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Immigrant and U.S.-Born Migrant Farmworkers: Dual Paths to Discrimination-Related Health Outcomes

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Research with immigrant Latino populations often point to findings that immigrants tend to evidence better health outcomes than nonimmigrants. When exploring differences based on nativity, comparisons often end with just comparing these two groups. Exploring these variables alone may oversimplify the shared and unique paths of risk and resilience between these groups. Experimental research shows that discrimination is often directed toward immigrants, but U.S.-born Latinos report more frequent exposure. We sought to address this by examining two distinct pathways by which discrimination leads to negative health. A sample of 240 Latino migrant farmworkers completed questionnaires regarding immigration-related fears, discrimination, physical and mental health, demographics, and other outcomes. While U.S.-born participants reported similar or worse outcomes across health measures, the pathways to these outcomes appeared to differ between the two groups, with immigration-related fears accounting for substantial portions of these health outcomes, especially in the dual paths with discrimination (p values <.05). Simply comparing Latino groups across U.S. nativity may paper over important differences in how they arrive at those health outcomes, including that immigration-related concerns may exacerbate exposure to and severity of discrimination, which in turn leads to negative health outcomes. On the other hand, discrimination itself may account for numerous negative health outcomes more directly for U.S.-born Latinos.

Public Policy Relevance Statement
Latino migrant farmworkers often face discrimination and immigration fears. These experiences often lead to a decrease in healthcare service use and increase in negative health outcomes among Latino migrant farmworkers. Given the unique experiences of U.S.-born and non-U.S.-Latino migrant farmworkers, it is important to look at how each group experiences discrimination and immigration fear separately in order to address barriers to healthcare service use and health outcomes.

The United States (U.S.) Department of Labor classifies migrant farmworkers as seasonal farmworkers who travel to their job site and are not reasonably able to return to their permanent residence within the same day (U.S. Department of Labor, 2017). Latino migrant farmworkers in the U.S. are at risk of experiencing multiple persistent stressors that can negatively

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impact their physical and mental well-being, such as discrimination and immigration-related fears including significant fear of deportation (Andrews et al., 2020; Furgurson & Quandt, 2020; López-Cevallos et al., 2014). Moreover, increased immigration policing and threat of deportation can increase healthcare avoidance (Cabral & Cuevas, 2020), exacerbating already present health conditions (Berk & Schur, 2001; Cavazos-Rehg et al., 2007). Similarly, experiences of discrimination, which are more frequently reported among U.S.-born than immigrant Latinos, also forecast lower healthcare service utilization (Cristancho et al., 2008; Pérez et al., 2008) and poorer health outcomes across a variety of stress and inflammation-related domains (Krieger & Sidney, 1996; Rohleder et al., 2012; Vachon-Presseau et al., 2013). Despite lower healthcare utilization, immigrant Latinos tend to evidence overall better health outcomes and lower stress-related biomarkers of health (e.g., allostatic load; Salazar et al., 2016), though this finding is inconsistent across many mental health domains (Teruya & Bazargan-Hejazi, 2013)

As such, the present study sought to move toward comparisons of potentially separate pathways for health outcomes among U.S. born and immigrant Latino migrant farmworkers. We specifically examine the combination of immigration-related fear and related discrimination for immigrant migrant farmworkers and a direct path involving the effects of discrimination experiences among U.S.-born migrant farmworkers.

Migrant Farmworkers, Discrimination, and Health Outcomes

Migrant farm work has been linked with harsh working conditions, increased mortality, social isolation, and lack of health resources (Cristancho et al., 2008; Ramos, 2017), which can all contribute to the observed elevated depression and anxiety symptomology among farmworkers. At the same time, migrant farmworkers are frequent targets of discrimination both within and outside of the farm work context (Grzywacz et al., 2010). Many Latino migrant farmworkers have reported experiencing prejudice and hostility in the communities in which they live, in part attributed to their transient lifestyle and minority status (Boggess & Bogue, 2016). Such experiences of discrimination are directly linked with depression and anxiety outcomes in this population (Andrews et al., 2020; Ramos et al., 2016). A wealth of research also supports the role of discrimination in multiple stress and inflammation-related outcomes such as hypertension, though primarily in African American samples (Brondolo et al., 2011; Dolezsar et al., 2014; Krieger & Sidney, 1996; Michaels et al., 2019).

While much of the work linking stress and inflammation-related health outcomes to discrimination utilizes a stress physiology framework, effects of discrimination on healthcare utilization may also explain this relation. Multiple models of healthcare utilization would suggest that experiences of discrimination in and outside the healthcare system would produce lower utilization (Fazeli Dehkordy et al., 2016; Pérez et al., 2008). For example, in the health belief model, utilization is partially determined by the ratio of perceived benefits to perceived costs of seeking care (Becker, 1974; Rosenstock, 1974). Discrimination represents a social cost of seeking care and expectations of discrimination reduce perceived benefits (Vega et al., 2009). Given the significant challenges migrant farmworkers face in seeking care (e.g., low rates of health insurance, high rates of poverty; Arcury & Quandt, 2007; Magaña & Hovey, 2003), discrimination would be hypothesized to further reduce already limited access to care. Empirical work with other Latino groups has also supported the impact of discrimination in reducing the utilization of multiple types of healthcare such as cholesterol testing, and flu vaccination (Pérez et al., 2008). Further, Latino populations in the U.S. experience persistent health disparities which have been linked to the myriad barriers they face in accessing healthcare treatment (e.g., cost, insurance coverage, or transportation; Cristancho et al., 2008; National Academies of Sciences et al., 2017). In a population where only 37% have reported using any healthcare in the previous year (López-Cevallos et al., 2014), not receiving any care and not having regular access to care could also have significant health consequences. Thus, some of the effects of discrimination on health outcomes may also operate through lower utilization of healthcare.

