or externally that makes it difficult to adapt and that demands increased effort from the person to maintain a state of equilibrium within himself and his external environment" (p. 2-3). Stress can be the excitement, challenge, inspiration to do well and perform at high levels, yet at the same time stress can make an individual fearful, angry, frustrated and unable to relax (Cosgrove, 2000). According to the American Psychological Association (2007), one-third of people in the U.S. regularly reported experiencing extreme levels of stress. Extreme levels of stress can make it difficult for individuals to operate in normal day to day activities (Humphrey & Humphrey).

These concerns, coupled with the pressures and responsibilities of the job have the potential to cause an excess of job stress. Concern with the affects of job stress on a person's productivity, absenteeism, and health-related problems have increased dramatically during the last decade (Vagg & Spielberger, 1998) resulting in employee dissatisfaction, lowered productivity, absenteeism, turnover, and burnout (Cummins, 1990; Spielberger & Reheiser, 1995). Furthermore, the presence of certain situational factors or personal characteristics such as personality, social support including marital status, and physical exercise can protect individuals from illnesses that may be caused by stress (Manning & Fusilier, 1999).

Teachers are not exempt from the concern surrounding job stress and burnout. According to Adams (1999), high levels of stress can be harmful to teachers and may negatively affect their teaching, personal lives and, most importantly, their students. While most teachers agree that teaching is rewarding, it is also considered a difficult career because of too few resources, too much paperwork, crowded classrooms, students with emotional problems, low salary and high-stakes standardized testing (Strauss, 2002). Humphrey and Humphrey (1986) estimated that teachers make more than 400 decisions a day. This is particularly true in agricultural education as teachers face the challenge of meeting both traditional teacher roles as well as additional specific programmatic roles associated with teaching secondary agricultural education (Torres, Ulmer, & Aschenbrener, 2007).

Job stress research relative to secondary agriculture teachers has implications for improving the nature of the job and providing insight into possible interventions. The most influential framework for conducting research on job stress has been person-environment (PE) fit theory (Brewer & McMahan, 2004; Edwards & Cooper, 1990; Spielberger & Vagg, 1999). The PE fit theory is proposed as an approach for understanding the process of adjustment between individuals and their work environment (Caplan, 1987). According to the theory, stress results from the demands of the job that the person may not be able to meet, insufficient supplies, or strain in the workplace and the person's individual needs as observed by the interaction of the individual with his or her work environment (Landsbergis, 1988; Vagg & Spielberger, 1998). The interaction between an individual and his or her environment determines whether or not a

situation is stressful for that person (Brewer & McMahan). When demands of the job exceed a person's ability to meet those demands, the fit between an individual and their environment is incompatible; leading to a condition of stress. Those who are experiencing high amounts of stress need to be aware of the possibility of burnout. Freudenberger (1974) defines burnout as the extinction of motivation or incentive, where one's devotion to a cause or relationship fails to produce the desired result.

PE fit theory identifies of two basic measures regarding a person and the environment. The first measurement is objective, and the second is subjective. The objective environment indicates physical and social situations and events as they exist, independent of the person's perceptions, whereas the subjective environment refers to situations and events as perceived by the person (Edwards & Rothbard, 1999). This study focuses on the subjective measures of PE fit. Within this study, subjective PE fit measures become a concern of job stress due to the perceived misfit between perceptions and values.

According to Olpin and Hesson (2007), stress can be dichotomized into good and bad stress, where bad stress may lead to physical and mental exhaustion, illness and ultimately breakdown or a complete state of job burnout. In contrast, good stress is characterized by healthy tension that is associated with performance; as stress levels increase, so does performance. This concept is best described as the Yerkes-Dodson Principle (Olpin & Hesson, 2007) which suggests that to a certain point, a specific amount of stress is healthy, useful, and even beneficial. However, the Yerkes-Dodson Principle also suggests that the relationship between increased stress and increased performance does not continue indefinitely, rather at some point, stress becomes fatigue and crosses over to bad stress or said differently, a state of distress.

Review of Literature

Stressors resulting from job responsibilities include factors such as work conditions, technological advancements, work responsibilities, underutilization, lack of autonomy, role conflict, lack of support from supervisors and colleagues, organizational climate and transferable job skills (Cooper & Payne, 1988).

Teacher stress literature is a subset of a much larger effort to investigate the affects of job stress in a variety of occupations and settings (Guglielmi & Tatrow, 1998). However, stress in education is not a new concern. Humphrey and Humphrey (1986) reported that teachers averaged four and a half days of absences each year with a third of those absences being related to stress. In addition, it was reported that 35 percent of teachers indicated calling in sick due to fatigue and 84 percent believed that there were health hazards in teaching. Furthermore, 80 percent said their view of teaching had changed since beginning in the profession, and 23 percent admitted having a poor ability to cope with stress (Humphrey & Humphrey).

