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## **Combinatorial Effects of Discrimination, Legal Status Fears, Adverse Childhood Experiences, and Harsh Working Conditions among Latino Migrant Farmworkers: Testing Learned Helplessness Hypotheses**

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### **Abstract**

Migrant farmwork is often characterized by harsh working conditions that carry significant physical and mental health consequences. Using a learned helplessness framework, the current study examined the extent to which discrimination, immigration legal status difficulties, and adverse childhood experiences moderated the effects of harsh working conditions on depression and anxiety. The study also examined the extent to which harsh working conditions mediated the effects of discrimination, immigration legal status difficulties, and adverse childhood experiences on depression and anxiety. Participants were 241 migrant farmworkers recruited in the Midwest. Participants completed interviews consisting of the Migrant Farmworker Stress Index (MFWSI), Adverse Childhood Events scale (ACEs), Everyday Discrimination Scale, the Centers for Epidemiology Scale for Depression (CES-D), and the seven item Generalized Anxiety Disorder scale (GAD-7). Tests of indirect effects suggested, working conditions mediated the effects of ACEs, immigration legal status fears, and discrimination on CES-D and GAD-7 scores ( $p$ -values  $< .05$ ). Higher ACEs and discrimination also appeared to be associated with larger effects of harsh working conditions on depression and anxiety ( $p$ -values  $< .05$ ), while legal status fears did not significantly moderate the effect of harsh working conditions on either outcome ( $p$ -values  $> .05$ ). Likely through different mechanisms, adverse childhood experiences, discrimination and immigration legal status are associated with higher risk of harsh working conditions and subsequently these conditions account for much of the relations between these three stressors with

depression and anxiety. Additionally, discrimination and adverse childhood experiences appear to then enhance the effects of working conditions.

## Resumen

El trabajo de agrícolas migrantes se caracteriza por condiciones severas que incrementan el riesgo de enfermedades médicas y de salud mental. Nuestro estudio examinó qué tanto la discriminación, el miedo por el estado legal, y las experiencias adversas durante la niñez (ACEs) aumentaron el efecto de condiciones laborales severas en la depresión y ansiedad. El estudio también examinó si las condiciones laborales explican los efectos de discriminación, el miedo del estado legal, y ACEs en la depresión y ansiedad. Participantes eran 241 trabajadores migrantes agrícolas Latinos del medio occidente (midwest) de los Estados Unidos. Participantes completaron entrevistas de Migrant Farmworker Stress Index (MFWSI; una medida de estrés por trabajadores agrícolas), escala de ACEs, Everyday Discrimination Scale (medida de discriminación), Centers for Epidemiology Scale for Depression (CES-D; medida de síntomas de depresión) y Generalized Anxiety Scale (GAD-7; medida de síntomas de ansiedad). Una serie de modelos de ecuaciones estructurales examinaron ACEs, miedo por estado legal y condiciones laborales severas como predictores de CES-D y GAD-7. Pruebas de efectos indirectos indicaron que las condiciones laborales explicaron parte de los efectos de discriminación, ansiedad y miedo por estado legal en la depresión y ansiedad. También, ACEs y discriminación aumentaron los efectos de las condiciones laborales en los síntomas de depresión y ansiedad ( $p < .05$ ) pero el miedo por el estado legal no cambió estos efectos ( $p > .05$ ). Probablemente por mecanismos diferentes, ACEs, discriminación y miedo por el estado legal predicen condiciones laborales severas y estas condiciones incrementan el riesgo de síntomas de depresión y ansiedad. Además, la discriminación y ACEs quizás incrementan los efectos de las condiciones laborales.

## Keywords

Latino migrant farmworkers; mental health

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Multiple investigations have characterized the number and type of stressors faced by Latino<sup>1</sup> migrant farmworkers while also testing their association with depression and general anxiety (Cobb, Xie, Meca, & Schwartz, 2017; Gilbert et al., 2015; Krieger & Sidney, 1996; Slopen et al., 2016, 2016; Soto, Dawson-Andoh, & BeLue, 2011; Torres, Driscoll, & Voell, 2012). Migrant farmworkers are often exposed to harsh working conditions, which we define as conditions that pose risks of injury or illness. Such conditions are often accompanied by experiences of discrimination and stress related to legal status, which also predict depression and anxiety outcomes (Ramos, Carlo, Grant, Trinidad, & Correa, 2016; Ramos, Fuentes, & Carvajal-Suarez, 2018a). Qualitative studies have indicated that both discrimination and fear related to immigration legal status work in concert to place Latino migrant farmworkers at

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<sup>1</sup>The research team would like to acknowledge the importance of terminology for describing Latina/o/x populations. Different members of the research team itself held differing perspectives on which term to use, including that some authors advocated for the use of Latinx. Specifically, the importance of gender inclusivity and avoiding cis-hetero-normativity were discussed. We, however, decided to retain the term “Latino”, despite its potential shortcomings with its reflection of masculine and dichotomized gender norms, because it was the term most recognized and preferred by the community members who contributed substantially to the overall research project both as participants and as liaisons. Thus, while we understand the importance and implications of the term, we have elected to retain “Latino” in order to comport with the preferences of the community involved with the study.

greater risk of experiencing harsh working conditions and enhanced stress associated with such conditions (Winkelman, Chaney, & Bethel, 2013). Less work has quantitatively examined these hypotheses.

In addition to experiences of discrimination and immigration legal status fears, a rapidly growing body of research indicates that exposure to adverse events in childhood may be key to understanding the effects of ongoing stressors. Specifically, adverse childhood events (ACEs) dramatically increase the risk of depression and anxiety concerns, while also appearing to increase exposure to and effects of several other stressors (Felitti et al., 1998; Ports, Ford, & Merrick, 2016; Whitfield, Anda, Dube, & Felitti, 2003). Yet, the role of ACEs in isolation and in combination with the harsh working conditions faced by Latino migrant farmworkers remains untested in this population. Given the ways in which ACEs, discrimination, and immigration legal status fears may both lead to and increase the effects of harsh working conditions, we examine the following models: (1) a mediational model in which harsh working conditions mediates the effects of discrimination, legal status fears, and ACEs on depression and anxiety and (2) a second model in which each of these stressors also moderate the effects of harsh working conditions predicting depression and anxiety outcomes.

### **Mediated Moderated Model of Learned Helplessness with Harsh Working Conditions**

Migrant farmworkers conduct seasonal agricultural labor, while residing temporarily in the area (U.S. Department of Labor, 2016), and this work has been associated with harsh working conditions, increased mortality, social isolation, discrimination, immigration legal status fears that produces significant fear of deportation and lack of health resources (Cristancho, Garces, Peters, & Mueller, 2008; Ramos, 2017). As the most direct stressor experienced as a result of farmwork, Latino migrant farmworkers frequently experience harsh working conditions that result in disparities in work-related injuries (Ramos et al., 2016; Ramos, Fuentes, & Carvajal-Suarez, 2018b). Migrant farmwork presents a variety of other harsh conditions such as limited access to restrooms, long working hours (e.g., 12+ hours of work per day for several consecutive days), limited access to water, physically demanding labor, and harsh treatment by employers (Hiott, Grzywacz, Davis, Quandt, & Arcury, 2008; Hovey, Magaña, & Booker, 2003; Ramos, Su, Lander, & Rivera, 2015). Due to the risk of injury and other job-related demands in migrant farmwork, harsh working conditions have frequently been associated with deleterious mental health outcomes, including depression and general anxiety among Mexican immigrant farmworkers (Grzywacz, Hovey, Seligman, Arcury, & Quandt, 2006; Grzywacz et al., 2010; Ramos et al., 2015; Vega, Warheit, & Palacio, 1985).

Harsh working conditions are not experienced evenly across the population of Latino migrant farmworkers and qualitative studies suggest conditions likely worsen in environments where workers have few options to respond to or report harsh conditions or mistreatment (Winkelman et al., 2013). A learned helplessness framework provides a theoretical lens to explain how stressors that prevent or limit responses to working

conditions may both increase exposure to and exacerbate the mental health effects of these conditions. In brief, the learned helplessness framework suggests that as individuals experience stressors that they are unable to avoid or escape, they make fewer attempts to avoid or escape future instances of such stressors thereby increasing their exposure (Abramson, Seligman, & Teasdale, 1978). Additionally, learned helplessness frameworks suggest that repeated exposure to such stressors combined with perceived or actual inability to avoid them result in increasingly negative perceptions of not only the events themselves, but also the self and broader external environment. These negative perceptions were originally employed to explain the development of depressive symptoms, especially those related to self-efficacy and the likelihood of future success (Seligman, 1974). Learned helplessness has since been frequently applied to general anxiety and worry (Bargai, Ben-Shakhar, & Shalev, 2007; Hammack, Cooper, & Lezak, 2012; Maier, 1993), in particular the potential for persistent vigilance and worry related to inescapable stressors.

