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A Qualitative Approach to Understanding Grain Bin Entry Decisions by Youth

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ABSTRACT

Youths – defined as children under the age of 18 – are frequently involved in agricultural work. Parental assignment, briefing, and supervision of hazardous farm tasks have an influence on youth safety, yet many youths are injured or killed performing these tasks. This research utilized a qualitative approach to analyze why youths choose to make hazardous decisions regarding grain bin entry and factors that played a role in youths' decisions. Because we know that youth are working on the farm, the study's objective was to examine the parent-youth relationship to determine the conditions under which youth would follow or refuse their parents' orders. Ten students who attended a Midwestern land-grant institution were interviewed. Interviewees had experience working inside grain bins, were highly involved in their family farming operations while under 18 years old, and worked under frequent parental supervision. Interviewees shared conditions where they followed their parents' orders even when they knew the task was unsafe. Moreover, participants indicated when they would refuse orders from parents. Findings showed that the primary source of agricultural safety knowledge came from the interviewees' parents. Interviewees did not necessarily demonstrate a "blind trust" in their parents, as they were not willing to follow all orders they were asked to complete. However, all interviewees indicated that their parents would not ask them to do anything unsafe. Many barriers to farm safety were emphasized by the interviewees, which may contribute to youths choosing to make hazardous decisions regarding grain bin entry under some conditions. The research implications are emphasized relative to youth safety outcomes on family farms.

KEYWORDS

Youth in agriculture; farm safety; youth perceptions; safety factors

Introduction

Nearly 893,000 youths live on a farm in the United States.[1] Historically, youths have been heavily involved with their farming operations, [2] as over half of the youths living on farms also participate in farm work.[1] With the considerable number of youth workers in agriculture, there are also many injuries and fatalities among this population. Approximately 33 children are injured in agriculture-related incidents each day, [3] and agriculture incidents average one child fatality every three days.[4]

Compared to other industries, the injury and fatality rate of youth workers in agriculture far exceed the average rates. Between 1992 and 2002, the fatality rate of agricultural workers aged 20 and younger was 3.6 times the rate of young workers across all industries, and 2.9 times the rate of all workers across all industries.[5] Since 2009, the fatality rate of youth workers in agriculture aged 19 and younger has exceeded that of all other industries combined.[6]

Some argue that the nature of farm work is inappropriate for youths, [2] and thus the Hazardous Occupations Orders for Agriculture (AgHOs) were created. The AgHOs outline eleven hazardous tasks considered too dangerous for youths under 16 years old to complete.[7] Although, youths who work on farms owned or operated by their parents are permitted to perform any task.[7] This vastly differs from the hazardous orders for non-agricultural occupations, which requires a minimum age of 18 to complete hazardous tasks and does not include a parental exemption.[8]

Parent supervision of farm tasks

Parents regularly supervise their youths as they complete agricultural work.[9] In half of youth

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injury cases, the youth was under the surveillance of an adult performing farm work nearby.[10] This fact debunks a myth believed by parents that keeping their children close to them will keep them safer.[11] Parents often think that safety is "common sense",[11] not recognizing that their own knowledge and life experiences contribute to their so-called "common" safety sense.

Youths are socialized to understand that parents have authority over their children.[12] A strong predictor of child obedience to adult orders is a preexisting relationship between the adult and the child.[13] However, when analyzing the parent-youth supervisor-employee relationship in agriculture, one study determined that youths value their personal safety over parental authority and pressure.[14] Therefore, despite having a strong relationship, youths may refuse their parents' orders when asked to complete an unsafe farm task. The researcher examined this phenomenon by studying youth decision-making.

Decision-making

The Theory of Cognitive Dissonance explains the relationship between contradicting cognitions, which causes an uncomfortable state of mind.[15] When a person encounters a case of contradicting cognitions, they will attempt to resolve this conflict quickly to reduce the mind's uncomfortable state.[16] This theory can be applied to agriculture when a worker will use any prior knowledge, perhaps contradicting, to resolve a conflict. There are three ways an employee could address a conflict in a safety scenario: (1) ignore their own judgment and obey the leadership, (2) disregard the leadership and follow their own judgment, or (3) delay the decision until forced to act.[17]

Adolescent workers are more likely than adult workers to conform to the authority's rules.[18] Westaby and Lowe[19] found when the authority is stern about not taking risks while working, employees are less likely to take risks. The same assumption can be made about young agricultural workers under parent supervision. If parents are stern about not taking risks while completing farm work, it is expected that youths will be less likely to take risks while working.

