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# Social and Gender Inequalities in Depressive Symptoms Among Urban Older Adults of Latin America and the Caribbean

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***Objectives.*** This study examined gender differences in depression by examining differential exposure and vulnerability to socioeconomic factors during the life course.

***Methods.*** The data used for the analyses originated from a cross-national survey of older adults living in seven large Latin American cities. We examined associations between depressive symptomatology and socioeconomic conditions and health indicators in childhood, adulthood, and old age. We used the Geriatric Depression Scale to classify respondents with high levels of depressive symptoms.

***Results.*** The prevalence of depression in the urban population of Latin America was relatively low, ranging across cities from 0.4 to 5.2% in men and from 0.3 to 9.5% in women. Women were more exposed to social and material disadvantages during their life course than men but were not more vulnerable to them than men. Current socioeconomic conditions and health status as well as functional disabilities mainly accounted for gender differences in the prevalence of depression. Additionally, poor health and hunger during childhood, as well as illiteracy or lack of education, were associated with depression in both men and women.

***Discussion.*** Cumulative life course exposure to social and material disadvantage and current material, social, and health conditions explain the higher frequency of depression in women.

STUDIES over the past decades have widely documented the higher prevalence of depression in women across life stages and ethnic groups in relation to men (Ustun, Ayuso-Mateos, Chatterji, Mathers, & Murray, 2004). Although a gender gap in depression is rapidly established during puberty, its magnitude decreases from early adulthood to late life due to the growing vulnerability of aging men to health conditions such as chronic diseases and to social changes (i.e., retirement and bereavement; Beekman et al., 1997; van Grootheest, Beekman, Broese van Groenou, & Deeg, 1999). Furthermore, it seems that the amplitude of the gender gap varies depending on the context. Indeed, in more egalitarian societies, where economic security is not a major concern, the gender gap in the prevalence of depression among elderly adults is 1.6 to 1 (Minicuci, Maggi, Pavan, Enzi, & Crepaldi, 2002; Sonnenberg, Beekman, Deeg, & van Tilburg, 2000; Takkinen et al., 2004). In less egalitarian societies, however, gender differences in depressive symptoms at older ages resemble those observed in early life (Romero, Ortiz, Finley, Wayne, & Lindeman, 2005; Zunzunegui, Beland, Llacer, & Leon, 1998), with an overall ratio of depression of 2:1 (women:men).

## *Life Course and Mental Health*

Studies have revealed that the association between social conditions and mental health may be established early in life and reinforced during the life course (Gilman, Kawachi, Fitzmaurice, & Buka, 2002; Grundy & Sloggett, 2003; Hambleton et al., 2005; Muntaner, Eaton, Miech, & O'Campo, 2004; Stansfeld, Head, Fuhrer, Wardle, & Cattell, 2003). Until now, findings concerning the association between social conditions in childhood and depression in adults have been controversial (Gilman et al., 2002; Harper et al., 2002; Pearlin, Schieman, Fazio, & Meersman, 2005), and researchers know little about the effects of social conditions on depression later in life. Life course studies have shown that low socioeconomic status in childhood may increase the risk of depression not only because of its effect on psychological development, early onset of depression (Gilman et al., 2002; Krause, 1999; Wickrama, Conger, & Abraham, 2005), and adverse physical health (Weinreb et al., 2002), but also because of cumulative disadvantage (i.e., low levels of education, unemployment, poor living arrangements, and low income; Dahl & Birkelund, 1997; Grundy & Sloggett, 2003). Experiencing poor health during childhood may affect occupational mobility and labor market participation, as people who are less healthy are at higher risk of unemployment, and this may be directly related to a greater risk of suffering chronic conditions and poor mental health (Tausig, 1999).

Education provides a route to higher status, well-paid occupations, and, therefore, accumulated wealth and higher

pensions in later life (Bosma, Schrijvers, & Mackenbach, 1999; Singh-Manoux, Clarke, & Marmot, 2002). Lower education is associated with early onset of depression and high risk of depression throughout adult life (Miech, Eaton, & Brennan, 2005). Low educational level has also been associated with a high prevalence of depressive symptoms in later life (Minicuci et al., 2002; Romero et al., 2005; Zunzunegui et al., 1998). Evidence reviewed by Tausig (1999) demonstrated a relationship between class-related occupation, job characteristics, and mental health. Later in life, current material conditions appear to be strong predictors of depression (Chi et al., 2005). The effect of current material conditions on elders' health may reflect early life exposures (Hatch, 2005) or material or social resources that can be used to deal with and adapt to a current health problem (e.g., access to health services and health insurance coverage, greater social participation; Wallace & Gutierrez, 2005).

The stress paradigm can be used to conceptualize the relationships between social conditions and mental health (R. J. Turner & Lloyd, 1999). Most exposures and vulnerabilities are linked to life course experiences (Pearlin et al., 2005; Pearlin & Skaff, 1996). People exposed to severe economic conditions in early life and who have low educational attainment tend to report irregular employment histories, more work pressure, less autonomy and control at work, and more occupational stressors, which have a negative effect on their well-being (Krause, 1999; Pearlin et al., 2005). Disadvantageous socioeconomic situations in adulthood, in turn, are at the root of economic strains that are likely to have cumulative effects on the organism and its biological functions (Lehman, Taylor, Kiefe, & Seeman, 2005; Seeman et al., 2004). With age, there is an increase in exposure to health and economic problems, as well as in vulnerability to them (Pearlin & Skaff, 1996); older people in a lower social position appear to be highly vulnerable to those stressors (Bisschop, Kriegsman, Deeg, Beekman, & van Tilburg, 2004; Chi et al., 2005).