In the current study, we propose discrimination and immigration legal status difficulties as two related stressors that likely prevent farmworkers' ability to respond to or report harsh conditions thereby fitting the learned helplessness framework. We also proposed ACEs as a distal stressor that may contribute to perceiving each of the other stressors and exacerbating their effects. In effect, harsh working conditions would be proposed to both mediate and be moderated by stressors that limit farmworkers' response to such conditions. Specifically, this suggests that when other stressors prevent avoiding or escaping from harsh working conditions, these conditions may then be experienced more frequently and thereby lead to greater depression and anxiety symptoms. From a learned helplessness framework, such stressors may also increase the effect of harsh working conditions by reducing workers' perceived ability to respond to harsh conditions and increasing the stress associated with these experiences. As such, harsh working conditions may both mediate and be moderated by the stressors examined that in different ways may contribute to learned helplessness responses.

### **Harsh Working Conditions and Other Stressors as Mediators**

Prior qualitative work with Latino migrant farmworkers has specifically identified discrimination and immigration legal status difficulties as potential factors that may both enhance the likelihood of exposure to harsh working conditions and their effects (Winkelman et al., 2013). These are examined first. The potential mediation of the effect of ACEs may operate differently such that a portion of the effect is accounted for by discrimination and legal status fears. ACEs are discussed second.

#### **Harsh working conditions mediating effects of discrimination and legal status fears.**

Migrant farmworkers are frequent targets of discrimination both within and outside of the farmwork context (Grzywacz et al., 2010). At the same time, multiple investigations have found that experiencing discrimination, even in subtle forms, predicts a range of deleterious health effects that include depression, anxiety, cardiovascular disease, and poorer cancer outcomes among others (Cobb et al., 2017; Krieger & Sidney, 1996; Soto et al., 2011; Taylor et al., 2007). Many Latino populations report widespread experiences with discrimination

(Cobb et al., 2017; Soto et al., 2011). Immigrants, in particular, may face additional exposure to discrimination, given that degree of accentedness and perceived immigration legal status appear to increase the likelihood of being targeted for discrimination (Dovidio, Gluszek, John, Dittmann, & Lagunes, 2010; Nelson Jr, Signorella, & Botti, 2016). While direct effects of discrimination may explain much of these results, preliminary research supports the possibility the experiences of harsh working conditions may partially explain these findings. Specifically, some research has indicated that participants frequently reported not being able to avoid or escape harsh conditions and mistreatment due to fear about discrimination-related retribution (Winkelman et al., 2013). Furthermore, individuals may be more likely to perceive work conditions as stressful after experiencing discrimination inside the work context (Imam, Shah, & Raza, 2014). The learned helplessness framework would suggest the inability to escape harsh conditions would lead to more experiences of such conditions. Given the effects of farmworkers' work conditions on mental health, they may therefore account for some of discrimination's effects on depression and anxiety outcomes.

Examining discrimination and responses to harsh working conditions among migrant farmworkers may be incomplete without also examining immigration-related factors. Fears related to deportation or other documentation concerns are common among migrant farmworkers (Grzywacz et al., 2010; Winkelman et al., 2013) and may increase the risk of experiencing discrimination (Cobb et al., 2017). Across immigrant populations, those without documentation, those connected to immigrants without documentation, or even those without a permanent status may become targets of discrimination in housing and employment contexts (Hall & Greenman, 2013; Hall, Greenman, & Farkas, 2010; Haubert Weil, 2009). In these cases, perpetrators may exploit their knowledge of immigrants' immigration status fears and perceived inability of such immigrants to respond to instances of discrimination. Qualitative research with Latino migrant farmworkers, and other Latino populations, has mirrored these findings in that participants report fears of reprisal and retribution for reporting or responding harsh working conditions due to fears of deportation (Winkelman et al., 2013). That is, the feared reprisal is that their legal status will be reported or that their report will be ignored as a result of their status. Taken together with results regarding the effects of discrimination on mental health, the effects of immigration status fears on mental health outcomes may operate, at least in part, through its increased risk of exposure to discrimination and potentially related harsh working conditions.

### **Adverse childhood events increasing risk stressors in adulthood.**

In addition to ongoing and recent stressors that contribute to the effects of harsh working conditions, historical stressors such as childhood adversity may also be important to consider. Though not directly associated with migrant farmwork itself, adverse childhood events (ACEs) may contribute to similar learned helplessness mechanisms in responding to harsh working conditions, but may also enhance these effects via stress response effects. ACEs generally refer to experiences of traumatic events (e.g., physical abuse) and significant family disruption (e.g., parental substance use) during childhood (Felitti et al., 1998). With the advent of the ACEs checklist (Felitti et al., 1998), numerous studies over the last two decades have demonstrated that ACEs forecast a variety of negative health outcomes, including mental health (Brockie, Dana-Sacco, Wallen, Wilcox, & Campbell, 2015; Hughes

et al., 2017; Kalmakis & Chandler, 2015) and work-related outcomes in adulthood (Anda et al., 2004).

Prior work has already demonstrated that ACEs disproportionately impact Latino populations (Slopen et al., 2016). In U.S. samples, ACEs are often higher among Latino populations and those who experience poverty (Gilbert et al., 2015; Slopen et al., 2016). Despite widespread examination of ACEs, ACEs have yet to be studied among migrant farmworkers. However, migrant farmworkers are overwhelmingly Latino and experience high rates of poverty (U.S. Department of Labor, 2016). Pertinent to potential mediation, ACEs appear to significantly increase the risk and effects of multiple stressors in adulthood through a variety of mechanisms (Brockie et al., 2015; Danese & McEwen, 2012; Hammen, Henry, & Daley, 2000; Heim & Nemeroff, 2001). ACEs have also been shown to increase perceptions of and exposure to work-related difficulties specifically (Brockie et al., 2015; Danese & McEwen, 2012). Some mechanisms that account for the effects of ACEs on later life stressors likely fit the learned helplessness framework, though additional mechanisms may also be necessary. Fitting the learned helplessness framework, ACEs are highly related to hopelessness and other negative perceptual biases (Haatainen et al., 2003). Specifically, ACEs appear to be inversely related to dispositional optimism and self-efficacy in adulthood (Korkeila et al., 2004; Sachs-Ericsson, Medley, Kendall-Tackett, & Taylor, 2011), which in turn mediate the relations between ACEs and negative health outcomes. Further, ACEs may increase negative social expectations given that exposure to forms of childhood adversity increases sensitivity to and speed of recognizing negative facial expressions (Masten et al., 2008; Rauch et al., 2000). ACEs may therefore operate by not only decreasing the avoidance of potential stressors, but also by increasing attention to and negative appraisals of situations such as work stressors. For example, it may be that workers are more likely to perceive that bathroom conditions are bad (a commonly assessed item for farmworker conditions) or attend to the “bad” aspects of such conditions when they have experienced greater degrees of ACEs. Thus, among migrant farmworkers, ACEs may be associated with greater exposure to and recognition of discrimination and related harsh working conditions, which in turn may predict depression and anxiety outcomes.

### **Roles of Discrimination, Legal Status Fears, and ACEs in the Mediated Moderated Model Discrimination as a Moderator.**

The association between harsh working conditions, depression, and anxiety may also be moderated by experiences of discrimination and ACEs. Prior work has postulated that discrimination may exacerbate the effects of harsh working conditions because of fear of retribution in reporting unsafe environments (Benach, Muntaner, Chung, & Benavides, 2010). Supporting this hypothesis, experiences with discrimination have been found to increase the effect of work-related stressors on mental health outcomes (Mays, Coleman, & Jackson, 1996; Murry, Brown, Brody, Cutrona, & Simons, 2001), though these studies have typically included office-based or service industries for which stressors differ significantly. Research with African Americans has suggested that discrimination in non-work contexts also increases the effects of workplace stressors (Mays et al., 1996). Theoretical and empirical work combining these results with learned helplessness frameworks suggest that discrimination lowers self-efficacy in responding to negative working conditions and in turn



results in negative perceptions of the work environment and high degrees of work-related stress (Heslin, Bell, & Fletcher, 2012). Although the settings examined previously differ significantly from migrant farmwork, qualitative results with Latino migrant farmworkers mirror learned helplessness hypotheses. Thus, in addition to the potentially increasing exposure to or perceptions of harsh working conditions, discrimination may enhance the downstream effects of this stress on related disorders, such as depression and anxiety, though this has yet to be tested quantitatively among migrant farmworkers. Qualitative work with migrant farmworkers has also suggested that immigration status fears may increase the effects of both discrimination and work-related stress due to the inability to respond to discrimination (Winkelman et al., 2013). Thus, utilizing a learned helplessness framework, the inability to respond to such instances of both discrimination and harsh working conditions may moderate the effects of harsh working conditions on depression and anxiety.

