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"If I feel like I am in danger, I leave": pesticide exposure, agentic strategies, and gender among Latine farmworkers in Idaho

Rebecca L. Som Castellano[1] · Lisa Meierotto[2] · Carly Hyland[3] · Cynthia Curl[4]

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Abstract

Pesticide exposure is a common occupational hazard for Latine farmworkers laboring in the United States, causing harm to farmworkers' wellbeing and the wellbeing of their families and communities. While existing scholarly literature documents various issues related to occupational pesticide exposure for farmworkers, limited research has centered on farmworkers' voices to understand their views on pesticides, including the degree to which they express or experience a sense of agency in managing pesticide exposure. This paper outlines key findings from mixed methods research conducted throughout 2022 focused on pesticide beliefs and exposure among Latine farmworkers in Southwestern Idaho. Drawing from survey and interview data, we focus on findings related to the following questions: Do farmworkers believe they have agency in protecting themselves from pesticides? What strategies do farmworkers use to protect themselves from pesticides in their agricultural work? What factors limit or facilitate farmworkers engaging in agentic acts as they work to protect themselves from pesticides? We further consider these questions through a lens of gender, utilizing concepts of carework, hegemonic masculinity, and familism to frame how gender and intersectional factors may shape the degree to which and the ways in which agency is expressed and enacted by farmworkers in their agricultural labor.

Keywords Farmworkers · Gender · Labor · Agency · Carework

Abbreviations

PPE Personal Protective Equipment
WHO World Health Organization

Introduction

Pesticide exposure is a common occupational hazard for Latine[1] farmworkers laboring in the United States (U.S.), causing harm to farmworkers, their families and communities. Pesticide exposure is associated with a range of human health concerns (Nicolopoulou-Stamati et al. 2016; Curl et al. 2020; Aguilar Buenrostro and Martinez 2024), including fertility and reproductive concerns (Bretveld et al. 2006), carcinogenic and respiratory effects (Salameh et al. 2006), and hospitalization and death (WHO 1990). One recent study found that fatality rates among farmworkers are seven times higher than the national average (May and Arcury 2020). For farmworkers, pesticide exposure is shaped by a range of factors, including race, citizenship status, and gender, which can influence the types of work that farmworkers engage in, their access to personal protective equipment

✉ Rebecca L. Som Castellano
rsomcastellano@boisestate.edu

[1] School of Environment, Department of Sociology, Boise State University, Boise, ID, USA

[2] School of Public Service, Boise State University, Boise, ID, USA

[3] UC Berkeley, Environmental Health Sciences, UC Agriculture and Natural Resources, Boise, ID, USA

[4] School of Public and Population Health, Boise State University, Boise, ID, USA

[1] In this paper we use the term Latine as a gender inclusive replacement for the term Latino/a. Many scholars have noted that this term is more commonly used and accepted by Spanish speaking populations and is the current vernacular in activist circles (Miranda et al. 2023).

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(PPE), and the degree of power they have within the agri-food system (Hyland et al. 2024a, b).

From public and community and environmental health research we know that enacting agency can reduce the impacts of pesticide exposure. Described in further detail below, agency here refers most basically to the capacity to act. For instance, research suggests that the use of PPE can be effective in shielding oneself from pesticide exposure and that removing shoes before entering a home, washing work clothes, and taking showers after work can reduce the spread of occupational pesticide exposure to one's home and family members (Quandt et al. 2006; Levesque et al. 2012; Furlong et al. 2015; Walton et al. 2016; Fuhrimann et al. 2020). However, this body of scholarship often fails to center farmworker voices in order to provide a nuanced understanding of farmworkers' views on pesticides, and how they enact agency regarding pesticide exposure. In addition, this research often provides a limited view on how structural and cultural factors, including gender, shape agentic strategies of farmworkers related to pesticides.

On the other hand, social science and humanities work focused on the experiences of farmworkers often employs a political economy perspective to highlight how historical and contemporary structural and cultural forces lead to the exploitation of farmworkers. This scholarship importantly sheds light on the ways in which systems of power shape the life chances and life experiences of farmworkers. However, this research at times fails to account for agency. Further, research on experiences with pesticides tends to focus on the experiences of men (Arcury et al. 2009, 2010; Krenz et al. 2015). While many farmworkers in the U.S. are constrained in the wage-labor market because of their race, class, gender, and immigration status, farmworkers may also express agency in their work, and the enactment of agency is likely shaped by a range of factors, including gender. Understanding the agentic strategies of those who experience marginalization and how this may be shaped by gender not only honors the knowledge and experience of individuals and communities who are suffering, but can also inform programs and policies aimed at increasing awareness and improving conditions for farmworkers.

In order to center the voices of farmworkers and gain insight into whether and how farmworkers consider agency in relation to pesticide exposure, we utilize a mixed-methods approach with data gathered throughout the Treasure Valley of Idaho. In particular, this paper considers (1) how farmworkers perceive agency in their occupation, (2) the agential strategies that farmworkers use to protect themselves from pesticides in their agricultural work, and (3) how structural forces, particularly gender, shape the expression and enactment of agency by farmworkers. Utilizing concepts of care-work, hegemonic masculinity and familism, we consider these aspects of agency through a lens of gender. By doing so, we aim to center the voices of farmworkers, and gain a more nuanced understanding of whether and how farmworkers consider agency in relation to pesticide exposure, including how gender socialization shapes experiences with pesticides and the deployment of agentic strategies.

To be clear, the aim of this paper is not to ignore the legal violence experienced by farmworkers or to absolve the agri-food industry of responsibility for the harms of agricultural pesticides and how the use of technology increases profit for corporations while relying on vulnerable populations to subsidize agriculture. Nor are we arguing that farmworkers are responsible for protecting themselves. Instead, we are interested in understanding how farmworkers, who are often understood as a marginalized population, cope with vulnerability by enacting agency. By understanding how farmworkers express and experience agency in their work, and how agential strategies emerge from intersectional experiences related to privilege and disadvantage, we can strengthen theory related to the dynamic experiences of farmworkers, and inform policy and practice.

Literature review

Farmworker agency and pesticides

At its most basic, agency refers to the capacity to act. Scholars have long debated the degree to which agency is constrained (and enabled) by structure. Nodding to Fraser's (1992) writing, Charrad (2010) notes that agency is "a conception that can accommodate both the power of social constraints and the capacity to act situated against them (Fraser 1992, p. 17)" (2). Here we conceptualize agency similarly; farmworkers are operating within intersecting forms of marginalization, but are also capable of acting, despite the social constraints which shape their life chances and life experiences.

Much of the existing literature on farmworker agency as it relates to pesticides comes from environmental health scholarship, where researchers often focus on relationships between perceived risk, perceived control, and risk behavior. The health belief model is frequently used to predict risk behavior, and self-efficacy and perceived control are two elements that give attention to agency. Self-efficacy, which, according to Bandura (2000), is the foundation of agency, "is the belief that one has the capacity to attain specific goals; it reflects the individual's confidence that she or he can exert control over oneself and one's environment" (Arcury et al. 2022, p. 434).

