

INVESTIGATING COMMUNITY FACTORS AS PREDICTORS OF RURAL 11TH- GRADE AGRICULTURAL SCIENCE STUDENTS' CHOICE OF CAREERS IN AGRICULTURE

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Abstract

This study investigates the links between community contexts/factors and rural 11th-grade agricultural science students' choice of careers in agriculture. A logistic regression model was developed and tested to examine the extent to which nine measures of community contexts (i.e., membership in FFA, membership in 4-H, community attachment, community satisfaction, length of residency in the community, positive perception of local community, preference for residing close to nature, and participation in volunteer activities) influence the odds of a student choosing a career in agriculture. The results show that the major community factors influencing the choice of agriculture related careers are membership in 4-H club, participation in FFA, preference for living close to natural environment, opportunity to achieve dream career in the rural community, and participation in volunteer activities within the community.

Introduction

What do I want to be when I grow up? What is the best career for me? These are questions every young person asks themselves and gets asked by others at some point in time, especially during the high school years. Although these questions may appear simple and ordinary, they are not always easy to answer in absolute terms. This is because many factors interact and come into play in answering the questions. The answers given by young people to the question, what next after high school are based on several previous experiences and also reflect the context of their daily lived experiences, especially within their families and communities (Lumby, Foskett, & Maringe, 2003).

Although the choice of future careers may be a challenge for young people in general, it is often a dilemma that is both complex and dynamic for rural youth in particular. This is because rural youth are always torn between two competing forces—the desire to remain in their rural or farming communities and maintain ties with

family, community, and tradition versus the temptation to leave their rural communities in pursuit of educational and occupational opportunities elsewhere (Hektner, 1995; Johnson, Elder, & Stern, 2005). However, because of the declining employment and few or no postsecondary educational opportunities in most rural communities, rural youth, despite their strong attachments to their communities, have had to *move out* or *get out* of their communities in order to *move up* or *get on* economically (Hektner, 1995; Jamieson, 2000).

The persistent problem of youth out-migration leaves rural communities with an increasingly declining agriculture labor force (Beale, 2000). Hence, it is often a challenge for rural agricultural science teachers and rural youth development personnel to ensure that their programs and curriculum stimulate in their students the desire to pursue agriculture related career options, especially in the area of farm production. Encouraging students to pursue careers in the field of agriculture and other related areas is therefore of vital importance in ensuring a replacement for the

aging farming population (Conroy, Scanlon, & Kelsey, 1998).

Although researchers are aware of the role of community contexts (e.g., sense of belonging in the community and the degree of satisfaction with the attributes of the local communities) in shaping the career choices of rural youth (Fernandez & Dillman, 1979; Glendinning, Nuttall, Hendry, Kleop, & Wood, 2003), there is a paucity of research in this area. In particular, the researchers of the present study are unaware of any previous study examining the effects of community factors on rural students' choice of agriculture related careers or any study examining the same relationship in rural high school students enrolled in agricultural science programs. As an attempt at filling the observed gap in literature, the current study examines the influences of community factors on rural agricultural science high school students' choice of agriculture related careers.

Theoretical Framework

Social capital theory (Coleman, 1988) has been used to explain the career aspirations of rural youth (Israel, Beaulieu, & Hartless, 2001). Within the community, social capital refers to the social interactions and social resources that support the achievement of individual goals. The presence of such social resources in rural places cannot be overemphasized. Rural places are characterized by unique social environments and social interactive processes that foster the formation and sustainability of effective social capital. For example, compared with urban communities, rural communities are more cohesive and closely knit and have stronger community ties and networks (Hofferth & Iceland, 1998). Also, rural people are more attached to place, have a greater sense of collectivity, are less mobile, are more likely to reject a job offer because it is located elsewhere, and are more likely to report that they would be sad to leave their community (Kasarda & Janowitz, 1974; Hofferth & Iceland; Howley, 2006).

