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Neighborhood Hispanic composition and depressive symptoms among Mexican-descent residents of Texas City, Texas

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Abstract

Substantial research shows that increased Hispanic neighborhood concentration is associated with several beneficial health outcomes including lower adult mortality, better self-rated health, and fewer respiratory problems. Literature on the relationship of Hispanic composition and depressive symptoms is more equivocal. In addition, few studies have directly investigated hypothesized mechanisms of this relationship. This study uses data from a probability sample of 1,238 Mexican-descent adults living in 48 neighborhoods in Texas City, Texas. Multilevel regression models investigate whether Hispanic neighborhood composition is associated with fewer depressive symptoms. This study also investigates whether social support, perceived discrimination, and perceived stress mediate or moderate the relationship, and whether results differ by primary language used at home. We find that individuals living in high Hispanic composition neighborhoods experience fewer depressive symptoms than individuals in low Hispanic composition neighborhoods. In addition, we find that these beneficial effects only apply to respondents who speak English. Social support, perceived discrimination, and perceived stress mediate the Hispanic composition-depressive symptoms relationship. In addition, discrimination and stress moderate the relationship between Hispanic composition and depressive symptoms. Our findings support theories linking higher neighborhood Hispanic composition and better mental health, and suggest that Spanish language use, social support, discrimination and stress may play important roles in the Hispanic composition-depressive symptoms relationship.

Keywords

USA; Hispanic; Depressive symptoms; Neighborhood ethnic composition; Social support; Discrimination; Stress; Spanish language

Introduction

Substantial research demonstrates that neighborhood social context contributes to the development of health disparities (Diez Roux & Mair, 2010; Sampson et al., 2002). In particular, concentrated disadvantage is associated with poor social, physical and mental health outcomes, and contributes to health disparities among racial and ethnic groups (Franzini et al., 2005; Ross, 2000; Subramanian et al., 2005). Concentrated disadvantage

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frequently clusters with contextual risk factors including social and physical disorder, residential turnover, and single parent households (Sampson et al., 2002). Spatial overlap of structural risk compounds the negative outcomes associated with these factors (Diez Roux & Mair, 2010).

Concentrated disadvantage is also associated with racial concentration (Massey et al., 1991); however, the health effects of racial concentration vary by race and ethnicity. For example, African American residential concentration is associated with increased rates of poor outcomes such as mortality and infectious disease (Acevedo-Garcia, 2000; Polednak, 2010). In contrast, Hispanic residential concentration is associated with improvements in respiratory problems, mortality, cancer, self-rated health and birth outcomes despite similarly low socioeconomic status and educational attainment (Cagney et al., 2007; Eschbach et al., 2005; Eschbach et al., 2004; Hummer et al., 2007).

An increasing number of studies investigate mechanisms linking Hispanic neighborhood composition and better health (Almeida et al., 2009; Osypuk et al., 2009; Vega et al., 2011; Viruell-Fuentes, 2007; Viruell-Fuentes & Schulz, 2009) though few have directly tested the mediating or moderating role of hypothesized mechanisms (Kwag et al., 2012; Rios et al., 2012). This study contributes to this literature by investigating the role of social support, discrimination and stress in the relationship between neighborhood Hispanic composition and depressive symptoms.

Factors underlying Hispanic concentration

The complexity of ethnic concentration effects on Hispanic health likely reflects the complexity of the sources of Hispanic self-segregation. Hispanic residential segregation reflects both historical and contemporary processes of discrimination, exclusion and avoidance (Telles & Ortiz, 2008) as well as voluntary self-segregation that emerges as part of the process of chain migration (Portes & Zhou, 1993). While residential patterns of any racial and ethnic group derive in part from voluntary choices and external barriers, the balance of these influences was very different in the settlement history of African Americans and Mexican Americans in the United States (Massey & Mullen, 1984).

