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Psychological and behavioral acculturation in a social network of Mexican Americans in the United States and use of dental services

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Abstract

Objectives: We used data from the TalaSurvey study to examine associations between dental health experiences, social network characteristics, and levels of behavioral and psychological acculturation in one location in the American Midwest.

Methods: Starting in parishes and community organizations, we identified adults of Mexican origin living in Indianapolis, who were 1st- or 2nd-generation immigrants from Tala, Mexico. Using a social networks methodology and following extensive formative research, we created an egocentric social network survey and administered it via face-to-face interviews. We identified the peers (alters) in interviewees' (egos) personal networks. We asked egos about multiple oral health and dental care variables for self and for alters. Acculturation (psychological and behavioral) was measured with a validated tool. Through logistic and negative binomial regression, we examined the effects of acculturation and network composition on ego's dental insurance status, dental office visits, and the reason for most recent dental office visit.

Results: A total of 332 egos (mean age 36; 63% female) were interviewed: 90% were born in Mexico; 45% had completed elementary school or lower; and most had low income. Each ego named 3.9 (SD±1.9) alters in his/her personal network, for a total of 1299 alters (mean age 39; 61% female). Both behavioral acculturation and psychological acculturation were moderately associated with dental insurance coverage, and greater behavioral acculturation predicted more frequent dental care. More psychologically acculturated egos were more likely to seek preventive

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Conflict of interest

The authors declare they have no conflict of interests.

care. Further, egos with more highly educated networks sought care more frequently and for preventive purposes, net of ego's own education and acculturation.

Conclusions: This study contextualizes acculturation of Mexican Americans within the personal networks in which oral health discussion takes place. The findings underscore the critical importance of acculturation and social network factors in shaping a subgroup of Latinos' orientation toward dental care.

Keywords

dental health; Mexican American; Mexican immigrants; network science; oral health behaviors; social network analysis

Latino adults are disproportionately affected by adverse oral health outcomes[1,2]. In the case of Mexican Americans, the largest subgroup of Latinos in the United States, adults are at higher risk than other Americans for caries, gingivitis, and chronic periodontitis. Further, Latinos use oral health services at lower rates, including oral cancer screening and any dental care in the prior 12 months[1]. National data for 2011–2012 showed that Hispanic adults are more likely to age with more complete sets of teeth compared to other ethnic groups but are also more likely for those teeth to have untreated caries[2]. In this article, we examine the contribution of behavioral and psychological acculturation to oral health disparities in one subgroup of Latinos in the United States. In contrast to prior research described below, we adopt a social network perspective which situates Mexican American acculturation within the local social networks where oral health decision-making and social influence take place.

Acculturation and oral health

Latinos migrating to the United States arrive generally healthier than many other Americans and their second-generation Latino peers, despite often having lower socioeconomic status and enduring the stress of immigration[3]. However, Latino groups tend to become less healthy over time. It has been proposed that this is attributable to the simultaneous adoption of less healthful lifestyle factors (e.g., modern 'American' diet) and the erosion of traditional protective factors[4]. The immigrant health paradox is understudied in oral health research, but the mechanisms for this pattern, particularly with respect to dental caries, may be broadly posited as follows: When Latinos move to the United States, they develop a unique set of cultural norms that blend poor attention to preventive and clinical behaviors from premigration heritage[5] with American dietary norms[6]—specifically, often eating highly accessible, cariogenic foods and drinks. The problem is exacerbated by an increase in disposable income with which to purchase snack foods and sugary drinks. Although this hypothesized mechanism appears reasonable, a detailed examination of the influences of acculturation and assimilation is necessary.

Acculturation is the set of adaptations to living within a new sociocultural context, over time and across places; it has different dimensions[7]. Measurement is not an easy task, as there are no universal definitions of acculturation; the diversity of conceptualization and metrics of acculturation constructs is extensive[8]. Historically, most measures addressing the

relationship of health status and gradients of acculturation in the specific case of Mexican Americans were limited to the individual person[7] and developed decades ago, before recent sociodemographic changes in migration[9]. Most measures rely on preferred use of language and self-definition of ethnic heritage, such as the Hazuda[10] and Cuellar scales[11]. These are simple to obtain but they have limitations (see Appendix S1).

