THE INFLUENCE OF PARTICIPATING IN LIVESTOCK PROJECTS ON 4-H DEVELOPMENTAL OUTCOMES AMONG PIMA COUNTY SENIOR 4-H MEMBERS AS PERCEIVED BY THEIR PARENTS

By Autumn Gilbert

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Final approval and acceptance of this thesis is contingent upon the candidate’s submission of the final copies of the thesis to the Graduate College.

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Abstract

The purpose of this study was to describe the influence of participating in livestock projects on 4-H developmental outcomes among senior Pima county 4-H members in the last four years as perceived by the member’s parents. The study also sought out to, compare these outcomes among the different livestock species (Beef, Goat/Sheep and Swine. An electronic questionnaire was sent out and 54 respondents were analyzed to reach the findings. Participants were asked questions about the perceived developmental outcomes their children gained from their time in a 4-H livestock project using the Thriving Model to generate questions to gauge these outcomes. The data shared that there is little difference when looking at developmental outcomes comparing species, however all species were very influential on these developmental outcomes as perceived by participants parents. It is recommended to continue supporting these projects and making them widely accessible for all youth who wish to participate in them.

Introduction

4-H is a nationally known youth organization that stems from the Cooperative Extension System. 4-H has provided youth with opportunities to develop life skills and fulfill their motto of "making the best better" with hands-on projects (National 4-H Council, 2020) for over 100 years. In 1902, 4-H founder A.B. Graham saw a need for youth participation in hands-on agriculture projects. He created the very first 4-H club in Clark County, Ohio (National 4-H Council, 2020). Now in the modern day, over six million youth participate in 4-H annually, and Arizona alone boasts over 48 projects (Arizona Cooperative Extension, 2020).

4-H believes in the power of youth and uses the program to bring out the best in each kid (Arizona Cooperative Extension, 2020). 4-H programmers reach members by utilizing a non-formal teaching method. This improves 4-H members' lives in their community, county, state,
and national settings (Severs et al., 2007). The 4-H program is open to all youth ranging between the ages 8 to 19. 4-H promotes the development of important life skills and to become contributing members of society (severs et al., 2007). The Arizona 4-H program offers over 48 projects including STEM, agriculture, natural resources, and family consumer science projects. Some of the projects available in Pima County are the livestock projects. The livestock projects in Pima county include Beef, Goat, Sheep, and Swine (Arizona Cooperative Extension, 2020).

4-H livestock projects require large amounts of personal responsibilities and financial inputs (Rusk et al, 2003). The responsibilities are time-consuming and require youth to be daily caretakers of their projects. Members must learn to manage their time to finish their schoolwork, participate in school and community extra-curricular activities, and still tend to their 4-H project’s feeding and husbandry needs (Rusk et al.) Members also have common associated cost with their projects (Bolman, 2003). These projects are relatively expensive when compared to non-animal project (Bolman, 2003). Understanding the time and money youth invest into their projects is vital to understanding the outcomes that come from the project.

Livestock projects share many similar experiences within Pima County 4-H. However, there are inherent differences each species possesses. These items include the amount of time, money, and recourses youth must put into these projects. Each project also has different supplies and materials required to take care of the animal properly. The figure below is information about each project collected by the extension faculty in Pima county from 2019. These items can be used to see some of the differences each livestock specie possesses.
Figure 1. Moore, J. Unpublished document from the Pima County Extension Office, 2019

Life Skills Model

4-H uses the Norman and Jordan's (2006) Targeting Life Skills Model. The center of the model is presented as a four-leaf clover which is the official 4-H emblem. The clover represents the 4-H pledge: head, heart, hands, and health. All 4-H projects fall into one of these categories to show how the organization focuses on Youth Competencies (Norman & Jordan, 2006). The figure below shows each main category and sub-categories. These are 35 of the valued life skills 4-H aims to give youth through their programming. This system targets each skill for youth to master each competency. This model is essential when looking at desired life skills gained from individuals within 4-H programs. However, this model does not address long-term progression from a high-quality 4-H program. These life skills are important, but this research will focus on the thriving model developmental outcomes gained by processing and thriving within a 4-H program.

