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Identifying a knowledge gap of blueberry health benefits: The role of education, income, generation and gender

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Identifying a knowledge gap of the health benefits of blueberries: The role of education, income, generation and gender

Lower socioeconomic groups may not learn as quickly or retain as much knowledge as higher socioeconomic groups because higher socioeconomic groups often have easier access to the relevant resources. With many health benefits associated with blueberry consumption, this study examined consumers' knowledge level of blueberry benefits, and investigated whether a knowledge gap existed among high and low socioeconomic groups and among different demographic groups. An online survey using non-probability sampling was distributed to grocery shoppers from 31 states in the United States. Post-stratification weighting of data was used to adjust the bias resulted from non-probability sampling. The respondents answered on average more than half of the questions correctly about blueberry benefits. A knowledge gap exists between those with some college education or a college degree and those with a high school degree or lower education. While respondents demonstrated acceptable knowledge of blueberry benefits, an opportunity exists to increase the awareness of the health benefits of blueberries, especially among those with lower levels of education. Future research should determine the relationship between knowledge gap and a broader range of factors such as motivation and social contacts.

Introduction

In the United States (U.S.), blueberry production proved to be a growing industry from 2013 to 2014. National blueberry production increased by 5% from the 2013 season, reaching 5.67 million pounds in 2014 (U.S. Department of Agriculture, 2014). It is estimated that total fresh and processed blueberries provide an economic value of \$824.9 million (National Agricultural Statistics Service, 2015). Blueberries are grown in several states including Alabama, Arkansas, California, Florida, Georgia, Indiana, Michigan, Mississippi, New Jersey, New York, North Carolina, Oregon, and Washington (U.S. Department of Agriculture, 2014). The variety of growing states allows for a vast availability of blueberries in the U.S. The market introduction of blueberries from other countries such as Chile, Canada, Mexico, and Argentina at varying times (Evans & Ballen, 2014), allows the national blueberry market to be stocked year-round.

The increase in U.S. blueberry production was met with an increase in the demand for blueberries in 2014. According to the U.S. Highbush Blueberry Council (2014a), the number of households that reported buying blueberries once in the past month doubled from 2008 to 2014. The increasing supply of blueberries in the U.S. is not only important to satiate consumers' high demand for blueberries, but also provide unique health benefits to consumers. The U.S. Highbush Blueberry Council cites several studies that discuss blueberry attributes that address a wide range of health issues (U.S. Highbush Blueberry Council, 2014b).

Blueberries have been attributed to having high antioxidant properties, which help to protect the heart and brain and may also act as anti-cancer agents (Bornsek et al., 2012). The Centers for Disease Control and Prevention cites heart disease and cancer as being the two leading causes of death by a large margin over any other causes of death (Centers for Disease Control and Prevention, 2015). The decline in functional mobility of older adults may be counteracted when blueberries are consumed daily (Schrager, Hilton, Gould, & Kelly, 2015). Functional mobility

improvements include assessments of grip strength, reaction time, and the number of errors in steps while walking. Studies citing that blueberries may be a contributing factor to reducing risk for these causes of death are promising for both producers and sellers of berries, but also for people who may be at increased risk for these diseases. The antioxidants in blueberries may also protect eyes from aging caused by light-induced damage (Liu et al., 2012). Brain function has also been shown to improve with adding blueberries to diets. In a study of children between the ages of seven and nine, those who were given blueberries in the form of a milkshake “produced significantly better performance in delayed word recognition sustained over each test period” than those children who did not receive the blueberry drink (Whyte & Williams, 2012, p. 637). Additionally, supplementing blueberries into the diets of adults with an increased risk for dementia has significantly improved memory function (Krikorian et al. 2010). The U.S. Department of Agriculture has also referenced these nutritional benefits of blueberries on its websites and educational materials (e.g. USDA SNAP-Ed Connection, 2017, USDA National Institute of Food and Agriculture, 2016; Yan, 2014).

While a direct link between the knowledge of the health benefits of blueberries and increased consumption has not been proven, previous literature has linked health-related knowledge with behavior changes such as decreased smoking, less alcohol consumption, and increased exercise (Kenkel, 1991). Even though a gap exists between knowledge learned and related behavior, transmitting knowledge is the first step to make related behavior change (Sligo, & Jameson, 2000).

Although all people may benefit from learning about the health benefits of blueberries, certain socioeconomic groups may not receive information related to the health benefits of blueberries as quickly as other groups (Tchicaya, Lorentz, Demarest, & Beissel, 2018; Tichenor, Donohue, & Olien, 1970). This paper sought to discover consumer knowledge related to the health benefits of blueberries and if this knowledge varies by demographic groups. In the event that more people are made aware of the health benefits of blueberries, demand may continue to rise as it did from 2008 to 2014 (U.S. Highbush Blueberry Council, 2014a). This increase in awareness will only come from increased communication with the lesser-reached groups. With the information gained from this research comes the opportunity to strategically communicate with the audiences that have yet to be reached with the information that is already available. If knowledge does vary between groups of people, the existing messages can be tailored to reach these groups while new, targeted information can be developed to penetrate these groups further.

Theoretical Framework

The originally proposed knowledge gap hypothesis states that as information flows into a social system, people with higher socioeconomic status would acquire the information at a faster rate and retain more knowledge than people with lower socioeconomic status (SES) (Tichenor et al., 1970). Viswanath, Kahn, Finnegan, Hertog, and Potter (1993) concluded from a number of studies that the acquisition of information among social groups was persistently unequal. Despite the concerns of the original hypothesis that mass media would widen the knowledge gap, some scholars (e.g. Ettema & Kline, 1997) suggested that such a gap may begin to narrow as more functional information flows into the social system, motivating individuals to seek information.

SES is usually measured by individuals' education, income, occupation, or a composite of these indicators (Fretz, Schneider, McEvoy, Hoogeveen, Ballantyne, Coresh, & Selvin, 2016; Winkleby, Jatulis, Frank, & Fortmann, 1992). Five specific factors have been identified to be responsible for the knowledge gap: communication skills, prior knowledge, relevant social contacts, selective use, acceptance and storage of information, and structure of the media system (Bonfadelli, 2002). Research has identified that education level is one of the components leading to differing levels among these knowledge gap factors (Kiviniemi, Orom, Waters, McKillip, & Hay, 2018; Lovrich & Pierce, 1984; Turrell & Kavanagh, 2006). Higher SES individuals have better communication management skills, and are able to better use and interpret media messages than those with lower SES; higher SES individuals also have broader social and/or local contacts that provide additional interpersonal information sources and they tend to actively seek information more frequently. Additionally, the media system provides rich information that can be more sufficiently used by higher SES individuals than lower SES individuals (Gaziano, 2017; Lovrich & Pierce, 1984).

SES indicators were found to be significantly related to individuals' knowledge of food and nutrition (e.g., Campbell, Abbott G, Spence, Crawford, McNaughton, & Ball, 2013; Giskes, Avendaño, Brug, & Kunst, 2010; De Irala-Estevez, Groth, Johansson, Oltersdorf, Prattala, & Martínez-González, 2000; Giskes, Turrell, Patterson, & Newman, 2002). Individuals with lower levels of income and education were found to have lower levels of nutrition knowledge and make food choices less consistent with dietary guideline recommendations compared with their more affluent or educated counterparts (Campbell et al., 2013; De Irala-Estevez et al., 2000; De Vriendt, Matthys, Verbeke, Pynaert, & De Henauw, 2009; Giskes et al., 2002; Giskes et al., 2010; Hendrie, Coveney, & Cox, 2008; Turrell & Kavanagh, 2006). Higher SES groups were found to adhere more to plant-based and alcohol/salad food patterns, while lower SES groups were tied more to sweets/fats and southern food patterns (Kell, Judd, Pearson, Shikany, & Fernández, 2015). Some research studies have argued that the knowledge gap was not solely attributable to education (e.g., Ettema & Kline, 1977; Chew & Palmer, 1994). Individuals' motivation has also significantly influenced people's knowledge acquisition capability (Ettema & Kline, 1977; Mead, Cohen, Kennedy, Gallo, & Latkin, 2015), thus directly impacting their knowledge level. Similarly, Chew and Palmer (1994) found that the gap of knowledge regarding nutrition between people with higher interest and lower interest remained constant and significant. Interest predicts knowledge gain resulting from information exposure more strongly than education (Chew & Palmer, 1994; Rotgans & Schmidt, 2017).

Kwak (1999) proposed that education and motivation were not necessarily independent from one another and developed a contingency model of knowledge gap phenomena. In an examination of an individual's involvement in a political campaign and its influence on his or her knowledge, Kwak (1999) found that respondents' television viewing of the campaigns significantly reduced the knowledge gap between higher and lower educated respondents. Viswanath et al. (1993) examined the level of motivation and education in acquiring cancer and diet information in a community that received a health campaign for one year. The research found a significant knowledge gap among different education level groups. Furthermore, despite other studies that showed motivation could overcome a knowledge gap resulting from education levels,

this study found that an education-based knowledge gap consistently existed within more-motivated groups.

Demographic characteristics were also found to be relevant to knowledge level regarding nutrition and diet (e.g., Hendrie et al., 2008; De Vriendt et al., 2009). Hendrie et al., (2008) used multiple regression analysis and determined that gender, age, education level, and employment status were significant predictors of nutrition knowledge level. Similarly, De Vriendt et al. (2009) used a linear regression model and found significant association of women's knowledge of nutrition with education level, age, occupation type, smoking behavior, and work status.

Infusion of mass media information in a social system is able to widen the knowledge gap, as well as close it, between people with different education levels (Ettema, Brown, & Luepker, 1983). Previous research found television to be an effective medium to gain knowledge for those with less background knowledge and weaker cognitive skills (Neuman, Just, & Crigler, 1992; Prior, 2005), and therefore narrow the knowledge gap between the less informed and well informed (Grabe et al., 2009; Holbrook, 2002; Liu & Eveland, 2005). Ho (2012) found attention to newspapers and television news about H1N1 influenza positively influenced public knowledge about the flu pandemic. Individuals who paid a high amount of attention to television news about H1N1 tended to possess greater H1N1-related knowledge than those who paid a low amount of attention.

Internet engagement has been found to be positively related to education level (Lee, 2009; Shim, 2008). Shim (2008) indicated that those with high education levels would gain more health knowledge than those with low education when their frequency of using Internet is the same, thus suggesting the Internet could widen the knowledge gap between people with high and low education levels. However, Cacciatore, Scheufele, and Corley (2014) argued that the Internet could also close the knowledge gap. Cacciatore et al., (2014) found that the number of days a week that respondents spent online was significantly related to knowledge levels about nanotechnology. Since online sources had the capability to tailor information to specific audiences, which traditional media was incapable of, Cacciatore et al. (2014) concluded that the Internet had such a distinct effect among low-educated groups that it "appears capable of eliminating the education-based gaps entirely" (p. 12). Kim (2008) suggested that people may find an issue interesting or important from traditional media such as reading a newspaper or watching television, and then go to the Internet for further information.

Today, more consumers use new media to receive and seek information than ever before. About two-thirds of the Americans own a smartphone, and many of these smartphones are the owners' key access to the online world (Smith, 2015). Most smartphone owners have also used their phones to look up health-related information (Smith, 2015). Blueberry-related content has also been increasing on the Internet (Attaway, Clark, & Hummel, 2012) and consumers have demonstrated their interest in receiving such information from a variety of sources through their social networks (Attaway, Clark, & Hummel, 2012). Attaway et al. (2012) suggested the Cooperative Extension Service should utilize social networks to build connections with their consumers. Additionally, previous research (e.g. Griffiths, Calear, Banfield & Tam, 2009; Meier,

Lyons, Frydman, Forlenza, & Rimer, 2007) has suggested that online interpersonal support groups and social media groups have created opportunities for seeking and offering health information.

Purpose and Objectives

The purpose of this research was to examine knowledge of the health benefits of blueberries between grocery consumers with different socio-economic, age, and gender characteristics to determine if a knowledge gap exists to strategically communicate with the audiences that have yet to be reached with the information that is already available. The specific objectives of this research were:

1. Describe consumers' knowledge of the health benefits of blueberries.
2. Determine if a knowledge gap regarding health benefits of blueberries exists between respondents with different education and income levels.
3. Determine if a knowledge gap regarding health benefits of blueberries exists between respondents within different age and gender groups.

Methods

An online survey was used to collect data from adults in states that received shipments of Florida-grown blueberries in the year preceding data collection. The population was limited to adults in these 31 states because this study was part of a larger project related to improving the marketing of Florida blueberries. The respondents were recruited by an external online survey company, Qualtrics, using non-probability sampling. Non-probability sampling has become an acceptable alternative to probability sampling and has been used to gather data from consumer populations in social science research because of coverage and non-response challenges encountered with probability sampling (Baker et al. 2013). Non-probability samples, including the one used in this study, are often gathered online by identifying and recruiting panels of individuals who are willing to complete surveys (Baker et al. 2013). However, selection, exclusion, and non-participation biases are a limitation to using non-probability sampling. For example, participants of the study must have access to an Internet accessible computer, tablet, or smartphone, which is a limitation because it excluded people without such access. To address these limitations, post-stratification weighting of the data was completed before data analysis (Baker et al., 2013; Kalton & Flores-Cervantes, 2003). The data were weighted according to the 2010 United States' Census population estimates for the following regions: South Atlantic (FL, GA, SC, NC, VA, WV, MD, DE), Mid Atlantic (PA, NY, NJ, CT), New England (NH, VT, ME, MA, RI), East South Central (AL, MS, TN, KY), East North Central (OH, IN, IL, MI, WI), West South Central (AR, LA), West North Central (MN, IA, MO). The states included in the West South Central and West North Central regions were adapted to include only the states where Florida-grown blueberries were shipped and respondents resided. A total of 3,100 respondents started the survey. However, only 2,100 respondents provided complete and usable responses, resulting in a participation rate of 67.7%. One attention filter was included in the survey to help ensure that respondents were reading the questions and not just clicking responses. The attention filter asked respondents to "select strongly disagree." Respondents who selected an option other than "strongly disagree" were terminated from the survey.

Questions regarding respondents' knowledge of the health benefits of blueberries and demographics were of interest for this study. Respondents were tested on their knowledge of the health benefits of blueberries through a series of seven statements that were presented to each respondent in the same order. Respondents were asked to indicate whether the statements were true or false. Five of the statements were true (e.g. Blueberries can improve memory, Blueberries help reduce the effects of aging) and two of the statements were false (e.g. Blueberries help achy joints, Blueberries limit hearing loss). If respondents answered a question correctly, they received a score of one for that item. If they answered a question incorrectly, they received a score of zero for that item. Therefore, each respondent could receive a total knowledge score ranging from zero (answered all knowledge questions incorrectly) to seven (answered all knowledge questions correctly).

Respondents were asked to answer demographic questions regarding their education, income, age, and gender. Respondents could select their education level from the options of less than 12th grade (did not graduate high school), high school graduate (includes GED), some college (no degree), 2-year college degree, 4-year college degree, and graduate or professional degree. For data analysis, education data were recoded into three groups: high school graduate or less, some college (no degree), and college degree. Respondents could select their annual household income from the options of less than \$30,000 to more than \$100,000, at \$10,000 increments between \$30,000 and \$100,000. For data analysis, income data were recoded into three groups: \$30,000 or less, \$30,000 - \$59,999, and \$60,000 – More. Respondents reported their age by indicating their year of birth. For data analysis, respondents were grouped into age groups by generation. Those born before 1946 were grouped into the *Greatest Generation*, also known as the *Silent Generation*. Those born between 1946 and 1964 were classified as *Baby Boomers*. The *Generation X* group included those born between 1965 and 1981. Those born between 1982 and 2004 were classified as *Millennials* (Bump, 2014). Due to a small percentage of respondents representing the *Greatest Generation*, the *Greatest Generation* was grouped with the *Baby Boomers* for analysis to increase power of the statistical test. The larger survey included additional questions such as importance and satisfaction of several blueberry traits, seasonality knowledge, and questions regarding perceptions of Florida blueberries.

Prior to data collection, the survey instrument was validated by a panel of experts including a professor, and two assistant professors specializing in social sciences in agriculture as well as a professional working in the fruit and vegetable industry. Following data collection and weighting, data were analyzed for descriptive statistics. Additionally, a one-way ANOVA was used to analyze data for objectives two and three. A one-way ANOVA is a statistical test that compares the mean of two or more groups (Field, 2013). The statistical significance was set at 95% confidence.

Results

Of the 2,100 respondents, most were female (74.6%), and 25.4% were male (Table 1). Most of the respondents were Baby Boomers (36.9%), followed by Generation X (32.9%), Millennials (25.4%), and Greatest Generation (4.8%). Just under half of respondents (44.3%) had a college degree, while 27.9% had a high school education or less, and 27.8% had some college

education. The highest percentage of respondents (37.5%) had an annual household income between \$30,000 and \$59,999.

Table 1

Demographic Characteristics of the Respondents

Demographic Categories	<i>f</i>	%
Gender		
Female	1567	74.6
Male	533	25.4
Generations		
Millennials	533	25.4
Generation X	691	32.9
Baby Boomers	775	36.9
Greatest Generation	101	4.8
Education		
High School graduate or less	586	27.9
Some college (no degree)	583	27.8
College degree	930	44.3
Annual Income		
Less than \$30,000	717	34.1
\$30,000 - \$59,999	788	37.5
\$60,000 – More than \$100,000	595	28.3

Objective 1: Describe Consumers’ Knowledge of the Health Benefits of Blueberries.

Seven specific statements about the health benefits of blueberries were presented to the respondents in the survey. Five out of the seven statements were true, and two of the statements were false. Respondents were asked to determine whether each statement was true or false. The number of correct responses among all seven statements varied greatly. Over 80% of respondents correctly identified that the statements “Blueberries help ward off heart disease” and “Blueberries lower risks to cancer” were true. Less than half of the respondents correctly identified that the statement “Blueberries help with achy joints” was false (Table 2). The mean overall knowledge score for the respondents was 4.55 (*SD* = 1.22), which indicates respondents correctly answered 64.9% of the questions.

Table 2

Knowledge Statements about the Health Benefits of Blueberries

Knowledge Statements	True or False	correct <i>n</i>	correct %
Blueberries help ward off heart disease	T	1748	83.2
Blueberries lower risks to cancer	T	1713	81.6
Blueberries decrease hearing loss	F	1382	65.8

Blueberries help revert aging	T	1366	65.0
Blueberries can improve memory	T	1335	63.6
Blueberries strengthen eyesight	T	1087	51.7
Blueberries help with achy joints	F	916	43.6

Objective 2: Determine if a Knowledge Gap Regarding Blueberries Exists Between Respondents with Different Education and Income Levels.

The analysis of knowledge among education groups revealed that some college ($M = 4.60$, $SD = 1.26$) and college graduate ($M = 4.60$, $SD = 1.18$) groups had higher knowledge of the health benefits of blueberries than the high school graduate or less group ($M = 4.42$, $SD = 1.24$) (Table 3). The assumption of equal variances was found violated thus the mean knowledge scores for education level were compared using Welch ANOVA instead of one-way ANOVA. The Welch ANOVA showed a significant difference between education groups ($F(2, 2096) = 4.06$, $p = .018$). However, the effect size for knowledge level ($\omega^2 = .003$) was small according to Cohen's guidelines (1988) (Table 3). Therefore, only .3% of variance in knowledge level was due to education. A follow-up test, using planned contrasts, revealed that there were significant differences between the high school graduate or less group and the college graduate group ($t = -2.62$, $p = .009$) as well as between the high school graduate or less group and the some college (no degree) group ($t = -2.38$, $p = .017$) (Table 4). There was not a significant difference between the some college (no degree) and college graduate groups (Table 4).

Table 3

Welch ANOVA Test of Respondents' Knowledge Level among Different Education levels

Education level	<i>n</i>	<i>M</i>	<i>SD</i>	ω^2	<i>F</i>	<i>p</i>
High school or less	586	4.42	1.24	0.003	4.06	.02*
Some college	583	4.60	1.26			
College graduate	930	4.59	1.18			

Note. * $p < .05$

Table 4

Planned Contrasts of the Differences of Knowledge Level among Different Education Levels

(I) Group	(J) Group	ΔM (I-J)	<i>t</i>	<i>SE</i>	<i>p</i>
High school or less	Some college	-.17	-2.38	.07	.017*
	College graduate	-.17	-2.62	.06	.009**
Some college (no degree)	High school or less	.17	2.38	.07	.017*
	College graduate	.01	.081	.06	.94
College graduate	High school or less	.17	2.62	.06	.009**
	Some college	-.01	-.081	.06	.94

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

The analysis of knowledge among income groups revealed the following mean knowledge scores shown in the Table 5. The mean knowledge scores for income level were compared using a one-way ANOVA. The result did not show a significant difference between income groups ($F(2, 2096) = 1.94, p = .14$) (Table 5).

Table 5

One Way ANOVA Test of Respondents' Knowledge Level among Different Income levels

Education level	<i>n</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>p</i>
Less than \$30,000	717	4.48	1.26	1.94	.14
\$30,000 to \$59,999	788	4.60	1.19		
More than \$60,000	595	4.55	1.21		

Objective 3: Determine if a Knowledge Gap Regarding Blueberries Exists Between Respondents within Different Generations and Gender Groups.

The mean knowledge score for females was 4.58 ($SD = 1.22$), which was slightly higher than the mean score for males ($M = 4.46, SD = 1.20$). The one-way ANOVA did not show a significant difference in the mean knowledge score between gender groups ($F(1, 2097) = 3.60, p = .06$) (Table 6).

Table 6

One Way ANOVA Test of Respondents' Knowledge Level among Different Gender Groups

Gender	<i>n</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>p</i>
Male	533	4.46	1.20	3.60	.06
Female	1567	4.58	1.22		

The mean knowledge score of the *Millennial* generation was 4.56 ($SD = 1.20$). For *Generation X*, the mean was 4.56 ($SD = 1.20$). For the combined group of *Baby Boomers and Greatest Generation*, the mean was 4.53 ($SD = 1.24$). A one-way ANOVA test did not show a significant difference in the mean knowledge scores between generations ($F(2, 2096) = .186, p = .83$) (Table 7).

Table 7

One Way ANOVA Test of Respondents' Knowledge Level among Different Generation Groups

Generation	<i>n</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>p</i>
<i>Millennial</i>	533	4.56	1.20	.186	.83
<i>Generation X</i>	691	4.56	1.20		

Conclusion

Overall, consumers were able to correctly answer more than half of the blueberry benefit knowledge questions, indicating an acceptable level of knowledge about these benefits. However, there is still room for improvement considering the gaps that were found among different aspects of knowledge. Specifically, the majority of respondents answered questions relating to cancer and heart disease correctly, but were not as accurate in their knowledge concerning eyesight and joints. The high percentage of respondents correctly identifying blueberries as deterrents for cancer and heart disease may be related to the high awareness of these two diseases. The Centers for Disease Control and Prevention's (2015) findings that these are the two leading causes of death in America may have led to more personal research related to preventing the diseases, leading to the respondents being exposed to these findings more than other benefits. Personal motivation and interest may be the key to the cancer and heart disease related questions receiving the highest mean knowledge scores for all respondents (Ettema & Kline, 1977).

Research concerning the anti-aging properties of blueberries (Schrager et al., 2015; Liu et al., 2012) suggests that these anti-aging properties span a spectrum of aging characteristics from protecting eyes from damage over time (Liu et al., 2012) to increasing the mobility of the elderly (Schrager et al., 2015). Just more than half of respondents correctly identified that blueberries could reduce the effects of aging, despite the research suggesting several aging benefits. Additionally, the benefit of improving memory was found to apply to both children (Whyte & Williams, 2012, p. 637) and adults (Krikorian et al. 2010). Improvement in memory was one of the three lowest the health benefits of blueberries to be correctly identified. This suggests there is still work to be done to disseminate this information to all age groups about the memory and aging benefits. This lower level of knowledge may be related to personal interest and being more concerned about leading causes of death than aging or memory loss. Achy joints were the least correctly identified, meaning that respondents incorrectly believed that blueberries help with achy joints.

In terms of education and income affecting the knowledge level of blueberry benefits, education was found to have a significant effect on knowledge, while income did not. Those with some college or more education were found to have higher levels of knowledge than those with high school or less education, even though only small amount of differences were due to education. Education's effect is consistent with previous literature, while income not having an effect is inconsistent with other findings (Tichenor et al., 1970; Viswanath et al., 1993; Winkleby et al., 1992). These research findings have been consistent in that the more educated groups, and presumably higher SES group, receive and retain more information about the benefits of blueberries. Though lower SES individuals do not receive information as quickly or retain as much of the information, those with lower levels of education did have some knowledge of the health benefits of blueberries.

Following research by Lovrich and Pierce (1984), individuals in higher SES groups may be at an advantage because of their higher levels of education leading to their ability to interpret

messages they receive about blueberry benefits better than those with lower education levels. They may also have better contacts with professionals or like-minded individuals that seek out the information about nutrition benefits, leading to their higher knowledge level (Lovrich & Pierce, 1984). This could include better access to healthcare or health education programs. Education's effect on overall nutritional knowledge is researched widely (De Irala-Estevez et al., 2000; De Vriendt et al., 2009; Giskes et al., 2002, Giskes et al., 2010; Hendrie et al., 2008; Turrell & Kavanagh, 2006). Education has a significant effect on the level of nutritional knowledge, including knowledge of blueberry benefits. However, it has been shown that education alone cannot explain differences in knowledge (Ettema & Kline, 1977). The respondents' individual motivation and interest may also be impacting their knowledge of the health benefits of blueberries. Those with family histories of diseases such as heart disease or cancer may have a greater incentive to protect themselves and may be more likely to seek out information about prevention. While motivation and interest were not measured in this study, they may be helpful indicators of how to close the knowledge gap of blueberry benefits, as interest has been found to predict knowledge better than education (Chew & Palmer, 1994) and motivation is correlated with education (Kwak, 1999) in identifying knowledge gaps.

Both gender and age were not found to be significant in accounting for differences in the knowledge about blueberry benefits, which is inconsistent with the literature (Hendrie et al., 2008, Vriendt et al., 2009). Though this study did not predict individuals' knowledge with a regression analysis based on education, age, and gender (among other factors), these factors were found in previous studies to be indicative of different knowledge levels. Had age been treated as a continuous variable and been used in a regression model to predict mean scores, it may have been a significant predictor of knowledge. However, the researchers of this study chose to utilize generational groups in order to have a more defined target audience if significant differences were found. The average overall knowledge score of 4.55 out of seven, is promising for both the blueberry industry and the health of consumers, but there is still work to be done to spread the benefits to people of all SES classes.

Recommendations

Consumers presented a higher level of familiarity with the blueberry benefits concerning cancer and heart disease than other benefits such as reducing the effects of aging, improving memory, and strengthening eyesight. Therefore, agricultural extension faculty, health communicators, and practitioners should emphasize the lesser-known health benefits when promoting blueberries. This will help the public to gain a more comprehensive understanding of the health benefits of blueberries and increase the possibility that they will consume more blueberries to capture these benefits. Increased communication about the health benefits may also welcome new blueberry consumers who had not previously known about the health benefits of blueberries or encourage existing blueberry consumers to purchase more.

The ultimate purpose of increasing the knowledge level and closing the knowledge gap of the health benefits of blueberries is to encourage more people from all social groups to consume more blueberries. Effective blueberry promotion and communication strategies should be used to enhance the public's knowledge about the health benefits of blueberries. Blueberry organizations

throughout blueberry growing states and the nation should provide effective marketing tools to help farmers and marketers with promotion of their blueberries, as well as communication of the health benefits of blueberries. Extension faculty and blueberry producers should create opportunities such as blueberry tastings or blueberry u-picks during blueberry season to disseminate information about the health benefits of blueberries, especially among people with high school education or lower.

Literature has shown that television campaign viewing has the potential to close gaps between high and low education level groups (Ettema et al., 1983; Ho, 2012; Kwak, 1999). Additionally, Cacciatore et al. (2014) stated that the Internet has allowed its users to tailor information to different audiences and its ability of closing knowledge gaps. To close the knowledge gap regarding the health benefits of blueberries, agricultural and health communicators and related organizations should consider using the Internet or televised Public Service Announcements to increase the public's knowledge level of the health benefits of blueberries, while hopefully narrowing the knowledge gap. However, before investing in a communication channel, extension faculty and health communicators should ensure that their target audience, perhaps a low education audience, can be reached through that communication channel.

This research investigated the influence of socio-demographic characteristics on overall knowledge of the health benefits of blueberries. Further analysis of potential knowledge gaps of individual health benefits of blueberries should be explored. Researchers should consider additional knowledge questions or alternative measures of knowledge, such as open-ended responses graded by a rubric, to determine the breadth and consistency of the knowledge gap observed related to the health benefits of blueberries. Future research should also analyze other aspects that have been formerly suggested to attribute to the knowledge gap, including level of motivation, prior knowledge, use of information, relevant social contacts, communication skills, and structure of the media system (Bonfadelli, 2002). In terms of the influence of motivation on knowledge level, it is worthwhile to explore what activities, life experiences or family backgrounds influence people's motivation to acquire health information such as the health benefits of blueberries. These findings could inform communicators in creating effective activities and messages to boost their audience's motivation to seek out blueberry-related information. In addition, this information would help communicators to use storytelling as a strategy to engage target audiences by tying communication to relevant life experiences and family backgrounds.

To develop effective communication strategies to promote blueberries, future research should examine how consumers currently seek and receive blueberry-related content. The use of new media (including smartphone, social media, and interpersonal online social network) for nutritional information should also be analyzed as new media has become an important outlet for health-related information (Smith, 2015). Researchers should further investigate individual's information processing patterns regarding health-related information. For example, research could test how different message appeals (e.g. rational appeal, emotional appeal, and social appeal) impact populations with different education levels in the acceptance and storage of blueberry health benefit knowledge.

Research studies regarding health education have shown positive, encouraging, inspiring messaging are more persuasive and would be more likely to make long lasting impact to health behavior change (McKinnon, 2007; Ybarra, Holtrop, Prescott, & Strong, 2014). Researchers should create positive messages about the blueberry benefits and test the message effectiveness. Effective messages could be used for cancer and heart health campaign in addition to blueberry promotion and marketing.

In terms of social contacts and communication skills, researchers could utilize focus groups with only high blueberry knowledge participants and only low blueberry knowledge participants to discuss how social contacts and communication skills influence individuals' knowledge acquisition about blueberries. Themes from different knowledge level groups could be compared to inform strategies to enhance blueberry knowledge acquisition through social events or communication trainings. Further research is needed to identify what media channels consumers frequently use to seek nutrition-related information among audiences with different education levels. The findings will assist agricultural and health communicators in identifying the most appropriate channel to target their audiences.

This study focused solely on the health benefits of blueberries. The methods and model used in this study could be applied to the study of vegetables, grains, or other fruits. Researchers should expand the research scope and examine whether knowledge gap of health benefits exist for other foods. Such studies could help educators and communicators to develop materials to advance the health and nutrition education of their target audiences.

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A Reason to Reason: Motivations Influencing Youth Participation in 4-H State Horse Judging

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A Reason to Reason: Motivations Influencing Youth Participation in 4-H State Horse Judging

Assessing the motivational factors driving youth to become engaged and devoted to a state 4-H horse judging program will assist in allowing extension professionals to better facilitate programs geared towards promoting higher levels of achievement, life and career readiness, and professional success. Using the Self-Determination Theory (SDT) as the theoretical framework, this study used a questionnaire administered to a purposive sample of the 2016 Colorado, Florida, and Texas state 4-H horse judging contestants facilitated by Colorado State University, the University of Florida, and Texas A&M University (n = 71). Intrinsic motivation was found to be the highest motivator followed by extrinsic motivation and perceived confidence. The top four intrinsic items that most strongly influenced respondents were wanting to learn something new, liking horses, being interested in learning about horses, and desiring to gain more confidence speaking in public. The top three extrinsic items were taking time to study with their team, doing well for their team, and it helping them become more competitive for scholarships in general. Respondents were most confident about choosing the most suitable horse for a specific discipline or purpose, answering general questions about horses, and choosing the best quality horse based on the form and function of the animal. Incorporation of these motivational factors into horse judging program coaching techniques could result in greater engagement and devotion of senior 4-H horse judging participants. Likewise, utilizing these specific motivation factors as foundational elements in horse judging program development can allow extension professionals to reach a larger youth audience, enabling them to promote positive lifestyle development and career preparedness through horse judging programs.

Introduction

Youth programs associated with agriculture have been used by extension professionals to engage and educate youth through agricultural events for decades (Lancaster, Knobloch, Jones, & Brady, 2013). Horse judging is an example of one of these events, and is recognized at the collegiate level for potential scholarship opportunities (Equestions Horse Judging Answers, 2015). Individuals participating in 4-H horse judging contests are required to rank a set of four horses according to the standards set by the breed organization the horse belongs to for the discipline (or class) being exhibited. These classes include circumstances where the conformation of the horse is judged, as well as those where the athletic ability of the horse is judged (University of Florida, Department of Animal Science, 2016a). The purpose of horse judging is to give youth the opportunity to participate and actively learn about the equine industry while developing personal, professional, and social skills (Anderson & Karr-Lilienthal, 2011; Nash & Scant, 2005; Ward, 1996). Life skills such as leadership, sportsmanship, and handling pressure are also skills they may obtain (Anderson & Karr-Lilienthal, 2011). Additionally, research shows 4-H animal science programs have positive influences on decision-making, positive self-esteem, responsibility, and relating to others (Rusk, Martin, Talbert, Balschweid, 2002; Ward, 1996). Horse judging programs also promote the pursuit of careers in an agricultural-related industry by providing participants with hands on experiences (Nash & Scant, 2005).

Many studies have investigated the benefits and motivational factors associated with youth

events such as participation on judging teams. In a study by Nash and Scant (2005), the majority of animal judging alumni agreed their youth judging experiences played influential roles in their personal success. Lancaster, Knobloch, Jones, and Brady (2013) focused on the intrinsic factors associated with motivation and the resources team members utilized to prepare for agricultural events. Assessing the motivational factors driving youth to become engaged and devoted to a 4-H horse judging program will assist in allowing extension professionals to better facilitate opportunities and programs geared towards promoting higher levels of achievement, life and career readiness, and professional success (Anderson & Karr-Lilienthal, 2011; Nash & Scant, 2005; Ward, 1996). Additionally, capitalizing on specific motivation factors relating to best coaching practices, social involvement, intrinsic desires, and award/recognition opportunities will assist in facilitating the 4-H purpose of promoting positive lifestyle development (Anderson & Karr-Lilienthal, 2011; Nash & Scant, 2005; Ward, 1996).

Literature Review

Self-Determination Theory (SDT) was used as the theoretical foundation for the study (Ryan & Deci, 2000a) and motivation served as the central theme. SDT has been correlated with types of motivation (e.g. amotivation, extrinsic, intrinsic) with specific outcomes related to performance, persistence, and well-being (Deci & Ryan, 2008; Ryan & Deci, 2000a). Deci and Ryan (1985) designed SDT to organize cognitive, affective, and behavioral variables using constructs in motivation. The three basic needs in SDT include: competence, autonomy, and relatedness (Ryan & Deci, 2000a). The satisfaction of these needs is a determining factor of the type of motivation influencing an individual (Ryan & Deci, 2000b).

Deci and Ryan (1985) referred to competence as “the accumulated result of one’s interactions with the environment, of one’s exploration, learning, and adaptation” (p. 27). Perceived competence, or self-efficacy, is often mentioned in relation to extrinsic motivation whereas competence refers to intrinsic motivation (Ryan & Deci, 2000b). Autonomy is described by Deci and Ryan (1985) as the level to which “people use available information to make choices and to regulate themselves in pursuit of self-selected goals” (p. 154), referring to the propensity of an individual to act as an initiator of his or her own behavior (Patrick et al., 2007). In SDT, motivations and behaviors described as self-determined are associated with more autonomous socio-environments (Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004) and have been correlated with improved individual learning, performance, and persistence (Deci & Ryan, 2000b; Vansteenkiste et al., 2004). The third basic need in SDT, relatedness, is defined as the need to feel both connected with and understood by others (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000). In other words, self-determined behavior is enhanced in individuals feeling a sense of belonging in correspondence to a group (Ryan & Deci, 2000b). In terms of SDT, contexts facilitating relatedness between an individual and another individual or group are positively correlated with self-determined motivation (Ryan & Deci, 2000a). Contexts combining competence, autonomy, and relatedness are illustrated in the literature to satisfy an individual’s innate basic need to demonstrate self-determined behavior (Deci & Ryan, 2008a; Deci & Ryan, 2008b; Ntoumanis, 2001; Ryan & Deci, 2000a; Ryan & Deci, 2000b; Vansteenkiste et al., 2004).

