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The Impact of the California Drought on Food Security among Rural Families of Mexican Origin

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Introduction

Since 1995, the United States (US) has been monitoring food security trends through an annual supplement to the Current Population Surveys. Food security for a household, as defined by the Economic Research Service (ERS), is the "access by all people at all times to enough food for an active and healthy life". Alternatively, food insecurity means "limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways". Through the 18-item Food Security Survey module, food security can be measured and categorized into four groups. These four groups include food secure, marginal food secure, low food secure, and very low food secure. This instrument captures levels of food security at household, adult, and child levels.

In 2014, 86% of the US population was food secure, leaving 14% as food insecure (which includes both low food secure and very low food secure).[1] Prevalence of low and very low food security differs across ethnic/racial groups within the US. Specifically, Latino and black household heads report disproportionally high levels of food insecurity. In 2014, 22.4% of Latino and 26.1% of non-Latino black (NLB) households were food insecure, compared to 10.5% of non-Latino white-headed households. During the 2007-8 recession and its aftermath, Latino, compared to NLB, households reported higher overall food insecurity for several years.

Although national data consistently document the differences among ethnic/racial groups, policy makers also need to see how food security differs according to occupation, education, and immigrant status within the sub-groups at greatest risk. For example, the national reports aggregate all Latino households but do not present specific food security prevalence for agricultural (farmworkers) households in the US. Yet, previous regional studies among Latino farmworkers report levels of food insecurity from 47% to 70%, well above the national average for Latino households.[2-4] Other than undocumented status, studies among Latino farmworkers have not identified specific household demographic characteristics that explain variability in food security in North Carolina.[2,4] However, seasonal employment is a common factor driving cycles of food insecurity in farmworker populations.[4,5] Other studies in low-income Latino population also found that higher levels of acculturation and parental education are related to greater food security.[6]

To be able to direct resources to the most vulnerable groups, policy makers must be able to identify the households at greatest risk of food insecurity. They also need information on how these households respond

to external shocks to the system, such as natural disasters or major shifts in employment due to local plant closures, as well as seasonal employment. However, there is limited research on how marginalized groups like farmworkers respond to environmental challenges. A study in North Carolina found a high level of concern about hurricanes, especially among migrant farmworkers, but few were prepared for an emergency.[7] The biggest challenges were their lack of ability to navigate community resources due to linguistic barriers and dealing with loss of agricultural jobs in the aftermath. Thus, natural disasters and other environmental changes may surface many challenges for this population, and it is important to investigate how they respond.

This information is urgently needed because several studies have documented adverse effects of food insecurity on child development. [8-10] Food insecurity can create a high stress environment for children, and consequently puts children at risk of developing health problems as adults.[10] Food insecurity has been associated with negative academic performance, psychosocial outcomes, and overall social skill development.[8]

With disproportional rates of food insecurity in Latinos, it is essential to research those communities who are most vulnerable to economic shocks. Considering that 2015 marks the fourth year of the California drought, many rural communities have been left with limited water usage. Farmers have had to prioritize on acreage and planting, making decisions that trickle down and impact the farmworker. To date, there are few studies that examine the effects of climatic conditions on food security of farmworkers. Thus, the purpose of this study was to explore the impact of California's drought on farm-working families with young children. Quantitative methods are used to identify the characteristics of households at greatest risk of food insecurity. Qualitative methods are used to explore coping strategies and family decision-making in the context of broader community changes due to the drought among rural families of Mexican-origin with children.

Methods

California's Central Valley is prime agricultural land, contributing to the State's top ranking position in agriculture production.[11] In 2012, California set a state record, bringing in $46 billion dollars. The Central Valley is also one of the regions most profoundly affected by the recent drought. This

region is one of the fastest growing areas of the state and is home to many farm-working families.

With a population of 8,106, the site for this study is one of many rural towns located within Fresno County (Fig 1).[12] Its small town culture mirrors many communities located along the Central Valley. About 91 percent of the residents are of Mexican descent. The community's remote location isolates the town from larger cities, the largest of which is Fresno -- about 43 miles away. As the site sits in the middle of acres used for agricultural production, many of its community members work these fields. Thus, employment is largely seasonal, dependent on planting and harvesting of crops.