The diverse roots of Mexican American residential concentration lead to uncertain expectations about its effects. Discrimination, isolation and concentration of economic disadvantage may create barriers to social mobility and concentrate the impact of multiple stressors, just as they do for African Americans. However, concentrated Hispanic neighborhoods, even when poor, exhibit evidence of stable social organization, including high rates of residential stability, employment, two-parent households, and home and car ownership (Moore & Pinderhughes, 1993; Moore, 1989).

The complex origins of Hispanic concentration are reflected in the divergent findings of studies on neighborhood Hispanic composition and depressive symptoms. Some studies report fewer depressive symptoms for Hispanic residents (Gerst et al., 2011; Kwag et al., 2012; Mair et al., 2010; Ostir et al., 2003; Vega et al., 2011) while, others find no change (Aneshensel et al., 2007; Rios et al., 2012; Wight et al., 2011) and others show significant positive change (Lee, 2009) in depressive symptoms. Differences in sample composition by nativity, national origin, linguistic isolation, and region may explain the inconsistency. The effect of ethnic composition on health may vary by nativity and national origin (Finch et al., 2007; Lee & Ferraro, 2007) or by region due to variations in sociopolitical context and Hispanic health (Sundquist & Winkleby, 2000).

Hypotheses about mediators of Hispanic concentration effects

Exposure to stress, discrimination and social support are important risk factors for depressive symptoms (Berkman & Glass, 2000; Finch et al., 2000; Kessler, 1997; Cook et al., 2009). If exposure to these factors varies with neighborhood Hispanic composition, then they may mediate the Hispanic composition-depressive symptoms relationship. Here, we consider evidence and hypotheses on mediators and moderators of the ethnic composition effect on mental health.

Social support

Access to social support improves mental health (Berkman & Glass, 2000). Ethnic homogeneity may increase social support by increasing neighborhood solidarity, trust and local social ties (Bledsoe et al, 1995). Dense social networks in Hispanic neighborhoods provide members with instrumental, financial and emotional support (Espinosa & Massey, 1997). Hispanic cultural patterns of reciprocal exchange (Almeida et al., 2009) further increases the likelihood of support networks in Hispanic enclaves.

Stress

Living in a neighborhood of high Hispanic composition may reduce exposure to stressful experiences. Disadvantaged Hispanic neighborhoods exhibit relatively high social organization, as already described. Ethnically homogenous neighborhoods also frequently share language and social norms (Diwan, 2008; Portes and Zhou, 1993). These factors increase neighborhood stability and provide residents with financial and social resources, which may reduce exposure to stressful experiences in the neighborhood (Cassel, 1976; Carpiano, 2006; Diwan, 2008).

Discrimination

Discrimination plays a leading role in producing health disparities (Krieger, 2000; Viruell-Fuentes, 2007) including mental health (Finch et al., 2000; Finch et al., 2001; Umaña-Taylor & Updegraff, 2007). Perceived racism varies with neighborhood demographics (Dailey et al., 2010), and Hispanic concentration may reduce exposure to discriminatory experiences (Viruell-Fuentes, 2007). Ethnographic accounts of Mexican women's experiences in a diverse community highlight discriminatory experiences (Viruell-Fuentes, 2007). Low experience of discrimination in high percentage Hispanic neighborhoods could reduce depressive symptoms in those neighborhoods.

Hypotheses about moderators of Hispanic concentration effects

Social support, stress, and discrimination

Social support, stress and discrimination may also moderate the effect of Hispanic composition on depressive symptoms. That is, the effect of composition on depressive symptoms may be larger for individuals with lower social support, or higher stress, or higher experience of discrimination. For example, neighborhood solidarity in Hispanic neighborhoods could buffer against low support or high stress and discrimination by providing a sense of connection and ethnic pride despite the absence of supportive ties (Umaña-Taylor & Updegraff, 2007; Viruell-Fuentes & Schulz, 2009). Increased local social ties in Hispanic neighborhoods may buffer the effects of neighborhood disorder on depressive symptoms (Ross & Jang, 2000). Individuals who have experienced ethnic discrimination may perceive neighbors in co-ethnic neighborhoods to be more understanding than neighbors in ethnically diverse settings. Thus, Hispanic concentration may influence depressive symptoms, not by changing the distribution of stress, discrimination and social support, but by ameliorating their depressive effects.

