Journal of Human Sciences and Extension

Volume 12 | Number 2 Article 14

9-2024

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Recommended Citation

Hood, L. B., Eck, C. J., Layfield, K. D., & Donaldson, J. L. (2024). Were The “Best Made Better”? A Content Analysis of South Carolina 4-H Programming. *Journal of Human Sciences and Extension, 12*(2), 14. DOI: https://doi.org/10.55533/2325-5226.1484

Were The "Best Made Better"? A Content Analysis of South Carolina 4-H Programming

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Since 1902, 4-H Youth Development programs have been implemented by Cooperative Extension agents or educators for teaching, influencing, and leading youth to new life skills that can positively impact their futures. The 4-H motto is "learn by doing" and is practiced with a hands-on learning approach. Unfortunately, during the COVID-19 pandemic, 4-H programs and clubs around the nation were confined to home or distance learning and no group interaction, limiting this hands-on learning approach. This study analyzes how 4-H, specifically in South Carolina, was implemented without meeting in person and how it affected retention rates during the pandemic. Analysis of quantitative data revealed a change in knowledge after participating in the virtual and take-home activities. The theoretical framework undergirding this study was McClelland's Need for Achievement Theory, which comprises three factors, or needs: achievement, affiliation, and power. Future recommendations include, but are not limited to, gathering more input from 4-H youth and their families to understand needs and to ensure programs are relevant and appealing to all eligible persons, as well as aligned with the Essential Elements of 4-H, plus training for Extension professionals to create consistent surveys using 4-H Common Measures.

Keywords: achievement theory, Extension education, youth development.

Introduction and Problem Statement

Land-grant universities across the United States are home to Cooperative Extension Services for each state, serving as an *extension* of the university's resources to each county in that state (Gould et al., 2014). Those *university resources* come in the form of Extension agents, specialists, and educators who have a degree or background relevant to their area of specialization (Contributor, 2020). Extension professionals are the connection between the public

and the university; therefore, they must be adaptable to various teaching and learning styles to meet the needs of their constituents (Cooper & Graham, 2001). As noted by Gould et al., "in the last decade, Cooperative Extension has rapidly diversified its portfolio in many ways to respond to the needs of people in our rapidly changing society, including adapting to online learning environments and the cloud" (2014, para. 7).

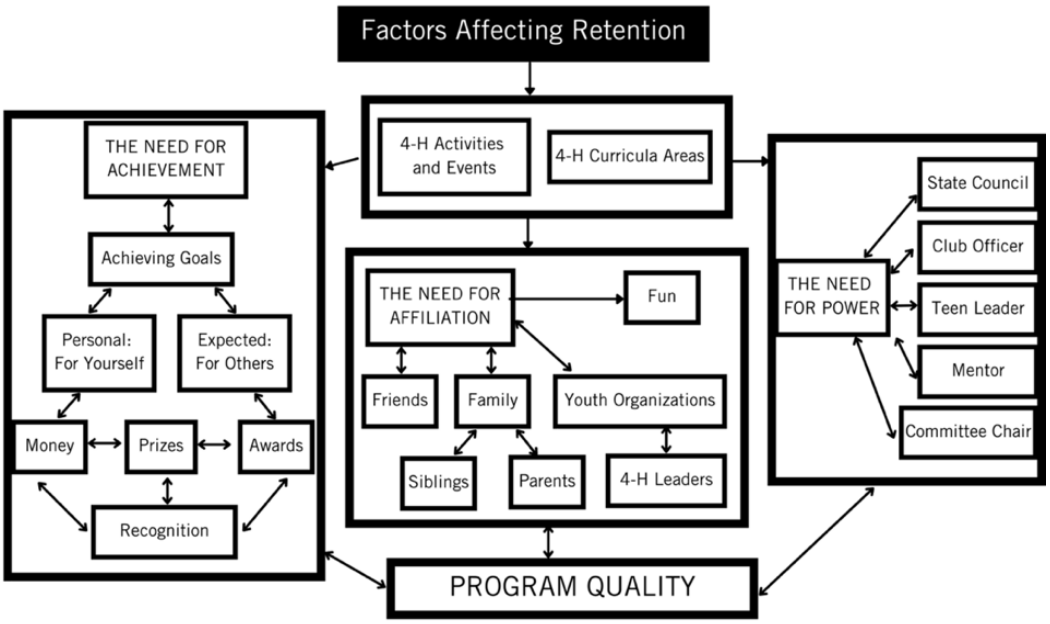
During the pandemic, school closures meant that youth were learning virtually from home. Because of the quick thinking of Cooperative Extension and 4-H staff and volunteers, virtual and kit-based programs were developed to aid in learning virtually. Extension personnel recognized that, "during this time of uncertainty, Extension [could] act as an important resource to help people adapt to new life circumstances such as homeschooling and unemployment" (Narine & Meier, 2020, p. 13). The primary solution to the problem was offering virtual programming (Arnold & Rennekamp, 2020). While this virtual solution, just like the K-12 schools' approach, worked well for some, it did not work for all (Garbe et al., 2020). Lack of Internet, technology resources, understanding of technology or Internet, etc., discouraged many people who had grown so used to in-person activities and opportunities from participating (Morefield & Fabregas Janerio, 2020). The 4-H motto, "To Make the Best Better," encourages each member to do his or her best and improve with each successive effort to reach his or her full potential (University of Idaho, n.d.). 4-H staff and volunteers worked tirelessly to create ways "To Make the Best Better" in their communities during COVID-19-related shutdowns.