Perceptions of self-efficacy are often linked to perception of control, and previous research shows that perceived

control can be associated with lower perceived risk (Edelson et al. 2018). Further, farmworkers with a greater sense of control may be less likely to experience pesticide exposure (Levesque and Arif 2014), in part because they may be more likely to enact agentic strategies. Some studies have found that farmworkers perceive little control over pesticides (e.g., Quandt 1998) and that having a lower sense of control can be related to decreased use of safety practices (Elmore and Arcury 2001). Sense of control can also be linked to socio-economic factors, with those having higher incomes being more likely to express perceived control (Elmore and Arcury 2001). Similarly, research has found that farmworkers with more knowledge related to pesticides are more likely to enact agency. However, structural factors can shape the degree to which control can be realized, in part because of potential lack of power over environments (Elmore and Arcury 2001; Cabrera and Leckie 2009; Edelson et al. 2018; Remoundou et al. 2015; Arcury et al. 2022).

While considerable attention has been paid to the relationship between perceived risk, perceived control and risk behavior related to pesticides, this research often lacks consideration of power, including a lack of attention to how gender and other factors, such as hierarchies on farms, shape perception of and enactment of agency. Previous research has called for greater consideration of gender in relation to risk perception (Gustafsod 1998), and considering the role of gender as it relates to pesticides and agency is vital for several reasons, including because women farmworkers are usually responsible for the care of family. In addition, theorizing the role of gender may provide new insight with regards to why and how farmworkers enact agentic strategies related to pesticides (or don't). Further, scholars have noted that qualitative research may capture nuance as it relates to farmworker concerns with pesticides that quantitative data does not (Edelson et al. 2018).

Agency as embedded within structures and institutions

Agency needs to be understood as embedded within "institutional or structural contexts" (Charrad 2010, p. 519), and examining agency among farmworkers means considering how the agency of farmworkers is shaped by structural inequalities and the structure of agriculture, which intersect. Historical and contemporary structural forces have shaped the exploitation of farmworkers, and knowing the ways in which farmworkers operate within the structure of agriculture is valuable not only in understanding vulnerability but also in understanding agency.

Several critical social scientists have studied the experiences of farmworkers, including experiences with occupational hazards, such as pesticides. Much of this research has employed a political economy perspective to highlight how historical and contemporary structural forces lead to the exploitation of farmworkers. While this collective work importantly highlights concerns related to farmworkers and experiences with pesticides, this research can underemphasize agency. Some scholars have called out the ways in which research on farmworkers emphasizes the structural vulnerability of marginalized populations, while not leaving sufficient space for other aspects of farmworkers' lived experiences. For instance, in 2016, Holmes wrote about the concept of the "suffering slot," arguing that we should not "flatten the multi-faceted nature of lives by leaving out any of [the] realities [of farmworkers]." He emphasizes that we should leave space for the range of experiences of farmworkers, including suffering, care responses, joy, and more. Some examples of scholars highlighting the ways in which farmworkers engage in agentic acts including Horton (2016), who considers strategies that farmworkers use to survive in conditions of extreme heat, Schmid (2019), who examines entrepreneurship among farmworkers in the tomato industry, Cook (2023), who discusses how the social organization of farm work can shape farmworker agency, and Minkoff-Zern (2019), who documents the transition from farmworker to farmer. However, there is a lack of research considering how agentic acts are used strategically by farmworkers to manage the challenges of their work, and how this is shaped by gender.

For farmworkers, structural changes in agriculture and broader global political processes have shifted who works in agriculture and the conditions of that work. For instance, hired farmworkers play a growing role in the U.S. agrifood system (USDA 2022), and a large proportion of hired farmworkers identify as Hispanic or Latine. More recently, there has been an increase in the number of women working in agriculture (Meierotto and Som Castellano 2020). The lives of farmworkers are also shaped by the rise of industrialized agriculture, including changes in the use of pesticides and other technologies. While some of these shifts in the agrifood system can be interpreted as positive for farmworkers (such as mechanization), many have either diminished the need for farmworkers or made the work more dangerous (such as the increased use of pesticides). Furthermore, changing immigration policies have significantly influenced the experiences of farmworkers, such as the rise of the H2A Visa program.[2] Additionally, agriculture is often considered "exceptional" as it has historically operated outside of labor standards.

[2] The H2A Visa program is a program run by the US Department of Labor, designed to bring foreign nationals to the United States on a temporary basis to provide employees for temporary agricultural jobs (USCIS 2024).

While more women are working as farmworkers, hierarchies on farms and in agriculture can shape what types of work women do. These hierarchies are associated with differential pay as well as differential exposure and risk. For example, women may be more likely to weed, plant, or harvest rather than operate farm machinery, and are more likely to work seasonally. Men are more likely to mix and apply pesticides, and operate farm equipment. These variable tasks and gender hierarchies on farms can influence the risks farmworkers experience. Further, women employed as farmworkers are often responsible for labor in the private sphere, and aspects of farmwork, such as long hours, are often incongruent with the hours childcare is available. Work-family conflict can make it difficult for women to fulfill gendered expectations in both the public and private spheres (Som Castellano et al. 2022). In sum, the gender division of labor both on farm and off can influence how agricultural work is experienced, including how the risk of farmwork plays out.

The agrifood system relies upon the exploitation of individuals and communities, primarily from Mexico and Central America, and an intersectional lens highlights how various dimensions of marginalization and inequality, including ethnicity and race, gender, class, geography, and documentation status, shape the life chances and life experiences of Latine farmworkers (Meierotto et al. 2020). The vulnerability of farmworkers influences wellbeing broadly, and farmworkers experience a range of negative impacts from their work, including increased isolation, difficulties in upholding gendered responsibilities in the public and private spheres, and poor health outcomes (Arcury et al. 2014; Asad 2020; Curl et al. 2021; Som Castellano et al. 2022). However, despite the vulnerability and attendant adverse outcomes experienced by farmworkers, agency still exists.

Potential power of agency: structural transformation or survival

While scholarship often focuses on agency as the potential of actors to create structural transformation, others view agency as multidimensional (Ayala and Murga 2016). When considering agency among marginalized populations, it can be understood as involving "the capacity of actors to critically shape their own responsiveness to problematic situations" (Emirbayer and Mische 1998, 971). Embedded agency is a concept that feminist scholars have used to understand how agency is both context-specific and created and enacted in a "direct relationship to structures of subordination" (Korteweg 2008, p. 438). The goal of enacting agency and navigating within or around structural limitations may not be about *changing* structure but rather about survival or tackling "day-to-day problems, needs, and concerns" (Charrad 2010, p. 518). Guthman (2017), quoting Coe and Jordhus-Lier (2011), notes that for farmworkers, agency may involve "'small acts of getting by' or individual efforts to improve materially the conditions of existence" (26). In this conceptualization agency can reproduce both existing inequalities and structural constraints, but it can also be creative (Chong 2006). In this paper, we similarly employ the concept of agency to consider how farmworkers may enact agency not to change structural conditions but rather to address concerns or improve the material conditions of day-to-day lives. In doing so, individuals may uphold structures, such as gender structures or the structure of the agrifood system, while also caring for themselves and their families.