### *Gender Explanations*

Studies have also shown that socioeconomic conditions are major causes of the gender differences observed in late-life depression (Minicuci et al., 2002; Romero et al., 2005; Sonnenberg et al., 2000; Zunzunegui et al., 1998). Scholars have offered two nonexclusive explanations to explain how social factors relate to gender differences in health: the *differential exposure* hypothesis and the *differential vulnerability* hypothesis (Walters, McDonough, & Strohschein, 2002). According to the differential exposure hypothesis, women's higher prevalence of depression results from (a) more frequent exposure to cumulative social and economic disadvantage as a consequence of different structural locations compared to men: lower levels of education, lower income, less skilled occupations, poverty, greater likelihood of widowhood and financial difficulties during their retirement years (Arber, 1997; Miech et al., 2005; Mirowsky, 1996; Mirowsky & Ross, 2001, 2002; Prus & Gee, 2003; Takkinen et al., 2004); and (b) greater exposure to lifetime stressors because of their higher levels of demands and obligations and less availability of resources to cope with them (Kessler & McLeod, 1984; J. R. Turner & Avison, 1987); these lifetime stressors include economic insecurity, social isolation, and the presence of chronic conditions and disability (Elliott, 2001; Moos, Schutte, Bernnan, & Moos, 2005; Schoevers, Geerlings, et al., 2000; Takkinen et al., 2004). According to the differential vulnerability hypothesis, the greater prevalence of depression observed in women is due to the stronger impact of socioeconomic position, social relations, and chronic stressors on the physical and mental health of women compared to men (Denton & Walters, 1999; Prus & Gee, 2003; Rieker & Bird, 2005).

Researchers have tested the differential exposure and the differential vulnerability hypotheses in studies of gender differences in mental health among young and middle-aged populations. The differential exposure hypothesis (Elliott, 2001) and the differential vulnerability hypothesis (Denton & Walters, 1999; McDonough & Walters, 2001) have explained gender differences in depression. Among older adults from four European countries and Israel, gender differences in depression were related both to differential exposure and to vulnerability (Zunzunegui et al., 2007).

In summary, researchers can explain gender differences in mental health by (a) following a life course approach, because gender determines the nature of social exposures and protective factors for mental health during infancy, childhood, adolescence, and adult life (Moen & Chermack, 2005); and (b) using the stress paradigm to explain how gender and social conditions increase social stress acting on mental health (Pearlin et al., 2005).

### *Current Research*

The lack of harmonized measurements of social conditions have hampered cross-cultural studies in life course epidemiology. In particular, a range of valid socioeconomic indicators throughout the life course is needed to assist in the study of gender differences in mental health in later life (Arber, 1997; Dahl & Birkelund, 1997; Grundy & Holt, 2001; von dem Knesebeck, Luschen, Cockerham, & Siegrist, 2003). Here, we used data from a cross-national study of urban noninstitutionalized older adults aged 60 and older obtained from five Latin American and two Caribbean cities between 1999 and 2000 (Albala et al., 2005). This study, due to the homogeneity in the measurement of social circumstances and health status throughout the life course, offers an opportunity to examine gender differences in depression from a life course perspective.

The population in Latin America and the Caribbean (LAC) is aging faster than the North American and European populations. In this region of the world, population aging coincides with the increasing social inequalities, poverty, unemployment, violence, and malnutrition that have arisen after a period of structural adjustment and the dismantling of the incipient welfare state in the 1990s (Pinzon & Solas, 2002). Two recent surveys have provided information on LAC elders: the SABE study (*Salud Bienestar y Envejecimiento*; Pelaez et al., 2004) and the Integrated Response of Health Care Systems to Rapid Population Ageing–World Health Organization (2001) study. According to SABE, older women are less educated than older men, are not encouraged to be socially or economically independent during their lives, and are more likely than men to work in domestic services (Pinzon & Solas, 2002). Among the elderly population, women are less likely to have salaried or self-employment income than men; among those receiving income, women receive smaller amounts (James, Cox, & Wong,

Table 1. Mean and Prevalence of Depressive Symptoms in Seven SABE Cities[a]

| City | *M* (*SD*) | | | Score 6–10 (%) | | Score ≥11 (%) | | |
|---|---|---|---|---|---|---|---|---|
| | Women | Men | Diff | Women | Men | Women | Men | Missing |
| Buenos Aires | 2.80 (2.98) | 2.31 (2.59) | 0.495* | 13.3 | 9.7 | 3.2* | 2.1 | 78 (7.5%) |
| Bridgetown | 1.88 (1.82) | 1.82 (1.93) | 0.059 | 4.6 | 5.4 | 0.3 | 0.4 | 36 (2.4%) |
| Havana | 3.65 (3.63) | 2.14 (2.73) | 1.520* | 20.6 | 11.4 | 6.7* | 1.9 | 191 (10.0%) |
| Mexico City | 3.40 (3.43) | 2.58 (2.78) | 0.816* | 15.4 | 13.4 | 6.2* | 1.6 | 45 (3.6%) |
| Montevideo | 3.26 (3.33) | 2.44 (2.80) | 0.926* | 17.9 | 9.2 | 5.0* | 3.4 | 30 (2.1%) |
| Santiago | 4.31 (3.79) | 3.38 (3.23) | 0.923* | 20.6 | 14.4 | 9.5* | 5.2 | 48 (3.7%) |
| Sao Paulo | 3.47 (3.22) | 2.64 (2.72) | 0.836* | 18.9 | 11.9 | 4.9* | 2.2 | 313 (14.6%) |

*Notes*: SABE = Project *Salud Bienestar y Envejecimiento*; *SD* = standard deviation.
[a]Weighted data for descriptive measures.
*$p < .05$ (not weighted) for differences betweeen women and men.