U.S. Nativity, Immigration-Related Fears, and Health Outcomes

U.S. nativity may complicate the relation between discrimination, healthcare utilization, and health outcomes. While most migrant farmworkers are born outside the U.S., a substantial number are born in the U.S. with some samples of migrant farmworkers having as much as 30% of participants who were born in the U.S. (Ramos et al., 2015). Effects of nativity have rarely been explored among this group of workers. Still, nearly double the number of U.S.-born farmworkers report having utilized healthcare in a 2-year span (80%) compared with foreign-born farmworkers (46%; Hoerster et al., 2011). The gap in healthcare access may result from substantially greater barriers to care for those born outside the U.S. These disproportionate barriers include lower likelihood of having health insurance, higher rates of limited English proficiency, and higher rates of poverty among foreign-born Latinos compared with their U.S.-born counterparts (Cristancho et al., 2008; Heyman et al., 2009). Further, each of these barriers has been linked with U.S.-nativity differences in care access in general Latino samples (González et al., 2009).

Immigration status and fears of deportation likely represent another barrier to care that is particularly salient for migrant farmworkers. Qualitative and quantitative work has found that immigration-related fears (e.g., fear of deportation or of being caught without documentation) occur at high rates among migrant farmworkers (Andrews et al., 2020; Ramos et al., 2015). Fear of deportation or concerns regarding one's legal status may lead undocumented immigrants to forgo seeking healthcare, which may in turn lead to higher rates of morbidity and mortality from chronic and severe illnesses (Castro-Echeverry et al., 2013; Poon et al., 2013). Immigration-related fear may also indirectly lead to lower healthcare utilization and deleterious health outcomes through discrimination (Cobb et al., 2017; Soto et al., 2011). Qualitative and preliminary quantitative work suggests that migrant farmworkers' vulnerable immigration statuses and limited recourse for responding to workplace abuse may increase their risk of experiencing discrimination (Andrews et al., 2020; Winkelman et al., 2013).

Immigration-related fear is also a stressor that may directly lead to negative health outcomes (Cabral & Cuevas, 2020). Concerns about documentation and immigration issues have been associated with higher depressive symptoms and poor self-rated health among

farmworkers (Hiott et al., 2008; Ramos et al., 2015; Ramos, 2018). Latino immigrants with concerns about deportation are at heightened risk of experiencing negative emotional and physical health outcomes (Cavazos-Rehg et al., 2007). Though not frequently linked with physical health outcomes, the persistent worry of immigration-related concerns would appear likely to also evidence similar physiological effects as other stressors that induce a chain of heightened physiological stress and inflammation. Physiological stress (e.g., persistent heightened autonomic arousal) and related inflammation are routinely linked with several negative physical health outcomes ranging from diabetes (Wellen & Hotamisligil, 2005), to hypertension (Krieger & Sidney, 1996), to difficulties with pain and fatigue (Rohleder et al., 2012; Vachon-Presseau et al., 2013), to overall self-rated health (Carroll et al., 2009), and even early mortality (Arnold et al., 2012; Berkman & Syme, 1979).

Particularly given the linkages between immigration-related fears and discrimination, it would appear that U.S. nativity would be associated with better health outcomes. The reverse has more often been found, including among migrant farmworkers (Alderete et al., 2000). The finding that U.S.-born Latinos evidence poorer health outcomes than those born outside the U.S. has been dubbed "the immigrant paradox" (Burnam et al., 1987). However, this effect has failed tests of replication on several occasions with some reviews suggesting the difference may be minimal (Alegría et al., 2008). One reason for the inconsistency may be that different health risk pathways exist for U.S. born and immigrant Latinos, including among migrant farmworkers. Specifically, U.S.-born Latinos often report more experiences of discrimination than their foreign-born counterparts (Arellano-Morales et al., 2015). Further, U.S.-born Latinos report avoiding healthcare services due to concerns of discrimination more so than foreign-born Latino individuals, who alternately report underutilization of healthcare services due to immigration fears (Derose et al., 2007; Held et al., 2020; López-Cevallos et al., 2014; National Academies of Sciences et al., 2017; Pérez-Escamilla et al., 2010). Thus, in samples where U.S.-born Latinos experience significant discrimination and foreign-born Latinos experience low levels of immigration-related fear, the immigrant paradox may be more likely because of these distinct paths. Alternately, in samples where immigration-related fears are elevated, the immigrant paradox may be less evident. Both discrimination and immigration-related fear may vary by community and by time, given that immigration enforcement policies and actions have varied substantially over the last 20 years (Becerra et al., 2017; Meissner & Gelatt, 2019). Migrant farmworkers born outside the U.S. may be particularly vulnerable to such variations in immigration enforcement and policy has given the high rates of individuals who are undocumented and the potential insecurity of authorized temporary worker statuses often afforded to others. Therefore, understanding the immigration and discrimination-related pathways to healthcare utilization and health outcomes and their differences based on nativity is critical for understanding the health of Latino migrant farmworkers.