### **ACEs as a Moderator.**

ACEs may function somewhat differently, but may also exacerbate the effects of ongoing stressors on mental health. Given data that ACEs are highly related to hopelessness and other negative perceptual biases (Haatainen et al., 2003), these mechanisms may increase the effects of ongoing stressors when they occur. Prior work with forms of childhood adversity also suggests that greater exposure to adversity is associated with poorer stress hormone regulation in laboratory-based stress induction tasks (DeSantis et al., 2011). Thus, while ACEs may moderate the effects of harsh working conditions, it may do so through somewhat different mechanisms relative to discrimination and legal status fears.

### **Purpose and Hypotheses**

The present study examined the effects of harsh working conditions and several stressors that may increase exposure to and the effects of these conditions on depression and anxiety. Based on a learned helplessness framework, multiple hypotheses were examined.

Hypothesis 1: Harsh working conditions will account for significant portions of discrimination's relation to depression and anxiety symptoms. Discrimination will be associated with higher degrees of harsh working conditions and harsh working conditions will be associated with greater anxiety and depression symptoms.

Hypothesis 2: Harsh working conditions and discrimination will account for significant portions of legal status fears' relations to depression and anxiety symptoms. That is, legal status fears will be positively associated with both discrimination and harsh working conditions, which will in turn predict depression and anxiety symptoms as outlined in Hypothesis 1. Thus, harsh working conditions and discrimination will act as double mediators of legal status fears' relation to depression and anxiety symptoms.

Hypothesis 3: Harsh working conditions and discrimination fears will account for significant portions of ACEs' relation to depression and anxiety symptoms. Building on Hypothesis 1 and 2, ACEs will be positively associated with discrimination and harsh working conditions, which in turn predict depression and anxiety symptoms. Thus, harsh working conditions and



discrimination will act as double mediators of ACEs' relation to depression and anxiety symptoms.

Hypothesis 4: The effects of harsh working conditions on depression and anxiety will depend on discrimination, legal status fears, and ACEs such that the effects of harsh working conditions will be greater at higher levels of discrimination, legal status fears, and ACEs compared with lower levels of these variables.

## Methods

### 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 US ( $n = 202$ , 83.8%) and completed measures in Spanish ( $n = 219$ , 90.8%). Additional background information is contained in Table 1.

### Procedures

Data collection for the current study 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. Then, the team visited farmworker camps in the rural Midwest between July and September 2016. Potential participants were informed of the study through meetings at farmworker camps after working hours by members of the research team. During these meetings, the purpose of the study was explained and any questions were answered. If workers were interested in participating and met the inclusion criteria, they were informed of their rights as research participants both orally and in writing, and informed consent was obtained. All study materials were available in English and Spanish. Existing Spanish versions were used for all measures, except demographics, which were translated for study purposes. In individual interviews with all participants, a member of the research team read each question to the participant and marked the corresponding response on the questionnaire, which assessed perceived health status, healthcare access, depression, anxiety, migrant farmwork-related stress (e.g., stress related to working conditions), adverse childhood events, discrimination, work context (e.g., hours worked), and demographics. Interviews took approximately 45 minutes to complete, and participants were given \$15 cash for their participation in the study. The study was approved by the university's Institutional Review Board.

## Measures

### Adverse Childhood Events (ACEs)

ACEs were assessed using the ACEs scale. The ACEs scale has been used in numerous national and international studies of public health in Spanish and English (Felitti et al., 1998; Gilbert et al., 2015; Hughes et al., 2017; Kalmakis & Chandler, 2015; Slopen et al., 2016). It consists of 10 dichotomous (yes/no) items focusing on various highly stressful events that individuals may have experienced during childhood (e.g., child physical abuse or witnessing

domestic violence). The version used in this study was modified by removing the sexual abuse item in order to better comport with community expectations and to ensure that research staff were able to respond adequately to any adverse responses to participation. Similar to other studies, a sum score was used in all analyses (Brown et al., 2009; Felitti et al., 1998). Table 1 contains descriptive information.

### Harsh Working Conditions and Legal Status Fears

Working conditions during migrant farm work were measured by using the Migrant Farmworker Stress Inventory (MFWSI), a 39-item measure that assesses several stressors related to migrant farmwork (Hiott et al., 2008; Hovey et al., 2003). Participants rated the perceived degree of stress they experienced resulting from each potential stressor. Each item was measured on a Likert-type scale from 1 ‘not at all stressful’ to 4 ‘extremely stressful’. Participants were also able to select ‘have not experienced’, which was coded as 0. Thus, the measure assesses both exposure to and the subjective appraisal of each stressor, which is key for learned helplessness hypotheses that would suggest inability to avoid/escape would enhance both the exposure to and subjective stress of the event, which in turn lead to depression and anxiety symptoms. Alternate approaches in which items were recoded as either “experienced” (1) or “not experienced” were also examined and yielded identical results with regard to significant relations, but evidenced poorer fit to the data. Thus, in order to retain the full sample, the combined measure of both experiences of and subjective stress toward harsh working conditions was retained.

Although an overall composite score is often used (Grzywacz et al., 2010; Hovey et al., 2003), the current study first sought to examine subfactors based on prior principal components analyses as there had previously been identified a subfactor that focused significantly on work conditions (Hiott et al., 2008). These prior analyses that utilized both English and Spanish versions of the MFWSI had identified five factors: 1) Legality and logistics (five items), 2) Social Isolation (four items), 3) Work Conditions (four items), 4) Family (four items), and 5) Substance Abuse by Others (two items). Neither the five-factor nor the single factor models evidenced good model fit in confirmatory factor analyses used in the current study (see Analyses section for additional information). As a result, a theoretically-driven factor consisting of items focusing on working conditions was constructed and evidenced good fit (see Measurement models section). The final four items used in the working conditions latent factor used in the current study evidenced adequate internal consistency in the overall sample ( $\alpha = .71$ ), in Spanish ( $\alpha = .72$ ), in English ( $\alpha = .70$ ) and evidenced good model fit through CFA procedures, which are described in the analysis section. Table 1 contains descriptive information.

Legal status fears were also assessed using two items from the MFWSI. These two items were selected based on a previously found immigration-related issues factor with three items, in which the third item in this study did not load well onto the factor. Factor loadings of the two other items were also high ( $\lambda > .90$ ). Given the high factor loadings and that only two items would remain (Ramos et al., 2015), the third item was therefore removed and the two remaining items were combined into a single measurement item. The remaining items also showed substantial theoretical coherence by assessing fears of deportation (item 30) and

worries about not having a permit to work in the US (item 14). Scores from these items were summed to form a single composite score. Approximately one third of participants reported ever fearing they might be deported ( $n = 81$ , 33.6%) or ever worrying about not having a permit to work in the US ( $n = 76$ , 31.5%). Table 1 contains additional descriptive information.

### Depression and Anxiety Symptoms

Depression symptoms were measured by using the revised Center for Epidemiologic Studies Depression scale (CES-D). The revised CES-D is a 10-item depression screening tool. For each item (e.g., felt lonely, restless sleep, people disliked me, felt depressed, etc.), 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). Prior investigations have supported two factor structures, with some studies indicating a single factor may be appropriate and other studies, including studies with immigrants that utilized the Spanish language version, have suggested a two-factor solution consisting of positive and negative affect may be more appropriate (Canady, Stommel, & Holzman, 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, Kertz, Bigda-Peyton, McCoy, & Aderka, 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 current study, the negative affect subscale also demonstrated good internal consistency in Spanish ( $\alpha = .81$ ) and English ( $\alpha = .86$ ). The full scale with positive affect items appeared to show poor consistency in Spanish ( $\alpha = .67$ ) and adequate consistency in English ( $\alpha = .80$ ). Additional information regarding measurement fit is described in the Results section. Table 1 contains descriptive information.

Anxiety symptoms were assessed using the seven-item Generalized Anxiety Disorder (GAD-7) questionnaire (Spitzer, Kroenke, Williams, & Löwe, 2006). The GAD-7 assesses the frequency of seven symptoms based on diagnostic criteria for generalized anxiety disorder (Beard & Björgvinsson, 2014; García-Campayo et al., 2010; Löwe et al., 2008; Spitzer et al., 2006). Participants are asked to report how often they have experienced each item in the last two 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 diagnostic measures (Beard & Björgvinsson, 2014; García-Campayo et al., 2010; Löwe et al., 2008; Naeinian, Shairi, Sharifi, & Hadian, 2011; Ruiz et al., 2011; Spitzer et al., 2006). The Spanish version has also demonstrated good internal consistency ( $\alpha = .94$ ) and concurrent validity with Spanish-speaking samples (García-Campayo et al., 2010). A single factor structure has been supported in English and Spanish language samples (García-Campayo et al., 2010; Löwe et al., 2008). Internal consistency in the current study was also high in the overall sample ( $\alpha = .90$ ), in Spanish ( $\alpha = .89$ ) and in English ( $\alpha = .93$ ). Additional information regarding measurement fit is described in the Results section. Table 1 contains descriptive information.