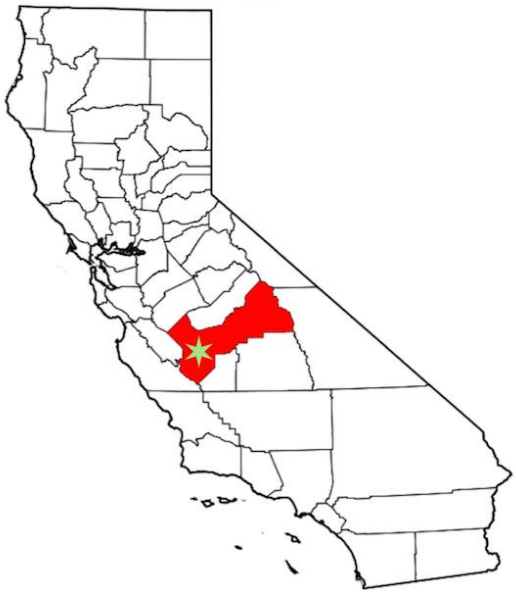

Figure 1: Map of California. Fresno County is highlighted in red

The *Niños Sanos, Familia Sana* (NSFS) was a five-year childhood obesity prevention study. The main goals of this intervention study were to increase fruit and vegetable consumption and prevent excessive weight gain in Mexican-origin children, ages 2-8 years. Two communities, a control and an intervention community, have been followed since 2011. Through a community-based participatory approach, the intervention families received culturally-adapted nutrition education for parents and children, an enhanced physical education program in the schools, and a monthly voucher worth $25 to purchase fruit and vegetables at a local store.[13,14] The control community received monthly educational workshops on non-nutrition topics, such as school success, mental health, and other issues of interest to immigrants. Families were recruited based on the

inclusion criteria eligibility: having at least one child between 2-5 years in 2012; at least one parent of Latino ethnicity; and residence in the designated school districts within Fresno County. The protocol for the study was approved by the UC Davis Institutional Review Board. All participants signed informed consent forms in their preferred language (Spanish or English).

Household Surveys

Promotores (local lay workers) helped recruit families for the larger study in the intervention and comparison communities. Local Spanish-speaking staff and UC Davis students conducted interviews in a local office or in the homes of participants at baseline in 2012. The household interview included the USDA 18-item food security measurement tool[1] as well as questions assessing household socioeconomic characteristics, child feeding practices[14], acculturation[15], and household purchases.[13] From these interviews, this paper will only present the quantitative data on food security, acculturation, and selected household characteristics.

SAS Version 9.3 (2002-2010 SAS Institute Inc., Cary, NC, USA) was used for the quantitative analyses. Based on guidelines[1] for using the 18-item USDA Food Security Supplement, household food security was calculated as a continuous variable (range: 0-18) and a categorical variable (food secure, 0-2 affirmative items; low food secure, 3-7 affirmative items; or very low food secure, 8 or more affirmative items). Bivariate analyses, using chi-square or Kruskal Wallis tests, examined the relationships between demographic/household characteristics and food security as either a categorical or continuous variable. Since several variables, such as mother's and father's education, were strongly correlated (r=0.50 or more), stepwise multiple regression was used to select a subset of the variables most strongly related to food security ($p < 0.15$) to use in the final model. Analysis of covariance was used in the final model to examine interactions between household occupation and other characteristics of the family. Significance level was set at $p=0.05$.

Focus Group Discussions

To investigate the impact of the drought on NSFS families, the researchers conducted focus groups in the intervention community. With an interest in comparing agriculture-employed families and non-agricultural families, the initial intent was to recruit a random sample from

the larger NSFS sample based on employment status. This recruitment strategy was not feasible because the *promotores* thought it would be very challenging to find a mutually convenient time to convene groups of the desired size. In addition, the NSFS sample was largely employed in the agricultural sector. Therefore, using a convenience sampling method, *promotores* successfully recruited NSFS participants using a $10 gift card and free lunch as incentives. Two-weeks prior to each focus group, *promotores* phoned participants to schedule the sessions. Follow-up phone-calls were made the day before and day of the session as reminders. These efforts were made to assure participation. The four groups were separated between two female and two male sessions.