In general, social capital theory posits that the aspirations and career choices of young people are greatly influenced by the

“set of supportive interpersonal interactions that exist in the community” (Israel et al., 2001, p. 44). That is, rural youth's career choices are influenced by the social resources derived from their interactions with other members of the community. Such interactions include attendance and participation in community and volunteer activities as well as participation in youth associations. For example, rural youth are more likely to participate in 4-H and FFA than their urban counterparts (Blackwell & McLaughlin, 1999; Israel et al. 2001); and, rural youth from farming backgrounds are more likely to be members of FFA than those from nonfarming backgrounds (Esterman & Hedlund, 1995). By participating in these groups, rural youth are able to interact with educated adults and role models that can stimulate in them a desire to aspire to high income jobs as opposed to the low income jobs available in their rural communities. These youth groups are also avenues for rural adolescents to become familiar with the diverse arrays of agricultural careers of which they may not be aware.

The theory of community attachment also provides insight into the effect of community factors such as community attachment and community satisfaction on the career choices of rural youth (Howley, 2006). Community attachment refers to an individual's sense of belonging, connectedness, rootedness or bonding to the community in which they reside (Goudy, 1990; Theodori, 2004), whereas community satisfaction is defined as the level of contentment or desirability that residents have for the economic and social attributes of their communities (Brown, 1993). Research suggests that both community attachment and satisfaction exert strong effects on the career aspirations of rural youth (Fernandez & Dillman, 1979; Glendinning et al., 2003). Rural and farm youth with strong levels of attachment to their families and rural communities may be more willing to choose agriculture careers or inherit a farm business in order to remain close to their family and community than those with lower levels of attachment (Hektner, 1995). That is, strong social ties may constrain some rural youth from

aspiring to nonagricultural careers that are most times located outside their rural communities.

Similarly, rural youth that are highly satisfied with their communities may be willing to remain in the community and more likely to choose careers within the field of agriculture. On the other hand, rural youth who are dissatisfied with the social and economic attributes of their community will be more willing to choose nonagriculture careers as a way of escaping their communities. According to Johnson et al. (2005), rural youths' perception of the local job opportunities affect their career choices and intention to remain or leave their local communities. For example, students who view the local job opportunities (e.g., farming) as appropriate may be more likely to choose careers in agriculture. Further, Johnson et al. posited that rural youths' residential preferences also influence their career choices. For example, rural students who prefer to live close to their parents and those who prefer to live close to nature or natural environments are more likely to choose careers that can be achieved in their rural communities.

Purpose

Using the literature reviewed as a backdrop, the present study examines the influences of community contexts and factors on rural 11th-grade agricultural science students' choice of agriculture related careers. The specific purpose is to determine the extent to which nine community variables (i.e., membership in FFA, membership in 4-H, community attachment, community satisfaction, length of residency in the community, positive perception of local community, preference for residing close to nature, and participation in volunteer activities) influence the odds of a student choosing an agriculture related career.

Methods

Data Description

The targeted population included all 11th-grade high school students enrolled in agricultural science programs in rural

Indiana. Of the 62 schools eligible to participate in the study, only 13 schools gave absolute permission for the study. Absolute permission implies that the principal of the school gave a written permission and the agricultural science teacher was willing to administer and collect the surveys from the students. The data for this study comes from a total of 118 useable surveys collected from 11th-grade students enrolled in agricultural science programs in the 13 participating schools. With regard to the demographic characteristics of the students, 59% were boys, and 41% were girls. About 98% of the participants identified themselves as Caucasians, whereas the remaining 2% were Latina/o. The mean age of the sample is 16.66 years ($SD = 0.54$).

Rurality is defined in this study using the Office of Management and Budget (OMB) classification of counties as metropolitan or nonmetropolitan. The OMB classification, which is based on population sizes and integration with large cities, defines a rural/nonmetropolitan county as a census bureau having no more than 50,000 inhabitants (Ricketts, Johnson-Webb & Taylor, 1998).

Survey Instrument

This study is based on students' responses to questions from three sections of a multisection survey instrument. Prior to use, the instrument was reviewed by a panel of experts in sociology, rural sociology, curriculum and instruction, and agricultural/vocational education to assure content and face validity. The first section of the survey solicited demographic information such as age, race, and gender from the students.