Motivation is used to describe the “energization and the direction of behavior” (Deci & Ryan, 1985, p. 7). Intrinsic motivation is defined as “the doing of an activity for its inherent

satisfactions rather than for some separable consequence” (Ryan & Deci, 2000b, p. 56). Individuals who are intrinsically motivated participate in self-determined behaviors due to personal interest in the activity itself based on the activity’s alignment with personal values and beliefs (Deci & Ryan, 2008b; Ntoumanis, 2001). Intrinsically motivated behavior requires the fulfillment of all three basic needs: competence, autonomy, and relatedness (Brière, Vallerand, Blais, & Pelletier, 1995). Outcomes associated with individuals described as intrinsically motivated have been described through research to be persistent, have greater psychological health and well-being, show more self-regulatory behavior, illustrate a natural inclination towards mastery, assimilate more readily, and have a more spontaneous interest in exploration (Deci & Ryan, 1985; Patrick et al., 2007; Ryan & Deci, 2000a; Ryan & Deci, 2000b; Vansteenkiste et al., 2004).

Ryan and Deci (2000b) defined extrinsic motivation as an activity “done in order to attain some separable outcome” (p. 60). Extrinsic motivation is illustrated by an individual engaging in a behavior as a means to an end and not for self-determined reasoning (Ntoumanis, 2001) such as obtaining a tangible reward or avoidance of punishment (Deci & Ryan, 2008a). The main difference between intrinsic and extrinsic motivation is the level of autonomy associated within the context of the environment (Deci & Ryan, 1985; Ryan & Deci, 2000a; Vansteenkiste et al., 2004). Outcomes associated with the introduction of autonomy in an extrinsically motivated context have been supported through research to show improved performance levels, greater persistence, and more depth to learning as compared to more controlled environments (Ryan & Deci, 2000a; Ryan & Deci, 2000b).

While perceived confidence is not a motivation factor, it is a direct result of both intrinsic and extrinsic motivation (Ryan & Deci, 2000). Research in SDT has supported a positive relationship between confidence levels and perceived competence (Patrick et al., 2007). Competence directly correlates with SDT as a basic and innate psychological need (Deci & Ryan, 1985) and is one of the three basic needs associated with intrinsic motivation (Ryan & Deci, 2000b). Research in Positive Youth Development theory has recognized that high competency and confidence are supporting elements in a positive youth lifestyle (Lerner et al., 2005; Zarrett & Lerner, 2008).

Purpose and Objectives

The purpose of this research was to identify the motivational factors that influenced youth to participate in a 4-H horse judging program. The target population was youth ages 14 - 18 (or senior level competitors) that participated in a state 4-H horse judging contest. The sample was a census of 4-H senior level competitors at the Colorado, Florida, and Texas state horse judging contests. The objectives were to:

1. Determine the demographic characteristics of senior 4-H state horse judging participants.
2. Identify motivation factors that influenced youth to participate in a senior 4-H horse judging program.
3. Identify if a relationship existed between intrinsic motivation, extrinsic motivation, and perceived confidence factors in youth at state 4-H horse judging contest.

Methods

The current study was descriptive and correlational exploring motivations of senior level respondents at state 4-H horse judging contests. The study used a questionnaire administered to a purposive sample of the 2016 Colorado, Florida, and Texas state 4-H horse judging contestants facilitated by Colorado State University, the University of Florida, and Texas A&M University. Respondents at the Colorado contest were invited based on the individual team selection process that varied between each county (Colorado State University Extension, 2016). Teams at the Florida contest were invited by either placing at a qualifying contest or being selected by their county as one of two teams permitted to represent each county (University of Florida, Department of Animal Science, 2016c). Teams at the Texas contest were invited by placing in the top three at the district level of competition (Texas A&M Agrilife Extension, 2016). The questionnaire was administered to a total of 132 respondents at the Colorado, Florida, and Texas state 4-H horse judging contests, and a total of 71 individuals received parental consent and completed the questionnaire for an overall response rate of 53.8%. According to the literature, this response rate would be considered adequate for a youth focused study (Nulty, 2008).

The researcher adapted a questionnaire developed by Lancaster et al. (2013) to measure motivation type through the lens of SDT (Deci & Ryan, 1985). Florida contestants completed the questionnaire using computerized tablets, whereas Colorado and Texas respondents completed the questionnaire on paper. The instrument was distributed in person by the researcher. The questionnaire was reviewed and approved for age appropriate content and validity by a panel of experts. Pilot testing occurred to increase validity using a sample of youth and collegiate horse judging team alumni from the University of Florida, with a total of 19 respondents. The survey instrument was approved by the University of Florida's Institutional Review Board.

The demographic information in this study was presented in a check all that apply or multiple-choice question style. Data from the demographic questions was examined using descriptive statistics. The scale items referring to the motivation constructs were sorted into three groups based on characteristics of motivation referenced in the literature review: intrinsic motivation factors ($n = 7$), extrinsic motivation factors ($n = 14$), and perceived confidence factors ($n = 8$) (Deci & Ryan, 1985; Ryan & Deci, 2000a, 2000b). An index for each motivation factor was measured using a five-point Likert-type scale adapted from a preexisting questionnaire and the pilot study data (Lancaster et al., 2013; Perloff, 2009). The index for the scale was labeled 1 = *strongly disagree*, 2 = *disagree*, 3 = *neither agree nor disagree*, 4 = *agree*, and 5 = *strongly agree*. Since perceived confidence has been attributed to both intrinsic and extrinsic motivation within the literature, this variable was left as its own construct to avoid confounding the intrinsic and extrinsic motivation variables (Ary et al., 2010; Deci & Ryan, 1985; Ryan & Deci, 2000b) and the index for the scale was labeled 1 = *no confidence*, 2 = *slightly confident*, 3 = *confident*, 4 = *very confident*, 5 = *extremely confident*. Frequency counts were calculated for responses to each Likert-type scale item and placed into one of three groups categorized by the real limits of the scale. The real limits of the intrinsic and extrinsic scale were 1.00 – 2.49 = *strongly disagree/disagree*, 2.50 – 3.49 = *neither agree nor disagree*, and 3.50 – 5.00 = *agree/strongly agree*. The real limits of the personal confidence scale were 1.00 - 2.49 = *no confidence/slightly confident*, 2.50 – 3.49 = *confident*, 3.50 – 5.00 = *very confident/extremely confident*. The means and standard deviations for each motivation factor group were calculated based on the real limits of the motivation factor

scales using SPSS. Percentages were calculated using the number of responses for each scale category group divided by the total sample number provide a comparison for each motivation factor index. The reliability of the instrument was calculated during pilot testing using Cronbach's alpha using SPSS. Constructs for motivation factor were evaluated to determine the reliability of the instrument. According to Ary et al. (2010), reliability for research purposes should have a Cronbach's alpha score of at least .70 or higher. Pilot test data revealed constructs to be reliable with a Cronbach's alpha value of .809 for intrinsic motivation, .838 for extrinsic motivation and .947 for perceived confidence.

Objective three determined if a relationship existed between any of the motivation factors. A Pearson's correlation (r) was run on the values to assess the strength of relationships between the variables. To determine the strength of the relationship, the relationships were ranked from negligible to perfect. A relationship with a negative or positive correlation coefficient of .01 to .09 was considered negligible, .10 to .29 was considered low, .30 to .49 was considered moderate, .50 to .69 was considered substantial, .70 to .99 was very high, and 1.0 was a considered a perfect relationship (Miller, 1994).

Results

Demographics

The majority of respondents in the study were white (93%), female (81.6%), in ninth and tenth grade (57.3%) and were between the ages of 14 to 16 (76.5%) (Table 1). Only 7.4% of the sample indicated they were Hispanic/Latino(a)/Chicano(a).

Table 1

Demographic characteristics

	<i>n</i>	%
Sex		
Male	13	18.6
Female	57	81.4
Grade Level		
8th or below	1	1.5
9th	23	33.8
10th	16	23.5
11th	15	22.1
12th	13	19.1
Age		
13 or under	1	1.5
14	17	25
15	21	30.9
16	14	20.6
17	13	19.1
18	2	2.9

Hispanic/Latino(a)/Chicano(a)	5	7.4
Race		
American Indian or Alaskan Native	2	2.8
Black or African American	0	0.0
Asian or Pacific Islander	3	4.2
White	66	93.0
Other	0	0.0
State		
Colorado	31	43.7
Florida	9	12.6
Texas	31	43.7

Describe Motivational Factors

The intrinsic motivation item frequencies are listed in Table 2. The top four intrinsically inclined items that most strongly influenced respondents in this study to participate on a 4-H horse judging team were wanting to learn something new, liking horses, being interested in learning about horses, and desiring to gain more confidence speaking in public. The overall mean intrinsic motivation score was ($M = 4.51$, $SD = .43$) indicating respondents agreed/strongly agreed with the intrinsic motivation items.

Table 2

Intrinsic motivations

Item	Strongly Disagree/Disagree %	Neither Agree or Disagree %	Agree/Strongly Agree %
I want to learn something new.	0	1.4	99.6
I like to see new places.	2.8	15.5	81.7
I like horses.	0	2.8	97.2
I am interested in learning about horses	0	2.8	97.2
I see horses being a part of my life in the future.	2.8	9.9	87.3
I want to gain more confidence speaking in public.	4.2	4.2	91.6
I was willing to take time to study alone.	5.6	24.0	70.4

The extrinsic motivation item frequencies are listed in Table 3. The top three extrinsically inclined items that most strongly influenced respondents in this study to participate on a 4-H horse judging team were taking time to study with their team, doing well for their team, and it helping them become more competitive for scholarships in general. The overall mean extrinsic motivation score was ($M = 4.16$, $SD = .73$) indicating respondents agreed/strongly agreed with the extrinsic motivation items.

Table 3

Extrinsic motivations

Item	Strongly Disagree/Disagree %	Neither Agree or Disagree %	Agree/Strongly Agree %
My coach encouraged me to be on the team.	9.8	21.2	69.0
My friends were participating.	24.0	23.9	52.1
I have previous work experience with horses, and thought that I would do well.	2.8	8.5	88.7
My parents/guardians wanted me to participate.	8.4	23.9	67.7
I want to be recognized for my horse judging ability.	4.2	24.0	71.8
I want to win awards.	9.9	19.6	70.5
I was willing to take time to study with my team.	0	7.0	93.0
I wanted to do well for my team.	1.4	5.6	93.0
I wanted to do well for my 4-H club.	4.1	9.9	86.0
It will help me be more competitive for scholarships in general.	2.8	4.2	93.0
I show horses, which led to an interest in judging.	18.3	5.6	76.1
It will help me get into college.	2.8	14.1	83.1
It will help me be more competitive for collegiate judging scholarships.	4.2	18.3	77.5
It will help me be more competitive for scholarships in general.	2.8	4.2	93.0

The perceived confidence item frequencies are listed in Table 4. The three perceived confidence items that respondents in this study identified to be the most confident in completing were choosing the most suitable horse for a specific discipline or purpose, answering general questions about horses, and choosing the best quality horse based on the form and function of the animal. The overall mean perceived confidence score was ($M = 4.01$, $SD = .55$) very confident/strongly confident with the perceived confidence items.

Table 4

Perceived confidence item frequencies

Item	No Confidence/Slightly Confident %	Confident %	Very Confident/ Extremely Confident %
Answer general questions about horses.	5.7	12.9	80.4
Answer questions about horse anatomy/characteristics.	15.7	25.7	58.6
Answer questions about equine facility management.	25.7	20.0	54.3
Answer questions about feeding nutrition.	20.0	27.1	52.9
Identify breeds of horses.	10.0	14.3	75.7
Identify differences among horses in comparison.	1.4	20.0	78.6
Choose the most suitable horse for a specific discipline or purpose.	4.2	12.9	82.9
Choose the best quality horse based on the form and function of the animal.	2.9	17.1	80.0

Relationship between Motivational Factors

The strongest relationship among variables was classified as very substantial in strength and were visible between the intrinsic and extrinsic index ($r = .69$). Other notable relationships were classified as moderate and were visible between the perceived confidence index variable and extrinsic index score ($r = .31$). All of the correlation coefficients previously discussed were considered significant at the 0.01 level (Table 5).

Table 5

Relationships between motivational factors

	Intrinsic index	Extrinsic index	Perceived confidence index
Intrinsic index	1.00	.69*	.12
Extrinsic index	.69*	1.00	.31
Perceived confidence index	.12	.31*	1.00

Note: * $p < 0.01$.

Conclusions and Discussion

The demographics revealed underrepresented characteristics in regards to race, with American Indian or Alaskan Native and Asian or Pacific Islander having the lowest representation. In terms of ethnicity, there was an underrepresentation of Hispanic/Latino(a)/Chicano(a). Also, an underrepresentation of males was revealed. One possible connection to this finding pertains to a national study which sought to identify and describe the demographic characteristics of the average 4-H volunteers, state specialists, and agents in 4-H programs (Culp, McKee, & Nestor, 2005). The results from this study indicated the average 4-H volunteer, state specialist, or agent in 4-H programming to be white, females in their 40's who work full-time jobs (Culp et al., 2005). If this trend is still currently occurring nationwide, the lack of diversity in leadership in the 4-H organization could be a factor in the absence of the representation of minority groups. In this circumstance, it is important to note that the data from the sample regarding demographic information should not be generalized to the target population of all senior level 4-H state horse judging participants nor all senior level 4-H horse judging participants in any of the states represented.

Overall, the highest average motivation factor frequency was the intrinsic motivation. Most notably, the scale item with the lowest positive response in terms of frequency counts was the idea of studying alone. This lower level of agreement could have been attributed to the framing of the question compared to the other intrinsic motivation item frequencies. The most positively accepted was "I want to learn something new." This response was supported by the literature describing intrinsic motivation and an internal locus of causality (Ryan & Deci, 2000b). Individuals showing an internal locus of causality are likely to exhibit satisfaction and personal enjoyment in what they do (Ryan & Deci, 2000b). This assumption is complimented by the next two highest scale items: "I like horses" and "I am interested in learning more about horses." The connection between horses and an internal locus of causality further increases the validity of the construct in the context of this study (Deci & Ryan, 2008; Ryan & Deci, 2000b).

In regards to the extrinsic motivation frequency values, the top three frequencies could be divided into team member influence and desire for scholarship. There was a difference in the competitiveness for general scholarships responses when compared to collegiate judging scholarships. This trend could be attributed to the tendency for individuals who are motivated by extrinsic factors to experience burnout more rapidly than those motivated by intrinsic factors (Deci & Ryan, 2008; Ryan & Deci, 2000b). In addition, the team-oriented tendency which showed some of the highest frequencies of agreement was starkly contrasted by the high level of frequencies in the disagreement category for the statement "My friends were participating." This reduced desire to participate based on friends participating could be based on the idea that their friends are not interested in participating, therefore the respondent gave an answer based of an objective scenario rather than his/her preference of being around friends.

In reference to the perceived confidence frequency values, the top three categories were "choose the most suitable horse for a specific discipline or purpose," "answer general questions about horses," and "choose the best quality horse based on the form and function of the animal". All of these items are directly linked with the expectations associated with horse judging (Colorado

State University Extension, 2016; Texas A&M Agrilife Extension, 2016; University of Florida, Department of Animal Science, 2016b). The lowered average frequency exhibited by respondents for the perceived confidence construct could have been related to the two questions in the construct not as directly related to horse judging which had the lowest overall frequency for the *very confident/extremely confident* category: “answer questions about feeding nutrition” and “answer questions about equine facility management”. Since these two scale items might have been viewed as out of context based on the central idea of the current event the respondents were engaging in, the lower percentages of overall frequencies in the *very confident/extremely confident* category could have been a residual effect.

Objective three determined if a relationship existed between any of the motivation factors by using a multiple linear regression analysis. A very substantial correlation was found between intrinsic motivation and extrinsic motivation. This finding alludes to the positive influence intrinsic motivation has on extrinsic motivation. This suggests that those who are intrinsically motivated are more likely to have extrinsic motivation or that motivation is not exclusive. Another relationship was identified, providing a relationship between perceived confidence and extrinsic motivation. This relationship was classified as moderate and suggests that those with greater personal confidence are motivated by extrinsic factors.

Limitations to this study included sample sizes when comparing to the target population, transferability of the reliability of the constructs from the pilot study date to the questionnaire administered to the youth respondents, and the time in which the questionnaire was administered at the contest could have affected the results of the study. Since the questionnaire was administered after the respondent completed his/her last reasons set, the individual could have experienced mental fatigue or resentment from the intensity of the contest which could have resulted in an inaccurate self-report of motivation factor influencing the individual to participate at a state 4-H horse judging contest.

Implications

One of the practical implications to take away from the findings was the importance of extension professionals to advertise positive youth development programs like horse judging to a more diverse population. The professional and life skill enhancement that can be developed through involvement in a horse judging program and programs similar to it have been repeatedly cited in the literature (Anderson et al., 2014; Nash & Scant, 2005). Careful note should be made to the trend of white females as the majority of the sample in two key states which are among the top competitors in the collegiate horse judging industry (Colorado State University, College of Agricultural Sciences: Animal Sciences, 2016; West Texas A&M University). The current study could offer extension professionals insight into the recruitment of a more diverse generation of horse judging participants through data pertaining to which minorities are present.

The current study has implications for coaches. By having an in depth understanding as to what types of motivation factors might be present within each individual member of a team, the coach could more effectively tailor his/her teaching methods to preventing burnout (Deci & Ryan, 2008; Ryan & Deci, 2000a). Not only is it important to appeal to individual motivation factors of a team, but it is also important for the coach to understand how these motivation factors amongst

different individuals on the team might build upon one another. The coach could consider coming up with exercises that promote relatedness to prevent burnout (Ryan & Deci, 2000b).

Recommendations

Based on the homogenous nature of the sample in the current study, more research should be conducted on how gender might affect motivation type. Best coaching and team management practices could then be developed based on the themes identified in gender among participants to help prevent individual burnout in competitive 4-H activities. More research on gender and motivation could also investigate differences in perceptions of how scale items are framed.

This study found correlations between intrinsic and extrinsic motivation factors. Due to the relationship found, it is recommended that these factors not be viewed exclusively when choosing team members. Pairing a team based on intrinsic motivation alone could result in potential burnout due to lack of extrinsic motivation (Ryan & Deci, 2000b). In contrast, teams paired strictly based on extrinsic motivation, could lack intrinsic motivation. Personal confidence was also found to have a relationship with extrinsic motivation. This finding suggests that personal confidence can be increased through extrinsic factors, such as team and coach relationships and potential for future advancement. It is encouraged that coaches be cognizant of these extrinsic effects on personal confidence and utilize this motivation to build personal confidence levels in team members.

In order to improve the generalizability of the current study this research should be replicated at state contests around the country. Following this, a meta-analysis of the results from all the states could be assessed and compared. In a similar fashion, this research could be conducted at the national and county level. In addition, a comparative study between 4-H and FFA teams could assess motivation factors present in individuals who seek solely out of school activities versus those who have it already built into their school curriculum.

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Impact of a Poultry and Egg Food Safety Education on 4-H Youth

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Research: Quantitative and Content Analysis

Research Priority Area: Meaningful, engaged learning in all environments

Impact of a Poultry and Egg Food Safety Education on 4-H Youth

This study sought to evaluate a poultry and egg food safety education intervention for 4-H youth. Materials developed and shared with students were infused with key content stemming from microbiological research findings associated with this project and a content analysis of other key findings in the field that consumers ought to know and apply to reduce instances of food-borne illness and death. With financial support from the United States Department of Agriculture (USDA) National Institute of Food and Agriculture (NIFA) Agriculture and Food Research Initiative (AFRI), the Poultry and Egg Education Project (PEEP) accomplishes this goal for families and communities by evaluating knowledge, attitudes, perceptions and intentions of implementing lessons learned during a workshop on poultry and egg food safety. Among a convenience sample of 4th-6th grade 4-H youth attending various 4-H camps (n = 190), post-test knowledge scores were significantly higher than pre-test scores. The workshop teaching poultry and egg food safety was effective in knowledge creation. Following the workshop youth had positive changes in attitudes, perceptions, and intentions regarding adopting the food safety messages that, if applied, could reduce food-borne illness and death. According to these findings and Ajzen's (1991) Theory of Planned Behavior, we expect participants to implement appropriate food safety behaviors related to handling and use of poultry and poultry products. Continuation, improvement, and expansion of the PEEP curriculum were recommended. Specific curriculum improvement strategies include more age-appropriate options and more formalized lesson plans designed to engage learners. Recommendations for testing an improved curriculum with an experimental design are also made.

Introduction

Each year 48 million illnesses, 128,000 hospitalizations, and 3,000 deaths are attributed to foodborne illness in the United States (US) (Centers for Disease Control and Prevention [CDC], 2016a). On average, one in six Americans becomes sick from foodborne illness each year (CDC, 2016a). These illnesses are a burden to public health and expensive; yet, they are largely preventable (CDC, 2016a). Consumers can greatly reduce their risk of foodborne illness by learning safe purchasing, storing, handling and preparing practices at home (Kosa, Cates, Bradley, Godwin & Chambers, 2014).

Many consumers, however, are not following recommended best food safety practices, contributing to the large numbers of foodborne illness and outbreaks (Kosa et al., 2014). Though many consumers believe it is not common for people in the U.S. to become sick from food prepared in the home, food safety experts report the home is the primary location of foodborne illnesses (Kosa et al., 2014). The danger of foodborne illness is higher among children and youth. A significant portion of foodborne illnesses are caused by *Salmonella* and *Campylobacter*, bacteria commonly found in poultry and eggs (CDC, 2016a).

The Poultry and Egg Education Project (PEEP) has a goal to reduce illnesses from *Salmonella* and *Campylobacter* by educating and improving consumer handling and preparation of raw poultry products in the home. PEEP is the education body, part of an Agriculture and Food

Research Initiative (AFRI) Competitive Grant supported by the National Institute of Food and Agriculture (NIFA) of the United States Department of Agriculture (USDA).

Food safety is the probability of not suffering from consuming a specific food (Henson & Traill, 1993). Of the 48 million foodborne illnesses in the United States each year, *Salmonella* and *Campylobacter* cause nearly 2 million foodborne infections and at least 450 deaths ever year (CDC, 2016c; Scallan et al., 2011). Poultry and eggs pose one of the greatest risks of foodborne disease in the US when compared to other foods (Kosa, Cates, Bradley, Chambers & Godwin, 2014). *Salmonella* is a common cause of food poisoning and symptoms can last up to a week. Similarly, *Campylobacter*, is one of the most common causes of diarrhea in the US (CDC, 2016b). The risk for illnesses associated with both of these pathogens is especially high for older adults, infants and persons with chronic diseases (CDC, 2016c). Safe cooking and pasteurization kill *Salmonella* and *Campylobacter*. The only way to prevent illnesses associated with these pathogens is to practice recommended food safety best practices. For this reason, education of food safety should include the safety of handling, preparing, and cooking poultry and eggs in the home (Kosa et al., 2014).

Theoretical Framework

This study integrated Ajzen's Theory of Planned Behavior (TPB) (Ajzen, 1991) and Rogers' (2003) Diffusion of Innovation Theory to identify variables that consistently impact behavior change. TPB helps program creators and facilitators address or target specific behaviors (Lobb, Mazzocchi, & Traill, 2006) by focusing on attitudes, intentions, and subjective norms (beliefs and motivations). Diffusion of Innovation theory demands that knowledge and awareness is also a key element in the process of predicting or changing behaviors. Behavioral beliefs are the likely outcomes of the behavior being studied as well as the evaluations of these outcomes. They produce a favorable or unfavorable attitude in the individual toward the behavior (Ajzen, 2006). Attitudes have been shown to influence and predict behavior (Ajzen, 1991; Wilcock, et al., 2004). Therefore, in order for educators to plan and implement food safety curriculum, it is important to understand the consumers' attitudes towards food safety (Wilcock, et al., 2004). Normative beliefs are the beliefs about the expectation of others and the desire to comply with these expectations (Ajzen, 2006). These beliefs are based on the individual's perceived social pressure to perform or not to perform a certain behavior (Ajzen, 1991). The third type of belief included in this theory, control beliefs, is the individual's perceived behavioral control that impacts the performance of the behavior (Ajzen, 2006). This belief is assumed to take into account past experiences, perceived difficulty or ease and anticipated obstacles (Ajzen, 1991). The central factor to this theory is the individual's intention to perform a specific behavior (Ajzen, 1991). When all three types of the beliefs described combines, an intention is formed (Ajzen, 2006). According to the theory an individual's intention to engage in a certain behavior directly influences the likelihood of that behavior occurring (Ajzen, 1991). This concept is largely due to the assumption an individual's intentions are indicators of motivational factors such as; how much effort they are willing to exert and how hard they are willing to try in order to perform a particular behavior (Ajzen, 1991).

This theory is consistent with other research findings suggesting intention is a strong predictor of behavior (Dedobelleer, Champagne, & Potvin, 1999). Lobb, Mazzocchi, and Traill

(2006) used the theory to analyze behaviors associated with risky or health-related actions. Researchers have applied the theory to studies addressing smoking, risky driving, exercise and food choices (Lobb, et al., 2006). Shapiro, Porticella, Jiang, and Gravani (2011) found the theory of Planned Behavior to provide a useful framework for understanding the adoption of safe home food handling practices. During a 5-point Likert scale questionnaire, Shapiro et al., (2011) were better able to understand the gap between awareness, attitude and behavioral intentions. Ultimately, they found knowledge about potential risks and safe practices, behavioral control and social norms played an important role in regulating food handling. However, Shapiro et al., (2011) found knowledge and awareness alone will most likely not bring about change.

Though intention is not the same as behavioral change, it can be a strong driving force to action (Lohse, 2006). Understanding both beliefs and intentions through the theory of planned behavior can help researchers or implementers understand how to impact behavioral change. Which can add knowledge and awareness to interventions to bring about change, and the more favorable the attitude and subjective norm, and the greater the perceived control, the stronger the intention to perform the behavior (Ajzen, 1991). According to Rogers (2003), knowledge and awareness are seminal factors of adopting new ideas and implementing behavior change. Figure 2-1 depicts a conceptual model of how the theoretical framework of this study guided our research plan. It also shows how practitioners can help target improved poultry and egg safety behavior of youth by studying how their knowledge, beliefs, attitudes and intentions affect behavior.

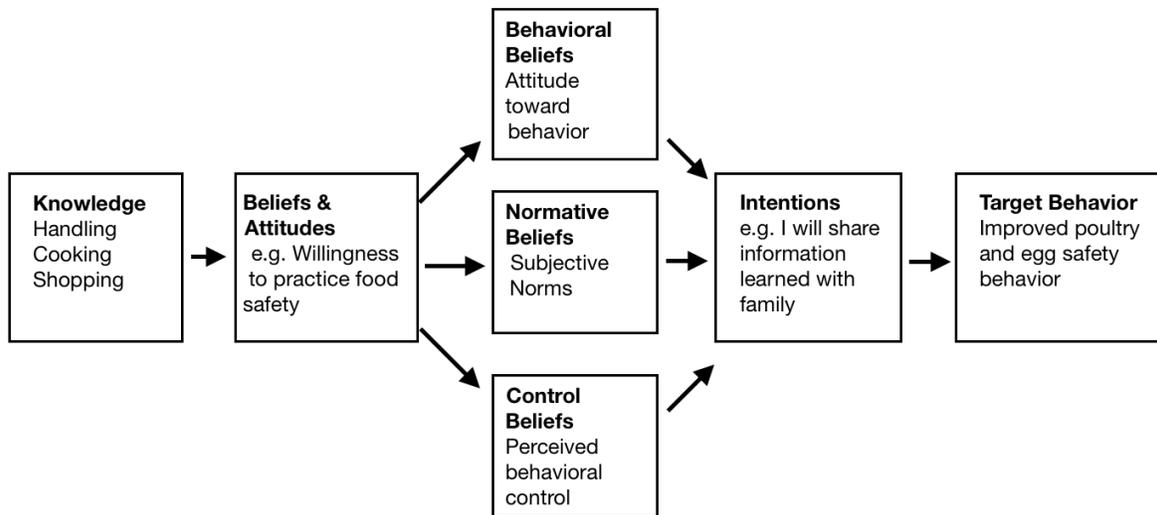


Figure 1. How youth’s knowledge, beliefs attitudes and intentions affect behavior of poultry and egg safety practices: A conceptual model

Food safety experts report many Americans believe foodborne illness at home is not very common (Kosa, Cates, Bradley, Chambers & Godwin, 2015). However, approximately one-fifth of all foodborne diseases in the United States could be attributed to poor food handling practices at home (Gould et al., 2013; Redmond & Griffith, 2003). Although food safety behaviors among consumers in the US typically seem to be improving over time, risky consumer practices are still

very common (Hanson, Hughes, & Liu, 2015; Fein et al., 2011). Though most of what we know about consumer food safety practices are the results of self-reported surveys, it should be noted actual food handling practices often differ from self-reported practices (Jay, Cormar & Govenlock, 1999; Wilcock, Pun, Khanona, & Aung, 2004). However, the literature base indicates a strong lack of consumer knowledge or willingness to comply to food safety recommendations.

Lack of knowledge can be a major barrier preventing consumers from changing risky food practices. According to McIntosh, Christensen, and Acuff (1994), consumer knowledge is a major factor in willingness to change current practices. Simply making people aware of foodborne pathogens could play a significant role in reducing foodborne illness (Lin, Jensen, & Yen, 2004). Altekruise, Street, Fein, and Levy (1996) reported those who had heard of *Salmonella* were more likely to follow related food safety recommendations. According to a study of US consumers conducted by Lin et al. (2004), although the majority of participants had heard of *Salmonella* (94%) as a major concern in food safety, only 7% were aware of *Campylobacter*. Additionally, only half of the participants considered food contamination by microorganisms a serious food safety problem (Lin et al., 2004). Though knowledge alone does not automatically lead to safer consumer practices, it enables the consumer to reflect upon their risky practices.

Both knowledge and attitudes of food safety recommendations and practices are affected by various social, cultural, and economic demographics (Lando & Chen, 2012; Lin et al., 2005; Wilcock et al., 2004). Fein et al. (2011) reported younger consumers were more likely to consume risky foods. Additionally, Wilcock et al. (2004) noted many food safety habits and cultural preferences develop at an early age and can become deeply ingrained. Lin et al. (2004) concluded foodborne illnesses may be reduced by increasing both consumer awareness of foodborne pathogens and raising consumer motivation to use food safety information.

Because foodborne illness is a national health risk affecting all ages, it is imperative to include teaching youth at an early age about the risks associated with mishandling foods (Richards, Skolits, Burney, Pedigro, & Draughn, 2008). Middle school is an optimal time to teach food safety to youth because they are in the process of developing lifelong behaviors (Richards et al., 2008). In a research study designed to validate an interdisciplinary food safety curriculum for middle school students, Richards et al. (2008) reported a substantial gain in knowledge of food safety concepts after middle school students participated in a food safety curriculum. Additionally, the self-reported attitudes and behaviors of students increased from the post-test to the 6 month follow up test (Richards et al., 2008).

Guion, Simonne and Easton (2004) discovered food safety is a topic youth are interested in during their research study of Florida 4-H youth. Additionally, they reported a large majority of youth indicated they would attend educational programs about food safety (Guion et al., 2004). However, they noted nearly one third of the youth who participated in their study reported they had not received information on food safety (Guion et al., 2004). Therefore, the need exists for a 4-H educational program on food safety (Guion et al., 2004). Additionally, research suggests the most effective food safety curriculum should be tailored towards changing the behaviors which are most likely to result in foodborne illnesses (Richards et al., 2008) as well as engaging and hands on (Guion et al., 2004).

Furthermore, this study focused on the impact of PEEP among youth, because Extension educators have long realized youth were more receptive than their parents to adopt new information and were more open to new ideas (Kress, 2014; VanHorn, Flanagan, & Thomson, 1998). Because 4-H reaches so many youth in early adolescence, it has the opportunity to significantly influence young people (Boyd, Herring & Briers, 1992).

Ladewig and Thomas (1987) reported that skills and attitudes [such as safe handling and use of poultry and eggs] formed during 4-H do carry into adulthood; and just as youth in the early 1900's lead community change by teaching their families new knowledge, youth today can make an impact by becoming the early adopters of science based knowledge (Kress, 2014) like the findings from our PEEP project. In this way, 4-H is a viable avenue for Cooperative Extension in developing young people to not only become competent adults, but to pave the way to change in their communities (Fox et al., 2003; Kress, 2014).

Purpose and Objectives

The purpose of this study was to gain a better understanding of how providing 4-H youth with poultry and egg safety messages from PEEP could help reduce instances of foodborne illness by examining youths' intentions of implementation of lessons learned during an educational workshop. The objectives of this study included:

1. Determine the major themes of poultry and egg safety developed from the research findings of the PEEP to be used in poultry and egg safety education for youth.
2. Describe pre and post-test knowledge in poultry and egg safety as a result of a one-hour educational workshop at a 4-H youth camp.
3. Describe participants' perceptions, attitudes and intentions regarding proper poultry and egg food safety behaviors.

Methods and Procedures

Our study used mixed methods, content analysis in the first phase of this study, followed by a pre-test, educational intervention, post-test and post-test only survey tool among a convenience sample of 4-H youth.

Content analysis is a research methodology, which seeks to identify and evaluate themes to better understand their meaning (Krippendorff, 2013). By using this method, a large amount of information can be organized into major themes. Three goals were identified in order to complete the content analysis. These goals included:

1. Read and analyze all published findings to date from the USDA-NIFA-AFRI-funded PEEP project being conducted by Tennessee State University, Kansas State University, and Research Triangle International.
2. Identify egg and poultry food safety themes and messages and assign weight to themes based on frequencies of these themes and messages within PEEP research.

3. Determine areas of focus for PEEP lesson/curriculum development.

For goal one, we critically reviewed and analyzed findings in 22 articles, posters and research presentations coming from our USDA-NIFA-AFRI PEEP project. To complete goal two, we used a frequency system (Stemler, 2001) based on keywords, to identify poultry and egg food safety themes in the aforementioned sources. Additionally, within each theme, more detailed sub themes were identified. Each theme mentioned was counted as one frequency per source. A total number of sources mentioning each theme was established.

Themes and subthemes were labeled with a keyword written on sticky notes to bookmark them in articles. A sticky note with a number was also placed on each article, poster or presentation to give it a case number. Excel was used to input themes or subthemes addressed in each source. For goal three of the content analysis, frequency scores were used to determine which messages and themes were of the highest concern. The subthemes with the highest frequency scores under each major theme were labeled as crucial areas of improvement.

Once the content analysis was complete and themes were identified, the results were brought before a panel of experts and scientists who conducted the studies under investigation for verification. Themes and subthemes were used to create the workshop on poultry and egg food safety that was disseminated to participants.

Objectives two and three were accomplished with a survey research design. A one-hour workshop for middle school aged 4-H youth at select locations around Tennessee was conducted on the poultry and egg food safety themes. The tone of the workshop was informal and casual, and allowed for group discussion.

The population was 4-H youth who attended 4-H summer camps and day camps in 2016. The goal was to obtain a criterion sample of youth in grades four through six, from each of the three regions of Tennessee. A total of 190 youth completed a pre-test and post-test questionnaire of poultry and egg food safety knowledge, participated in the one-hour workshop, and completed a posttest only questionnaire measuring perceptions, attitudes and intentions regarding proper poultry and egg food safety behaviors. Only participants who completed all three parts were analyzed.

An email was sent to Extension 4-H agents conducting 4-H camps in every region in May of 2016. A second email was sent two weeks after the first email to agents whom had not responded. Once an agent responded and agreed to the researcher administering the workshop at camp, parent consent forms were sent to the agents who also collected them for us. At the conclusion of each workshop, surveys and consent forms were collected and assigned a code representing each participant.

In order to measure the changes in food safety knowledge, a pre-test/post-test questionnaire with twelve items, including multiple choice and true/false questions, were administered to reflect the major themes (handling, cooking, and shopping) of PEEP identified in the content analysis. These items were validated by two experts in food science, and administered at the beginning of

the workshop and then immediately after. It is important to note that the short time between the pre and post-test could be a threat to the internal validity of the content assessment.