The purpose of the focus groups was to determine whether there had been any family or community changes in Firebaugh. The authors prepared the questions following the methodology of Richard Krueger.[16] These included introductory, transition, tunnel, and concluding questions. While crafting the questions, the authors planned to explore the following: family decision-making and dynamics; impact on employment; adaptability; implications for children; and the use of community resources. Figure 2 displays the set of questions that were used to as a guide to navigate the focus groups.

A bilingual graduate student (LR), whose family had worked in agriculture in the Central Valley, facilitated the focus groups with the help of a co-facilitator. A bilingual female co-moderated the women's groups and a bilingual local staff member (male) co-moderated the men's groups. The sessions lasted about 1 ½ hours each. Each focus group was audio recorded and later transcribed verbatim by the moderator. The two co-moderators read the transcriptions to ensure accuracy and that the language nuances were understood.

Two researchers reviewed and coded the transcriptions using NVivo Version 10.2.1. The researchers analyzed the coded data for emerging themes using a grounded theory approach. Specific themes were selected in agreement by the two researchers.

Figure 2: Focus group questions

1. Hello, to get to know a little more about each of you, please introduce yourselves, tell us where you work, how many people live in your house, and how many years you have lived in this community?

2. On television and radio, there has been a lot of news about the drought during the past year. What changes have you noticed here in this community (probe for: employment, prices, families leaving the town) Can you give me a specific example?

3. When there is not enough money, many people say that one cannot buy the necessities. Has this happened to someone you know or to you? How has your shopping changed? What have you stopped buying?

(Alternative question: What tradeoffs do people have to make on a limited budget? For example, please describe any types of goods or activities that one has to forgo (probe for: foods, sports/activities for kids, clothing, household items/repairs, or entertainment).

4. Though all of you have different jobs, most of you work in agriculture. Can you give me an example of how jobs in agriculture have been affected?

5. A person in the community commented that due to stress caused by lack of money, he cannot eat a healthy diet. Does this apply to you? Can you give me an example of how your diet has changes? What types of foods are you buying less, buying more?

6. In these difficult times, can you give me an example of the worries that keep you awake at night?

7. What resources have you accessed? (Probe for food give-aways, food stamps/CalFresh, WIC) If you didn't access these resources, what were some of the reasons? What were the barriers that kept you from accessing these resources?

8. If the drought does not get better, what will this mean for your

family? (probe for; especially the children, problems at home or changes).

9. In summary, during these times of economic stress, what do you think the leaders of this community should know and do? If you could talk with them, what would you ask them? What resources would you like to see in the community to help with the drought?

Results

This section describes the quantitative findings from the household survey in Part I and the qualitative emerging themes from the focus groups in Part II.

Part I: Characteristics of households at greater risk of food insecurity

The descriptive participant characteristics of food security are presented in Table 1a and Table 1b. In the total sample of 336 households, 45.8% reported food insecurity during the past three months with 112 (33.3%) being low food secure and 42 (12.5%), very low food secure. Most fathers (66%) were engaged agricultural work as their primary occupation; most mothers (67%) were homemakers. About 87% of the fathers and 83% of the mothers were born in Mexico. Though 85% and 93% of the sample reported household income at or below 130% and 185% (respectively) of the federal poverty level, only 54% were currently enrolled in the Supplemental Nutrition Assistance Program (SNAP) and 75%, in the federal Special Supplemental Nutrition Program for Women, Infants, and Children (WIC).

Each characteristic was compared among the different levels of food security: food secure, low food secure, and very low food secure. Characteristics that were positively related to greater food insecurity included: older maternal and paternal age; fewer years of maternal and paternal education; lower maternal acculturation score; lower monthly household income; larger household size; greater number of children; male household head employed in agriculture; and household currently enrolled in SNAP. No significant relationship was observed between food insecurity and country of mother's or father's birth; years of residence in the US; single mother (not living with partner); mother's occupation as homemaker; or currently enrolled in the WIC program.