Many studies have attempted to identify the sources of stress in elementary and secondary school teachers (Borg & Riding, 1991; Farber, 1984; Friedman, 1991; Guglielmi & Tatrow, 1998; Kyriacou & Sutcliffe, 1978; Mazur & Lynch, 1989; Milstein, Golaszewski, & Duquette, 1984; Mykletun, 1984; Olson & Matuskey, 1982). According to Cosgrove (2000), factors leading to teacher stress were students who are poorly prepared, student indiscipline, poor

working conditions, time pressures, low job status, and conflicts with colleagues. Other factors leading to teacher stress included role overload, poor learner behavior, lack of resources, class size, diversity in individuals with whom they have to work, and lack of motivation of co-workers (Smylie, 1999).

The end result of teacher stress has been that many talented men and women with high expectations of achievement become dispirited and disillusioned. Some have left the teaching profession; others have stayed, but have been plagued by a multitude of physical, emotional and behavioral stress-related manifestations (Milstein & Golaszewski, 1985). This has been particularly true for new teachers. Roulston, Legette, and Womack (2005) confirmed that about 33 percent of new teachers quit the teaching profession within the first three years of their career. Having the ability to deal with stress is vital in teacher retention. According to Croom (2003), agriculture teachers experienced moderate levels of emotional exhaustion in their work. However, there is hope for stressed teachers. Research (Cohen & Willis, 1985; Shumaker & Czajkowski, 1994) showed social support reduces the impact of stressors on a variety of outcomes, including psychological well-being, job satisfaction, and risk of physical illness.

The demands of the job coupled with the range of responsibilities of operating, managing and teaching in an agricultural education department may well create stress in teachers. Agriculture teachers draw upon physical, emotional and intellectual resources in order to be effective in the classroom (Cano, 1990). The phenomenon of increasing job responsibilities in agricultural education has been well documented in the literature (Delnero & Montgomery, 2001). One early observation cited by the National Research Council (1988) was secondary agriculture teachers spend a great deal of time helping students excel in production-oriented FFA competitive events and award programs and less time on classroom instruction. In recent years, more, not less has been added to the job responsibilities in agricultural education. Adding to the pressure of frequent decision making, secondary agriculture teachers work well beyond a 40-hour work week preparing lessons, evaluating student work, coaching career development teams, and supervising student projects (Croom, 2003; Straquadine, 1990; Torres et al.). Little problems do add up; taking more of a toll on the health and well-being on individuals (London & Spielberger, 1983) and contributing to stress and burnout. Based on one estimate, 54 percent of all worker absences are in some way stress related, and cost U.S. industries over \$150 million per year (Elkin & Rosch, 1990; Karasek & Theorell, 1990). Researching the source of job stress relative to agriculture teachers has implications for improving the nature of the job and may provide insight into possible interventions in cases where stress exists.

Purpose and Research Objectives

The purpose of the study was to explain and predict job stress among secondary agriculture teachers from selected characteristics. The following research objectives were addressed in the study:

1. Describe selected characteristics of secondary agriculture teachers (sex, marital status, and hours per week at work, personality type, and number of teachers in department, days a week of exercise, sources of social support, number of years teaching, number of children, and number of years at current school).

2. Describe the level of job stress among secondary agriculture teachers.
3. Determine the number of teachers who have reached the stress threshold.
4. Predict job stress from selected characteristics of secondary agriculture teachers.

Procedures

The design for this study was descriptive-correlational research. The accessible population was secondary agriculture teachers in North Carolina ($N = 415$) during the 2007-2008 academic year. The frame was obtained from the North Carolina Agricultural Education Office. Deliberate efforts were made to remove duplicate names and ensure an accurate frame was obtained. A simple random sample was used to select subjects for the study. According to Krejcie and Morgan (1970), the desirable sample size was $n = 201$ to obtain a known precision ($\pm 5\%$) and confidence level (95%).

Instrumentation

Data were collected using the Job Stress Survey (JSS) developed by Spielberger and Vagg (1999). The JSS was a standardized and commercially available instrument designed to measure job stress as a function of job-related items perceived to be a source of severe and frequent stress. The JSS contained two sections. Section one sought to determine teachers' perceived level of severity for 30 common job-related stressors using a scale from 1-9; nine being the most stressful measure.