<table>
<thead>
<tr>
<th>Project</th>
<th>Length of Project (Average)</th>
<th>Time spent with project (per week)</th>
<th>Cost (Price of livestock + feeds and other associated cost)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beef</td>
<td>10 months</td>
<td>23 hours</td>
<td>$4,700</td>
</tr>
<tr>
<td>Goat/Sheep</td>
<td>8 months</td>
<td>9 hours</td>
<td>$1,500</td>
</tr>
<tr>
<td>Swine</td>
<td>5 months</td>
<td>16 hours</td>
<td>$1,490</td>
</tr>
</tbody>
</table>

Figure 2. Targeted Life Skills Model
The 4-H Thriving Model is a new model developed by Mary E. Arnold that focuses on "Predicting the Impact of 4-H on Positive Youth Development" (Arnold, 2008, p 1). According to Arnold (2018), 4-H members should follow the process, thrive, and achieve critical developmental outcomes. This research will focus on the 4-H developmental outcomes, which include Academic Achievement and Motivation, Social Competence, Personal Standards, Contribution to Others, Connection with Others, and Personal Responsibility (Arnold, 2018). These factors "articulates the connection between traditional 4-H activities and strategies and the research that supports the developmental impact of them" (Arnold & Silliman, 2017, p 14). This study will explore these developmental outcomes. These outcomes will determine whether a member gained positive youth development while in their 4-H livestock project.

Arnold defines the five different developmental outcomes, and these definitions will lead this research. These outcomes are an "essential part of positive youth development and a marker of adolescent well-being "(Arnold & Gagnon, 2019, p 29). In Arnold’s first draft of the thriving model Academic Success and Academic Motivation are two different constructs. For the purpose of this study, these two constructs were split into two different sets of questions. This was done because members motivations are not strictly confined to an academic setting and is hard to gauge in three questions. To fully describe motivation in the study, this outcome will be given its own set of questions. Overall, this study will focus on six developmental outcomes. Academic success is described as students' grades and willingness to learn. Motivations looks at members level of engagement, determination, and ambition. Social Competence is how young people get along with others and follow the rules (Arnold, 2018). Personal standards "captures a young person's sense of right and wrong, and a personal commitment to make ethical and just choices"
(Arnold & Gagnon, 2019, p 29). Contributions to Others reflect members' abilities to serve others. Connection with Others reflects youth's need to have a positive relationship. Finally, Personal Responsibility is a young person that "lives up to the values respect, responsibility, honesty, and caring" (Arnold & Gagnon, 2019, p 28). These six outcomes will be essential for defining what members should get out of a high-quality program.

![Diagram of the 4-H Thriving Model](Arnold, 2017)

**Methodology**

**Purpose of the Study**

4-H members are encouraged to enroll in different projects that fit their personal interests. One of the many projects offered is the livestock projects. 4-H focuses on youth and their development by promoting life skill development and producing contributing members of society (Miller, 1991; Seevers, Graham, & Conklin, 2007). The purpose of this study is to evaluate Pima County's senior 4-H members' youth developmental outcomes gained in a livestock project as perceived by their parents.
Research Objectives

1. Describe the level of perceived developmental outcomes among the parents of 4-H members participating in livestock projects (Beef, Goat/Sheep, and Swine).

2. Compare the perceived developmental outcomes level among the parents of 4-H members participating in livestock projects by species (Beef, Goat/Sheep, and Swine).

Research Design

This study's design is non-experimental correlation research that will allow the researcher to "investigate the relationship (correlation) between two or more variables" (Ary et al., 2019, p11). The study will target parents of senior members enrolled in a Pima Country 4-H livestock project within the last four years to determine their perceived life skills gained. A questionnaire will be emailed to one parent of the past senior members in a livestock project from the last four years. This survey's components include a questionnaire, data collection, and data analysis.

Subject Selection

The target population consisted of parents of senior members of Pima County 4-H, enrolled with a livestock project within the last four years. Purposive sampling, a form of non-probabilistic sampling, was used, and results will not be generalized. Purpose sampling "sample elements judged to be typical, or representative, are chosen from the population. The assumption is that errors of judgment in the selection will counterbalance one another" (Ary et al., 2019, p183). The data may not represent all 4-H members because not all parents will participate in the questionnaire. Sampling errors cannot be entirely avoided due to the study's nature, "Sampling errors result from the fact that the researcher has observed only a sample and not the entire population" (Ary et al., 2019, p186). Selection error was avoided by obtaining a list of all parents of senior Pima County 4-H members within the last four years. Before data was
evaluated, the results were purged for duplicates and other errors. The threats to frame error will be overcome by obtaining the parent contact information from Pima County extension staff.