An eighteen-item post workshop survey, with scale reliabilities from ($\alpha = .73$ to $.88$), was administered at the conclusion of the workshops to identify youths' attitudes ($\alpha = .83$), intentions ($\alpha = .88$), and perceptions ($\alpha = .73$) of the information learned during the workshop. The survey items included general statements about the effectiveness of the workshop as well as content specific intention statements relating to the themes of the content analysis. The survey was created using a 5-point summated rating scale of agreement (Vagias, 2006) with the options, strongly agree, agree, neither agree nor disagree, disagree and strongly disagree.

Questionnaires were graded and scored by hand. For each individual question in the pre-test questionnaire and post-test questionnaire, the number one was entered if the participant correctly answered the question and a zero was entered if the question was answered incorrectly. Data from the Excel document was imported into a file using Statistical Package for Social Sciences (SPSS) version 18.0 for Windows. A paired samples t-test was completed to compare pre-test and post-test knowledge scores. Cohen's Interpretation of Effect Size (Cohen, 1988) was used to determine significant differences in means of scores for each individual question as well as the questionnaire as a whole. Significance was set at $p < 0.05$ and Cohen's interpretation of effect size intervals were used to interpret d , $0.2 =$ small, $0.5 =$ medium, $0.8 =$ large.

For the post-test only surveys of perceptions, attitudes, and intentions, the following rating scale was implemented. Strongly agree=5, Agree=4, Neither agree nor disagree=3, Disagree=2, and Strongly disagree=1. The mean, standard deviation, and frequency of each item was calculated. For reporting purposes, frequency and percent scores for agree and strongly agree were added together to create a total agree score. Likewise, disagree and strongly disagree responses were added together to create a total disagree score.

An Analysis of Variance (ANOVA) test was used to determine if there was a significant difference between knowledge, perceptions, attitudes and intentions among different state regions represented by youth at the workshops. There were no geographic differences for knowledge, $F(3, 186)=1.84$, $p < .05$ or perceptions, attitudes and intention, $F(3, 185) = 2.13$, $p < .05$. Therefore we can surmise that the sample was representative of the population because there were no differences based on geography. It should also be noted that 4-Hers are historically a very homogenous group and we did not expect to see differences between them.

Results/Findings

In the content analysis of PEEP research, a total of 22 articles, posters and presentations of the PEEP were analyzed. Based on frequency scores, three major themes were identified. These themes were handling and storage behaviors ($f = 36$); cooking behaviors ($f = 25$); and shopping behaviors ($f = 26$). Each major theme was then separated into sub themes. For handling and storage behaviors, three sub themes were created: cross contamination ($f=13$); storage of poultry and eggs at home ($f = 11$); and washing and sanitizer use ($f = 12$). The cooking behaviors theme was separated into four subthemes. The highest scoring sub theme in this category was identified as

thermometers and food temperatures ($f = 11$). The subthemes for cooking behaviors are visual cues for doneness ($f = 8$); runny, undercooked or raw eggs ($f = 5$); and thawing ($f = 1$). The shopping behaviors theme was separated into four sub themes as well. They are separating poultry from other foods when shopping ($f = 10$); utilizing grocery store meat plastic bags ($f = 7$); purchasing eggs ($f = 4$); and hand sanitizers at grocery stores ($f = 5$)

To complete goal three of the content analysis, subthemes with the highest frequency scores were identified. Under the handling and storage behaviors theme, the subtheme with the highest frequency score was cross contamination ($f = 13$). The other two subthemes, storage of poultry and eggs at home ($f = 11$) and hand washing and sanitizer use ($f = 12$) were very close behind cross contamination. The subtheme with the highest frequency score under cooking behaviors was thermometer use and food temperatures ($f = 11$). The subtheme with the highest frequency score under shopping behaviors was separating poultry from other foods when shopping in the grocery store ($f = 10$). Table 1 summarizes themes and subthemes identified in the content analysis and the corresponding sources in which the themes were found.

A paired-sample t-test was conducted to compare 4-H members' knowledge of poultry and egg safety before the workshop and after the workshop. A total of ($n = 190$) youth completed both the pre-test and post-test questionnaires. Table 2 summarizes pre-test and post-test scores of the youth who participated in the study. There was a significant difference in the overall pre-test scores for poultry and egg safety knowledge before the workshop ($M = 6.61$, $SD = 1.74$) and overall posttest scores ($M = 10.46$, $SD = 1.65$); $t(189) = -24.61$, $p < .001$. The effect size for the difference was large, Cohen's $d = 2.21$ (Table 3). In Table 3, there is a summary of the percent correct and incorrect responses for knowledge by sub-theme. Change in percent of correct responses from before to after the workshop is also presented.

For the handling theme, there was a significant difference in pre-test ($M = 3.38$, $SD = 1.03$), and post-test ($M = 4.57$, $SD = .73$) knowledge scores, $t(189) = -14.682$, $p < .01$. The effect size was large, Cohen's $d = 1.15$, indicating an increase in knowledge on handling practices. For the cooking theme, there was a significant difference in pre-test ($M = 1.58$, $SD = 1.06$) and post-test ($M = 3.97$, $SD = 1.10$) knowledge scores, $t(189) = -23.440$, $p < .001$. The effect size was very large, Cohen's $d = 2.25$. There were five questions relating to the cooking theme. For the shopping theme, there was a significant difference in pre-test ($M = 1.66$, $SD = .58$) and post-test ($M = 1.90$, $SD = .33$) knowledge scores, $t(189) = -5.399$, $p < .001$. The effect size was medium, Cohen's $d = .41$. There were two questions relating to the shopping theme.

Means and standard deviations were calculated to analyze the youth's responses to the post workshop survey describing perceptions, attitudes and intentions regarding the information they learned. Frequencies for objective three were calculated by adding agree and strongly agree answers to create a total agree, and disagree and strongly disagree answers to create a total disagree (Table 4).

Table 1

Summary of Sources and Themes Identified in the Contents Analysis

Source	Source Type	H ¹	H ²	H ³	C ¹	C ²	C ³	C ⁴	S ¹	S ²	S ³	S ⁴
Andrews (2014a)	News	1	1	1		1	1		1	1	1	1
Andrews (2014b)	News	1	1	1					1	1		
Chambers (2014)	Presentation		1	1	1				1	1		1
Chen, Godwin & Chambers (2016)	Article	1										
Chen et al. (2014)	Presentation	1							1	1		
Donelan et al. (2015)	Article	1	1						1	1		1
Freeman (2014)	News	1		1	1	1	1					1
Godwin & Cates (2015)	Presentation	1		1	1	1			1	1		
Godwin (2015)	Presentation	1	1	1					1			
Godwin (2014c)	Presentation				1	1						
Harding (2014)	Presentation	1		1	1	1	1					
Kilozo-Nthenge et al. (2016)	Article	1	1									
Koppel et al. (2016)	Article	1	1								1	
Koppel et al. (2014)	Presentation	1	1								1	
Kosa et al. (2015a)	Article		1	1	1	1	1				1	
Kosa et al. (2015b)	Article	1	1	1	1	1		1	1			
Kosa et al. (2014)	Presentation				1							
Kosa et al. (in-review)	Article				1							
Lafferty (2014)	Presentation								1			1
Maughan et al. (2015a)	Article			1	1							
Maughan et al. (2016)	Article		1	1	1	1	1					
Work (2014)	Presentation			1					1	1		
Total		13	11	12	11	8	5	1	10	7	4	5

Note. H1= cross contamination, H2= storage of poultry and eggs, H3= hand washing and sanitizer use, C1= thermometer use and food temps, C2= visual cues for doneness, C3= runny, undercooked and raw eggs, C4= thawing, S1= separating poultry and eggs at the grocery store, S2= grocery store meat bags, S3= purchasing eggs, and S4= hand sanitizer at the grocery store

Table 2

Summary of Means and Differences of Pre-test and Post-test Knowledge by Theme

Theme	Pre-test Knowledge <i>M (SD)</i>	Post-test Knowledge <i>M (SD)</i>	<i>t</i>	<i>df</i>	<i>p</i>	Cohen's <i>d</i>
Handling	3.38 (1.03)	4.57 (.73)	-14.682	189	.00	1.15
Cooking	1.58 (1.06)	3.97 (1.10)	-23.440	189	.00	2.25
Shopping	1.66 (.58)	1.90 (.33)	-5.399	189	.00	.41
Overall	6.61 (1.74)	10.46 (1.65)	-24.61	189	.00	2.21

Note. Handling (scale = 0 to 5), Cooking (scale = 0 to 5), Shopping (scale = 0 to 2); *Cohen's d*, Small (0.2), Medium (0.5), Large (0.8). $p < 0.05$.

Table 3

Pre-test and Post-test Knowledge of Poultry and Egg Safety (n = 190)

Item	Pre-test Knowledge		Post-test Knowledge		% Change
	%		%		
	Correct	Incorrect	Correct	Incorrect	
Length of time for hand-washing	47	53	93	6	46
Using soap	90	10	92	7	2
Hand-washing frequency	93	7	97	3	4
Shopping order	87	13	96	3	9
Bagging poultry at the store	78	22	93	6	15
Using a thermometer to ensure safety	67	33	95	5	28
Safe thawing	17	83	70	30	53
Time to cook after thawing	30	70	58	42	28
Internal cooking temperature of poultry	28	72	87	12	59
Home refrigerator settings	50	50	89	11	39
Temperatures where bacteria grows best	16	84	86	14	70
Properly storing poultry	59	41	84	15	25

Overall, youth demonstrated high intentions of practicing food safe poultry and egg behaviors. 89% of participants indicated they would remember to wash their hands before handling or preparing food. 81% agreed to wash their hands with soap for at least 20 seconds. 83% reported they were less likely to cause cross contamination by using the same plates or utensils for cooked and raw poultry. Participants also showed high intentions of sharing what they have learned with their family members (72%), as well as reminding them about certain safety procedures.

According to the findings, youth will help keep kitchen areas clean (73%, $M = 3.95$, $SD = 1.02$), remind family members to put away leftovers (74%, $M = 3.97$, $SD = 0.96$), remind family

members of safe thawing procedures (74%, $M = 4.03$, $SD = 1.02$), and remind family members to use cooking thermometers (73%, $M = 4.02$, $SD = 0.94$).

Table 4

Youth Attitudes, Intentions, and Perceptions Regarding PEEP Recommendations

Item	Agree %	Neither %	Disagree %	<i>M</i>	<i>SD</i>
Attitudes about...					
This information is important to learn	82	9	5	4.20	0.98
How enjoyable learning the material was	74	14	8	4.03	1.04
Remembering where to store eggs and poultry	76	15	6	4.00	0.91
Not consuming raw or runny eggs	74	14	9	3.99	1.06
Practicing food safety procedures at home	66	23	8	3.83	0.91
Intentions to...					
Wash hands before handling or preparing food	89	5	3	4.34	0.74
Refrain from using the same plate or utensils for cooked poultry and raw poultry	83	9	5	4.16	0.9
Use soap and water for 20 seconds	81	12	4	4.15	0.95
Remind family not to thaw poultry on the kitchen counter or under hot water	74	17	4	4.03	1.02
Remind my family to use cooking thermometers to check for doneness	73	19	5	4.02	0.94
Remind family to put away leftover food within one hour	74	17	5	3.97	0.96
Help family keep kitchen area clean	73	17	6	3.95	1.02
Share information learned with family	72	20	5	3.91	0.92
Perceptions of...					
Importance of food safety at home	86	7	3	4.24	0.84
Properly washing hands	82	11	4	4.19	0.86
Safe internal temps for poultry/egg dishes	81	12	3	4.14	0.97
New knowledge about poultry and egg safety	83	6	5	4.09	1.14
Cross contamination and prevention	78	11	7	4.02	1.09
Total				4.04	0.71

Note: Agree = Agree + Strongly Agree; Disagree = Disagree + Strongly Disagree; 1 = Strongly Disagree, 2 = Disagree, 3 = Neither Agree or Disagree, 4 = Agree, 5 = Strongly Agree.

Overall 83% of participants agreed they new knowledge about poultry and egg safety as a result of the workshop. Additionally, 86% of participants agreed they understood the importance of food safety at home. Furthermore, youth reported learning about food safety practices, such as, safe internal temperatures for poultry and egg dishes (81%), ways to prevent cross contamination (78%), and how to properly wash hands with soap and running water (82%).

Conclusions and Recommendations

Content analysis yielded themes representing poultry and egg food safety concepts that were taught to 4-H youth in Tennessee. The handling and storage behavior theme was the theme with the highest frequency score ($f = 36$). This theme was separated into three subthemes: cross contamination, storage of poultry and eggs at home, and hand washing and sanitizer use. The cooking behaviors themes had a frequency score of 34 ($f = 25$) and included the subthemes: thermometer use and food temperature, visual cues for doneness, runny, undercooked or raw eggs, and thawing. The last theme identified in the content analysis was shopping behaviors, which included a breakdown of 4 subthemes: separating poultry from other foods, utilizing meat plastic bags, purchasing eggs, and hand sanitizer.

In our study using a one-hour workshop format, 4-H youth's basic knowledge of food safety concepts increased; youth perceptions to lessons learned in the workshop were very positive; participants reported they learned new things about poultry and egg safety; participants agreed it was important for youth to learn about poultry and egg safety; youth attitudes/beliefs after the workshop were very positive; youth were more willing to practice various food safety procedures, such as proper hand washing and proper food storage; youth were more willing to implement poultry and egg safety practices at home; and youth indicated they would share these practices with their family members.

These findings are important because the Theory of Planned Behavior suggests favorable attitudes and reported intentions often lead to desired targeted behavior (Ajzen, 1991), and Rogers' (2003) Diffusion of Innovation Theory touts the essential nature of awareness and knowledge. Therefore, it is reasonable to believe youth who participated in this study will implement poultry and egg safety practices learned now, and as they grow into adulthood. It is also reasonable to believe that a complete curriculum with lesson plans, videos, activities, and assessments would have an even greater impact than a one-hour workshop format. A complete curriculum developed for PEEP should include the following messages: prevent cross contamination at home by cleaning and hand washing; correctly store poultry and eggs at home; use thermometers correctly and adhere to recommended internal cooked temperatures for poultry and eggs; don't trust visual cues when checking for doneness of egg dishes; don't eat runny or undercooked eggs; separate poultry and other foods in shopping carts and bags at the grocery store; and use of plastic meat bags provided at the meat section for poultry products.

The following recommendations for further action and research were born from this study. Education in and about safe handling and use of poultry and poultry products should not only continue, but be improved upon and expanded. Educational materials to educate youth regarding themes should be further developed with the best of what is known about the principles of teaching and learning. Educational materials should also be developed for various age levels. This study should be replicated when more formal lesson plans and educational resources are finalized. Follow-up studies should utilize random selection and ensure that students have been exposed to respective lesson plans that were developed for each theme/subtheme. Participants and youth like them in replication studies should be studied with longitudinal and observational research to determine if their reported "planned behavior" is enacted. Parents and other members of the family and community in which youth live and move should be studied as well to determine changes in their knowledge, attitude, perception, intention, and ultimately behavior. Educators should be

made aware of the science and be trained in content and the educational materials available that will help students with safe handling and use of poultry and poultry products.

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Integrating Food Science into High School Agricultural Education in Tennessee

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Integrating Food Science into High School Agricultural Education in Tennessee

One in six Americans is affected by foodborne illnesses, but agricultural education can reduce such instances. Raw and undercooked poultry and eggs are often associated with foodborne illnesses. Educating consumers about the safe handling of poultry and eggs is an important component of reducing foodborne illnesses. Secondary agricultural education can help with this issue. In Tennessee there are a number of pathways and courses integrating food safety/science in high school agricultural education programs, and a new pathway, Food Science and Safety. It is important to assess teachers' integration of food science and their desire to teach in the new pathway. It is also important to understand teachers' current food safety knowledge. We assessed teachers' reported importance ratings and ability levels for certain food safety practices to identify potential training priorities. According to the assessment, teachers need the most professional development in the areas of "safely transporting packaged food products to market," "creating a clean and safe environment for slaughter and packaging," and "safely storing packaged food products while at market." Teachers also indicated that food safety lessons could be incorporated into existing pathways in secondary agricultural education.

Introduction

The Centers for Disease Control (CDC) estimates that approximately one in six Americans, or approximately 48 million people, will be affected by foodborne illnesses yearly. Approximately 128,000 of these people are hospitalized and 3,000 people die (Centers for Disease Control and Prevention, 2016). Most foodborne illnesses are caused by eight known pathogens. *Campylobacter* and *Salmonella* pathogens are in the top five of the pathogens that cause humans to become sick, hospitalized or die (Centers for Disease Control and Prevention, 2016). The United States Department of Agriculture's Food Safety and Inspection Service has found that raw and undercooked poultry and eggs are often associated with *Campylobacter* and *Salmonella* (2015). However, agricultural education can do its part to reduce these instances by educating youth and consumers on how to reduce their risk of foodborne illness from *Campylobacter* and *Salmonella* pathogens by safely purchasing, storing, handling and preparing poultry products and eggs.

Historically, students were taught new agricultural practices by participating in youth clubs (i.e. Corn Clubs, FFA, 4-H) with the goal that they would share their knowledge with their parents (Urichio, Moore, & Coley, 2013). When youth demonstrate the success of learning a farming practice, adults are more likely to adopt the practice (Rasmussen, 1989). This same concept can be used in high school agricultural education and food safety lessons. Students in agricultural education can share what is learned in the classroom about food safety knowledge and practices with their families, friends and others.

The Poultry and Egg Education Project (PEEP) is a USDA-funded, research-based educational program that produced a curriculum comprised of consumer-focused, impactful messages addressing poultry and egg safety practices (Godwin & Ricketts, 2018). The intention of the PEEP curriculum was to inform and educate consumers how to better store, handle, and prepare raw poultry and eggs to reduce illnesses and deaths from *Salmonella* and *Campylobacter* (Godwin, 2015). Agricultural education in Tennessee has faced many recent changes, including those based on the integration of the Common Core Standards Initiative to the Complete College

Tennessee Act. Agricultural education teachers in Tennessee cover a diversity of topics, from floriculture to poultry (Tennessee FFA, n.d.). It is important to use curricula that are relevant, rigorous and applicable in content, and by gathering feasibility data from teachers related to food safety courses, lessons, and integration, PEEP can focus its curriculum development.

The theoretical framework identified for determining agricultural education teachers' interests, intentions, and integration of food science/safety, specifically poultry and egg education, includes the Concerns-Based Adoption Model (CBAM) (Hall & Horde, 1987) and Ajzen and Madden's (1986) Theory of Planned Behavior (TPB). According to CBAM, teachers have concerns that need to be answered before they can adopt or make any other decisions about a particular curriculum or curriculum component. In fact, CBAM also posits that the teacher is the central figure in a complicated adoption-decision process. Validation research indicates "that successful implementation of [programs] depends on teachers' participation and comfort level of the initiative" (Mugweni, 2012, p. 78). According to TPB, teachers' behavior is directly influenced by their intention to perform the behavior, and their intentions are influenced by behavioral beliefs (e.g., positive or negative beliefs about integrating a food safety lesson), subjective norms, and behavioral control (e.g., perceptions about how well qualified a teacher might be to teach a certain food safety topic).

Purpose and Objectives

The purpose of this study was to determine agricultural education teachers' interests, intentions, abilities, and levels of integration in an effort to disseminate potentially life-saving information in the secondary agricultural education curriculum, specifically through the new Food Science pathway in Tennessee, but also through other pathways and courses not directly related to food science. The following four objectives guided this study:

1. Describe teacher interests and intentions regarding the new Food Science and Safety pathway being introduced by the state of Tennessee.
2. Identify current and expected ways that food science/food safety integration that could take place in current courses and topics being taught.
3. Describe teacher perceptions of the importance level of, and their competence in, teaching food safety practices, and identify the teacher education/training priorities of five food safety practices.
4. Identify types of teaching resources that teachers would most like to use if they integrated lessons on poultry and egg food science and safety.

Methods

The population being studied included all agricultural educators in Tennessee. Data were collected from educators attending the FFA Convention. This descriptive study utilized the survey research method. The researcher-developed instrument contained 20 items, including six items related to participants' current teaching experiences and views on food science pathways. There were five items related to food safety practices that teachers were asked to rank by importance and then rank their own ability level in applying these practices. Level of importance was measured on a five-point summated rating scale (i.e. Likert-type), in which 1=*not at all important*, 2=*somewhat*

important, 3=neither important nor unimportant, 4=somewhat important, and 5=very important.

Teachers' ability levels in these five food safety practices was also measured with a five-point scale, in which 1= *not at all qualified*, 2=*somewhat qualified*, 3=*neither qualified nor unqualified*, 4=*somewhat qualified* and 5=*very qualified*. Teachers were asked seven food-safety knowledge questions related to the proper handling and preparation of raw poultry and eggs in the home. Six questions were formatted as multiple-choice, and one question was true or false. Lastly, a demographic section collected data related to participants' gender, age, name of current school, years of teaching experience and number of students in the teachers' FFA chapter.

The instrument was checked and validated for face and content validity by faculty in the College of Agriculture with expertise in Food Science and Safety and Agricultural Education. Analysis was conducted at the item level so construct reliability was established for this researcher-developed instrument.

Upon Institutional Review Board (IRB) approval, researchers administered instruments in person at the state FFA convention and electronically via the university Qualtrics account. At the state FFA convention, we had an educational display related to food safety at the convention's career /trade show. When teachers visited the display, we asked them to complete the questionnaire. This approach did not yield a large enough portion of teachers in Tennessee, so the instrument was loaded onto Qualtrics Survey Software and an email was sent to teachers following the convention. A total of 89 educators completed the surveys out of a possible 339 teachers in the state. Data were analyzed using Qualtrics, Microsoft Excel, and IBM® SPSS® Statistics 24.0. Descriptive statistics conducted included mean-scale scores and standard deviations, frequencies, percentages, median and mean-weighted discrepancy scores.

Results

Teachers indicated that many of the courses they planned to teach should incorporate lessons pertaining to food safety. Some of these courses included: *Agricultural Science*, *Large Animal Science*, *Greenhouse Management*, and *Veterinary Science*. While most teachers expressed interest and felt qualified to teach the new Food Science pathway, there were others who failed to express an interest. The results also showed many teachers looked for and used a variety of educational resources related to food safety to integrate in their lessons.

The teachers' demographic background was reported as being majority male ($n=55$, 71%) and female ($n=22$; 29%). The mean age was 40 years old, and 14 was the mean for years of teaching experience. There were a total of 62 high schools represented from across Tennessee. The FFA chapters ranged in size from 20 to 375 members with a median member size of 88.

Teachers were asked to select, from a list of all known courses, the courses that they were currently teaching. They were also asked to select, from a list of all courses, the ones they thought could be related to food science and food safety. The most frequent course offered by teachers in Tennessee was *Greenhouse Management* ($f=38$), followed by *Agriscience* ($f=36$), and then *Small Animal Science* ($f=27$). There were twenty responses noted as *other* for the question seeking to determine if current agriculture courses were being taught. Thirteen of these responses were categorized as *Agricultural Mechanics* and three of the responses were categorized as *Agricultural Engineering*. Five *other* responses were recorded as *Alternative Energy*, *Work-based Learning*,

Co-op, Floral Design, and Leadership. Frequencies and percentages of all courses teachers were currently teaching are listed in Table 1 and ranked from highest to lowest frequency.

Table 1
Courses Taught by Teachers in the Current Year

Course	<i>f</i>	%
Greenhouse Management	38	49
AgriScience	36	46
Small Animal Science	27	35
Agricultural Power & Equipment	24	31
Veterinary Science	24	31
Livestock Management	23	29
Principle of Agricultural Science	22	28
Landscaping & Turf Science	21	27
Wildlife Management & Recreation	21	27
Other	20	26
Horse Science	18	23
Advance Principle of Agricultural Science	11	14
Forestry Management	11	14
Plant & Soil Science	11	14
Agricultural & Bio systems Engineering	8	10
Org Leadership & Com	8	10
Principle of Horticultural Science	8	10
Supervised Agricultural Experience	7	9
Floriculture	6	8
Intro to Agricultural Science	6	8
Agricultural Business & Finance	5	6
Aquaculture & Hydroponics	5	6
Advance Hydroponics	4	5
Agric. Food & Nat Resources	4	5
Animal Biotechnology	2	3
Plant Biotech	2	3
Advance Aquaculture Science	1	1
Exploring Agricultural Science	1	1
Principles of Agribusiness	1	1
Advance Principles of Meat Science	0	0
Agricultural Economics	0	0

In Table 2 a summary of teachers' responses when asked what courses they planned to teach during the coming school year is provided. They were again given the option of selecting from a list of courses all that applied. The course with the most frequent response was *AgriScience* ($f=51$). The next most frequent response was *Greenhouse Management* ($f=36$), followed by Large Animal Science ($f=34$). There were four responses reported as *other*, which included *Alternative*

Energy, Agricultural Engineering, Work-based Learning, and Introduction to GIS.

Teachers were asked how interested they would be in teaching the new Food Science pathway. Half of the respondents indicated they were somewhat interested in the Food Science pathway ($f = 39$, 50%) followed by 21% ($f = 16$) stating they were not at all interested. A total of 18% ($f = 14$) reported being somewhat interested and 12% ($f = 9$) were very interested.

Teachers were then asked how qualified they would be to teach the Food Science pathway. Thirty-three (43%) reported they were somewhat qualified, while 27 (35%) reported being somewhat unqualified. Nine teachers (12%) indicated they were very qualified, and eight (10%) indicated they were not at all qualified.

Table 2

Percentage of Courses Teachers Planned to Teach in the Coming Year

Course	<i>f</i>	%
AgriScience	51	68
Greenhouse Management	36	48
Large Animal Science	34	45
Small Animal Science	33	44
Landscaping & Turf Science	31	41
Veterinary Science	27	36
Principles of Agricultural Mechanics	25	33
Agricultural Power & Equipment	21	28
Org Leadership & Communication	16	21
Nat Resources Management	12	16
Principles of Plant Science & Hydroculture	12	16
Agricultural & Biosystems Engineering	11	15
Agricultural Business & Finance	11	15
Applied Environmental Science	11	15
Plant & Soil Science	9	12
Supervised Agricultural Experience	8	11
Agricultural Food, & Nat Resources	6	8
Principles of Agribusiness	6	8
Food Science & Safety	4	5
Introduction to Agricultural Science	4	5
Other	4	5
Principles of Food Production	3	4
Advance Food Science	2	3

Note. % is out of 75 respondents. There were 377 total responses.

Respondents were then asked which of the courses they believed could integrate lessons in food safety. *Food Science and Safety* received the most responses ($f = 71$), with 92% of respondents

choosing this course. *Advanced Food Science* received the second most responses ($f = 67$), with 87% of the respondents choosing this course. *AgriScience* received the third most responses ($f = 65$), with 84% of the respondents choosing this course (See Table 3).

Table 3

Teachers Who Believed Food Safety Could be Integrated (in each course)

Course	<i>f</i>	%
Food Science & Safety	71	92
Advanced Food Science	67	87
AgriScience	65	84
Agriculture Food & Nat Resources	61	79
Principles of Food Production	57	74
Large Animal Science	42	55
Intro to Agricultural Science	41	53
Greenhouse Management	33	43
Principles of Plant Science & Hydroculture	33	43
Veterinary Science	31	40
Plant & Soil Science	29	38
Supervised Agricultural Experience	27	35
Agricultural & Biosystems Engineering	24	31
Agricultural Business & Finance	22	29
Applied Environment Science	20	26
Principle of Agribusiness	19	25
Small Animal Science	18	23
Nat Resources Management	13	17
Org Leadership & Communication	12	16
Landscaping & Turf Science	4	5
Principles of Agricultural Mechanics	3	4
Agricultural Power & Equipment	2	3
Other	1	1

Note. % is out of 88 total respondents. There were 695 total responses.

Regarding poultry and egg food safety specifically, respondents were asked to rate the importance of key food safety practices, and their ability or competence in key food safety practices. Table 4 shows mean weighted discrepancy scores (MWDS) ranked from highest to lowest, calculated to identify the areas of greatest need for professional development (McKim & Saucier, 2011). It was found that teachers have the most in-service needs for *Proper handling of raw poultry or eggs in the home to prevent transfer of harmful bacteria to other food/surfaces* (M=4.84 Importance; M=3.83 Ability) and *Creating a clean and safe environment for slaughter and packaging* (M=4.84 Importance; M=3.58 Ability). Using a thermometer when cooking poultry and eggs to determine if the final product is cooked completely and safely was indicated the lowest importance and ability by teachers.

Table 4

Importance, Ability, and Mean Weighted Discrepancy Scores of Food Safety Skills (n = 77)

Item	Mean Importance	Mean Ability	MWDS
How to safely transport packaged food to market	4.73	3.34	5.60
Creating a clean and safe environment for slaughter and packaging	4.84	3.58	5.31
How to safely store packaged food products while at market	4.79	3.53	5.21
Proper handling of raw poultry or eggs in home to prevent transfer of harmful bacteria to other food/surfaces	4.84	3.83	4.39
Using a thermometer when cooking poultry and eggs to determine if the final product is cooked completely and safely	4.52	3.74	3.22

In Table 5 there is a list of teachers' knowledge of relevant food safety practices related to poultry and eggs. Teachers were most knowledgeable of the importance of hand washing after handling poultry and eggs (99%) and of using a thermometer to determine whether or not whole chickens and turkeys are done, or safe to eat. However, teachers were less knowledgeable of the fact that a thermometer should also be used with ground turkey (67%) and egg dishes (33%). Ninety-two percent of the respondents knew that the bottom shelf of a refrigerator, with a plate or pan under the meat, was the safest place to store poultry. Teachers mostly (88%) understood that an appliance thermometer designed for refrigerators and freezers was the best way to ensure a safe temperature. Most (86%) also knew that the refrigerator was the safest way to thaw frozen poultry. Only 62% knew that 165 degrees Fahrenheit was the safe temperature for cooked poultry.

Table 5

Frequency (f) and percent (P) of correct responses by teachers to knowledge questions (n = 77)

Item	f	%
What is the best way to ensure the refrigerator is at a safe temperature?	69	88
When storing raw poultry in the refrigerator, is it best to store the product on the bottom shelf with a plate or pan underneath the packaging?	71	92
Which of the following is the safest way to store eggs?	59	76
After handling raw eggs or poultry, you should do what?	75	99
Which of the following listed below are safe ways to thaw frozen chicken before cooking?	66	86
Should a cooking thermometer be used on whole chickens or turkeys to determine if the final product is cooked completely and safely?	76	99
Should a cooking thermometer be used on chicken parts, such as breast or thighs to determine if the final product is cooked completely and safely?	61	79
Should a cooking thermometer be used on ground turkey to determine if the final product is cooked completely and safely?	51	67

Should a cooking thermometer be used on egg dishes to determine if the final product is cooked completely and safely?	25	33
The internal temperature of a poultry product should be (165 degrees F) to ensure it is cooked completely and safely.	46	62

Teachers were asked the question, “*When teaching food safety pertaining to poultry and eggs, which of the following educational resources would you like to incorporate into your lesson/lessons?*” Five choices were provided, which included: videos, written information, pictures, charts, diagrams and other. Video was the most popular choice (96%). A total of 78 respondents provided 354 responses to the question. There were 13 *other* responses for resources that would be helpful. Nine of the other responses were for additional forms of hands-on learning and demonstrations, and one response for HACCP training materials. Results are provided in Table 6.

Table 6

Teachers’ Choices for Food Safety Educational Resources (n = 77)

Resource	<i>f</i>	%
Videos	75	96
Pictures	69	88
Written info	66	85
Diagrams	66	85
Charts	65	83
Other, please explain	13	17

Conclusions

Foodborne illnesses affect about 48 million people (Centers for Disease Control and Prevention, 2016). Raw and undercooked poultry and eggs are often associated with foodborne illnesses (USDA, 2015). Educating consumers about safe egg and poultry packages is an important method for reducing foodborne illnesses. While the topic is important for all to be aware of, our study shows that, at least in secondary agricultural education, courses related to food safety are not being taught. The Tennessee Department of Education supports educating students about the importance by adding a new pathway in Food Science to the state agricultural education curriculum. This will involve requiring high school teachers to teach food science and food safety.

This pathway has the potential to educate students about food safety, and ultimately reduce foodborne illnesses. But, when we asked teachers what courses they planned to teach, only five percent had plans to teach *Food Science and Safety*; only three percent planned to teach *Advanced Food Science*. More teachers indicated they would integrate the lessons and materials developed as part of this project into other courses. These findings support the Concerns-Based Adoption Model (CBAM), which reports that teachers will have concerns that need to be answered before they can adopt or make any other decisions about a particular curriculum or curriculum component. It is important to understand teachers’ concerns regarding new curricula in food safety skills and lessons so Tennessee State University and others involved in curriculum development in the state

can help guide the discussion and develop curriculum to educate the public.

In addition to foods courses, teachers felt food science and food safety education could be best integrated into Agriscience and Agriculture, Food, and Natural Resources (AFNR), two introductory-level courses. Interestingly, there were no agriculture courses into which teachers felt food science/food safety could not be integrated.

In this study, agricultural education teachers indicated that many of the courses they planned to teach should incorporate lessons addressing food safety. Most expressed an interest in, and felt qualified to teach, the new Food Science pathway. They also felt that it was very important to incorporate different subject areas dealing with poultry and egg food safety into their curriculum. Agricultural education teachers are perfectly positioned to educate about food safety, as students often share what is learned in the classroom with family, friends and the community. While the United States' food supply is among the safest in the world, we must not forget that consumers are becoming increasingly concerned with the safety of the food supply as the number of food recalls and the related media coverage has increased (Williams-Whatley, Doerfert, Kistler, & Thompson, 2005). This type of social norm fits into Ajzen and Madden's (1986) Theory of Planned Behavior (TPB) pointing out that behavior is directly influenced by intention to perform the behavior, behavioral beliefs, and behavioral control. In other words, food safety is an area where Tennessee teachers can make a significant difference, given the findings of this study and the current social norms.

Related to the poultry and egg food-safety concepts that come from the bench science portion of our project, teachers had the greatest in-service training needs for “ways to teach their students to safely transport food to markets,” “create clean and safe environments for slaughter and packaging,” and “safely store packaged food products at market.” Koundinya and Martin (2010) conducted a similar study to determine the food safety in-service educational needs of agriculture teachers in Iowa. They found that a majority of agriculture teachers reported a need for in-service education in general food safety. The teachers specifically reported the in-service education focus on foodborne illnesses, food safety, bacterial contamination, food irradiation, food processing and pesticide pollution. Once educators are knowledgeable on these topics, they are better positioned to educate their students.

The last objective was to determine which resources teachers thought would be most effective for sharing food safety knowledge related to poultry and eggs. “Videos” was the resource they thought would be most effective, which is good since a reported educational product for this project was the use of videos to support lesson plans.

Learning safe food practices at an early age is beneficial in the long run, and ensuring that all students receive food safety education is critical (Food and Drug Administration [FDA], 1998). Young people, especially, should be the target for education in agriculture because people tend to shape their perceptions at an early stage, and changing those perceptions becomes more difficult later in life (Holz-Clouse & Jost, 1995).

Recommendations/Implications

The goal of the Poultry and Egg Education Project (PEEP) was to develop a curriculum to

educate consumers about poultry and egg food safety, thereby reducing the risks related to foodborne illnesses. High school agricultural education in Tennessee adoption of a new Food Science pathway will allow this opportunity. If the Food Science pathway utilizes the PEEP curriculum and lessons, teachers, students, and others may apply important information that could save their lives.

It is important for Tennessee State University professors to gain a better understanding of areas of concern in food science and food safety if agricultural education is going to make a significant contribution to reducing foodborne illness and death. Once these areas are identified, Tennessee University will have the opportunity to revise lessons that have been developed, or develop courses which will improve the preparation of current and future agricultural education teachers about food science and food safety.

To make more teachers aware of the Food Science and Safety Pathway, and to make them more aware of ways to integrate food science and safety in current pathways and courses, in-service education should be developed and disseminated via teacher workshops and video (live and archived).

Lastly, a replication study that seeks responses from the entire [state] agriculture-teacher population is needed to gain more information about their knowledge, intentions and ultimately, behavior related to teaching food science and safety, specifically those related to poultry and eggs.