Agentic acts, gender and carework

Gender can enable and constrain agency and shape the agentic strategies enacted. The concept of carework can help frame our understanding of gender differences in agentic strategies, including as it relates to pesticide exposure. The concept of carework "refers to all the forms of labor (including unpaid work) that is critical to the maintenance of social life" (Andersen 2011, p. 13). Many scholars have discussed how carework matters for family and society maintenance, including Gilligan (1977) and Tronto (1987). In the context of Latine farmworkers, previous research documents that Latinas remain primarily responsible for reproductive labor and managing the demands of productive and reproductive work (Aranda 2003), and that the interactions between reproductive and productive labor can be both challenging (Som Castellano et al. 2022) as well as a source of "happiness, dignity, and social legitimacy" (Griffith et al. 2018, 224).

Carework can involve caring for, which includes the practical aspects or tasks related to care, and caring about, which involves the affective and emotional aspects of care (DeVault 1991). Carework is often used to understand (usually women's) unpaid labor, particularly in the enactment of domestic tasks. However, Gerstel (2000) notes that carework is both "a survival strategy and a demanding labor of love" (467). In this paper, we are interested in exploring how carework can be understood through agentic acts, including practices in the public sphere that may influence the private sphere. Here, agentic acts related to pesticide exposure can be viewed through a lens of care.

The concept of carework is deeply intertwined with a theory of gender socialization. We are taught to enact care in ways that align with our assigned gender within a given culture, and these expectations can be carried throughout the life course. Femininity and masculinity can encompass the idealized performance of gender identity for individuals,

are internalized starting from a young age, and often occur within specific institutional and cultural contexts. Further, gender performance is shaped by social interactions in everyday life (Camacho et al. 2023).

Care is both gendered and raced (Nayak 2023), and there have been increasing calls to decolonize care, which includes acknowledging how people experiencing oppression may experience care differently (Nayak 2023). Abrego and Schmalzbauer (2018) note that for Latinas motherhood often centers on sacrifice and direct care. The ways in which Latina farmworkers then engage in carework should be understood through a lens of gender, as well as race and ethnicity, rurality, local economic conditions, and more.

While carework for women may be expanded because of their gender, men's engagement with carework can be limited by masculinity (Elliott 2016; Nayak 2023). Hegemonic masculinity, which occurs at the "pinnacle of the gender order" (Elliott 2016), is a concept introduced by Connell (1987) and refers to the "normative constellation of attitudes, traits, and behaviors that become the standard against which individual men measure the success of their gender accomplishments" (Kimmel 2012, p. 235). Hegemonic masculinity can work to marginalize men "on axes such as race, ethnicity, class, and ability (marginalized masculinities)" (Elliott 2016, p. 245). While hegemonic masculinity should be understood as a concept that is more "than the actions of one individual against another" (Nayak 2023), at the individual level, hegemonic masculinity can include certain behaviors or actions, such as physical strength, self-control and emotional restraint (Calasanti 2003). It is a contested concept, but one that can provide insight into the ways in which gendered expectations shape individual action. Masculinity may make it difficult for individuals to enact carework through agentic strategies given the emphasis on activities such as economic provisioning and opposition to emotion or connection. Sometimes, men may avoid caring to uphold normative understandings of masculinity (Elliott 2016).

Hegemonic masculinity should not be understood as static or binary. Instead, it involves behaviors or actions that can be reproduced (and challenged) through social practice (Nayak 2023). Several scholars have applied the concept of caring masculinities to frame how people may augment dominant masculinities and enact care. While some view caring masculinities as the antithesis of hegemonic masculinity, others view the relationship between hegemonic masculinity and caring masculinities as more fluid. For instance, as Nayak (2023) notes, hegemonic masculinity can incorporate aspects of care (175).

Further, the enactment of masculinity occurs within local contexts, including material conditions, local political and economic realities (Nayak 2023). Aranda (2003) notes that new modes of caregiving can emerge from constraints. Applied to understanding agency among farmworkers, we might consider how, despite the potential risks of pesticides, women are socialized to ensure the safety of their children - both in terms of managing pesticide exposure for themselves (so they can keep working) and their children (to protect their physical health). This socialization to care may lead them to participate in work they view as risky but engage in protective behaviors. Conversely, men may be primarily concerned with providing economically and upholding hegemonic norms of masculinity, both of which may involve not enacting protective behaviors. In other words, gender may shape the degree to which or ways in which farmworkers enact agentic strategies related to pesticide exposure. At the same time, the possibility for change remains, and we can understand how practices related to hegemonic masculinity may be supplemented, shifted, or rearranged through acts of care.

Additionally, the relationality of care may influence farmworker agency. An ethics of care perspective has been critiqued as "Western-centric" and lacking an intersectional perspective (Robinson 2020). An intersectional perspective suggests moving beyond an individual or nuclear-family focused understanding of care to consider how care can be directed towards community and kin. This understanding of care draws our attention to familism, which refers to how obligation to family and community shapes or motivates behavior. While at times conceptualized as solely about care oriented towards family, Paredes et al. (2020) note that "the main component of familismo, whether defined by values or behaviors, is the centrality of the (extended) family where family support, obligation, and reciprocation extend beyond the nuclear family to an extended network" (pg. 75). In this conceptualization, familism can extend beyond those related through blood or law and can include those who provide support and where obligations are shared (Paredes et al. 2020). When we consider how agency and carework relate to pesticide exposure, the concept of familism draws our attention to how agency as carework may be enacted for the benefit of not just the individual or nuclear family but a broader set of individuals to whom people are connected.

The benefits of carework are wide-ranging and can include both aspects of social change and personal benefits. In the case of farmworkers and pesticides, enacting care can benefit individuals by minimizing their exposure and related risks, and it can also benefit family and friends, such as by minimizing the exposure of others who share living spaces.

Methodology and study site

Data for this study came from an interdisciplinary and mixed methods study that occurred across Southwestern Idaho

from April through July of 2022. Building from long-term ethnographic and mixed methods work with farmworkers, this iteration of research involved a group of interdisciplinary scholars examining exposure, beliefs, and experiences with pesticides among Latine farmworkers in Idaho.

Idaho has over 24,000 farms and ranches, producing more than 185 commodities (ISDA 2023). Idaho ranks first in the nation for the production of potatoes, barley, peppermint oil, trout and alfalfa hay, second for hops, and third for sugar beets, milk and cheese. Much of this agricultural production occurs in our region of study. Around 62,000 agricultural workers are employed annually in the state, and "seasonal and migrant" workers comprise approximately 80% of the workforce during the peak months (Idaho Extension 2023).

For this research, we recruited 62 individuals, 32 women and 30 men, aged 18 years and older who identified as Latino/a/x[3] and engaged in farmwork. We utilized known contacts, community partners, and snowball sampling to recruit participants for this research project. Participants were asked to complete two study visits, occurring within seven days, where a questionnaire was administered and urine samples were collected. In addition, participants were asked if they would participant in a semi-structured interview. From this group of 62, we conducted 18 semi-structured interviews with seven men and 11 women. 95% of the participants reported being born in Mexico; they ranged in age from 25 to 71, with a mean age of 45; 25% were in the U.S. on an H2A visa, and 12 reported being pesticide applicators (two women and 10 men). Of those we interviewed, two were H2A workers, and five were pesticide applicators (four men and one woman).

