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Symbolic Interactionism: A Framework for Understanding Risk-Taking Behaviors in Farm Communities

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ABSTRACT

Risk behaviors are key drivers of occupationally related injuries and illnesses, considerably impacting the uptake and success of injury interventions, technologies, and practices. This is certainly true in the agricultural sector, where farmers often ignore recommended safety practices or have even been known to disable safety technologies. Although research studies have characterized specific individual safety or risk behaviors, few studies have thoroughly examined farmers' risk and safety orientations or how these develop in response to environmental and societal exposures. This study utilizes data collected over the past decade with a variety of small to midsize farm personnel to explore the meanings that farmers ascribe to risk and safety and how these influence risk and safety behaviors. In all, over 90 interviews with farmers, farm-wives, and family members were reviewed. Researchers used a grounded theory approach to identify patterns of environmental and societal exposures, as well as their impact on farmers' risk and safety orientations. Analysis revealed exposures and orientations to risk and safety, which could be largely explained through the lens of symbolic interactionism. This framework posits that people create a sense-of-self as a way of adjusting and adapting to their environment. For farmers in this study, belief in their ability to persevere allows them to succeed, despite the considerable stressors and challenges they face each day. However, this identity can, at times, be maladaptive when it is applied to safety decisions and hazard exposures. The authors discuss the implications of this research and how it may be used to productively inform future farm safety efforts.

KEYWORDS

Anthropology; farmer identity; farm safety; risk behavior; symbolic interactionism

Introduction

According to the Census of Fatal Occupational Injuries, there are nearly 5,000 fatal, work-related injuries[1] in the United States every year. Bureau of Labor injury data demonstrate that roughly 7% of these fatal injuries can be attributed to farming, forestry, and fishing (AFF) activities,[2] despite that fewer than 2% of US workers are employed in these industries. Considerable research has been conducted over the past few decades to identify and address factors that contribute to AFF injuries and illnesses. To be specific, in a 2016 search of the National Center for Biotechnology Information PubMed database, nearly 2,600 publications regarding AFF hazards and interventions were identified. Despite the dedicated efforts to eliminate injury and illness in these industries, a reliable, widespread solution to the prevention problem has yet to be identified.

Looking at agricultural injury prevention in particular, safety approaches have largely focused on the "Three Es"—a term that refers to the use of "Education, Engineering, and Enforcement" to prevent hazard exposures.[3] The Three Es have been widely practiced by agricultural health and safety researchers for nearly nine decades and continue to be the most common prevention strategies employed in the agricultural sector.[3] Furthermore, these continue to be cited as the most viable approaches for reducing injury and illness rates in the agricultural sector.[4,5]

Looking at the practice of worker education, roughly 99 peer-reviewed articles are dedicated to the description or evaluation of farm safety training programs. Although often associated with changes in safety knowledge or minor improvements in safety practices, these studies are vulnerable to self-reporting bias.[6] Long-term impacts

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are infrequently assessed, making it difficult to say how successful educational approaches are in the long run.[7] A meta-analysis of agricultural safety interventions employing randomized controlled trials, controlled pre-post studies, and interrupted time-series studies, revealed that farm safety trainings "did not indicate any injury reducing effect."[8]

Engineering controls or use of personal protective equipment (PPE) have also been lauded as a promising solution for worker protection. Programs to increase the use of power take-off (PTO) shields, respiratory masks, and rollover protective structures (ROPS) are widely represented in the safety literature.[9–11] However, despite the availability of proven safety equipment, many engineering solutions do not progress to the stage of widespread dissemination or adoption by workers and employers.[9,12–14]

Enforcement, the last "E" in the prevention triumvirate, has shown some success in addressing safety hazards on farms.[15] However, regulation is a contentious topic in the farm community[16] and receives little support from farmers or farm advocacy groups.[17,18] Most importantly, policy and revisions to equipment standards can take many years to propose and pass, whereas enforcement provides its own unique challenge given the Occupational Safety and Health Administration (OSHA) small farm exemption.[19–21]

The benefit of these prevention strategies is that they attempt to address hazard exposures from a variety of angles. However, the success or failure of each of these approaches is still considerably reliant on behavior modification, that is, worker acceptance and adoption. As cited by Kaustell et al.,[22] the interaction of farmers' personal characteristics and the farm environment can be either powerful barriers or facilitators to safety improvements and safety behaviors. Although successes in injury prevention have been documented,[23–26] there is still much to learn regarding methods for successfully modifying or understanding worker behaviors.