This article seeks to describe the extent to which 4-H members, particularly in South Carolina, have been positively impacted by efforts made by South Carolina 4-H Extension agents, educators, specialists, and volunteers. For this study, we define "positively impacted" as having gained knowledge, becoming a new 4-H club member, or re-enrolling as a 4-H member after participating in the virtual 4-H programs.

Theoretical or Conceptual Framework

The theoretical framework undergirding this study was McClelland's (1987) Need for Achievement Theory. McClelland proposed a theory of motivation that is strongly associated with learning concepts (Pardee, 1990), which explains that the main theme of McClelland's theory is that needs are learned through coping environments. McClelland's (1987) theory is made up of three factors: a need for achievement, a need for affiliation, and a need for power (Gill et al., 2010; see Figure 1).

Figure 1. Conceptual Framework of Factors Affecting Retention, Based on McClelland's Motivational Needs Theory



Note. From "Factors Affecting Teen Involvement in Pennsylvania 4-H Programming," by B. E. Gill, J. C. Ewing, and J. A. Bruce, 2010, *Journal of Extension, 48*(2), https://archives.joe.org/joe/2010april/a7.php.

As shown in the conceptual framework diagram, "the need for achievement can be met through the projects that members complete and goals that they reach" (Gill et al., 2010, para. 5). During the pandemic, many schools shut down and shifted to home-based distance-learning models (Golberstein et al., 2020), and 4-H changed many of its learning opportunities and projects to be free or low-cost online and printed resources to support 4-H families during school and club closures (Sirangelo, 2020). In the case of this study, South Carolina 4-H agents developed online curricula that were relevant and challenging for participants.

According to Gill et al. (2010), "the need for affiliation can be met through the relationships made with friends, parents, siblings, and 4-H leaders. By joining 4-H, youth have the opportunity to associate with a group of individuals with similar interests." In South Carolina, 4-H members stayed connected with their clubs via Zoom meetings, social media, and email newsletters. Gill et al. (2010) discussed that, in Pennsylvania 4-H, various leadership roles assist in meeting the need for power. South Carolina 4-H members were offered opportunities to apply for leadership roles, such as serving as project area ambassadors (Livestock; Natural Resources; Healthy Lifestyles; and Science, Engineering, Mathematics, & Technology (STEM)) or state teen council officers and in Pinckney Leadership programs. These opportunities were essential for allowing members to feel a sense of power.

McClelland's (1987) theory is seen in 4-H studies relating to member retention (Gill et al., 2010) and participation (Baney & Jones, 2013). The conceptual model ultimately connects overall member retention primarily back to program quality. Since 4-H programs and activities were affected by COVID-19, 4-H faculty and staff adapted traditional programs for innovative delivery (Arnold & Rennekamp, 2020). This study used the conceptual model and the Essential Elements of 4-H to determine the impact virtual/distant delivery had on 4-H members' achievement and development. As documented in the 4-H literature, "the Essential Elements of a 4-H experience are the 'best practices' that help staff and volunteers address the four basic developmental needs of youth—belonging, generosity, independence, and mastery" (USDA, 2016).