Using stepwise multiple regression, a subset of variables from Tables 1a and 1b was selected for the final model. No significant interactions were observed. The final model, shown in Table 2, indicates that mother's education, occupation in agriculture, SNAP status, number of children, and marginally father's age were independently related to greater food insecurity, as measured 0=food secure to 18=most food insecure. Since SNAP eligibility is partly determined by gross monthly income not exceeding 130% of the federal poverty level (FPL), an alternate poverty variable (income $\leq$ 130% of the FPL: yes/no) was substituted in the analysis. This poverty variable did not perform better (explain more the variance) than the SNAP variable.

Table 1a: Demographic characteristics [mean ± (SD)] by food security status of the total sample

	All n=336	Food secure n=182	Low food secure n=112	Very low food secure n=42	P-value[1]
Mother's age, (yrs.)	33.5 (7.0) n=334	32.7 (6.9)	33.7 (6.6)	36.3 (8.3)	0.02
Mother's years in US, (yrs.)	13.8 (7.6)	13.6 (7.6)	13.7 (8.0)	14.6(6.2)	0.51
Mother's education (yrs.)	9.5 (3.9) n=327	10.5 (3.6)	8.6 (3.7)	7.6 (4.3)	0.00
Mother's acculturation score	-1.9 (1.8) n=330	-1.6 (2.0)	-2.3 (1.5)	-2.4 (1.3)	0.02
Father's age (yrs.)	37.0 (7.9) n=278	35.9(7.4)	37.4 (8.3)	41.9 (7.6)	0.00
Father's years in US (yrs.)	18.0 (8.2) n=225	17.5 (7.7)	17.2(8.6)	21.8 (8.1)	0.02
Father's education (yrs.)	8.5 (3.8) n=273	9.5 (3.8)	7.7 (3.3)	5.9 (3.3)	0.00
Household income last month ($)	1913 (1153)	2109 (1302)	1798 (958)	1367 (613)	0.00
Household size (no.)	4.9(1.4)	4.7 (1.4)	5.0 (1.2)	5.5 (1.4)	0.00
Children (no.)	3.8 (1.2) n=332	3.6 (1.2)	4.0 (1.2)	4.4 (1.2)	0.00

[1] Kruskal-Wallis Test (for nonparametric variables)

Table 1b: Demographic characteristics [% (n)] by food security status of the total sample

	All	Food secure	Low food secure	Very low food secure	
	n=336	54%, n=182	33%, n=112	13%, n=42	P-value[1]
Single mother/not with partner					
Yes	21 (70)	48 (34)	36 (25)	16 (11)	
No	79 (262) n=332	55 (145)	33 (87)	12 (30)	0.50
Father works in agriculture					
Yes	66 (174)	48 (83)	38 (67)	14 (24)	0.00
No	34 (88) n=262	72 (63)	23 (20)	5 (5)	
Mother is homemaker					
Yes	67 (222)	50 (111)	37 (82)	13 (29)	0.10
No	33 (107) n=329	63 (67)	27 (29)	10 (11)	
Father, US-born					
Yes	13 (36)	66 (24)	28 (10)	6 (2)	0.29
No	87 (242) n=278	54 (131)	34 (81)	12 (30)	
Mother, US-born					
Yes	17 (57)	63 (36)	28 (16)	9 (5)	0.30
No	83 (274) n=331	52 (143)	35 (95)	13 (36)	
Enrolled in WIC[2]					
Yes	75 (251)	56 (141)	30 (76)	14 (34)	
No	25 (85)	48 (41)	42 (36)	10 (8)	0.11
Enrolled in SNAP[2]					
Yes	56 (188)	45 (86)	35 (66)	20 (36)	
No	44 (148)	65 (96)	31 (46)	4 (6)	0.00

[1] Chi-Square test [2] WIC=Special Supplemental Nutrition Program for Women, Infants and Children and SNAP= Supplemental Nutrition Assistance Program

Table 2: Regression analysis of household characteristics related to food insecurity[1] (n=282)

Variable	Estimate	Standard Error	P-Value
Intercept	+4.24	1.27	0.00
Maternal educ. (yrs)	-0.23	0.05	0.00
Currently SNAP Yes=1 No=0	+1.06	0.42	0.01
Father's age 1=> 41 years 0=< 40 years	+0.84	0.48	0.08
Children (no.)	+0.42	0.19	0.02
Agricultural worker Yes=1 No=0	+0.93	0.45	0.04