2003). According to SABE, in Argentina, Chile, and Uruguay, noncontributory old-age pensions vary between US$120 and $331 per month, whereas contributory pensions cover less than one fifth of elderly women and half of elderly men (Pinzon et al., 2002). In the English-speaking Caribbean countries, social security contributory pensions cover less than one third of the elderly population (Planning Institute of Jamaica, 2005), and old-age pensions are nonexistent or amount to no more than US$50 per month (Economic Commission for Latin America and the Caribbean, 2003). Most elderly men and women are economically dependent on their children and extended family (Camejo, 1999; Eldermire-Shearer, 2005). Chronic diseases, functional limitations, and disabilities occur more frequently among older women than among older men in LAC cities (Al Snih, Ray, & Markides, 2006; Reyes-Ortiz, Al Snih, & Markides, 2005; Reyes-Ortiz, Ostir, Pelaez, & Ottenbacher, 2006; Wong, Pelaez, & Palloni, 2005). Descriptions of the health status of older populations in Buenos Aires, Santiago, and Montevideo indicate that women experience more depressive symptoms than men (Zunzunegui et al., 2002).

### *Hypotheses*

This article addresses gender differences in depressive symptoms in older LAC populations. We hypothesized that LAC women would be more prone than men to depressive symptoms, given their life-long history of exposure to social and material deprivation and poor health (Ferranti, Perry, & Ferreira, 2003; Palloni, Pinto-Aguirre, & Pelaez, 2002) and their greater vulnerability to these factors. We tested this hypothesis by answering the following research questions: What are the differences in depressive symptoms between older women and older men living in LAC cities? Are these differences explained by differential exposure to childhood or adult socioeconomic circumstances, current material and social resources, or health risk factors? Does differential vulnerability to material, social, and health risk factors account for such differences?

## Methods

### *Study Population*

The SABE project is a multicentric cross-sectional study that surveyed 10,661 men and women aged 60 and older from the following seven LAC cities during 1999/2000: Buenos Aires, Argentina ($n = 1,043$); Bridgetown, Barbados ($n = 1,508$); Sao Paulo, Brazil ($n = 2,143$); Santiago, Chile ($n = 1,301$); Havana, Cuba ($n = 1,905$); Mexico City, Mexico ($n = 1,311$); and Montevideo, Uruguay ($n = 1,450$; Albala et al., 2005). The main purpose of the SABE survey was to study the health and the well-being of older people in LAC countries. SABE was coordinated by a team of researchers from Pan American Health Organization, the Center for Demography and Ecology at the University of Wisconsin–Madison, and a corresponding team of local principal investigators in each country (Wong, Pelaez, Palloni, & Markides, 2006). With the exception of Barbados and Chile, the samples were all multistage, stratified, clustered samples (see details in Wong et al., 2006). Study organizers modeled the SABE questionnaire after various instruments used in other studies (Wong et al., 2006). All cities participating in SABE adhered to a protocol whereby the target persons were interviewed only if they were shown to be cognitively able. In cases where the person could not respond directly to a specially designed short cognition instrument, a proxy was selected, and a special instrument was applied. Response rates ranged from 95.3% in Cuba to 62.5% in Argentina. Researchers carried out assisted interviews in 1.1% of cases in Montevideo, 3.8% in Buenos Aires, 4.3% in Bridgetown, 5.9% in Mexico City, 9.0% in Havana, 9.2% in Santiago, and 12.9% in Sao Paulo. Data from Bridgetown were not analyzed because only 4 elders experienced symptoms fulfilling the definition of depression (Table 1). The analyses were performed on the 84% ($n = 7,649$) of the sample that had complete data.

### *Measures*

*Depression.*—Study organizers used the Geriatric Depression Scale (GDS) to assess the presence of depressive symptoms. The scale contains 15 items consisting of questions with dichotomous yes/no responses that are assigned a value of 0 or 1 (see Appendix). A response with a value of 1 is considered positive for depressive symptoms. We used a diagnostic approach (classifying older men and women as severely depressed according to a cutoff point) as opposed to a psychological distress approach (using the score as a continuous variable) for purposes of interpretation, comparability with other studies, and estimation of the magnitude of gender differences. The GDS-15 is a well-known instrument for use with older adults, although the recommended cutoff point varies among populations (Almeida & Almeida, 1999;

Fountoulakis et al., 1999; Martinez de la Iglesia et al., 2005; Paradela, Lourenco, & Veras, 2005; Robison, Gruman, Gaztambide, & Blank, 2002). We chose a cutoff of 10/11 to increase specificity and, consequently, to reduce misclassification bias (Rothman & Greenland, 1998). Respondents with a score of 11 or more on the GDS-15 are considered likely to be severely depressed, according to the *International Classification of Diseases*-10th revision (Almeida & Almeida, 1999).

*Material and social conditions.*—Organizers assessed socioeconomic conditions during childhood by asking the following questions: During the fist 15 years of your life, (a) did you live in a rural area for 5 years or more? (yes/no); (b) what was your family's economic situation? (good/average/poor); (c) would you say that your health was excellent, good, or poor? (excellent/good/poor); (d) was there a time when you did not have enough to eat and were hungry? (yes/no).

We defined adult socioeconomic status by (a) level of education, measured by asking the respondent the highest level of schooling he or she had completed, which was then further classified into four categories according to each country's school system; and (b) life-long occupation, which was recorded according to the International Standard Classification of Occupations (ISCO-88). We further sorted life-long occupation into five categories: (a) white collar (members of executive branch, business management, scientific and intellectual professionals, and mid-level technical personnel and professionals), (b) blue collar (office employees, service workers, and salespersons involved in trade and commerce), (c) semi- and unskilled workers (office workers, artisans in the mechanical arts and other types of arts, machine and equipment operators, unskilled workers, members of the armed forces), (d) housewives, and (e) farm workers. Because there were no differences between the more extended categories, we collapsed the variables educational level and life-long occupation, respectively, into two general categories: no schooling (illiterate, no formal education) versus other (some primary and more); and nonmanual (white collar, blue collar) versus manual (semiskilled, unskilled, farmers). We initially examined the housewife category separately and then included it in the manual worker category, as we found no differences in terms of prevalence of depressive symptoms, as well as in childhood socioeconomic conditions or education, among housewives as compared to women in the manual category.