Survey data was gathered face-to-face via tablets using Redcap software at two separate visits with participants. The first visit involved a detailed survey, and questions on the survey aimed to capture demographics, respondent's experiences with agriculture (e.g. occupational history and crops work with), use of personal protective equipment and engagement with personal protective behaviors, and views on pesticide risk and degree of control over the potential harm of pesticides. At the second visit a much shorter survey was administered, aimed solely at capturing factors related to potential recent occupational pesticide exposure. Survey data was analyzed using Stata13 (StataCorp. 2013). For the purposes of this paper, we utilize the survey data to provide basic context through which to interpret or understand the qualitative data emerging from the semi-structured interviews. Thus, the analysis was focused on descriptive statistics.

[3] We used the terms Latino/z/x during the survey design and implementation phase, which is why we use these terms here, rather than Latine.

Semi-structured interviews were conducted in person, in the language preferred by participants (either English or Spanish), at locations most convenient for participants. The semi-structured interviews were audio recorded, transcribed, and translated as needed. For analysis of the qualitative data we used an inductive and deductive approach. We started by using a pilot phase (Giesen and Roeser 2020), in which we created a codebook outlining codes and associated meanings. From there, two team members skilled in qualitative methods each hand-coded an initial interview transcription and then compared notes. They used qualitative comparisons between coders to maintain coder consistency (O'Kane et al. 2021). From there, they each coded half of the interviews using the codebook, and then reviewed and completed a secondary coding on the other set of interviews. Engaging in "coordination through mutual adjustment" (Hall et al. 2005) allowed the data to be coded through a team process that ensured rigor and thoroughness.

Findings

Farmworker concerns with pesticides and enactment of agency

In order to contextualize the role of farmworker agency related to pesticides it is helpful to understand how concerned our research participants were with pesticides. Our research participants broadly expressed concern about pesticide exposure. When asked, "To what degree are you worried about the long-term health effects of being exposed to pesticides?" 15 said they were moderately worried, 26 were somewhat worried, and 19 were very worried. 17 out of 18 interviewees also expressed concerns with pesticides. Some expressed concern about short-term impacts. For instance, Luis stated, "There's a risk all the time, especially when you apply chemicals. When you don't handle them the right way, there's a risk. And it's pretty high sometimes. And, of course, your health or the health of everybody else around you is going to be in danger." Concerns about longer-term effects were more common, with cancer a particular concern. When asked about his views on pesticides Hector stated, "Well, they can cause cancer in some moment, and not necessarily right away, but over decades." Concern was also expressed with regard to acute pesticide positioning. Fabiola stated, "Yes, you end up wondering if it's going to happen to you. Because it did happen to us. It did happen to me. There were four or five of us who were coming out of the wheat, and you can't see us. The wheat is high. You're there working and the plane went by and I just saw the downfall, but I could feel that chemicals fell on me." In sum, the data suggest that farmworkers in this study were concerned with pesticide exposure and potential adverse

health outcomes. This finding supports previous work documenting that farmworkers often have relatively high levels of concern related to occupational pesticide exposure (Arcury et al. 2002; Cabrera and Leckie 2009). In the context of agency, this concern matters, as concern can be an important motivator for action.

Moving from concern to expressions of agency, we first look at data that gauges the degree to which farmworkers believe they have agency. To measure this, we included questions on the survey related to perceptions of control (Edelson et al. 2018). For instance, we asked participants whether they agreed with the statement: "There is not much you can do to protect yourself from pesticides." 20 respondents agreed with this statement, 37 did not agree (nearly 60%), and 5 said they did not know. 11/32 women agreed, while 9/30 men agreed. We also asked, "Do you believe you have control over avoiding possible harmful effects of pesticides?" and 30 reported that yes, they believe they have control; 31 reported no, they do not believe they have control. 15/32 women reported that they believe they have control, while 15/30 men believe that they have control. 42% of the pesticide applicators responded yes, while 58% responded no. In sum, these data suggest that while some people do not believe they have control, many farmworkers express a sense of agency about protecting themselves from pesticides. Again, this finding supports previous work, which has demonstrated that farmworkers have relatively high levels of perceived control related to pesticide safety (Arcury et al. 2002).

Other measures of perceived control reveal how farmworkers were using agentic strategies. For instance, a majority of survey participants reported washing their hands while working in the field (nearly 89%), showering after work (95%), changing clothes after work (96%), washing clothes after work (95%) and wearing protective clothing while working (98%). These can all be understood as agentic strategies to reduce potential pesticide exposure.

The qualitative data further reveals the expression of agency among interview participants. For instance, Amelia told us about a time when she enacted agency to protect her health: "the other day the large machine was there, and then I asked, "Hey, are they going to spray that area? So, I can go home." And they told me, "No, they are just washing it." And then I said, "It smells bad." And it was just water. I said, "These are plants and weeds. There's nothing here that smells." And it was because they were washing the machine and I didn't know. And I got scared and I called them. […] I called and said that I was leaving. Yes, I don't care if they fire me." Marco stated that, "Well, I've always taken precautions. In general, when I don't feel safe in a job, I make a decision. I don't need the supervisor to tell me. If I don't feel comfortable at work, or if I feel like I am in danger, I leave." Several farmworkers spoke about smelling pesticides and then leaving a field. For instance, Josefina stated that "If it smells, we do get out of there."

A few agentic strategies related to pesticides were most commonly reported: (1) using personal protective equipment (PPE), (2) attending training and observing notifications, and (3) being able to advocate for oneself. We turn now to examining these agentic strategies in more detail.

Personal protective equipment and cleaning self and clothing

One way that farmworkers protect themselves from pesticide exposure is by using PPE, and previous research has found that farmworkers who believe they have more control as it relates to pesticides are also more likely to protect themselves (Arcury et al. 2002). PPE is a broad category of items used to protect an individual from workplace hazards, including gloves, long pants, long-sleeved clothing, and respirators. In addition, cleaning clothes after work can be an effective way of reducing pesticide transfer within a household.

From the survey data 95% of respondents reported wearing gloves, 90% reported wearing long shirts, and 56% reported wearing a mask. When asked if PPE had been used in the past three days, the numbers went down slightly, with 82% reporting wearing gloves, 87% reporting wearing long-sleeve shirts, and 48% wearing masks. The most common reasons given for not wearing PPE were heat and discomfort, a finding consistent with previous research.

However, PPE may not always be accessible to farmworkers. In addition, having equipment that fits properly is very important for it to be effective. For this reason, we also asked, "Do you ever feel like you do not have access to personal protective equipment in your size?" Seven respondents reported that they do not feel like they have access to PPE in their size. There were no meaningful differences with regard to gender (4/31 women vs. 3/29 men did not feel that they had PPE in their size). This suggests that a majority of participants did not experience size as a limitation with PPE.

The interviews revealed more in-depth information about the use of PPE. Many spoke about the importance of wearing PPE to protect themselves from pesticides. For instance, Josefina stated that "we're always protecting ourselves, I think, protecting ourselves when we're doing the – when we break the hoses, and we tie them, we cover ourselves – well, I try to cover my face very well, the safety glasses in case it streams out – because it has the water that is irrigating the crop, we know that they add pesticides to it." And Fatima discussed washing her clothes, in order to protect those around her: "And I try to always take care when I get

home that the clothes I bring home are not soiled, maybe with chemicals that you don't look at, always separate the clothes outside and wash them separately from the other clothes."