Piaget's Stage Theory of Cognitive Development states that individuals are unable to think abstractly until they reach the final stage of cognition between 12 and 18 years old.[20] Yet, neurodevelopmental research indicates that an individual's brain continues developing well into their 20s.[21,22] As a result, the National Institute for Occupational Safety and Health categorizes youth as those aged 24 years and younger.[23] Before reaching this age threshold, youths' risk-assessment skills may be inadequate in potentially hazardous situations. If a youth was assigned a potentially hazardous farm task by their parent at a young age, they may be unable to reason and make safe decisions.

This research's central hypothesis was the approach parents take to the supervision of hazardous tasks plays a role in youth safety-related decision-making on family farms. Youth decision-making was analyzed through the lens of one hazardous farm task: grain bin entry. This study was aimed to improve understanding of the decision-making processes of youths who enter grain bins. Qualitative data were collected according to two research questions:

(1) Why do youths choose to make hazardous decisions regarding grain bin entry?
(2) What factors play a role in youths' decisions to enter grain bins?

Methods

The research was granted exempt status from the Institutional Review Board (IRB ID 20–044). The methodology followed Merriam's basic qualitative research design.[24] Because qualitative research is based on the underlying theory of social constructivism, this study sought to "Understand how people make sense of their lives and their experiences" [22, p. 24]. Creswell[25] stated that social constructivism is a suitable theoretical framework when the analysis reveals how individuals interact with their world. This research sought to explore youths' social constructivism to make sense of their experiences completing a hazardous farm task while under parent supervision. This approach was deemed appropriate due to the anticipated

differences in participants' interactions with grain bins and parent supervision.

The researchers were interested in analyzing university-aged students who were raised on a family farm. University students were chosen for several reasons. One reason was the distance the students had from the decision-making tasks studied. Some interview questions required a level of reflection, which would be difficult to answer if the student is closer to the tasks. The assumption was that students who were farther away from the decision choice emotionally would be less concerned about "defending" their actions and more likely to explain their actions, meeting the research objectives of the study. Further, limited published research examines how university-aged students perceive agricultural hazards and make decisions about how to manage these hazards.[26–28] Finally, the authors work at a research-intensive land-grant institution with a large College of Agriculture and Life Sciences. The students had the knowledge that the authors were seeking and therefore, provided an adequate study population. Participants self-disclosed prior experiences working inside grain bins while under 18 years old. Using these criteria, a convenience sample was obtained from the population (approximately 2,700 students) as participant recruitment was self-nominating.[29] Participants who indicated an interest in completing an interview received a short Qualtrics^{XM} survey. The researcher then used a purposeful sampling process to select a diverse pool of interviewees based on their survey responses. Selected interviewees were highly involved in their family farms, had work experience inside a grain bin, and were supervised by their parents.

Interviews were conducted using WebEx™, which enabled a virtual "face-to-face" interview experience. Participants provided written consent to audio-record the conversations for transcription purposes. Interviewees were promised anonymity in the interview analysis and report, and participant confidentiality was maintained throughout the study. The researcher facilitated a semi-structured interview process,[24] where participants shared their experiences working on the farm under parent supervision. Participants also explained the conditions under which they would obey or refuse a parent's orders to complete an unsafe farm task. All interview participants were awarded a 20 USD gift card as an incentive for their participation.

Triangulation methods were utilized by comparing participants' interview responses to their survey responses, which helped increase internal validity.[30] Because the interviews were audio-recorded, the researcher simultaneously collected and analyzed the data. The researcher conducted member checks to the successive interviews to help interpret preliminary findings.[24] The researcher transcribed the audio-recorded files after each interview and assigned codes for emerging themes based on the study's two research questions. Using the constant comparison method,[31] interviews proceeded until saturation was reached for the main themes.

Results

There were 40 students who participated in the survey, and 10 initial interviewees were selected based on their responses. Because theme saturation was reached by the 10th interview, the interviews ceased. Interviewees were 18–24 years old.

Table 1.. Demographics of Interview Participants.