Purpose

The present study sought to explore separate mediational pathways to stress-related health outcomes between U.S.-born and foreign-born Latino migrant farmworkers. More specifically, we sought to examine the different discrimination-related and immigration fear-related pathways to lack of healthcare access and stress-related health outcomes. The study used data from the Nebraska Migrant Farmworker Health Study 2016, which included data on multiple stress-related health outcomes, including depression, anxiety, pain, fatigue, and overall self-reported health. We hypothesized that relative to those born in the U.S., foreign-born migrant farmworkers would be more likely to report immigration-related fears, which would in turn predict higher discrimination and poorer related health outcomes: lower service utilization, lower self-rated health, and higher pain, fatigue, depression, and anxiety. We further hypothesized that immigration fears would independently predict poorer health outcomes: lower service utilization, lower self-related health, and higher pain fatigue, depression, and anxiety. We hypothesized that relative to foreign-born migrant farmworkers, U.S.-born farmworkers would report higher instances of discrimination with greater differences after controlling for immigration-related fears. To understand how these two paths (the immigration-related fear path and the direct discrimination path) may mask differences in health outcomes of U.S.-born and foreign-born Latino migrant farmworkers, we also sought to examine the "immigrant paradox" by directly comparing the two groups across each outcome.

Method

Participants

Participants were 241 Latino migrant farmworkers recruited in the rural Midwest between May and September of 2016. The majority were men (n = 190, 78.8%) and average age was 36.41 years (SD = 13.66, range = 19–72 years). The majority of participants were born outside the United States (n = 202, 83.8%) and completed measures in Spanish (n = 219, 90.8%).

Procedure

Data collection was conducted by five bilingual and bicultural members of the research team. Farmworker camps were identified with the help of community partner organizations that provided services to farmworkers. The research team visited farmworker camps in rural Nebraska between July and September 2016. Potential participants were informed of the study through meetings at farmworker camps after working hours. During these meetings, the research team explained the purpose of the study and answered any questions. For any interested participants, oral informed consent was obtained. All study materials were available in English and Spanish, and validated Spanish translations were used for all measures if available. Surveys were completed through oral interviews with participants, which took approximately 45–60 min to complete. Individuals were given $15 cash for their participation. The study was approved by the University of Nebraska Medical Center institutional review board.

Measures

Immigration-Related Fear. Immigration fear was assessed using an item from the Migrant Farmworker Stress Inventory (MFWSI; Hovey, 2000), which is a reliable and valid measure of the stress inherent in a migrant farmworker lifestyle (Hiott et al., 2008). This item asked participants how stressful they found it to "worry about being deported." Participants responded to the question based

on a Likert-type scale from 1 "not at all stressful" to 4 "extremely stressful".

Discrimination. Discrimination was measured using the 10-item Expanded Everyday Discrimination Scale (Williams et al., 1997, 2008). The expanded scale assesses discrimination experiences across 10 situations (e.g., being followed in stores). Participants indicated how often each situation had happened to them in their day-to-day lives with responses ranging from 1 (*never*) to 4 (*more than four times*).

Healthcare Access/Utilization. Healthcare access and utilization was assessed by multiple items derived from the Behavioral Risk Factor Surveillance Survey (BRFSS; Centers for Disease Control & Prevention [CDC], 2015) asking participants whether or not they had a regular source of care (i.e., a healthcare provider), health insurance, and been deterred from care due to cost ("Was there a time in the past 12 months when you needed to see a doctor but could not because of cost?").

Stress-Related Mental Health. Depression symptoms were measured by using the revised Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977). The revised CES-D is a 10-item depression-screening tool. For each item (e.g., felt depressed), participants were asked to indicate how often they experienced each symptom within the last week, and responses ranged from 0 "rarely or none of the time" to 3 "most or all of the time". Investigations have supported two-factor structures for the CES-D. Some studies indicated that a single factor may be appropriate while other studies, including studies with immigrants that utilized the Spanish language version, suggested a two-factor solution consisting of positive and negative affect may be more appropriate (Canady et al., 2009; González et al., 2017). In both cases, the single factor and negative affect factor have demonstrated good internal consistency in exploratory and confirmatory factor analyses (Björgvinsson et al., 2013; Canady et al., 2009; González et al., 2017; Grzywacz et al., 2006). Additionally, the scale has demonstrated strong convergent validity with comprehensive diagnostic interviews. Adequate internal consistency was found for the single factor score ($\alpha = .78$) and the negative affect subscale ($\alpha = .85$) from the CES-D in the overall sample. In the present study, the negative affect subscale also demonstrated good internal consistency in Spanish ($\alpha = .81$) and English ($\alpha = .86$). The full scale including both positive and negative affect items appeared to show poor consistency in Spanish ($\alpha = .67$) and adequate consistency in English ($\alpha = .80$).

Anxiety symptoms were assessed using the seven-item generalized anxietydDisorder (GAD-7) questionnaire (Spitzer et al., 2006). The GAD-7 assesses the frequency of seven symptoms based on diagnostic criteria for generalized anxiety disorder. Participants reported how often they experienced each item in the last 2 weeks with responses ranging from 0 "not at all" to 3 "nearly every day." The scale has previously demonstrated good internal consistency, test–retest reliability, and convergent validity with other measures (e.g., Beard & Björgvinsson, 2014; García-Campayo et al., 2010), including with Spanish-speaking samples (García-Campayo et al., 2010). Internal consistency in the present study was good ($\alpha = .90$).