## Experiences of Discrimination

Participants' experiences with discrimination were assessed using the expanded Everyday Discrimination Scale (Williams et al., 2008; Williams, Yu, Jackson, & Anderson, 1997). The expanded scale assesses discrimination experiences across 10 situations (e.g., being followed in stores). Participants indicate how often each situation has happened to them in their day-to-day lives with responses ranging from 1 "Never" to 4 "More than four times". It has demonstrated good internal consistency in factor analytic studies and concurrent validity (Krieger, Smith, Naishadham, Hartman, & Barbeau, 2005; Taylor, Kamarck, & Shiffman, 2004). Responses are summed to form a total score. The vast majority of participants reported experiencing at least one of these events ( $n = 208$ , 86.3%). Additional descriptive information is contained in Table 1.

## Demographic and Background Variables

Age, gender, country of origin, years in the U.S., education, English language proficiency, and income were assessed as demographic and background variables. English language proficiency was measured by a single question, "How well do you speak English?" There were four original response options which were later dichotomized into not well or not at all (0) and well or very well (1). Education was also measured by a single item, and responses were collapsed into three categories, less than high school education (0), high school graduate (1), and at least some college and/or technical training (2). Participants were asked if they were born in the U.S. (0) or outside the U.S. (1). If participants indicated they were born outside the U.S., a follow-up question assessed in which country participants were born. All items were translated by bilingual, bicultural research assistants for the purposes of this study. Descriptive information for each of these variables is contained in Table 1.

## Analytic Approach

In order to test hypothesized mediation and moderation, a series of structural equation models (SEM) were constructed. For these models, the following recommendations by Hu and Bentler (Hu & Bentler, 1999) were used to determine good model fit: CFI .95, SRMR .08 and RMSEA .06. The measure of  $\chi^2/df < 2$  was also used as an indicator of acceptable model fit. First, given the multiple factor structures used with the MFWSI and its relatively infrequent use in SEM, multiple measurement models were examined. In each model, items were individually loaded onto a single latent factor. The previously used five factor approach was examined first, but did not evidence good model fit<sup>2</sup>. Given the poor model fit and the lack of items directly referencing harsh working conditions while conducting migrant farmwork, a theoretically driven factor was examined. For this factor, items were selected based on whether they directly referenced working conditions (e.g., working in bad weather). Selected items were: "I have to work long hours," "I have to work in bad weather," "The conditions in the bathroom are bad," "Not enough water to drink

<sup>2</sup>Several alternate approaches to measuring the MFWSI were explored, including using a summative approach that has been typically used in analyses of this measure. None of the primary results involving the MFWSI changed (i.e., no differences in significance tests or tests of moderation). The CFA-based approach was therefore retained as the stressors included in the measure are likely best described as reflective of several forms of stressors, such as the poor working conditions explored here, rather than being an exhaustive and summative list. This also allows for better controlling of measurement error.

when working,” “Because of the physical nature of farmwork, I have health problems,” and “Because of farmwork, I do not have time to get things done outside of work”. These items were then tested using confirmatory factor analyses (CFA) with total item disaggregation (i.e., all items were loaded individually). Once an appropriate measurement model of the MFWSI was obtained, it was combined in a larger model consisting of an anxiety symptoms latent factor comprised of individual GAD-7 items and a depression symptoms latent factor consisting of individual CES-D items. All items were loaded individually (i.e., total disaggregation). This model was further refined by examining poorly loading items, modification indices and items with high standardized residual covariances (i.e., > 2.0) (Kenny, 2011). Such items were considered candidates for removal<sup>3</sup>.

Once an appropriate measurement model was determined for these three scales, two series of models were constructed. The first was a mediational model that examined hypotheses 1, 2, and 3 that ACEs, discrimination, and legal status fears would be associated with higher ratings of harsh working conditions, which would in turn predict depression and anxiety symptoms. This model also examined the extent to which legal status fears would predict exposure to discrimination. Alternate mediational models were also tested as a means of exploring alternate mediational structures (e.g., all mediational relations were iteratively reversed) and each provided poorer model fit than the model presented here. Figure 1 shows the final mediational model with all mediational paths. The second examined moderational hypotheses (Hypothesis 4) that tested the extent to which discrimination, ACEs, and legal status fears were associated with larger effects of harsh working conditions on depression and anxiety. The moderational model was constructed by iteratively testing interaction terms of ACEs, discrimination, and legal status fears with the harsh working conditions latent factor. Interactions were examined using the latent moderated structural equations approach described by Maslowsky et al (Maslowsky, Jager, & Hemken, 2015), which involves computing interactions from latent terms using random effects modeling. Interactions were examined iteratively in order to reduce model complexity and improve model convergence. Figure 2 shows the moderational model. Similar to recommendations by Maslowsky et al. (2015) all interactions were further explored by plotting simple slopes of the effect of harsh working conditions at high (one standard deviation above the mean) and low values (zero, for ACEs and discrimination) of all significant moderators (see Figure 3). In all models, gender, poverty, U.S. nativity, and English language proficiency were examined as control covariates. All analyses were completed using MPlus version 8.0.

Prior to examining these models, 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 non-significant ( $p > .05$ ), which suggested data were not significantly missing in a non-random fashion. Further, missing data were estimated using Full Information Maximum Likelihood, which appears to reduce biases resulting from missingness (Enders & Bandalos, 2001). Additionally, CES-D and GAD-7 items were both multivariate and univariate kurtotic. Analyses were conducted with GAD-7 and CES-D

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<sup>3</sup>.Analyses were completed with and without removing items from the latent measures examined here. No differences emerged in any of the significance tests completed. As such, the models with items removed, and therefore better model fit, were retained.

variables as linear and ordinal categorical. Results are presented for the linear results only because models with CES-D and GAD-7 as ordinal categorical variables consistently evidenced problems with model convergence and deriving appropriate solutions. Further, analyses were completed utilizing robust maximum likelihood, which has been shown to reduce biases associated with violations of normality (Li, 2016). Significance tests of indirect effects were also examined with MLR and bootstrapped confidence intervals with conventional maximum likelihood. All significance decisions and directions of effects remained the same across the two tests. We therefore present results with MLR. Table 4 contains a correlation matrix of all variables used in the mediation model.

## Results

### Measurement Models

The initial working conditions MFWSI model evidenced good model fit,  $\chi^2(9) = 19.58$ ,  $p = .021$ ,  $\chi^2/df = 2.18$ , CFI = .95, TLI = .92, RMSEA = .07 (90% CI, .03-.11), and SRMR = .05. Items 19 (“Not enough water to drink when working”) and 32 (“The conditions of the bathroom are bad”) emerged as candidates for removal as both evidenced factor loadings below .60 and had multiple standardized residual covariances greater than 2.0. These items were removed iteratively and each iteration improved the model fit. The final model evidenced good model fit,  $\chi^2(2) = 1.35$ ,  $p = .510$ ,  $\chi^2/df = 0.967$ , CFI > .99, TLI = 1.01, RMSEA < .01 (90% CI, <.01-.11), and SRMR = .01. Additionally, the measure appeared to retain its theoretical coherence with items focusing on different types of harsh working conditions: working in bad weather, having health problems because of the physical nature of the work, working long hours, and not having time for things outside of work because of the farmwork.

Using items from the CES-D and GAD-7, latent depression and anxiety factors were then added to the model with resulting harsh working conditions factor. The initial model evidenced good model fit across most measures,  $\chi^2(186) = 327.60$ ,  $p < .001$ ,  $\chi^2/df = 1.76$ , RMSEA = .06 (90% CI, .05-.07), and SRMR = .06, except for CFI (.90) and TLI (.89); however, both positive affect items (“I was hopeful about the future” and “I was happy”) were removed iteratively from the CES-D as they evidenced low loadings. The CES-D then contained only items from the negative affect factor. The resulting model evidenced improvement model fit with most indicators evidencing good model fit,  $\chi^2(149) = 234.24$ ,  $p < .001$ ,  $\chi^2/df = 1.57$ , RMSEA = .05 (90% CI, .04-.06), and SRMR = .05, and CFI (.94) and TLI (.93) nearing but not reaching criteria for good model fit. Additional modifications were explored and it appeared that the relation between the CES-D item related to loneliness (“I felt lonely”) and multiple MFWSI items that would theoretically result in social isolation (e.g., working long hours, not having time to do things outside of work, fearing deportation). Multiple approaches to resolving this were explored and the item was ultimately removed. The item related to restlessness on the GAD-7 (“Being so restless that it’s hard to sit still”) evidenced similar error covariances with items related to working long hours and was also removed. Finally, three residual covariances were added to the model due to items’ theoretical overlap that may not be adequately captured by the latent factors. This included covariances between the two MFWSI items referencing working long hours (MFWSI 2 and



7), two items from the CES-D and GAD-7 that reference intrusive thoughts (CES-D item 2 and GAD-7 item 2), and two items from the GAD-7 referencing cognitive symptoms (items 1 and 2). Following these changes, the model evidenced good fit across all measures,  $\chi^2(113) = 140.56, p = .040, \chi^2/df = 1.24, CFI = .97, TLI = .97, RMSEA = .03$  (90% CI, .01-.05), and SRMR = .04. However, because of the significant modifications to measures, analyses were completed with and without the above modifications to CES-D and GAD-7 items and without covariances between errors. None of the results testing hypotheses differed across the two models and the more refined model was retained and presented here.