The second part consisted of questions about the educational and career aspirations of the students. Information about the career aspirations of the students was solicited in two ways. First, the students were asked, "If you plan to attend college, which of the following best describes what you would like to study?" Response categories included agriculture, education, arts and humanities, engineering and technology, veterinary medicine, pharmacy, human medicine, etc. Second, the students were asked to indicate

their dream jobs or careers. Specifically, the question was, "Which of the following best describes your dream job or career?" The question was adapted from a national survey of adolescents developed by Bearman, Jones, and Udry (1997). In addition to providing the categories, Bearman et al. included relevant examples of each category. Although response options were provided, some of the students in the present study who felt the provided options did not fully describe their choices indicated their specific career dreams using the "others" category. Such specific responses from students included manager, business owner, farm manager, equine management,

landscape, and horticulture. Table 1 provides information about the categories and corresponding examples. Students' responses to both questions were used to determine students' interests in agriculturally related careers. All the students that indicated interests in any agricultural field in either or both questions were categorized as choosers of agriculture related careers. The choice of agriculture related careers was the dependent variable for this study; students choosing agriculture related careers were termed "choosers" and coded as "1," whereas students preferring nonagriculture related careers were termed "non-choosers" and coded as "0."

Table 1
Response Categories Provided to Describe Students' Dream Careers

Response categories	Provided examples
Manager	Executive director
Professional 1	Doctor, lawyer, scientist, engineer, pilot
Professional 2	Teacher, librarian, nurse, professor
Military/security	Police officer, soldier, fire fighter
Technical	Computer scientist, radiologists
Office worker	Bookkeeper, office clerk, secretary
Sales worker	Insurance agent, store clerk
Personal service	Housekeeper
Construction worker	Carpenter, crane operator
Mechanic	Electrician, plumber, machinist
Factory worker or laborer	Assembler, janitor
Farm/fishery worker	No example was provided
Homemaker	Stay at home Mom/Dad
Others	No example was provided
Undecided	

The third section of the survey solicited information about community factors. First, the students were asked to indicate how long they have stayed in their present communities. Responses were recorded as a ranked variable (i.e., 1 = "less than 5 years," 2 = "5 to 10 years," 3 = "10 to 15 years," and 4 = "more than 15 years"). Second, the students were asked about their membership in the 4-H and FFA clubs (for both variables, 1 = "yes" and 2 = "no"). Third, the students were asked about their participation in volunteer activities within their communities (0 = "never," 1 = "once a year," 2 = "once in 6 months," 3 = "once every 2 months," 4 = "once a month," 5 = "once every 2 weeks," and 6 = "once a week").

Fourth, students' residential preference for living close to nature was assessed by a Likert-type question asking them to indicate on a scale of 1 to 4 how important living close to natural environment is to them. Fifth, the students were asked to indicate if they agreed or disagreed with the statement, "I can achieve my dream career in my community." Response options ranged from strongly disagree to strongly agree. Finally, this section also consisted of two summated rating scales; (1) a 14-item community attachment scale (Cronbach alpha, $\alpha = .90$) adapted from Theodori (2001, 2004), and (2) an 11-item community satisfaction scale ($\alpha = .85$) asking the students to state their degree of satisfaction with certain attributes of their communities (e.g., opportunity to earn high income, opportunity for vocational training, and local shopping facilities).

Data Analysis

Data were coded and analyzed using the Statistical Package for the Social Sciences (SPSS version 15.0). Descriptive statistics including frequencies, percentages, means and standard deviations were used to describe the variables examined. As stated previously, the purpose of this study was to examine the extent to which the community variables predicted whether or not a student would choose a career in agriculture. Hence, the following logistic regression model was developed and tested:

$$X_b = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9$$

where X_b = choice of agriculture related career, b_0 = constant, X_1 = membership in FFA, X_2 = membership in FFA, X_3 = positive perception of community as a place to achieve career dreams, X_4 = living close to nature, X_5 = participation in volunteer activities, X_6 = community attachment, X_7 = community satisfaction, X_8 = length of stay, and X_9 = perception of local job opportunities. The coefficient of each predictor is represented by the corresponding b .

Specifically, a forced or "entry" method of regression in which all predictor variables are entered in one block (i.e., at the same time) was used. The advantage of using the forced method is that the estimates are not affected by random variations in the data (Field, 2005). The method of logistic regression was judged suitable for the analysis for a number of reasons. First, logistic regression is the most appropriate in situations where the variable to be predicted (or dependent variable) is categorical in nature (Pallant, 2005). In the present scenario, the dependent variable is the choice of agriculture related career which is a dichotomous variable (i.e., "yes" or "no"). Second, in logistic regressions, neither the dependent variable nor the error terms are required to be normally distributed. Third, there is no assumption of a linear relationship between the dependent and the independent variables (Field; Garson, 2006). An alpha level of .05 was set for all analyses.