Physical Health. Self-rated health was measured with a single standard question, "Would you say that in general your health is … excellent, very good, good, fair, or poor?" Response options were coded 4, 3, 2, 1, and 0, respectively.

Fatigue. Fatigue was assessed using the Iowa Fatigue Scale (IFS), an 11-item general fatigue-screening tool (Hartz et al., 2003). Participants rated the frequency with which they experienced each item, (e.g., feel worn out) within the past month. Response options ranged from "not at all" (1) to "extremely" (5), and five items were reverse coded. A total score for the scale was derived by summing the scores across all items. This scale has been found to have good internal consistency in a previous study, $\alpha = 0.90$ (Hartz et al., 2003). In the current sample, the reliability was adequate, $\alpha = 0.83$.

Pain. Pain was measured by a single question, "Do you have any body parts that cause you consistent pain?" Response options were categorical and included head/neck, eye, chest/trunk, back, arm/shoulder, finger(s), hand/wrist, leg/knee/hip, toe(s), or foot, and "other" where participants could specify the body part that caused them pain if it was not part of the available response options. Pain was used as a dichotomous variable. If the participant reported pain at any site, they were coded as (1) and if they reported no pain, they were coded as (0).

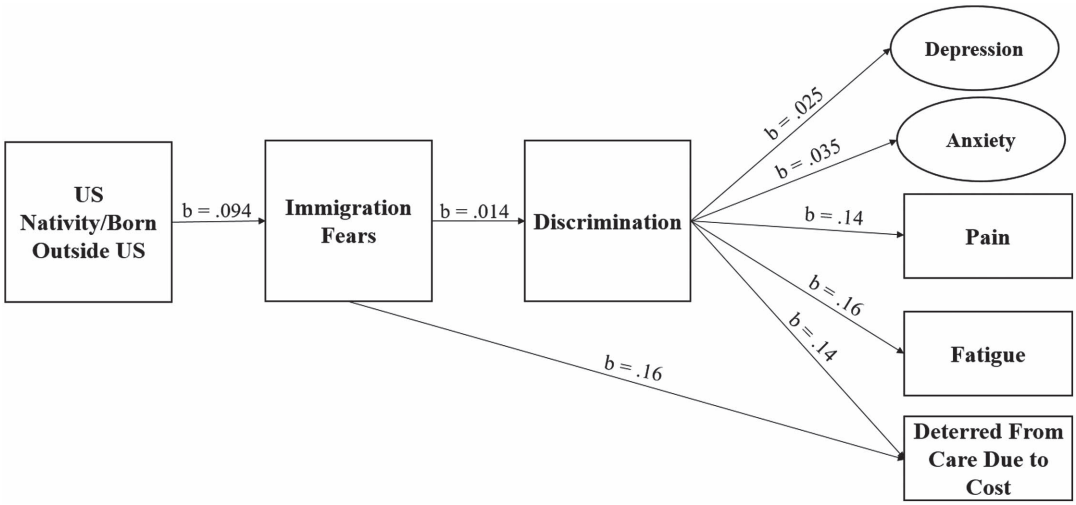
Demographics. Age, gender, and nativity status were assessed as demographic and background variables. Nativity status was assessed by a single question that asked whether participants were born in the U.S. or outside of the U.S.

Analytic Approach

In order to test hypothesized mediation, a series of structural equation models (SEM) were constructed. The first model examined differences by nativity for each outcome: discrimination, immigration fears, having a regular source of care, being deterred from care due to cost, depression, anxiety, pain, fatigue, and self-reported health. Gender, age, having health insurance in the U.S., and poverty were examined as control covariates across all models. The following recommendations by Hu and Bentler (1999) were used to determine good model fit: Comparative Fit Index (CFI) $\geq .95$, Standardized Root Mean Reidual (SRMR) $\leq .08$, and Root Mean Square Error of Approximation (RMSEA) $\leq .06$. The measure of $\chi^2/df < 2$ was also used as an indicator of acceptable model fit. Depression and anxiety latent factors were created with CES-D and GAD-7 items, respectively, using a previously established measurement model using these data (Andrews et al., 2020).

In the second model, a mediational structure was constructed that examined the potential differing mediational pathways leading to health outcomes for U.S.-born and foreign-born Latino migrant farmworkers (Figure 1). Immigration fear was examined as a mediator of U.S. nativity differences in discrimination. Both discrimination and immigration fears were examined as mediators of nativity differences in both care utilization variables (i.e., regular source of care and being deterred from care due to cost). All four of these variables were then examined as mediators of nativity differences in depression, anxiety, pain, fatigue, and self-reported health (Figure 1). Because separate mediational pathways were proposed for U.S.-born and foreign-born participants, each mediational pathway was examined regardless of whether nativity differences

Figure 1
Testing Different Pathways to Health Outcomes for Immigrant and U.S.-Born Latino Migrant Farmworkers



Note. Age, health insurance status, meeting 100% of federal poverty guidelines, and gender were included as covariates but not depicted for simplicity of presentation.

emerged in Model 1. Typical assessments of model fit (e.g., CFI) are not available for the second model because it required theta parameterization with Monte Carlo integration in order to examine dichotomous variables (i.e., regular source of care and deterred from care due to cost) as mediators. Alternate model configurations were compared using BIC to ensure that the most appropriate model is presented.