Purpose

Prior to shutdowns caused by the COVID-19 pandemic, 4-H clubs conducted meetings in person with leadership from Extension agents, educators, and specialists, as well as 4-H volunteers (Arnold & Rennekamp, 2020). Grégoire (2004) noted that dedicated staff and volunteers of the 4-H program have aided in evolving and adjusting to changing needs. In a time of shutdowns and virtual programming (Arnold & Rennekamp, 2020), it is more important than ever to determine the extent to which 4-H members, particularly in South Carolina, have still been positively impacted by efforts made by South Carolina 4-H Extension agents, educators, specialists, and volunteers. Four research objectives guided this study:

1. Describe the virtual 4-H opportunities available in South Carolina during the COVID-19 pandemic.
2. Establish the demographics (i.e., age, state of residence) of the youth participating in the virtual 4-H opportunities.
3. Determine participants' self-perceived change in knowledge after participation in 4-H virtual opportunities.
4. Identify participants' future interest in 4-H and 4-H opportunities.

Methods

This non-experimental research study was conducted online with 1,669 youth participants from across South Carolina. The youth ranged in age from 5 to 18 years old. The youth were selected because of their previous participation in a South Carolina 4-H-related activity or program that took place from March 2020 until June 2021. Different virtual programs and activities (i.e., 4-H at-home kits that were mailed from the county Extension offices) were offered in all corners of South Carolina for varying costs. Families were not limited to one option but could choose multiple options from their respective regions and even from other regions. To best answer the established research objectives, a mixed-methods research design was implemented, but the quantitative analysis approach will be discussed for this publication.

When this study came to fruition in December 2020, virtual 4-H programming was in progress, and quantitative data was collected through surveys designed in Qualtrics. Because neither a list of programs offered nor their respective survey data was available in a bank at the South Carolina 4-H State Office for review, the research team searched through 2020 4-H summer camp advertisements on social media platforms (i.e., Facebook and Instagram) to gather the list of programs from around South Carolina. The research team then contacted the 4-H agents who offered the programs to request permission to use their survey data for this research study. Therefore, this study implemented an existing data design using the end-of-program surveys which were created by the host South Carolina 4-H agents in different 4-H regions.

Privitera (2020) describes an existing data design as the collection, review, and analysis of any type of existing documents or records. Since the surveys were created by different individuals for different programs, the formats varied slightly. However, there was overlap in the overarching concepts, allowing the data to be purposeful in conducting this study. This study could also be called a content analysis (Privitera, 2020), since the participants of the virtual 4-H programs recalled their perceptions of those programs in surveys which are now being evaluated further. Validity and reliability (Privitera, 2020) of the data are of concern when using multiple survey instruments, which the research team acknowledges. In the case of this study, individual Extension agents developed program evaluation surveys in conjunction with the Clemson Extension director of assessment, providing continuity between surveys. Additionally, the raw Qualtrics survey data were acquired from the respective agents via email and compiled into one file for further statistical review through SPSS, further providing validity and reliability to the data analysis. A limitation of this existing data design is the relatively low response rate for each of respective surveys. Although 1,669 youth participated in the virtual programming, complete survey responses were received from only 198 participants (11.86%).

Using SPSS, the quantitative data were analyzed using descriptive statistics (i.e., frequencies and percentages). Eight different South Carolina 4-H programs were identified for the study. Each program was delivered in a virtual format and used related program evaluation questions pertaining to demographics, involvement in 4-H (member or non-member, county where they live/participate in 4-H), and opinion of the activity or kit offered (i.e., was the activity fun/educational, worth the cost, did participating influence youth to join 4-H or re-enroll the next program year, and other perceptions).