[1]Food insecurity is measured by a score (0=food secure to 18=most food insecure); F-Value= 12.68; R-squared=0.19; P <0.00

Part II: Coping strategies, family decision-making, family dynamics, community changes, employment and assistance

The focus group sample consisted of 13 mothers and 13 fathers who were all enrolled in the NSFS study. Only eight participants were US-born; the rest were born outside of the US. Participants had been living in this community for different lengths of time, ranging from 2 to 41 years. The majority of the participants (n=18) stated that the male household head worked in an agriculture related job. However, there were a few participants (n=8) where the male household head work in truck drivers, administrators for water conservation companies, and construction workers.

The focus groups provided rich evidence regarding the impact of the drought on communities who are dependent on agriculture. All four focus groups elaborated on themes related to family impact and decisions; community changes; work changes; and the use of assistance programs.

Family Decisions

Families reported facing trade-offs in decisions regarding bills, food shopping, family support, medical attention, and savings (Figure 3). They mentioned economizing on their daily expenses by setting budget priorities. They considered paying bills, including rent, utilities, and prior debt commitment, to be most important. Their grocery list has also changed in the past year; now they are buying only the necessary food items they need such as milk, eggs, and tomatoes. For example, they have cut back on meat, sodas, and grapes. Due to the uncertainty of earnings, they reported being unable to implement other usual money-saving strategies, like buying in bulk or larger sizes and taking full advantage of specials. Although they have tried to stretch their food budget, these measures have not been enough to offset the increase in food prices. Many have a financial commitment to their relatives in Mexico and in their community. Due to their restricted budget, they have minimized the support they provide their families, who are also in need. Furthermore, as families have tried to work with a restricted budget, they are still saving less than previous years. The increase in food prices, rent, and other bill prices has made it harder for families to put away money for emergencies.

Figure 3: Family decisions subthemes and quotes

Sub-themes	*Quotes*
Pay bills first	"One always has to find a way to stretch their income. One needs to make sure the bills are covered, especially those one has a long-term commitment to. "First of all, the most important are, rent bills, light and gas bills, phone bills, and car payments…grocery shopping comes after that."
	"Most importantly you buy basic products such as

Stick to basic foods	milk and tomatoes. However, the cost of these things is still going to be high. Everything is expensive, the milk, the eggs are really expensive, and beans." "When you go to a grocery store and [your child] wants a dessert or something, however, you're limited because you take a certain amount to just buy what is necessary. During these times, there is no room for luxuries, we just want to eat. We just need to buy the necessary food items; the beans, rice, and vegetables."
Support family in US and in Mexico	"I find myself helping my relatives a lot more. I am taking food to my mom and siblings so they can support themselves. They are the ones that are struggling a little more because they work in the fields." "I have a savings and I tell myself "the day my husband takes me to Fresno I am going to buy this". If in that same week my parents call me to tell me they are ill, my priority is them, everything else comes after."
Postpone non-urgent medical attention	"Yes one feels very limited. I sometimes need to buy a medication, but my daughter needs clothes or shoes. I have to choose between buying medicine or shoes. If both are needed, one doesn't know what to do"
Set aside less savings	"I don't know how things are going to go this time around. Harvest time is when one can save money because one works 12 hours 7 days a week, and things are better. But if one works less he earns less money and saves less."

Family Dynamics

Families have faced challenges within their household and these family dynamics do not go unnoticed by children (Figure 4). For example, parents reported having to turn down their child's requests for foods and giving up family outings to prioritize the needs of the household. Especially, the women emphasized the stress they have experienced and feelings of "incompetency" as their financial situation worsens. One woman tied the family stress to child behavior problems (bullying) in school.

Participants expressed concern about not being able to take care of their elderly parents and sadness in not being able to provide something special at Christmas for their children. Furthermore, fathers have been forced into jobs that are further away; thus, families spend less time together. More women are now having to work when before the men's income was enough to support a family.