Prior to testing models of mediation, missing data and analytic assumptions were checked. Multiple variables contained missing data. Across all variables, 20 (8.3%) participants had variables with any missing data. Further, all variables individually contained less than 10% missing values. Little's MCAR was also nonsignificant ($p > .05$), which suggested data were not significantly missing in a nonrandom fashion. Further, missing data were estimated using full information maximum likelihood, which appears to reduce biases resulting from missingness (Enders & Bandalos, 2001). Further, analyses were completed utilizing robust maximum likelihood (MLR), which has been shown to reduce biases associated with violations of normality (Li, 2016). Indirect effect tests of mediation were primarily tested using recommendations by Fritz and Mackinnon (2007) suggesting that tests of the individual effects of the mediational relation are most appropriate. However, comporting with convention, we supplemented these with tests of indirect effects using bootstrapped confidence intervals with traditional maximum likelihood.

Results

Model 1. Baseline U.S. Nativity Differences in Immigration Fears, Discrimination, and Health Outcomes

When comparing those born in the U.S. to those born outside the U.S., those born outside the U.S. reported lower levels of depression symptoms ($b = -0.19$, $SE = .09$, $p = .033$), anxiety symptoms ($b = -.30$, $SE = .14$, $p = .028$), pain ($b = -1.22$, $SE = .38$, $p = .001$), and discrimination ($b = -3.06$, $SE = 1.37$, $p = .025$), but they also reported more immigration-related fear ($b = 2.55$, $SE = .30$, $p < .001$). There were no significant differences across nativity for fatigue, self-rated health, reporting a regular source of care, or being deterred from care due to cost (p values $>.05$); however, being deterred from care due to cost did approach significance ($b = -.80$, $SE = .41$, $p = .053$). Among covariates, having insurance in the U.S. predicted the likelihood of having a regular source of care ($b = 1.73$, $SE = .37$, $p < .001$), being deterred from care due to cost ($b = -1.11$, $SE = .49$, $p = .022$), and immigration fear ($b = -.90$, $SE = .35$, $p = .010$). Gender also predicted several outcomes, with women reporting more anxiety symptoms ($b = .30$, $SE = .08$, $p = .018$), depression symptoms ($b = .23$, $SE = .09$, $p = .010$), fatigue ($b = 3.79$, $SE = .84$, $p = 1.11$, $p = .001$), and higher likelihood of being deterred from care due to cost ($b = 1.25$, $SE = .36$, $p = .001$). Age positively predicted the likelihood of reporting pain ($b = .006$, $SE = .002$, $p = .013$) and negatively predicted self-rated health ($b = -.03$, $SE = .01$, $p < .001$). No other relations were significant for covariate predictors and poverty did not predict any outcome (p values $>.05$).

Model 2: Testing Differential Paths to Healthcare Utilization and Health Outcomes

Predictors of Immigration-Related Fear. Same as Model 1, as all predictors were the same.

Predictors of Discrimination. Immigration fear positively predicted discrimination ($b = .61$, $SE = .155$, $p < .001$). Those born outside the U.S. reported less discrimination and this effect appeared larger than in baseline analyses ($b = -4.62$, $SE = 1.39$, $p = .001$). No other predictors were significant (p values $>.05$).

Predictors of Being Deterred From Care Due to Cost. Adding immigration fear and discrimination as predictors

relative to the baseline model, immigration fear ($b = .18$, $SE = .07$, $p = .007$) and discrimination ($b = .07$, $SE = .03$, $p = .012$), predicted whether participants were deterred from care due to cost, such that those with higher immigration fear and more experiences of discrimination, reported cost-related barriers to care more relative to those with lower immigration fear and fewer experiences of discrimination, respectively. Women still reported being deterred from care due to cost more than men ($b = 1.32$, $SE = .36$, $p < .001$) and those born outside the U.S. reported being deterred from care due to cost less than those born in the U.S. ($b = -1.29$, $SE = .50$, $p = .010$). No other predictors were significant (p values $>.05$), and having insurance in the U.S. was no longer significant ($b = -.87$, $SE = .48$, $p = .070$).

Predictors of Having a Regular Source of Care. Overall, only health insurance status ($b = 1.78$, $SE = .39$, $p < .001$) predicted a regular source of care, such that those with health insurance in the U.S. more frequently reported having a regular source of care relative to those without insurance. No other predictors were significant (p values $>.05$).

Predictors of Depression. Those with higher discrimination ($b = .03$, $SE = .01$, $p < .001$) and women ($b = .20$, $SE = .08$, $p = .011$) reported significantly higher depression symptoms relative to those with lower discrimination and men, respectively. No other predictors were significant (p values $>.05$).

Predictors of Anxiety. Those with higher discrimination ($b = .03$, $SE = .01$, $p < .001$) reported higher symptoms of anxiety relative to those with lower discrimination. The effect in which those born outside the U.S. reported significantly lower anxiety symptoms remained significant ($b = -.26$, $SE = .12$, $p = .029$). Women also reported higher symptoms of anxiety than men ($b = .27$, $SE = .12$, $p = .023$). No other predictors were significant (p values $>.05$).