**Instrumentation**

Data was collected using an online Qualtrics questionnaire that contained two sections. The first section contained questions about the youth member's youth projects and time within a 4-H program. The second section contained questions about parents perceived developmental outcomes throughout their child’s time participating in a livestock project through 4-H. The parents then had the opportunity to read statements representing the six developmental outcomes from Arnold’s Thriving model (Figure 2.).

To measure each outcome, three questions were developed to represent each developmental outcome. Participants rated the level of influence livestock projects have on developing the six defined outcomes using a sliding scale ranging from 0-100. The range of influence was re-coded to simplify the results using a 1-5 range (Code: 1= 0-20, Not at all Influential, 2= 21-40, Slightly Influential, 3= 41-60, Somewhat Influential, 4= 61-80, Very Influential, 5= 81-100, Extremely Influential). The data was summarized using descriptive statistics.

**Validity and Reliability**

"The process of gathering evidence to support, or fail to support, a particular interpretation of test scores is referred to as validation" (Ary et al., 2019, p 100). Context validity was determined through a panel of experts. "Context validity concerns item sampling adequacy—that is, the extent to which a specific set of items reflects a content domain" (DeVellis 2003, p 84). The panel of experts consisted of Cooperative Extension personnel and members within the Agricultural Education, Technology, and Innovation faculty. Panel members were selected based
on their extensive knowledge regarding youth development programming and their role within the state of Arizona 4-H programs. Panel members reviewed the questionnaire to determine proper context, instrumentations, and insight. A draft questionnaire was provided to each panel member and reviewed, allowing them to provide the necessary feedback. After experts evaluated the questionnaire, modifications were made to minimize measurement error. Cronbach’s alpha was calculated on the data to estimate the reliability of the questionnaire items. Cronbach’s Alpha was 0.85 (n=18).

Data Collection

Senior 4-H member information had been collected from the Pima County Extension Office records. The information provided included their full name, livestock project(s), and parental email addresses. Another parameter that was used to define the sampling frame was senior 4-H members who had a livestock project from 2018 to 2021. This list of names was purged for duplicates in two areas. Area one was to eliminate duplicated participants' children that participated in multiple species. The largest in weight specie was taken to evaluate in the questionnaire (Beef =1000-1600lbs, Swine= 225-285 lbs., Sheep= 120-190 lbs., Goats= 80-110 lbs.) The second purged area was for participants who had multiple senior-aged children who were participating in livestock projects. Only one child from each family was evaluated, this evaluation was based on age. The eldest child from each family was selected to gauge the level of influence on 4-H developmental outcomes.

In Spring of 2021, the questionnaire was sent out via email to selected participants, along with a letter of intent. This email provided a link to the questionnaire as well as, information about the study and the purpose of the study. A follow-up email was sent to non-respondents two days after the initial email. Three days later, a final email was sent to non-respondents which
included the end date of the questionnaire. No further effort was made to contact the subjects. As a result, non-response error was disregarded because the study was not generalizing beyond those subjects who participated in the study. A total of 143 questionnaires were sent out via email and there was a response rate of 38% (n=54). Data were imported to SPSS version 28. Descriptive statistics were calculated for each Likert-type statement. The descriptive statistics include frequencies, percentages, means, and standard deviations. Data was analyzed as a whole and by specie. Species were broken into Beef, Goat/Sheep and Swine. The goat and sheep projects were combined because of the similar experiences they share. The response rate reported for each species was Beef (n=15), Goat/Sheep (n=15) and swine (n=24).

**Findings**

To describe the level of influence 4-H has on life skill development, Table 1 reports the means and standard deviation for each construct. The scale on the questionnaire ranged from 0-100. This scale was then confined and recoded from 1-5; (Coded as 1=No, Influence, 2=Slightly Influential, 3=Somewhat Influential, 4=Very Influential, 5=Extremely Influential).

Table 1 displays the level of influence on 4-H developmental outcomes resulting from livestock projects as perceived by parents of senior ages 4-H members. The data results found that parents of senior 4-H members who participated in a livestock project were more likely to grow in the developmental outcome area, Contribution to Others ($M=4.87; SD=1.54$). Parents also perceived that livestock projects contributed to all development outcomes. The means and standard deviations are also shown in Table 1. Overall, the results found that having a livestock project contributed to 4-H developmental outcomes ($M=4.44; SD=0.77$) as perceived by parents of senior 4-H members.
Table 2 provides the results for each of the 18 statements that comprise the six development outcomes. Frequencies and percentages, along with the mean and standard deviation, were comprised in this table.
Table 2.
Level of Influence on Life Skill Development Perceived by Parents of Senior Ages Pima County 4-H Members in the Last Four Years (n=54)