We used perceived sufficiency of income and source of income as indicators of current material resources. Perceived income was self-reported as sufficient or insufficient. The principal sources of income were current paid work, retirement income or pension, assistance from family inside the country, assistance from family outside the country, private income or savings, and social welfare. For this analysis, we classified the principal source of income into two categories: income from paid work or retirement pension, and income from all other sources. Because the young-old were more likely than the older old to be in paid jobs, we adjusted all analyses for age.

We categorized marital status in two groups: presence of a partner or absence of a partner.

*Health and functional status.*—Chronic conditions (hypertension, diabetes, cancer, hip fracture, stroke, cardiovascular diseases, arthritis) were assessed by self-report. We dichotomized comorbidity as none or one chronic condition versus two or more.

Functional status was assessed via lower body functional limitations and difficulty or inability to perform basic activities of daily living (ADLs) or instrumental activities of daily living (IADLs). We considered participants to have lower body functional limitations if they experienced difficulty walking 100 yards (or one block in the Spanish version) or climbing one flight of stairs (or one floor in the Spanish version; Guralnik, Ferrucci, Simonsick, Salive, & Wallace, 1995).

IADL disability assessment in SABE included eight activities: managing money, shopping, using the telephone, taking medications, using transportation, preparing meals, doing light housework, and doing heavy housework. For this article, we excluded three items due to a gender-biased response: More men than women stated that they never prepared meals, or never did light or heavy housework. For each of these activities, perceived difficulty was asked as follows: no difficulty, with difficulty, cannot do it, and do not do it. For people who answered that they did not do a task, we performed an imputation using information on cognitive function ($n = 2{,}822$). Individuals with cognitive impairment according to the definition used in the SABE protocol (Pelaez et al., 2004) were classified as "with difficulty or unable to perform the task," and those without cognitive impairment were classified as "no difficulty." We categorized the remaining participants as 0 (no difficulty) and 1 (with difficulty or unable to do it). Lastly, we dichotomized IADL disability as having difficulty/being unable to perform at least one task versus no having difficulty.

Basic ADL disability was assessed via six activities: bathing, toileting, dressing, walking across the room, eating, and getting out of bed. The response categories describe whether the respondent performed the activities with or without difficulty. We summed items involving activities performed with difficulty (range 0–6) and then dichotomized the responses as having difficulty with at least one activity versus having no difficulty.

### *Missing Data*

Missing values in items of the GDS affected 1,408 interviewees. In order to reduce misclassification in the dichotomous response (i.e., to avoid classifying some people with missing data as not depressed because they did not respond to more than one item), we imputed missing values as follows: (a) If one item was missing, the missing value was assigned the value of 0 ($n = 1{,}556$); (b) if two or three items were missing, 1 point was added to the total score ($n = 743$); (c) if four or more items were missing, the person was excluded from the analysis ($n = 705$); this included those who needed a proxy. We based this decision on an analysis of missing data that showed that missing only one item was more likely to be a negative response (+0) than a positive one (+1). Missing two or more items was more likely to occur in those classified as depressive rather than nondepressive based on the data available for the other items. In the imputation of missing items, 10 persons initially classified as not depressed moved to the depressed category. For the overall questionnaire, the variables with the highest percentages of missing data were lower body limitations

(3.0%), occupation (1.7%), and receiving a pension or income from paid work (1.0%). Data on childhood social circumstances and health status, education, and health variables were missing in less than 1% of cases.

### *Statistical Analysis*

We investigated the distribution of depression, social, and health variables by gender within each city using a chi-square test (Tables 1 and 2). For the GDS-15 scores, we used general linear models to compare depressive symptoms among cities by gender (Table 1). We used logistic regression to examine the age-adjusted association between social and material conditions and health factors, and depression within each city. We assessed the homogeneity/nonhomogeneity of each multivariate coefficient (effect of each factor separately on depression, adjusted for age) across countries following Dyer's approach (Dyer, 1986; Noale et al., 2005).

After determining homogeneity/nonhomogeneity effects, we fit the logistic models as follows: (a) gender and age, (b) childhood social circumstances, (c) adult socioeconomic position, (d) current material and social circumstances, and (e) health and functional status. At each step, we examined two-order interactions between gender and each covariate in the instances when the covariate association with depression was homogeneous across cities (i.e., Gender × Education). We tested three-order interactions (Gender × Education × City) if heterogeneity was found.

## Results

Table 1 presents the distribution of GDS-15 scores by gender. The prevalence of depressive symptoms was higher among women than men in six of the seven cities. The highest prevalence of depressive symptoms in both women (9.5%) and men (5.2%) was in Santiago.

Table 2 shows the distribution of risk factors for depression separately for men and women across cities. Except for in Buenos Aires, men were more likely than women to have experienced average/poor socioeconomic position during childhood. Experience of hunger was significantly higher in men than in women in three cities: Havana, Mexico City, and Montevideo. Women in Buenos Aires, Mexico City, Santiago, and Sao Paulo were more likely to report illiteracy or not having attended school than men. In all cities except Havana, women were more likely than men to have been manual workers, and Havana and Mexico City reported the highest percentage of housewives. Women reported insufficient income more frequently than men in Buenos Aires and Santiago. Across cities, the percentage of elders reporting insufficient income was highest in Havana. Women in all cities analyzed were less likely than men to have a partner and less likely to be receiving pension or employment income; the percentage of women not receiving pension or employment income was highest in Mexico City, Sao Paulo, and Havana.