Results and Discussion

Descriptive Statistics

The categorical variables are described in terms of frequencies and percentages in Table 2. The ordinal and continuous variables are described in terms of the means, standard deviations, and minimum and maximum values as presented in Table 3.

Table 2
Descriptive Statistics for Categorical Variables (n = 118)

Variables	Yes n (%)	No n (%)
Agriculture careers (n = 118) ^a	33 (28.0)	82 (69.5)
Membership in 4-H (n = 115)	37 (32.2)	78 (67.8)
Membership in FFA (n = 115)	68 (59.1)	47 (30.9)

^aThree of the students (2.5%) are yet to decide their future careers.

Table 3
Descriptive Statistics for Ordinal and Continuous Variables (n = 118)

Variables	M	SD	Min.	Max.
I can achieve my dream career in my community	2.25	0.92	1.00	4.00
Living close to natural environment	2.89	0.86	1.00	4.00
Participation in volunteer activities	3.12	1.99	1.00	7.00
Community attachment	37.73	7.97	17.00	55.00
Community satisfaction	29.48	6.01	11.00	40.00
Perception of local job	2.01	0.48	1.00	3.00
Length of stay in the community	3.51	0.92	1.00	4.00

Model Assessment

In general, when logistic regression models are developed and tested, the models are assessed in terms of their overall performance or goodness of fit by conducting the omnibus tests of model coefficient and the Hosmer and Lemeshow test. For a logistic regression model to be considered as having adequate goodness of fit, the omnibus tests of model coefficient

must be significant at p -values less than .05 and the Hosmer and Lemeshow test must be nonsignificant at p -values greater than .05 (Pallant, 2005). As revealed in Table 4, the model tested in this study passed both tests. The p -value of the omnibus tests of model coefficient was less than .05, and the p -value of the Hosmer and Lemeshow test was by far greater than .05. Hence, it can be said that the model fits the data adequately well.

Table 4
Model Assessment

Goodness of fit test	χ^2	df	p
Omnibus tests of model coefficient	32.25	9	.000
Hosmer and Lemeshow test	6.89	8	.548

Predictive Ability of the Model

The predictive ability of a logistic regression model is measured by the Cox & Snell *R* square and the Nagelkerke *R* square values, which indicate the amount of variation in the dependent variable explained by the model (Pallant, 2005). With regard to the model tested in this study, the value of the Cox & Snell *R* square

was .256 while the value of the Nagelkerke *R* square was .365, suggesting that between 25.6% and 36.5% of the variability in the choice of careers in agriculture and related fields was explained by the set of variables included in the model. Table 5 provides information about the contribution or importance of each predictor variable included in the model.

Table 5
Predictive Ability of the Variables in the Model

Variables in the model	<i>b</i>	<i>SE</i>	Odds ratio
Membership in 4-H club	1.27*	0.57	3.57
Membership in FFA	1.40*	0.65	4.10
I can achieve my dream career in my local community	0.75*	0.36	2.12
Living close to natural environment is important to me	1.21**	0.37	3.35
Participation in volunteer activities in the community	-0.34*	0.16	0.71
Community attachment	0.01	0.05	1.01
Community satisfaction	-0.03	0.05	0.97
Perception of local job	0.69	0.64	2.00
Length of stay in the community	-0.35	0.34	0.70

Note. *b* = Regression coefficient; Odds ratios are calculated as exponential of *B* values, i.e., Exp (*B*).

* $p < .05$, ** $p < .01$.

The results show that five out of the nine predictor variables contribute significantly to the predictive ability of the model. That is, the major factors influencing the choice of agriculture related careers among the students are membership in 4-H club, participation in FFA, preference for living close to natural environment, opportunity to achieve dream career in the rural community and participation in volunteer activities within the community. Community attachment, satisfaction, perception of local job options, and length of stay in the community did not contribute significantly to the model.