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**An Analysis of Rural North Carolina Superintendents' Views Regarding the Presence of
Future Ready Graduate Attributes within the Instructional Environment**

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An Analysis of Rural North Carolina Superintendents' Views Regarding the Presence of Future Ready Graduate Attributes within the Instructional Environment

The purpose of this research study was to determine the extent to which future ready graduate attributes are found within the instructional environment of North Carolina's rural public-school districts, as perceived by their respective superintendents. In relation to the teacher awareness of future ready graduate attributes, it was recognized by Superintendents that teachers appeared to be aware of the majority of the attributes, with the only exception being the attribute of multi-lingual being found to have limited awareness by teachers. Regarding teachers' reinforcement of the future ready graduate attributes in the instructional environment, the attributes of multi-lingual, health-focused life-long learner, and self-directed responsible worker, were noted to be reinforced "to a limited extent". Superintendents ascertained that students displayed limited awareness of the future ready attributes of multi-lingual, financial literate citizen, and being a self-directed responsible worker.

Introduction

The guiding vision of the North Carolina State Board of Education (2016) stated "every public-school student will graduate from high school globally engaged and prepared for work and postsecondary education, in order to be a productive citizen." In addition, the previous mission statement similarly noted "every public-school student will graduate from high school, globally competitive for work and postsecondary education, and prepared for life in the 21st Century" (North Carolina State Board of Education, 2006). With 80 of North Carolina's 100 counties considered to be rural, which is defined as having 250 people per square mile or less, the majority of the state's school systems or local education agencies (LEA), geographically reside in these areas (The Rural Center, 2014). Thus, the aforementioned mission statements have major implications for education in rural North Carolina. Fourteen of the remaining counties are considered to be regional city/suburban counties (population densities between 250 – 750 people per square mile) and six counties classified as urban (population densities between 750 - 1,933 people per square mile) (The Rural Center, 2014).

American Rural Education Overview

According to the National Association of State Boards of Education (2015) one-third of the United States' approximately 100,000 public school districts are in rural regions. These schools collectively serve nearly 12 million students, roughly a quarter of all-American students. The racial and ethnic diversity of students in rural schools is on the rise, with 26.7 percent of all rural public-school students coming from a minority group. A large number of students in this group currently lives below the poverty line throughout the country. The overall complexity of culture and demographic diversity within rural schools today will require expanded public understanding and policy attention. Many challenges and aspects shape the backdrop of rural schools such as persistent poverty, diversity, multiple cultural identities, and isolation that is often due to geography, culture, and lack of broadband. Further, rural schools are faced with the mounting requirements to address new educational reforms and administrative tasks as are urban schools; although, with more limited staff and overall resources.

Currently, rural schools do have more access to technology than in the past, which allows students access to courses not geographically available in their respective locality. However, there are still major disparities that exist in rural schools in relation to technology access (National Association of State Boards of Education, 2015). Marre' (2014) indicated that in surveys taken by the U.S. Census Bureau between the years 2008 -2012, the segment of the rural working-age population (ages 25-64), with a college degree or higher was 14 percentage points lower as compared to urban areas. The aforementioned assessment also included a section of the adult population with a 4-year degree being two percentage points higher when considering the rural-urban gap. The concept of educational attainment, an indicator of the stock of human capital in a community or region, remains a great factor affecting the growth and prosperity of local economies in both rural and urban areas (Marre', 2014). According to Marre' (2014) American rural communities are experiencing a declining younger population, with its young educated population opting for more affluent suburban and urban areas, where opportunities abound and social outlets are available. One aspect that has been cited to address the educational gap in rural communities is the enhancement of rural community colleges and distance learning opportunities (Marre', 2014).

North Carolina Rural Education Overview

The future success of North Carolina and in particular rural North Carolina will be directly tied to the success and reinvestment of its young people in their respective communities (N.C. Rural Economic Development Center, 2011). Overall, low educational attainment has been one major issue facing rural economic development (Marre', 2014). According to the (North Carolina Rural Economic Development Center, 2013) there was a time when North Carolinians could obtain good jobs to support a family without the completion of high school, but with changes in North Carolina's industrial and economic profile over the past twenty years, this is no longer a possibility. This possibility of employment security without advanced training is disappearing quickly from the landscape. The economy of today demands an education beyond high school. Rural North Carolina can only build this future economy if the state has an adequately trained workforce. Surveys are showing that today's rural North Carolina students are increasingly seeing the value of obtaining an education post high-school (The Rural Center, 2015). In 2011, 84 percent of rural high-school seniors in North Carolina planned to pursue some type of formal education beyond high school, with another five percent planning to enter the military (N.C. Rural Economic Development Center, 2011). However, the challenge still remains that many of these students are living in communities with a low-tax base and resulting in lack of support for the educational system. Moreover, many parents within these communities lack the educational background to assist their children with pursuing educational aspirations or the understanding of what it entails to achieve higher education and other career training opportunities (The Rural Center, 2015).

According to The Rural Center (2015) the educational attainment of rural North Carolina adults has improved at a steady pace since 2000 with just 18 percent of rural North Carolinians over the age of 25 having less than a high school diploma, and 32 percent possessing a high school diploma, in comparison to 34 percent of adults in regional city/suburban counties having a high school diploma; and 31 percent in urban counties. With regard to higher education, 18 percent of rural North Carolina adults have a bachelor's or advanced degree; with 32 percent having either

an associate degree or some college experience (Rural Center, 2015). North Carolina ranks near the top in comparison to other states in terms of the largest rural enrollments, with only Texas surpassing North Carolina. In 13 states nearly one-third of all students were enrolled in rural school districts, with North Carolina topping the list in 2013 (Johnson, Showalter, Klein, and Lester, 2014). Additionally, North Carolina is classified as a state where more than one third of the rural students are students of color (Johnson, Showalter, Klein, and Lester, 2014). The states of Texas, North Carolina, and Georgia, with the largest rural minority enrollments, service one-third of all rural minority students in the United States. With regard to English language learners (ELL), 18 states have ELL rates above the national average in the following descending order: New Mexico, Alaska, Washington, Oregon, Texas, Nevada, Idaho, North Carolina, Florida, Colorado, Arizona, Utah, Delaware, South Carolina, Wyoming, South Dakota, Montana and Arkansas (Johnson, Showalter, Klein, and Lester, 2014).

With regard to the state of education in rural North Carolina, since 2006, rural high school graduation rates have improved nearly 20 percent (The North Carolina Rural Economic Development Center, 2013). Overall this brings the four-year rural graduation rate to 78 percent and puts rural students on even ground with their urban counterparts. Interestingly, the highest graduation rates are in rural counties. The greatest urban graduation rate in 2011, Orange County, was 86 percent, with six rural counties experiencing higher rates. In contrast, the high school graduation rates were below 70 percent in eight rural counties, with no urban counties reporting numbers lower than 70 percent (The North Carolina Rural Economic Development Center, 2013).

Theoretical Framework

Human Capital Theory

Scholars differ on how human capital is defined. Goode (1959) defined human capital as the knowledge, skills, attitudes, aptitudes, and required traits contributing to overall production. Van Loo and Rocco (2004) indicated human capital should be considered an investment in human resources for employees to possess the necessary “skills and knowledge” (p. 99), while Swanson (2001) defined human capital as an investment in people. Both Van Loo and Rocco and Swanson indicate that this investment is often used to enhance knowledge and skills of employees in hopes of increasing worker output. The economist Gary Becker introduced the human capital theory in 1962. In his book, *Human Capital* (1993), Becker stated that “education and training are the most important investments in human capital” (p. 17).

Bowles, Gintis, and Osborne (2001) stated that human skills represent individual capacities contributing to production as an argument in the production function. Blundell, Dearden, Meghir, and Sianesi (1999), found that there are two main components of human capital that are highly correlated: early ability (whether acquired or innate) and skills acquired through formal education or training on the job. It is important to note that human capital greatly differs from other assets, essentially because it yields market returns only in proportion to the worker’s supply of labor (Hall and Johnson, 1980). According to Becker (1993), the human capital theory is the most influential economic theory of western education.

Expert Oriented Model Theory

The Expertise-Oriented approach relies primarily on professional expertise to judge the quality of an institution, program, product or activity (Fitzpatrick, Sanders, & Worthen, 2011). Some professional judgment is involved in all evaluation approaches, but the expertise-oriented approach uses the reliance on professional expertise as the primary evaluation strategy. A professional or expert would be someone who can offer the most knowledge needed to evaluate the program, institution, or agency. The expertise-oriented approaches to evaluation have emphasized the central role of expert judgment, experience, and human wisdom in the evaluative process and have focused attention on such important issues as whose standards (and what degree of transparency) should be used in rendering judgments about programs (Fitzpatrick, Sanders, & Worthen, 2011). This study relied on the input of North Carolina Public School Superintendents in rural areas, to provide their expert opinions in relation to the study objectives.

SCANS Report

The Department of Labor conducted a study, in May of 1990 to gauge how well schools prepared young people for the work force (Secretary's Commission on Achieving Necessary Skills, 1991). This was a historic event in that it was the first time American businesses were given a voice to clearly state to educators what students needed to know to be successful in the workplace. A major goal of the report was to present the necessary functional and enabling skills that society must offer to every child by age 16 (Secretary's Commission on Achieving Necessary Skills, 1991). The SCANS report consisted of a three-part foundation component and five workplace competencies. The three foundation skills were Basic Skills (Reading, Writing, Arithmetic/Mathematics, Listening, Speaking), Thinking Skills (Creative Thinking, Decision-Making, Problem Solving, Seeing Things in the Mind's Eye, Knowing How to Learn, Reasoning), and Personal Qualities (Responsibility, Self-Esteem, Sociability, Self-Management, Integrity/Honesty).

Also, the report provided five competencies that effective workers must acquire: (1) Resources (Time, Money, Materials and Facilities, Human Resources); (2) Interpersonal skills (Participate as a Member of a Team, Teach Others New Skills, Serve Clients/Customers, Exercise Leadership, Negotiate, Work with Diversity); (3) Information Management (Acquire and Evaluate Information, Organize and Evaluate Information, Interpret and Communicate Information, and Use computers to Process Information); (4) Systems (Understand Systems, Monitor and Correct Performance, Improve or Design System); and (5) Technology (Select Technology, Apply Technology, and Maintain and Troubleshoot Equipment). All of the aforementioned competencies cited in the report are foundational competencies that are directly embedded within the Future Ready Graduate Attributes being analyzed for this study. The skills sets identified within the SCANS Report are skill sets that are seen as fundamental foundational tools needed for success in all work venues, and thus have high applicability for workplace success in the 21st Century global society.

Future Ready Graduate Attributes

In order to prepare students for life and work in the 21st Century Economy, the North Carolina State Board of Education in the mid 2000's adopted the Partnership for 21st Century

Learning Framework (2017), which in their mission states that it was founded to “serve as a catalyst for 21st century learning to build collaborative partnerships among education, business, community and government leaders so that a learners acquire the knowledge and skills they need to thrive in a world where chance is constant and learning never stops.” To provide more specific guidance and clarity The North Carolina State Board of Education adopted the following seventeen attributes as characteristics that a future ready graduate should possess: Science Savvy, Effective Problem Solver, Strong Team Contributor, Critical Thinker, Financially Literate Citizen, Literate Consumer of Media, Curious Researcher, Capable Technology User, Creative/Innovative Thinker, Proficient Reader, Effective Communicator, Self-Directed Responsible Worker, Skilled Mathematician, Relationship Builder, Knowledgeable Global Citizen, Health-Focused Life-Long Learner, and Multi-Lingual (North Carolina Principals and Assistant Principals Association, 2016).

Superintendents of the public-school districts are ultimately responsible for ensuring the aforementioned mission statements are achieved; however, no current research has been conducted to examine how superintendents perceive their respective rural LEA is performing in preparing students with the Future Ready Graduate Attributes, as adopted by the North Carolina State Board of Education. Given this, the researchers of this investigation, sought to achieve the goal of determining the North Carolina rural superintendents’ views regarding Future Ready Graduate Attribute preparation within their LEA.

Purpose and Research Questions

The purpose of this research study was to determine the extent to which Future Ready graduate attributes are found within the instructional environment of North Carolina’s rural public-school districts, as perceived by their respective superintendents. The following research questions provided the overall foundation of this respective study:

1. What are the perceptions of North Carolina rural public-school superintendents in relation to what extent teachers in their respective LEA are aware of Future Ready Graduate Attributes?
2. What are the perceptions of North Carolina rural public-school superintendents in relation to what extent teachers in their respective LEA reinforce Future Ready Graduate Attributes within their daily instructional environment?
3. What are the perceptions of North Carolina rural public-school superintendents in relation to what extent students in their respective LEA display Future Ready Graduate Attributes?

Methodology

The population for this descriptive survey research study consisted of 100 of the 115 North Carolina Public School Superintendents. The 100 Superintendents were selected from districts that are considered to be rural. For this study, an original survey was created adapted by the study researchers and modified from studies conducted by Graham (2001), and Alston, Cromartie, Warren-English, and Wakefield (2009). The survey instrument consisted of four sections: Section I. Teachers Awareness of Future Ready Graduate Attributes, Section II. Teachers Reinforcement

of Future Ready Graduate Attributes in Daily Instruction, Section III. Student Demonstration of Future Ready Graduate Attributes, and Section IV. General Demographic Information. This manuscript focused on data from the first three sections of the survey. Sections I – III consisted of the 17 Future Ready Graduate Attributes as adapted by the North Carolina State Board of Education in 2007. For each characteristic, respondents selected one response from a five-point summated scale (i.e. Likert-type) with the following responses: Not At All = 1.00 – 1.49, To a Limited Extent = 1.50 – 2.49, To An Acceptable Extent = 2.50 – 3.49, To a Great Extent = 3.50 - 4.00.

The validity of the instrument was established by means of content and face validity. Brown (1983) defined content validity as “the degree to which items on a test representatively sample the underlying content domain” (p. 487). Brown recommended using expert judges as one means of establishing content validity. The panel of experts consisted of faculty within the school administration graduate program at the principal investigator’s respective institution, who have experience in training upper level public school executives. All faculty were tenured that served on the expert judges panel. Face validity was established with the aid of a panel of experts in the area of teacher education and administration. In order to establish the reliability of the survey instrument, a pilot test was conducted with a combination of superintendents not included in the final survey population in addition to some principals for a total of twenty individuals. Chronbach’s alpha was used as the reliability measure for this study. For this study it was determined that measures of at least .85 were considered satisfactory, after a review of literature in some other areas of social science research (Schmidt & Hunter, 1996). Chronbach’s alpha reliability coefficients for the survey were as follow: Section One = 0.92, Section Two = 0.91, and Section Three = 0.89. No adjustments were made to the survey as result of the reliability analysis.

A three-round web-based questionnaire was used for this study. Elements of Dillman, Smyth, and Christian’s (2009) Tailored Design Method were utilized to achieve an optimal return rate, given its wide usage in social science research, and proven methodology. An initial letter informing the potential respondents that they would be receiving an invitation by email with a link to the study survey was sent approximately two weeks before the survey email was sent. By the end of one week, 20 surveys had been received. After week one had passed a reminder email was sent and by the end of week two, 11 more responses had been received. A final email was sent, yielding seven more surveys. The final response rate was 38% (N = 38). Given the size of the population, researchers deemed this response rate acceptable (Fan & Yan, 2010; Lance, Butts, & Michels, 2006). In order to control for non-response error Lindner, Murphy, and Briers (2001) and recommended comparing early to late respondents. Research has shown that late respondents are often similar to non-respondents. For this study early was defined as respondents within the first week of the survey, with late being defined as any responses received after this point. No significant differences were found in this study among the seventeen total variables that were analyzed.

Findings

Table 1 presents the perceptions of respondents with regard to the extent to which they believe teachers are aware of Future Ready Graduate Attributes. With regard to the attributes of Proficient Reader, Capable Technology User, Effective Problem Solver, Effective Communicator,

Critical Thinker, Creative/Innovative Thinker respondents indicated that teachers were aware of them to an acceptable extent. Moreover, the attributes of Strong Team Builder, Self-Directed Responsible Worker, Skilled Mathematician, Relationship Builder, Science Savvy, Literate Consumer of Media, Health-Focused Life-Long Learner were found to be at an acceptable level, as related to teacher awareness of them. Pertaining to the awareness of teachers regarding the attributes of Effective Communicator, Self-Directed Responsible Worker, Skilled Mathematician, Relationship Builder, Knowledgeable Global Citizen, and Health-Focused Life-Long Learner, all were found to be to an acceptable extent. Other variables found to be acceptable were Knowledgeable Global Citizen, Curious Researcher, and Financial Literate Citizen. In contrast to the aforementioned attribute findings, the teachers' awareness level regarding the attribute Multi-Lingual was judged to be to a limited extent.

Table 1

Teacher Awareness of Future Ready Graduate Attributes

Characteristics	NAA (f)	TALE (f)	TAAE (f)	TAGE (f)	Mean
1. Proficient Reader	0	2	16	20	3.47
2. Capable Technology User	0	5	14	19	3.37
3. Effective Problem Solver	0	4	18	16	3.32
4. Effective Communicator	0	5	20	13	3.21
5. Critical Thinker	0	8	16	14	3.16
6. Creative/Innovative Thinker	0	9	16	13	3.11
7. Strong Team Builder	0	10	15	13	3.08
8. Self-Directed Responsible Worker	1	5	22	10	3.08
9. Skilled Mathematician	1	10	17	10	2.95
10. Relationship Builder	1	9	19	9	2.95
11. Science Savvy	0	12	17	9	2.92
12. Literate Consumer of Media	1	10	21	6	2.84
13. Health-Focused Life-Long Learner	1	11	19	7	2.84
14. Knowledgeable Global Citizen	1	11	21	5	2.79
15. Curious Researcher	1	16	17	4	2.63
16. Financial Literate Citizen	2	16	18	2	2.53
17. Multi-Lingual	8	18	11	1	2.13

Scale: Not at All (1) = NAA, To a Limited Extent (2) = TALE, To an Acceptable Extent (3) = TAAE, To a Great Extent (4) = TAGE

Table 2 presents the perceptions of respondents concerning the extent to which they believe teachers reinforce the Future Ready Graduate Attributes, within the daily instructional environment. With regard to the attributes of Capable Technology User, Proficient Reader, Effective Problem Solver, Effective Communicator, and Critical Thinker respondents indicated that teachers reinforced them to an acceptable extent. Moreover, the attributes of Creative/Innovative Thinker, Strong Team Builder, Relationship Builder, Skilled Mathematician, and Literate Consumer of Media were found to be at an acceptable level, as related to teacher's reinforcement of them within the instructional environment. Pertaining to the teachers' reinforcement of the following attributes in the instructional environment: Curious Researcher, Science Savvy, and Knowledgeable Global Citizen were found to be to an acceptable extent. In contrast to the aforementioned findings, respondents indicated that teachers only reinforce the following attributes to a limited extent within the daily instructional environment: Financial Literate Citizen, Health-Focused Life-Long Learner, Self-Directed Responsible Worker, and Multi-Lingual.

Table 2

Teacher Reinforcement of Future Ready Graduate Attributes in the Instructional Environment

Characteristics	NAA (f)	TALE (f)	TAAE (f)	TAGE (f)	Mean
1. Capable Technology User	1	3	16	18	3.32
2. Proficient Reader	0	4	16	16	3.29
3. Effective Problem Solver	0	5	24	9	3.12
4. Effective Communicator	0	7	19	12	3.09
5. Critical Thinker	0	8	20	10	3.06
6. Creative/Innovative Thinker	1	7	17	13	3.06
7. Strong Team Builder	1	8	19	10	3.00
8. Relationship Builder	1	10	17	10	2.94
9. Skilled Mathematician	0	14	15	9	2.91
10. Literate Consumer of Media	0	11	22	5	2.82
11. Curious Researcher	1	12	19	6	2.82
12. Science Savvy	1	11	22	4	2.74
13. Knowledgeable Global Citizen	3	11	18	6	2.73
14. Financial Literate Citizen	2	20	12	2	2.41
15. Health-Focused Life-Long Learner	0	14	19	5	2.29
16. Multi-Lingual	7	16	14	1	2.21
17. Self-Directed Responsible Worker	0	7	18	13	2.12

Scale: Not at All (1) = NAA, To a Limited Extent (2) = TALE, To an Acceptable Extent (3) = TAAE, To a Great Extent (4) = TAGE

Table 3 presents the perceptions of respondents with regard to the extent to which they believe students display the Future Ready Graduate Attributes. With regard to the attributes of Capable Technology User, Proficient Reader, Creative/Innovative Thinker, Effective Problem Solver, and Strong Team Builder respondents indicated that students' display of the attributes was to an acceptable extent. Moreover, the attributes of Relationship Builder, Critical Thinker, Literate Consumer of Media, Curious Researcher, and Effective Communicator were found to be displayed at an acceptable level. The students' display of the following attributes: Science Savvy, Knowledgeable Global Citizen, and Health-Focused Life-Long Learner were found to be to an acceptable extent. In contrast to the aforementioned findings, respondents indicated that student's display of the following attributes was to a limited extent: Financial Literate Citizen, Self-Directed Responsible Worker, and Multi-Lingual.

Table 3

Students' Display of Future Ready Graduate Attributes

Characteristics	NAA (f)	TALE (f)	TAAE (f)	TAGE (f)	Mean
1. Capable Technology User	0	2	17	19	3.44
2. Proficient Reader	0	5	24	9	3.03
3. Creative/Innovative Thinker	0	10	17	11	2.97
4. Effective Problem Solver	0	13	20	5	2.84
5. Strong Team Builder	0	12	22	4	2.84
6. Skilled Mathematician	0	15	16	7	2.84
7. Relationship Builder	0	16	15	7	2.81
8. Critical Thinker	0	14	20	4	2.78
9. Literate Consumer of Media	0	15	18	5	2.78
10. Curious Researcher	0	16	17	5	2.75
11. Effective Communicator	0	16	17	5	2.75
12. Science Savvy	0	15	20	3	2.72
13. Knowledgeable Global Citizen	1	19	15	3	2.53
14. Health-Focused Life-Long Learner	0	22	13	3	2.50
15. Self-Directed Responsible Worker	0	17	17	4	2.49
16. Financial Literate Citizen	0	26	11	1	2.31
17. Multi-Lingual	5	22	11	0	2.10

Scale: Not At All (1) = NAA, To A Limited Extent (2) = TALE, To an Acceptable Extent (3) = TAAE, To A Great Extent (4) = TAGE

Conclusion

In relation to the teacher awareness of Future Ready Graduate Attributes, superintendents perceived teachers appeared to be aware of the majority of the attributes, with the only exception being the attribute of Multi-Lingual. Regarding teachers' reinforcement of Future Ready Graduate Attributes in the instructional environment, the attributes of Multi-Lingual, Health-Focused Life-Long Learner, and Self-Directed Responsible Worker, were perceived to be reinforced to a limited extent. With respect to students display of Future Ready Graduate Attributes the following were perceived to be displayed to a limited extent: Multi-Lingual, Financial Literate Citizen, and Self-Directed Responsible Worker. The Human Capital Theory emphasizes that human capital is the knowledge, skills, attitudes, aptitudes, and required traits contributing to overall production (Goode, 1959). It appears that superintendents perceived that the total Human Capital function is not being developed within the students being served, by the respective school districts. Moreover, the attributes contained within the framework of the Partnership for 21st Century Learning Framework (2017) and endorsed by the North Carolina State Board of Education are not being fully addressed.

The findings on Multi-Lingual attribute are concerning when considering Hornberger (2009) who indicated that in the 21st Century world constructs such as ethnolinguistic diversity and inequality, intercultural communication and contact, and global political and economic interdependence, are major realities of today's world, and for the most part put pressures on the public educational systems. According to the United Nations (2012) multi-lingual education approaches are imperative for the preparation of 21st Century students and professionals. With the increasing diversity of rural and urban communities, it is imperative that schools prepare students with multi-lingual capabilities.

According to Tobin (2000) some of the major foundational elements in effective work systems are self-correcting, self-managing, self-accountable, self-governing behavior, all of which are elements of self-directed learning. Self-directed learning has become increasingly relevant in today's complex workplace where both leaders and employees must assume personal responsibility for their learning. The skill of Self-directed learning within a workplace can encourage employees to actively cooperate with their colleagues, in order to tackle complex and real problems (Webster-Wright, 2009).

The Organization For Economic Co-Operation and Development (2006) indicated that financial education is increasingly important, not just for investors, but for the public at large. Moreover, the inclusion of financial literacy with public school systems, is an essential too needed for life long financial stability and success. Financial Literacy is increasingly becoming imperative for the average family trying to decide how to balance budgets, purchase a home, fund college education, and plan for future retirements.

The National Scientific Council on the Developing Child (2010) indicates that a vital and productive society, with a prosperous future is tied directly to the early and continuing health of its young people. Establishing healthy habits is the foundation for a lifetime of sustained well-being. Within rural areas, where there is disproportionate presence of chronic diseases, the initiation of healthy habits and its inclusion in public schools is imperative.

Implications and Recommendations

Nationally there is difference between school officials' views of the college readiness of students and student performance. School officials estimate that just 63% of their graduating seniors nationally will be sufficiently prepared for college-level coursework without the need for remediation, and moreover that 51% will graduate from college (MetLife, 2011). It has also been found that only 25% of high school graduates who took the ACT in 2012 were ready for college-level work (ACT, 2012). With regard to student preparation there is agreement that students today embarking upon the workforce must exhibit the same kind of high proficiency in academic knowledge and skills as those entering the university (ACT, 2006; Alliance for Excellent Education, 2009; Educational Policy Improvement Center, 2009). According to ACT (2009) teachers at the both the secondary and postsecondary levels believe that the skills and knowledge required for college readiness and career readiness overlap to a great extent.

According to the United States Department of Agriculture (2017) there is a clear link between education and economic outcomes for rural people and their localities. Overall rural Americans are becoming increasingly educated, however these gains vary greatly across demographic groups. Rural women are outpacing rural men in terms of education attainment, with educational attainment among rural whites being higher than that of other racial and ethnic minorities in rural regions (United States Department of Agriculture, 2017). When comparing rural against urban areas, rural areas are still falling behind urban areas in terms of the portion of adults with college degrees. Given the findings of this study, it is imperative that North Carolina's rural school districts prepare students with the requisite knowledge, skills, and dispositions needed for success in today's highly competitive workplace and life in the global society as whole.

Based upon the conclusions and implications from this study, two major recommendations have resulted from this study. The first recommendation is to provide teachers with professional development as related to emphasizing Future Ready Graduate attributes in daily instruction such as Multi-Lingual, Health-Focused Life- Long Learner, and Self-Directed Responsible Worker, in order for them to be reinforced within daily instruction, across curricula. Lastly it is recommended to increase the emphasis on the Future Ready Graduate attributes of Multi-Lingual, Financial Literate Citizen, and Self-Directed Responsible Worker, through effective pedagogical methods. Given the aforesaid statements, effective pedagogical methodologies are critically important in order to better equip Rural North Carolina's public-school students for future workplace success and life overall.

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4-H Wildlife Habitat Education Program: A Qualitative Study in Career Exploration

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4-H Wildlife Habitat Education Program: A Qualitative Study in Career Exploration

Previous studies have documented the Wildlife Habitat Education Program (WHEP) builds life skills of 4-H participants. Furthermore, youth education and development of life skills are enhanced through 4-H educational efforts that provide hands-on learning projects and concepts that ultimately assist in career development (Bandura, Barbaranelli, Caprara, & Pastorelli, 2001; Bourdeau, 2004). The purpose of this study is to describe WHEP participants' perceptions of careers in wildlife management after the completion of the annual program. The central research question guiding this study was how do 4-H members view careers in wildlife management after participating in WHEP? A focus group comprised of nine WHEP participants was conducted at the Tennessee 4-H Wildlife Judging contest to determine participants' perceptions of careers in wildlife management after completion of the annual program. Focus group participants indicated participating in WHEP peaked their interest in wildlife and provided an opportunity to experience the importance of natural resource management. Future research should be conducted on a national level that measures the perceptions of outdoor enthusiasts regarding the fundamentals of wildlife management. This question could give insight on the transfer of knowledge between adults and youth.

Introduction

Participation in 4-H programs has resulted in students taking more science-related classes in high school, which is a direct result of life-skill development in those areas (Heck, Carlos, Barnett, & Smith, 2012). Furthermore, students who have participated in 4-H have shown substantial growth in life-skill development (Diem, 2001). Life skills are competencies that enable youth to function within society (Ratkos & Knollenburg, 2015). Moreover, youth education and development of life skills are enhanced through 4-H educational efforts that provide hands-on learning projects and concepts that ultimately assist in career development (Bandura, Barbaranelli, Caprara, & Pastorelli, 2001; Bourdeau, 2004). Heck, Carlos, Barnett, and Smith (2012) suggested 4-H programming may influence career interest in science-related fields and enable long-term application of content learned. Moreover, career development is a lifelong process of workforce engagement where opportunities are available for professional growth through choosing among employment prospects made available to individuals (Ferry, 2006).

The Wildlife Habitat Education Program (WHEP) has a rich history developed over the past 40 years in Tennessee. After beginning in 1978 (National 4-H Council, 2014), the 4-H Wildlife Judging Contest expanded to a national program in 1989 (Harper, 2015). The national program was named WHEP and is the only national youth program that teaches wildlife and fisheries management with a scientifically based curriculum created and managed by wildlife professionals (Allen, Elmore, & Harper, 2013). More than 10,000 4-H youth have participated in WHEP, and the numbers continue to grow (Harper, 2015). Previous research indicated WHEP participants were more likely to implement wildlife management practices and teach others about wildlife management principles (Allen et al., 2013; Kleist, Moorman, DePerno, & Bardon, 2010). Furthermore, Allen and Elmore (2012) found both youth and adults perceived participation in WHEP had a positive effect on the improvement of life skills, such as teamwork, oral communication, written communication, social skills, decision making, and leadership. Although

WHEP provides life skills, it is not clear if the program stimulates career exploration among participants. More importantly, 4-H professionals must ensure youth are provided opportunities to apply career choices learned in their 4-H project to bring 4-H programs full circle in the education cycle (Carlson & Maxa, 1998).

Purpose

The purpose of this study was to describe WHEP participants' perceptions of careers in wildlife management after the completion of the annual program. The central research question that guided this study was how do 4-H members view careers in wildlife management after participating in WHEP?

Theoretical Framework

Bandura's (1986) social cognitive theory served as the theoretical framework for this study. Social cognitive theory seeks to explain the process of learning and human behaviors (Schunk, 2012). Schunk (2012) explained how the assumptions made by this theory "address the reciprocal interactions among persons, behaviors, and environments; enactive and vicarious learning (i.e., how learning occurs); the distinction between learning and performance; and the role of self-regulation" (p. 119). Furthermore, according to Bandura (1997), individuals have an aspiration "to control the events that affect their lives" and view themselves as an agent (p. 1). A key component of this process is self-regulation, which is "the process whereby individuals activate and sustain behaviors, cognitions, and affects," and these mechanisms work towards the fulfillment of goals (Schunk, 2012, p. 123). Behaviors are associated with self-regulation and how an individual regulates their behaviors affects their achievement of goals (Schunk, 2012).

Individuals who implement a learning-goal orientation have a "higher self-efficacy, task value, and achievement" (Schunk, 2012, p. 431). In the learning process, goals are essential for success as the aspiration provides individuals with "tunnel vision" to accomplish tasks (Schunk, 2012, p. 139). Task value often refers to the students' view of the task. Also, motivation can be achieved through the process of modeling (Schunk, 2012). This process involves individuals observing others who receive rewards as a result of specific actions; therefore, the individuals model those actions observed to achieve the same rewards (Schunk, 2012).

As stated by Schunk (2012), "self-efficacy is a belief about what one is capable of doing; it is not the same as knowing what to do" (p. 146). Self-efficacy is imperative for success (Schunk, 2012). The stronger the student's personal self-efficacy, the greater their efforts and probability of success (Bandura, 1986). What people think, believe, and feel affect their behaviors (Bandura, 1986). The effects of these reactions then determine an individual's thought patterns and emotional reactions (Bandura, 1986). As Extension agents are charged with the full circle of education (Carlson & Maxa, 1998), an agent should strive to develop a learning environment that incorporates the interactions of human behaviors and personal factors as described by Bandura (1986). Therefore, by obtaining an understanding of Bandura's (1986) social cognitive theory, Extension agents can use the theory to enhance their specific programs and improve their facilitation of learning in youth development.

Methods and Procedures

The population for this study was the participants in the Tennessee 4-H Wildlife Judging contest (called WHEP at the national level). The purposive sample consisted of nine participants who were selected based on their 4-H agent's recommendation to represent each region of Tennessee. A purposeful sample uses select participants who can provide relevant information about the topic (Ary, Jacobs, Sorensen, & Walker, 2014) and assumes the investigator wants to gain insight and must select a sample that will provide the most learning opportunities (Dooley, 2007). The nine students who were selected were comprised of senior-high 4-H members, ninth through twelfth grades, who participated in the Tennessee State 4-H Wildlife Judging program and represented the Eastern, Central, and Western Regions of The University of Tennessee Extension.

A semi-structured interview guide was created to provide a clear set of instructions for the interviewer (Ary, et al., 2014). In addition, the semi-structured interview provided the opportunity for identifying new ways of seeing and understanding the topic through the answers of the participants (Ary, et al., 2014). The researcher provided the interview guide to the participants before the focus group session. The benefits of this guide provided the participants with ample time to think about the question before the focus group session but also the freedom to express individualistic views on the topic (Ary, et al., 2014). The focus group participants were asked the following questions:

1. Has your knowledge of wildlife management transformed after participating in WHEP?
2. How has your attitude toward a career in wildlife management changed after participating in WHEP?
3. Have your views on what wildlife professionals actually do changed since participating in WHEP? If so, how?
4. Do you think you are more likely or less likely to pursue a career in wildlife management, given your experiences in this program?
5. What kind of things do you think you would do to prepare for a career in wildlife management?
6. What is a wildlife management career to you?
7. What do you think you do in a career in wildlife management?
8. What are the challenges in preparing for a career in wildlife management?

The researcher served as the moderator during the focus group meetings and directed the dialogue by using open-ended questions from the interview guide that could lead into discussions (Israel & Galindo-Gonzalez, 1992) related to the central research question. The researcher made notes as a second observer collected data on the dialogue and on the interactions between participants of the focus group (Israel & Galindo-Gonzalez, 1992). Also, the researcher directed the interview questions around the purpose and needs of WHEP and the specified characteristic of views towards a career in wildlife (Israel & Galindo-Gonzalez, 1992). The viewpoints expressed within the focus group were tape-recorded and promptly transcribed to maintain accuracy of the focus group discussion (Ary, et al., 2014). Also, data saturation was achieved through the nine participants' responses as responses to the questions were either agreed upon or repeated. Individual participants were assigned a letter by the researcher (A, B, etc.) to protect their identities. The focus group conversation was transcribed and provided a documentation trail for

the data to be analyzed (Ary, et al., 2014). In addition, a reflective log was recorded to capture the researcher's thoughts as they occurred.

After reading through the transcriptions multiple times, the initial researcher and an outside researcher, experienced in qualitative research, utilized thematic analysis to arrive at three common themes that surfaced (Bogdan & Bilken, 2007). The themes that surfaced occurred by coding the transcription of the focus group first by words or phrases that emerged from the conversation (Bogdan & Bilken, 2007). After specific codes were labeled, those codes were placed into categories (Bogdan & Bilken, 2007). The researchers then examined the categories and revisited the literature to arrive at three themes (Bogdan & Bilken, 2007). The three themes developed directly related to What people think, believe, and feel affect their behaviors (Bandura, 1986). The effects of these reactions then determine an individual's thought patterns and emotional reactions (Bandura, 1986). Therefore, the three themes that evolved from this process were participants (a) interest and excitement regarding wildlife management, (b) importance of wildlife professionals, and (c) benefits/challenges to wildlife management.

Triangulation ensured validity throughout the study, maintaining credibility. Triangulation occurs when researchers agree on specific outcomes throughout the study, which yields the same understanding of the outcomes (Bogdan & Bilken, 2007). All documents utilized throughout this study were triangulated, including the interviews themselves, personal observations, and reflections which are also representative of credibility.

To represent dependability of this study and minimize bias during the interview process, a peer reviewer, which is a university-trained faculty member in qualitative studies, scanned for consistency among participant responses, researcher notes, and observations, and served as peer reviewer by facilitating the guidance of both the analysis of data and theme development (Bogdan & Bilken, 2007). To maintain transferability, the use of participant interview responses, the literature review, and reflective notes and observations were utilized (Bogdan & Bilken, 2007). All participants of this study facilitated a check of individual transcripts, establishing confirmability (Bogdan & Bilken, 2007).