Interview Number	Sex	State of Residence	Involvement in Farm Operation	Times in Grain Bin as Youth	Parent Supervision
1	Female	Iowa	Always	20+ times	Most of the time
2	Male	Iowa	Always	20+ times	About half the time
3	Male	Iowa	Most of the time	16–20 times	Always
4	Male	Iowa	Most of the time	20+ times	Most of the time
5	Male	Illinois	Most of the time	20+ times	Always
6	Female	Iowa	Always	20+ times	Most of the time
7	Male	Virginia	Always	20+ times	Most of the time
8	Female	Iowa	Some	20+ times	Always
9	Female	Iowa	Most of the time	20+ times	Always
10	Male	Iowa	About half the time	20+ times	Most of the time

Table 1 displays the interviewee demographics. Per the two research questions, five themes emerged from the interviews (1) parents provide youths with farm safety knowledge, (2) farm parents and youths have a unique supervisor-employee relationship, (3) farm youths trust their parents, (4) youths value their personal safety, and (5) there are barriers to farm safety.

Parents provide youths with farm safety knowledge

Participants shared diverse sources of farm safety knowledge, including Farm Safety Days, growing up on the farm, and hearing stories about traumatic incidents. However, most participants claimed to have learned about farm safety from their parents, specifically their fathers. Some participants told short stories about how their parents would brief them on safety concerns before beginning farm tasks. When asked where she learned about farm safety, Participant 1 explained, "My dad taught me everything I know … I would be running around with him as like a little 5-year-old … and he was always teaching me then … My dad is a really good teacher telling us the dos and don'ts." Some participants reiterated personal quotes from their parents. Participant 5 quoted his father:

> I would say 99% [of farm safety knowledge] has come from my dad and just him always saying, "There's no reason to be scared of any work that you do on a farm. No matter if we're climbing a silo or we're getting in a grain bin, or we're doing whatever." He said, "Never be scared of it, but you always have to respect what could happen."

Emphasizing the understanding of "what could happen" was mentioned by several participants as methods their parents used to share safety information. Specific to grain bins, parents were generally the information source. Participant 5 noted, "My dad always equated working in grain bins to working with cows. The fastest way is to do it slow. Because if you get in a rush, you're going to screw something up." Other parents used scare tactics to ensure their youths were safe. Participant 4 recalled, "Before we even start, [my parents] were going to get me introduced to what could happen, maybe even to scare me a little bit so I am a little safer I guess on my own. And that worked." Participant 4 believed the scare tactics positively influenced his safety:

> As I got older, you … start to hear stories about things like that happening. Where a guy was wearing a loose sweatshirt or something and he got caught in a PTO and his arm was pulled off … and that's where you really get to see the reality of, "Oh, that's why [my parents] told me that before I even started doing that."

Parents play a role in how youths learn about farm safety and this theme emerged very clearly from the interviews. A second theme was the unique supervisory relationship that forms between farm youths and their parents.

Farm parents and youths have a unique supervisor-employee relationship

In many ways, the supervisor-employee relationship at a workplace parallels the relationship between farm parents and their youths. In terms of refusing orders given by superiors, Participant 3 admitted, "I guess from personal experience, usually disagreements don't always go over very well … they're kind of the boss, you know, you do what you're told."

Interviewee 2 related this point to how he was raised to respect authority. Despite later indicating that he and his father did not have the best relationship, he stated:

> Being from the Midwest … If your parent or employer tells you to do something, most of us are raised to kind of just do it. Or do something in order to move towards that goal, regardless if you're following their direct action or not. But telling them "no" is pretty strong.

Participant 5 considered the parent-child relationship and the challenges of opposing orders to complete hazardous tasks. He revealed, "I feel like that's a lot more uncomfortable for a kid to tell their mom or dad like, 'Yeah, I don't want to. It's dangerous.'" Participant 8 agreed, citing the early age many youths begin their work on the farm. She mentioned, "Most people start working on the farm when they're pretty young, so I don't think like straight up telling your parent that, 'I'm not going to do that' is very common in any case." Participant 4 joked about completing farm tasks to avoid being reprimanded, saying, "Maybe with a little bit of fear from, 'Oh shoot, what's dad going to say if we can't get this stuff done on time?'"