Nativity and language

The effect of ethnic concentration on depressive symptoms may vary by nativity and by linguistic acculturation (Vega et al., 2011). The direction of these effects is uncertain. Hispanic concentration may buffer challenges in the migration experience by increasing access to co-ethnic ties (Finch et al., 2007; Portes & Zhou, 1993). Alternatively, instrumental assistance in immigrant networks may not depend on spatial proximity (Aguilera, 1999; Espinosa & Massey, 1997). For U.S.-born Hispanics, Hispanic concentration may mitigate acculturation stress by reinforcing a sense of ethnic identity and pride (Umaña-Taylor & Updegraff, 2007; Viruell-Fuentes & Schulz, 2009). Alternatively, for U.S.-born Hispanics, residence in ethnic enclaves may impact perceived social status and reflect limited social mobility (Burnam et al., 1987; Franzini & Fernandez-Esquer, 2006). However, Cook et al (2009) found that change in social status did not predict risk of psychiatric disorder among Hispanic adults.

Use of Spanish language is an alternative marker of assimilation and acculturation. (Waters & Jiménez, 2005). Linguistic isolation may protect against the risk-enhancing effects of time in the US for both immigrants and U.S.-born Hispanics (Finch et al., 2000).

Summary of hypotheses

From this review, we generated four hypotheses about the relationship between Hispanic neighborhood composition, mediators, moderators, and depressive symptomology, in a crosssectional dataset in a mixed native and immigrant Mexican-descent population in Texas:

H1: Higher neighborhood Hispanic composition will be associated with fewer depressive symptoms than lower neighborhood Hispanic composition.

H2: Social support, perceived discrimination, and perceived stress will mediate the effect of neighborhood Hispanic composition on number of depressive symptoms.

H3: The relationship between Hispanic composition and depressive symptoms will vary by Spanish language use.

H4: Social support, perceived discrimination, and perceived stress will moderate the effect of neighborhood Hispanic composition on number of depressive symptoms.

METHODS

Data

Data are from the Hispanic subjects in the 2004 baseline of the Texas City Stress and Health Study (TCSHS). The TCSHS was designed to assess neighborhood social and environmental effects among individuals with high exposure to petrochemical processing in Texas City, Texas. The data include a large sample of Mexican- and US-born Mexican-descent individuals age 25 and over. This study includes only U.S.-born and Mexican-born Hispanics of Mexican-descent (n=1,238).

Data collection has been described in detail in prior work (Cutchin et al., 2011). Eligible subjects were identified through a listing of all household units in 12-square mile area encompassing around 75% of the city's population. Following enumeration, stratified sampling based on age and race/ethnicity proceeded in 3 strata: Hispanics ages 25 – 64 years old, Hispanics ages 65 years or more, and non-Hispanics (not used in this study). All Hispanic housing units were eligible to participate. In each Hispanic household, one Hispanic adult between the ages of 25 and 64 and all Hispanic adults age 65 years or more

were selected for interview. Researchers obtained informed consent from all participants prior to home-based interviews (82% response rate at baseline; 80% of eligible subjects consented).

Neighborhood-level data were generated by matching US Census 2000 block level data with TCSHS neighborhood boundaries. Neighborhood boundaries (n=48) were defined by the socio-spatial neighborhood estimation method (SNEM), which incorporates 1) street patterns, 2) residential patterns including housing types and densities, 3) nonresidential land use, 4) landforms including barriers to passage and interaction, and 5) geographic spread (Cutchin et al., 2011).

Measures

The primary outcome of interest is number of *depressive symptoms*, measured by the Center for Epidemiologic Studies Depression Revised scale (CES-DR) ($\alpha = 0.92$) (Fogel et al., 2006; Van Dam & Earleywine, 2011). In this scale, higher scores suggest more depressive symptoms (Radloff, 1977). The CES-DR shows good validity when compared to similar anxiety and affect scales (Watson et al., 1988). The CED-DR was transformed to its natural log due to positive skew (Cole et al., 2000). The CES-DR has occasionally shown minimal non-equivalence by ethnicity in cross-ethnic samples; however, risk of misclassification is small, particularly for Mexican-descent persons (Crockett et al., 2005).