Several publications with an explicit research focus on acculturation and oral health have been undertaken on Latinos in the United States. The earliest one is an assessment of HHANES 1982–1984[12] that used Cuellar's scale, comprising scores for language use and ethnic self-classification. Another report using Cuellar's scale contrasted HHANES data for Mexican Americans, Puerto Ricans, and Cubans[13]. Again acculturation was considered to modify the use of dental care, but having dental insurance and higher levels of educational attainment were the most important variables. Another study teased out differences across convenience samples from Central America and Mexico[14]; its reliance on use of English and educational attainment made the role of acculturation fairly nonspecific. Other papers about the role of acculturation (for any minority group in the United States, including Latinos) on oral health have found some positive associations between language used at home and/or heritage, and dental sealants[15], pain[16], and visits[17] but others did not[18–21]. The one comprehensive review[22] concluded that there were positive, negative, and ambiguous associations published. On the whole, however, there was a positive effect of increased acculturation on immigrants' use of dental care services, noting two caveats: increased services may not necessarily lead to improved oral health status, and there is sparse research using multidimensional scales of acculturation.

A major gap in the oral health disparities literature remains because it is not fully understood when and how relevant norms are acquired, nor why immigrants fail to engage the dental care system in ways conducive to optimal oral health outcomes[23–25]. While acknowledging that structural barriers play a fundamental role in oral health disparities[26] within the larger dimension of immigration as a social determinant of health[27], the current body of knowledge has not sufficiently characterized the role of acculturation in Latino oral health disparities.

Social network perspective in oral health

We propose to add a network perspective to start addressing such gaps in the oral health outcomes and behaviors of Mexican Americans relative to Whites. We focus research on this subgroup to reduce variation associated with the diversity of national origins within Latinos. Social science research submits that social network dynamics underlie the acculturation process. The acculturation career—or the timing, sequence, and combination of changes over time following immigration—is closely linked to social interaction with different individuals, groups, and institutions within the mainstream culture[28–30]. Recent immigrants interweave traditional norms and customs with those that are newly acquired through contact with mainstream American society and more established immigrants, or 'sponsors'[31]. Understanding how and why new oral health or dietary behaviors are adopted while other traditional behaviors are retained requires an understanding of changes in the norms, attitudes, and information flowing through social networks, and of the evolving composition of immigrant social ties.

The social network perspective starts with the premise that behaviors, beliefs, and values of individuals are shaped through contact and communication with others. A social network can be defined as a 'structure of relationships linking social actors'[32], or a 'set of individuals who are either directly or indirectly connected'[33]. This perspective is unique in that it embeds individuals and their decisions, outcomes, and life opportunities in the larger social context of relationships, group membership, and community[34,35]. Social network analysis focuses on a target individual and members of his or her personal community network, using characteristics of the network to predict wellbeing or other outcomes. Social network analysis is distinct from other relational approaches (e.g., social support research) in that it focuses on the quantifiable linkages between and among network ties, permitting an evaluation of the impact of one's position in a personal network. Network methods are critical for understanding oral health disparities because they shift the focus from individual risk factor epidemiological approaches to a broader social structural and cultural environment on which immigrant acculturation depends. This change in focus to personal community networks is consistent with calls in the oral health literature to address the role of informal sources of information and support[36].

This report adopts an egocentric network perspective to examine data from the TalaSurvey Study, an investigation into the nature and distribution of social network ties, oral health risk and protective behaviors, and use of dental care, in a community of urban-based Latinos of Mexican origin living in the United States. In the present report, we explored the relationship between acculturation, social network characteristics, and key experiences with dental care systems. These were as follows: having dental insurance, number of months since last dental office visit, and the principal reason for the last dental office visit.

Materials and methods

Participants and study procedure

Participants were urban-based Mexican American adults, first- or second-generation immigrants, who could read and write English or Spanish. They were recruited in the fall and winter of 2013 in a saturated sample of parishes or community organizations in greater Indianapolis. Project procedures were approved by an IRB at Indiana University (#1306011692). Participation included signing a letter of informed consent in Spanish or English after explanations in either language. Sessions lasted 20–45 min and were conducted in English or Spanish. A questionnaire was adapted from prior work[37] to include network name generator questions and oral health domains. After iterative refinement in focus groups, Spanish–English translation and back translation was undertaken.

Psychological–behavioral acculturation scale

We employed a Psychological–Behavioral Acculturation Scale (P-BAS) separately validated for Mexican Americans in the American Midwest[38]. The Psychological–Behavioral Acculturation Scale (P-BAS) is a self-administered questionnaire containing 66 items and has been used previously in oral health research[39]. It incorporates distinct behavioral and psychological acculturation domains[40–42]. While the former deals with the acquisition of

adaptive behaviors to a new environment, the latter encompasses norms, ideologies, beliefs, and attitudes that resemble the mainstream culture[41,42].