Next, the predictive ability of each of the five significant factors in Table 5 is discussed in terms of the values of the odd ratios. First, the data showed membership in 4-H to be positively related to the odds of a

student choosing an agriculture related career. Students who are members of 4-H were about 3.6 times more likely to choose agriculturally related careers than non-members of the 4-H club. Second, there was a positive relationship between membership in FFA and the likelihood that a student would choose an agriculture related career. Members of the FFA club were about 4.1 times more likely to choose careers in agriculture than non-FFA members. The results suggest that participation in these youth associations motivate students to pursue agricultural careers; likewise, these clubs may indeed be avenues for rural adolescents to become familiar with the diverse arrays of agricultural and related careers that may be unknown to them.

Third, the results revealed that students with high levels of positive perception (or

belief) of their rural communities as a place where they can achieve their dream careers were more likely to choose careers in agriculture. As revealed by the odds ratio for this variable, a unit increase in students' perception of the community as a place to achieve their dream careers raised the odds of choosing agriculturally related careers by about 2.12 times. Fourth, there was a positive relationship between students' preference for living close to nature and their choice of careers in agriculture. The results showed that for every unit change in the preference for living close to natural environments, the likelihood that a student would choose a career in the field of agriculture increased by about 3.4 times. These results confirm the position of Johnson et al. (2005) that rural youth's perception of employment in their local communities and their residential preferences impact their career choices.

Fifth, the data showed a significant relationship between participation in volunteer activities within the community and the choice of careers in agriculture and related fields. However, it is intriguing that the direction of the relationship was negative, suggesting that students who participate in volunteer activities within the community were about 0.71 times less likely to choose careers in agriculture than their counterparts who do not participate in volunteer activities.

Conclusions

In conclusion, the results of this study support the reports of previous studies (e.g., Lumby et al., 2003; Johnson et al., 2005) that community contexts and factors influence rural adolescents' career choices. Specifically, the results of the logistic regression model revealed that the combination of the community variables employed as predictors in this study explained about 25.6% to 36.5% of the variability in the choice of agriculturally related careers among the students. Also, the results showed that membership in 4-H club, participation in FFA, preference for living close to natural environment, opportunity to achieve dream career in the rural community and participation in volunteer activities

within the community are significant predictors of students' choice of agriculture careers, whereas the effects of community attachment, satisfaction, perception of local job options and length of stay in the community did not contribute significantly to the model.

The following specific conclusions can be made based on the data analysis: First, membership in FFA and 4-H increase the likelihood that students would choose careers in agriculture. Second, students who view their rural communities as a place where their career dreams can come true are more likely to choose careers in agriculture. Third, students who have a high preference for living close to nature are more likely to opt for agriculture careers. Lastly, students who participate in volunteer activities within the community are less likely to choose careers in agriculture and related fields.

Recommendations and Implications

On the basis of the results of this study, a number of recommendations are made. First, rural communities that are faced with declining farm and agriculture labor may think of youth development incentives geared at increasing young peoples' participation and involvement in the 4-H and FFA clubs. It is very obvious that when students participate in these groups, they are motivated to choose careers in agriculture and therefore more likely to remain in their local communities. In the same vein, universities with colleges of agriculture need to keep looking to the 4-H and FFA clubs as avenues of recruiting freshmen students into their programs. This also calls for greater involvement in these clubs on the part of the universities in terms of research, engagement, program development and the evaluation of such programs. In fact, a formidable partnership between rural communities and colleges of agriculture is strongly recommended. Likewise, guidance counselors should be aware of the effects of these clubs on the career choices of young people and be prepared to use the information as a tool in counseling students.

Second, it is recommended that rural youth development workers need to come up with programs that may help students to see

their communities as places where their dreams can come true. This may include exposing students to the vast array of career choices available in the field of agriculture. It is very possible that some students do not see their communities as places to achieve their dreams because they think agriculture is all about farming and farm production.

Third, further studies are needed to understand why participation in volunteer activities within the community may reduce the odds of choosing agriculturally related courses. A possible explanation is that participation in volunteer activities may motivate students towards careers in the field of care giving. For example, participating in community programs targeted at feeding the poor or helping abused children might open the minds of students to existing needs in their communities; such experiences could lead students to pursue careers in nursing and social work as opposed to agriculture. However, this example is just a suggestion; hence, further study is needed to understand this phenomenon.

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