In the past few decades, researchers have increasingly examined the predictive value of various health behavior models and have used these to try to better understand what drives risk and safety behaviors in farm communities. Most of these behavioral studies have been restricted to the assessment of individual behaviors or specific injury topics.[27–30] Although this research approach narrows the focus of inquiry and simplifies research, it isolates the individual from the environment and social support systems that influence worker behaviors and operates under the assumption that "safety" and "risk" have the same meaning and associations for everyone.

This narrow focus obfuscates the relationship between individual behaviors, culture, work environment, and social norms. It also ignores the fact that these influences constantly shape and reshape an individual's perception of what is "safe" and "risky." As stated by Murphy et al., published over 20 years ago, "Cultural traditions should not be ignored, and voluntary cooperation among all of the affected groups is the preferred method of achieving a common objective such as safety education and injury reduction."[7] In other words, if we want to truly accomplish lasting and significant change in risk behaviors, we need to examine them in situ. Given the need for a wider perspective, this paper seeks to explore farmers' discussions of risk and safety behaviors from an ethnographic perspective. In short, the authors explore the question of health and safety from the farmer's perspective, embedding it in the context of lived experiences and the social and cultural meanings that develop as a result of these experiences.

Methods

The data presented in this paper have been gathered from conversations with farm owners and family members over the course of a decade. Although a great deal of informal participant observation was carried out during farm visits, interviews were chosen as the primary source of formal data collection, given the focus of the research, which was to understand farmers' perspectives regarding farm and safety practices, as well as the meanings ascribed to these practices. Interview transcripts from 93 farmers, farm spouses, and family members were included in the analysis. These individuals represent numerous segments of the farm community, such as dairy, livestock, crop, and organic farmers, as well as individuals who play a variety of roles on the farm such as principal operators, farm wives,

business partners, and workers. Most informants represented small family farms or midsize operations (employing three to five nonrelated workers). Individuals were typically sampled from commodity lists or referred by safety trainers, extension specialists, farm-bureau members, or other farmers. Most informant interviews conducted in the initial years of data collection were either conducted by the primary author or by other researchers with direction from the primary author. In keeping with anthropological practices, interviews were largely unstructured[31] and typically took place on the farm, enabling researchers to observe informants in their environment, which helped to contextualize the information shared. Some interviews involved discussion with only one informant, whereas others included several members of the family or worksite, providing further insights regarding family interactions and gender roles. Interview guides and prompts largely focused on questions that would provide illustrations of the daily lives of informants, their aspirations and concerns, and their work activities. Discussions of health, safety, and risk were also a strong component of the conversations and focused on individuals' orientations towards these concepts.

All interviews were taped, transcribed, and reviewed to identify segments of the discussion that related to health, safety, or risk behaviors. NViVO Qualitative Data Analysis Software (QSR International, 2012) was used to organize and compare key segments of data across interviews, in order to employ a grounded theory approach. Grounded theory[32] was selected as the analytical framework, as it is best suited to the process of moving from informant discussions to abstract theory. Identified segments of data were then examined for the purpose of clarifying the meanings ascribed to farm risk and safety practices. These key segments were given short descriptive terms (or codes) to capture the overarching information tagged in each segment of highlighted text. Interviews were also reviewed to identify patterns in the construction of meanings and how these developed in response to societal norms and environmental influences.

A primary association that emerged from interviews was the relationship between risk, identity, and the farm environment. These patterns were compared with existing cultural and social theories to examine the relative novelty of the behavioral patterns identified. A review of the anthropological and sociological literature found close connections between the concept of symbolic interactionism and the conceptual connections identified in our research. These patterns are thus described within the framework of symbolic interactionism in an effort to provide a more thorough understanding of how orientations towards risk are socially and environmentally constructed. All components of the research were approved and monitored by the institutional review board at the Bassett Research Institute.

Results

Symbolic interactionism

As will be demonstrated in our summary of farmers' risk and safety discussions, farmers have unique associations with the concept of risk and safety. These associations are shaped by the environments in which they are created and seek to assist the farmer in adapting to the many circumstances they encounter on a daily basis. Given this framework, risk-taking behaviors, from the perspective of a farmer, can be seen as both purposeful and utilitarian. This perspective is reflected in sociological discussions which have explored how identity and a concept of self can be influenced by social influences, which are filtered and revised to support the objectives of the individual.