### **Mediational Model: Testing Hypotheses 1, 2, and 3 with the Role of Harsh Working Conditions**

The full mediational model in which harsh working conditions were examined as mediators of the effects of discrimination, fears of deportation, and ACEs on depression and anxiety evidenced good model fit across all indicators,  $\chi^2(213) = 286.71, p = .001, \chi^2/df = 1.35, CFI = .95, TLI = .94, RMSEA = .04$  (90% CI = .03-.05), SRMR = .05. This model tested hypotheses 1, 2, and 3 that harsh working conditions would account for the effects discrimination, legal status fears, and ACEs, respectively.

**Predictors of Harsh Working Conditions.**—As a first step to testing Hypotheses 1, 2, and 3, we examined the specific paths predicting harsh working conditions. Immigration legal status fears ( $\beta = .27, p = .003$ ) and discrimination ( $\beta = .33, p < .001$ ) positively predicted migrant harsh working conditions, providing initial support for hypotheses 1 and 2; however, ACEs did not ( $\beta = .05, p = .536$ ). Results from the full mediation model are presented in Table 2.

**Predictors of Discrimination.**—As a second step to predicting Hypotheses 2 and 3, which stated that ACEs and legal status fears would predict discrimination we tested specific paths predicting discrimination, providing additional support for hypothesis 2. Immigration legal status fears ( $\beta = .17, p = .002$ ) and ACEs ( $\beta = .39, p < .001$ ) positively predicted experiences of discrimination. No other predictor of discrimination was significant ( $p$ -values  $< .05$ ). Results from the full mediation model are presented in Table 2.

**Predictors of Depression Symptoms.**—As a next step to testing mediation hypotheses, we tested the direct effects of harsh working conditions on depression symptoms, which was significant and in the expected direction for each of hypotheses 1, 2, and 3 ( $\beta = .59, p < .001$ ). Though not examined as part of identified hypotheses, the effect of ACEs on depression symptoms was also positive and significant ( $\beta = .33, p < .001$ ). Immigration legal status fears and discrimination did not significantly predict depression symptoms ( $p$ -values  $> .05$ ). None of the control covariates were significant ( $p$ -values  $> .05$ ). Results from the full mediation model are presented in Table 2.

**Predictors of Anxiety Symptoms.**—The direct effect of harsh working conditions on anxiety symptoms was also significant and in the expected direction as outlined in hypotheses 1, 2, and 3 ( $\beta = .39, p < .001$ ). Similar to results with depression, ACEs was the



only variable that evidenced a significant direct effect ( $\beta = .39, p < .001$ ). Results from the full mediation model are presented in Table 2.

**Mediational Paths to Depression and Anxiety Symptoms.**—As a final step to testing the mediation proposed in Hypotheses 1, 2, and 3, several indirect effects were examined indicating significant mediational paths. The sums of the indirect paths of ACEs, discrimination, and immigration legal status fears predicting depression and anxiety symptoms were all significant ( $p$ -values for all total indirect effects  $< .05$ ). That is the total amount of effects for each variable that was accounted for by other variables was significant. The individual indirect paths that make up each of these relations were examined next. First, in testing the single mediation path for Hypothesis 1 (that harsh working conditions would mediate the effect of discrimination), the indirect effects of harsh working conditions as a single mediator for depression ( $\beta = .19, p = .001$ ) and anxiety symptoms ( $\beta = .13, p = .001$ ) were significant and in the expected direction.

For the mediational paths testing Hypothesis 2, the indirect path examining harsh working conditions as a single mediator was significant in predicting depression ( $\beta = .16, p = .014$ ) and anxiety ( $\beta = .10, p = .014$ ) and in the expected direction. The indirect effect examining discrimination and harsh working conditions as double mediators were significant and in the expected direction predicting depression symptoms ( $\beta = .03, p = .024$ ) and anxiety symptoms ( $\beta = .02, p = .030$ ). The indirect effect examining discrimination as an individual mediator between immigration legal status fear and depression symptoms was not significant in predicting depression ( $\beta = .02, p = .198$ ) or anxiety symptoms ( $\beta = .02, p = .200$ ).

For the mediational paths testing hypothesis 3, the single indirect path with only harsh working conditions as a mediator was not significant in predicting depression or anxiety symptoms ( $p$ -values  $< .05$ ), but the double mediational path that examined the indirect pathway through both discrimination and harsh working conditions was significant in predicting both depression ( $\beta = .08, p = .003$ ) and anxiety symptoms ( $\beta = .05, p = .004$ ). The single indirect path with only discrimination was also not significant in predicting depression or anxiety symptoms ( $p$ -values  $< .05$ ). Therefore, only the double mediational path provided support for Hypothesis 3. Figure 1 shows the full mediational model.

**Testing Moderation.**—Portions of Hypothesis 4 (that ACEs, discrimination, and legal status fears would be associated with higher effects of harsh working conditions on depression and anxiety) were tested iteratively. The first random effects model testing moderation examined interactions involving discrimination. Specifically, the interaction between harsh working conditions and discrimination was significant in predicting depression symptoms ( $\beta = .22, p = .045$ ) and anxiety ( $\beta = .16, p = .045$ ), suggesting the effect of harsh working conditions was larger at higher levels of discrimination. The model examining interactions with immigration legal status fears suggested that legal status did not moderate the effect of harsh working conditions for either depression symptoms ( $\beta = .10, p = .187$ ) or anxiety ( $\beta = .05, p = .447$ ). Finally, the interactions involving ACEs also indicated that the interaction between harsh working conditions and ACEs was significant in predicting depression symptoms ( $\beta = .31, p = .001$ ) and anxiety ( $\beta = .20, p = .006$ ). Thus, Hypothesis 4 was only supported for ACEs and discrimination, but not legal status fears.

In probing significant interactions further, the effects of harsh working conditions on depression and anxiety symptoms remained significant and positive at all levels of discrimination and ACEs ( $p$ -values  $< .05$ ). The effects of harsh working conditions were larger at higher levels of discrimination or ACEs compared with lower levels. Results from simple effects testing are shown in Table 3. The effect of moderation on mediational paths was also examined. The indirect effect of discrimination on depression symptoms with harsh working conditions as a mediator was significant at low levels of discrimination ( $\beta = .15$ ,  $p = .003$ ) and was larger at higher levels of discrimination ( $\beta = .29$ ,  $p < .001$ ). The indirect effect of ACEs on depression or anxiety symptoms with harsh working conditions as a single mediator was not examined, given that ACEs did not significantly predict harsh working conditions. However, the double mediational relations in which both discrimination and harsh working conditions were mediators demonstrated a similar pattern. The indirect effect of the two mediators was significant and positive at low values of ACEs ( $\beta = .05$ ,  $p = .007$ ) and was larger at high values of ACEs ( $\beta = .11$ ,  $p < .001$ ). Figure 2 shows the moderational model and Figure 3 plots the effect of harsh working conditions at differing levels of ACEs and discrimination.

## Discussion

Using a learned helplessness framework, the current study examined the extent to which discrimination, immigration legal status fears, and adverse childhood experiences (ACEs) were related to higher exposure to and larger effects of harsh working conditions on depression and anxiety symptoms. Results largely supported our hypotheses. Hypothesis 1, which stated that harsh working conditions would account for the relations of discrimination with depression and anxiety symptoms, was fully supported. Hypothesis 2, which stated that discrimination and harsh working conditions would account for relations of immigration legal status fears with depression and anxiety symptoms, was also fully supported. Hypotheses 3 was only partially supported in that discrimination and harsh working conditions together accounted for parts of the relations of ACEs with depression and anxiety symptoms; however, neither harsh working conditions nor discrimination individually accounted for the relations of ACEs with depression and anxiety symptoms.

Hypothesis 4 also received partial support in that ACEs and discrimination were associated with stronger effects of harsh working conditions on depression and anxiety, but legal status fears were not. Still, the effect of harsh working conditions was significant at all levels of discrimination and ACEs. Taken together, these results largely suggest that ACEs, discrimination and immigration legal status fears may collectively enhance exposure to harsh working conditions and related stress, while ACEs and discrimination may enhance the effects of such exposure on depression and anxiety. Taken together, they provide preliminary support for learned helplessness hypotheses in the ways that these stressors may increase exposure to harsh working conditions and increase risk for its associated mental health consequences.