Women reported more chronic conditions than men in all six cities and were more likely to be disabled in all except Mexico City, where the prevalence of reported ADL disability was similar in women and men. Elders in Mexico City, Santiago, and Sao Paulo reported the highest rates of disability.

Homogeneity across countries was confirmed for most of the associations between social, material, and health factors, and depression. Pooled logistic regression coefficients adjusted for age confirmed that female gender (odds ratio [OR] = 2.18, 95% confidence interval [CI] = 1.69–2.83), hunger during childhood (OR = 2.23, CI = 1.77–2.82), poor health during childhood (OR = 1.57, CI = 1.25–1.97), illiteracy or no schooling (OR = 1.76, CI = 1.33–2.34), insufficient income (OR = 3.11, CI = 2.32–4.22), and not receiving pension or employment income (OR = 1.27, CI = 1.00–1.62) were associated with depression. Having two or more chronic conditions (OR = 2.16, CI = 1.72–2.70), being functionally limited (OR = 6.36, CI = 4.90–8.26), and being disabled in one or more IADL (OR = 5.95, CI = 4.70–7.53) predicted depression across cities. Neither rural life during childhood (OR = 1.03, CI = 0.83–1.29) nor perceived socioeconomic conditions in childhood (OR = 1.10, CI = 0.86–1.40) were related to depression, and so we excluded these two variables from further analysis.

The association of occupational class, marital status, and ADL disability with depression differed across cities (Table 3). Manual occupation was associated with higher odds of depression in Mexico City and Montevideo but not in the other four cities; living without a partner was related to higher odds of depression in Buenos Aires, Havana, and Montevideo, but not in Mexico City, Santiago, or Sao Paulo. ADL disability was strongly associated with depression in Mexico City, Montevideo, and Santiago (OR ~6.0) and showed lower but significant associations in Buenos Aires, Havana, and Sao Paulo (OR ~3.0).

Table 4 shows multivariate logistic regression models. The ORs for gender increased slightly when childhood circumstances were included (ORs = 2.18–2.30) and remained significant after inclusion of adult and current conditions (Models 2 and 3). Gender differences lost significance when health variables were included (Model 4). We found no interactions between gender and childhood circumstances at this step of the analyses ($p = .2$, for gender and hunger interactions; $p = .16$ for child health and gender), nor for education ($p = .27$), occupation ($p = .37$), or marital status ($p = .27$).

Childhood hunger remained associated with depression even when all socioeconomic and health factors were introduced, but perceived health during childhood lost significance when current morbidity and disability variables were included (Model 4). Education generated an independent effect on depressive symptoms, even after adjustment for childhood conditions and occupation. Its effect on depressive symptoms was no longer significant when current social and material conditions and health indicators were added to the regression.

The association between manual work and depression in Mexico City and Montevideo was no longer significant when current social and material circumstances were included ($p = .12$); however, nonmanual workers in Santiago appeared to experience depressive symptoms more frequently than manual workers and housewives, even when controlling for current social and health conditions. Perceived income and source of income remained significantly associated with depression after adjustment for all life course exposures.

Heterogeneity in the association between marital status and depressive symptoms across cities was persistent for Havana and Montevideo; elders without a partner in those cities reported higher odds of depression than those living with

Table 2. Gender Distribution of Social and Health Factors in Six Latin American Cities

| | Buenos Aires (Argentina) | | Havana (Cuba) | | Mexico City (Mexico) | | Montevideo (Uruguay) | | Santiago (Chile) | | Sao Paulo (Brazil) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Variables | Women ($n$ = 660) | Men ($n$ = 383) | Women ($n$ = 1,197) | Men ($n$ = 708) | Women ($n$ = 740) | Men ($n$ = 507) | Women ($n$ = 920) | Men ($n$ = 530) | Women ($n$ = 855) | Men ($n$ = 446) | Women ($n$ = 1,262) | Men ($n$ = 881) |
| Childhood social and health circumstances | | | | | | | | | | | | |
| Rural life (yes) | 37.5 | 39.8 | 49.7 | 53.4 | 53.7 | 56.5 | 42.2 | 45.1 | 48.3 | 51.6 | 58.1* | 69.2 |
| Perception of socioeconomic status (average/poor) | 52.9 | 49.0 | 70.1* | 79.5 | 74.9* | 81.3 | 62.0* | 68.4 | 53.0* | 63.4 | 67.5* | 73.1 |
| Perception of health (good/poor) | 47.1 | 51.0 | 64.2 | 64.1 | 53.8 | 50.5 | 57.8 | 58.2 | 65.9 | 61.0 | 51.9 | 48.8 |
| Hunger (yes) | 10.1 | 12.2 | 20.8* | 28.2 | 25.5* | 34.8 | 10.6* | 13.8 | 19.0 | 22.6 | 18.5 | 21.8 |
| Adult socioeconomic position | | | | | | | | | | | | |
| Level of education (illiterate/no schooling) | 6.6* | 3.0 | 5.2 | 4.3 | 27.9* | 19.4 | 6.6 | 5.0 | 17.7* | 11.6 | 29.3* | 21.1 |
| Occupation | | | | | | | | | | | | |
| Nonmanual | 33.6* | 44.5 | 41.9 | 40.7 | 29.5* | 37.4 | 24.0* | 37.0 | 20.7* | 37.6 | 23.0* | 35.4 |
| Manual | 53.1 | 55.5 | 33.8 | 59.3 | 45.8 | 62.6 | 64.7 | 63.0 | 64.7 | 62.4 | 67.0 | 64.6 |
| Housewife | 13.3 | | 24.2 | | 24.8 | | 11.3 | | 14.7 | | 10.0 | |
| Current social and material circumstances | | | | | | | | | | | | |
| Perception of income (insufficient) | 68.4** | 63.2 | 80.6 | 76.5 | 49.2 | 47.1 | 59.4 | 54.6 | 70.4* | 63.6 | 69.0 | 67.9 |
| Source of income (other than pension/work) | 6.8* | 15.2 | 23.2* | 2.8 | 68.0* | 28.6 | 18.6* | 6.1 | 14.6* | 3.0 | 28.5* | 6.8 |
| Marital status (no partner) | 56.7* | 25.4 | 76.9* | 35.5 | 61.1* | 23.1 | 64.7* | 27.4 | 57.5* | 21.7 | 58.6* | 20.9 |
| Health | | | | | | | | | | | | |
| Chronic conditions (>2) | 48.6* | 36.4 | 55.0* | 32.9 | 37.7* | 25.5 | 50.6* | 32.7 | 46.6* | 30.1 | 45.4* | 36.4 |
| Lower body limitations (1 or 2) | 45.2* | 25.8 | 46.6* | 25.2 | 47.9* | 31.0 | 46.6* | 29.4 | 48.0* | 30.5 | 42.1* | 27.4 |
| IADLs (≥1) | 21.3* | 9.5 | 24.8* | 13.8 | 29.0* | 14.1 | 16.3* | 7.8 | 28.8* | 15.2 | 32.4* | 18.0 |
| ADLs (≥1) | 20.2* | 12.8 | 22.5* | 14.1 | 21.8 | 16.2 | 21.1* | 10.9 | 25.2* | 17.3 | 22.4* | 14.8 |