H. Blumer, a student of Mead's, later referred to this perspective as "symbolic interactionism" and continued to explore the idea that objects, phenomenon, or relationships do not have inherent meaning but are instead imbued with meaning. This meaning is socially constructed, ever changing, and responsive to the social and environmental cues that surround it. These meanings, in turn, allow individuals to formulate decisions and navigate their lives successfully. The following segments illustrate farmers' assessments of their risk and safety behaviors, their orientations to these concepts, and how these orientations have developed in response to the sociocultural environment.

The work environment

In interviews with farmers and family members, informants describe the farm as a constantly shifting and demanding environment that takes its toll physically, mentally, and economically on the individuals that inhabit it. As discussed by informants, working on a farm requires the ability to juggle many competing demands, with very little help, in environmental conditions that range from extremely hot to extremely cold, wet, or dry. Farmers indicated that they typically work 10–12-hour days, sometimes 7 days a week, and many indicated that vacations, if they did occur, were few and far between. These conditions stand in stark contrast to typical US work environments, where workers have a controlled, comfortable workspace, with regular breaks and a 9-hour work day. Informants explained that breaks and vacations are just not possible given the current economic environment in farming, which makes it nearly impossible to offer competitive wages for nonfamily labor assistance. Families are also smaller than they once were, making it difficult to rely on other family members to meet the labor demands on small farms.

> *Livestock farmer talking about a typical day on the farm*: "We start early, probably around 6 or 6:30 and mostly around here we start outdoors. So one of the elements that we are working with at all times is the weather. Either the hot sun or wind, we get a lot of wind out here, and of course the cold and the snow. So we have real issues with weather because in the beef cattle operation, nothing is warm. There are no warm barns. Unless you are in the tractor, everything is cold and you are subject to the elements. The cattle are fed in the morning with the tractors and by hand. The pens are cleaned, pretty much by hand, and cattle are moved from place to place and the calving situation. So we are dealing with calving issues most of the wintertime. During the summertime, most of the cattle are on pasture, which means working with fences, barbed wire, electric fence and chain saws, to work with the cattle and fencing areas. Then we are doing crops, which primarily on this farm is hay crops. That pretty much takes a day. In the evening we do chores again through the fall and winter months. We repeat the process we did in the morning, more feeding, more cleaning. It generally makes for a full day of working with cattle in the wintertime and working with crops in the summertime."

This farmer went on to discuss how farmers reconcile these demands by trying to be efficient and resourceful on the job, while taking pride in a hard day's work and solace in the precious, but limited, segments of time that they get with their family. This ability to make it work, despite difficult conditions, appears to be both a source of pride and frustration for farmers. The following discussion with a New York crop farmer (former dairy farmer), nicely describes how the volatility and challenges of the work environment require determination and self-sacrifice and the willingness to work until your body gives up:

> *Crop farmer (former dairy farmer)*: "They can't control the weather, they can't control the prices, they can't control accidents and that kind of stuff. But they get up and do it again, put in as much time as you have to. If you have [to] miss going to something that's what you do. That's what they have control over as long as their bodies work."

Risk also appears to be a consistent feature in the farm landscape, whether it be the risk of losing the farm due to a bad crop, sick animals, changes in market value of products, or the risk of personal injury or illness. Interestingly, farmers often find themselves in the position of having to choose one risk over the other (financial harm or physical harm), as described by this farmer:

> *Livestock farmer*: "Obviously, and this gets into a much bigger thing, if farming was more lucrative you'd get more people into it. If farming was more lucrative they could hire folks and have folks there and they'd have the financing with which to buy the equipment that's good and then have the financing with which to pay more people to help them that are there to watch out and they wouldn't be so pressed for time or convenience because that's often one of the big draw backs to it. It's like; well I'm going to do this, cut the safety measures, take a short cut because…"

The financial environment

Many small to midsize farm operations experience considerable financial challenges that add to the already inherent challenges and stressors of farming. The relatively small profit margins force farmers to get by with less, whether it be new equipment, workers, or safety upgrades. These financial challenges add to an already stressful environment, where only the strong, resilient, and resourceful survive. This point is highlighted

in the following excerpts from interviews with farmers discussing barriers to safety:

> *Livestock farmer's wife*: "I would say financial, because a lot of guys cannot afford good stuff. I remember when we were dairy farmers with my previous husband. We had junky junk. We had to make do with what we had. We couldn't afford to do anything to it. None of them had roll bars. We couldn't afford them."
>
> *Diversified farmer*: "They simply don't make ends meet and what suffers as a result of that is maintenance on equipment, safety things are an absolute luxury and they really, really are…I need to cut the field today and if I have a shield on the PTO that's great. If I don't, I can still cut the field. That's the reality of it."