### **Learned Helplessness and the Effects of Harsh Working Conditions.**

The current findings add to prior work on harsh working conditions by demonstrating that the often-replicated effects of harsh working conditions on mental health outcomes appeared to be increased by the presence of other stressors common among this population. Migrant farmworkers are disproportionately exposed to stressors such as harsh working conditions, discrimination, and fears related to immigration legal status (Cristancho et al., 2008; Ramos, 2017). Our results suggest discrimination is an extremely common experience among migrant farmworkers with the vast majority (86.3%) reporting they had experienced at least one instance of discrimination. Though less common, a substantial minority reported fearing deportation or worries related to not having a permit to work in the US. Less work has examined the prevalence of ACEs among migrant farmworkers, but these results suggest similar prevalence among migrant farmworkers, given that prevalences of each ACE item and the ACEs sum were similar to prior US Latino samples (Slopen et al., 2016). Approximately two thirds of participants reported having experienced at least one ACE in their lifetime (66.3%).

Looking at the results using a learned helplessness framework, the highly common stressors experienced by migrant farmworkers might reduce their ability to make changes or escape from these harsh working environments due to fear of retribution. Though very preliminary, the inability to escape or make changes may in turn expose them to more harsh working conditions, increase stress associated with these experiences, and exacerbate negative mental health outcomes. Additional work is needed to longitudinally assess these findings and to more thoroughly examine potential mechanisms (e.g., locus of control and perceived ability to respond to working conditions) and the likely bidirectional relations between each of these outcomes (e.g., depression or anxiety symptoms likely enhance the subjective stress associated with harsh working conditions). Nevertheless, the current findings are concordant with prior qualitative work suggesting that immigration legal status fears may increase the effects of both discrimination and work-related stress due to the inability to respond to discrimination (Winkelman et al., 2013). It is noteworthy that the results were nearly identical with depression and anxiety symptoms. While a negative reporting bias could partially explain these results, it may also be that the learned helplessness mechanisms apply to both disorders. Further, the measurement approach here that prioritized distinguishing between depression and anxiety factors makes it unlikely that the mechanisms simply target overlapping symptoms. This is an important distinction given the significant work demonstrating the highly frequent co-development (Cohen, Andrews, Davis, & Rudolph, 2018) and co-occurrence of depression and anxiety disorders (Kessler et al., 2008). Thus, the persistent exposure to stress and subjective negative reactions to such stress could target overlapping mechanisms that produce distinct but related depression and anxiety symptoms (e.g., inability to escape may yield vigilance for such stressors, an anxiety symptom, and hopelessness regarding one's ability to overcome obstacles, a prototypical depression symptom).

Further, results specific to discrimination comport with prior work showing that discrimination lowers self-efficacy in responding to negative working conditions and in turn results in negative perceptions of the work environment and high degrees of work-related

stress (Heslin et al., 2012). A perhaps novel mechanism is that childhood adversity appears to indirectly predict harsh working conditions. Building on prior work suggesting that childhood adversity may increase awareness of others' negative emotions (Masten et al., 2008; Rauch et al., 2000), this may suggest that ACEs leads to greater awareness or perceptions of discrimination that then limit the perceived ability to respond to harsh working conditions. Finally, this work uses quantitative methodology to expand on prior qualitative work suggesting discrimination and legal status fears may be associated with greater exposure to harsh working conditions.

### Strengths and Limitations

While the study provides novel findings regarding the combinatorial relations among stressors common among migrant farmworkers, findings should be interpreted in the context of the study's limitations. The study used a convenience sample of migrant farmworkers from only a single region of the country. Thus, results may not generalize to other Latino migrant farmworker populations. Additionally, the use of correlational methodology within a single instance of measurement limits the extent to which direction of causal relations among stressors can be inferred, given that temporal precedence cannot be established. For example, while stressors may lead to greater depression or anxiety symptoms, depression in particular may be associated with both a negative reporting bias such that participants are more likely to recall negative events than participants stressful events leading to overreporting (Krackow & Rudolph, 2008; Liu & Alloy, 2010). Similarly, depression and perceived stress during negative events may operate bidirectionally. This explanation would largely fit the proposed learned helplessness framework, but cannot be tested with the current cross-sectional methodology. The measurement of harsh working conditions may also be limited, as the previously utilized factor structures for the MFWSI were not supported in confirmatory factor analyses with the current sample. While power was likely sufficient to estimate CFA models with a similar number of factors, items per factor, and missingness (Wolf, Harrington, Clark, & Miller, 2013), additional measure refinement is likely needed and may limit the current results. Additional work is needed to further validate appropriate factor structures for this measure among different samples of migrant farmworkers. Data were also significantly kurtotic and may also reduce confidence in the results, though several steps were taken to reduce potential biases associated with non-normality. These limitations, however, should also be weighed in the context of the study's strengths, including the distinct forms of stressors assessed and the use of trained interviewers to complete the questionnaire with workers thereby ensuring a better understanding of the questions. Additionally, the study utilized structural equation modeling to better account for potential measurement error in the constructs assessed, which is uncommon in studies of migrant farmworkers, a highly understudied Latino population.

### Conclusions

The current research is among the first to explore how stressors experienced by Latino migrant farmworkers may combine to predict deleterious mental health outcomes. These data largely support a learned helplessness framework in which stressors that limit farmworkers' ability to respond to or escape harsh working conditions increase their exposure to and the effects of such conditions. Given that migrant farmworkers are exposed

to many unique stressors that can lead to deleterious mental health outcomes and that they mainly reside in rural areas where access to healthcare services is limited, especially mental health services, such results can be used to inform prevention, intervention, and outreach efforts. These results show that discrimination and immigration legal status fears may lead to more injuries and health difficulties via the increased exposure to harsh working conditions. Thus, interventions may need to address perceived inability to respond to harsh conditions while being sensitive to the potential fears of retribution related to legal status and prior histories of discrimination. Such interventions may therefore be likely to improve health and wellbeing among this understudied population.

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**Public Significance Statement:**

This study suggests that harsh working conditions are associated with depression and anxiety among Latino migrant farmworkers. These working conditions also account for some of the effects of childhood adversity, discrimination, and legal status fears. Finally, childhood adversity and discrimination appear to enhance the negative effects of harsh working conditions on depression and anxiety.

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**Public Health Statement:**

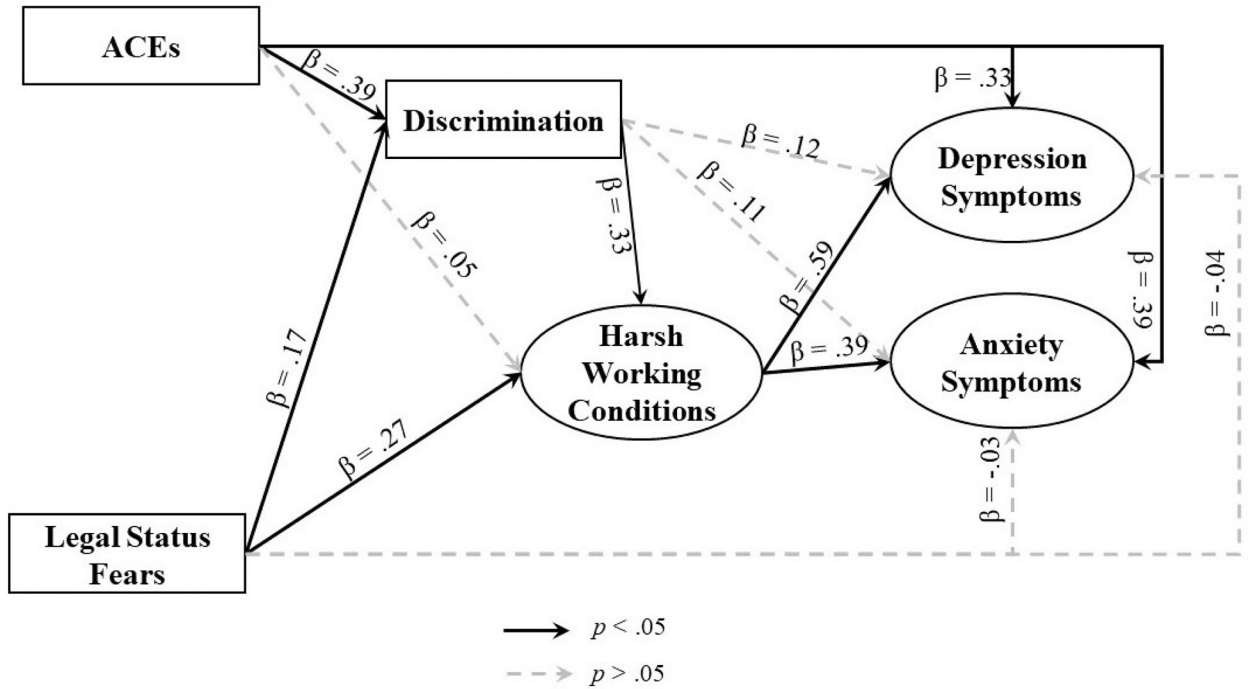
Experiences of discrimination and legal status fears are associated with greater exposure to harsh working conditions among Latino migrant farmworkers, a population that already experiences high risk of work-related injury. Childhood adversity and discrimination also appear to increase the effect of harsh working conditions on depression and anxiety symptoms.