Nearly all interviewees stated that their parents had never asked them to do something unsafe or uncomfortable. Nonetheless, participants were adamant that if their parents did ask them to do anything unsafe, they would refuse orders. Participant 2 asserted, "I don't have any problems with disagreeing with [my dad] and telling him 'no' … but I don't remember any time that I specifically had to tell him 'no.'" Participant 1 had a similar experience with her father. She claimed she would openly refuse dangerous orders, declaring, "If it's too dangerous to enter the bin, and if dad's yelling at me to go enter the bin, … I would be like, 'No I'm not going in there.'"

Two female participants explained that they would refuse to follow parent orders if they felt incapable of completing the task or fearful of the task. Participant 8 explained, "If I ever expressed like, fear … like if I was scared, then [my dad] would … change his mind." She later shared, "I wasn't … capable of doing it. Like, I wasn't strong enough a lot of the time to lift the auger … I was telling [my dad] like, 'I can't do that … You're gonna have to come in and do that … because I can't lift it up.'" Participant 6, who also works with her father on the farm, agreed that she would refuse orders if she did not feel like she had the appropriate skill level. Although knowledge and skill level do not align exactly, when asked the conditions under which she would deny her parents' instructions, Participant 6 answered:

> Something that I didn't feel like I was capable of doing. Like that was above my skill level … Sometimes [my dad] expects me to do stuff that I either don't know how to do or don't feel like I have the strength to do.

As part of the supervisor-employee relationship, farm youths hold a certain level of trust in their parent. The third theme discusses this trust and how it may influence youths' obedience or refusal of parental orders.

Farm youths trust their parents

Nearly all interviewees declared that their parents would not ask them to do anything that their parents would not do. There are clearly tasks on the farm that are more appropriate for adults than youth, but participants trusted their parents to prioritize the personal safety of their child. The trust participants hold in their parents does not always translate into safer tasks for youth. Yet, Participant 6 described her parents as "even-keeled," later mentioning, "I wouldn't be blatantly disobedient to my parents, but I also don't think that they would tell me to do something that they didn't see themselves doing." Participant 8 similarly shared, "I trust my dad a lot. And I know that he would always … put himself more at risk than me." She later noted, "You just trust your parents and you do what they tell you."

Finally, Participant 7, who has asthma, said that his father typically enforced him wearing a respirator while completing dusty farm work. He shared one time the respirator was overlooked, yet he continued trusting his father:

> There are a few times … we were rushed … pulling corn out of the bin … I wouldn't have a mask on and I would say, "Hey dad, shouldn't I have a mask on?" He would say, "No, no, no, that's fine. We're not gonna be here that long." You know, I trusted him … I mean, I'm still here living to tell about it today.

There was strong evidence that interviewees trusted their parents. However, this was not "blind trust" – youths would first consider their safety. A fourth theme discusses the value youths hold in their personal safety.

Youths value their personal safety

Despite the parental influence, interviewees consistently held personal safety in high regard. Based on the interviews, youth take their personal safety seriously and understand that their safety is in part their own responsibility. Participant 7 stated, "I mean, everybody wants to be safe, or everybody wants to think that they're being safe." Likewise, Participant 10 reported, "People at their core are wired for self-preservation. Nobody wants to get hurt while they are working and are always weighing the risks." Personal safety was especially of concern while working with grain bins. Participant 6 expressed, "Obviously safety is important when entering grain bins and anything to do with grain bins."

Personal safety was explicitly held in higher regard than productivity. Participant 9 claimed, "You have to be safe first in order to have your productivity." Participant 1 equated productivity with injury, noting, "You can't be productive if you're sitting in the hospital bed." Participant 8 prioritized her safety over productivity during busy times. She asserted, "People are just more concerned about their safety than … taking that last load in."

Even while working with others, personal safety remained the dominant priority. When asked about working under supervision, Participant 8 stated, "You always want to … do what you're told to do … and there's a certain point when your personal safety, your own life, kind of overtakes that." Participant 7 emphasized that farmers want to stay safe and healthy. He remarked, "Everybody wants to be safe. Nobody wants to get hurt. Nobody wants to see somebody that they care about get hurt."

Although individuals may value their personal safety, there are still barriers to remaining safe on the farm. The final theme discusses several barriers to farm safety stressed by interviewees.