Eliminating hired help is another strategy for cutting costs, which also seems unavoidable given the lack of qualified workers willing to work hard for minimal pay, as discussed by this informant:

> *Livestock farmer*: "There is too much work for one person, but it's still difficult to lay out a salary for another person. It's difficult to find somebody that can work on a farm today. The safety issues with dealing with the cattle and machinery and hiring somebody that can do the things without being totally supervised all the time is difficult."

Given the realities of the financial market and the work environment, farmers respond by changing what they can control, for example, the time and effort they invest in their farms:

> *Livestock farmer*: "[Farmers] make do and survive because they know how to adjust. That is why young people don't stay on the farm, too much work for too little money. When I went to get my first farm tax return done, the tax preparer said your labor is worth nothing. I said I knew that a long time ago."

It is important to note that the fear of financial harm is not an irrational one for small and midsize farmers. For many years, fuel, seed, and labor prices have continued to climb, whereas their profits appear to be stagnant, especially for dairies. As farmers look around and see neighboring farms closing their doors, they become keenly aware of their precarious position.

> *Dairy farmer's wife*: "Like he said we've been here 100 years. I mean the family. Today it's just not getting passed down anymore. Our whole road here where we meet 28, we're the last ones here. When we go, there won't be any."

Given this environment, it is interesting to consider what subjective meanings farmers associate with the concepts of risk and safety and how these influence their orientation to these concepts. Based on our informant interviews, safety is seen as an expense that farmers can ill afford. Although they are aware that injury or illness can be costly, the possibility of physical harm appears to be largely hypothetical in comparison with the expensive and immediate possibility of losing a field of hay or an animal, events that can turn the financial tide for a farm.

The social environment

As described in the previous section, the challenges of the work environment demand both resilience and determination from the individuals who dedicate their lives to farming. These personal qualities are thus highly valued in farm communities and are seen as one of the more unique characteristics of farm families. At a young age, children are not only given considerable responsibility, they are expected to live up to these responsibilities, to work hard, and to be self-reliant.

> *Livestock farmer taking about growing up on a farm*: "Going to school was a vacation. So we have edified and sent the wrong message out to the farming community that you are supposed to work this hard. That somehow through the universities and through extensions, produce more, produce more, produce more, we were always taught to do more … We've been actually trained and re-enforced in the fact that you do it yourself."
>
> *Dairy farmer's wife*: "…our daughter Krista was always a worker, always. When she was little and we would feed calves together, sometimes in the middle of the night when I would worry about the youngest calf, I'd go into Krista's room. Here she was 10 years old and I'd say, 'Krista did we remember to feed the baby calf under the hay mound stairs?' and she'd say, 'yes mom'. But my son, I did often have to say, your poppa and nana have been out in that barn since 5:30 so you get up there and do your part."

Exposure to risk appears to be an additional, albeit informal, part of children's training and is likely a subconscious acknowledgement in the community that to farm means to accept risk.

Livestock farmer: "I mean I learned to drive a tractor when I was 5 or 6 years old. We were always driving the tractors."

Livestock farmer's wife recalling a conversation with her husband about a near miss event involving their teenage son: "He said that our son would have never gotten squished, because he would still have had enough room when the tongue hit the other part of the tractor, because the wagon was at an angle so it would have hit and stopped it. I said yes, but the kid was scared and you didn't tell him what to do in that situation. He said that he would have figured it out. I said he did, he ran."

Risk behaviors are often frequently modeled by significant others, further normalizing children's orientation towards risk by teaching them to cut corners and ignore safety practices. Many of the farmers who participated in the interviews were generational farmers, who grew up on farms and recalled the dangerous practices they saw other family members engaging in as children.

Dairy farmer: "I'll tell you a story when I was 6, 7, 8 years something like that. They used to chop corn with a neighbor. My grandfather was unloading the wagon and the shield was off … He stepped over the power take-off shaft, caught his pants, took everything off but his underwear, work shoes and his socks."