Figure 4: Family dynamics sub-themes and quotes

Sub-themes	*Quotes*
Deny child requests	"What about the times I have nothing to make them dinner? They notice when their friends tell them "in my house they are making this". My children tell me about. It saddens me because this has happened to me. There have been times during Christmas where I have not been able to make them anything special. This stresses me out"
Feeling stressed and incompetent	"One stresses because one is unemployed. The stress isn't just for us because there are times when our children speak to us and we respond frustrated or angry. We have feelings of incompetency because we cannot provide what is necessary."
Parents spend more time away from children	"For a father, 6 hours of work is not enough to support a family, with a house and all the bills. Because of how things are a woman now needs to work. The children are then left behind so both parents can work to support the family. This wasn't the case before. The man

	could support his family alone." "Our children suffer because they are not used to staying in strangers' homes. We leave them and they start crying."
Fewer family outings	"There were times where we would take our children out or go eat fast food. I would even take them to the beach during the weekends…Now they say, 'Mommy, why don't you take us there?' 'My child, there isn't any money to go out.' 'Mommy, you don't want to take us."

Community Changes

Community changes have been on-going since the beginning of the drought (Figure 5). As the drought progresses into its 4th year, the town has issued stronger watering restrictions, and prices have increased for residents and agriculture growers. Local prices of foods have also increased, especially for items that need water like tomatoes, melons, lettuce and vegetables. Because of drought, there are fewer jobs available for community members. There also have been fewer migrant farmworkers establishing themselves in the area due to the scarcity of jobs. Furthermore, families have left the community to find jobs elsewhere. These evident community changes have played a role in the morale of the community. However, when asked about how they react as a community during hardships, the women and men both said they remained united.

Figure 5: Community changes sub-themes and quotes

Sub-themes	*Quotes*
Fewer jobs	"Out of the 23 years I have lived here, I have never witnessed so many changes caused by the drought. Water equals life. We live off agriculture and there are less jobs now. It has been four years"

Relocation of community members	"A lot of families are leaving from here. They are migrating to other states where they have family and where there are jobs. There are no jobs here, and those that have a job are privileged." "Because there are less jobs, there are hardly any people in Mendota. People are building cardboard homes due to the unemployment rates, there are no jobs. The town of Five Points is about to close because there are hardly any people, and there is no water."
Prices have increased	Well, yes, especially in the fruit, vegetables, or tomato and how expensive it is. Then, one says, "Now, I am only going to take 2 tomatoes. And now, they put lemons at 4 for a dollar and before, they were 10 for a dollar."
Water restrictions	"Water prices have increased because this town does not have water. We are restricted from watering our lawns." "People are talking about a town near Visalia. The houses there are left without water. Certain days of the week, the town takes bottled water to families. They also have to shower in water tanks because their home has no water."
Community remains united	"We are here to support each other. We will help each other, especially if we see a neighbor who is in need."

Work Changes

The drought has caused growers to switch their crop selection (Figure 6). Many growers are choosing to grow almonds and pistachios instead of floor crops like tomatoes and lettuce. This crop change has changed the job opportunities for farmworkers. Works hours have decreased from 13 hours to 6-8 hours. Some participants have been left without a job or have a greater commute to their worksite. The change of local crops has changed the need for workers. As growers also try to economize, they are

implemented systems that require fewer workers. This has consequently, left many community members unemployed.

Figure 6: Work changes sub-themes and quotes

Sub-themes	Quotes
Type of work	"There was a lot of work in the tomato fields, enough for people to work 11 to 12 hours. Now those tomato fields are being converted into almond and pistachio orchards. Fewer workers are needed to work orchards."
Work travel has increased	"There is less work. It is more difficult to find and one needs to travel further away to find a job. The money that is earned is spent in transportation expenses. Very little money is left."
Work hours have decreased	"Before I would work 12-14 hours and would make a decent living. Now they have more machines or they have more people working fewer hours. One is making one fourth of what they use to make and they do not earn any overtime"

Assistance/Grit

During the past four years, the frequency of food distribution events has increased, as well as community dinners (Figure 7). Most participants reported taking advantage of such resources; however, a few were not aware of the help in the community or worked during the times food was disbursed. Remotely located neighborhoods seemed to be less aware of what was happening in the centralized community. However, there was a strong sense of community helping within the participants. This capacity to support each other provided a strong indicator of self-empowerment or grit within the community to withstand collectively the dire impact of the drought on employment and economic security. Participants who attended the food distribution events reported getting extra food items to share with neighbors who were also in need. Participants also expressed attending communal weekly dinners. Furthermore, although participants are aware

of government assistance programs like SNAP, they felt they did not qualifying for this type of government assistance.