Training and notification

Training is an essential dimension of agency for farmworkers, as it enables individuals to gain information that can inform decision-making around personal protection. One way farmworkers receive information about pesticides is through federally mandated training. Separate, specialized training is required for pesticide applicators.

In the survey, we asked, "Have you ever attended a pesticide safety training that talks about reentry intervals and tells you where the central location is that has all of the pesticide safety information? This might include attending agricultural training or watching a movie at the farm with the pesticide training information." 75% responded yes, they have, while 25% responded no, they have not. Again, the numbers here did not vary much by gender (23/31 women reported yes, while 22/29 men responded yes). These findings suggest that a majority of farmworkers are receiving the training that is legally required.

Through the interviews, we gathered more nuanced information about these trainings. In the interviews, some farmworkers expressed that the trainings were helpful, particularly those who applied pesticides and attended the required training for pesticide applicators. For instance, when asked if he felt that the training for pesticide applicators was effective, Luis stated, "I think it is. […] I didn't know anything about this, and I learned, so I think it's pretty important." However, others talked about how the trainings, particularly the general training for non-pesticide applicators, lacked sufficient detail or were boring. For instance, Fabiola stated, "they just explain the minimum that you can't wash your hands in the canal. You can't wet your forehead when you're hot. They explain that you have to wear long sleeves. You have to wear a hat – you can't eat the fruit." Some participants stated that in-person training would be much more effective, rather than just watching a video. When asked if he had ideas for how the trainings could be made better, Luis stated that "I believe that if you go and talk personally to make it interactive – how do you say? Yes, interactive to the rest of the guys, then they pay more attention than if they're just watching a video. Because if you're there even if you play the video, you can tell them, "You better watch this because I am going to ask questions as soon as this is done." And that gets them more interested and gets people more involved in the process."

Accessing information

Informing oneself can also be an agentic strategy. As noted above, farmworkers with more knowledge related to pesticides may be more likely to enact agency (Arcury et al. 2002; Remoundou et al. 2015; Edelson et al. 2018). In the survey, we asked, "Please indicate if you agree with the following statements … I can access information about the laws that protect agricultural workers from pesticides." Forty-eight respondents agreed with this statement, while 11 did not agree. 25/32 women agreed, while 23/30 men agreed. This suggests that a majority of our sample felt confident they could access information. Interview participants also spoke to the importance of gaining access to information. As Marco told us, "I don't like trusting someone if I don't know them, so I first – since my health is first, I take my – how do I say it? I inform myself first, to know before starting the work what we're going to do, where everything is, and if in the case that a contamination occurs to know where to get the information and know where it is. But the majority of the people don't know, just the supervisor." Marco draws our attention to farmworkers enacting agency in order to become knowledgeable about pesticides.

Being listened to

We asked farmworkers about the degree to which they believed they would be listened to, which can be another indicator of perceived agency. For instance, we asked: "Please indicate if you agree with the following statements … I believe I would be listened to by my employer or supervisor if I had a concern about pesticides." Forty-nine agreed, while 11 did not agree. 24/32 women agreed, while 25/30 men agreed. We also asked, "Please indicate if you agree with the following statements … I believe I would be listened to by the Idaho State Department of Agriculture if I had a concern about pesticides." Forty-three respondents agreed, while 10 did not agree. 22/32 women agreed, while 21/30 men agreed. Similar to the survey data, the interviews also provided mixed results with regards to expressions of agency. For instance, some farmworkers indicated that they do feel that they would be listened to by those in positions of power. When asked if they would feel comfortable expressing a concern related to pesticides, Fabiola stated, "No, because they're not going to – they're just going to say, "Get out of there, and go somewhere else." She further noted that in the past, when officials had been made aware of instances of pesticide exposure, nothing had been done. Others expressed more comfort. For instance, when Luis was asked if he would feel comfortable and able to report an instance of pesticide exposure, he said, "Absolutely."

In sum, we found that farmworkers are concerned with occupational pesticides, and that many believe that they have agency, including related to avoiding or minimizing pesticide exposure. At times, agential strategies are used purposefully to limit the harmful effects of their jobs. While not focused on changing structure, these agential strategies still have meaning and shape farmworkers' experiences, including by potentially limiting the harmful effects of pesticides for themselves, and in turn their families. However, some did express limited agency, suggesting that the structure of the agrifood system and hierarchies limit the degree to which agency is felt or expressed.

Farmworker agency, social structure, and gender socialization

Scholars have noted that agency can be meaningful, while still being constrained by structural inequality (Ayala and Murga 2016). While the data above demonstrates expression of agency, unsurprisingly we also found that agency is constrained or enabled by numerous factors.

Agency limited by legal violence: industrial practices, lax regulations and limited enforcement

Many interview participants discussed experiencing pesticide exposure via drift from airplane applications on adjacent farms. When asked if they had ever been working and observed spraying on a nearby field, Fatima said, "Yes." When asked if this had been a cause for concern, she stated, "No, just the smell that is so strong. It's a strong smell, and you say, "They're spraying, we shouldn't be out here."

When asked a similar question, Carina told us, "Sometimes we get informed. My boss always tells me which fields are going to get sprayed or something. We don't – we're not around then. And then, another farmer is spraying – I have two farmers that are really good about it. They stop and tell us, "You know, we're gonna spray this," and we have time to get out, which we do. And sometimes, they can be a mile away spraying and they won't let you know and you can smell all that and if we do, we get out of there and go somewhere else." Thus, while farmworkers may be able to express agency at times, agrifood practices and lack of regulations, such as adjacent farms not being required to notify farmworkers operating in nearby fields of impending pesticide application, can limit the power of agentic acts.

Agency limited by quality of training

People also expressed concern about training for pesticide applicators. When asked, "Have you ever attended a pesticide applicator safety training?" 4 out of 12 pesticide applicators reported no. While the numbers were small, women were more likely not to receive this training, relative to men (of the two women who reported being a pesticide applicator, one reported not receiving the training, while three men reported not having received the training). H2A workers were also more likely not to receive pesticide applicator training. Three H2A workers who engaged in pesticide application answered this question, and two reported not having received this training. These numbers are too low to making meaningful conclusions, and further research on the dynamic relationship between pesticide applicator training and structural inequalities is warranted.

Agency limited by lack of information

Some farmworkers expressed dissatisfaction with the amount of information they were given and the ways in which they were informed about pesticide application. For instance, when Hector, an H2A worker, was asked, "If you wanted to know what the rules are and what the breaks and the structure is, is there someone you can ask this information to directly?" he responded by saying, "Here in the company, no."

Similarly, Maria told us "Well, I think that they should give more guidance. Like [pesticide] side effects. In the video, it explains that you have to use pants, gloves, and everything else. But I think that they should have more signs about spraying pesticides, specifically what day if it's been more than 72 hours. For us to be cautious because of the residue. Wash your hands thoroughly. To protect ourselves."

Here, we see that Maria is interested in enacting agentic strategies but feels limited based on the information provided. This suggests that the agrifood industry and regulatory environment can work against farmworkers' desire to enact agency.