<table>
<thead>
<tr>
<th>4-H Developmental Outcomes with Statements</th>
<th>No Influence</th>
<th>Slightly Influential</th>
<th>Somewhat Influential</th>
<th>Very Influential</th>
<th>Extremely Influential</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Academic Success</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>As a result of the livestock project, my child has learned about his/her animal.</td>
<td>1 1.90</td>
<td>2 3.70</td>
<td>0 0.00</td>
<td>7 13.00</td>
<td>44 81.50</td>
<td>4.69</td>
<td>0.85</td>
</tr>
<tr>
<td>As a result of the livestock project, my child developed several related skills.</td>
<td>1 1.90</td>
<td>2 3.70</td>
<td>1 1.90</td>
<td>7 13.00</td>
<td>43 79.60</td>
<td>4.11</td>
<td>1.28</td>
</tr>
<tr>
<td>As a result of the livestock project, my child gained employability skills.</td>
<td>5 9.30</td>
<td>3 3.70</td>
<td>2 3.70</td>
<td>15 27.80</td>
<td>29 53.70</td>
<td>4.69</td>
<td>0.82</td>
</tr>
<tr>
<td><strong>Connection with Others</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>As a result of the livestock project, my child established a wide circle of friends.</td>
<td>5 9.30</td>
<td>0 0.00</td>
<td>7 13.00</td>
<td>17 31.50</td>
<td>25 46.30</td>
<td>4.06</td>
<td>1.20</td>
</tr>
<tr>
<td>As a result of the livestock project, my child formed close friendships.</td>
<td>5 9.30</td>
<td>2 3.70</td>
<td>3 3.70</td>
<td>10 18.50</td>
<td>34 63.00</td>
<td>4.22</td>
<td>1.28</td>
</tr>
<tr>
<td>As a result of the livestock project, my child met new people.</td>
<td>3 3.70</td>
<td>2 3.70</td>
<td>1 1.90</td>
<td>16 29.60</td>
<td>32 59.30</td>
<td>4.33</td>
<td>1.08</td>
</tr>
<tr>
<td><strong>Contribution to Others</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>As a result of the livestock project, my child helped others along the way.</td>
<td>2 3.70</td>
<td>1 1.90</td>
<td>0 0.00</td>
<td>5 9.30</td>
<td>46 85.20</td>
<td>4.70</td>
<td>0.88</td>
</tr>
<tr>
<td>As a result of the livestock project, my child added value to the experience of others.</td>
<td>3 3.70</td>
<td>1 1.90</td>
<td>2 3.70</td>
<td>4 7.40</td>
<td>44 81.50</td>
<td>4.57</td>
<td>1.06</td>
</tr>
</tbody>
</table>
As a result of the livestock project, my child supported others in their efforts.

**Motivation**
As a result of the livestock project, my child developed determination.
As a result of the livestock project, my child demonstrated ambition.
As a result of the livestock project, my child became driven to be successful.

**Social Competence**
As a result of the livestock project, my child learned to interact with others.
As a result of the livestock project, my child developed self-control.
As a result of the livestock project, my child expressed empathy toward others.

**Personal Standards**
As a result of the livestock project, my child expected to experience success.
As a result of the livestock project, my child developed goal-oriented behaviors.
As a result of the livestock project, my child developed high expectations for his or herself.
Note: Scale is coded: 1=Not at all Influence, 2=Slightly Influential, 3=Somewhat Influential, 4=Very Influential, 5=Extremely Influential
Objective 2 sought to compare different livestock projects and their perceived life skill development for the second research objective. Table 3 provides the overall mean and standard deviation for each construct broken down into species. The beef project reported a total mean of 4.46 (SD=.97), the sheep and goat project had the highest mean of 4.50 (SD=.55), and the swine project reported the lowest overall mean of 4.30 (SD=.83). Overall, the greatest difference in total mean developmental outcome measure (.20) occurred between goats/sheep and swine projects. Moreover, the data concluded that all livestock species influenced the advancement of 4-H developmental outcomes as perceived by the parents of senior 4-H members.

Table 3.