Neighborhood Hispanic composition is measured as the percentage of Hispanic people in the neighborhood based on US Census 2000 data, in 6 groups (≤16%; >16% to ≤20%; >20% to ≤25%; >25% to ≤35%; >35% to ≤45%; >45%) (reference: level 1, ≤16%). (We used Hispanic composition as a close proxy for Mexican-descent composition because of its availability in block data, and hence use the more general term.) Socioeconomic disadvantage is measured by *median house value*, using data from the 2005 Galveston County Central Appraisal District Geographic Information System parcel data file. Residential stability is measured as neighborhood *percent owner* from the Census.

Social support is measured with the Social Support Survey from the Medical Outcomes Study (Sherbourne & Stewart, 1991). The survey addresses four support domains—emotional, tangible, affectionate, and positive social interaction—as well as an overall index. The overall scale and subscales demonstrate high reliability ($\alpha = 0.97$ and $\alpha > 0.90$, respectively) (Sherbourne & Stewart, 1991), and has been used with samples of multiple races and ethnicities (Costa Requena et al., 2007; Yu et al., 2004). We combine the four subscales (range: 0–100), where higher values indicate higher levels of support.

The *Perceived Stress Scale* (PSS) is a 10-item scale (range: 1–40) measuring the degree to which life situations are considered stressful. Higher scores on the PSS indicate higher levels of perceived stress. The full scale has high reliability ($\alpha = 0.85$) and good validity (Cohen et al., 1994) and is appropriate for use in Hispanic samples (Flores et al., 2008). We dichotomized at the mean to address negative skew.

Perceived discrimination (PD) is composed of 3 items—feeling unaccepted, been treated unfairly, and seen others treated unfairly due to being Spanish or Hispanic. The first item was developed in-house while the latter two items ($\alpha = 0.76$) came from an existing scale (Finch et al., 2001) developed in a Mexican-descent sample. The full three-item scale has good reliability in this sample ($\alpha = 0.72$). A summary scale was generated in which higher scores reflect higher levels of perceived discrimination (1–4) and then dichotomized (1/2+) due to positive skew.

Spanish language. Spanish language is dichotomized as use or no use of Spanish language. Using Spanish language refers to using mostly/only Spanish in the home; not using Spanish language refers to using mostly/only English or both English and Spanish in the home. The high correlation of Spanish language and foreign-birth in the sample made it impossible to estimate effects of each adjusted for the other. Thirty percent of the sample was foreign-born, including 85% of the primary Spanish language users. In unreported models, immigrant status showed similar relationships with depressive symptoms, percent Hispanic, and the pathway variables. We chose to employ Spanish language use as the theoretically more-robust indicator of the relevant characteristics shared by foreign-born and Spanish speaking U.S. native populations (Vega et al, 2011).

Multivariable models include individual-level covariates: age (years), gender, marital status (married or unmarried), education (< high school, high school, > high school), and annual income. We used and two domains of stressors: a self-reported count of major stressful life events (0–30 coded as 0, 1, or 2+) and chronic conditions (0–6: stroke, cancer, diabetes, hypertension, arthritis, heart attack coded as 0, 1, or 2+). Annual income is coded as low (< $25,000), middle ($25,000 to $49,999), high (>$50,000), and missing (n=144).

Analysis

Descriptive statistics reporting the distribution and central tendencies of variables and covariates were calculated using SAS 9.2 software. All models were estimated using two-level random-coefficient regression models in HLM 6, in which the level-1 equation estimates the effect of individual-level factors on depressive symptoms, and the level-2 equations estimate the contribution of neighborhood-level factors on the individual-level intercept and coefficients.

We first estimate three bivariate regressions (discussed but not shown) and three multilevel models (Table 2) to assess whether social support, discrimination or stress mediate the effect of percent Hispanic on depressive symptoms. To investigate whether these variables moderate the effect of percent Hispanic on depressive symptoms, we add the pathway variables and their interaction with percent Hispanic, and add interaction terms of percent Hispanic and Spanish language (Tables 3 and 4).