Subjectivity Statement

Two researchers were involved in this study: (a) an agricultural leadership and communication master's student and (b) a professor of agricultural leadership and education. The master's student researcher has completed a bachelor's degree in wildlife management and fisheries science. In addition, this researcher is employed as a county extension director with responsibilities in both adult and youth natural resources education. The professor of agricultural leadership and education is a former school-based agricultural education teacher and has recently published works in the areas of leadership, STEM, education, and college instruction. In addition, this researcher has prior experience with qualitative data collection techniques, including facilitating focus groups, and has published qualitative works. Collectively, we believe 4-H members construct attitudes, beliefs and behaviors towards career exploration before they pursue a career. We believe participation in 4-H play a role in member's ability to comprehend life skills, critical thinking skills and setting goals. Furthermore, we believe 4-H can be an asset to the youth's

livelihood by allowing members to apply the newly learned skills in their communities. These beliefs influenced and provided the basis for the theoretical lens of this study.

Findings

The research question was how do 4-H members view careers in wildlife management after participating in WHEP? The participants provided detailed information about their perceptions of a career choice in wildlife management. Many of the responses brought forth deeper understanding of the validity of WHEP. The researcher was able to distinguish the three themes: interest and excitement regarding wildlife management, importance of wildlife professionals, and benefits/challenges to wildlife management.

Interest and Excitement Regarding Wildlife Management

The results showed the focus group in agreement that WHEP peaks an interest in wildlife management and creates excitement about helping wildlife. Two participants gave intricate descriptions of how each participant looked forward to learning more about wildlife management. For example, one of the participants stated, “WHEP definitely piques your interest in wildlife, and this program makes the participants excited, so they tell other people about it.” The consensus of the focus group was the excitement created by WHEP translated to a desire of applicability. Participant B affirmed, “In this program, I have seen there is a lot to learn. WHEP opens the door to do so and to apply what we learn.” Focus group members agreed WHEP was extremely content based and offered a reasoning component that contributed to the interest in the program. Participant A added, “The most difficult part is the reasoning component, but it adds quality to the program. I think the focus shifts to the ability to apply what is learned.”

Importance of Wildlife Professionals

Responses indicated WHEP participants were introduced to wildlife officers, land managers, and wildlife educators. In addition, Participants A, D, E, H, and I indicated WHEP gave a purpose to be in the outdoors. Participant D stated, “This program [WHEP] gave me a practical aspect of going out in the woods and looking at birds and studying animals.” Although the consensus was the participants had experience in wildlife before participating in WHEP, the program gave purpose to wildlife management and demonstrated a need for wildlife management. Participant H mentioned, “I have always been into wildlife, but this gives me a reason to learn about it and how to do something about it.” The participants also stated that each understood the importance of wildlife professionals. For example, Participant H expressed, “I always thought of nature as something that nobody necessarily had to help with, but the more I learn about WHEP and the Tennessee Wildlife Resources Agency the more I understand how important these careers are.”

WHEP introduces a career in the field of wildlife management and other fields of science. According to Participant C, “WHEP gives us some really good connections with the professionals who run the science and wildlife programs and make it fun to learn. This also allows us how to show others what we learned, and the principals involved and how to treat the resources involved.”

Participant E added, “This program has made me realize how relevant other sciences are in principles of wildlife, especially engineering. That is the field I want to go into.”

Benefits and Challenges of Wildlife Management

The focus group participants believed WHEP integrated other fields of science. Participant E said,

I think WHEP has not necessarily made me more or less interested in a career in wildlife, but it has opened my eyes to how relevant wildlife is and natural resources in general tied into other career fields, particularly engineering. That is the field that I want to go in.

Participants E, G, and J believed WHEP connected other career fields by allowing individuals to practice decision-making skills and accomplish objectives. In addition, the focus group participants indicated WHEP gave them a perspective of how other fields of science interact upon each other. Participant E stated, “This program emphasizes we do not exist in a bubble and being involved in WHEP would be great way to gain experience in dealing with these complex systems of natural resources.”

According to the responses given during the focus group meeting, Participants A, C, D, and H understood some of the challenges associated with a career in wildlife management. A common response was working with people can create challenges for wildlife professionals. Participant C and G believed it was more about managing people than wildlife. Participant G shared “This program has also opened doors to wildlife management and showed me it is more than just managing animals and the environment, but it also involves people and people are hard to manage sometimes. The difference in opinions can be a challenge.” Participant C added

The challenge is not just between educated people vs. uneducated people but within differences by opinions. These are very complex systems to work in. There are gray areas; there are slight differences in techniques, and sometimes it is not necessarily right or wrong.

However, Participants E, G, and J indicated WHEP teaches the benefits of wildlife management. Participant H also mentioned, “This program sheds light to the challenges, but also goes into detail about the benefits of wildlife management. This program shows us the benefits are worth the challenge.”

Focus group participants also indicated WHEP gave them value for wildlife and other components of nature. Stewardship was mentioned throughout the focus group meeting. Participant G stated, “I feel WHEP is about doing what we can to achieve landowners’ objectives. The challenges are time and resources, like money, but ultimately, being a good steward is what it takes to be a wildlife manager.”

Discussion

Career development is a lifelong process of engaging the workforce through choosing among employment opportunities made available to them (Ferry, 2006). Youth are influenced by many factors involving career development, such as their personal ability and educational

fulfillment (Bandura, Barbaranelli, Caprara, & Pastorelli, 2001). Bandura's (1986) social cognitive theory perpetuates that individuals should consider participants' environment, behavior, and personal factors in influencing one's decision making. Therefore, Extension agents are challenged to provide programs that support youth in their career choice (Ferry, 2006) and to do this, one's personal factors must be understood.

Personal factors are influenced by behavior and the environment (Bandura, 1986). In the context of this study, the personal factor of interest was attitudes of participants towards a career in wildlife management (Schunk, 2012). Attitudes can be measured to show perceptions of Extension's clientele towards program goals (Schunk, 2012). The environment WHEP creates appears to spawn perceptions of a career in wildlife management. When asked if the youth were more likely to pursue a career in wildlife management, Participant G responded, "Yes, it has also opened my mind about going into wildlife and the management of it."

In addition to WHEP facilitating an environment that promotes perceptions of career development, Participants B, C, G, and H indicated WHEP made them realize how important wildlife management and wildlife professionals are for Tennessee's natural resources. This has implications broader than career development as it suggests that knowledge gained through participating in WHEP assist individuals in being stewards to the land.

4-H professionals must ensure youth are provided opportunities to apply what the youth have learned from involvement in their 4-H project (Carlson & Maxa, 1998). This application of knowledge gained during their 4-H experiences comes full circle in the education cycle (Carlson & Maxa, 1998). 4-H professionals are charged with youth development and when positive impacts from a program are demonstrated, the success of the program is revealed (Carlson & Maxa, 1998). Overall, this study found WHEP fits the education cycle by peaking interest in wildlife management. The integration of life skills and career exploration increase the validity of WHEP. The program associates life skills, career exploration, and the fundamentals of wildlife management to the youth.

This study found that the impact of WHEP was even greater than its stated purpose providing hands-on environmental education opportunities to teach youth the fundamentals of wildlife and fisheries science and appropriate management practices (Allen & Elmore, 2012). WHEP assists in building life skills for participants and demonstrates the importance and justification of wildlife management and wildlife professions. This study found WHEP not only enables 4-H participants to see the complexity of the available natural resources but helped participants see the connections to other fields of discovery such as science and engineering.

Implications and Recommendations

The study found WHEP peaked an interest in wildlife management among participants of the Tennessee 4-H Wildlife Judging contest. This interest can often lead to a desire to apply the skills learned to the participants' communities. Therefore, 4-H can use this research to demonstrate the impact of the organization's programming efforts. Historically, 4-H has strived to teach fundamental practices to youth and relay the knowledge back to the communities (National 4-H Council, 2014). To sustain this desire of applicability, WHEP should continue to promote being a

part of and sharing the common good in wildlife management. Research should be conducted to identify what elements of WHEP peak interest and excitement.

Responses indicated participation in 4-H Wildlife Judging allowed an understanding of how important wildlife management careers are in protecting and enhancing natural resources. Furthermore, the professionals who conduct 4-H Wildlife Judging communicate a justification and purpose for wildlife management. This study found these professionals were successful models that cued emotional arousal. In addition, participants indicated perceptions of a behavioral change regarding career exploration.

4-H should examine the models of WHEP to facilitate change. For example, 4-H could adopt similar models and incorporate it into the curriculum in other programs offered to youth. With models communicating a justification and purpose of wildlife management, 4-H members should relay the information they have learned through WHEP to adults. By relaying this information to other people, it could achieve greater compliance with the science associated with wildlife management and regulation. Furthermore, research should be conducted on a national level that measures the perceptions of outdoor enthusiasts regarding the fundamentals of wildlife management. This question could give insight on the transfer of knowledge between adults and youth.

This study indicated the 4-H Wildlife Judging participants expanded their knowledge of the benefits and challenges related with a career in wildlife management. Participants' claimed wildlife management incorporates other fields of science in the career as well. 4-H could advertise this inclusiveness in promoting WHEP to others who may be interested. 4-H professionals could offer this to students who have interests other than wildlife management. Further research needs to be conducted to examine WHEP's ability to incorporate other fields of science into their careers.

Setting goals and objectives are two key elements in 4-H programming. The participants of this study claimed working with people could be a challenge sometimes; however, working with objectives and setting goals could address this challenge. 4-H professionals could include the fundamentals used by WHEP when teaching youth how to set and reach goals. Further research should investigate participants' ability to achieve goals while working in a team.

4-H stimulates critical thinking skills in educational programs. Participants indicated WHEP's reasoning component forced them to use critical thinking skills. Furthermore, previous literature reported youth seek experience when choosing their ideal career and participants believed WHEP provided skills that aid in college enrollment and career exploration. Another area of discussion is a sense of passion a person has for a career. Tennessee 4-H Wildlife Judging participants believed a person who pursues a career must be passionate about the job a person is performing. The consensus of the focus group was WHEP created emotional triggers regarding wildlife management and created that passion.

Overall, the focus group provided data with positive attitudes regarding a career in wildlife management. Participants indicated WHEP provided experiential learning, which is needed to apply the knowledge learned and to consider a career choice. Furthermore, WHEP enhanced their appreciation of wildlife management professionals and a need for wildlife management. In

conclusion, WHEP is providing an opportunity for 4-H participants to experience the full educational cycle by incorporating career exploration, life skills, critical thinking skills, and applicability.

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Evaluating Public Perceptions of Agricultural Water Use by Regions to Guide Extension Programming

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Evaluating Public Perceptions of Agricultural Water Use by Regions to Guide Extension Programming

Agricultural water use accounts for a large portion of water withdrawal in the United States (U.S.). The agricultural industry has recently come under public scrutiny as increased droughts across the nation has led to competition for water. The added pressure has led to an increase in policy aimed at curbing agricultural water use in many parts of the U.S. At the same time, public perception of agricultural water use was at an all-time low with little recognition that agricultural water needs differ depending upon geographic location. The purpose of this study was to evaluate public perceptions of water use across the nation to assist extension educators in the development of programs focused on educating about diverse agricultural water needs. The findings revealed respondents generally trust farmers when it comes to water use and believe farming practices have a positive effect on the natural environment. There were observed differences between regions when it came to farmers' use of resources and how they negatively impact the environment, with respondents from the West having a significantly more negative opinion. Universities and extension educators were found to be the most trusted source of information, therefore regionally specific agricultural water use extension programs could assist in developing an educated public.

Keywords: trust, extension, education, social capital, water, regional differences

Introduction

“Most Americans assume that water supply is both reliable and plentiful” (Attari, 2014, p. 5129). However, over the past 100 years, water has become increasingly limited and low water levels are a constant threat (Araya & Kabakian, 2004). The United States Geological Survey (USGS) reported 355 million gallons per day is withdrawn in the U.S. alone (USGS, 2014). Agricultural water use accounts for a large portion of the water withdrawn in the U.S. According to Schaible and Aillery (2012), “irrigated agriculture accounts for 80-90 percent of consumptive water use in the United States” (p. 5) and has recently come under public scrutiny (Lamm, Taylor, & Lamm, 2016) as competition for water needs have increased. There has also been increased pressure to implement water policy and water management to force the sustainability of irrigated agriculture due to the continued and growing agricultural demand for water resources (Bian, Williams, Benson & Segarra, 2016).

Diverse agricultural water issues have emerged across the U.S. For example, in the Midwest, water used for irrigation is mainly pumped from the High Plains Aquifer, one of the largest aquifers in the United States. The aquifer is a critical source of water for American agriculture and other industries in eight states (Colorado, Kansas, Nebraska, New Mexico, Oklahoma, South Dakota, Texas, and Wyoming) providing water for 27% of the crop production in the U.S. (Drummond, 2003). It is now in jeopardy of depletion within only a few decades (Mann, 2009). Due to a prolonged drought, the current usage of the aquifer is unsustainable as the water is used faster than it is recharged.

In the Northeast, farmers near the Chesapeake Bay area have faced several water issues, most specifically related to water quality. Problems include nutrient, sediment, and toxic

contaminant pollution from agriculture, storm water runoff, and nonpoint source runoff (Chesapeake Bay Program, 2012; USGS, 2015).

In the Southeast, Georgia, Florida, and Alabama have been engaged in a decades-long “water war” (Dunkelberger, 2017). The states have been battling over water allocation in two major basins that cross their borders (Southern Environmental Law Center (SELC), 2017). One of which, the Apalachicola-Chattahoochee-Flint Basin, has been named the most endangered river basin in the U.S. (Howard, 2016).

On the opposite side of the country, California has suffered from prolonged drought (Sokolow, Godwin, & Cole, 2016) causing current water supplies to diminish resulting in recurring irrigation issues (University of California, 2015). The Central Valley of California is one of the most agriculturally productive areas in the U.S. (Panda, 2015) accounting for 66-70% of the total irrigated area in the western region (Elias et al., 2016). Aquifers in the Central Valley are so overdrawn that some fields have sunk by over 30 feet (Nijhuis, 2014).

Since 2000, Texas has been subjected to two major droughts in 2006 and again in 2011. These two droughts took the lives of hundreds of people and lost the agricultural industry billions of dollars due to crop failure (Combs, 2012). In 2011, nearly 90% of the state was in exceptional drought status and conditions did not improve until 2013 (Combs, 2012).

Over time, the industrialization of agriculture has advanced and consumers have become removed from the farm, creating a disconnect (Rumble & Irani, 2016). The agriculture industry has tried to address the disconnect by communicating with consumers, however, this has proven to be difficult (Rumble & Irani, 2016). A suggested solution to improve communication has been to increase the transparency of the agricultural industry (Garner, 2009; Roybal, 2012). Effective communication methods that develop trust between consumers and the agricultural industry have the potential to make lasting results with policy developed from an educated, informed perspective. Extension programs can play a role in this by educating the public about agricultural water use to ensure an accurate portrayal of agricultural needs and sustainable use of this precious resource are known (Lamm et al., 2016).

Today the general public has an all-time low trust in businesses, government, and news media; with people most likely to trust colleagues, friends, and family (Rawlins, 2008). The internet has created a world where transparency is expected. Access to information is now a need of consumers regardless if the supplier wants to expose itself (Rumble & Irani, 2016). Trust is important for reaching agreement between various stakeholders when solving environmental problems related to watersheds (Leach & Sabatier, 2005).

A study by Mase, Babin, Prokopy, and Genskow (2015) focused on trust between agricultural and non-agricultural respondents on water quality throughout the watersheds in the U.S. They found nonagricultural respondents were more trusting of the quality of water when compared to agricultural respondents. This same study found extension programs, soil and water conservation districts, Natural Resources Conservation Services, and State agencies were the most trusted sources of information (Mase et al., 2015).

As drought, extreme weather events, and wars over water rights continue it is important to understand public trust of agriculture water use in the different regions of the U.S. Stakeholders must work together to develop sustainable solutions that will allow for the water needed for population growth, the sustainability of natural systems and agricultural production. This must be done to benefit consumers and to protect the viability of a strong U.S. agricultural industry. For the public to make informed decisions about agricultural water use it is imperative that educators understand their levels of trust with agricultural producers and perceived transparency of the agricultural industry. Extension educators are influential within their local communities, providing educational programs across the nation (Vörösmarty, Green, Salisbury, & Lammers, 2000) and have the potential to address perceptions of agricultural water use but need to be specific when meeting regional needs.

Theoretical Framework

Social capital theory was used as the framework to guide this study. Social capital is the collective value of all social networks and the inclinations that arise within groups as members strive to help one another (Putnam, 2000). This is particularly important when trying to understand relationships and how relationships are used to share knowledge (Warren, Sulaiman, & Jaafar, 2013). Traditionally, social networks were limited to a geographical location, but with the global society that exists today, social networks have become far more diverse and dynamic (Young, 2011). Social media increases the chance of having a greater network, thus providing access to new information and resources (Warren et al., 2013). Extension educators seek to understand how individuals share resources or knowledge to gain a perspective on how they can be best educated (Putnam, 2000).

Miller and Buys (2008) aimed to understand how social capital would affect human water use behaviors in a drought-stricken area of Australia. This study indicated that close neighborhood connections played a large part in residents practicing environmentally friendly car washing techniques (Miller & Buys, 2008). The study results also indicated that social capital can be a cause of fostering negative norms rather than positive norms (Miller & Buys, 2008). Negative norms in this study occurred when self-reported proactive residents indicated they participate in environmentally unfriendly gardening in the form of applying weed killers, pesticides, and herbicides to their garden (Miller & Buys, 2008).

Jones, Evangelinos, Gaganis, and Polyzou (2010) conducted a study that aimed to understand how social capital was influenced by consumers' perceptions of water conservation policies. When discussing water management with consumers, it was found that institutional trust was the most important factor of social capital as it relates to policy acceptance (Jones et al., 2010). In addition, Jones et al. (2010) found that social trust and adhering to social norms was found to cause citizens to be less compelled to follow water conservation policies. This study also indicated social networks were an influencer of improving domestic water systems (Jones et al., 2010).

Robinson and Meikle-Yaw (2007) conducted a case study to understand how social capital was fostered through Extension projects in the community. In two Mississippi Delta communities, organizations were created through Extension to develop a public playground in one community and a Martin Luther King, Jr. memorial park was established in the other (Robinson & Meikle-

Yaw, 2007). The community projects were assembled by the members of the community given their agreement with ten values and principles provided (Robinson & Meikle-Yaw, 2007). The results of the study discussed that because the members of the community came together to complete these community restoration projects for the community in which they belonged, allowed for the members to be further invested in their community and more civically engaged because of the social capital built during the process (Robinson & Meikle-Yaw, 2007).

Purpose and Objectives

The purpose of this study was to examine public perception of agricultural water use across the U.S. to inform the development of regionally appropriate extension programs. The study was guided by the following objectives:

1. Describe respondents' perceptions of agricultural water use by regions which were broken into four key concepts: trust in water use and protection, use of resources, agriculture's positive impact on the environment, and agriculture's negative impact on the environment.
2. Determine if perceptions of agricultural water use differed between regions.

Methods

This research was part of a larger study of public perceptions of agricultural water use, with four sections relevant to the research objectives. The researchers used a third party public opinion polling company, Qualtrics, to distribute an online survey to capture public perceptions of agricultural water use. The population of interest was U.S. residents aged 18 and older. A non-probability, opt-in sampling technique was used (Baker et al., 2013). The instrument included demographic screening questions to ensure respondents accurately reflected the U.S. adult population. After criteria-based selection and quality assurances, a sample of the population was obtained ($N = 1,050$). Prior to analyzing the data, post-stratification weighting methods were used based on the 2010 U.S. Census for age, gender, and race/ethnicity to ensure the respondents were representative of the population of interest and geographically represented the nation (Kalton & Flores-Cervantes, 2003). This is standard practice to overcome the limitations of non-probability sampling (Baker et al., 2013; Kalton & Flores-Cervantes, 2003).

Prior to sending the survey, an expert panel that included faculty and staff from The University of Florida reviewed the survey instrument. Additionally, The University of Florida Internal Review Board approved the study. The results were exported and analyzed using SPSS version 23. Descriptive statistics were used to calculate the perception of agriculture water use. ANOVAs were used to determine if statistically significant differences in perceptions of agricultural water use existed between U.S. regions with an $\alpha < .05$ set *a priori*.

The respondents were split based on the home state they reported being from. The regions included the Northeast, the South, the Midwest, and the West. The following states made up each region:

- Northeast: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont
- South: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas, Virginia, and West Virginia
- Midwest: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, Oklahoma, South Dakota, and Wisconsin
- West: Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming

To understand perceptions of agricultural water use, respondents were presented with a list of 24 statements and asked to indicate their level of agreement or disagreement towards farmers and farming practices on a 5-point Likert-type scale with responses including 1 = *strongly disagree*, 2 = *disagree*, 3 = *neither agree nor disagree*, 4 = *agree*, or 5 = *strongly agree*. The 24 statements were broken down into four key concepts: trust in water use and protection, use of resources, positive-framed relationship with the natural environment, and negative-framed relationship with the natural environment.

An example of one of the four statements that made up the trust in water use and protection concept included *farmers can be relied upon to keep their promises when it comes to water use*. Responses to the four items were averaged to create an overall index score. The index was found to be reliable with a Cronbach's α of .74.

To understand the use of resources concept, three statements were used to create the resources concept scale. *Farmers should save as much water as possible when irrigating crops even if it means I have to pay more for food I purchase* is an example of a statement from this concept area. Responses to the three items were averaged to create an overall index score. The index was found to be reliable with a Cronbach's α of .84.

Questions to understand the positive relationship with the natural environment included five statements. An example of one of the five statements included *farming protects our natural environment*. Responses to the five items were averaged to create an index score. The index was found to be reliable with a Cronbach's α of .84.

Finally, to determine if agriculture had a negative impact on the environment, five statements were offered to respondents. An example of a statement from this concept area was *fertilizers used on farms pollute natural water sources*. The negative-framed statements used the following scale: 1 = *strongly agree*, 2 = *agree*, 3 = *neither agree nor disagree*, 4 = *agree*, and 5 = *strongly agree*. Responses to the five items were averaged to create an index score. The index was found to be reliable with a Cronbach's α of .86.

The demographic characteristics of the respondents are presented in Table 1. Most of the respondents were White with the Northeast region having the largest percentage. Between the Northeast and the South, the gender representation was fairly even, however in the Midwest the majority of respondents were female whereas in the West the majority of respondents were male. The West had the largest group of respondents identifying as Hispanic or Latino and the highest number of respondents with a 4-year college degree or above followed closely by the Northeast.

Overall the largest political affiliation was Democrat. Lastly, about a quarter of all the respondent groups had an annual household income of \$50,000 to \$74,000 a year (see Table 1).

Table 1

Demographic Characteristics by Region

	Northeast (n = 236) %	South (n = 364) %	Midwest (n = 240) %	West (n = 210) %
Sex				
Female	54.4	56.1	59.4	29.6
Male	45.5	43.9	40.6	70.4
Race				
African American	6.8	14.9	11.9	10.9
Asian	3.4	4.9	1.3	11.3
Caucasian/White	75.0	64.9	73.0	54.4
Native American	.7	.6	1.0	0.4
Ethnicity				
Hispanic/ Latino	12.3	13.2	10.3	22.5
Age				
20 - 29	22.5	17.4	11.4	22.5
30 - 39	14.8	21.3	16.8	12.7
40 - 49	19.7	19.7	19.3	14.5
50 - 59	18.2	18.4	20.3	13.9
60 - 69	14.0	12.2	13.4	10.1
70 - 79	5.4	7.7	8.5	6.2
80 years and older	5.2	3.3	10.3	20.1
Education				
Less than 12 th grade	1.8	1.0	0.5	4.0
High school graduate	27.8	20.7	28.8	8.1
Some college education	20.8	29.7	24.7	21.3
2 year college degree	9.9	15.1	14.2	12.9
4 year college degree	24.7	25.2	23.4	32.7
Graduate degree	15.1	8.3	8.4	21.0
Annual Household Income				
\$24,999 or less	20.9	23.6	23.7	17.0
\$25,000 to \$49,999	23.2	29.4	36.0	24.5
\$50,000 to \$74,999	24.6	21.9	27.0	24.5
\$75,000 to \$149,999	26.1	20.2	11.7	28.6
\$150,000 to \$249,999	2.4	3.9	1.0	3.8
\$250,000 to or more	2.8	1.0	0.6	1.5
Political Affiliation				
Democrat	42.8	36.1	34.1	41.0
Independent	24.9	24.7	26.0	26.4
Non-affiliated	9.0	10.2	13.4	6.7

Results

Perceptions of Agricultural Water Use

Regarding *trust in water use and protection*, respondents across the nation equally agreed *farmers used sound principles to guide their behavior when it comes to water*. Additionally, respondents equally had the highest agreement that farmers are concerned about water resources when making decisions about farming (see Table 2). Respondents neither agreed nor disagreed that farmers used sound principles to guide their behavior when it comes to water or that they can be relied upon to keep their promises when it came to water use. Respondents in the Midwest and South were more likely than other regions to think it was important to watch farmers closely to ensure they are not taking advantage of water resources. Those in the West also had a lower level of agreement when it came to trusting farmers will keep their promises about water use.

Regarding *use of resources*, respondents felt farmers should use as little pesticides as necessary, use as little fertilizer as necessary, and as little water as possible even if it means having to pay more for food purchases (see Table 2). The South was slightly more likely to disagree with the statements compared to the other regions.

Most respondents neither agreed nor disagreed agriculture had a *positive relationship with the environment* (see Table 3). The exception was respondents from the West who expressed a slightly higher level of agreement when it came to farm lands or privately owned agricultural lands allow water to return and recharge groundwater resources. Respondents from the Northeast expressed the lowest level of agreement that farmers only use as much pesticides or fertilizer as necessary on their fields and crops.

Respondents had mixed feelings on whether *agriculture had a negative impact on the environment*. Over half of all respondents felt animal waste, pesticides, and fertilizers used on farms pollute natural water sources, with pesticides having the highest negative response. In terms of farming causing water runoff, responses were a more varied: the West and the Midwest had a higher response rate in agreement, whereas the northeast and the South neither agreed nor disagreed. When it came to farming causes soil erosion, responses were even more varied between strongly agree, agree, and neither agree nor disagree. The highest response was from the West with 42.7% of respondents agreeing that it does cause soil erosion.

Differences in Perceptions of Agricultural Water Use by Region

A series of one-way ANOVAs were conducted to compare the effect of region on perceptions of agriculture water use. There was a significant difference at the $p < .05$ and $p < .01$ level in two areas, *agricultural use of resources* and *agriculture having negative impact on the environment* (see Table 4). Post-hoc comparisons using an LSD test indicated overall mean score differences. Responses differed significantly between respondents from the South and all other regions. The Northeast, Midwest, and West all had a higher perception compared to the South that farmers should use as little resources as possible. In addition, there was also a significant difference

between the South and the West regarding *agriculture's negative impact on the environment*. The South had a higher perception of agriculture's negative impact on the environment compared to the lower perception of the West (see Table 5). As it relates to agriculture's negative relationship with the natural environment there were significant differences between the South and the west at the $**p < .01$ value, with the West having a more negative perception of the agriculture industry compared to the South.

Table 2

Trust and Resources Results and Comparison between Groups

<i>Regions</i>	Strongly Disagree/Disagree %				Neither Agree nor Disagree %				Strongly Agree/Agree %			
	NE	S	MW	W	NE	S	MW	W	NE	S	MW	W
<i>Trust in Water Use and Protection</i>												
I think it is important to watch farmers closely so they do not take advantage of water resources	14.7	17.5	22.6	18.7	30.6	33.0	32.6	16.9	54.7	49.5	34.8	64.3
Sound principles seem to guide farmer's behavior when it comes to water	9.5	7.5	7.3	10.7	35.9	31.2	23.8	24.2	54.6	61.3	68.9	65.2
Farmers can be relied upon to keep their promises when it comes to water use	10.1	13.4	12.7	17.5	43.0	35.5	31.2	33.8	46.9	51.2	56.2	48.7
I know farmers will be concerned about water resources when they make important decisions about farming	4.2	3.6	2.4	4.2	11.8	10.0	9.5	10.3	84.0	86.4	88.2	85.4
<i>Agricultural Use of Resources</i>												
Farmers should use as little pesticides as absolutely necessary even if it means I have to pay more for food I purchase	6.1	13.4	6.5	7.9	23.8	25.6	17.8	18.4	70.1	61.0	75.6	73.7
Farmers should use as little fertilizer as absolutely necessary even if it means I have to pay more for food I purchase	7.2	17.1	9.4	7.7	29.0	30.8	24.5	26.2	63.8	52.2	66.1	66.0
Farmers should save as much water as possible when irrigating crops even if it means I have to pay more for food I purchase	10.6	12.1	8.9	8.3	30.3	32.4	29.2	29.4	59.0	55.4	61.9	62.3

Note: Northeast (NE; $n = 236$), South (S; $n = 364$), Midwest (MW; $n = 240$), and West (W; $n = 210$).

Table 3

Positive and Negative Relationship Results and Comparison between groups

<i>Regions</i>	Strongly Disagree/Disagree %				Neither Agree nor Disagree %				Strongly Agree/Agree %			
	NE	S	MW	W	NE	S	MW	W	NE	S	MW	W
<i>Agriculture's Positive Impact on the Natural Environment</i>												
Farmers only use as much pesticides as necessary on their fields and crops	22.6	18.1	16.6	25.1	37.4	36.0	37.1	29.3	39.9	45.9	46.3	45.5
Farmers only use as much fertilizer as necessary on their fields and crops	16.9	16.9	16.6	22.3	39.8	41.2	35.3	34.0	43.3	41.9	48.0	43.7
Farm lands or privately owned agricultural lands allow water to return and recharge groundwater resources (such as aquifers where we get our drinking water)	7.4	6.4	7.2	7.8	37.3	33.7	37.1	21.8	55.3	59.9	55.8	70.6
Farming protects our natural environment	9.3	7.9	12.7	19.0	27.2	31.3	30.8	26.5	63.6	60.8	56.4	54.5
Farmers conserve water	12.3	13.7	13.2	14.0	45.6	37.3	45.9	32.7	42.0	49.0	40.9	53.3
<i>Agriculture's Negative Impact on the Natural Environment</i>												
Animal waste used on farms pollutes natural water sources	12.3	17.6	19.2	12.1	34.8	29.6	28.4	28.6	52.9	52.8	52.4	59.3
Pesticides used on farms pollutes natural water sources	6.1	9.7	7.6	6.8	25.7	25.2	22.8	19.0	68.0	65.1	69.6	74.2
Fertilizers used on farms pollutes natural water sources	7.8	11.7	9.3	8.6	26.7	30.3	27.9	30.8	65.5	58.0	62.8	60.6
Farming causes water runoff	22.0	22.8	18.9	12.1	37.5	41.2	27.2	37.1	40.6	36.0	53.9	50.7
Farming causes soil erosion	26.3	28.2	29.3	30.8	34.0	38.6	32.8	26.5	39.7	33.2	37.9	42.7

Note: Northeast (NE; $n = 236$), South (S; $n = 364$), Midwest (MW; $n = 240$), and West (W; $n = 210$).

Table 4

Differences in Agricultural Water Use by Region and ANOVA Tests

	Northeast (<i>n</i> = 236) <i>M</i> (<i>SD</i>)	South (<i>n</i> = 364) <i>M</i> (<i>SD</i>)	Midwest (<i>n</i> = 240) <i>M</i> (<i>SD</i>)	West (<i>n</i> = 210) <i>M</i> (<i>SD</i>)	<i>F</i>	<i>p</i>
Trust in water use and protection	3.74 (.60)	3.75 (.63)	3.75 (.53)	3.78 (.59)	.31	.82
Agriculture had a positive impact on the environment	3.50 (.76)	3.54 (.75)	3.40 (.75)	3.55 (.83)	.66	.58
Agriculture had a negative impact on the environment	3.51 (.80)	3.38 (.85)	3.51 (.74)	3.59 (.74)	2.	.03*
Agricultural Use of Resources	3.87 (.90)	3.66 (.99)	3.88 (.89)	3.93 (.89)	4.39	.00**

Note. * $p < .05$ and ** $p < .01$.

Table 5

Post-Hoc Test Differences in Regions

	Region	Regions	Mean Dif.	<i>p</i>
Trust in water use and protection	South	Northeast	.00	.96
		Midwest	.00	.99
		West	-.04	.50
Agriculture had a positive impact on the environment	South	Northeast	.04	.62
		Midwest	.13	.23
		West	-.02	.47
Agriculture had a negative impact on the environment	South	Northeast	-.13	.08
		Midwest	-.13	.7
		West	-.21	.00**
Agricultural Use of Resources	South	Northeast	-.21	.01**
		Midwest	-.22	.00**
		West	-.27	.00**

Note ** $p < .01$.

Conclusions

The findings revealed respondents across the U.S. trust farmers when it came to their water use and they had a positive perception regarding agriculture's positive impact on the environment. Differences were observed when it came to farmers' use of resources and their negative impact on the environment, with respondents from the West having a significantly more negative perception compared to respondents in other U.S. regions.

Respondents felt farmers should only use the necessary amount of resources (e.g. pesticides, fertilizer, and water) as needed. Additionally, respondents reported being willing to pay more for food if farmers would limit their use of pesticides, fertilizer, and save water. This

indicated the public is willing to work with farmers to support their businesses, if in turn the agricultural industry does their part to protect the natural environment.

According to social capital theory, knowledge can be accessed through various networks of social relationships among individuals. The study conducted by Jones et al. (2010) indicated that institutional trust was the most important factor of social capital. Similarly, the results of this study can be used to strengthen social ties and increase transparency between members of the general public and the agricultural industry, disagreements between various stakeholders can be resolved and plans of action can be created. As stated previously, extension educators are influential within local communities and are the most trusted sources of information. Much like the study of Robinson and Meikle-Yaw (2007), Extension supported community projects created social ties within the communities leading community members to be more civically engaged.

Implications and Recommendations

This study provided an opportunity to demonstrate an array of perceptions related to agricultural water issues by U.S. region. Prior to providing recommendations based on the results, it is important to recognize the limitations of this study. A potential limitation was the use of a non-probability sampling. While weighting techniques were applied, the relationship between the sample and the population is unknown. It is unclear how representative it is of the population as whole and should be interpreted with caution.

Since local university extension, soil and water conservation districts, and state agencies were found to be the most trusted sources of information in a study by Mase et al. (2015), it is important for the university to be transparent with the public about agriculture-related information in order to regain trust. It is important for extension programs to consider creating partnerships to transfer knowledge to multiple stakeholders to create a larger network for social capital. Perhaps forums targeted at members of the media could be used to educate those having a large amount of influence about agricultural water use.

Building social ties between extension educators and members of the public can increase the chance of a greater, more informed network. This informed network could address the negative media coverage and explain what the agricultural industry is doing to mitigate high water consumption activities. It could also be used to assist in the development of policy with individuals representing all water stakeholders present to ensure policy and regulation is formed to sustain natural resources without devastating agriculture.

Farmers in local communities could open their farms to the public to build social capital with the local residents. For these open-houses or field days farmers could offer local residents a transparent look at how farmers use pesticides, fertilizers, and water on their operations. This would provide an opportunity for local citizens get a first-hand look at how agriculture is using their resources. This also provides an opportunity for the public to develop educated perceptions of agriculture's positive and negative impacts on the environment.

Extension educators involved in water education should also increase initiatives that would help enhance perceptions of agricultural water use (Lamm et al., 2016) since agricultural water use

accounts for a significant amount of water withdrawal (Schaible & Aillery, 2012). For example, producing television clips and YouTube videos that demonstrate practical techniques farmers and producers use to maintain and preserve water could be helpful. Extension programs should be delivered both online and in person; both options would allow participants to increase their knowledge on a broad set of topics and connect interested parties to those living within their communities (Wolfson et al., 2015).

In an effort to educate the public, Extension educators can increase awareness of local farmers' positive agricultural water use in their regional communities. Public visibility can come in the forms of signage at the local grocery store next to the produce and meat section indicating where the product was grown and how the farm positively promotes agricultural water use within the region, social media campaigns that highlight local farmers' sustainable agricultural water use practices, and signs visible from the road indicating that a farm is practicing positive and sustainable agricultural water use. For example, extension educators in the South can publicly promote farmers' low use of pesticides, fertilizer, and water. Extension educators in the West and Midwest can publicly promote what farmers are doing to decrease water runoff. Extension educators in the West can publicly promote how farmers work to decrease soil erosion. The public in the western U.S. exhibited a more negative perception of agricultural water use perhaps because water shortages have been highlighted repeatedly. Therefore, extension educators have a greater challenge ahead of them in trying to increase public understanding of farmers' agricultural water use.