The second section sought to determine the frequency to which teachers encountered the job-related stressor at work during the previous six months using a scale that ranged from zero to more than nine occurrences in the last six months (0 – 9+). The two responses (severity and frequency) were used to produce three stress index scores: Job Stress Index (JS-X), Lack of Support Index (LS-X), and Job Pressure Index (JP-X). Index scores were calculated by multiplying severity scores by frequency scores. A third section was added to the questionnaire which sought teachers' personal, home and work-related information. Both a paper-pencil and electronic version of the JSS were prepared for use with participants.

Spielberger and Vagg (1999) reported the validity and reliability of the JSS through the results of previous studies. The creation of the instrument was detailed in the *Job stress survey: Professional Manual*. The manual further reported that the job-related items in the JSS were analyzed for construct validity using factor analysis. An alpha coefficient of .87 was reported for the Job Stress Index while the Lack of Support Index and the Job Pressure Index both had an alpha of .80 (Spielberger & Vagg).

Data Collection

Data were collected during the months of May and June of 2008. This period of time can be characterized as representing a high level of activity to include FFA Career Development Event activities as well as typical spring academic semester, instructional activities, and events. For many, this was also the end of the school year and researchers were striving to collect data before teachers began summer activities. Three points of contact were utilized when collecting

data. The data collection process began by mailing teachers a personally signed 3"x5" pre-notice postcard announcing the intent of the study and the forth coming request for participation. Two days later a personalized paper questionnaire was mailed to teachers. An email reminder was sent to teachers who had not responded by the specified date approximately seven days later. Using the HostedSurvey.com service, teachers were sent an email which included a personalized URL hyperlink to the online questionnaire. The opening page of the online questionnaire contained a message to teachers detailing the importance of the study and their participation as well as instructions for completing the online questionnaire. As a result, a response rate of 54% ($n = 108$) was achieved.

Teachers who responded by completing the questionnaire were assumed to represent response bias. Miller and Smith (1983) suggested procedures for examining response bias by comparing a sampling (10% to 30%) of non-respondent data to respondent data. Toward that end, a random sample representing 30% ($n = 29$) of the non-respondents was taken.

Non-respondents were mailed an envelope packet containing a revised and signed cover letter, a paper copy of the questionnaire, and a self-addressed, stamped return envelope as a reminder to participate in the study. The final contact with non-respondents consisted of a personalized email with a personalized link to the online questionnaire; followed by phone calls to all non-respondents. These efforts yielded a 34% ($n = 10$) response rate, acknowledging some remaining potential for response error.

Data from teacher respondents ($n = 108$) and non-respondents ($n = 10$) were statistically compared on the primary variable of interest (JS-X). Using an independent samples t -test, no significant ($p < .05$) differences were found between respondent and non-respondent data on the variable of interest. Thus, non-respondent data were pooled with the respondent data, yielding a total response rate of 118 (59%).

All returned and/or submitted questionnaires yielded usable data. Data were coded by the researchers and analyzed using SPSS (v.15). Frequencies, percentages, and measures of central tendencies and variability were used to summarize the data. Stepwise multiple regression was also used in analyzing the data. According to Cohen and Cohen (1983), stepwise multiple regression should be used when the goal of the researcher is explanatory and/or predictive in nature; while Lewis-Beck, Bryman, and Liao (2004) suggested that stepwise multiple regression was appropriate when there was inadequate theory or subject knowledge to indicate the priority of one independent variable over another. The minimum number of cases required when using stepwise regression ($n \geq 40m$, where m is the number of predictor variables) was guided by Tabachnick and Fidell (2001). Further, the variance inflation factor (VIF) statistic was used to quantify the severity of multicollinearity. According to O'Brien (2007), some researchers use a VIF value of 5 and others use a VIF value of 10 as a critical threshold reflecting the presence of multicollinearity. For this study, the researchers used a value of 5 as the critical threshold. Cohen (1988) was used to calculate effect size. Interpretation of effect size was done using Thalheimer and Cook's (2003) descriptors for describing the relative size of Cohen's d . An alpha level of .05 was set *a priori*.

Results

Research question one sought to describe selected characteristics of secondary agriculture teachers and the schools where they taught. Table 1 displays the data. There were 73 male teachers (64.60%) and 40 female teachers (35.40%). The majority ($f = 79$, 71%) of secondary agriculture teachers reported working between 46 to 65 hours a week. More than half of the teachers (59.46%) described themselves as extroverts. Eighty percent of the teachers were employed in a one or two teacher department ($f = 91$, 80.53%). All ($f = 112$, 100%) teachers indicated receiving social support from friends and/or family with less than half indicating social support from membership in professional associations ($f = 52$, 46.43%) and just over half receiving support from community organizations ($f = 67$, 59.82%). Agriculture teachers had an average of 13 ($M = 12.95$, $SD = 9.99$) years teaching experience with over 9 ($SD = 8.56$) of those years at their current school. They also had an average of 1.32 ($SD = 1.23$) children with most respondents indicating marital status as married ($f = 90$, 79.65%).