We assessed spatial autocorrelation using OpenGeoDa to estimate the Moran's I statistic. Spatial autocorrelation was determined to be insufficient to bias analyses (Moran's I = 0.165) and a spatial dependency term was not included in the models.

RESULTS

Sample characteristics are presented in Table 1 for all explanatory variables and covariates. The mean depressive symptoms score is 8.5 (standard deviation=12.4) and the majority of subjects live in a neighborhood composed of between 15 and 45% Hispanic. Just under one-quarter of the sample predominantly use Spanish inside the home (23.1%). On average, Mexican-born subjects have lived in the U.S. for just over 20 years (standard deviation: 14.9).

Hypothesis 1: Effect of percent Hispanic on depressive symptoms

Table 2 shows the results of the models examining the effect of percent Hispanic on depressive symptoms. Higher percent Hispanic is associated with lower depressive symptoms score while adjusting for individual- and neighborhood-level controls (Model 2), as hypothesized. While the relationship is monotonic, only the highest percent Hispanic level compared with the lowest is significantly associated with lower depressive symptoms

score. Model 2 also shows that Spanish language is associated with fewer depressive symptoms, paralleling previous reports of the effect of acculturation on depressive symptoms (Ortega et al., 2000).

Hypothesis 2: Mediation by social support, discrimination and stress

Models 3a, b, and c (Table 2) serially add social support, perceived discrimination and perceived stress to Model 2. Each variable has a significant effect on depressive symptoms in the expected direction; greater social support is associated with fewer depressive symptoms while greater perceived discrimination and stress are associated with more depressive symptoms. Each variable removes the significance of the contrast between high and low categories of percent Hispanic reported in Model 2.

Hypothesis 3: Effect of percent Hispanic on depressive symptoms by Spanish language use

Model 4 (Table 3) shows a weak interaction between Spanish language and high neighborhood percent Hispanic, with adjustment for individual- and neighborhood-level covariates except the pathway variables. In stratified analyses (Table 4), highest neighborhood percent Hispanic is significantly associated with reduced depressive symptoms for English speakers, only. In contrast, percent Hispanic exhibits no significant relationship with depressive symptom for Spanish speakers.

Hypothesis 4: Moderation by social support, discrimination and stress

Discrimination exhibits a significant interaction with high percent Hispanic compared to low percent Hispanic ($\beta=-0.5$, $p\leq 0.05$) (Table 3, Model 5). Stratified analyses show that only respondents with high discrimination exhibit a protective effect of highest (>45%) versus lowest (≤16%) percent Hispanic on depressive symptoms ($\beta=-0.83$, $p<0.01$).

A similar pattern emerges for stress. In the parameterization reported, there is no significant interaction between stress and Hispanic composition. However, in supplementary analyses, the interaction of stress and a continuous measure of percent Hispanic approaches significance ($\beta=-0.01$, $p<0.06$). In the stratified analyses (Table 4), only respondents reporting high levels of stress exhibit a protective effect of neighborhood Hispanic composition on depressive symptoms ($\beta=-0.56$, $p\leq 0.05$). Neighborhood Hispanic composition is not significantly associated with depressive symptoms among respondents with low levels of stress.

The interaction of social support and percent Hispanic is not significant and results are not shown.

Discussion

This study explores the relationship between neighborhood Hispanic composition and depressive symptoms for Mexican-descent residents with attention to three factors—social support, discrimination, and stress—as mediators and moderators of the composition-depressive symptoms relationship. We find that increased Hispanic composition significantly reduces depressive symptoms. These findings are concordant with theories linking increased neighborhood Hispanic composition and decreased depressive symptoms. Specifically, we find an advantage among residents living in neighborhoods of very high compared to very low Hispanic composition.

We also find that the effect of neighborhood Hispanic composition depends on several individual characteristics—language spoken at home and level of discrimination and stress.