Perceptions of water issues, and actual water issues, vary depending upon geographic location. It is important that extension educators create programs based on the issues pertaining to their particular area. Increasing communication about agricultural water use can increase stakeholder awareness and improve public perception. Increased awareness will ultimately create more informed policy and regulations benefiting water allocation for all water users.

Additional studies should be conducted to continue adding to the agricultural water use and extension education literature. Studies could be conducted based on additional demographics to determine audience segments' perceptions of agriculture water use. Other demographics that could be used to segment audiences are age, generation, individual state, income level or education attainment, and race. Segmenting audiences would increase the ability to dive deep into specific issues and discussions because extension educators would be addressing specific concerns related to agriculture water use rather than speaking broadly. In addition, after extension programming specifically addressing agriculture water use was conducted, a study could intentionally measure the longitudinal effect of the program on public perception of agriculture water use.

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**Resiliency and Leadership of Tobacco Producers in
Greene County, TN: A Qualitative Study**

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Resiliency and Leadership of Tobacco Producers in Greene County, TN: A Qualitative Study

The purpose of this study was to identify the perceptions of current Greene County burley tobacco producers in a declining global tobacco industry. The central research question was “How have you maintained your leadership and resilience in burley tobacco production in Greene County?” Ten Greene County producers participated in this study through an interview conducted utilizing a series of 33 questions aimed at determining specific themes regarding resiliency in their communities, as well as the individual producers’ adaptive leadership styles. Data collected from interviews were synthesized to correlate perceptions of current tobacco production in Greene County from the inception of the tobacco program to present-day regarding cultural norms and economic impact, while simultaneously providing a portrayal of tobacco as a viable cash crop and its significance to present-day global production with the direct correlation of a community’s response to overcoming significant change. It was discovered burley tobacco has historical ties to the producers in Greene County, but with the significant changes that have occurred within the industry in the last 20 years, it has become almost impossible to remain profitable. As a result, Greene County producers have utilized an adaptive leadership approach to forge new paths in agriculture enterprises, as well as becoming leaders on the forefront of a dwindling industry in Greene County, contributing to resiliency in a changing market environment.

Introduction

The tobacco industry continues to change at an ever-rapid pace with global supply and demand, world health issues, and environmental regulations steering the direction (Tiller, 2000a; Tiller, 2000b). The tobacco industry has seen several changes since the Tobacco Quota Buy-out in 2004. This industry has remained true to its heritage by continually proving to be a source of income that not only grows nest-eggs financially but grows the next generation to appreciate the hard work involved with growing a crop of burley tobacco (Yeargin & Bickers, 2015).

The passage of the AAA (Agricultural Adjustment Act) of 1938 proposed the idea that tobacco producers should earn a safety net under auction prices and provided manufacturers with a stable crop of raw material for several decades (Tindall, 1967). The AAA of 1938 designated parity as the formalized method of arriving at a fair price, thus the creation of what came to be known as the support price. The support price represented the minimum price producers would receive for a unit of their product (Schickele, 1954). It was during this time the quota system evolved and began tying tobacco producers to acreage allotments determining the maximum acreage of tobacco they could produce. The allotments were based on historical production of the farm demonstrated and reported by the producer as to where tobacco was grown on their land (Agricultural Adjustment Act of 1938). Tobacco producers were then given a marketing card to facilitate the production and marketing of their tobacco crops (Schickele, 1954).

Additional significant historical factors affecting the marketing of burley tobacco were The Farm Pounding Quota Revisions Act (FPQRA) of 1990 and the advent of cross-county leasing in TN, both of which spurred economic changes in the industry. Most prominent was the allowance to sell burley quotas providing a permanent mechanism to place a larger volume of burley quota into the hands of producers who intended to produce the quota (Snell & Chambers, 1991). As

indicated by Mathis and Snell (2012), TN was facing a permanent loss of some of their quota due to low utilization, or production of quota in several high-production-cost counties. With the inception of these two critical additions to the Tobacco Program, the first stirrings of producers questioning the benefits of the quota program were born (Mathis & Snell, 2012). In addition, numerous lawsuits from both within and outside the tobacco industry continually brought pressure on the Tobacco Program during the 1990's (Mathis & Snell, 2012). Hence the Master Settlement Agreement (MSA), which was an accord reached on November 23, 1998 between the state Attorneys General Office of 46 states, five United States territories, the District of Columbia, and the five largest tobacco companies in America concerning advertising, marketing and promotion of tobacco products (Master Settlement Agreement, 1998) and this was the largest civil litigation settlement in history. The primary purposes for MSA funding to the states involved Medicaid services for smoking-related illnesses and educational programs to reduce underage smoking (Master Settlement Agreement, 1998). Due to the MSA of 1998, TN has received over \$2.3 billion in payments of the total \$4.8 billion, which will be in effect until 2025 (Master Settlement Agreement, 1998) and are referred to as the Phase I Tobacco Payments.

To ease the burden of the MSA on tobacco owners and producers, the National Tobacco Growers Settlement Trust was established by Philip Morris, Brown, and Williamson Tobacco Corporation, Lorillard Tobacco Company, and R.J. Reynolds Tobacco Company to compensate tobacco quota owners and producers for potential reductions in their tobacco production and sales (Mathis & Snell, 2012). These payments more commonly became known as the Phase II payments and totaled \$4.15 billion earmarked as payment to tobacco quota owners and producers in 14 states over the 1998-2007 period (Tiller, Feleke, & Starnes, 2010). Regarding Phase II allocations, TN received nearly \$400 million through 2010, which directly benefitted the tobacco producers and quota owners at a 90 percent/10 percent split, respectively (Tiller, Feleke, & Starnes, 2010).

Due to the passage of the MSA, which began during President Clinton's term as part of his Presidential Tobacco Commission and further spurred by a pessimistic outlook and rapidly declining quotas, tobacco state congressional members intensified their efforts to move toward a buyout in 2002 (Mathis & Snell, 2012). Finally, on October 22, 2004, the Fair and Equitable Tobacco Reform Act of 2004, otherwise known as the Tobacco Quota Buyout, was signed into law (Womach, 2004). This occurred after gaining momentum upon endorsement from Philip Morris, the leading cigarette manufacturer in the United States, which also supported Federal Drug Administration (FDA) regulation on tobacco products (Mathis & Snell, 2012). Although the FDA was not the vehicle who moved the proposed buyout into legislation, it had a great bearing on the overall outcome of the legislation. The Tobacco Quota Buyout was attached to a must-pass corporate tax bill known as the American Jobs Creation Act (Womach, 2004).

Lastly, when President Obama signed the Family Smoking Prevention and Tobacco Control Act, the FDA gained authority to regulate the production and marketing of cigarettes and other tobacco products (Family Smoking Prevention and Tobacco Control Act, 2009). Their first major regulatory action came in 2009 with the banning of the flavored cigarettes, declaring they were a gateway for children and youth to pick up the smoking habit (Harris, 2009). As dramatic changes within the industry continue to occur, production will continue to shift from the mountains of East TN into more feasible production/marketing locales within both the United States and globally (Tiller, 2000a; Tiller, 2000b). As a result, Greene County producers' transition from a culture alive

and vibrant with tobacco as its roots and foundation to more diversified farming initiatives to remain viable in production agriculture (Yeargin, 2008a; Yeargin, 2008b). Communities within Greene County are in jeopardy of losing a way of life; a tradition, along with the threat of a tremendous economic breach being felt within the boundaries of Greene County (Yeargin & Bickers, 2015).

Theoretical Framework

“Resilience is best defined as an outcome of successful adaptation to adversity” (Reich, Zautra, & Hall, 2010). Most would consider the response to adversity to be an individual basis, determined by a crisis. However, communities are engaged daily in practices that foster resilience at the community level, and crises can differ in definition dependent upon the situation(s) (Gaventa, Smith & Wellingham, 1990). Resilience can be looked upon as a theory, encompassing both a set of capacities and strategy for promoting a readiness response to any type of crisis (Norris, Stevens, Pfefferbaum, Wyche, & Pfefferbaum, 2008). The construct of resilience “...refers to a dynamic process encompassing positive adaptation within the context of significant adversity” (Luthar, Cicchetti, & Becker, 2000, p. 543). To expand on this concept, Ledesma (2014), described three resilience models used to describe the impact of stress on quality adaptation in the event of a crisis. Within the scope of this study, the challenge model represents the ability to enhance a community’s adaptation to a stressor, enabling individuals to better prepare for the next set of challenges (Ledesma, 2014).

As described by Frankenberger, Mueller, Spangler, and Alexander (2013), for communities to develop and/or maintain resilience, they must first be prepared. This means individuals within a community who are affected by a current perceived crisis will typically seek information from the knowledge of those in the community that have managed a similar crisis before (Frankenberger, Mueller, Spangler, & Alexander, 2013). Secondly, communities must respond to the perceived crisis (Frankenberger, Mueller, Spangler, & Alexander, 2013). This is often a response from the local government acknowledging the crisis, and lastly, innovation becomes the key to success when a community is engaged in a crisis. The adaptive capacity at the community level is enabled because of a shared learning process among all those involved in the community (Berkes, 2007). As defined by Northouse (2013), “adaptive leadership is a unique kind of leadership that focuses on the dynamics of mobilizing people to address change” (p. 260). Included in the adaptive leadership model are a certain series of situational challenges that create specific leadership behaviors, thus resulting in adaptive work in which individuals emerge as leaders in their communities. Furthermore, Wong (2004) described adaptive leaders as those who learned to live with unpredictability, hence spending less time fretting about the ability to establish routines or controlling the future; rather focusing more on exploiting certain opportunities to become successful. Adaptive challenges are problems that are not easy to identify, thus often requiring a shift in perception because of dealing with a substantial change (Northouse, 2013).

Adaptive challenges are tied to emotion, therefore imparting a necessary need to change (Northouse, 2013). As a result, coping becomes an adaptive skill (Heifetz, 1994). This approach mitigates frustration felt by the process of adaptive change (Northouse, 2013). As most individuals inherently avoid change, it is necessary for adaptive leadership to guide the process, deliberate acknowledgement for successful growth to continue, as well as to give voice to the concerns of

those affected (Northouse, 2013). As a result, there is a buy-in from all affected parties resulting in a more flexible transition of change because adaptive leadership is follower-centered (Northouse, 2013).

Purpose

The purpose of this study was to identify the perceptions of current Greene County burley tobacco producers in a declining global tobacco industry. The central research question was “How have you maintained your leadership and resilience in burley tobacco production in Greene County?”

Methods and Procedures

This qualitative study was grounded in phenomenology (Lincoln & Guba, 1985) and the researchers collected in-depth interviews, which provided the opportunity for participants to develop and give their personal thought processes without fear of bias and/or influence from other respondents, especially in controversial, sensitive, or tabooed subjects (Mack, Woodsong, Macqueen, & Guest, 2005). Historical records were retrieved through industry portals and current industry employees, as well as Farm Service Agency, to identify 10 prospective participants for this study, utilizing purposive sampling to identify appropriate participants (Mack, Woodsong, Macqueen, & Guest, 2005). Interviews were conducted over a three-month duration with past and present Greene County growers and ranged in length from one hour and 45 minutes to almost six hours.

Ten producers ranging in age from 22 to 78 years were interviewed. Four producers were 40 and under, two were in their forties, one was in his fifties, and two were in their sixties, representing an average age of 49 years. All producers were male and were natives of Greene County.

Among the 10 producers, they have a combined 367 years’ experience in working on a tobacco farm. Three producers claimed to have been actively engaged in tobacco production their entire life. Only one producer is considered new to the industry, having only been engaged in tobacco production for four years and is also of whom the youngest respondent at age 22. The remaining six range from 33 years to 45 years being actively engaged in tobacco. Interestingly, three of the remaining six became actively engaged in production at age 18 with two of those becoming active in the industry before age 12. Each participant received a code number to maintain confidentiality (Bogden & Bilken, 2007). Documents collected included personal field notes from each interview, as well as personal journal reflections upon completion of the interviews, and audio transcriptions from each interview. The reflection journal enabled further interpretation of data at any time throughout the research for this study, thus creating the opportunity to triangulate the data and maintain trustworthiness. Interviews were audio-recorded and later transcribed, facilitating better acquaintance with the research (Lincoln & Guba, 1985).

Data from interviews determined perceptions of current tobacco production in Greene County from the inception of the tobacco program to present-day. Interviews both reflect cultural norms and economic impact, while simultaneously providing a portrayal of tobacco as a viable

cash crop. Interview data concluded the significance of present-day global production with the direct interaction of a community's response to overcoming significant change. Triangulation ensured validity throughout the study, maintaining credibility (Lincoln & Guba, 1985). Triangulation occurs when all respondents agree on specific outcomes throughout the study, which yields the same understanding of the outcomes (Lincoln & Guba, 1985). All documents utilized throughout this study were triangulated, including the interviews themselves, personal observations, and reflections, and field notes, as well as a thick description of each participant, which are also representative of credibility.

The theme development transpired through two individuals familiar with the study: the researcher and faculty advisor. Once the transcriptions were complete, the researcher and faculty advisor individually coded the data and repeatedly revisited those codes to establish themes. The themes that were created from coding the transcripts and placing those codes into categories were impact on personal farm, sense of pride in community, resiliency, and adaptive leadership. In addition, there was more rich data to capture and seven additional subthemes were agreed upon. The subthemes identified were impact on personal farm level were diversification of their personal farming operations, production and marketing constraints, and concern for future generations. Subthemes of sense of pride in their community were communication; perceptions; heritage and historical legacy; and community involvement and community economics.

To represent dependability of this study and minimize bias during the interview process, a peer reviewer, which is a university-trained faculty member in qualitative studies, scanned for inconsistencies among participant responses, researcher notes, and observations, and served as peer reviewer by facilitating the guidance of both the analysis of data and theme development. To maintain transferability, the use of participant interview responses, the literature review, reflective notes and observations, as well as prolonged engagement in the field were utilized. All participants of this study facilitated a check of individual transcripts, establishing confirmability. Participants were not guided in their responses through the structure of probing questions and interview questions. To minimize bias during the interview process, both interview questions and probing questions were structured so participants were not guided in their responses. A university faculty member served as a peer reviewer, who is trained in qualitative studies, and facilitated the guidance of both the analysis of data, and theme development.

Researcher Subjectivity Statement

Having grown up on a burley tobacco and beef cattle family farm only fifty miles from Greene County, TN, I am highly cognizant of the potential loss in cultural traditions and how directly significant changes can alter the sense of pride and connection within communities when suffering a loss of a typical *way of life* on the farm. It is from my own personal experience, as well as personal observations during interviews with respondents of this study and later reflections upon their answers and research for this study, I recognized although change is inevitable, communities' can withstand certain change and emerge triumphant in future pursuits without losing the legacy of their historical past.

It is those direct lines with our past that drive us to succeed and enable us to impart a lasting footprint of our own in making the transition to a better tomorrow. It is the personal relationships

that flourish in these communities, along with a personal sense of pride in our upbringing and current farming endeavors that allows each of us to look toward the future while never forgetting our past. It is the realization that without those generations before us, paving the way for our personal successes, perhaps the legacy they left for us to love today would be of a different status quo.

I write this as I sit in the former Austin Company's main office headquarters, which today is my office, complete with the Diamond G emblazoned on the smokestack out in front of the building that ironically houses the The University of Tennessee Extension, Greene County offices. It stands tall and proud towering over this unforgotten and distinctly memorable area of downtown Greeneville, reminding us of our cultural legacy that will forever remain in this historic district where our roots run deep with the production of a plant that epitomizes the foundation of a community rich with culture and the birthplace of the world's second largest leaf dealer today.

Burley tobacco, although a 13-month job and some of the hardest work I have ever been personally involved with, gave me opportunities far surpassing anything I could have ever imagined. Being raised on a fourth-generation burley tobacco farm, I was taught from a very early age the importance of hard work and helping my fellow neighbors. It instilled a sense of spirit in me that will forever remain because I know I am who I am today as a result of those many summers hoeing endless rows of tobacco or handing up every stick of tobacco into the barn or grading tobacco in weather so cold you could never feel your fingers or toes. Tobacco gave me not only a sense of pride for myself and my family legacy, but for my overall community. My small community in Haywood County, North Carolina is very different now than it was sixteen years ago when I left, but that spirit lives on in the little valley of Crabtree, traditionally known today as one of the best burley tobacco growing regions in Western North Carolina. There may not be a lot of the *golden leaf* seen growing on the roadsides or hanging in the barns, but we all know and remember.

Findings

Four specific themes emerged from this study, which were impact on personal farm, sense of pride in community, resiliency, and adaptive leadership. Within those themes, seven additional subthemes emerged. The subthemes of impact on personal farm level were diversification of their personal farming operations, production and marketing constraints, and concern for future generations. Subthemes of sense of pride in their community were communication; perceptions; heritage and historical legacy; and community involvement and community economics.

Impact at Personal Farm Level

The impact at the personal farm level theme focused on the 10 participants thoughts and reactions of how the tobacco buy-out had affected them and their family from a personal farm level. The subtheme areas that evolved from this are diversification of personal farming operations,

production and marketing constraints, and the concern for future generations related to tobacco production.

Diversification of personal farming operations.

All 10 producers agreed they had each diversified their farming operations because of factors within the tobacco industry. One producer (P1) performs custom spraying in his community. Two producers (P3 & P10) own lawn and/or landscape companies as a side business for the farm. Six (P1, P3, P6, P7, P8, & P9) own beef cattle; one (P7) operates a dairy farm; four (P1, P3, P6 & P8) produce hay and/or straw for resale; four (P1, P4, P5, & P8) grow corn and/or soybeans; and five (P1, P2, P5, P6, & P8) are involved in commercial fruit and vegetable operations, specifically pumpkins, blueberries, squash, and cabbage with one producing wine grapes for a local vineyard.

Upon inquiring which farm enterprises were of highest market value, two of the 10 producers (P3 & P6) claimed beef cattle. Of the remaining eight producers, five (P4, P5, P8, P9, & P10) reported tobacco was their highest value cash crop, and two (P1 & P7) reported a combination of both the beef cattle and tobacco were their highest valued crops. One producer stated, “grapes were the most profitable in my overall farming operation last year” (P2).

Production and marketing constraints.

Regarding production and market changes the producers have personally experienced in the last 10 years, three (P5, P6, & P10) reported no significant change. Of those three, one is not currently producing tobacco (P10) and one is relatively new to the industry and unfamiliar with the quota system (P5). As one producer explained, “I have only been in production for four years. I got in because of my dad. No real changes” (P6).

Five producers (P1, P6, P7, P8, & P9) stated they now operate utilizing the big bale package versus the small bale. As one producer stated, “I have gone from small bales to big bales. My acreage is up” (P1). Although one producer confirmed bigger bales was a positive change in the last 10 years, he also stated, “I simply could not afford the big bale as an option on my farm due to my small production size” (P3). As a result, the company penalized him for delivering in small bale packages.

In addition, as one producer pointed out, “Production is limited based on what pounds the company will contract to you. Therefore, I have no personal choice on how much I can grow. It is all controlled by the company because of their contract numbers” (P1). Yet another producer claimed, “The market is very unstable with uncertainty” (P2). Seven producers (P1, P4, P5, P6, P7, P8, & P9) claim they are striving to build or maintain a high level of agronomic practices on their operations through proper usage of pesticides, resistant varieties, and decreasing costs of overall inputs to remain profitable. As one producer described, “I am more in tune with my tobacco as a crop” (P5).

All producers were familiar with the Tobacco Quota Buyout. One producer illustrated, “Initially the buyout looked good for producers, and it worked well because companies made it

look attractive. It made the tobacco get in the hands of those who really wanted to produce it. During the Tobacco Quota Buyout, pounds were in the hands of those wanting to make a profit without even growing tobacco. The disadvantage now is companies are smart enough to know the cost of production, and with no price support or government intervention companies have too much control of the marketing system. They totally control the price, who can grow tobacco, and then ultimately who can market tobacco” (P1).

However, one producer stated, “Well, the Tobacco Quota Buyout forced a lot of growers out of business. But, the tobacco is in the hands of those who want to grow it now, like myself. Price support gave us a safety umbrella because now the buyout just gave all the control to the companies. We, as producers, really have no say” (P8).

Concern for future generations.

When asked what the future holds concerning tobacco production on their farms, only five (P3, P6, P7, P8, & P9) responded they wanted to continue growing tobacco. One producer said, “I love to grow it! I need to survive” (P7). Yet another simply declared, “I’ll keep growing” (P9). One producer (P5) indicated he would decrease production, with the remaining three (P1, P2, & P4) declaring the possibility of quitting production altogether. As one producer stated, “If I can find something to replace tobacco income wise, I would. I would quit growing tobacco tomorrow, and I am very near to that point now because of the cost of producing a profitable crop. Profit margins are down, labor issues are a problem, and qualified labor is absolutely an issue. Tobacco is nowhere near appealing to grow as it once was. I only grow it today for sentimental reasons, and because I’m good at producing it because I always have. The policy problems difficulties are all too much to try to keep growing without the profit we use to receive” (P1). Yet another producer simply stated, “It does not look very good. I am thinking about quitting” (P4). One producer (P10) was unsure about his future production.

Eight of the 10 producers (P1, P3, P4, P5, P6, P7, P8, & P9) felt tobacco was on its way out in Greene County. One grower stated, “Well, it sure is not as fun as it used to be. I will grow as long as they let me, I guess” (P8). One producer described, “This area has historically produced high-quality tobacco, and at one time we were the largest tobacco producing county in the entire state of TN. We no longer are anywhere close to being relevant on the domestic or the world-wide crop” (P1). When asked how the buyout has affected Greene County production since 2004, five producers (P1, P2, P4, P6, & P7) remarked there has been a decrease in production. One (P8) cited there were simply no producers left in the county, with one remarking, “Just drive around. It is evident. There is no tobacco left here. The small guy is out” (P8).

Regarding the influence of younger generations, nine of the 10 producers (P1, P2, P3, P4, P5, P6, P7, P8, & P10) were adamant about the younger generation not getting involved in the industry. One producer stated, “I would struggle to encourage any young person to even consider growing tobacco these days” (P3). Six producers (P1, P3, P4, P5, P6, P7, & P8) stated even if the younger generation wanted to get into the industry and produce tobacco on their farms as a mainstay, it would be difficult. As one producer so eloquently stated, “First off, even if young people are interested in producing tobacco, their opportunity or potential of getting into the industry is very, very slim. I would struggle to encourage any young person to even consider

growing tobacco these days” (P1). One producer stated, “There is no more room to play” (P4). A younger producer claimed, “Younger folks like me just can’t get in even if they want to” (P8). Yet another younger producer illustrated, “Cattle prices are high and other crops are bringing more money to the farm cash flow” (P3). And last, “I am young. How long can I stay? It is up to the company” (P6).

Sense of Pride in Community

The sense of pride in one’s community does impact how one is perceived and how one interacts with community constituents in addition to communicating with the direct contract companies. 10 ten tobacco farmers who were interviewed discussed how communication and perceptions in the community have impacted them since the tobacco buy-out. Also, the 10 producers valued tobacco production as a heritage and historical legacy along with being involved in the community and supporting the community economic growth.

Communication.

Producers were asked if and how the direct communication from their contracting company(s) had affected their production/marketing plan since 2004. Of the 10 respondents, five (P2, P3, P5, P9, & P10) indicated they knew what was expected in advance from the company. One producer acknowledged, “I know what companies will pay up-front, what they are looking for, and how I can adjust accordingly” (P5). Yet another producer stated, “We both signed the contract before the crop year. I must deliver what I say. The company has to deliver the price” (P9).

Perceptions.

All 10 producers have all been actively engaged in tobacco production at some point throughout their lifetime. However, production has decreased at a steady pace since the Tobacco Quota Buyout in 2004. All 10 producers reported they are significantly growing less tobacco today than they were prior to and/or right after the buyout. As one producer noted, “After the buyout, I took a full-time job off the farm. As a result, my production decreased on the farm” (P5).

One producer stated, “The government should be left out of it all together” (P2). Yet another producer stated, “Well in my case I have never been more tickled to get tobacco pounds in the hands of those who really wanted to grow it. I was someone who really wanted to produce it. I do not have to spend months and months begging to get pounds now like I used to. That was crazy, but the price per pound dropped, meaning I ended up with the same amount of money, but there again I could focus on my production and my farm other than chasing down pounds” (P4).

Three producers (P4, P8, & P9) agreed the buyout forced some producers out of business, but also rid the market of those individuals wanting to get rich off tobacco without growing the labor-intensive crop as suggested by one producer, “After the Tobacco Quota Buyout, the quota owners got rich. Well, those that owned any quota. I leased a lot of pounds. The game is the same. The Tobacco Quota Buyout did weed out those guys who just did not care about growing quality. I prefer the contract system. If you grow quality, they [companies] will take care of you” (P9).

Upon asking what producers thought about the inception of the GAP program, two producers (P3 & P4) claimed it was ridiculous, declaring, “There is no rhyme or reason. No consistency at all. They need to give us a break and realize we are business operators and tobacco producers! GAP makes no sense” (P4). Whereas, three producers (P1, P5, & P9) felt the concept is good for the producer, although maybe not efficient, as noted by one producer, “The concept is good and could be useful to the industry. I have always been supportive, although to this point it has not been effective in my opinion” (P1). One producer also noted, “It has been a good program. It raises awareness. It makes all of us as producers more competitive and efficient in the long run” (P5). One producer commented, “I am much more cautious while handling my tobacco” (P2).

Of the 10 producers, four (P3, P5, P6, & P9) hold only one contract to market their crop and four (P1, P2, P4, & P8) hold two contracts to market their tobacco, whereas, one producer (P7) admitted to holding two contracts and sometimes selling to the auction system. When inquired what their thoughts were specifically related to direct market contracts, four (P2, P3, P4, & P9) indicated a positive response, with one stating, “I wouldn’t go back to the poundage system for nothing” (P4)! Five (P1, P5, P6, P7, & P8) indicated they felt the contract system only benefitted companies, and that there was no room for the grower. As one producer indicated, “They are just too picky. Just let me sell my tobacco” (P7)! Yet another producer claimed, “This is the only way to conduct business in today’s word. My opinion” (P2).

Heritage and historical legacy.

When producers were posed the question as to what historical relevance Greene County has played or continues to play on the worldwide supply and demand stage, all 10 producers overwhelming declared that Greene County was historically the largest market in the state of TN. One of the 10 producers actually declared, “Tobacco was King” (P10)! With another agreeing, “Tobacco put us on the map” (P6)!

Community involvement and community economics.

When producers were asked if they realized the impact tobacco has played in the role of economic contributor to Greene County, the overwhelming response was verbatim, “Absolutely” from seven (P1, P2, P3, P4, P6, P7, & P10) of the ten producers. The remaining three (P5, P8, & P9) answered with, “Yes”; “Hell yes;” and “Oh, yes!” From these responses, it is clear to infer from the resounding replies all 10 producers were indeed aware of the role tobacco serves as an economic contributor to Greene County.

Resiliency in Greene County

As indicated by nine of the 10 producers (P1, P2, P3, P4, P5, P6, P7, P8, & P9), they are currently still growing burley tobacco as a means of income for their farming operations, illustrating resiliency at the community level. Regarding market changes in Greene County, all 10 producers have continually diversified and/or produced more burley tobacco to stabilize farm income. As one producer indicated, “We [Greene County] should be able to continue to grow and deliver based on supply and demand in production worldwide” (P2), illustrating resiliency has been an active concept throughout the county for many years. In addition, as noted by one producer

concerning the effect of the Tobacco Quota Buyout, “Some expanded production. Some got out of production. Some diversified” (P5). Although all but one producer feels like burley tobacco production will continue to decline in Greene County, all producers are cognizant of the crop’s influence in their hometown, indicating a community rich in resilience. As one producer remarked, “Reflecting on my childhood, tobacco was what paid the bills” (P6).

Adaptive Leadership

In referencing adaptive leadership and their influence on burley tobacco production in Greene County, eight producers (P1, P2, P4, P5, P6, P7, P8, & P9) have adapted to the changes within the burley tobacco industry in some fashion. Of the remaining two, one producer (P10) has completely exited production. The remaining producer has been unable to adapt in the changing market environment and has thus received a lower price for his tobacco claiming, “I am too small to go to a big baling system. Therefore, I deliver in small bales and get a lower price” (P2).

Four producers (P1, P2, P5, P8, & P10) have made significant changes in their production practices to maintain profitability at the farm level. As one producer stated, “I have gone from the small bales to the big bales and added new varieties” (P1). One producer (P8) studies Crop Protection Agents (CPA’s) to determine which will work more effectively and yield a lower input cost. Yet another producer proclaimed, “I have been trying to change my production program to be more in-line with that of the company, especially agronomic practices” (P5). As indicated by that same producer (P5), the GAP program has afforded the opportunity for producers to become more “in-tune” with their crop. Yet another producer remarked, “I do more record-keeping now to maintain compliance with the company” (P8), and as one producer pronounced, “We all are now more accountable” (P9).

Conclusions, Implications, and Future Recommendations

Burley tobacco has been and will continue to play an important role in Greene County, TN’s economic sector, as well as maintain the historical ties framed within the context of tradition. Producers in this study identified diversification of their personal farming operations necessary to either maintain current production of burley tobacco or to maintain viable on their farms independent of tobacco. As a result, burley tobacco production represents an adaptive challenge for both burley tobacco producers and citizens within Greene County, TN, as well as the entire tobacco industry in the United States. Greene County, TN demonstrates adaptive leadership through the ability to see the big picture and its relation to both a personal farm income from the tobacco producer’s standpoint. In addition, adaptive leadership is displayed through the overall economic impact at the community level while simultaneously creating an environment satisfactory to both parties.

Tobacco was profitable, and although hard work, provided a more-than-decent income for farm families throughout the county (Yeargin, 2008a; Yeargin, 2008b). How could families afford to continue to grow tobacco, but how could families afford not to? Perhaps through a process known as resilience. As this study so poignantly clarifies, there is a connection between the farmer and the tobacco plant itself which has repeatedly stood the test of time. There is a long-withstanding legacy that evokes a sense of nostalgia and pride among the communities that have

historically grown tobacco. All 10 producers felt a shift in culture to a specific way of life involved with the production of burley tobacco on their family farms, spanning multiple generations. Therefore, this study reveals a deep culture of tobacco production as a mainstay crop for community livelihoods.

Greene County entered a financial predicament with the abolishment of the Tobacco Program in 2004, which led to an emotional breakdown of farming communities throughout Greene County (Yeargin & Bickers, 2015). Greene County has seen the phenomenon of communities overcoming adversity and rising to the challenge of resilience first-hand. Although, many producers exited tobacco production during this transitional time, they either chose to diversify their farming operations to remain viable or sought a full-time job off the farm (Yeargin & Bickers, 2015). It lies within the communities to determine whether to succeed and/or fail after industry-changing events alter the current path of production. As shifts in production have occurred in burley tobacco production since 2004, so too, has the shift in mindset for Greene County citizens (Yeargin, 2008a; Yeargin, 2008b). Although no longer the tobacco giant they once were, they remain profitable in a plummeting domestic industry, staring adversity in the face, acknowledging change, and accepting the challenge to be a resilient community. They remain steadfast in their ability to withstand financial and emotional impediments through the realization of tobacco as a cultural tradition, revered and valued by those intrinsically impacted, whether directly or indirectly, through the production of burley tobacco in Greene County.

This study also concluded all 10 producers realized tobacco was a huge economic contributor to the Greene County economy. They all viewed the 2004 buyout as a negative change for the overall Greene County economy and claimed a significant exit of producers had occurred since the buyout, thus in their opinion, weakening the overall economy in Greene County. In addition, all producers in this study have demonstrated and overcome adaptive challenges, therefore making them leaders in their communities. Because adaptive challenges are tied to emotion, the need to change becomes necessary (Northouse, 2013), and thus, coping becomes an adaptive skill (Heifetz, 1994). Tobacco producers in Greene County have become key to strategizing negotiations from the farm level all the way to the legislative level, enabling all those involved with the industry a process in which clarification from all perspectives could be defined. This has resulted in a more cohesive approach to deliberate change, therefore mitigating frustration felt by the process of adaptive change (Northouse, 2013). Because many individuals inherently avoid change, it becomes necessary for adaptive leadership to guide the process for successful growth to continue as well as to give voice to the concerns of those affected (Northouse, 2013).

Burley tobacco production and marketing has significantly changed in the last 20 years, resulting in a diminished profit for both individual producers and Greene County communities as a result. However, in response to the industry's tumultuous transition, Greene County burley tobacco producers have risen to the challenge by adapting their production and/or marketing methodologies. Greene County continues to undergo momentous change, but with adaptive leaders at the helm, Greene County will continue to emerge triumphant in the face of crisis. Greene County is a resilient community born out of commitment to a legacy that has long withstood the test of time and contributed to an economy rich in agriculture and pride in their tobacco heritage. Moreover, changes have rampantly occurred in the last several years and continue to remain eminent in the burley tobacco industry, both locally and globally. As a result, both independent

farms and steadfast tobacco farming communities will be in transition to remain profitable in the ever-changing industry. Will the United States remain a player in global supply and demand when other countries can produce the “big leaf” so much cheaper? Where does the future lie with agrarian communities regarding alternative enterprises replacing the lost income from tobacco? It will be interesting to delve into the interpretations of burley tobacco producers in the future to determine advantageous outcomes benefiting local communities with diversification efforts while maintaining a unique bond with sustaining their tobacco heritage.

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Allocation of Time Among Preservice Teachers During Their Clinical Experience

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Allocation of Time Among Preservice Teachers During Their Clinical Experience

Student teaching is one of the most profound opportunities that teaching candidates experience as part of their preparation program (Clark, Byrnes, & Sudweeks, 2015). This process is an opportunity for the student to make the transition from student to professional educator and take knowledge of theory and change it, through experience, into practice. During student teaching, university students are expected to mirror the actual job expectations of their cooperating teachers which include all areas of the three-circle model of agricultural education (classroom teaching, FFA, SAE activities) in addition to the roles of program administrator, college student, and adult educator. There is a connection between the amount of time spent in an activity and levels of self-efficacy associated with the activity and further connections between levels of self-efficacy and longevity in the field of education and this study examined the allocation of time among preservice teachers over their student teaching experience. Weekly reports were submitted by cohort students to university supervisors and compiled for data analysis. Among the five general categories used, the most time was allocated to serving as an FFA advisor and secondary instructor, a smaller amount was spent in “student” roles, and the remaining time dedicated to program administrative roles and adult education. Analysis of sub-categories within the broader roles revealed that student teachers were having drastically different experiences in terms of time allocation.

Introduction/Literature Review

The national teaching shortage is well established. Within the field of agricultural education, there have been unfilled vacancies every year since 1965 (Kantrovich, 2007). While professional attrition will always be present, part of the shortfall in teachers is caused by completers of agricultural teacher preparation programs not entering the teaching workforce. Roberts, Greiman, Murphy, Ricketts, and Harlin (2009) noted that only 70% of qualified candidates chose to enter the profession. Kantrovich (2007) reported that only 53% of candidates from the same time-period entered the profession specifically to teach high school agriculture. With such a large proportion of newly certified teachers choosing not to enter the profession of agricultural education there is a need to critically examine the teacher preparation process to help minimize these losses and help fill the demand for highly qualified teachers.

In education, self-efficacy has been an important construct associated with increased student performance (Ross, 1992). The increase in student performance could be connected to other studies that linked increased teacher self-efficacy with teachers who spend more time working with struggling students (Gibson & Dembo, 1984) and who are more prepared and organized (Allinder, 1994). Additionally, working teachers with higher perceived levels of self-efficacy report higher levels of commitment to the profession and reduced intentions to leave the classroom (Blackburn & Robinson, 2008; Caprara, Barbaranelli, Borgogni, & Steca, 2003; Coldarci, 1992; Walker, Garten, & Kitchel, 2004).