Length of time on the job or at a farm

Many farmworkers are employed by contractors rather than farmers. In our research those employed directly by a farmer and who had worked for that farmer for a longer time appeared to be more likely to express agency. Carina exemplifies this dynamic, stating, "Yeah, I have my choices so – […] I work for [name redacted] farms, and I've been there for 42 years. So – they know me and I know them and I feel confident saying no and I argue a lot with them. Yeah, I get my way sometimes."

Luis, who had also worked for the same farmer for many years, was asked if he felt comfortable reporting to his boss (the farm owner) if something was not safe. He said, "Well, first of all, I am straightforward, and I tell the guys straight, "Hey, you're not doing it right. This is not safe for you or for

the crew around here." And, of course, I have my supervisors. In this case, the owners and I have to tell them, "Hey, I noticed this. And I am just letting you know so you have the records because if that thing happens again, then we have to do something." [interviewer: So, you feel comfortable talking to the owner?] Luis: Yes, absolutely."

On the other hand, several farmworkers expressed concern about losing their job if they reported concerns and discussed how this limited their agency. Teresa noted, "Well, it's not like I decided to do it. How can I say this? I mean, I have to do whatever they ask me to do. It's not like I get to decide."

Agency limited by marginalization and legal violence

Similar to other scholars (e.g. Heine et al. 2017), we found that legal status, immigration policy, and language were factors that can limit farmworker agency. Natalia stated, "Since I don't speak English. I understand very little. I don't have a driver's license; I don't have a Social Security Number. If I had all these things, then maybe I would look for a better job. Something that wouldn't be out in the sun at the farm." Raul stated that "Yes, I don't know how to do anything else. […] If I knew how to do something else, if I knew English, and I had studied, I wouldn't be here." And Eugenio noted that, "here, the mother tongue is English, but they also give you the benefit of having Spanish class so you can learn and be bilingual, but not in Guatemala. There in Guatemala, they tell you English is good, but they don't give you that course. So, it's difficult for us because, really, we don't know a lot of English."

A number of interview participants spoke about how language and immigration status, as well as lack of credentials, prevented them from engaging in work they did in their home countries once they were in the U.S. For instance, we heard the following from Eugenio:

> When I was in my country, in Guatemala, I had never worked in the fields. I studied. I got my degree in business administration. I worked in a bank for three years. After that, because of the need in our country, since it's an underdeveloped country, I decided to come here. So, I had to come, but really, it's hard to have opportunities here. So, the majority of those of us who have come to this country have had to do jobs that we've never done before. So, we have to. We don't have another choice.

In addition to language and lack of credentials, documentation status also influences agency.

Clara, who was a hairdresser in Mexico, said "If you don't have [a] Social Security [card], you can't get your license, and for the government, you have to – to be able to do any kind of work, you have to have a license. If not, you'll get in trouble."

Hector exemplified how the H2A program can limit agency. He relayed a story of being forced to act as a pesticide applicator, having taken no required training.

> I was with a coworker who that was his role, so since I was with him, I didn't even know that I was going to do that, but they just told us, "You have to fumigate these fields." They didn't tell me beforehand, but I didn't know.

He noted he got sprayed by pesticides doing this work:

> Last year, I started with watering. I was an irrigator. So, putting the pipes with the water manually and then, from there, I applied pesticides. I would fill the backpack with pesticides and I would spray around the fields. And also, with the truck as well, but that's where we would spray our whole bodies. So […] when we would apply it, it would spray us.

He told another story of exposure:

> I remember we were harvesting, and a little plane passed by very close fumigating another field next to us. So, I don't know if it's something that won't hurt us or if they don't care. I don't know. And they say that when they put chemicals on a field, they put a sign up or something like that. When they put that sign up, they don't have us go in there, but the sprayers, the tractors pass close by and that doesn't – that's what happens, they don't let us know that much. They don't care that much about letting us know.

Generally, being a pesticide applicator places you higher up in the hierarchy on farms – this work is often (although not always) considered more skilled and higher paid, and requires additional training. However, in this instance, the marginalization of this farmworker via the H2A program, which predominantly provides work opportunities to men and can be considered a form of unfree labor (Meierotto et al. 2025), put him at significant risk for pesticide exposure.

Our data also suggest that gender hierarchies on farms shape farmworker agency. In particular, women are less likely to work in positions of power and are more likely to work in contingent positions (lower paid, viewed as less skilled). For instance, when asked if he was aware of women acting as pesticide applicators, Luis said, "No, well, I've

never seen a woman apply pesticides. It's normally done by men." Luis continued, "we work in different crews. For example, the ladies normally do cleanups. They work on the fields and cleanups. They don't really work on the farm. […] we've been running all year on the farm, and the girls are just seasonal." Amelia noted that some people expressed discontent when women took on jobs with more power on farms, stating, "Sometimes women have to do jobs that are more intense to make more money. And you see that there have been many issues with that, like, "No, you're making more money."

This gender division of labor on farms can have implications related to pesticide exposure. In our research, we have found that, at times, women have higher levels of pesticides in their systems, or equal levels, despite working fewer hours and being less likely to be tasked with mixing or applying pesticides (Hyland et al. 2024b). One possible explanation for this is that while they are less likely to work directly with pesticides they may be more likely to work in direct contact with crops, which may increase their likelihood of exposure. It is also possible that because of these hierarchies, women are more likely to experience acute pesticide poisoning. In the survey, we asked participants, "In your life, have you ever suffered an acute pesticide poisoning?" 20% of the people who responded to this question reported yes, and women were more likely to have reported yes (25.9%) than men (13.8%).

In the interviews we heard many stories of acute pesticide exposure. For instance, Amelia relayed the following: "We were cleaning the potatoes, and they would ask us to get out. And the planes would fly over and spray the fields. And then we were allowed back in, but the pesticide was there." The accounts of acute pesticide exposure were often connected to doing fieldwork and nearby farms being sprayed. For instance, Fabiola noted that "That's the only bad thing is that they don't communicate. I think that they should communicate among themselves because sometimes you're in the field, but the neighbor is spraying. They aren't spraying in your work site, but someone else is spraying and it makes it to you."

In sum, our data suggest that intersections of gender, immigration status, language, and more can shape experiences on farms, including experiences with pesticides. This aligns with previous research highlighting how (1) structural factors such as race, gender and immigration status can shape perceived control and agency, (2) that lack of control can make it hard to engage in protective behaviors and (3) that self-efficacy can shape farmworkers feelings of safety (Edelson et al. 2018). These on farm experiences, combined with structural factors, can in turn shape expressions of agency, which we turn to next.

Agentic strategies and gender socialization

Agency, particularly for those experiencing marginalization, may not involve resistance or structural transformation but rather small acts that attempt to tackle day to day problems, or improve the material conditions of life. In addition, previous research has found that those who experience systematic discrimination may be more likely to be concerned with pesticide exposure (Edelson et al. 2018), and that male farmworkers are more likely to engage in risky behavior, relative to female farmworkers (Cabrera and Leckie 2009). Here, we argue that gendered expectations, including those related to childcare, may shape not only perceptions of risk and control, but the use of agentic strategies. In this research we do see evidence that farmworkers enact agency, and that the strategies that are used (or not) can be understood through a lens of gender. The concepts of carework and hegemonic masculinity are helpful in interpreting data related to gender and agency among farmworkers.