Findings

Research Objective 1: Describe the Virtual 4-H Opportunities Available in South Carolina During the COVID-19 Pandemic

Eight different virtual 4-H activities were identified for the study:

- South Carolina 4-H@Home

- 2020 The Fair—A Virtual 4-H Summer Camp
- 2020 Camp America—A Virtual 4-H Summer Camp
- 2020 International Culinary Tour—A Virtual 4-H Summer Camp
- Chester & York Counties 4-H Virtual Summer Camp—Explore SC
- Chester & York Counties 4-H Virtual Summer Camp—Around the World
- Tri-County 4-H Virtual Tree Camp
- Pee Dee Region Grab & Go Camp Kits Summer 2020

Each activity was assembled into a kit offering a lesson and including most or all necessary materials (except for *South Carolina 4-H@Home*). Each activity kit or experience was designed to align to the Essential Elements of 4-H, which are "the 'best practices' that help staff and volunteers address the four basic developmental needs of youth—belonging, generosity, independence, and mastery" (USDA, 2016). Table 1 identifies the virtual 4-H opportunities and participation during the COVID-19 Pandemic in South Carolina, along with the response rate for the post-program surveys.

Table 1. Virtual 4-H Opportunities and Participation During the COVID-19 Pandemic in South Carolina

Virtual 4-H Program	***N***	***n***	***Response Rate %***
2020 4-H International Culinary Tour	23	1	4
2020 Camp America—A Virtual 4-H Summer Camp	26	3	12
Chester and York Counties 4-H Around the World Camp	11	0	0
Chester and York Counties 4-H Virtual Explore Camp	11	2	18
Pee Dee Region Grab & Go Camp Kits	68	17	25
South Carolina 4-H@Home	1,448	166	12
The Fair—A Virtual 4-H Summer Camp	16	5	31
Tri-County 4-H Virtual Tree Camp	77	4	5

South Carolina 4-H@Home was a daily lesson emailed to those who registered beginning March 18, 2020. The lesson included a materials list consisting primarily of items already found around the home. The lessons were emailed daily until schools were dismissed for summer break in May 2020. Lessons were then emailed once per week until the schools resumed in August. From August 2020 until January 2021, the lessons were emailed once per month, with at least three themed lessons in a bulk packet.

The Extension 4-H programs in Newberry, Saluda, Aiken, and Edgefield Counties offered a series of three "virtual road trips" that lasted 1 hour per day for a week at a time. The activities were also designed so that youth were not sitting in front of a computer the entire time. Each registered youth, ages 5 to 19, received a packet prior to the start of camp including any hard-to-find materials needed to complete the activities. *The Fair—A Virtual 4-H Summer Camp* provided daily activities that brought to mind the sights, sounds, and smells of the fair. Registrants received an email on Monday, June 8, 2020, with instructions for each day.

Participants explored the "fair" using recipes, virtual tours, hands-on activities, guest speakers, books, and more. *Camp America* was designed to expose youth to all things American: foods, landmarks, history, heroes, and more. Registrants received an email on Monday, June 22, 2020, with instructions for each day. The camp explored America using recipes, virtual tours, hands-on activities, guest speakers, books, and more. Finally, beginning Monday, July 20, 2020, *The International Culinary Tour—A Virtual 4-H Summer Camp* "toured" a different country each day though recipes, virtual tours, hands-on activities, books, and more.

Chester and York Counties created two virtual camps and a series of kits for summer 2020 programs. *Explore S.C.* gave participants the opportunity to "tour" South Carolina and learn the sights, sounds, and symbols of the state from June 22–26, 2020. Virtual tours included the State House in Columbia, Lemaster Dairy at Clemson University, a peach orchard in Aiken, and the beach in Charleston. Activities dealing with the state symbols were also included in the kits. The online activities remained available through July 15th. *Around the World* was the second virtual camp opportunity. This camp was a virtual tour around the world. Daily activities included hands-on lessons and activities, virtual tours, and crafts that could be completed at the participant's own pace. Daily presentations were not live but were released daily through a slideshow in Google Classroom (no prior experience with Google Classroom was needed). The online activities remained available through September 1st.

Chester and York Counties' series of kits consisted of *Slammin' Science*, *4-H Down on the Farm*, and *Virtual Tours with 4-H. Slammin' Science* consisted of six individual activities that revolved around STEM. Participants became true scientists and made slime, created paper circuits, explored properties of air, created a stop-motion video, and created a geyser. *4-H Down on the Farm* allowed participants to create a desktop greenhouse, grow five different crops in a glove, learn the many uses of corn with a few hands-on experiments, and create a farm web to learn about life's necessities. Finally, *Virtual Tours with 4-H* allowed participants to "take" tours of various places around the United States and the world using an application and a virtual-reality viewer that fit over most smartphones.