There are barriers to farm safety

Farming poses unique, uncontrollable hazards that make it unsafe. It is a career with low control and high demand – farmers have little control over certain success factors, like weather and market prices, yet farming requires a high demand of capital and labor. Interviewees mentioned how cost is a negative deterrent to safety, such as purchasing personal protective equipment or engineering controls. Participant 10 stressed, "It costs a lot of money to implement safety things."

There are certain agricultural seasons when productivity is essential. Participant 8 noted, "When things get really busy during planting or harvesting … people don't want to take … the safety precaution for something because they just want to get it done." Regarding an example of a time where rushing might be warranted, Participant 2 described, "If you were hauling corn and you had a blockage, and you maybe wanted to take more time to kind of resolve that issue safely, but you knew rain was coming." Some participants mentioned that rushing was often a cause of incidents. Participant 4 explained:

> Someone knows that there's a shortcut available that's not the correct way to do something, but because they're trying to get something done … before the weather comes in, before the sprout comes in, or so they can make it to an appointment in town, whatever it might be. Everything is kind of regarded around the emphasis of time, and so when that becomes an issue, that's when I think accidents start to happen.

Many interviewees attributed a lack of employees as a safety barrier. Participant 5 mentioned, "Not having enough people around … so you gotta do something yourself or … nobody there to watch over you … A lot of guys have to be independent." Specific to working inside grain bins, Participant 6 expressed, "I think that being alone is really dangerous, and when you're alone, I think that productivity kind of takes a back seat to being safe." Participant 5 shared that working with others manages farmers' stress. He reasoned, "Just the thought of somebody else being there would make you feel better, and you know if you're under less stress, you're going to make less mistakes usually."

Lastly, many participants mentioned the farmer's false sense of security and the thought that an incident would not happen to them. Participant 7 stated from personal experience, "I consider myself a safe person, but you know, there's always that one time where you're like, 'Oh, it doesn't matter this time … We'll make it work and we'll just go ahead and do something maybe that's not the safest.'" The same interviewee later noted, "That mindset of, 'Maybe this one time I'll be … alright … nothing's gonna happen to me.'" Participant 8 had a similar theory, stating, "The mindset of … 'Oh, it won't happen to me,' and … knowing that you're doing something dangerous but … trusting yourself and thinking that'll be okay."

The many barriers to farm safety may entice workers to disregard their personal safety. The following section discusses the implications of

these findings and what they may mean for youth safety outcomes on family farms.

Discussion

The first research question asked why youths choose to make hazardous decisions regarding grain bin entry. Based on the interview dialogue, participants were aware of the hazards in grain bins, however, they also mentioned several barriers to farm safety. Comments from the respondents relate to the "risk-taking orientation" among youth workers in all organizations.[19] "Global risk taking," a term describing a person's willingness to participate in activities that have components of physical danger, is also relevant within the farm environment. All respondents acknowledged that the farm had many examples of physical hazards. Yet, despite previous research findings that parental risk taking was positively associated with higher levels of youth global risk taking,[19] all respondents indicated that they would make a safe choice, no matter what their parent directed. Sanderson et al.,-[32] noted that children on the farm learn primarily by observing their parents and modeling parental behavior. While they work to master tasks, they often work in hazardous areas without supervision[32] and are sometimes injured. The role of parent attitudes and beliefs is important in safety outcomes, as noted by Sanderson et al.[32] and others,[9] with the role of the father especially highlighted.

Despite these factors influencing personal safety, most interviewees indicated that they would choose a safe option if faced with a potentially hazardous situation in real life. Many also agreed that they would respect their parents' orders until the situation became unsafe, unto which they would openly refuse orders. Yet, research by Larson-Bright et al.[33,34] suggests that no firm line exists on the difference between safe and unsafe. This is especially true in cases where youth are working on developmentally inappropriate tasks.[32] Overall, interviewees claimed to know the hazards, value their personal safety, and refuse unsafe supervisor orders, despite conclusions of the scientific literature that highlight unsafe practices inherent to the culture of farming.[32] If all these statements are true, the question remains as to why youths choose to follow orders and make hazardous decisions regarding grain bins.