*Notes*: IADLs = instrumental activities of daily living; ADLs = activities of daily living.
*$p < .05$ for differences between women and men.

a partner even when current economic circumstances and health status were taken into account.

The number of chronic conditions was no longer significant when social and economic factors were included; lower body functional limitations and IADL disability were associated with depressive symptoms, with women and men being similarly vulnerable (no significant interactions with gender). ADL disability was still a strong predictor of depression in Mexico City, but ADL associations with depression were not significant in the other cities.

Table 3. Logistic Odds Ratios for Depressive Symptoms According to Occupation, Marital Status, and ADLs

| City | Occupation (Manual vs Nonmanual) | Marital Status (Without Partner vs With Partner) | ADL Disability (1 or more vs 0) |
|---|---|---|---|
| Buenos Aires | 1.37 (0.59–3.16) | 2.47 (1.01–6.05) | 3.30 (1.44–7.53) |
| Havana | 0.90 (0.55–1.44) | 3.63 (1.91–6.88) | 3.22 (1.94–5.34) |
| Mexico City | 2.62 (1.15–5.94) | 1.53 (0.81–2.88) | 5.51 (2.91–10.42) |
| Montevideo | 3.40 (1.52–7.59) | 4.94 (2.44–10.00) | 5.37 (3.05–9.34) |
| Santiago | 0.71 (0.42–1.19) | 1.50 (0.88–2.54) | 6.76 (4.04–11.33) |
| Sao Paulo | 1.26 (0.69–2.27) | 1.22 (0.73–2.04) | 3.69 (2.19–6.22) |

*Notes*: Data are odds ratios (95% confidence intervals). All models adjusted for age. ADL = activity of daily living.

## Discussion

### *Principal Findings*

The analysis presented in this article demonstrates that gender differences in depressive symptoms were consistent across the various LAC urban settings. The prevalence of depressive symptoms among Latin American elders was lower than what has previously been reported using the Center for Epidemiologic Studies–Depression scale (Bisschop et al., 2004; Black, Goodwin, & Markides, 1998; Minicuci et al., 2002; Zunzunegui et al., 1998) and the GDS-15 (Chi et al., 2005; Romero et al., 2005). Contrary to previous studies, we used a cutoff of 10/11, looking for higher specificity in the diagnosis of depression. The prevalence of depressive symptoms in the study population was similar to the prevalence of major depression—using the *Diagnostic and Statistical Manual of Mental Disorders* and the Diagnostic Interview Schedule—in developed societies (Blazer, 2003). The magnitude of the gender gap in depression encountered was similar to that observed in older populations in Leganes, Spain (Zunzunegui et al., 1998); in 16 villages in rural China (Chen et al., 2005); and among older Mexican Americans living in five southwestern states (Black et al., 1998), but was wider than what has been observed in other European elderly populations in Italy, Holland, and Sweden (Minicuci et al., 2002; Sonnenberg et al., 2000; Takkinen et al., 2004).

We expected gender differences in depressive symptoms to mirror the more frequent exposure of LAC women to socioeconomic disadvantages (lower levels of education; greater likelihood of manual occupation, widowhood, and insufficient income) during adulthood and old age, and the greater prevalence of poor health status among older women as compared to older men. However, the gender coefficient in the depression equation changed only slightly when childhood and adulthood circumstances were included. In contrast, we observed a significant decrease, reaching nonsignificance, when social and health conditions during old age were included. Thus, the gender gap in depression observed among Latin American elders reflects gender-related disadvantages of older women, in comparison to older men, with respect to marital status, current socioeconomic resources, and physical functioning.

These observations support the differential exposure hypothesis, according to which differences between women and men in the prevalence of depression are explained by women's greater exposure to current life stressors (Moos et al., 2005; Schoevers, Beekman, et al., 2000; Takkinen et al., 2004). Furthermore, these findings illustrate the usefulness of the stress process paradigm to explain depression in later life (Krause, 1999; Pearlin et al., 2005).