Studies have sought to identify areas of where teachers’ self-efficacy are low and generated recommendations for professional development areas with investigations into perceived efficacy in mathematics (Stripling & Roberts, 2012), science (Hamilton & Swortzel, 2007), dealing with students with special needs (Aschenbrener, Garton, & Ross, 2010), as well as the relationship of self-efficacy and community connectedness (Langley, Martin, & Kitchell, 2014). Beyond

measuring self-efficacy in subject areas or dealing with populations, studies have investigated the self-efficacy of agricultural teachers based on certification method (traditional or alternate). Rocca and Washburn (2006) found that there was no difference in self-efficacy when comparing traditionally and alternately certified teachers while Duncan and Ricketts (2008) found certified teachers were more efficacious in content knowledge, program development, and FFA and Supervised Agricultural Experience activities.

As part of a teacher preparation program, student teaching has been regarded as being an important capstone experience (Myers & Dyer, 2004; Borko & Mayfield, 1995; Edgar, Roberts, & Murphy, 2009; Smalley, Retallick, & Paulsen, 2015) where prospective teachers have an opportunity to learn from real-world, high-impact experiences (Smith & Rayfield, 2017) and develop self-efficacy as teachers. Two longitudinal studies noted a decrease in efficacy midway through student teaching and that efficacy was at its highest at the conclusion of student teaching (Roberts, Harlin, & Ricketts, 2006; Roberts, Mowen, Edgar, Harlin, & Briers, 2007). This finding was supported by Swan, Wolf, and Cano (2011) who, when measuring changes in self-efficacy in the first year of teaching, noted the highest levels of self-efficacy immediately following student teaching.

The quality of the student teaching experience has strong implications for the profession. Student teachers who had a positive teacher preparation reported higher levels of self-efficacy (Ronfeldt & Reininger, 2012; Knobloch, 2006; Whittington, McConnell, & Knobloch, 2006). Conversely, a lack of positive experiences leads to diminished self-efficacy which is associated with lower levels of job satisfaction and a decrease in the planned career longevity of the early career teacher (Blackburn & Robinson, 2008; McKim & Velez 2015).

The quantity of work placed on student teachers is a key consideration in examining and developing student teaching opportunities. In a study of non-agricultural education pre-service teachers, Fives, Hamman, and Oliverrez (2007) posited that the high workload placed on student teachers may be creating early burnout in student teachers and impacting their decision to enter the field. This potential early burnout is of special concern in preservice agricultural teachers where the three-circle model of agricultural education increases the time commitment expected of cooperating agricultural educators and their student teachers. A study in Georgia reported that agricultural teachers average a 57-hour work week, plus an additional 20+ hours attending to family obligations (Murray, Flowers, Croom, & Wilson, 2011). The long hours are not localized to the southeast. McKim and Velez (2016) noted that agricultural education teachers from the western states work more than 55 hours during an average week.

The challenging schedules of an agricultural teacher, and the implications for potential student teacher burnout, lends itself to a need to prioritize where student teachers allocate their time. Torres and Ulmer (2007) found that student teachers spent most of their time planning for instruction, teaching, and on teaching-related activities, and the smallest amount of their time on administrative related activities. This aligns with a later study where Robinson, Krysher, Haynes, and Edwards (2010) reported student teachers spending much of their time observing their mentor teachers and teaching class. These studies on how student teachers spent their time parallels studies on the perceived importance of student teaching activities. Smalley, Retallick and Paulsen (2015a, 2015b) reported that student teachers saw planning for instruction as being the most important

activity while cooperating teachers perceived the most important activity as evaluating student performance. In a study of university supervisors, Paulsen, Smalley and Retallick (2016) identified planning for instruction, teaching, evaluating students, and assisting students and their supervised agricultural experiences (SAEs) as the most important constructs of student teaching.

The types and volume of experiences are not the only factor in developing student teacher self-efficacy. Relationships with the cooperating teacher (Harlin, Edwards & Briers, 2002), the nature of feedback provided (Edgar et al., 2009), and pace of experiences all play a role in the process. In a study comparing 15-week to year-long placement, it was suggested that the year-long internship provided more opportunity for developing self-efficacy through vicarious experiences (Clark, Byrnes, & Sudweeks, 2015). In addition to the length of placement, McKim and Velez (2016) posit that self-efficacy from student teaching is influenced by the number of courses taught and further suggest flexibility in course loads.

Conceptual Framework and Model

Self-efficacy is defined as an individual's perceptions regarding their capabilities, both cognitive and physical, to plan, organize and execute certain activities (Bandura, 1986). Teacher self-efficacy relates to the beliefs teachers hold about specific competencies in the profession (Pendergast, Garvis, & Keogh, 2011) but not necessarily their actual ability to complete the competencies (Tschannen-Moran, Woolfolk-Hoy, & Hoy, 1998). The idea of cultivating self-efficacy in teachers has been posited as essential in creating a profession of committed and effective teachers (Tschannen Moran & Woolfolk-Hoy, 2001).

Bandura (1986) suggested that there were four primary experiences that shape self-efficacy: mastery experiences, vicarious experiences, social persuasion, and physiological/emotional states. Of these, Bandura noted that mastery experiences were the most powerful and posited that perceptions of self-efficacy for a given task is related to the individual having more positive (successful) experiences in that task. This is supported by a study that reported the more time a preservice teacher spent on leadership related activities, the more their leadership self-efficacy increases (McKim & Velez, 2017).

Vicarious experiences take place before and during the student teaching experience. The experience of observation and reflection can be a strong opportunity to build self-efficacy in the absence of mastery experiences (Bandura, 1977). In teacher preparation programs, these observation activities can include watching other student teachers as part of a teaching methods or other preparatory class, observing cooperating teachers during field experiences or during student teaching, and observing first year teachers or teachers from other fields. This list is not exhaustive, but all of the included items have been shown to increase self-efficacy in pre-service teachers (Wolf, Foster, & Birkenholz, 2010; Knobloch, 2001).

The element of social persuasion has been defined as positive feedback or encouragement on one's ability to complete a task successfully. This feedback is most often in the form of communication from a cooperating teacher, but may also include feedback from university supervisors, teacher educators, or peers (McKim & Velez, 2016). Wolf et al. (2010) noted that written and verbal feedback increased self-efficacy in student teachers. Another study found that

providing formal structure to the feedback showed less increase in self-efficacy than unstructured feedback (Edgar et al., 2009).

The last element listed by Bandura (1986) as a factor of self-efficacy are the combined ideas of physiological, emotional, and/or psychological states. These include the thoughts and feelings one is experiencing prior to, during, and after completing a task. There is limited research in agricultural education on this topic. One author suggested that this was due to difficulty in measuring the construct (Wolf et al., 2010) while another suggested that the more positive feelings are during or following an experience, the more self-efficacy will result from it (Clark et al., 2015).

With a foundation built on these four sources of self-efficacy development, and a review of the literature, the authors developed the conceptual model shown in Figure 1.

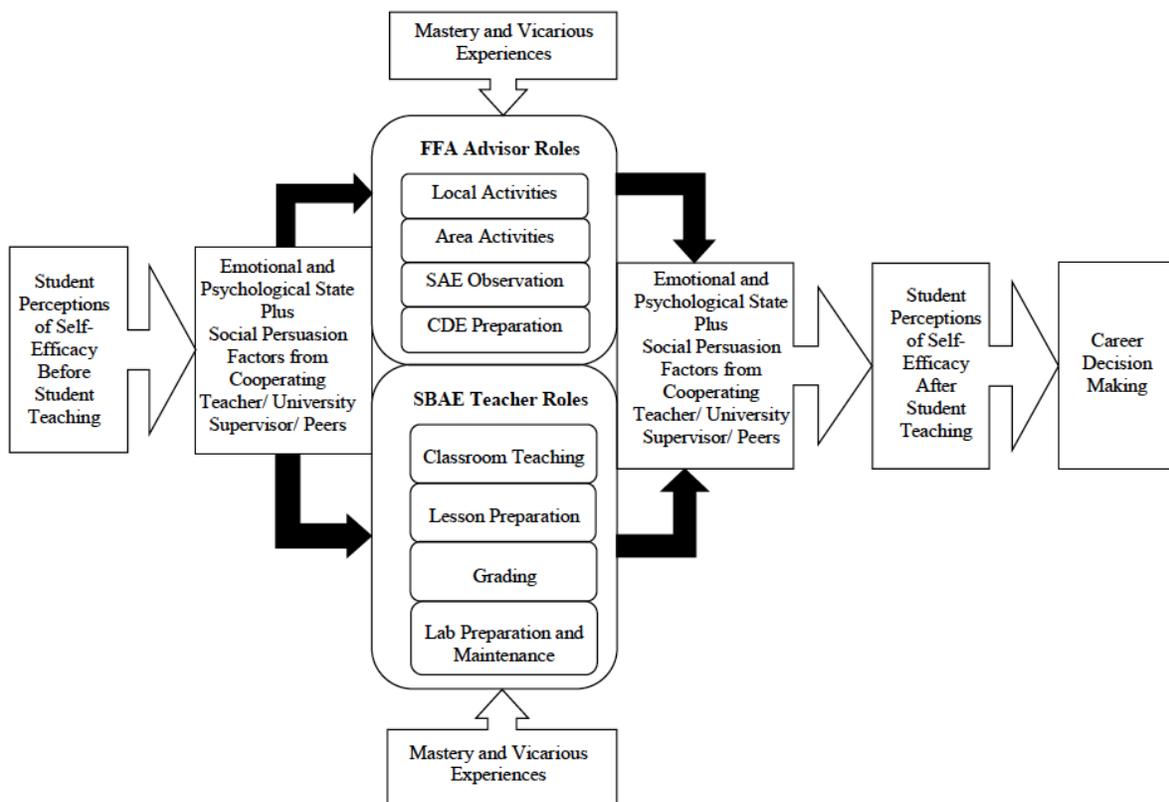


Figure 1. Conceptual model of self-efficacy development during the student teaching experience.

The model is based on the premise student teachers enter their placement experience with a certain level of self-efficacy from prior classes and experiences and, during the student teaching rotation, have a series of mastery and vicarious experiences. The impact of these experiences are influenced by emotional and psychological states and further shaped by social persuasion factors including interactions with peers, cooperating teachers, university supervisors, faculty as well as persons outside the student teaching experience. The unique interaction of these four factors shape the student's sense of self-efficacy following student teaching and may influence individual decisions to enter the profession as a teacher in secondary school based agricultural education programs.

Purpose and Objectives

There is an established connection between levels of self-efficacy based on the amount of time spent engaged in an activity (Krysher, Robinson, & Edwards, 2015; McKim & Velez, 2017). Furthermore, there is a relationship between self-efficacy and career longevity (Blackburn & Robinson, 2008; Caprara et al., 2003 1992; Walker et al., 2004). The connection between volume of experience and self-efficacy, burnout, and potential career longevity provided the impetus for this programmatic evaluation of student teacher hours. This study is not an investigation into student teacher self-efficacy, it extends previous research of student teacher time allocation (Torres & Ulmer, 2007; Robinson et al, 2010) and provides a snapshot of one group of student teachers in west Texas by documenting how placement time was allocated. The objectives guiding this study were to:

1. Describe the number hours spent by student teachers in the categories of FFA advisor, SBAE teacher, college student, adult educator, and other professional responsibilities as well as more specific sub-categories.
2. Describe the time spent observing, preparing, and teaching by the cohort through the progression of the student teaching experience.
3. Describe the differences in hour allocation among the cohort in the categories of FFA advisor, SBAE teacher, college student, adult educator and other professional responsibilities.
4. Compare the hours spent by individual student teachers in the aggregate categories of FFA advisor and SBAE teacher.

Methods

Student teachers from the Spring 2017 cohort at Texas Tech University ($N = 15$) were used as the source of data. Utilizing a provided Microsoft Word template, based on an instrument developed by Torres and Ulmer (2007), students completed weekly work summaries and reflections. Student teachers used these documents to self-report the number of hours spent in: 1) Observing Cooperating Teacher, 2) Preparation for Instruction, 3) Classroom and Laboratory Teaching, 4) Laboratory Preparation and Maintenance, 5) Grading/Scoring of Student Work, 6) Administrative Duties/Program Management, 7) Professional Activities (meetings, in-service), 8) SAE Observations and Recording, 9) FFA Activities – Local, 10) FFA Activities – Area, District, and/or State, 11) CDE Preparation, 12) Adult Education, and 13) Conferencing with Cooperating Teacher. The reflective portion of these reports provided brief explanations of how the time was specifically used and any thoughts or reflections the students had on their experiences. These reports were emailed to the university supervisors and cc'd to a common recipient who managed the files and helped facilitate data entry.

The reports were analyzed for completeness and any missing records were addressed by contacting the individual students for clarification or correction. The self-reported hours were

totalled and entered into Microsoft Excel worksheets by week. The 13 categorical totals were compiled into a separate cohort data sheet. In each of the 13 areas, means, standard deviations, and percentages were calculated using the included functions in Microsoft Excel and verified using processes provided by Field (2014) and Lane (n.d.).

The researchers generated a broader view of the cohort’s experience by grouping the thirteen teaching areas into five different general categories within the student teaching experience: 1) Learning as a Student, 2) Serving as a SBAE Teacher, 3) Other Administrative Duties, 4) Advisor Duties, and 5) Adult Education. The data sets for these general categories were analyzed using descriptive statistics for mean, standard deviation, percentages of the sum of all time reported, and percentages of the category.

Findings

The first research objective was to describe the hours dedicated by the cohort in generalized categories specified by the researchers (Table 1). During their clinical experience, the 15 student teachers averaged 713.8 hours of engagement over their 15-week placement. The average time spent serving as an FFA Advisor was 281.7 hours and accounted for 4,226 (39.5%) of the total time spent by the cohort. The next largest block of time included activities serving as a SBAE teacher with 4,067 hours allocated ($M = 271.1$, 38.0%). Activities as a preservice college student was the next largest allocation of time at just over 1957 hours ($M = 130.5$, 18.3%) followed by other professional and administrative duties, and adult education.

Table 1

Time Allocation of Preservice Teachers in General Categories

Activities	Hours	<i>M</i>	<i>SD</i>	% of Time
FFA Advisor	4,226.0	281.7	166.6	39.5
SBAE Teacher	4,067.0	271.1	126.2	38.0
College Student	1,957.4	130.5	80.8	18.3
Administrative / Professional	325.0	21.7	39.1	3.0
Adult Educator	132.0	8.8	17.4	1.2
Total	10,707.4	713.8	155.4	-

The instrument contained 13 categories that provide a more detailed picture of time allocation (Table 2). Serving as an FFA Advisor represented the largest allocation of time with efforts dedicated to FFA activities at the area, district, or state level accounting for 1719.0 hours (16.1%) of the cohort’s total time over 15 weeks with a per-student mean of 114.6 followed by 1,000.0 hours of SAE observations. Local FFA activities represented 777.0 hours, and CDE preparation 730.0 hours. Serving as a SBAE teacher represented the next largest allocation of time. Within the category, classroom instruction accounted for 2,310.5 hours (21.6%) of the total time invested by the cohort, followed by lesson preparation at 904.0 hours, grading (530.0 hours), and laboratory preparation and maintenance (322.5 hours).

Activities associated with being a college student represented the third largest time usage. Observing the cooperating teacher accounted for 1,306.5 hours (12.2%). Corporately 650.9 hours were spent meeting with the cooperating teacher (6.1%). Administrative activities accounted for the next largest block of time with program administration (e.g. membership, stock show entries) accounting for 199.5 hours (1.9%) and other professional obligations (staff meetings, professional development, staff duty) representing 125.5 hours (1.2%) of the cohort total.

Table 2

Distribution of Hours Among Student Teachers for Specific Activities Associated with Serving as FFA Advisor, Secondary Instructor, Student, and Administrative/Professional

Activity	Hours	<i>M</i>	<i>SD</i>	% of Total Time	% of Category
<u>FFA Advisor</u>					
Area, District, State FFA Activities	1,719.0	114.6	132.4	16.1	40.7
SAE Observations	1,000.0	66.7	101.0	9.3	23.7
Local FFA Activities	777.0	51.8	55.9	7.3	18.4
CDE Preparations	730.0	48.7	22.1	6.8	17.3
<u>SBAE Teacher</u>					
Classroom Instruction	2,310.5	154.0	80.2	21.6	56.8
Lesson Preparation	904.0	60.3	40.0	8.44	22.2
Grading	530.0	35.3	17.4	4.95	13.0
Lab Preparation and Maintenance	322.5	21.5	29.2	3.01	29.2
<u>College Student</u>					
Observing Cooperating Teacher	1,306.5	87.1	60.8	12.2	66.8
Meeting with Cooperating Teacher	650.9	43.4	30.6	6.1	33.2
<u>Administrative / Professional</u>					
Program Management	199.5	13.3	32.7	1.9	61.4
Professional Activities	125.5	8.4	7.7	1.2	38.6

The second objective was to examine the progression of time spent observing cooperating teachers, preparing for instruction, and teaching throughout the progression of the clinical experience. Table 3 provides the mean time spent by the cohort in the three categories.

Table 3

Progression of Time Spent Observing, Preparing, and Teaching by Preservice Teachers

Interval	Observing		Preparing		Teaching	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1	28.70	20.91	11.10	7.92	19.10	13.92
2	17.57	12.25	11.50	10.08	38.00	29.32

3	12.60	10.63	9.60	6.90	24.30	17.02
4	12.77	14.63	15.10	10.90	32.40	22.30
5	15.47	14.73	13.00	11.30	40.30	19.44

Note: The weekly reports were aggregated into five three-week intervals.

The amount of time student teachers spent observing (Figure 2) was highest in the first three weeks ($M = 28.70$, $SD = 20.91$), decreased through the second ($M = 17.57$, $SD = 12.25$) and third ($M = 12.60$, $SD = 10.63$), before increasing during the last phase of the student teaching experience. There was an increase in the time spent preparing for instruction from the first interval ($M = 11.10$, $SD = 7.92$) to the second ($M = 11.50$, $SD = 10.08$) before a drop in the third interval ($M = 9.60$, $SD = 6.90$) and a peak in the fourth ($M = 15.10$, $SD = 10.90$). Finally, time spent preparing for instruction decreased in the fifth interval ($M = 13.00$, $SD = 11.30$). The time student teachers spent teaching classes was the lowest during the first interval ($M = 19.10$, $SD = 13.92$) and increased in the second interval ($M = 38.00$, $SD = 29.32$). There was a decrease of hours spent teaching in the third interval ($M = 24.30$, $SD = 17.02$) before increasing through the remainder of the student teaching experience.

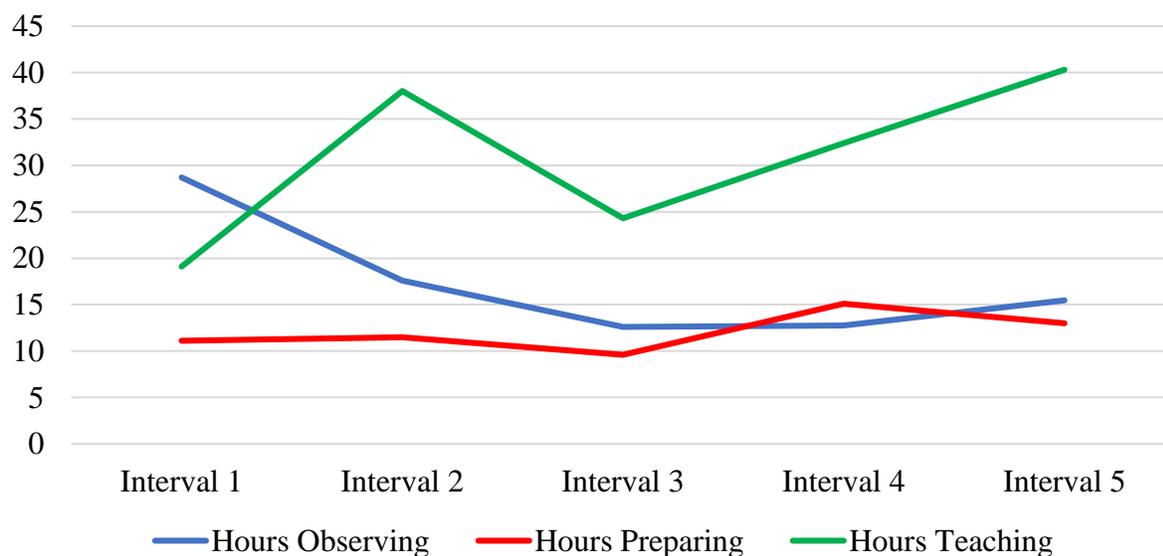


Figure 2. Visual representation of the progression of time (in hours) spent observing, preparing, and teaching by preservice teachers over five three-week intervals.

The third objective sought to describe the range in time allocation among individual preservice teachers in the five designated areas of work (Table 4). The amount of time spent as an FFA advisor had the greatest range of time reported over the 15-week experience at 565.5 hours ($M = 281.7$, $SD = 166.6$). Activities associated with being a SBAE teacher ($M = 271.1$, $SD = 126.2$) had the second largest range of time allocation at 431.5 hours. The range of time allocation for activities associated with being a student (291.5), program manager (160.5), and adult educator (70.0) showed similar levels of dispersion.

Table 4

Time Allocation of Preservice Teachers in General Categories

Activity	Minimum	Maximum	Range	<i>M</i>	<i>SD</i>
FFA Advisor Duties	92.5	658.0	565.5	281.7	166.6
Secondary Instructor	111.5	543.0	431.5	271.1	126.2
Student	33.5	325.0	291.5	130.5	80.8
Administrative / Professional	1.0	161.5	160.5	21.7	39.1
Adult Educator	0.0	70.0	70.0	8.8	17.9

The fourth objective sought to compare the number of hours spent by individual student teachers within the activities associated with serving as an FFA advisor and SBAE teacher. The total hours reported by individuals in the cohort in roles associated with these roles are shown in Table 5. Six students accumulated hours that were between one and two standard deviations from the mean and three students had scores that were beyond two standard deviations. One of these (Student 3) was the highest in hours spent (543) as an instructor equivalent to 2.16 standard deviations above the mean. However, this student was within one standard deviation in hours as an advisor. Students 1 and 11 were the two highest in hours spent as and FFA advisor and were and the lowest in hours spent as an instructor. Student one recorded 376.3 hours more than the mean as an advisor and 157.1 hours below the mean as an instructor. In the same categories, student 11 was above the mean by 355.8 hours as an advisor and 159.6 hours below the mean for serving as a classroom instructor. Three students reported scores that were below the mean in both categories and the remaining 12 students were above the mean in one category and below in the other. A visual representation of the individual student data in reported hours is presented in Figure 3.

Table 5

Hours Spent by Individual Student Teachers in the Roles of FFA Advisor and SBAE Teacher

Student	FFA Advisor (<i>M</i> = 281.7 <i>SD</i> = 166.6)		SBAE teacher (<i>M</i> = 271.1 <i>SD</i> = 126.2)	
	Reported Hours	Deviation	Reported Hours	Deviation
S1	658.0	376.3	114.0	-157.1
S2	262.0	-19.7	441.0	169.9
S3	178.0	-103.7	543.0	271.9
S4	220.0	-61.7	364.0	92.9
S5	188.0	-93.7	426.0	154.9
S6	92.5	-189.2	189.0	-82.1
S7	307.5	25.8	286.5	15.4
S8	264.0	-17.7	296.5	25.4
S9	349.0	67.3	157.5	-113.6
S10	196.0	-85.7	129.5	-141.6
S11	637.5	355.8	111.5	-159.6
S12	114.0	-167.7	262.0	-9.1

S13	367.0	85.3	192.0	-79.1
S14	95.0	-186.7	333.0	61.9
S15	297.5	15.8	221.5	-49.6

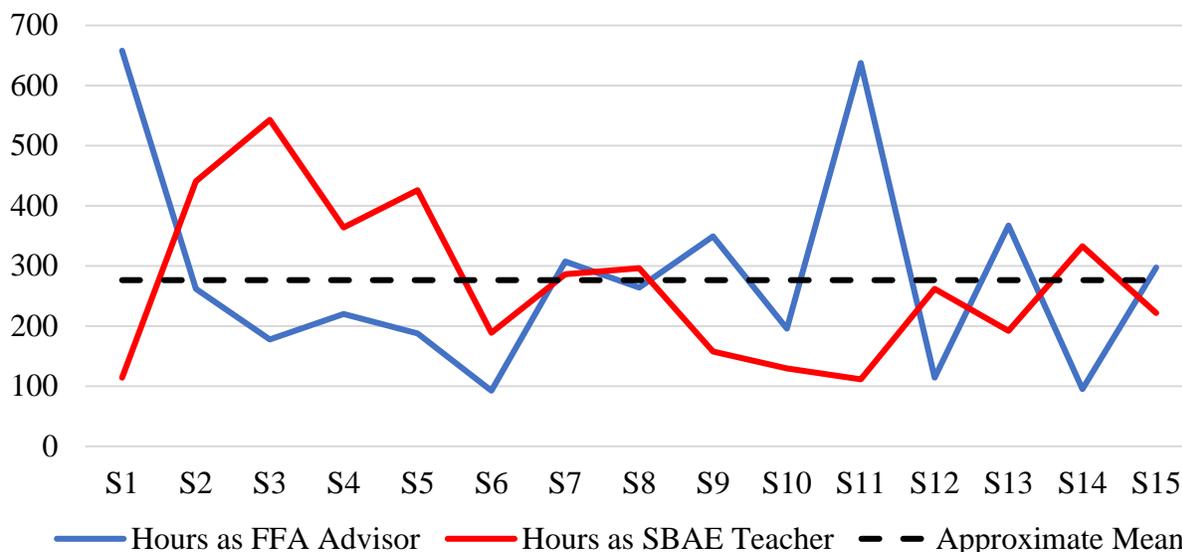


Figure 3. Individual student hours in the roles of SBAE teacher (Instructor) and as an FFA Advisor (Advisor). The detail level of the graph required creating a visual approximation means by averaging the means for the two categories and inserting that value for all points.

Conclusions, Implications, and Recommendations

During the clinical experience, preservice teachers collectively dedicated over three quarters of their time as FFA advisors and secondary classroom instructors and related activities. This is consistent with previous research (Paulsen, Smalley, & Retallick, 2016; Harlin et al., 2002). Within these areas, the most time was dedicated to serving as an FFA advisor (39.5%) compared with 38% of the total time spent as a secondary classroom instructor. This result conflicts with the importance placed on teaching noted by Smalley et al. (2015a; 2015b) and the results of Torres and Ulmer (2007) who reported students spending the most time in classroom teaching.

When analyzing data for more specific activities, the largest portion of time was spent in the classroom as an instructor followed by advising the FFA chapter at the regional and state levels, observing the cooperating teacher, and SAE supervision. What was most notable across these, and other, categories were the variation of hours among the student teachers. Across the cohort, direct classroom instruction averaged 154 hours ($SD = 80$), regional and state FFA activities averaged 115 ($SD = 132$), SAE observations and visits averaged 67 hours ($SD = 101$), and observation time of the cooperating teacher averaged 87 hours ($SD = 61$). These dispersions suggest that individual student teachers are having widely differing placement experiences in all areas of agricultural education.

This disparity among time allocation is reinforced by the findings of objectives three and four. Among the three largest uses of time, there was a 565.5-hour range of time for FFA advising

activities, 431.5 hours for activities associated with serving as a secondary instructor. When looking at hours spent by individuals in the roles of FFA advisors and secondary instructors, the differences in experiences become clearer. The two students with the most hours as FFA advisors recorded time over 350 hours above the mean ($M = 271.1$) yet were over 150 hours below the mean ($M = 281.7$) as SBAE teachers. Conversely, the individual reporting the most hours as a secondary instructor (543 hours) was over 100 hours below the group average as an FFA advisor.

While no two preservice teachers will have identical student teaching experiences, it is vital to ensure student teachers are confident and qualified in all areas before they are certified. Krysher, Robinson, and Edwards (2015), found that student teachers who spent more time teaching during their placement time were more self-assured about their abilities to teach. McKim and Velez (2017) reported an increase in self-efficacy in specific areas of agricultural education with an increase in the time spent in the respective areas. Studies outside of agricultural education provide similar findings. Dorel, Kearny, and Garza (2016) noted a relationship between the length of the student teaching experience and the participants perception of teacher efficacy. Prieto and Altmaier (1994) reported increased teaching self-efficacy in graduate teaching assistants who had received higher levels of training or experience. Similar relationships were reported in nursing students (Wilson & Byers, 2017) and employees relating their computer self-efficacy (Fagan, Neil, & Woodridge, 2003).

The implication of the dis-similarities among the time allocation of the student-teachers is a possibility for a corresponding difference in positive experiences and self-efficacy among the roles required of an agricultural educator. This is a key point in education as diminished self-efficacy has been associated increased levels of feelings of burnout (Skaalvik & Skaalvik, 2010), increased instances of physical or psychological ailments (Wang, Hall, & Rahimi, 2014) with a lowered self-projection of longevity in the field (Pfitsner-Eden, 2016; Wang, et al, 2014). This connection between low self-efficacy and teacher longevity in the profession also pertains to pre-service teachers choosing to enter the field (Rots, I., Aelterman, A., Vlerick, P., & Vermeulen, K, 2007).

It is recommended that more thorough and detailed guidelines are established by this, and other teacher preparation programs regarding time commitment and allotment expectations. Prior to the beginning of the field experience, these expectations should be clearly communicated to the members of the student teaching cohort. Additionally, a clear line of communication needs to be established with cooperating centers to help assure that student teachers are getting a well-rounded, complete experience and spending a sufficient number of hours completing the diverse job responsibilities of an agricultural science teacher.

The distribution of time spent observing by student teachers at Texas Tech University started out high then decreased through the conclusion of the student teaching experience until the slight increase through the final weeks of student teaching. This is consistent with the results of Torres and Ulmer (2007) with the exception of the increase in the final interval. Additionally, this cohort was consistent in the amount of time they spent planning for instruction as Torres and Ulmer (2007) suggested should happen. Wentz (2001) outlined three phases of student teaching: 1) orientation and observation, 2) assisting, and 3) assuming responsibility in the total school program. The student teachers in this cohort followed these phases in the teaching aspect with the

exception of the drop reported in hours spent teaching in the third-time interval. This reduction in hours spent teaching is potentially due to the timing of Career Development Events and livestock shows in Texas.

At the university level, the individuals involved in planning for the student teaching experience determine guidelines to ensure student teachers are receiving opportunities to practice skills during that time of year. Torres and Ulmer (2007) stated, there is a need for a “phase-out” period of student teaching. As student teachers reported spending the most time teaching in the final weeks of their experience, it is recommended that a plan for phasing out of the role of the teacher be outlined as an expectation. It is further recommended that cooperating teachers and administrators be invited to a professional development training hosted by the university prior to the beginning of the field experience. This training should outline expectations for both the student teacher and cooperating center. During the student teacher placement process, teacher preparation programs should ensure that selected cooperating teachers will provide opportunities in all aspects of the agricultural education program. It is imperative that cooperating teachers are willing and prepared to involve their student teacher and allow them to be active program participants (Jones, Kelsey, & Brown, 2014).

The data presented is a descriptive snapshot of one undergraduate agricultural education program and all findings are limited to the programmatic scope of the study. However, these findings prompted questions in the researchers regarding the nature of agricultural education and the three- circle model. If the model of agricultural education is based on the three circles of classroom instruction, FFA, and SAE; are the three-circles equal? If so, how do we as teacher educators convey the concept of a balanced program? Or is the role of the of the FFA advisor more time-consuming than serving as a classroom teacher? Further discussions of statewide, regional, and national trends may clarify this, as well as generate acceptable parameters for time allocation in the diverse areas of a student teacher experience in agricultural education. The scope of this study should be increased to include additional universities from across the region and nation. Additional analyses should be made to compare time allocation to geographic location within Texas or the nation to help determine if regional differences exist in programmatic priorities.

Programs and instructors have localized control over the areas of emphasis and act within the preferences of their administration and community. It is recommended that a better understanding of the preferences, priorities of the partnering district and instructor are established prior to placement of students at a given site. With this information, university faculty may need to discontinue utilizing particular programs if the localized priorities do not align with desired teacher preparation outcomes.

One of the key components of programmatic improvement is a willingness and ability to take an objective and critical look at current practice. The faculty at Texas Tech University are taking the first steps in this process. We encourage our colleagues to be willing to examine their own programs and practices and look forward to the discussions that will follow. Moreover, a critical look should be placed on the priorities of the communities of local high school agricultural education programs. These localized needs and desires should then be compared with State and National Association priorities to investigate alignment and discuss disparities. This careful

examination will aid teacher preparation programs in agricultural education to adjust where needed in order to provide the best possible teacher candidates.

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**Identifying Communication Strategies to Reach Florida about Government Regulated
Water**

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Identifying Communication Strategies to Reach Florida about Government Regulated Water

The largest consumers of water in Florida are single-family homeowners. The increase in population and the availability of quality water in Florida poses a concern. Identifying audience segments through demographic characteristics can assist in determining strategies to communicate with consumers about government regulated water policies. The purpose of this study was to examine how perceptions of government-mandated water conservation initiatives were related to reported water conservation behaviors based on demographics. Understanding the relationship between government-mandated water conservation initiatives and water conservation behaviors may assist in strategy development when communicating about the need to conserve water to various audience segments based on demographic characteristics.

Introduction

State water managers across the United States face growing concerns about the availability and quality of the freshwater supply (United State Government Accountability Office, 2014). Population growth, agricultural use, urbanization, climate change, and drought have impacted the growing disparity between the availability of quality water resources and demand for consumption. Increased water demand and a limited supply of water have prompted a conversation around the need for water conservation (Wickstrom & Specht, 2016).

In Florida, water is one of the most valued natural resources (Marella, 2008). Water sources in Florida are incredibly varied and include over 1,700 streams and rivers, 7,800 freshwater lakes, 700 springs, and 11 million acres of wetlands (Fernald & Purdum, 1998). Florida is also home to the most plentiful freshwater aquifers in the United States, which provides water to many springs and rivers (Florida Department of Environmental Protection [FDEP], 2016).

In 2010, public water use surpassed agricultural water use in Florida (Office of Water Policy, 2014) with single-family homes identified as one of the largest water users (Kenney, Goemans, Klein, Lowrey, & Reidy, 2008). Already high, water demand in Florida is expected to increase by 26% in 2020 due to the state's increasing population (Office of Water Policy, 2014).

In reaction to the 2001 drought, one of the worst droughts in Florida history, FDEP – in coordination with the state's five water management districts – developed specific water conservation recommendations to increase water use efficiency (FDEP, 2014). The recommendations were presented in a Joint Statement of Commitment (JSOC) by the five water management districts, FDEP, Florida Public Service Commission, Florida Rural Water Association, Florida Section of the American Water Works Association, and Florida Water Environment Association. A working plan was created and implemented in 2005 based on the recommendations from the JSOC. The plan included developing standardized definitions and performance measures, establishing a clearinghouse for water conservation, developing and implementing a standardized water conservation planning process for utilities, developing and maintaining a Florida-specific water conservation guidance document, and implementing pilot applications through cooperative agreements with volunteer utilities.

In conjunction with the work plan, various pieces of legislation were passed related to water conservation including the Clean Water Act, Safe Drinking Water Act, and various other laws that regulated the application of lawn chemicals and irrigation systems (University of Florida Extension, 2015). In 2009, Senate Bill No. 494 was amended to include mandatory licensing for commercial fertilizer application in urban landscapes and the mandatory installment of soil moisture monitoring systems on all landscape irrigation systems (Natural Resources; Conservation, Reclamation, and Use, 2009). Failure to comply with state statutes could result in monetary penalties for commercial contractors and private citizens.

Demographic and social factors are important aspects to explore when trying to understand consumers' water behaviors (Wolters, 2014). National surveys designed to explore the opinions of the American public in regards to climate change, which is directly linked to water issues, rely heavily on audience segmentation (Leiserowitz, Maibach, Roser-Renouf, & Hmielowski, 2012; Maibach, Roser-Renouf, & Leiserowitz, 2009; Maibach, Leiserowitz, Roser-Renouf, & Mertz, 2011). Kenney et al. (2008) observed three levels of water use in his study: high, mid, and low. Water user segments of the population were identified by specific demographic factors, specifically, that high-volume water users were older, wealthier, and lived in newer and larger homes. The three water-use groups also responded in various ways to water restriction and pricing structures, with the high-volume water users most responsive to price increases. An examination of audience segments for Extension water conservation programming in Florida revealed specific demographic segments based on membership in homeowner's associations (Monaghan et al., 2013). Residents in Florida that used landscape irrigation and lived in homeowner's associations were found to have lower perceived behavioral control over adopting water conservation practices in irrigation than others (Warner, Rumble, Martin, Lamm, & Cantrell, 2015).