Predictors of Self-Reported Health. Participants with higher immigration fear ($b = -.08$, $SE = .03$, $p = .002$), those who reported having a regular source of care ($b = -.37$, $SE = .14$, $p = .008$), and older participants ($b = -.02$, $SE = .01$, $p < .001$) reported significantly worse health relative to those with lower immigration fear, those who did not report being deterred from care due to cost, and younger participants, respectively. No other predictors were significant (p values $>.05$).

Predictors of Fatigue. Those with higher discrimination ($b = .16$, $SE = .06$, $p = .006$) reported more fatigue than those who reported less discrimination. Additionally, women ($b = 3.49$, $SE = 1.15$, $p = .002$) reported more fatigue than men. No other predictors were significant (p values $>.05$).

Predictors of Pain. Discrimination ($b = .06$, $SE = .02$, $p = .007$), age ($b = .03$, $SE = .01$, $p = .020$), and having a regular source of care ($b = .79$, $SE = .39$, $p = .045$) were positively associated with the likelihood of reporting significant pain. Those born outside the U.S. were less likely to report pain ($b = -1.25$, $SE = .45$, $p = .005$). No other predictors were significant (p values $>.05$; Tables 1 and 2).

Indirect Effects Testing Mediation. Indirect effects were only tested for mediation paths involving significant effects of discrimination or immigration fear on healthcare utilization or health outcomes, including the double mediation effects where immigration fear predicted discrimination, which then predicted other outcomes. For discrimination, this involved every outcome variable except self-rated health and having a regular source of care. For immigration fear, this included all indirect effects with outcomes directly predicted by discrimination as well as additional indirect effects where immigration fear predicted outcomes directly (i.e., anxiety and deterred from care due to cost). Each of these paths is described in Table 3.

First, the indirect effect of U.S. nativity on discrimination with immigration fear as a mediator was significant ($b = 1.54$, 95% CI = [0.62, 2.48]). Next, the indirect effects of U.S. nativity with immigration fear and discrimination as mediators were significant in predicting whether participants were deterred from care due to cost ($b = .10$, 95% CI = [.02, .24]), depression ($b = .04$, 95% CI = [.01, .07]), anxiety ($b = .05$, 95% CI = [.02, .10]), fatigue ($b = .25$, 95% CI = [.06, .52]), and pain ($b = .10$, 95% CI = [.019, .22]). The indirect effects of nativity with only immigration fear as a mediator were significant in predicting being deterred from care due to cost ($b = .45$, 95% CI = [.11, .91]) and anxiety ($b = .08$, 95% = [.01, .16]). In all cases, the indirect effect accounted for worse health outcomes among those born outside the U.S. relative to those born in the U.S.

Alternatively, the indirect effects of nativity with only discrimination as a mediator were significant in predicting being deterred from care due to cost ($b = -.30$, 95% CI = [−.79, −.04]), depression ($b = -.11$, 95% CI = [−.22, −.04]), anxiety ($b = -.16$, 95%

Table 1
Baseline Nativity Differences in Immigration-Related Fear, Discrimination, and Health Outcomes

Health outcomes	U.S. born		Foreign born		Difference		
	M or *N*	*SD* or %	*M* or *N*	*SD* or %	*b* or *aOR*	*SE*	*p*
Depression	7.63	6.32	5.41	5.05	−.19	.08	.03
Anxiety	13.00	6.56	10.04	4.30	−.31	.14	.03
Discrimination	8.62	7.81	5.30	6.47	−3.05	1.37	.03
Immigration-related fear	0.15	0.67	3.06	2.66	2.55	.30	.00
Fatigue	28.05	7.20	26.36	5.78	−.88	1.20	.46
Self-reported health	2.22	1.14	2.15	1.08	−.21	.21	.31
Pain	24	61.5%	74	36.6%	0.30	.38	.00
Having regular source of care	38	17.9%	7	17.9%	−.15	.47	.74
Deterred from care due to cost	16	41.0%	41	20.3%	−.80	.41	.05

Note. *aOR* = adjusted odds ratio. U.S. born were examined as the referent category.

Table 2
Testing Differential Paths to Healthcare Utilization and Health Outcomes

Predictors	Deterred from care due to cost		Having a regular source of care		Pain		Depression		Anxiety		Self-reported health		Fatigue	
	aOR	95% CI	*aOR*	95% CI	*aOR*	95% CI	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*
Immigration-related fear	1.19	1.05–1.36	1.10	0.94–1.29	1.06	0.94–1.19	.02	.01	.03	.01	−.08	.03	.07	.15
Born outside U.S.	0.28	0.10–0.74	0.97	0.34–2.78	0.29	0.12–0.69	−.13	.08	−.26	.12	−.01	.21	−.40	1.81
Health insurance	0.42	0.16–1.07	5.91	2.76–12.64	0.62	0.29–1.35	.03	.05	−.08	.07	.15	.15	−.61	.88
Discrimination	1.07	1.02–1.12	0.98	0.93–1.04	1.07	1.02–1.11	.03	.01	.03	.01	.01	.01	.16	.06
Gender	3.74	1.78–7.86	2.16	0.94–4.97	1.45	0.69–3.08	.20	.08	.27	.12	−.11	.18	3.50	1.15
Age	1.02	1.00–1.05	1.00	0.97–1.02	1.03	1.00–1.05	.003	.002	−.001	.003	−.02	.01	.002	.03
Having a regular source of care	NA	NA	NA	NA	2.20	1.02–4.75	−.09	.06	−.05	.08	−.37	.14	−.40	.91
Deterred from care due to cost	NA	NA	NA	NA	1.41	0.71–2.79	.13	.07	.11	.10	−.29	.17	−.99	.99

Note. *aOR* = adjusted odds ratio.