The farm identity

Looking at these social and environmental influences we can see how farmers are "products" of their work environment. In order to adjust to the demands of farming, they foster an identity that allows them to persist. Interviews with farmers clearly indicated that farming is not just a job, but a way of life and a consistent confirmation of their ability to "beat the odds." Farmers thus see themselves as winners in a game that few could survive. This socially constructed identity and association with farming allows them to adjust to the difficulty of farming by making the challenge, the reward.

Livestock farmer: "You see farmers are never going to get hurt, in the perception of their operation. Because they beat the government, they beat the bad prices. They are continually fighting and beating the weather. So overall, they have a natural tendency to consider themselves to be winners and to be immune from nature, from difficulties because every day they are faced with the challenges they have to win at. And they do or else they don't stay in the business. So they have a pre-conceived idea, it's sic [injury or death] not going to happen to them."

Diversified farmer's wife: "One thing about a farmer is he is independent. If he thinks he can get along without it, he will. They are proud. I know my husband is proud of the fact that he's a hard worker and determined and cannot quit until it's done."

Diversified Farmer's wife: "Farmers call other people who can't deal with the stress, they call them weak-minded. That may or may not be true, but that's the term that they use a lot."

In this light, embracing risks and adopting the identity of the "tough survivor" can be seen as a highly adaptive response to a very challenging environment. Without this socially constructed orientation to challenge and risk and a carefully nurtured self-perception of being able to come out on top, it is difficult to see how farmers could do what they do, day in and day out. However, although this identity and socially constructed reality allows them to keep the farm running, it can be maladaptive when applied to taking risks, as it allows farmers to believe that when exposed to hazards, they have the skills and experience to avoid injury. This point was made clearly in the following statement made by a farmer's wife:

Farmer's wife: "There is a feeling that the most important thing is to get the job done, and you have to take risks to do that. But, they think they have the kind of courage and experience [that they] can do that."

In light of the orientations that farmers have developed to risk and the invincible identity that they have constructed, it is not surprising that a "gap" between knowledge of risks and safety behaviors exists in the farm community.[32]

Limitations

The research presented in this article attempts to clarify risk and safety behavior drivers that have been previously described in the safety literature. An anthropological perspective is employed to examine these concepts in the larger web of social systems and environments. As with all research, there are potential study limitations that could impact study results. To be specific, our informants were almost exclusively small to midsize farm operations, and although various farm commodities were represented in our sample (mostly

dairy, livestock, and diversified farms), not all commodity groups were represented. Given that the research seeks to clarify how interaction with the social and physical work environment impacts farmers' orientation to risk, it is quite likely that similar patterns and orientations to risk and safety would be different for farmers working in different environments. For example, farmers who experience less economic stress or labor shortages may not develop similar identities or risk orientations as our informants. However, further research may help to outline the boundaries of these findings to assess their application to larger farms or other commodities.

Additionally, as with all qualitative research, the results are the researchers' subjective interpretation of data. However, further qualitative studies on this topic will provide reliability and validity checks of the data presented here. The presentation of similar studies in the discussion section offers an initial assessment of our results as they compare with other, similar research.

Discussion

As mentioned previously, public health and safety researchers have long discussed the frustrating gap between workers' knowledge of farm hazards and actual safety practices.[32–35] Although risky behaviors are by no means confined to the agricultural community, workers in this industry have been recognized for their relatively high tolerance of risk exposures.[36,37] The research presented in this article attempts to illuminate the farm safety/practice conundrum by examining farmers' orientations to risk and safety and how these socially constructed orientations have developed. In doing this, it is possible to widen the field of inquiry beyond a focus on the individual, in ways that foster "respecting, attending to and addressing local perceptions, interests and ways of life."[38]

Although seemingly contradictory, our informants indicate that putting oneself at risk can provide substantive benefits, especially when the environment provides few opportunities for negotiation. Farmers and family members repeatedly described the need to get work done quickly, efficiently, and cheaply; sometimes exposing oneself to hazards provided the best method of meeting these immediate goals. Given the reality of hazard exposures and the economic risks of farming, creating an identity that allows an individual to believe they can take on difficulty and survive can be interpreted as an adaptive reaction to a challenging scenario. Fortunately, these adaptive efforts can teach us a great deal about human behavior and about farmers, specifically.