In the survey, we asked whether respondents believed that women are more likely to be harmed by pesticides than men; 32% reported yes, while nearly 60% reported no. There did not appear to be large gender differences, with 11/32 of women and 9/30 men reporting yes. While a majority of farmworkers did not see women as more vulnerable to pesticides, there were important differences with regard to PPE usage, both in the survey and vividly in the interviews. In the survey, the most significant difference was with regard to mask usage. 27/32 women reported wearing a mask, while 8/30 men did. Further, when asked why PPE was not used, more than 33% of men said that it is not important; no women reported that it was not important.

One explanation for this lack of PPE use among men is hegemonic masculinity, which shapes the practices that men engage in, and works to uphold idealized understandings of gender. In her work with farmworkers, Horton (2016) discusses the division of labor in the fields, finding that "hard work is equated with masculinity" and that "these gendered constructions of male worth place men at a higher risk of heatstroke" (p. 28). In our interviews many interview participants noted how hegemonic masculinity influenced men's use of agentic strategies, including PPE usage and seeking help. For instance, Carina said "I have a crew of women, and it's more comfortable working with women than mixed because some guys are just terrible." She continued by stating that, "with men, especially Mexican ones, they're machos. They don't like to be told by a woman what to do." She went on to discuss how her husband experienced impacts from pesticide exposure, but failed to seek medical care. She was well informed about the risks of pesticides because she had attended the mandatory pesticide applicator training, but was still not able to convince her husband to

get help. She told us that "I get after him. I go, "Use all your equipment." I go, "Don't do it barehand like that."

Other farmworkers reported that men were more impulsive: "But one thing I know for sure is that the girls are more careful than the men, especially when there's danger involved. […] Because the men are more impetuous. […] They take more risks. They really don't think. They don't take a second or a minute to think whether they are doing the right thing or not."

Respondents also reported that men were less likely to seek help when they were exposed to pesticides. For instance, Antonia told us the following:

> My husband he sometimes applies chemicals carrying something on his back […] He would sometimes help prepare the chemicals to put on the tractor; my husband has spots on his arms that make him very itchy and on his back, on many parts of his body. […] they are like burns. […] But he scratches himself because he is very itchy because it burns and it is getting bigger, and it is inflamed, it is growing, it is spreading on his body. […] He doesn't want to go to the doctor, he says he's going to die anyway, I tell him, "I know, but if you can prevent it, you have to do it". He doesn't want to have treatment.

While the concept of hegemonic masculinity helps shape our understanding of why men may not employ agency related to pesticides, a carework perspective can inform our understanding of what may motivate women to enact agentic strategies. Several respondents spoke to the carework that women are expected to perform, and how this informs their agentic strategies as farmworkers. When Teresa was asked if she believes women are more vulnerable to pesticides, she replied,

> I think so. Maybe we're just as vulnerable. But then you go home to prepare your food. And you also clean the house. And maybe sometimes you forget, and you're not careful enough. And that means you're also contaminating your house. And if you see men, they just come home and eat. Or they come home and their wife tells them, "Change your clothes." And I feel that you come home and you're more in a rush to cook dinner, clean the house, or see the children.

Luis similarly noted that women play a protective role, stating, "Well, the nature of women is to be more protective […] I have a wife and a mother. They're more protective than men."

Fatima told us that men don't use PPE as much as women because of gender responsibilities:

> You're a little bit more afraid, more cautious […] as a woman you are more afraid of getting sick because you are the one who always says, "I take care of my children." […] I don't even have time to get sick right now. It's just saying, "I don't have time because I need to do things." So many people depend on me.

And Josefina stated "Well, I think that because we have the responsibility of preparing food at home, we have to be more cautious. We go home and wash our hands, cool down a little bit, take a shower, in order to continue making food. But the men get home and sit down." She continued by noting that the training videos taught her about how pesticides can be transferred into the home, and this motivated her to shower when she returns home from work, prior to engaging in household labor. "They made a video, and we have to be cautious in case we have pesticides on us so it doesn't affect the children."

Additionally, several respondents spoke about women utilizing PPE to protect their skin from the sun. While not directly in reaction to achieving protection from pesticide exposure, this is still a gendered way in which women use agentic strategies for personal protection. Clara said, "Last year [I was asked] if we used masks. I told her that I don't because I feel like I can't breathe, but the majority of women use them to cover themselves from the sun."

Finally, women also engaged in agentic strategies to address structural constraints they experienced, such as lack of transportation or medical care. When asked why she hadn't sought medical help for a previous injury, Maria told us, "Only the emergency room at the hospital is open late. I didn't know how to drive then, and I would've needed a ride; my children were younger, and I live alone. I don't have any family here. It's hard to find someone to leave the children with. Now they are older." Because women may face multiple forms of marginalization that limit their ability to seek help or care for themselves or those they are responsible for they may be more likely to protect themselves from risks of farm labor.

Taken together, this data suggests that agential strategies are shaped not only by the structure of the agrifood system, but also by social structure, and culture, including gender and family obligations. These findings suggest that gender socialization shapes how agency is enacted (or not) in protecting oneself, and by extension, one's family, from pesticides. A carework perspective helps explain why women are more likely to protect themselves by enacting agentic strategies. In many instances, being responsible for caring for children and for food provisioning shaped the actions of the women farmworkers we spoke to. On the other hand, hegemonic masculinity appears to limit the degree to which men enact agency in self-protection from pesticide

exposure. Several people we interviewed said that men were less likely to wear PPE, in part as a way to demonstrate masculinity. The gendered responsibility for providing economically also appears to motivate some men not to wear PPE because they see it as limiting their ability to engage in already difficult labor (such as by slowing them down or making the work more difficult, particularly when it is hot). Importantly, as we interpret these data we should understand gendered practices not as binary and static but as fluid and open to change. For instance, practices related to hegemonic masculinity may be supplemented through acts of care.

Further, when agentic strategies are enacted, structural inequalities may be reinforced. For instance, in the data presented here, we see how gender and the structure of the agrifood system are upheld despite or even because of the ways in which farmworkers enact agency. However, this does not mean that the agential strategies engaged by farmworkers do not have power. The enactment of agency by farmworkers may be powerful on multiple levels, including at the individual level, the household level, and at the community level. Enacting agency to protect oneself from pesticides, for instance, may reduce the harmful effects of exposure for one's health and the health of one's household. Being empowered to leave a field when one doesn't feel safe may help a fellow fieldworker to step away from a dangerous situation. These acts can have meaningful impacts on individual health and shift how individuals think about their work.