The second research question asked which factors played a role in youth grain bin entry decisions. Nearly all interviewees credited their parents for teaching them about farm safety. Therefore, parents must actively assume the role of "safety instructor" and not assume that their children know the hazards. Because parents supervise while their youth while they complete work, they undoubtedly influence youth entry into grain bins. Youths have a trust in their parents and think that they would not ask the youth to do anything that their parents would not do. The results from this study indicate that if a parent asked their youth to enter a grain bin, and the youth thought the situation was safe, they would likely enter. Although not evidenced by interviewees in this study, the trust could be blinding. If youths are unaware of the hazards, they may be willing to complete any farm task given by their parents. Because youths have limited life experience, parents must explicitly communicate the hazards of any farm task and directly supervise their youth as they work.

Previous research presented youth with hypothetical grain-handling scenarios and asked what they would do next if presented with that scenario in real life. They also ranked factors that affected their decision-making. The study found that youths prioritize their personal safety above parental authority and pressure when making decisions.[14] While these findings were fairly supported in this study, some interviewees provided contradicting insights. The in-theory versus in-use practice should be considered. What a participant says they "might" do in a situation may differ from what they would "actually" do. Some participants declared that they would refuse any unsafe orders from their parents, but also said they were raised to respect authority and could not imagine refusing a direct request from their parent. Participants also acknowledged that their parents had not asked them to do anything unsafe on the farm, so they have never had to refuse orders. Further research should be conducted to explore this concept in an agricultural setting. The research should study the precise conditions under which a youth would refuse an order that they felt was unsafe.

Limitations

This study has several limitations which must be noted. Because participants were aware that this study was seeking to understand farm safety habits of youth who were supervised by their parents, social desirability bias may have affected participants' answers.[35] Therefore, instead of stating how they truly feel about a topic, participants may have responded in a more socially desirable, risk-averse manner.[35]

According to decision-making researchers Kahneman and Tversky,[36] offering respondents the opportunity to make a hypothetical choice is the simplest procedure to investigate most theoretical questions, including the questions posed by this research. The method assumes that people often know how they would behave in an actual situation and that respondents have "no special reason to disguise their true choices." In this case, posing hypothetical questions to address the question concerning how youth would respond to a parent who asks them to take on a hazardous task, and the conditions under which they would reject the parent's request, is a reasonable method of gathering the needed data.

Finally, the interviewees were college students thinking about situations that occurred when they were in high school or younger. This study population was chosen for several reasons, as discussed in greater depth in the methods section. A primary reason for the choice of university students was the distance from the decision choice from both a time and an emotional perspective. A second reason for studying this age group was the lack of research on how agricultural university students perceive and operationalize agricultural hazards on the farm. The researcher's interest was to understand the conditions under which the youth would disobey the parent and act safely; students under the age of 18 were not required to secure this information. The researcher did not ask the youth to recall specific events, but to specify the conditions where they might disobey a parent's directive. While it is almost certainly true that a twenty-year-old thinks differently than a sixteen-year-old, the question did not ask youth to recall specific cases, but rather to reflect and articulate situations where they would not follow the parent direction, a more hypothetical response. Finally, IRB compliance was more straightforward with students aged 18 or older, because they could consent to the research without parental permission. For this reason, while the perception of respondents' age differences could be seen as a potential limitation, the researchers do not believe it influenced the findings dramatically.

Conclusion

Parent supervision of hazardous tasks impacts youth safety outcomes on family farms. Parents are credited as the primary source of farm safety knowledge to their children. Because safety is a learned behavior, farm safety conversations cannot be overlooked. Based on interview dialogue, successful methods in disseminating farm safety knowledge are briefings before completing a task, demonstrating technique, or sharing stories about what could happen as a scare tactic. Further, it is critical to have these conversations regularly and to utilize a variety of farm safety resources.

However, it must be acknowledged that although youths are aware of the hazards and claim to value personal safety, some youth may still choose to complete dangerous tasks without taking safety precautions, following the "risk taking orientation" motivation.[19] Several general barriers to remaining safe on the farm were emphasized, but normalizing the act of taking time to think through next actions is vital to youth workers' safety. Parental assignment of age-appropriate tasks based on cognitive-developmental research, explicitly sharing safety messages with their youths, modeling safe behavior, and teaching youths to value personal safety will positively impact youth safety outcomes on the family farm.

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