Tri-County 4-H (Anderson, Oconee, and Pickens Counties) offered a series of virtual summer kits: (a) trees, (b) baking, (c) pollinators, (d) pirates, (e) dissection, and (f) wildlife. This study focuses on the *Virtual Tree Camp*, which consisted of daily activities to be done over the span of a week to teach participants how to identify trees, create a tree book, press leaves, and more.

Finally, the Pee Dee Region offered a series of "grab & go" kits. *The Great Outdoors Camp Kit* taught youth how to make casts of animal tracks, dissect an owl pellet, go on a scavenger hunt, and use a magnifying glass to make up-close observations. *Full S.T.E.A.M. Ahead* focused on science, technology, engineering, art, and mathematics experiments. *Camp Cloverbud* was a literacy-based kit for younger ages (5 to 8 years old) that covered all the 4-H program areas.

Down on the Farm consisted of activities and lessons about animals, farm safety, gardening, pollinators, and farm commodities.

Research Objective 2: Establish the Demographics (i.e., Age, State of Residence) of the Youth Participating in the Virtual 4-H Opportunities

As previously noted, the survey data were existing, designed and collected by different agents from different regions, so all the surveys did not ask the same questions. Privitera (2020) discusses *nonresponse bias*, which occurs when participants choose not to complete a survey, to respond to specific survey items, or not to respond at all. The survey data presented below display nonresponse bias.

According to its civil rights statement, "Clemson Cooperative Extension Service offers its programs to people of all ages, regardless of race, color, gender, religion, national origin, disability, political beliefs, sexual orientation, gender identity, or marital or family status and is an equal opportunity employer" (Clemson Cooperative Extension, n.d.). South Carolina 4-H offers programs to youth ages 5 through 18 years old. The age group of 5 to 8 years old is called *Cloverbud*. Youth ages 9 to 13 are considered *juniors*. The older youth, 14 to 18 years old, are considered *senior* members. A plurality of respondents was of the *junior* member age group (48%), followed by *Cloverbud* age group (42%) (see Table 2).

Table 2. Age of Youth Participating in Virtual 4-H Opportunities (n = 205)

4-H Group/Age (years)	***f***	***%***
Cloverbud/5–8	87	42
Junior/9–13	98	48
Senior/14–18	20	10

All but one of the identified virtual 4-H opportunities offered in South Carolina were specifically for in-state residents. *South Carolina 4-H@Home* was offered nationwide, with participants registering from 46 of the 50 United States, plus Mexico, Japan, Canada, Scotland, Germany, South Africa, and the U.S. Virgin Islands. Almost 41% of the participants were from South Carolina. While it could be assumed that the 74 unknown responses are South Carolina residents, it is not confirmed in the other surveys that do not specifically ask for state of residence (see Table 3).

Table 3. State of Residence of Youth Participating in Virtual 4-H Opportunities (n = 240)

State of Residence	***f***	***Response Rate %***
South Carolina	98	41
Other	26	11
Unknown	74	31
Did not respond	42	17

Research Objective 3: Determine Participants' Self-Perceived Change in Knowledge After Participation in 4-H Virtual Opportunities

At the conclusion of the virtual 4-H opportunities, participants and their parents were encouraged to answer questions relating to the knowledge gained from the activities. Those questions were asked in a format that allowed participants to answer using a Likert-type scale (strongly agree, agree, neither agree nor disagree, disagree, strongly disagree). Some of the questions were written as statements like "Due to my participation in … My knowledge of … increased," while others were written as "Participation in … contributed to my child's education during COVID-19 school closures." Based on a five-point scale of agreement, the mean was 4.06 and the standard deviation 0.33. The participants (88%) who completed the surveys and answered these particular questions (n = 196) agreed with the statement that there was a change in knowledge after participating in virtual 4-H opportunities. No survey answers indicated disagreeing with a self-perceived change in knowledge after participating (see Table 4).