As stated by social science researcher Kathy Charmaz, "People share close ties, act in social worlds, work in organizations, adopt collective identities and subscribe to certain collective values and actions that may not demand continual scrutiny … As life becomes routine, the interpretive process compresses and people engage less in an overt inner conversation to mull over their situations. They are unlikely to change either their practices or meanings unless their situations have become problematic and their habitual responses no longer work."[39] This passage astutely describes how meanings and identities are created and maintained in response to one's environment and how they are eventually internalized so that reactions become automatic versus reflective. Once these are internalized, changing behavior becomes difficult, as individuals begin to operate on "autopilot." As Charmaz indicates, changing behavior is difficult at this stage and requires a shift in the environment, such that typical, automatic responses and orientations "no longer work."

Although it is possible to conclude from our research that farm risk/safety orientations are another example of how societal influences drive human behavior (social determinism),[39] it is also possible to conclude that individuals use societal influences as a way of explaining or "making excuses" for behaviors (dramaturgical analysis).[39] Genetic predispositions to risk-taking behavior have also been discussed in the psychological literature, introducing additional complexity to the question of how risk-taking orientations are created and reinforced, as well as whether they can be altered.[40] These studies point to the need for a more considered understanding of just how society and genetic structures drive risk behavior and how this knowledge can be used to more effectively change risk behavior.

In addition to providing a more integral understanding of farm risk behaviors, our research

provides increasing evidence of the tight linkages between identity and behavior and explores this from the perspective of symbolic interactionism. This perspective allows us to not only examine a primary facilitator of risk (identity), but also to accept the possibility that a positive association with risk is normal, purposeful, and to a certain degree beneficial.

Regarding the links between culture, identity, and risk, prior studies have identified similar patterns. In particular, self-identity has been found to increase the predictive validity of behavioral models, such as the Theory of Planned Behavior (TPB). TPB incorporates constructs such as attitudes, subjective norms, and perceived behavioral as predictors of changes in intention to change and actual behavior change.[41] When joined by existing TPB constructs, identity was found to improve the model's ability to predict behavior change.[42]

Our study also provides evidence that working hard is a "fundamental cultural value"[43] in the farm community, a connection that has been made by other social science researchers. In an ethnographic study conducted in 2002 in southern Wisconsin, researchers sought to understand farmer's work ethic and work behaviors and evaluate how these impact their health, relationships, and general quality of life. As in our study, Wisconsin farmers revealed that working hard is a way of life, one that is valued and inculcated at a very young age. The farmers from the Wisconsin study similarly described the rigors of farm work as bringing them a sense of "self-respect and meaning," which also allows them to provide a lifestyle for their families that nurtures independence and resilience.[44] Similar sociological factors and their impacts on farm safety have also been described in *Agricultural Medicine: Rural Occupational Health, Safety, and Prevention*.[45]

Given our findings and their close connections with a symbolic-interactionist perspective, it is possible to use this framework to more productively improve interventionists' approach to health and safety programs. Perhaps a good place to start is to acknowledge the fact that researchers and the communities they serve have different orientations to health, safety, and risk. Understanding this can foster a different, more informed approach to behavior change.

For example, instead of encouraging the adoption of safety technologies simply because they are safer, it may be more effective to develop technologies that are both safer and increase the efficiency of production, thus leading to financial savings. Other options could be to forego the emphasis on safety statistics and instead focus on the cost of injury over time and how this impacts the financial viability of the farm. Alternatively, if orientations to people, objects, or phenomenon are socially constructed through environmental exposures, it may be possible to alter the farm environment and farm work patterns so positive orientations to risk behaviors are no longer supported. Examining similar success stories, such as societal orientations to wearing seatbelts or smoking, may yield helpful examples for how societal norms can be successfully shifted.

Conclusion

In conclusion, the results from our interviews indicate that although seemingly maladaptive, farmers' risk practices are surprisingly adaptive given the societal, physical, and economic pressures they face daily. However, to see this, one needs to begin with the assumption that individuals are rational actors working within their social environments, a basic assumption that lies at the heart of anthropological and sociological research. As demonstrated in the interviews conducted with our informants, farming is regarded as inherently risky and survivable only through hard work and resourcefulness, not by adhering to safety practices. Given this point of view, our research suggests the need to determine how either the social environment could be changed or the values of independence and resilience could be used to adapt attitudes so that safety practices are also valued.