CI = [−31, −.06]), fatigue ($b = -.76$, 95% CI = [−1.49, −.16]), and pain ($b = -.29$, 95% CI = [−.69, −.06]). In all cases, the indirect effects accounted for better health outcomes among those born outside the U.S. compared with those born inside the U.S.

Discussion

This study examined the different pathways by which immigrant and nonimmigrant Latino migrant farmworkers experience discrimination and its subsequent role in health service utilization and health outcomes. Results largely supported the primary hypotheses. Specifically, while foreign-born participants appeared to evidence better health outcomes across most health outcomes, the indirect pathway with immigration-related fear predicted both healthcare utilization and deleterious health outcomes, and this pathway was more pronounced for foreign-born than for U.S.-born participants. This indirect pathway was significant even for outcomes where baseline differences in nativity were not, specifically fatigue and cost-related barriers to care. This suggests that even when health outcomes appear similar, U.S.-born and foreign-born Latino migrant farmworkers experience different risk pathways for these outcomes. In both cases and in line with prior research (Cobb et al., 2017; Soto et al., 2011), discrimination was associated with being deterred from care due to cost and several negative health outcomes. Discrimination, however, was not associated with all outcomes, specifically self-reported health and having a regular source of care. The primary difference between U.S.-born and foreign-born participants was the role of immigration-related fear, its association with discrimination primarily for foreign-born participants, and discrimination experienced by U.S.-born participants that was not associated with immigration-related fear. Thus, for participants born outside the U.S., there appeared to be two relevant pathways involving immigration-related fear—first a pathway in which immigration-related fear by itself mediated deleterious health outcomes, most notably lower self-reported health, and second, a compound indirect pathway in which immigration-related fear predicted discrimination, which subsequently predicted negative health outcomes. For U.S.-born participants, the indirect pathway involved higher degrees of exposure to discrimination relative to those born outside the U.S., which in turn predicted negative health outcomes. For all three paths, both immigration-related fear and discrimination predicted a greater likelihood of being deterred from care due to cost, but contrary to our hypotheses healthcare utilization variables largely were not significantly associated with health outcomes.

Results from both the baseline and the full mediational models suggested that those born in the U.S. experienced more discrimination than those born outside the U.S., but examining only differences in nativity appeared to mask the relationship of immigration-related fear and discrimination. This role was central in the different pathways between U.S.-born and foreign-born participants. That is, foreign-born participants experienced significantly more immigration-related fear, which in turn significantly predicted discrimination. After accounting for discrimination associated with immigration-related fear, the difference between U.S.-born and

Table 3
Tests of Indirect Effects

Mediational paths	*b*	95% CI
U.S. nat. → immig.-related fear → discrimination	1.55	.63, 2.49
U.S. nat. → immig.-related fear → discrimination → deterred from care due to cost	.10	.02, .24
U.S. nat. → immig.-related fear → discrimination → pain	.10	.02, .22
U.S. nat. → immig.-related fear → discrimination → fatigue	.24	.06, .51
U.S. nat. → immig.-related fear → discrimination → depression	.04	.01, .07
U.S. nat. → immig.-related fear → discrimination → anxiety	.05	.02, .10
U.S. nat. → immig.-related fear → deterred from care due to cost	.45	.11, .91
U.S. nat. → immig.-related fear → self-rated health	−.20	−.34, −.08
U.S. nat. → discrimination → deterred from care due to cost	−.30	−.79, −.04
U.S. nat. → discrimination → pain	−.29	−.69, −.06
U.S. nat. → discrimination → fatigue	−.73	−1.44, −.16
U.S. nat. → discrimination → depression	−.11	−.21, −.05
U.S. nat. → discrimination → anxiety	−.16	−.30, −.06

Note. U.S. nat. = U.S. nativity; immig.-related = immigration-related. Only indirect effects with significant direct paths were tested. Thus, no indirect effects of having a regular source of care were tested. Similarly, indirect effects involving the direct effect of discrimination on self-reported health were not tested.

foreign-born participants was still significant. Although the estimation method did not allow for typical effect size estimates, we used an approximate measure similar to Cohen's *d,* the mediated effect ($b = 1.52$) of immigration-related fear on discrimination, which represented a substantial portion of the overall variance in discrimination ($SD = 6.78$). This suggests that while U.S.-born Latino migrant farmworkers reported significantly more discrimination than those born outside the U.S., immigration-related fear and the conditions and policies producing that fear may be substantial risk factors for discrimination. Given the consistent effects of discrimination on a variety of health outcomes evidenced here and elsewhere (Brondolo et al., 2011; Krieger et al., 2005; Ryan et al., 2006), this risk pathway carries considerable implications for Latino migrant farmworker health.