It would be inaccurate to state that early social conditions play a lesser role in accounting for gender differences. Rather, the contribution made by childhood and adulthood social conditions (i.e., life conditions during infancy and education) to gender differences is encompassed in the resulting economic security and health conditions observed in late life. Childhood hunger (which might reflect economic hardship) and less than excellent perceived health in childhood predict depressive symptoms in Latin American elders. Disadvantaged social environment in childhood may influence the risk of depression in later life through direct effects on the early onset of depression or through social pathways producing cumulative disadvantage (Dahl & Birkelund, 1997; Krause, 1999) and greater exposure to social stressors and poor physical health (Pearlin et al., 2005). Lack of data on some of the well-known childhood stressors, such as parental loss and domestic violence, limits our ability to explain late-life depression (Wainwright & Surtees, 2002). Education was associated with depressive symptoms, although its effects decreased when current stressors were included. This suggests that, at least indirectly, poor education may be related to depression through increased incidence of chronic conditions and insufficient income (House, Lantz, & Herd, 2005; Miech et al., 2005).

Populations of older LAC women and men were found to be equally vulnerable to all of the factors considered (therefore the vulnerability hypothesis did not explain the gender gap in LAC elders). Contrary to what has been reported previously, living alone or not having a spouse was not particularly detrimental to men's (van Grootheest et al., 1999) or to women's mental health. Previous studies have indicated that among widowers, the greater risk of depression is related to the loss of emotional support and lack of help with housekeeping tasks following the death of their spouse (Umberson, Wortman, & Kessler, 1992). For widows, it is the loss of economic support that increases vulnerability to stress and depression (Umberson et al., 1992). In LAC populations, both mechanisms may have been acting so that we did not observe a differential gender association between lack of partner and depression. Nor did we find that men were more reactive to health factors related to depression (Beekman, Kriegsman, Deeg, & van Tilburg, 1995; Blumstein et al., 2004). Biological processes, which are not gender specific, are in operation (Bisschop et al., 2004; Black et al., 1998; Blazer & Hybels, 2005): Structural changes in the brain (i.e., in stroke and hypertension), deficiencies of the immune system (i.e., in arthritis), and neurotransmitter dysfunctions

Table 4. Logistic Regressions for Depressive Symptoms (Model Building)

| Variable | Model 1[a] | Model 2[b] | Model 3[c] | Model 4[d] |
|---|---|---|---|---|
| Gender (woman vs man) | 2.30 (1.77–2.99) | 2.20 (1.69–2.87) | 1.62 (1.21–2.16) | 1.16 (0.86–1.57) |
| Childhood social and health conditions | | | | |
| Childhood hunger (yes vs no) | 2.19 (1.72–2.78) | 2.08 (1.62–2.66) | 1.98 (1.54–2.55) | 1.64 (1.27–2.13) |
| Childhood health (poor/good vs excellent) | 1.37 (1.09–1.73) | 1.30 (1.03–1.64) | 1.27 (1.01–1.60) | 1.19 (0.93–1.51) |
| Adult social and material conditions | | | | |
| Education (no schooling vs primary or more) | | 1.38 (1.02–1.88) | 1.24 (0.91–1.69) | 0.99 (0.72–1.35) |
| Lifetime occupation (manual vs nonmanual) | | | | |
| Buenos Aires | | 1.22 (0.52–2.83) | 1.15 (0.49–2.68) | 1.05 (0.44–2.48) |
| Havana | | 0.85 (0.53–1.37) | 0.76 (0.47–1.23) | 0.77 (0.47–1.26) |
| Mexico City | | 2.01 (0.88–4.60) | 1.80 (0.79–4.15) | 0.78 (0.33–1.81) |
| Montevideo | | 2.87 (1.28–6.43) | 2.15 (0.95–4.86) | 1.87 (0.81–4.30) |
| Santiago | | 0.59 (0.35–1.01) | 0.53 (0.31–0.91) | 0.53 (0.30–0.93) |
| Sao Paulo | | 0.93 (0.51–1.69) | 0.79 (0.43–1.45) | 0.76 (0.41–1.40) |
| Current material and social conditions | | | | |
| Perception of income (insufficient vs sufficient) | | | 2.73 (2.00–3.74) | 2.23 (1.62–3.07) |
| Source of income (other vs pension/work) | | | 1.46 (1.09–1.96) | 1.37 (1.02–1.86) |
| Marital status (without partner vs with partner) | | | | |
| Buenos Aires | | | 1.60 (0.66–3.89) | 1.51 (0.62–3.69) |
| Havana | | | 2.98 (1.57–5.67) | 3.03 (1.58–5.82) |
| Mexico City | | | 1.38 (0.74–2.58) | 1.53 (0.80–2.92) |
| Montevideo | | | 3.85 (1.90–7.84) | 3.74 (1.79–7.65) |
| Santiago | | | 1.49 (0.88–2.54) | 1.27 (0.73–2.23) |
| Sao Paulo | | | 1.13 (0.74–2.58) | 1.16 (0.68–1.98) |
| Health conditions | | | | |
| Chronic diseases (≥2 vs 0–1) | | | | 1.24 (0.97–1.58) |
| Functional limitations (≥1 vs 0) | | | | 2.72 (2.01–3.67) |
| IADLs (≥1 vs 0) | | | | 2.42 (1.81–3.23) |
| ADLs (≥1 vs 0) | | | | |
| Buenos Aires | | | | 1.07 (0.46–2.46) |
| Havana | | | | 1.29 (0.75–2.20) |
| Mexico City | | | | 1.96 (1.02–3.74) |
| Montevideo | | | | 1.75 (0.96–3.21) |
| Santiago | | | | 1.21 (0.70–2.09) |
| Sao Paulo | | | | 1.40 (0.81–2.40) |

*Notes*: Data are odds ratios (95% confidence intervals). All models adjusted for age. IADLs = instrumental activities of daily living; ADLs = activities of daily living.