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References

1. Bureau of Labor Statistics. Revisions to the 2013 Census of Fatal Occupational Injuries (CFOI) counts. Available at: http://www.bls.gov/iif/oshwc/cfoi/rate2013ny.pdf. Published 2015. Accessed May 23, 2016.
2. Bureau of Labor Statistics. National Census of Fatal Occupational Injuries in 2014 (Preliminary Results). Available at: http://www.bls.gov/news.release/pdf/cfoi.pdf. Published 2015. Accessed May 23, 2016.
3. Sleet DA, Dahlberg LL, Basavaraju SV, Mercy JA, McGuire LC, Greenspan A. Injury prevention, violence prevention, and trauma care: building the scientific base. *MMWR Suppl*. 2011;60:78–85.
4. McCurdy SA, Carroll DJ. Agricultural injury. *Am J Ind Med*. 2000;38:463–480.
5. Solomon C. Accidental injuries in agriculture in the UK. *Occup Med (Lond)*. 2002;52:461–466.
6. Missikpode C, Peek-Asa C, Young T, Swanton A, Leinenkugel K, Torner J. Trends in non-fatal agricultural injuries requiring trauma care. *Inj Epidemiol*. 2015;2:30.
7. Murphy DJ, Kiernan NE, Chapman LJ. An occupational health and safety intervention research agenda for production agriculture: does safety education work? *Am J Ind Med*. 1996;29:392–396.
8. Lehtola MM, Rautiainen RH, Day LM, Schonstein E, Suutarinen J, Salminen S, Verbeek JH. Effectiveness of interventions in preventing injuries in agriculture—a systematic review and meta-analysis. *Scand J Work Environ Health*. 2008;34:327–336.
9. Chapel DB, Sorensen JA, Tinc PJ, Fiske T, Wyckoff S, Mellors PW, Jenkins P. Validation of self-reported power take-off shielding using on-site farm Audits. *J Agric Saf Health*. 2015;21:95–104.
10. Tinc P, Madden E, Park S, Weil R, Sorensen J. Concept identification for a power take-off shielding campaign. *J Agromedicine*. 2015;20:55–63.
11. Rautiainen R. Farm and Ranch Injury Survey: preliminary results from annual surveys conducted by the National Agricultural Statistics Service for CS-CASH covering the years 2011–2014. Available at: https://www.unmc.edu/publichealth/cscash/_documents/2011-2014%20Injury%20Survey%20Results.pdf. Accessed May 23, 2016.
12. Fiske T, Earle-Richardson G. Farm safety research to practice: the long road from the laboratory to the farm. *J Agromedicine*. 2013;18:11–17.
13. Hard DL, Myers JR. Adoption of rollover protective structures (ROPS) on U.S. farm tractors by state: 1993–1995, 2001, and 2004. *J Agric Saf Health*. 2011;17:157–172.
14. Syamlal G, Schleiff PL, Mazurek JM, Doney B, Greskevitch M. Respirator use among U.S. farm operators: evidence from the 2006 Farm and Ranch Safety Survey. *J Agromedicine*. 2013;18:27–38.
15. Liebman AK, Augustave W. Agricultural health and safety: incorporating the worker perspective. *J Agromedicine*. 2010;15:192–199.
16. FoxNews.com. Regulation nation: farmers worry over crop of new rules. Published September 14, 2011. Available at: http://www.foxnews.com/politics/2011/09/14/regulation-nation-farmers-worry-over-crop-new-rules.html
17. Richardson P. Rural kids, parents angry about Labor Dept. rule banning farm chores. *The Daily Caller*. Published April 5, 2012. Available at: http://vnnforum.com/showthread.php?p=1385265
18. US Department of Labor. Labor Department statement on withdrawal of proposed rule dealing with children who work in agricultural vocations. Published April 26, 2012. Available at: https://www.dol.gov/opa/media/press/whd/whd20120826.htm
19. US Department of Labor Policy Clarification on OSHA's Enforcement Authority at Small Farms. 2014. Available at: https://www.osha.gov/dep/enforcement/policy_clarification_small_farms.html. Accessed May 23, 2016.
20. Liebman AK, Wiggins MF, Fraser C, Levin J, Sidebottom J, Arcury TA. Occupational health policy and immigrant workers in the agriculture, forestry, and fishing sector. *Am J Ind Med*. 2013;56:975–984.
21. Heaney CA, Wilkins JR 3rd, Dellinger W, McGonigle H, Elliott M, Bean TL, Jepsen SD. Protecting young workers in agriculture: participation in tractor certification training. *J Agric Saf Health*. 2006;12:181–190.
22. Kaustell KO, Mattila TE, Rautiainen RH. Barriers and enabling factors for safety improvements on farms in Finland. *J Agric Saf Health*. 2011;17:327–342.
23. DeRoo LA, Rautiainen RH. A systematic review of farm safety interventions. *Am J Prev Med*. 2000;18:51–62.
24. Murphy DJ, Myers J, McKenzie EA, Cavaletto R, May J, Sorensen J. Tractors and rollover protection in the United States. *J Agromedicine*. 2010;15:249–263.