Table 1

Characteristics of North Carolina Secondary Agriculture Teachers (n = 118)

Characteristic	<i>f</i>	%	<i>M</i>	<i>SD</i>	Range
Sex					
Male	73	64.60			
Female	40	35.40			
Hours a Week at Work					
36-45 hours	13	11.71			
46-55 hours	51	45.95			
56-65 hours	28	25.23			
66-75 hours	15	13.51			
75+ hours	4	3.60			
Marital Status					
Married	90	79.65			
Unmarried	23	20.35			
Personality Type					
Extrovert	66	59.46			
Introvert	45	40.54			
Number of Teachers/Department					
1	45	39.82	1.84	0.86	1-5
2	46	40.71			
2.5	1	0.88			
3	17	15.04			
4	2	1.77			
4.5	1	0.88			
5	1	0.88			
Source of Social Support					
Friends and Families					
No	0	0.00			
Yes	112	100.00			
Professional Associations					
No	60	53.57			
Yes	52	46.43			
Community Organizations					
No	45	40.18			
Yes	67	59.82			
Number of Years Teaching			12.95	9.99	1-36
Number of Children			1.32	1.23	0-5
Number of Years at Current School			9.34	8.56	1-34
Days a Week of Exercise			2.40	1.93	0-7

Note. Frequency totals represent missing data; valid percents are reported

Research objective two sought to compare the level of job stress of secondary agriculture teachers as measured by overall Job Stress, Job Pressure, and Lack of Support to normative data. The job stress results in Table 2 reveal that agriculture teachers are in the 60th percentile of managerial/professional norm data on the Job Stress Index. Managerial/professional was chosen

as the norm data over the other norm group offerings reported in the manual because it most closely resembled the population being studied. Secondary agriculture teachers are also in the 64th percentile on the Job Pressure Index and in the 58th percentile on the Lack of Support Index.

Table 2

North Carolina Secondary Agriculture Teacher Job Stress Results (n = 118)

Index	Agriculture Teacher Data		M/P Norm Data ^a
	<i>M</i>	<i>SD</i>	<i>% ile</i>
Job Stress	22.23	11.61	60
Job Pressure	26.89	14.31	64
Lack of Support	20.72	14.75	58

Note. ^aM/P= Managerial/Professional

Because this is an average, objective three sought to determine how many teachers had crossed into the stressed category. The JSS Manual indicates that the 70th percentile ($M = 25.07$), on the Job Stress Index is indicative of a stressed individual. Slightly less than half of the teachers ($f = 57, 48.31\%$) fall into the stressed category (see table 3).

Table 3

Status of Secondary Agriculture Teachers in North Carolina (n = 118)

Status	<i>f</i>	<i>%</i>
Stressed	57	48.31
Unstressed	61	51.69

Stepwise multiple regression analysis was conducted to address research question four. The regression analysis was used to estimate the proportion of variance in job stress accounted for by the linear combination of selected teacher characteristics, including sex, marital status, number of children, years at current school, years of teaching experience, number of teachers in the department, exercise, hours/week at work, personality type, community support, and professional associations. Family/friend support was removed because the lack of variance made it a constant.

Only the Job Stress Index, as the dependent variable, was used in the regression as it is the omnibus measure which uses all 30 items from the Job Stress Survey. However, before conducting the regression, nine variables (marital status, number of teachers in department, years of teaching experience, number of children, years at current school, days a week of exercise, personality type, community support, and professional associations) of the 10 predictor variables were excluded from the regression analysis because of a low ($<.10$) bivariate relationship with the dependent variable. Of the remaining predictor variables (sex and hours per week at work) were independent (VIF) in their prediction.

The regression model (see Table 4) depicts the characteristic found to be significant in predicting Job Stress Index as a measurement of overall job stress. Four percent of the variance (Adjusted $R^2 = .04$; $F(1, 91) = 5.08, p < .05$) in agriculture teachers' Job Stress Index score can be predicted by teachers' sex, with females displaying a higher level of stress. The effect size of

sex was negligible ($d = .05$). By contrast, hours spent at work per week was not a significant predictor.