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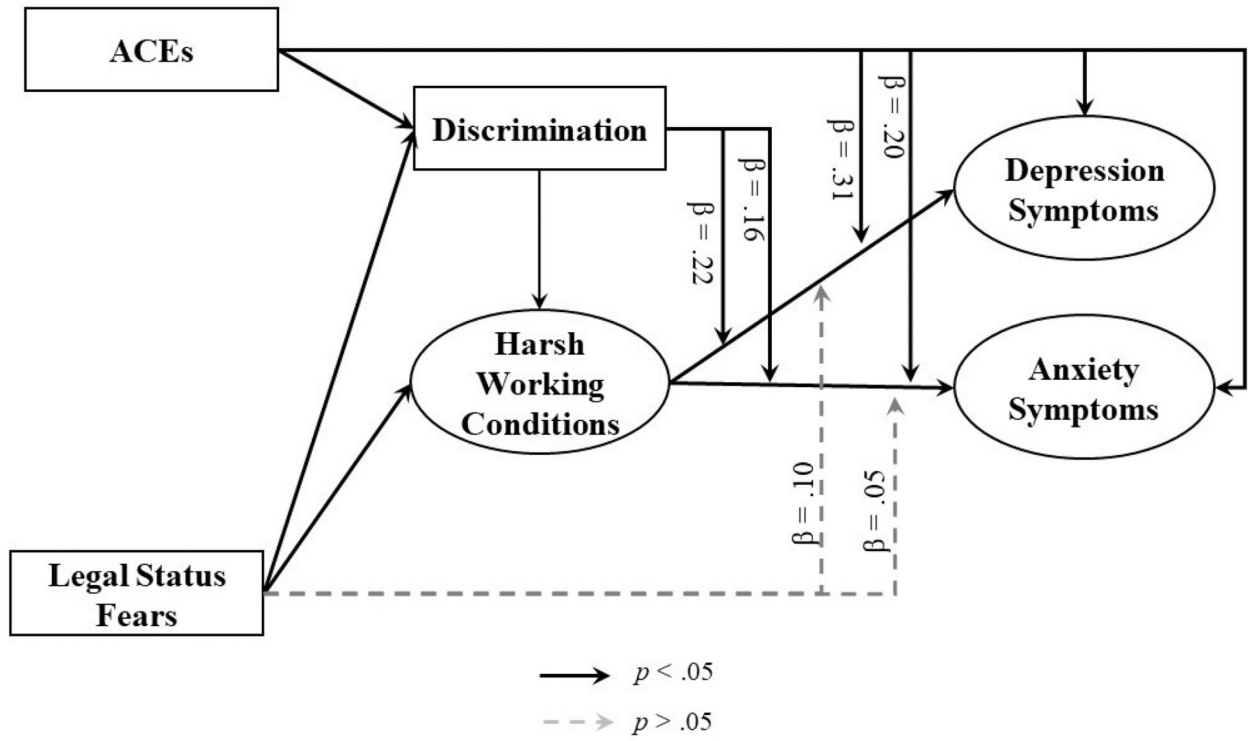
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**Figure 1.**

Model 1. Harsh Working Conditions as Mediator

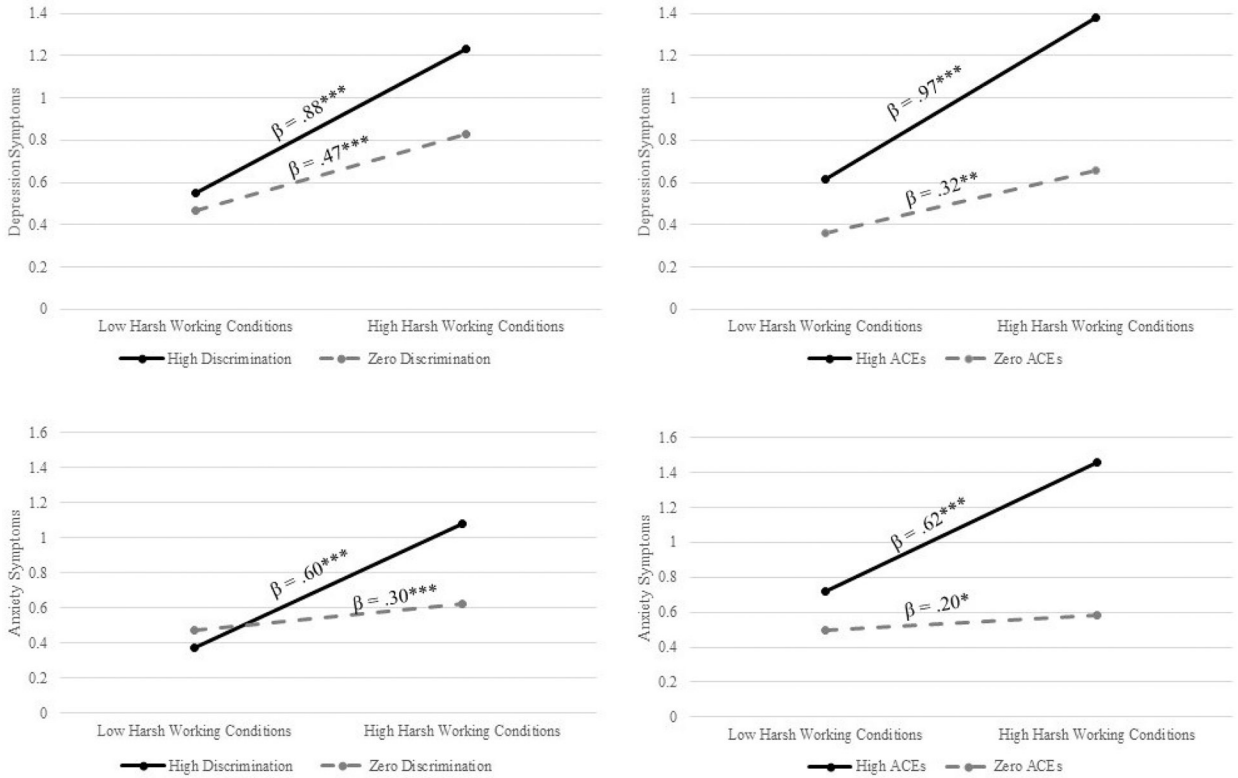
Note: All significant paths include significant mediational paths. Nativity, age, and gender were examined as covariates but were not significant predictors of any outcome variable and are not shown for simplicity. Harsh working conditions, anxiety, and depression were examined as latent variables but their measurement items are not shown for simplicity. Depression and anxiety symptoms were examined with latent factors that were revised from their initial factor structure. See Measurement Models for description of process of revising each structure.



**Figure 2.**

Model 2. Testing Moderation of the Effects of Harsh Working Conditions

Note: Moderational paths involving harsh working conditions were examined in separate models due to model complexity involved with examining multiple latent variable interactions. All significant paths include significant mediational paths at all tested levels of the moderators. Nativity, age, and gender were examined as covariates but were not significant predictors of any outcome variable and are not shown for simplicity. Harsh working conditions, anxiety, and depression were examined as latent variables but their measurement items are not shown for simplicity. Interactions were tested using interaction terms that are not shown in order to reduce figure complexity. Each interaction term was tested separately as a predictor of depression and anxiety symptoms using random effects modeling. Depression and anxiety symptoms were examined with latent factors that were revised from their initial factor structure. See Measurement Models for description of process of revising each structure.



**Figure 3.** Probing the Interaction Effects of ACEs and Discrimination with Harsh Working Conditions on Depression and Anxiety

Note: \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ . Effects were probed at one standard deviation above and below the mean of harsh working conditions. For discrimination and ACEs, effects were probed at one standard deviation above the mean and at the value of zero, since that was the lowest possible value for those measures. Interaction effects were also examined separately with random effects models. Depression and anxiety symptoms were examined with latent factors that were revised from their initial factor structure. See Measurement Models for description of process of revising each structure.