25. Hasle P, Limborg HJ. A review of the literature on preventive occupational health and safety activities in small enterprises. *Ind Health*. 2006;44:6–12.
26. Sorensen J. *Social Marketing for Injury Prevention: Changing Risk Perceptions and Safety-Related Behaviors among New York Farmers*. Umeå, Sweden: Umeå Universitet; 2009.
27. Fox S, Ricketts M, Minton JE. Worker injuries involving the interaction of cattle, cattle handlers, and farm structures or equipment. *J Agric Saf Health*. 2015;21:3–12.
28. Roberts MJ, Deboy GR, Field WE, Maier DE. Summary of prior grain entrapment rescue strategies. *J Agric Saf Health*. 2011;17:303–325.
29. Langley RL, Hunter J. Occupational fatalities due to animal-related events. *Wilderness Environ Med*. 2001;12:168–174.
30. Donham KJ, Lange JL, Kline A, Rautiainen RH, Grafft L. Prevention of occupational respiratory symptoms among certified safe farm intervention participants. *J Agromedicine*. 2011;16:40–51.
31. Hahn RA, Inhorn MC. *Anthropology and Public Health: BridgingDifferences in Culture and Society*. New York: Oxford University Press; 2009.
32. Glaser BG, Strauss A. *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Chicago, IL: Aldine Publishing; 1967.
33. Murphy DJ. *Looking Beneath the Surface of Agricultural Safety and Health*. St. Joseph, MI: American Society of Agricultural Engineers; 2003.
34. Dosman J, Hagel L, King N, Koehncke N, Kirychuk S, Trask C, Neudorf J, Day L, Voaklander D, Pickett W. The hierarchy of control in the epidemic of farm injury. *J Agromedicine*. 2015;20:360–369.
35. Kearney GD, Rodriguez G, Quandt SA, Arcury JT, Arcury TA. Work safety climate, safety behaviors, and occupational injuries of youth farmworkers in North Carolina. *Am J Public Health*. 2015;105:1336–1343.
36. Donham KJ, Lee B. The changing face of agricultural health and safety—alternative agriculture. *J Agromedicine*. 2009;14:70–75.
37. Langan-Fox J, Cooper CL. *Handbook of Stress in the Occupations*. Cheltenham (UK) and New York: Edward Elgar; 2011.
38. Weil R, Mellors P, Fiske T, Sorensen JA. Driveline shields: barriers and motivators to shield use for New York State farmers. *J Agric Saf Health* 2014;20:51–61.
39. Charmaz K. *Constructing Grounded Theory*. London: Sage; 2014.
40. Derringer J, Krueger RF, Dick DM, Saccone S, Grucza RA, Agrawal A, Lin P, Almasy L, Edenberg HJ, Foroud T, Nurnberger JI Jr, Hesselbrock VM, Kramer JR, Kuperman S, Porjesz B, Schuckit MA, Bierut LJ. Predicting sensation seeking from dopamine genes: a candidate-system approach. *Psychol Sci*. 2010;21:1282–1290.
41. Godin G, Kok G. The theory of planned behavior: a review of its applications to health-related behaviors. *Am J Health Promot*. 1996;11:87–98.
42. Armitage CJ, Conner M. Social cognitive determinants of blood donation. *J Appl Soc Psychol*. 2001;31:1431–1457.
43. Gulley J. *Beliefs and Values in American Farming*. Washington, DC: U.S. Department of Agriculture; 1974.
44. Bolwerk CA. The culture of farm work and its implications on health, social relationships and leisure in farm women and men in the United States. *J Cult Divers*. 2002;9:102–107.
45. Donham K, Thelin A. *Agricultural Medicine: Rural Occupational Health, Safety, and Prevention*. Hoboken, NJ: Wiley-Blackwell; 2006.