Table 4
Stepwise Regression of Predictors of Job Stress (Job Stress Index) among Secondary Agriculture Teachers (n = 118)

Variable	R	R ²	R ² Change	b	t	p	VIF	ES
Included	.23	.05						
Sex ^a			0.11	6.01	2.25	.03	1.00	Negligible
(Constant)				14.53	4.05	.01		
Excluded								
Hours per week at work ^b				0.12	1.14	.26	1.06	

Adjusted $R^2 = .04$; $F(1,91) = 5.08$, $p < .05$, Effect Size (ES) expressed as Cohen's d .

^aCoded: 0 = Male, 1 = Female; ^bCoded: 1 = 36-45 hours, 2 = 46-55 hours, 3 = 56-65 hours, 4 = 66-74 hours, 5 = 75+ hours

Conclusions, Implications and Recommendations

As a general profile, secondary agriculture teachers in North Carolina are mostly male, have an average of 13 years of teaching experience, with over nine years at their current school. Nearly eighty percent work in one or two teacher departments. Nearly everyone reported receiving social support, and one-third reported being an extrovert. Almost all of these teachers are married, with an average of 1.32 children. Nearly ninety percent of teachers reported working more than forty hours per week, and exercising an average of 2.40 days per week.

Based upon the findings of the study, secondary agriculture teachers in North Carolina on average are not in a state of overall distress. According to the *Job Stress Survey manual*, stress scores above the 70th percentile on a comparable norm data suggest a state of distress. Job Pressure was the highest norm percentile score at 64. Interpreting these results with the use of the Yerkes-Dodson Principle (Olpin & Hesson, 2007) would indicate that some teachers are experiencing healthy, productive stress which is pushing them to excel; however, some of the teachers have reached their stress threshold and crossed into distress.

While secondary agriculture teachers are not in a state of overall distress, on average, they are approaching the threshold of bad stress. As the roles of secondary agriculture teachers continue to increase, they will eventually lead to a point of task saturation. With emerging changes in education, curriculum, accountability and standards, secondary agriculture teachers are being asked to do more without reducing responsibilities. The question is not whether secondary agriculture teachers will reach a state of distress, rather how long it will be before it occurs, and what can be done to prevent it.

It is necessary that the agricultural education profession recognize the status of teacher stress. Agriculture teachers, in general, and specifically in North Carolina must begin to examine their roles and responsibilities with a concerted effort to manage their stress levels into healthy tension for healthy performance. Organizational leaders must also heed the status of teacher

stress and become more sensitive to the demands placed on teachers. Task saturation is too much to do with not enough time, not enough tools, or not enough resources. Specifically, secondary agriculture teachers will be unable to take on additional duties if appropriate resources and support are not provided. School administrators and state leaders should continue to seek opportunities that offer an abundance of resources and assistance that will aid teachers in their roles. Furthermore, perhaps teachers need to be proactive in reducing their tasks to manageable levels, where, in theory, they can get ahead by letting go of tasks associated with little or no measurable program or student impact.

The single predictor of overall stress was sex, with females appearing to be more stressed than males. The findings are consistent with the related literature. This means female agriculture teachers are experiencing higher levels of job-related stress. Perhaps, for some, this is because of the “spillover effect” of traditional roles married females may be assuming at home (e.g., having tasks inside the house) and mothers with family responsibilities (e.g., child rearing) that are over and above that of an agriculture teacher, creating a work overload situation. Sensitivity should be paid to the stress levels of all agriculture teachers, but specifically females when planning teaching-related events. Consideration should be given to making events more family friendly; for example, by reducing the number of weekend and night time activities. Furthermore, teacher conference planners should entertain the idea of providing child care services for teachers who might benefit by the service, thus allowing them to balance their role as parent and teacher.

It is of interest to note that, of the 12 variables considered as predictors of job stress according to the literature, only one was found to be significant. The hours spent at work per week was not found to be predictive of stress while some variables had such a low correlation with the dependent variable that they were not going to be significant (number of teachers in department, number of children, personality type, exercise, marital status, and sources of social support). The items not being predictive is counter to the literature in most cases. It is interesting to note that almost all of our teachers showed some level of social support which is a coping mechanism for stress (Cohen & Willis, 1985; Shumaker & Czajkowski, 1994; Travers & Cooper, 1996). Perhaps the items which are stressors for other teachers are not stressors for agriculture teachers. Perhaps agriculture teachers as a group are quite similar to one another and the sample of this study was not large enough to show variance among the factors.

The literature indicated that teachers are stressed. However, this study did not uncover all of the components contributing to that stress. There would be benefit from further studies seeking to account for the unknown predictors of job stress in agricultural education including a specific instrument might be better able to explain the stress caused by items such as classroom management, FFA advisement, and Supervised Agricultural Experiences.

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