The Central Role of Discrimination in Health Utilization and Outcomes

For healthcare utilization, none of the variables examined appeared to predict having a regular source of care, except for health insurance status. On the other hand, discrimination and immigration-related fear independently predicted whether participants were deterred from care due to cost, which largely coheres with prior literature (Cristancho et al., 2008). This is also consistent with the health beliefs model (Becker, 1974; Rosenstock, 1974), as the additional costs and reduced perceived effectiveness of services were hypothesized to compound being deterred from care due to cost. It also contributes to findings from this study that simply comparing across U.S. nativity may mask important differences in barriers to care for those born outside the U.S. and those born in the U.S. The two paths to lower utilization differed across nativity with immigration-related fear acting as a single mediator and as a double mediator with discrimination in accounting for greater likelihood of cost deterring them from care among those born outside the U.S. Alternatively, the influence of greater exposure to discrimination, relative to those born outside the U.S., was associated with greater likelihood of cost deterring them from care among those born in the U.S. In other words, discrimination is associated with deterrence from care due to cost for both groups, but its relative weight and the influence of immigration-related fear may give the appearance of similar utilization and barriers across nativity.

The effects of discrimination extended beyond cost-related barriers to care to several other health outcomes. Specifically, each specific health outcome assessed was positively associated with discrimination, such that higher discrimination was associated with more symptoms. The lone exception among those examined was self-reported health. This is consistent with other studies which have also found that discrimination worsens health outcomes (Cano et al., 2015; Hausmann et al., 2008; Pascoe & Smart Richman, 2009) and through stress-related mechanisms may increase risk for inflammation-related conditions that can include pain and fatigue (Rohleder et al., 2012; Vachon-Presseau et al., 2013). Further, much of the effect of immigration-related fear appeared to operate through its relation with discrimination. That is, after including discrimination in the model, immigration-related fear was only directly associated with self-reported health and anxiety. Its indirect effects through discrimination, however, significantly predicted all health outcomes except for self-reported health. Thus, immigration-related fear and discrimination may work in conjunction to explain multiple stress-related health outcomes among foreign-born Latino migrant farmworkers.

U.S. Nativity Differences in Immigration-Related Fear and Discrimination

Multiple factors may explain the distinct exposure to discrimination and immigration-related fear that differ across nativity. For example, those born outside of the U.S. are less likely to speak English and may be less likely to perceive discrimination as it occurs (Finch et al., 2000). Exposure to cultural norms may also explain this phenomenon, wherein those born in the U.S. have cultural lenses by which they may perceive discrimination as it occurs based on cultural knowledge and awareness of stereotypes (Arellano-Morales et al., 2015; Pérez et al., 2008). Finally, those born outside the U.S. may be less likely to be around those that perpetrate discrimination both when they are in the agricultural communities while they work and during off-seasons when they are less likely to reside in the U.S. (Viruell-Fuentes, 2007).

Alternatively, those born in the U.S. may have less self-focused immigration-related fears (the outcome measured here) due to birthright citizenship. However, recent cases have highlighted the potential for accidental deportation of U.S. citizens due to their Latino ethnicity (Olsen, 2017). Our study did not capture other-focused immigration-related fears in which those born in the U.S. may experience immigration-related fears for others (e.g., having a spouse or parent deported; Zayas et al., 2015; Zayas & Gulbas, 2017). This alternate pathway should be explored in future studies. Still, the present study highlights the unique experiences of Latino farmworkers by nativity and demonstrates a need to further examine the different pathways that predict negative health outcomes even when the "immigrant paradox" appears minimal, nonsignificant, or inconsistent. These results highlight how variations in exposure to discrimination and fears related to immigration policy and policing may drastically alter findings related to the immigrant paradox. In practical terms, the adds to the literature suggesting discrimination should be assessed in health services as a key social determinant of health (Davis, 2020), furthermore, increasing awareness of immigration-related fear could enhance education, outreach, and services for Latino migrant farmworkers. Clearly, assessing both discrimination and immigration-related fear would likely enhance understanding of contributors to disease as well as barriers to healthcare.

Limitations and Future Directions

While the study has notable strengths, particularly in recruiting a hard-to-reach vulnerable Latino worker population, it should be considered in the context of multiple limitations. First, the study employed only cross-sectional and correlational methods, which limits confidence in the temporal ordering of effects. Further, only self-reported measures were used, which may particularly limit findings regarding health outcomes. Still, substantial research has demonstrated the longitudinal effects of discrimination on the outcomes that were used and objective measures of health (Cano et al., 2015; Pascoe & Smart Richman, 2009; Pavalko et al., 2003). Relatedly, self-reported experiences with discrimination were only assessed in general settings and were not broken down specifically to the healthcare context. Further, the study did not

assess perceived fear of experiencing discrimination when seeking care, which further should be investigated as it more directly applies to the health beliefs model, perceived benefits of care, and perceived costs. Finally, our study focused on Latino migrant farmworkers in the Midwest. Latino farmworkers face many unique challenges that are particular to migrant farm work; therefore, our results may not generalize to the other Latino populations.

Conclusions

The paths leading to healthcare utilization and health outcomes among Latino migrant farmworkers appear to differ based on U.S. nativity. Results indicated that even when direct comparisons based on nativity are not significant, those born in the U.S. and those born outside the U.S. still experience different risk paths to these health outcomes, with the most notable differences being due to immigration-related fear. Examining discrimination or health outcomes alone does not account for the unique experiences of immigration-related fear among Latino migrant farmworkers born outside of the U.S. While several additional risk pathways exist, the study provides preliminary evidence that these pathways differ, even with no or inconsistent evidence of an immigrant paradox.

Keywords: latino health, latino migrant farmworkers, discrimination, immigration fear

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