Figure 7: Assistance sub-themes and quotes

Sub-themes	Quotes
Sharing food donations	"My neighbor is of older age. Three days ago she did not have anything to feed her children. I felt bad so I told my wife to give her some of what we had. She wanted rice so we gave her bags of rice and beans. I also sometimes get onions and give them to her." "Food banks are a big help. Before I would have to buy rice, tomato paste, and corn. That money I would have spent on those items; I am able to save or spend on other items."
Government assistance	"One tried to apply for food stamps but we don't qualify because of our income. However, at time our income is scarcely enough for food and bills. They think we have more and that's why they don't give us food stamps."

Discussion

California's Latino farm-working families are dependent on the climatic conditions that influence agriculture production. This quantitative and qualitative study aimed to understand more fully the challenges farm-working families endured during a time when growers changed production due to a drought, and farmworker jobs were scarce. With 45% of participants in this farmworker community reporting low or very low food security in 2012, these families faced food access challenges even before conditions worsened in the past three years. In this sample of predominately immigrant families, households headed by less educated mothers, older fathers, and adults engaged in farm-work were most vulnerable to food insecurity.

Findings from focus groups, conducted in 2015, suggest that families have demonstrated a sense of resiliency and grit by stepping into

a new workforce territory. Grit is a personality trait that allows one to rigorously work through challenges with perseverance.[17] Coupled with grit, *familismo* is a cultural value centered around family unity and may also enable them to adapt and survive through difficult times.[18] However, families are challenged because men have to seek employment outside of their community, leaving their families for days at a time. Also, women have deviated from their roles as homemakers to support their families; income from one working adult is no longer enough. Children notice the changes occurring in their home, especially during holidays. Parents cannot meet their children's requests and have less family outings. Although, the impact of these changes is evident, they have been able to adapt to survive. Their push for family unity has served as emotional support as they adapt to the changes that have surfaced in their household. Furthermore, the community has united, providing resources such as weekly communal family dinners and an increase in food bank distributions. This collective sense of survival, community, and *familismo* has allowed them withstand these dire economic conditions and is further exemplified by the families' willingness to share their excess food items with other community members in need.

The high prevalence of food insecurity (45%) is similar to findings conducted among Latino farmworkers in North Carolina.[2-4] Possibly because this study includes a more diverse sample of Latino households in both agricultural and non-agricultural occupations, certain characteristics of the households, in addition to occupation, are associated with greater food security despite the profile of poverty (85% report income less than 130% of the poverty level). These factors include maternal education and father's age. Low-income mothers with more years of formal education may have better skills in managing household budgets and/or more motivation to provide a higher quality diet on limited income.[19] Independently of family size, father's age is related to food insecurity. Older fathers, especially those that remain engaged in physically demanding work such as farm labor, may have more difficulty competing with younger men in finding seasonal work in times of job shortages. Thus, their contribution to household income is less predictable, increasing risk of food insecurity.

The positive relationship between food insecurity and SNAP participation is very likely to be due to selection bias in this cross-sectional study, meaning those in greatest need overcome fear, stigma and other barriers to enroll in SNAP. Other studies, designed to control for selection bias, have shown that SNAP participation reduces food insecurity.[20] The

fact that a poverty variable (≤ 130% of FPL) did not perform as well as the SNAP variable may also have to do with the relative ease of capturing the same construct by asking about current SNAP participation, compared to estimating monthly income and recording household members. Regarding WIC, most participants (93%) in this sample were income-eligible, if not categorically eligible for WIC (that is, household has a pregnant, nursing, or postpartum woman; infant; and/or child under 5 years). Thus, in this population, WIC participation was relatively high, possibly making the sample too homogeneous to detect differences in food security by WIC status