<table>
<thead>
<tr>
<th>Developmental Outcome</th>
<th>Beef (n=15)</th>
<th>Goat/Sheep (n=15)</th>
<th>Swine (n=24)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Academic Success</td>
<td>4.53</td>
<td>0.85</td>
<td>4.80</td>
</tr>
<tr>
<td>Connection w/ Others</td>
<td>4.44</td>
<td>1.03</td>
<td>4.12</td>
</tr>
<tr>
<td>Contribution to Others</td>
<td>4.64</td>
<td>1.04</td>
<td>4.62</td>
</tr>
<tr>
<td>Motivation</td>
<td>4.38</td>
<td>1.04</td>
<td>4.53</td>
</tr>
<tr>
<td>Social Competence</td>
<td>4.40</td>
<td>1.01</td>
<td>4.35</td>
</tr>
<tr>
<td>Personal Standards</td>
<td>4.40</td>
<td>0.99</td>
<td>4.53</td>
</tr>
<tr>
<td>Total</td>
<td>4.47</td>
<td>0.97</td>
<td>4.50</td>
</tr>
</tbody>
</table>

Note. Scale is coded: 1=Not at all Influence, 2=Slightly Influential, 3=Somewhat Influential, 4=Very Influential, 5=Extremely Influential)

Conclusions, Implications, and Recommendations

In conclusion, parents of senior 4-H members perceived that participation in livestock projects was very influential in developing 4-H outcomes (Academic Success, Motivation, Social Competence, Personal Standards, Contribution to Others, Connections to Others, and Personal Responsibility) identified by the 4-H Thriving Model (Arnold, 2017). Arnold defined long-term goals derived from the Outcomes of the 4-H Thriving Model to include: 1) academic and
vocational success, 2) civic engagement, 3) employability and economic stability, and 4) Happiness and wellbeing. Based on the 4-H Thriving Model, 4-H members who attain these outcomes are better prepared to achieve the long-term goals. It was further concluded that six of the 4-H outcomes, Contribution to Others, was most influenced by participating in livestock projects among senior 4-H members as perceived by their parents.

These developmental outcomes are likely achieved because 4-H youth who participate in livestock projects must care for their animal's wellbeing and exercise personal leadership and responsibility. The members must be self-motivated and able to provide the daily care required in an animal's life. Members also must learn time management to avoid having other responsibilities neglected (Rusk et al., 2003). With this internal motivation and high expectations, youth move through the thriving model and ultimately achieve the developmental outcome.

Members also display external motivation to market their animals for the County Fair Auction. The selling of their project allows members an additional opportunity to promote their healthy and respectable project (Ward, 1996). To achieve their goals 4-H youth put in a considerable amount of time, money, and resources (e.g., facilities, equipment, supplies, etc.) that may not apply to non-animal 4-H youth projects.

When comparing the level of influence on the total 4-H developmental outcomes by species (beef, sheep/goats, swine), we can conclude that there is relatively little difference among the three species. Notwithstanding, swine projects were relatively least influential when compared to beef and sheep/goat projects. Because all livestock projects were very influential on life skill developmental outcomes, there are other inputs and outputs 4-H members can consider when selecting a project. These inputs and outputs consist of, cost, time, and resources. As shown in figure 1 each project comes with inherited differences. It is vital to explore and
determine the animal-related requirements (e.g., facilities, feed, supplies, initial costs, time, etc.) before choosing and purchasing a livestock project. To this end, Bolman created a common costed list that members can expect when purchasing a livestock project (Boleman, 2003).

To promote livestock projects among 4-H members, it is recommended that the 4-H staff and Extension faculty make these projects accessible for 4-H youth who might not have resources available to them (“Loans”, 2021). By providing financial loan opportunities for 4-H members, they would have the ability to reduce the financial burden associated with purchasing livestock projects and the costs associated. Another opportunity that could be employed is an equipment sharing program. A county-wide exchange could allow members who can't afford the equipment to get started without adding more financial stress. Finally, it is recommended that leasing programs be available for 4-H members who do not possess the infrastructure and equipment to have a successful project. Providing the opportunity to lease livestock, allows 4-H youth to participate in the program even if they do not have the financial means, facilities and equipment that are required (“Penn State Extension”, 2021).

It’s recommended that potential 4-H livestock members and their parents explore the cost and time that these projects require. This will allow them to understand the ample amount of commitment these projects require. Members and their parents should also reach out to coordinators and project leaders and actively ask questions regarding the pros and cons of raising livestock projects through 4-H.

To advance the understanding of member participation in livestock projects, additional research should be conducted. For example, further research should focus on comparing resulting development outcomes resulting from livestock projects and non-livestock projects.
Furthermore, a continuation of the present study should be replicated in other counties across Arizona to determine if the results are similar.
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