Finally, this study shows that the protective effect of high neighborhood Hispanic composition is mediated by higher levels of social support and lower levels of discrimination and stress.

The interaction between primary language use is particularly important in view of evidence that acculturation may be accompanied by increased stress among immigrants and their descendants. Possible sources of this stress include negative perceived social status and discrimination. Acculturation can inspire internal and external conflict that may manifest as stress, anxiety, depression or substance abuse (Burnam et al., 1987; Ortega et al., 2000). English fluency may also raise expectations about social mobility, which can cause strain for individuals unable to move out of low income neighborhoods (Burnam et al., 1987; Cook et al., 2009). Finally, acculturation and generational status is associated with increased discrimination (Finch et al., 2000).

Living in a neighborhood of high Hispanic composition may buffer against these stressors by reinforcing a sense of identity and ethnic pride (Umaña-Taylor & Updegraff, 2007; Viruell-Fuentes & Schulz, 2009). Our results parallel one recent study in which neighborhood linguistic isolation protected against depressive symptoms for long-term migrants and US-born Hispanics only (Vega et al., 2011).

Spanish speakers appear to receive less benefit of high Hispanic composition. Speaking Spanish—as a measure of and barrier to acculturation (Waters & Jiménez, 2005)— may itself protect against depressive symptoms thereby dulling the effect of high Hispanic composition. A similar pattern with respect to acculturation and generational status has been observed for outcomes such as adult and adolescent behaviors (Acevedo-Garcia et al., 2005; Upchurch et al., 2001). Alternatively, language barriers may limit the extent to which Spanish speakers can interact with neighbors resulting in fewer supportive relationships or lower access to health-promoting information (Vega et al., 2011). In this way, speaking Spanish may limit the benefits individuals can gain from high Hispanic composition neighborhoods.

Social support, stress and discrimination each mediate the protective effect of Hispanic neighborhood concentration in these data. These findings suggest that residents of high Hispanic composition neighborhoods have increased social support, but decreased stress and discriminatory experiences compared to low Hispanic composition neighborhoods. Increased social support may come directly from co-ethnic neighborhood ties (Schweizer et al., 1998) or through neighborhood ties to extra-neighborhood support. At the same time, ethnic homogeneity may promote the *perception* of support through increased neighborhood solidarity and trust (Bledsoe et al., 1995). Alternatively, neighborhoods of high Hispanic composition may attract individuals with preexisting social support such as immigrants who frequently migrate through existing co-ethnic networks.

Stress mediates the effect of Hispanic composition, as well. Sources of reduced stress in high Hispanic composition neighborhoods include increased residential stability, high employment, two-parent households, and home and car ownership (Moore & Pinderhughes, 1993; Moore, 1989). Such stability provides residents with financial and social resources that can reduce stress (Cassel, 1976). Hispanic neighborhoods may also increase alignment between individual and neighborhood social norms and language, and reduce the stress associated with acculturation and migration (Diwan, 2008; Portes & Zhou, 1993).

Finally, mediation by discrimination suggests that residents of high Hispanic composition neighborhoods may experience lower rates of discrimination than residents of low Hispanic composition neighborhoods. These findings are supported by ethnographic work with

Mexican-descent women in Detroit (Viruell-Fuentes, 2007). Previous research has demonstrated that levels of discrimination vary by neighborhood demographics (Dailey et al., 2010), and discrimination has clear negative effects on mental health (Finch et al., 2000).

Several limitations must be acknowledged. First, Hispanic composition has been substituted for Mexican-descent composition due to census limitations at the block level. This substitution is unlikely to have prompted spurious findings because the majority of Hispanic Texas City residents are of Mexican-descent.

Second, results do not account for possible differences in reporting or expression of depressive symptoms. Individuals with a Hispanic cultural orientation may express psychological distress through somatic complaints rather than mood (Angel & Guarnaccia, 1989). In addition, issues of mistranslation can lead to systematic bias (Viruell-Fuentes et al., 2011). Reporting issues could contribute to observed differences in results by language use. However, somatization and mistranslation likely do not impact our findings given cross-cultural validity of the CES-D.