Agency and familism: the importance of community

Agency among Latine farmworkers should be further considered through the lens of familism, where the care of others may extend beyond self or blood relations (Paredes et al. 2020). Previous research has found that farmworkers are more likely to report concern for others related to pesticide exposure, than to report concern for themselves (Edelson et al. 2018), and the results from our survey similarly suggest that people are more concerned about the effects of pesticides for their kin or others in their community than themselves. While 61% of respondents stated that they believe that their health is harmed by pesticides, 82% reported that the health of other farmworkers is harmed by pesticides. In the interviews, we also heard expressions of agency through familism. For instance, Marco noted, "What I like about field work is that you're always outside. I like working outside. And besides that, it's the work my parents and grandparents taught me. I've always worked in farms since I was very young. So, for me, it's very comfortable to work with my hands in something that will help many people. And I feel grateful to work in the fields. I like farm work." Marco also noted that, "Yes, always together. The whole time – what happens to one, affects all of us. Whether it's – well, things could be bad at home and we try to help them out, or they lost a family member or something. We try to collect a donation or something. We're very united because […] we all work in the same thing. We know what it means to work under the sun, more than 100 degrees all the time. And, yes, we're like a family. We get together sometimes on the weekends to celebrate the birthday of a family member or friend." Eugenio similarly talked about unity among workers, stating that "I like that when we go in groups – for example, if someone stays behind on the row, the others come and we'll meet up to finish the row together. So, I like that there's not people who say, "Oh, no, no, if they stayed behind, they get left, and we're going to continue." No, instead, we all go at the same rate."

These quotes suggest that agency is not just an individual act but that farmworkers enact agency in order to engage in solidarity and show care for each other and their community more broadly.

Conclusion

The purpose of this paper is to examine the agential strategies that farmworkers use to protect themselves from pesticides in their agricultural work and to explore how structural forces, particularly gender, shape how agency is expressed and enacted by farmworkers. We consider this through a lens of gender, utilizing concepts of carework, hegemonic masculinity and familism. By doing so, we are able to not only center the voices of farmworkers, we are able to gain a more nuanced understanding of whether and how farmworkers consider agency in relation to pesticide exposure, including how gender socialization shapes experiences with pesticides and the deployment of agentic strategies.

Utilizing data gathered through a mixed methods approach with farmworkers in southwestern Idaho, we found that farmworkers often believe that they have agency in their labor, and that a range of agentic strategies are purposefully used by farmworkers to limit the harmful effects of occupational pesticides for themselves, and their families. These agentic strategies included the use of PPE, removing themselves from situations that are dangerous, seeking information, and speaking up when they had concerns. While not focused on changing structure, these agential strategies still have meaning and shape farmworkers' experiences. We also found that structure constrains agency. For instance, being employed directly by a farm, rather than by a contractor, being able to communicate in English, and having documentation status all appear to increase expressions of agency. Further, gender socialization shapes the degree to which and ways in which agentic strategies employed.

For instance, women appear to engage in agentic strategies related to pesticide exposure in part because of responsibility for childcare, while the enactment of agentic strategies related to pesticides appears to be limited by hegemonic masculinity. Finally, familism shapes how care is enacted through agency by influencing how people orient their concern and activities towards others, rather than themselves.

It is essential for scholars to understand how agency is enacted by groups that are highly marginalized, such as farmworkers. Viewing farmworkers' experiences through lenses of vulnerability and violence highlights how power operates within the agrifood system, immigration policy, and the broader political economy. However, it may limit our theoretical understanding of choice and decision making among farmworkers. Further, it does not acknowledge the ways in which farmworkers enact practices to protect themselves and their families, and in turn can limit our ability to inform strategies for improving farmworker well-being. For instance, our findings affirm the importance of pesticide information and training for farmworkers. It is not only crucial that trainings occur regularly, but our findings suggest that the quality and format of these trainings matter. In addition to enhancing existing training by having them in-person and providing more detailed information about pesticide application, farmworkers who are not pesticide applicators should be offered the opportunity to attend enhanced training, similar to the training offered to pesticide applicators. The data presented here also confirms the importance of signage and that notification about pesticide applications occurring on nearby farms must be required. These findings also suggest that gender importantly shapes agency related to pesticides, and a care perspective may be a helpful way to understand the use of agentic strategies related to pesticide exposure for farmworkers. Understanding the use of PPE as an act of care for self and others can be a powerful way of framing these critical practices. It not only provides theoretical framing for why some farmworkers may choose to use certain practices, but not others, but can also inform policy and practice.

However, we must be careful– while increasing the use of agentic strategies related to pesticide exposure at the individual or community level may help to improve the wellbeing of farmworkers and their families, the agrifood system must continue to be simultaneously held responsible for the damaging effects of industrialized practices on individuals and communities, both human and non-human. In this paper we do not aim to romanticize resilience or agency, nor do we argue that suffering doesn't exist. We do aim to honor farmworkers' agency, in order to recognize their perspectives and ability to act as agents in their own lives. Previous critiques of work highlighting the agency of farmworkers include overemphasizing the potential power of farmworker agency (Guthman 2017). It is not our aim to do so but instead to highlight how farmworkers may enact agency to respond to structural dynamics and suffering, including as it relates to pesticides.

In sum, when we recognize the ways in which farmworkers enact agency, we can understand more clearly how individuals operate within systems of inequality. This not only recognizes the humanity and power of those who experience marginalization but also informs policy and practice. This study is limited. Two primary limiting factors are the geographic scope and convenience sampling approach. While these factors limit the generalizability of the research to the farmworker community in the United State more broadly, the data collected and methodology do enable us to contribute to theory, and provide suggestions for policy and practice.

Future research should further explore how structural factors shape experiences with pesticide exposure, including the H2A Visa program; how state level policy shapes the enactment of agency and how this may intersect with gender; and how a carework perspective can be applied to the enactment of agency by farmworkers, and others working in agri-environmental spaces. By doing so we can better understand the multiple aspects of labor individuals and communities engage in for the betterment of self and community, ecology and society.

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Rebecca L. Som Castellano is Professor of Sociology and Director of Human-Environment Systems in the School of the Environment at Boise State University. Dr. Som Castellano received her PhD in Rural Sociology from the Ohio State University, and has been at Boise State University since 2013. She engages in interdisciplinary and mixed methods research, and prioritizes community engagement in her scholarship. Her current work focuses on (1) experiences with and perceptions related to pesticide use and exposure among Latina farmworkers in Southern Idaho, (2) understanding challenges to sustainability for farmers from refugee backgrounds in the Boise community, and (3) land use change, including concern with the development of agricultural land and sagebrush steppe in Idaho.

Lisa Meierotto is an Associate Professor in the School of Public Service at Boise State University. Dr. Meierotto received her PhD in Anthropology from the University of Washington, with an emphasis in environmental anthropology. She utilizes mixed methods in research and engages with interdisciplinary scholarship. Dr. Meierotto's research explores intersections between global migration, human rights, and environmental justice, with a particular focus on documenting the ecological knowledge of immigrant and Latinx agricultural workers.

Carly Hyland is an Assistant Professor of Cooperative Extension with UC Agriculture and Natural Resources and the UC Berkeley School of Public Health, Division of Environmental Health Sciences. She conducts community-engaged research aimed at characterizing and mitigating the impacts of climate change among agricultural workers, with a focus on wildfires, extreme heat, and pesticides. Dr. Hyland conducted her graduate training at UC Berkeley and postdoctoral training at Boise State University.

Cynthia Curl is an Associate Professor of Public and Population Health in the College of Health Sciences at Bosie State University. Dr. Curl received her PhD in Environmental and Occupational Health Sciences from the University of Washington, where she worked with the Pacific Northwest Agricultural Safety and Health Center. She is the Director of Boise State University's Agricultural Health Lab, and her research focuses on understanding how agricultural production affects the health of workers, people living in farming communities and the general public, with a particular emphasis on understanding the effects of exposures to agricultural pesticides.