Political ideology was also identified as a relevant factor in predicting environmental behavior and engagement in conservation efforts (Gromet, Kunreuther, & Larrick, 2013). Individuals that identified themselves as having politically conservative beliefs were less likely to adopt environmental behaviors based on the presence of environmental messaging (Gromet et al., 2013). Other studies identified age (Arcury, 1990; Dunlap, Van Liere, Mertig, & Jones, 2000; Kenney et al., 2008), attained education (Dunlap et al., 2000; Jones & Dunlap, 1992), and gender (Brehm & Eisenhauer, 2013) as demographic factors with a connection to conservation behavior. Demographic factors are essential in identifying audience segments. Audience segmentation allows agricultural communicators to group individuals into segments based on their specific needs and demographic variables. Targeted programming can motivate behavior change, specifically the adoption of water conservation behaviors (Warner et al., 2015).

As Florida moves to implement increased water regulations and restrictions, those trying to create change need to recognize that individuals are less likely to adopt water conservation behaviors if they do not trust the water authority or government (Jorgensen, Graymore, & O'Toole, 2009). Public lack of trust in the water authority and government presents a need for agricultural communicators to play a role in facilitating a conversation that focuses on water conservation efforts. Due to the largest user of water being homeowners, a shift must occur with communication messages tailored to audiences in suburban, single-family homes (Monaghan, Ott, Wilber, & Gouldthorpe, 2013) rather than just agricultural operations. Agricultural communicators have an opportunity to bridge the trust gap between the public and water and governmental authorities

(Jorgensen et al., 2009) and discuss water behaviors with consumers based upon their social and demographic factors (Wolters, 2014) as well as their political ideology (Gromet, Kunreuther, & Larrick, 2013). This study investigated existing perceptions of Florida's residents regarding government involvement in water regulation and water-use behaviors.

Theoretical Framework

The theory of planned behavior (Ajzen, 1991) was used as the framework for this study. The theory of planned behavior predicts behaviors through the combination of intentions to perform an action taken (Ajzen, 1991). The combination of perceived behavioral beliefs driven by attitude, normative beliefs driven by subjective norms, and control beliefs are driven by perceived behavioral control influence intention to act and actual behavior practiced (Ajzen, 1985; 1991). Understanding an individual's behavioral, normative, and control beliefs will theoretically allow one to predict their intent and behavior for a given action.

Ajzen (1985) describes behavioral beliefs as to how an individual believes they should behave towards a certain action. Their attitude toward this behavioral belief then allows them to perceive the behavior as positive or negative (Ajzen, 1985). Normative beliefs indicate how someone should act in a certain situation. Subjective norms are an individual's perception of how society will react to their normative beliefs (Ajzen, 1985). Ajzen (1985) also identified control beliefs as a presence of outside factors that influence an individual's ability to complete an action. Control beliefs are regulated by an individual's perceived behavioral control, which indicates how a person will be able to act with the presence of outside factors (Ajzen, 1985).

Previous studies have examined the links between environmental/water conservation attitudes and observed water consumption. Water users with positive environmental and water conservation attitudes consumed significantly less water when showering, washing clothes, irrigating their lawn or landscape, and using tap water than those with moderately positive attitudes or negative attitudes (Willis, Stewart, Panuwatwanich, Williams & Holingsworth, 2011). Corral-Verdugo, Bechtel, and Fraijo-Sing (2003) found general environmental beliefs had a significant impact on domestic water consumption.

Perceived efficacy is the ability to mitigate the impact of drought or water shortages can also impact an individual's choice to conserve (Lam, 2006). While positive environmental attitudes are predictors of voluntary water conservation behaviors, mandatory water restrictions have been found to be more effective in reducing water use (Kenney et al., 2008; Lee, 1981). Strategies that provide information on the environmental impact of daily activities are increasing in effectiveness (Delmas et al., 2013). Therefore, government regulation should be partnered with educational and informational programs targeting water conservation to reduce water consumption (Delmas, Fischlein, & Asensio, 2013).

Municipal government and utility companies use two types of strategies to reduce water use: price and rate structures or non-price strategies (Kenney et al., 2008). Consumer reduction of water use in reaction to price strategies is a result of a desire to save money and not the desire to lessen the impacts of overusing water (Lam, 2006). Attitudes and beliefs towards institutional actors that impose mandatory water conservations restrictions have also been examined. When

trust in the water provider and government institution is high, compliance with water restrictions is greatest (Lee, 1981). Jorgensen, Graymore, and O'Toole (2009) identified a lack of institutional trust and negative perceptions of government initiatives prompted individuals not to engage in water-saving behaviors.

Purpose and Research Objectives

The purpose of this study was to examine how perceptions of government-mandated water conservation initiatives were related to reported water conservation behaviors based on demographics. Understanding the relationship between government-mandated water conservation initiatives and water conservation behaviors may assist in strategy development when communicating about the need to conserve water to various audience segments based on demographic characteristics. The following research objectives guided this study:

1. Describe the respondents' water conservation behaviors;
2. Describe the respondents' perception of government-mandated water conservation measures based on demographics; and
3. Determine if the level of engagement in water conservation behaviors impacted perceptions of government-mandated water conservation measures.

Methods

An online survey was used to examine Florida residents' perceptions of government control and government autonomy-support in water conservation behaviors based on demographics. The survey was reviewed for content and validity by a panel of experts consisting of the director of the Public Issues Education (PIE) Center, the director of the Public Issues Education (PIE) Center, and a professor in agricultural and environmental communications. Qualtrics, an online sampling firm, was used to disseminate the survey to Florida residents age 18 or older. Non-probability sampling was used to recruit individuals included in the sample. Non-probability sampling is a commonly used sampling method in public opinion research allowing for population estimates (Baker et al., 2013). As with other forms of survey methodology, non-probability sampling does have limitations, including selection, exclusion, and non-participation biases (Baker et al., 2013). To help control for these limitations post-stratification weighting methods were implemented (Kalton & Flores-Cervantes, 2003).

A scale developed by Lavergne, Sharp, Pelletier, and Holtby (2010) was used to measure respondents' perceptions of government involvement in water conservation-behavior. The scale was divided into two segments designed to measure respondents' perceptions of government pressure or support to partake in water conservation behaviors. A three-item subscale was used to measure respondents' perception of government control in water conservation behaviors. The second subscale consisted of four items designed to measure respondents' perceptions of government autonomy-support in water conservation behaviors. Both scales were measured on a five-point Likert-type scale that ranged from 1 – *strongly disagree*, 2 – *disagree*, 3 – *neither agree nor disagree*, 4 – *agree*, and 5 – *strongly agree*. For both scales, the responses to the items were

averaged to create an overall index score that could range from one to five. The government control scale had an alpha reliability of .90 and the government autonomy-support scale had an alpha reliability of .80. Both scales exceeded the minimum requirements of reliability as outlined by Cronbach (1951).

Respondents' water conservation behaviors were examined using their responses to eleven statements. Seven statements were positive in nature, and four statements were negative. The eleven statements were adapted from items found in the 2012 RBC Canadian Water Attitudes Study (Patterson, 2012). Respondents reported their water conservation behaviors on a frequency scale that was later recoded to a dichotomous scale to sum the eleven variables into a conservation score. Respondents that reported engaging in a positive water behavior, or disengaging in a negative behavior, received a one for that item. Engaging in a negative behavior, or avoidance of a positive behavior resulted in a zero score for that item. The sum for all eleven items was reported as that individual's conservation score and could range from a zero to 11. A zero indicated the respondent did not engage in any positive behaviors and all negative behaviors, and an 11 indicated a respondent engaged in all of the positive behaviors and none of the negative behaviors.

The survey also asked respondents to answer a number of demographic questions. Respondents were asked to indicate their sex, race, age, education level, rural/urban residence, political affiliation, and homeownership in a categorical format.

A total of 516 individuals completed the survey of the 767 individuals invited for a response rate of 67.3%. The data were analyzed using descriptive and correlational statistics in SPSS ® 23.0. Descriptive statistics were used to analyze the first two objectives of the study and an ANOVA for the third objective.

Results

RO1: Describe the respondents' water conservation behaviors

Respondents were asked to report their water conservation behaviors by indicating whether or not they engaged in 11 specific positive or negative water behaviors (Table 1). Respondents most frequently reported the positive water conservation habits of turning off the water while brushing their teeth ($n = 373, 72.3\%$) and installing low-flow showerheads ($n = 297, 57.5\%$). Hosing down the driveway ($n = 336, 65.2\%$) was the most frequently reported negative water-use behavior.

Table 1

Water Use Behavior (N = 516)

	<i>n</i>	<i>%</i>
I turn the water off while brushing my teeth. *	373	72.3
I hose down my driveway.	336	65.2
I have water-efficient toilets installed in my home. *	297	57.5
I let my sprinklers run when it has rained or is raining.	282	54.6

I have low-flow showerheads installed in my home. *	282	54.6
I leave the water running in the kitchen when washing and/or rinsing dishes.	250	48.6
I shower for no more than five minutes each time I bathe. *	223	43.2
I have low-water consuming plants in my yard. *	180	34.9
I avoid watering my lawn in the summer.	168	32.6
I use recycled wastewater to irrigate my lawn/landscape. *	94	18.3
I use rain barrels to collect water for use in my garden/lawn. *	69	13.4

Note: *indicates positive water conservation behavior

Conservation scores were calculated for each respondent. A score of 11 indicated the respondent participated in all positive water-use behavior and no negative water-use behavior, while a zero score indicated the respondent participated in no positive water-use behaviors and all negative water-use behaviors. Five was the most frequent ($n = 85$, 16.6%) conservation score (Table 2). A small section of the respondents ($n = 4$, 0.8%) received a score of 11. Seven respondents (1.3%) received a score of zero, indicating they participated in no positive water-use behaviors and practiced all negative water-use behaviors. The mean conservation score was 4.95 ($SD = 2.34$).

Table 2

Conservation Score Frequencies (N = 516)

	<i>n</i>	%
0	7	1.3
1	29	5.7
2	49	9.6
3	66	12.9
4	70	13.6
5	85	16.6
6	69	13.5
7	60	11.6
8	44	8.6
9	24	4.6
10	7	1.4
11	4	0.8

Note. Conservation score was calculated for 11 measures, four negative and seven positive. Engaging in positive behavior or abstaining from negative behavior resulted in a score of one. Engaging in negative behavior or abstaining from positive resulted in a zero score. Scores were summed to create individual conservation scores.

Individual conservation scores were used to classify respondents as having high, mid-level, or low water conservation behaviors. Respondents were divided into high, mid-level, and low conservation groups based on z-scores. Those with a mean conservation score one standard deviation above the raw mean score were considered to have high conservation. Respondents with a mean conservation score one standard deviation below the raw mean score were considered to

have low conservation behaviors. The majority (68.1%) of respondents had mid-level water conservation behavior, 16.5% of respondents were classified as having low water conservation behaviors, and 15.4% were classified as having high water conservation behaviors.

To better understand conservation categories, demographic information was explored for each group. The high-conservation group was largely metropolitan ($n = 72, 91.1\%$), female ($n = 48, 60\%$), had received a two-year degree ($n = 21, 26.4\%$), owned their home ($n = 65, 82.3\%$), and was mainly comprised of Independents ($n = 28, 35.4\%$). The mid-level conservation group – the largest of all three classifications – was largely metropolitan ($n = 333, 94.9\%$), nearly equally comprised of males ($n = 178, 50.7\%$) and females ($n = 173, 49.3\%$), had a two-year degree ($n = 89, 25.4\%$), and mostly Democrat ($n = 123, 35.0\%$). The majority of the low-conservation group was metropolitan ($n = 78, 91.8\%$), female ($n = 59, 69.4\%$), had taken some college courses but did not earn a degree ($n = 25, 29.4\%$), rented homes ($n = 46, 54.1\%$), with approximately a third ($n = 30, 35.3\%$) reported less than \$24,999 in annual gross income, and was largely Democrat ($n = 35, 41.2\%$).

RO2: Describe the respondents’ perception of government-mandated water conservation measures

Respondents rated their level of agreement with seven statements, comprising two scales, regarding their perception of government control and government autonomy-support in individual water conservation and environmental behaviors (Table 4). Over half of the respondents ($n = 290, 56.2\%$) positively agreed that they have the choice to use government-provided strategies to help the environment. About one-third ($n = 188, 36.4\%$) of respondents negatively agreed that the government tried to impose environmental strategies on them. Mean scores were also calculated for each individual on the government control scale and perception of government autonomy-support subscale. The government control scale mean was 2.97 ($SD = 0.95$). The mean for the perception of government autonomy-support subscale was 3.38 ($SD = 0.84$).

Table 4

Perception of Government Involvement in Water Conservation and Environmental Behaviors (N = 516)

	Strongly Disagree/ Disagree %	Neutral %	Strongly Agree/Agree %
I think the government puts a lot of pressure on people to adopt environmentally conscious behaviors.	37.7	31.6	30.7
The government wants me to feel guilty when I do nothing for the environment.	36.4	28.3	35.3
The government is trying to force me to adopt environmental behaviors.	36.3	31.7	32.0

The government imposes its environmental strategies on us.	32.5	31.1	36.4
The government gives me the freedom to make my own decisions in regards to the environment.	22.8	30.9	46.3
I have the choice to participate in the environmental programs established by the government.	18.0	26.0	56.0
I have choice to use the strategies provided by the government in order to help the environment.	13.9	29.9	56.2

Note. A five-point Likert-type scale was used ranging from 1– *strongly disagree*, 2 – *disagree*, 3 – *neither agree nor disagree*, 4 – *agree*, and 5 – *strongly agree*.

Means for the perception of government of autonomy-support and control were also examined by sociodemographic variables (Table 5). Respondents 80 years old and older had the highest mean score ($M = 3.87$, $SD = 0.44$) for perceived government control, while those who were 20-29 had the lowest ($M = 2.51$, $SD = 0.93$). Those with less than a 12th-grade education had the lowest mean ($M = 1.92$, $SD = 1.04$) for government autonomy-support.

Table 5

Perception of Government Involvement in Water Conservation by Demographic Variable

		Government Control		Autonomy-support	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Sex					
	Male	3.07	0.96	3.30	0.89
	Female	2.89	0.93	3.46	0.79
Race					
	Caucasian/White (Non-Hispanic)	3.00	0.95	3.36	0.85
	Hispanic	2.82	0.72	3.40	1.05
	African American	2.79	0.81	3.44	0.74
	Asian	2.74	1.29	3.86	0.70
	Native American	2.59	1.34	3.87	0.91
Age					
	80+	3.87	0.44	2.56	0.46
	70-79	3.32	0.77	3.24	0.76
	60-69	3.12	0.95	3.42	0.87
	50-59	2.92	0.93	3.34	0.92
	40-49	2.83	1.06	3.38	0.84
	30-39	2.85	0.81	3.49	0.80
	20-29	2.51	0.93	3.56	0.71
	19 and younger	2.57	0.98	3.65	0.29
Education Level					
	Less than 12th grade	3.71	1.30	1.92	1.04

High school graduate	3.03	0.85	3.44	0.78
Some college, no degree	3.17	0.97	3.34	0.88
Two-year college degree	2.79	0.95	3.33	0.87
Four-year college degree	2.98	0.92	3.41	0.81
Graduate or professional degree	2.81	1.00	3.50	0.81
Rural/Urban				
Fewer than 2,500 - non-metro area	3.25	0.00	3.67	0.00
2,500 to 19,999 - non-metro area	3.06	0.50	3.58	0.75
20,000 or more - non-metro area	3.06	0.91	3.31	0.83
Fewer than 250,000 - metropolitan area	2.97	1.03	3.48	0.99
250,000 to 1 million - metropolitan area	2.94	0.98	3.28	0.85
Over 1 million - metropolitan area	2.97	0.95	3.41	0.84
Political Affiliation				
Republican	3.29	0.95	3.17	0.95
Democrat	2.70	0.79	3.58	0.68
Independent	3.08	1.02	3.40	0.89
Non-affiliated	2.86	0.94	3.24	0.76
Other	2.54	1.57	3.17	1.44
Homeownership				
Own	3.02	0.94	3.33	0.87
Rent	2.92	0.97	3.50	0.78
Other	2.48	0.80	3.49	0.82

Note. Both scales utilized five-point, Likert-type scales: 1 – *strongly disagree*, 2 – *disagree*, 3 – *neither agree nor disagree*, 4 – *agree*, and 5 – *strongly agree*.

To further describe the conservation segments, mean scores were calculated for perception of government control and autonomy-support for high, mid-level, and low conservation segments. The low conservation segment had the lowest level of perceived government control ($M = 2.87$, $SD = 0.87$) and government autonomy-support ($M = 3.23$, $SD = 0.78$) (Table 6). The high-conservation segment had the highest scores for both government control ($M = 3.01$, $SD = 0.99$) and government autonomy-support ($M = 3.57$, $SD = 0.84$).

Table 6

Government Perception by Conservation Segments

	Government Control		Autonomy-Support	
	M	SD	M	SD
High	3.01	0.99	3.57	0.84
Mid-Level	2.99	0.96	3.38	0.85
Low	2.87	0.87	3.23	0.78

Note. Both scales utilized five-point, Likert-type scales: 1 – *strongly disagree*, 2 – *disagree*, 3 – *neither agree nor disagree*, 4 – *agree*, and 5 – *strongly agree*.

RO3. Determine if the level of engagement in water conservation behaviors impacted perceptions of government-mandated water conservation measures

To determine if the level of engagement in water conservation behaviors impacted perceptions of government-mandated water conservation measures, a one-way analysis of variance (ANOVA) was used to compare the three groups for both the government control and government autonomy-support constructs. Tests for homogeneity of variance and other assumptions were calculated with no violations. Statistically significant differences were not found within the perception of government control scale. There was a statistically significant difference between groups within the perception of government autonomy-support $F(2,512) = 3.38$ $p = .04$. Post hoc comparisons using a Tukey HSD test indicated the mean score for the perception of government autonomy-support differed significantly between high and low levels of water conservation ($p = .02$), but not between mid-level and high or mid-level and low levels of water conservation.

Discussion and Conclusions

One important aspect of communicating positive water conservation behavior is understanding the demographic and social factors that influence water conservation (Wolters, 2014). Audience segmentation was identified as one way to create strategic messages to encourage sustainable conservation behavior (Leiserowitz, Maibach, Roser-Renouf, & Hmielowski, 2012; Maibach et al., 2011). The findings of this study were supported by previous studies which identified younger (Arcury, 1990; Dunlap et al., 2000; Kenney et al., 2008) and higher educated (Jones & Dunlap, 1992) individuals expressed more concern and were more likely to partake in conservation activities. Findings that women and Democrats largely comprised the segment with low water conservation behaviors deviated from previous studies which found that women (Brehm & Eisenhauer, 2013) and those that are politically democratic (Gromet et al., 2013) are most likely to engage in the highest levels of environmental behavior and express concern for the environment. Other studies indicated that education attained, age, and political affiliation are not significant predictors of environmental behavior (Brehm & Eisenhauer, 2013).

Three segments were identified within the population as having high, mid-level, and low water conservation behaviors. Understanding and describing the characteristics of each conservation group will assist utility managers, governments, agricultural communicators, and public educators in communicating the importance of water conservation (Kenney et al., 2008). Varying levels of water conservation behaviors can be partially explained through the theory of planned behavior that states an individual's intent to act is influenced by their attitude and beliefs towards the action (Ajzen, 1985). Results of this study indicated respondents disagreed or had neutral attitudes when asked about the level of government attempt to control or impose environmental strategies on them. Respondents also indicated they had largely neutral attitudes toward the level of government autonomy or support to engage in environmentally conscious behavior.

The low-water conservation segment had the lowest mean scores for perceived government control and autonomy-support. Low scores on both scales indicated a lack of personal efficacy when it comes to water conservation and low levels of trust in the government. Low self-efficacy (Lam, 2006) and low levels of trust in government (Jorgensen et al., 2009) have both been found to predict a lack of engagement in conservation behaviors. In this study, a significant difference was found between high and low levels of conservation and autonomy support, indicating perceived support from the government was likely to increase conservation behaviors.

A comparison of participation in water conservation behaviors and the government control and government autonomy-support scales revealed those who felt they had higher levels of government autonomy-support also had higher conservation scores. The findings of this study support the findings of Willis et al. (2011), who found those individuals with positive attitudes towards conservation and the environment had higher levels of conservation behavior. While positive attitudes towards the environment, and the perceived ability to make conservation decisions free from government interaction, influenced positive water conservation behavior, it is likely that increases in government water conservation mandates increased the level of conservation (Kenney et al., 2008).

Recommendations

The findings of this study revealed agricultural communication efforts should be focused on individuals within the low-conservation segment. More specifically, communication efforts should focus on increasing personal efficacy and knowledge about water conservation in Florida (Lam, 2006). Agricultural communicators should keep in mind the demographic characteristics of each conservation segment (Maibach et al., 2011; Monaghan et al., 2013) when creating water conservation messages. In this study, the low water conservation segment was identified as being largely female, renting a home in urban areas, making less than \$24,999 annually, and affiliating as Democrats.

Along with demographic factors in mind, communicators should work to build a feeling of self-efficacy and choice in promoting water conservation messages. Messages should focus on an individual's ability to impact water conservation efforts and their personal choice in engaging in the activities. Communicators should also focus on building a sense of trust and cooperation with government entities. Working to increase place meaning and attachment within the low water conservation segment could potentially lead to the adaption of water conservation behaviors (Brehm & Eisenhauer, 2013).

A lack of awareness in conservation practices may also impact an individual's ability to participate in that activity. Communication and promotion should emphasize the programs currently available in Florida and the existing regulations (Florida Department of Environmental Protection, 2002). Extension may serve as a viable way to communicate messages and encourage adoption of conservation behaviors (Monaghan et al., 2013).

Future research should focus on message creation and testing within each conservation group to encourage adaptation of water conservation behaviors. In addition to message testing, research should focus on preferred communication channels, including traditional media and social

media outlets. As Extension develops additional programming and communication campaigns, the effectiveness of those efforts in encouraging Florida residents to adopt water conservation behaviors should be explored. The effects of government regulations should also be examined. Trends in regulation over time – in comparison to prevalence in mass media and community preparedness – should be examined.

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If I Knew Then What I Know Now...
Southern Region Conference of the American Association for Agricultural Education
Distinguished Lecture
February 5, 2018

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Today, I want to share a little bit about some of the things I've learned over more than two decades in a department that encompasses agricultural education, leadership, Extension and communication. And I'm going to do that by using one of the most loved themes in *science fiction*, and that theme is time travel.

We're going to go back in time a little and introduce the old, current me to the young me. It's like old Biff from *Back to the Future 2* going back to young Biff with the sports almanac from the future, which tells young Biff which teams will win over the next 40 years. It's like old Spock going back and meeting young Spock in the rebooted *Star Trek* movies.

So why have old Ricky go back to talk with young Ricky?

Ten years ago, I hit a milestone in my university career. It was then that my oldest child entered college, and I realized that I had reached the chronological age that I could be college students' father. That was huge for me. Up until then, I could have been a big brother, or maybe a young uncle. And for me, because I started at the University of Florida in 1995 at the ripe old age of 29, this was a big deal.

With this last fall class, I have been teaching college for 24 years – 22 consecutively at the University of Florida, and two previously as a lecturer at Texas A&M. But let's focus on the 22 years at UF. A lot has changed in those 22 years. I'm not sure if you ever read the list of items that Beloit College puts together, but I find it extremely interesting. Every year, Beloit lists trends that the new college class has always grown up with. Here are some excerpts from the fall 2017 class:

- They are the last class to be born in the 1900s.
- They are the first generation for whom a “phone” has been primarily a video game, direction finder, electronic telegraph, and research library.
- Peanuts* comic strips have always been repeats. That's sad.
- They have largely grown up in a floppy-less world.
- There have always been emojis to cheer us up.
- Justin Timberlake has always been a solo act.

Just to name a few. So a lot has changed, just in their lifetime and in the “lifetime” of me teaching.

So it got me thinking. What if I could go back in time to the beginning of a young Ricky Telg’s academic career? What would I say? What would I do, as he prepares this journey? In other words, *if I knew then what I know now*, what would I do the same? What would I do differently?

Because let’s face it, when we get started, we don’t know it all. And typically, we feel too embarrassed to ask. We just spent tens of thousands of dollars and years of our lives getting an advanced degree. Aren’t we *supposed* to be ready? And the answer to that, of course, is.....yes and no.

Yes, because I think one of the purposes of an advanced degree is to teach you in areas that you don’t know about and to reinforce content in areas that you do.

And **no**, because I would hope that an advanced degree provides you with the view that there is so much that you don’t know, but we provide you with the skills and aptitude to try to learn it on your own.

Which again brings me back to “*if I knew then, what I know now.*” A lot of what I will share today comes with experience, a little maturity, quite a bit of ignorance, and just a few bumps on the head from the school of hard knocks.

So as I do my time travel bit, I think "Old Ricky" would like to tell "Young Ricky": Ricky, you did a good job keeping a “happy file.” Let me explain. Have you ever been just down? I mean really down. Let me tell you how to lift your spirits. Read a thank you card or letter from someone whose life you touched. Let me show you this. This is my “happy file.” In it contains many cards and letters of students, alumni, and clients that I’ve kept over the years. It’s not all of them, but it does represent a sizeable portion of them. I keep this folder in my desk drawer. And the cards range from a thank you for writing a letter of recommendation or for doing a workshop to emotionally impactful notes. So why do I keep them? Because I get down. And when I do, sometimes I’ll reach in my little “happy file” and pick out a card or letter or two. And it does my heart good to remind myself that we are in the business of positively impacting people’s lives.

If I had to do it over again, I would encourage me to take more psychology courses, especially in the area of educational psychology. And I would say that for anyone who wants to be a professor. Because my Ph.D. was in “educational human resource development,” I took one educational psychology class, but had I known then what I know now, I would have taken more. Why? The reason is that teaching doesn’t just happen in the classroom. I think graduates of our agricultural education, communication, extension, and leadership doctoral programs are very well prepared for conducting research and for teaching and learning what happens in the classroom. But I am not sure how well versed we are for the advising and heart-to-heart listening that goes on in our offices. In 1995, as a newly minted assistant professor, no one told me that I might have students come into my office whose parents were going through a divorce, whose mother was dying of cancer, whose roommate had tried to commit suicide the night before, and

more. And yes, these all have happened in my office. Now, a lot of how to handle some of this comes with years of experience and a little bit of wisdom, such as learning to keep my mouth shut and let the person talk. I always try to remember that God gave us one mouth and two ears for a reason: listen twice as much as you talk. This personal interaction is one of the reasons I am still teaching and advising. I think we do a good job of preparing our graduates with classroom management and content knowledge and skills development and research opportunities. But for many new assistant professors, as Young Ricky was and as many of you are or will be, we may not have the life experiences or the psychological knowledge to draw upon to know how to handle some of this. Of course, there are resources we can recommend that students access on campus, and part of our job is to be a resource for students, but in each case initially that I found myself in, I was a front-line responder, as many of you may find yourselves. I just want to be the best I can be to meet the needs of my students. To me, that means learning a little more about how people think.

Given that, the next would be to learn as much about your students as possible. I think I did that better in my early years, or maybe it's because I was closer to their age. But now that I'm older, I'll be honest, I am having a difficult time relating to the Millennials. Yes, I know they were born with a cell phone in their hand, but their need to constantly text or to be connected in my classes is driving me insane. And whose fault is it? Mine or theirs? Mine, because I struggle with how to engage them using the tools that they are using right now. If I had to talk to young me, I'd say to learn about my students. So the question to us is are we keeping up with knowledge about the next generation of students?

One way of learning about students is to find out how they're wired. That's why I would strongly recommend everyone to learn something about personality type – whether it's using True Colors or Myers-Briggs or some other personality type indicator. You learn a lot about yourself and about others by learning characteristics of personality type. I can't stress this enough. It's changed how I relate to people. I can try to talk to that person in his or her type. Case in point: I have been able to use True Colors, which categorizes personality type into four colors: *orange*, for those who are go-with-the-flow and spontaneous; *gold*, for the organized, follow-the-rules type (that's me); *blue*, for the emotional, relational individuals; and *green*, for those who are more rational and analytical. There's more to the different colors than that brief description, but that gives you the overview. By seeing that one student is green (rational) and another is blue (relational), you can talk to and advise the students in such a way that is attractive to his or her main color or personality type.

If I knew then what I know now, I would tell myself that it's important to adapt to the prevailing technology of the day, even if it means just riding the crest of the wave. When I got my Ph.D., my specialization was distance education development and delivery. And “the” delivery format of the day was satellite delivery. So I was learning how to use television satellites to get content from one point to multi-points. Now more than 20 years later, who uses satellites for distance education? Yeah, that goes back to one of my first points. If I had relied just on my Ph.D. only to teach me everything I thought I needed to know for my career in academia, I'd be out of a job by now because no one uses satellites for educational distribution. This is where the concept of digital immigrants and digital natives comes to play. I truly am a digital immigrant – someone who was not born into technology but who has learned to function

in it. Digital natives have had digital technologies existing in their world before they were born. Yeah. It's a challenge to keep up technologically, Young Ricky, so be ready.

Related to that: Try something new. Stanford University professor Robert Sapolsky found that if you're 35 years old or older when a style of popular music is introduced, there's a greater than 95 percent chance that you will never choose to listen to it. For eating at sushi restaurants, the window of receptivity closes by age 39; for getting body-piercing, by 23. The findings were reminiscent of studies that show that creativity declines with age, and that the older you get, the less open you are to someone else's novelty. Psychologist Dean Keith Simonton has shown that the decline in creativity and openness among great minds is not necessarily predicted by age so much as by how long people have worked in one discipline. Scholars who switch disciplines seem to have their openness rejuvenated. That may be because a new discipline seems fresh and original, or because a high achiever in one discipline is unusually open to novelty in the first place. Or maybe changing disciplines really does stimulate the mind's youthful openness to novelty. So the lesson here is to try different things. Think young.

Young Ricky, find a mentor quickly! You have to understand, when I started in my department at UF, back in 1995, we didn't have many senior faculty IN the department. Most senior faculty who had Agricultural Education and Communication faculty appointments were in administration, such as Dr. Larry Arrington, who was a district Extension director at the time, and Dr. Jimmy Cheek, who then was an assistant dean in the college of agriculture. Between 1993-95, then-chair Carl Beeman started replenishing the ranks with what he and others referred to as "young ducks." In about a two-year period, he hired Matt Baker, former department chair and dean, now professor at Texas Tech; Tracy Hoover, now associate dean at Penn State; Rick Rudd, department chair at Virginia Tech; and me. We were all pretty wet behind the ears. We kind of mentored each other. I guess we did okay, but it would have been extremely beneficial to have someone with a few more years under his belt to be a mentor to me. So if I had to tell myself something, I would have encouraged me more to find a mentor, even if it wasn't in my department or even at my own university. At the time 22 years ago, the landscape in agricultural communications on the national level also was different. There were very few "old ducks" then because the growth in agricultural communications really came about in the late 1990s and early 2000s. Now, agricultural communications has a richer pool of potential mentors. And I don't necessarily mean finding someone you can talk with about your progress toward tenure and promotion – although that's extremely important. I'm talking about finding someone you can establish a relationship with. I'd also remind us as senior faculty to maybe not even wait for a new person to ask for you to mentor him or her. Take it upon yourself to invest your time in someone.

In the magazine article "Why Leaders Still Need Leaders," Amy Simpson encourages leaders to find someone who can show you the ropes because you land in situations that call for wisdom beyond your experiences. She provides several reasons – including the following – why you find a mentor:

- *Investment*: Securing a mentor means you've found someone willing to make an investment in you.
- *Challenge*: Your mentor will push you to think outside your limited viewpoint and perspective.

- *Objectivity*: A mentor has personal distance from the issues you wrestle with and is able to look at your life with a more grounded and long-term perspective than you can.
- *Navigation*: A mentor can help you find your way.
- *Interpretation*: Having another set of eyes gives you twice the ability to interpret your world, thoughts, and experiences.

So senior faculty, invest in a young person.

Young Ricky, here's another thing: Dream. Yes, just dream. It doesn't matter if it's a big dream or a small dream. Just dream. I categorize big dreams as being seemingly just beyond your reach, but you keep dreaming anyway. For me, my biggest dream early in my life was to earn my Ph.D. by the time I was 30. I graduated from Texas A&M with my doctorate in May 1995 and turned 30 that October. So stretch yourself.

Have a vision. The Bible says where there is no vision, the people perish. The opposite is true, as well. With a vision, people prosper. The same is true for us. Without vision, we trudge through without direction. We don't prosper; we perish. So dream. Have a vision. And as you dream, set goals. Goals are well-defined dreams that are measurable. Getting in shape is not a goal; it's a wish. Running a half-marathon? That's a goal because you know you've accomplished it when you cross the finish line. So dream.

But also be content. It is okay to be content with where you are and with what you're doing. When I was being considered for an administrative position at another university several years ago, there was a major situation in my family that happened that caused me to pull my name from consideration. And it was the best decision I made because within two weeks after the new chair was named, my mother had a severe car accident, and a week after that my mother-in-law passed away after a battle with cancer, as well as three other significant events occurring in my family over the next four months. Had I taken the job and moved from Gainesville, it would have caused major disruptions in my family. It never occurred to me then until after all of these things happened, that maybe – just maybe – God was telling me that I should be content about where I'm supposed to be and with what I'm doing. This is not to say that I'll never change positions or do something different, but I would encourage Young Ricky to be content. Place priorities where they really count. Namely on your students. They need you. And on family. And yes, having three grandchildren who I get to see a lot – because they're all in Gainesville – does give me perspective on what is important in life.

Life is short. Dream. Have vision. Set goals. Be content.

Similarly, because life is short, it's okay to say no. Yes, Young Ricky, it's okay to say no. As a young assistant professor, you may not think you can, but, yes, you can. Be careful about trying to balance too much on your plate. I have been and continue to be concerned about the pace many of us maintain for ourselves. As we look to do all of these activities, I would caution Young Ricky and many of us, just because we can doesn't always mean we should. Does this good "opportunity" take away from something "great" that I could be doing? Do I *really* need to be a part of this project? Will I be able to spend as much time with my family if I take on this opportunity? As a young assistant professor, I didn't think I could say no. Now, I *understand* there are some *opportunities* – like "requests" from the vice president or dean where it's really difficult to say no to – but you can. And sometimes you should. And I have, but it is not easy.

Back in 2006, I was completely overcommitted with *opportunities* that I brought on myself at work, at church, and at home. All of these things were “good” things. But there were so many “good” things that they took a mental and physical toll. I was forgetting things, I felt sick. There was also an emotional and psychological toll. I ended up dropping everything at church, and it took about two years before I felt refreshed enough to get involved again. At work, I carefully examined what I was doing, declining those opportunities that I could say “no” to and saying “yes” to those opportunities that could move me from good to great. So practice saying “no.” There is only one you. Guard your time and your physical and mental resources wisely.

Last thing, Young Ricky, remember why you’re here, right here, right now. There is a masterful purpose for why you are here. You will touch the lives of young people who will go on to accomplish great things. And you will have had a major role in shaping them to reach their potential.

Let me say that this little bit of advice from Old Ricky to Young Ricky is true for us as well. We are here for a reason. Sometimes we lose track of that, when there are distractions, or “problem students” or issues, or whatever. But I want to tell Young Ricky (and us) that we may be the one person of influence that a college student needs. We have been entrusted with a tremendous responsibility. I enjoy all parts of what I do, but what gives me real fulfillment is working with students. You are here for a purpose. Remember that.

In closing, I want to visit for a moment the online lecture and book titled *The Last Lecture*. As you may remember, in 2007 Randy Pausch made a presentation to 400 Carnegie Mellon University students, called “Really Achieving Your Childhood Dreams” and about the cancer he was battling. The presentation and the ensuing book captivated the nation, particularly following his death in September 2008. He challenged his students to pursue what they wanted to do, to be who they wanted to be.

And I guess that’s what I wanted the presentation today to focus on, even if I had to envision going back 22 years to do it. The truth is none of us knows what tomorrow holds, what *might* happen. But we do have today. We can make a difference today, and as faculty and graduate students at major universities, that means making a difference in the lives of young people...today. I may not have all the answers, probably not a lot of them. But my hope is that Young Ricky would have been better prepared for his 22 years as an adviser and teacher at UF if Old Ricky could have given him a glimpse of the future. But you know what? Maybe it’s better not to know, to see into the crystal ball. Otherwise, what’s the fun in discovery? Thank you.