Third, issues of selection and residential mobility cannot be addressed in this study and are common challenges to neighborhood effects research (Diez Roux, 2004). Selection into Hispanic neighborhoods based on characteristics associated with depressive symptoms could confound study findings. Similarly, inability to move out of the neighborhood could confound findings if mobility is associated with depressive symptoms. These are valid limitations that future research should attempt to mitigate.

Other factors not tested here may contribute to the Hispanic composition-depressive symptoms relationship. For example, access to help-seeking avenues or increased resources utilization could mediate the effect. However, Hispanic individuals tend to address problems through informal avenues for issues like employment and housing (Aguilera, 1999; Espinosa & Massey, 1997), emotional support (Viruell-Fuentes & Schulz, 2009), and general problem solving (Kim & McKenry, 1998). Furthermore, neighborhoods of high ethnic concentration frequently correlate with deprivation of formal resources (Diez Roux & Mair, 2010). These factors, therefore, are unlikely mediators.

Finally, it is important to note that the experiences of Mexican-descent individuals in Texas City, Texas do not necessarily mirror those in other parts of the US. Mexicans are disproportionately concentrated in the southwest (Ennis et al., 2011), and there is a long history of Hispanic migration to the region. Many large Hispanic immigrant-based neighborhoods are well-established and offer residents the advantages of strong co-ethnic social organization such as Hispanic social and employment networks, grocery stores, small businesses, and other informal services (Moore & Pinderhughes, 1993; Small & McDermott, 2006). As a result, the characteristics of Hispanic neighborhoods in the Houston area may differ substantially from other regions.

In sum, this study finds that higher neighborhood Hispanic composition is associated with fewer depressive symptoms for Mexican-descent individuals in Texas City, Texas. Social support, discrimination and stress mediate the effect. In addition, Hispanic composition buffers the effects of high stress and discrimination on depressive symptoms. Finally, the advantages are observed among English-speaking respondents only. Our findings suggest that community life in ethnically homogenous neighborhoods carries important implications for individual well-being among Mexican-descent residents. Future research should focus on understanding pathways between Hispanic composition and mental health, which would allow health researchers and policy makers to tailor outreach programs to local dynamics and social structures. Understanding why Hispanic homogeneity supports health may offer insight into health promotion in non-Hispanic communities, as well. Such research would

move us towards an understanding of community and individual well-being that would transcend race and ethnicity, a possibility that carries important implications for preventive medicine and community health.

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Research Highlights

- Hispanic composition is related to fewer depressive symptoms for Hispanic residents
- These benefits extend to individuals who speak English, only
- Social support, stress and discrimination mediate the Hispanic composition effect
- Stress and discrimination moderate the Hispanic composition effect

Table 1

Descriptive analysis: individual- and neighborhood level variables of Mexican-descent individuals from the Texas City Stress and Health Study, (n=1,238)

Variable		Percentage or Mean
Female (%)		42.7
Age (yrs) (mean, SD)		46.4 (15.2)
Education (% dist)		
	Less than high school	51.2
	High school	26.3
	More than high school	22.4
Income (% dist)		
	Low	39.7
	Middle	30.7
	High	19.0
	Missing	11.6
Spanish language (%)		23.1
Married (% dist)		61.3
Life events (mean, SD)		
	None	36.6
	Low	20.3
	High	43.1
Chronic conditions (mean, SD)		
	None	50.7
	Low	25.5
	High	23.2
Discrimination (%) (Ref: never/sometimes)		
	Often/Always	24.0
Support (%) (Ref: low)		
	High	65.7
Perceived Stress (%)		
	Low	27.3
	Moderate	46.1
	High	26.6
Depressive symptoms (mean, SD)		8.5 (12.4)
Percent Hispanic (%)		
	≤16%	10.3
	>16 to ≤20%	14.6
	>20 to ≤25%	16.5
	>25 to ≤35%	29.2
	>35 to ≤45%	19.7
	>45%	9.8
Median House Value		