The themes of the focus groups provide a better understanding of family household dynamics and ability to adapt to hardships. Parenting limitations surfaced because of the drought's impact on family income. Very similarly to other studies, parents have confessed to feelings of incompetency and frustration due to their limitations on what they can provide to their children.[21] They try to cope with this by not taking their children grocery shopping, to avoid denying their requests. Their financial limitations have forced them to only take enough money to buy what is necessary. Not being able to provide during Christmas has contributed to these feelings. Their children are aware of changes and have verbalized their parent's financial shortcomings, especially during the holiday season. Parents expressed concern that their children compare themselves to their schoolmates. Other research suggests that stress caused by food insecurity may develop aggressive behaviors in children.[9]

As parents try to adapt and navigate very limited employment options, they are now leaving their children in strangers' homes so that mothers can also work. Children may develop feelings of abandonment as this shift away from familiar household surroundings creates additional psychological stressors both for parents and children. Parents also are making difficult trade-offs regarding their own health and the child's needs. For some, medications have become less of a priority as parents worry about providing enough for their children. This may jeopardize their own health and may lead to serious health problems. These type of trade-offs are result of lower household income due to fewer job opportunities. Furthermore, the drought's impact on agriculture production and employment has forced some families to relocate/migrate to other areas. According to these families, such drastic changes have not been seen in over 20 years. The water restrictions occurring in these communities may also be a core reason for the migration of these families. Communities

may be left without water or left with paying for high priced water, making their economic situation more difficult.

Policy makers should consider tapping into the assets of this population to confront acute and chronic economic challenges that threaten food security. Previous studies of economic pressure and hardship, similar to that described by the farmworker families in the current study, suggest that these types of stressors can result in negative psychosocial outcomes for both parents and children and endure across generations.[22] Termed the "family economic stress model," economic pressure disrupts parenting practices and causes negative psychological and social outcomes for children, a phenomenon replicated in Mexican families indicating that these processes are somewhat universal.[23] However, particular cultural factors do appear to play a protective role, such as *familismo*.[23] Thus, the community's resiliency, *familismo*, and grit should be used to catalyze more resources to help them adapt to the changes and challenges this type of employment brings.

Delivering culturally-tailored, interactive community workshops that capitalize on the social capital and grit of these communities can benefit their ability to navigate difficult employment and other situations. Workshops should focus on relevant topics such as budgeting, family coping strategies, making use of food bank donations, and how to manage an unpredictable workforce. Furthermore, providing resources that help these farmworker communities build other skills aside from farm labor could allow them to enter more promising labor markets that offer greater long term stability. Cooperative Extension programs which have historically worked closely with these communities play a critical role in supporting these rural California's communities and opportunities to expand and nuance their programs should be further explored. They can be key partners to strengthen and mobilize these communities by capitalizing on the findings of this study in their programs.

Strengths, Limitations, and Future Research

This study has important strengths and limitations to consider. Among the strengths, this study incorporated both quantitative and qualitative methodology. The full USDA 18-item tool was used to measure food security which enables comparison to national and other studies using that same instrument. The sample was from a difficult-to-reach Mexican-origin farmworker population, accessed at a time of economic crisis. Among the limitations, agricultural communities, although similar, differ in their access

to resources and water reservoirs. For example, some communities rely on private wells and do not have access to local safe drinking water. In some communities, people may need to travel 25 miles to the nearest store to purchase safe drinking water. Thus, not all of the challenges of those specific communities were captured. Therefore, more focus groups should be conducted in neighboring communities to compare unique findings to their respective community. Furthermore, understanding levels of food security in the beginning and peak of the drought will be important. Thus, food security data for 2015 will be collected.

Conclusions

Overall, this study provides a better understanding of the challenges farm-workers face within California's Central Valley. Climatic changes, although a world-wide phenomena, clearly have unequal and pernicious impacts, that in this case created significant challenges for these farm-worker families. Thus, it is vital to better understand these communities and their struggles. Their experiences are unique and provide insightful information regarding their skills for self-empowerment or community grit and the opportunities for policy makers to better mobilize the resources they need to better adapt to growing climatic stresses on employment security in agriculture.

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