**Table 1.**  
Descriptive Information of Demographic and Study Variables

	<i>N or M</i>	<i>% or SD</i>	<i>Min-Max</i>
Gender			
Men	190	78.8%	
Women	51	21.2%	
Born outside US			
Yes	202	83.8%	
Mexico	196	81.3%	
Years in the US	12.78	13.81	0–49
Legal status fears (from MFWSI)			
Ever experienced fear of deportation	81	33.6%	
Ever worried about not having work permit	76	31.5%	
Sum of items related to legal status fears	2.17	0.86	
Met federal poverty guidelines *	212	89.8%	
Education			
Middle school or less	84	40.2%	
Some high school	86	35.7%	
High school graduate or GED	60	24.9%	
Some college or higher	11	4.6%	
Age	36.41	13.66	19–72
Any experience of discrimination	208	86.3%	
Frequency total from Everyday Discrimination Scale	5.89	6.79	0–30
Adverse childhood experiences (ACEs)			
Emotional abuse or threats from parent	49	20.3%	
Physical abuse by parent	72	29.9%	
Low familial support	64	26.6%	
Parental neglect of basic needs	50	20.8%	
Parental divorce before age 18	41	17.0%	
Witness domestic violence	37	15.4%	
Exposure to household members abusing alcohol/drugs	38	15.8%	
Household member mental illness	23	9.5%	
Household member incarceration	45	18.7%	
At least one ACEs	160	66.4%	
Participants with 4 or more ACEs	43	17.8%	
Average total ACEs	1.74	1.95	0–9
Sum of harsh working conditions items (MFWSI)	6.17	4.30	0–19
Depression negative affect symptom total (CES-D) *	4.27	4.72	0–21
Anxiety symptom total (GAD-7)	3.54	4.85	0–21

Note:

\* Only negative affect items were used for analyses (two positive affect items were removed), as this appeared to present the best factor structure in the current study and fit results from previous studies with Latinx populations. Five participants did not report their income and this total is taken

from the 236 who did report income. CES-D – Centers for Epidemiological Studies Depression scale. GAD-7 – seven-item Generalized Anxiety Disorder scale. MFWSI – Migrant Farmworker Stress Inventory

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**Table 2.** Results from Mediation Model with Harsh Working Conditions and Discrimination Included

	Discrimin.			Harsh Work. Cond.			Dep. Symp.			Anx. Symp.		
	$\beta$	<i>b</i> (SE)	<i>p</i>	$\beta$	<i>b</i> (SE)	<i>p</i>	$\beta$	<i>b</i> (SE)	<i>p</i>	$\beta$	<i>b</i> (SE)	<i>p</i>
Gender	.03	.41 (1.22)	.735	.15	.24 (.14)	.071	.10	.09 (.07)	.174	.10	.14 (.10)	.174
Age	<.01	<.01 (.03)	.942	.12	.01 (<.01)	.151	.01	<.01 (<.01)	.864	-.08	01 (<.01)	.247
Born outside US	-.08	-1.47 (1.59)	.355	.01	.01 (.16)	.958	-.07	-.07 (.06)	.258	-.08	.13 (.10)	.190
ACEs	.39	1.36 (.25)	<.001	.05	.02 (.03)	.536	.33	.07 (.02)	<.001	.39	12 (.02)	<.001
Legal status fears	.17	.42 (.13)	.002	.27	.06 (.02)	.003	-.04	-.01 (.01)	.492	.03	.01 (.01)	.573
Discrim.	N/A	N/A	N/A	.33	.03 (.01)	<.001	.12	.01 (.01)	.138	.11	.01 (.01)	.136
Harsh work. Cond.	N/A	N/A	N/A	N/A	N/A	N/A	.59	.34 (.09)	<.001	.39	34 (.09)	<.001

Note: Discrimin. – Discrimination, Harsh Work. Cond. – Harsh Working Conditions, Dep. Symp. – Depression Symptoms, Anx.

Symp. – Anxiety Symptoms. Depression and anxiety symptoms were examined with latent factors that were revised from their initial factor structure. See Measurement Models for description of process of revising each structure.

**Table 3.**

## Tests of Interactions of Stressors on Depression and Anxiety Symptoms

	Depression			Anxiety		
	$\beta$	<i>b</i> (SE)	<i>p</i>	$\beta$	<i>b</i> (SE)	<i>p</i>
Working conditions by ACEs	.31	.09 (.03)	.001	.20	.09 (.03)	.009
Working conditions by legal status fears	.10	.02 (.02)	.187	.05	.02 (.02)	.447
Working conditions by discrimination	.22	.02 (.01)	.002	.16	.02 (.01)	.044
Probing simple effects of working conditions						
High ACEs	.97	.54 (.12)	<.001	.62	.52 (.13)	<.001
Low ACEs	.32	.22 (.07)	.002	.20	.22 (.08)	.010
High discrimination	.88	.48 (.11)	<.001	.60	.51 (.13)	<.001
Low discrimination	.47	.29 (.08)	<.001	.30	.30 (.10)	<.001

Note: Interaction terms were assessed in separate models using random modeling techniques that allow for testing interactions with latent variables. ACEs and discrimination were probed at one standard deviation above the mean (high values) and at a value of zero (low values). Depression and anxiety symptoms were examined with latent factors that were revised from their initial factor structure. See Measurement Models for description of process of revising each structure.

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Table 4.

Correlation Matrix of Variables Included in Final Mediation Model.

	MFWSI2	MFWSI4	MFWSI7	MFWSI21	CES-D 1	CES-D 2	CES-D 3	CES-D 4	CES-D 6	CES-D 7	CES-D 10	GAD-7 Item 1	GAD-7 Item 2	GAD-7 Item 3	GAD-7 Item 4	GAD-7 Item 5	GAD-7 Item 6	Discrimination	ACEs	Legal Status Fears	Age	Gender	Born outside US		
MFWSI2																									
MFWSI4	.24**																								
MFWSI7	.49**	.38**																							
MFWSI21	.35**	.33**	.53**																						
CES-D 1	.25**	.20**	.26**	.23**																					
CES-D 2	.25**	.19**	.24**	.30**	.36**																				
CES-D 3	.24**	.32**	.35**	.28**	.44**	.49**																			
CES-D 4	.21**	.28**	.33**	.40**	.31**	.29**	.45**																		
CES-D 6	.22**	.40**	.29**	.32**	.26**	.32**	.29**	.29**																	
CES-D 7	.28**	.29**	.31**	.39**	.34**	.48**	.45**	.42**	.51**																
CES-D 10	.24**	.27**	.29**	.22**	.27**	.31**	.42**	.35**	.25**	.30**															
GAD-7 Item 1	.17**	.17**	.26**	.26**	.45**	.50**	.45**	.38**	.42**	.49**	.33**														
GAD-7 Item 2	.18**	.22**	.25**	.32**	.41**	.59**	.54**	.39**	.37**	.51**	.31**	.73**													
GAD-7 Item 3	.28**	.26**	.31**	.31**	.49**	.47**	.54**	.38**	.39**	.50**	.33**	.64**	.69**												
GAD-7 Item 4	.24**	.18**	.26**	.34**	.41**	.47**	.47**	.41**	.33**	.55**	.34**	.61**	.59**	.60**											
GAD-7 Item 5	.29**	.19**	.27**	.25**	.41**	.30**	.39**	.32**	.30**	.47**	.37**	.46**	.49**	.51**	.57**										
GAD-7 Item 6	.15*	.33**	.21**	.21**	.35**	.41**	.41**	.29**	.43**	.39**	.34**	.50**	.45**	.43**	.51**	.38**									
Discrimination	.25**	.010	.34**	.29**	.30**	.30**	.35**	.31**	.24**	.40**	.29**	.33**	.31**	.42**	.39**	.34**	.28**								
ACEs	.12	.19**	.15*	.17*	.38**	.27**	.38**	.31**	.29**	.44**	.29**	.41**	.36**	.51**	.47**	.42**	.38**	.49**							
Legal Status Fears	.10	.20**	.20	.23**	.11	.07	.06	.08	.18**	.03	.05	.15*	.08	.14*	.06	-.01	.13*	.06							
Age	.09	.21**	0.06	.13*	-.01	.15*	.12	-.05	.10	.12	-.07	<.01	.05	-.04	-.02	-.07	.10	.01	.17**						
Gender	.12	.11	.15*	.08	.04	.27**	.20**	.08	.12	.25**	.28**	.13*	.20**	.21**	.27**	.20**	.08	.11	.19**	-.17*	.13*				
Born outside US	.02	.02	-.01	.04	-.11	-.04	-.08	-.15*	-.04	-.21**	-.23**	-.10	-.11	-.17**	-.26**	-.23**	-.13	-.18**	-.27**	.39**	.28**	-.21**	-.21**		

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	MFWSI2	MFWSI4	MFWSI7	MFWSI21	CES-D 1	CES-D 2	CES-D 3	CES-D 4	CES-D 6	CES-D 7	CES-D 10	GAD-7 Item 1	GAD-7 Item 2	GAD-7 Item 3	GAD-7 Item 4	GAD-7 Item 5	GAD-7 Item 6	Discrimination	ACEs	Legal Status Fears	Age	Gender	Born outside US
English proficiency	-.04	-.02	.01	.04	.11	.08	.12	.15*	.03	.26**	.22**	.18**	.20**	.19**	.25**	.22**	.10	.19**	.27**	-.34**	-.19**	.31**	-.70**

Note: All correlations are Pearson coefficients with raw, unestimated data.

\*  $p < .05$ ,

\*\*  $p < .01$