Variable		Percentage or Mean
	Mean, Range ($)	55,920.0 (12,490–160,310)
Percent Owner		
	Mean, Range (%)	62.3, (0–100)

Table 2

Standardized coefficients from hierarchical multilinear regression of depressive symptoms on individual- and neighborhood-level covariates from the Texas City Stress and Health Study (n=1,238)

	1	2	3a	3b	3c
Intercept	0.52**	0.6**	0.83**	0.51**	0.43**
Level 1					
Female	0.37**	0.36**	0.39**	0.37**	0.24**
Age (yrs)	−0.01**	−0.01**	−0.01**	−0.01**	−0.01*
Education (Ref: high)					
Low	0.24**	0.24**	0.22**	0.25**	0.13
Moderate	0.03	0.04	0.03	0.04	0.05
Income (Ref: high)					
Low	0.38**	0.39**	0.35**	0.41**	0.20*
Moderate	0.05	0.07	0.03	0.08	−0.01
Missing	−0.10	−0.06	−0.04	−0.04	−0.08
Married	−0.14*	−0.14*	−0.09	−0.12	−0.10
Spanish language	−0.21**	−0.19*	−0.18*	−0.19*	−0.12
Life events (Ref: none)					
Low	0.21*	0.21*	0.23**	0.22**	0.20**
High	0.80**	0.80**	0.80**	0.75**	0.61**
Physical health (ref: none)					
Low	0.23*	0.23*	0.20	0.22*	0.20*
High	0.59**	0.59**	0.57**	0.57**	0.53**
Social Support			−0.38**		
Discrimination (Ref: never/sometimes)					
Often/Always				0.34**	
Stress (Ref: low)					
High					1.10**
Level 2					

	1	2	3a	3b	3c
% Hispanic (ref:<=16%)					
>16 <=20%		0.04	0.04	0.04	−0.14
>20 <=25%		−0.08	−0.06	−0.10	−0.23
>25 <=35%		−0.14	−0.12	−0.13	−0.24
<35 <=45%		−0.14	−0.07	−0.14	−0.27
>45%		−0.30*	−0.25	−0.26	−0.26
Residential stability		−0.08	−0.1	−0.1	0.06
Median house value		0	0	0	0
σ^2_e	1.329	1.329	1.295	1.302	0.989
$\sigma^2_{intercept}$	0.006	0.007	0.011	0.007	0.021
$\sigma^2_{social\ support}$			0.014		
$\sigma^2_{discrimination}$				0.019	
$\sigma^2_{stress\ -\ moderate}$					0.078
$\sigma^2_{stress\ -\ high}$					0.071

*p≤0.05,

**p≤0.01

Table 3

Multilevel regression of depressive symptoms on percent Hispanic interactions with discrimination and Spanish language use, Texas City Stress and Health Study (n=1,238)

	Model 4	Model 5
% Hispanic (ref: <16%)	Spanish language	Discrimination
>16<=20%	0.45	−0.19
>20<=25%	0.22	−0.42
>25<=35%	0.11	−0.24
>35<=45%	0.29	−0.14
>45%	0.42 €	−0.50**

Models adjust for all individual- and neighborhood-level variables from Model 3

€ p=0.065

** p<0.01

Table 4

Effect of Percent Hispanic on depressive symptoms stratified by high and low discrimination, high and low stress, and Spanish or English language use, Texas City Stress and Health Study (n=1,238)

% Hispanic (ref: <16%)	Discrimination		Stress		Spanish language	
	High	Low	High	Low	Spanish	English
>16<=20%	−0.08	0.09	0.14	−0.38	0.61	−0.01
>20<=25%	−0.40	0.02	−0.27	−0.23	0.36	−0.12
>25<=35%	−0.39	−0.05	−0.19	−0.29	0.30	−0.14
>35<=45%	−0.38	−0.05	−0.25	−0.29	0.40	−0.21*
>45%	−0.83**	−0.13	−0.56*	−0.09	0.34	−0.40*

Models adjust for all individual- and neighborhood-level variables from Model 3

* p<0.05

** p<0.01