[a]Model adjusted for gender and childhood.

[b]Model adjusted for gender, childhood, adulthood.

[c]Model adjusted for gender, childhood, adulthood, current material and social conditions.

[d]Model adjusted for gender, childhood, adulthood, current material and social conditions, and health.

(i.e., in Alzheimer's disease) have been observed equally in women and men (Blazer & Hybels, 2005).

### *Cross-City Differences*

Although factors associated with depression showed similar associations across cities, significant differences in prevalence from one city to the next suggest that context-specific exposures occurred. Absence of partner was a stronger predictor of depression (after controlling for socioeconomic variables) in Havana and Montevideo than in the other cities. We believe that these differences are due to specific social network characteristics in these cities (i.e., low levels of social integration and less supportive networks), and this requires further study. ADL disability was an important predictor of depressive symptoms in Mexico City (even after controlling for social, material, and other health factors), which we could explain by lack of services. In fact, among the Latin American countries studied, Mexico has the lowest social investment and provides the lowest levels of health insurance coverage (Wallace & Gutierrez, 2005). Brazil, despite its high level of social inequality, is the country in which older adults are most likely to consult a health professional, whereas elders in Montevideo, Buenos Aires, and Havana experience the lowest level of inequality in terms of access to health services (Noronha & Andrade, 2005).

Depressive symptoms were less prevalent among nonmanual workers as compared to manual workers in the cities of Mexico City and Montevideo, whereas we observed the opposite in Santiago. The relationship between work and mental health may rely, at the individual level, on job stress characteristics, the social status of occupation (Stansfeld et al., 2003; Tausig, 1999; H. A. Turner & Turner, 1999), and the macroeconomic structure (Tausig, 1999). A white-collar or blue-collar worker may suffer different work stressors in one context than in another (Cortes, Artazcoz, Rodriguez-Sanz, & Borrell, 2004).

Where high rates of unemployment and social insecurity coexist, individuals in lower social positions such as manual workers are more vulnerable, as may be the case of workers in Mexico City. During an economic crisis, small business owners and high-level decision makers may suffer high job-related stress, as could currently be the case with Chilean elders. However, the SABE database does not contain sufficient information to test these contrasting hypotheses.

### *Limitations*

Research on mental health problems in older populations may produce underestimation of their prevalence. First, measures of depressive symptoms may not capture the unique ways in which depression manifests itself in elders and may lack an appropriate way to account for high levels of comorbidity (Krause, 1999). The GDS is a reliable instrument with little bias due to somatic symptoms, and one that is appropriate for measuring depression in older people across cultures (Yesavage et al., 1982). We used a dichotomous rather than a continuous outcome for depression to facilitate interpretation of the results. Prevalence ORs may be directly interpreted as relative risk when the frequency of the outcome is less than 10%. In our data, the associations were consistent when dichotomous and linear regressions were performed (analysis not shown). Second, the prevalence of depression may be underestimated because of cross-sectional bias. Indeed, individuals most prone to mental disorders or those who originate from low socioeconomic backgrounds are less likely to survive to old age and to respond to surveys (Goldman, Korenman, & Weinstein, 1995). However, institutionalization is rarer in LAC countries compared to developed countries.

Misclassification bias may be present in the estimation of the associations between social exposures and depression. It is difficult to estimate the direction and magnitude of recall bias in the measurement of early life exposures. Some studies have reported that mentally healthy participants forget negative childhood experiences more often than those with psychiatric disorders (see discussion in Harper et al., 2002), yet according to other researchers early experiences and self-reported information appear to be reliable (Kauhanen, Lakka, Lynch, & Kauhanen, 2006). We used perceived source of income (sufficient/insufficient) and main source of income (employment/pension vs other sources) as indicators of current financial hardship. Although these indicators are related to financial hardship, they are not perfect proxies. However, income insufficiency is a source of stress with consequences for mental health.

Traditionally, a married woman's occupation is defined according to her husband's occupation, or by applying the household based "dominance" method (in which the higher of the two spouses' occupations is assigned to both; Vagero, 2000). The SABE data did not provide information on husband's occupation. Analysis by city did not show differences in depression between women who worked in manual occupations and housewives. We used the woman's reported occupation for women who had been in the working force, and we created a single category for housewives and manual workers.

### *Conclusions*

Among Latin American older adults, gender differences in mental health are rooted in the differential life course determinants of current social and health events that produce stress. These findings imply that among LAC elders, gender differences in depression could be reduced through social policies promoting better employment opportunities and equal access for women to education, and guaranteeing sufficient pensions.

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Appendix. Geriatric Depression Scale–15

Please tell me if each of the following statements were true for you most of the time during the past 2 weeks. (yes/no/does not know/no response)

Have you been basically satisfied with your life? (yes = 0)
Have you dropped many of your activities and interests? (yes = 1)
Did you feel that your life is empty? (yes = 1)
Did you frequently feel bored? (yes = 1)
Were you in good spirits most of the time? (yes = 0)
Were you afraid that something bad was going to happen to you? (yes = 1)
Did you feel happy most of the time? (yes = 0)
Did you often feel helpless? (yes = 1)
Did you prefer to stay at home instead of going out and doing new things? (yes = 1)
Did you feel that you have more problems with your memory than other people your age? (yes = 1)
Did you feel it was wonderful to be alive? (yes = 0)
Did you feel useless or worthless in your present situation? (yes = 1)
Did you feel full of energy? (yes = 0)
Did you feel that your present situation was hopeless? (yes = 1)
Did you think that most people were better off than you? (yes = 1)

*Note*: The Geriatric Depression Scale is in the Public Domain.