Table 4. Participants' Self-Perceived Change in Knowledge After Participating in Virtual 4-H Opportunities (n = 196)

Level of Agreement	***f***	***%***
Strongly agree	17	9
Agree	174	88
Neither agree nor disagree	5	3
Disagree	0	0
Strongly disagree	0	0

Research Objective 4: Identify Participants' Future Interest in 4-H and 4-H Opportunities

The researchers postulated that, based on their participation in the virtual 4-H opportunities, participants could gauge their future interest in 4-H and 4-H opportunities after the COVID-19 pandemic restrictions are lifted. Not all the surveys asked this specific question, but most asked something aligning with a measurement of participants' future interest. Of those who were asked the question, 49.3% of virtual 4-H participants agreed they would "absolutely" be involved in the future and 46.5% indicated they would "possibly" be involved, while 4.2% indicated "at this time" they would not be involved. Based on a three-point scale of agreement, the mean was 2.45, and the standard deviation 0.58 (see Table 5).

Table 5. Participants' Future Interest in 4-H and 4-H Opportunities (n = 71)

Interest in Future 4-H Opportunities	***f***	***%***
Absolutely	35	49.3
Possibly in the future	33	46.5
Not at this time	3	4.2

Conclusions, Discussion, and Recommendations

Based on the program evaluations conducted about 4-H participation during the COVID-19 pandemic, the results demonstrate that a virtual and kit-based delivery mode was positive, as perceived by survey respondents. Most, if not all, county Extension offices worked with participants to ship kits for an extra fee if they were not from the offering county, which could have added to the registration totals. Gould et al. (2014) noted that "in our rapidly changing environment, Cooperative Extension has to maintain contemporary relevance and documented impact across the broad spectrum of our programming efforts" (para. 11), and this idea held true with the efforts made by South Carolina 4-H agents, specialists, and volunteers. Gathering more input from 4-H youth and their families is recommended to understand needs and ensure programs are relevant and appealing to all eligible persons.

The survey data indicated that there was a change in knowledge, as 97% of respondents strongly agreed or agreed that knowledge had improved. Only 3% indicated they did not have a strong opinion of a change in knowledge, and no one indicated they disagreed or strongly disagreed. Each 4-H activity or opportunity was intended to create a change in knowledge or behavior, and the data reflect that the activities and opportunities served their purpose as perceived by survey respondents. In addition, 49% of the participants would "absolutely" get involved as soon as possible, and 47% said they would "possibly" get involved in the future. This indicates the strength of virtual 4-H activities and opportunities for recruiting future participants.

From the surveys, the Essential Element of *independence* was highlighted by participants who indicated they would participate in future 4-H opportunities. *Mastery* was also highlighted, as participants indicated they had a change in knowledge and learned something new from participating in the virtual 4-H programs. McClelland's (1987) Need for Affiliation was underscored, as participants indicated they would be involved in future 4-H opportunities. Some of the open-ended questions on the *South Carolina 4-H@Home* surveys indicated the Essential Element of *belonging,* as participants indicated they enjoyed working with family members on the activities. A future recommendation is to align programs that are appealing and relevant to participants with the Essential Elements of 4-H.

Upon interpreting the existing data regarding demographics, it became evident that not all the surveys asked age, gender, residence (state or local), ethnicity, or 4-H membership status. Due to the variations in structure and types of survey data collected from South Carolina 4-H agents, it is recommended that instruction be delivered to Extension professionals to guide them in creating consistent surveys using the 4-H Common Measures. Further, "the 4-H Common Measures Reference Table identifies the outcomes addressed, the indicators for each outcome, the items that answer to each outcome, where the items were originally sourced, and alpha scores if available" (National 4-H Council, n.d., para. 1). If 4-H agents are not comfortable using the 4-H Common Measures, then a survey question bank should be developed and made available on

the state level. This bank of questions would allow for consistency among surveys and make examples available for Extension agents who have no experience with creating surveys.

Regarding future research, more studies are recommended to gather feedback from parents and members on their perceptions of their own states' programming efforts during the COVID-19 pandemic. Each state's land grant university operated differently, and it would be interesting to see the efforts that were made according to the varying operation requirements. Another topic to explore is related to 4-H program operations during the pandemic reopening stages. What were the rules on masks, group sizes, social distancing, or meeting location? How were these program operations perceived by youth, parents, volunteers, and other stakeholders? Future research should consider the multiple interfaces of public health and 4-H programming, as this topic area is so new.

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