Ego dental health variables and controls

We examined the relationship between acculturation and three dependent variables: having dental insurance coverage (1 = Yes, else 0), the count of months since ego's last dental office visit, and the 'main reason' for ego's last dental office visit (1 = checkup, examination, preventive, or other scheduled treatment ('preventive'), or 0 = emergency, or have never been ('emergency')). We also controlled for the influence of various ego characteristics: education level, sex, age, and percent of life spent living in the United States. Descriptive statistics are in Table 1, further details are in Appendix S2.

Egocentric network research design

Egocentric network analysis acquires information about egos (the focal person being interviewed) and their relationships with alters (people that egos name within their network of peers). In the present report, we focused on alters solicited from egos using the Oral Health Matters (OHM) name generator in the questionnaire: *Looking back over the past 12 months, who are the people with whom you discussed issues about dental health, the people in your life that you feel you can really count on for help when you have dental health problems?*[32,35] We asked egos detailed follow-up questions about each named alter.

To examine network influences on oral health experiences, we calculated network variables based on aggregated characteristics of each ego's named alters. Network size was calculated as the count of OHM network alters listed by egos. Average education was calculated as the average level of education among alters, measured on a 9-point scale. There were two additional binary network variables: whether or not any alter had dental insurance (1 = Yes, else 0), and whether or not ego's network was composed entirely of kin (1 = Yes, else 0).

Analysis summary and missing data procedures

We assessed the relationship between ego level of acculturation, network composition, and dental health experiences with logistic regressions for two binary outcome variables and a negative binomial regression for the count outcome. Analyses were conducted on a sample of 301 ego respondents for whom complete data was available. Full methodological details including sample selection are in Appendix S2.

Results

Among 301 Latinos (egos) retained for analysis, the mean age was 36 years (range 18–70) and 65% were female (Table 1). All egos indicated their parents were born in Mexico, and 90% reported being born in Mexico. 40% of egos had completed high school or more. Only 39% of egos had dental insurance, but 45% had a dental visit in the prior 12 months. Egos named an average of 3.9 (SD±0.1) alters in any personal network, for a total of 1,299 alters (mean age 39; 61% female). The average number of alters in egos' OHM networks was 2.7 (SD±1.9, range 1–9).

Results from logistic regression predicting whether or not ego has dental insurance coverage are presented in Table 2. In model (1), increasing psychological acculturation by 1 point (7-point scale) increases the odds of having dental insurance by a factor of 1.3 ($P < 0.001$). Behavioral acculturation, however, is not related to dental insurance coverage. Model (2) introduces controls for ego characteristics. In this model, both greater behavioral acculturation and psychological acculturation predict a modest increase in odds of having dental insurance (both $P < 0.10$). Egos who are high school graduates (or have greater educational attainment) have about twice the odds to have dental insurance (OR = 2.4, $P < 0.01$), and females are marginally more likely to have insurance than males (OR = 1.6, $P < 0.10$). Older egos have significantly lower odds of having dental insurance (OR = 0.6, $P < 0.001$), and percent of life spent in the United States has no effect on coverage. Model (3) introduces control variables based on the composition of egos' OHM networks. Egos with a larger network and egos with a network composed entirely of kin have significantly lower odds to have dental insurance coverage (OR = 0.8, $P < 0.05$, and OR = 0.5, $P < 0.05$, respectively). However, if any member of an ego's OHM network has dental insurance coverage, then ego's odds to be insured more than triple (OR = 3.6, $P < 0.001$). Average education level in the network has no effect, and the effects of other variables, including the acculturation scales, are consistent with model (2).

To further delineate the relationship between acculturation and oral health experiences, we use negative binomial regression to predict the count of months since ego's last dental office visit. For 17 egos, this information is not available and cannot be inferred based on other variables; these cases are thus omitted from this portion of the analysis. Model (1) includes the acculturation scales, Model (2) adds ego characteristics including dental insurance coverage, and Model (3) adds additional OHM network variables; the results are consistent across all models. Looking at Model (3), psychological acculturation has no significant effect, but increasing behavioral acculturation predicts significantly fewer months since ego's last dental office visit (IRR = 0.76, $P < 0.05$). To facilitate interpretation, each one-point increase in behavioral acculturation (4-point scale) decreases the expected count of months since last dental office visit by about 25%. As a point of comparison, having dental insurance reduces the expected count of months by about 43%, relative to the uninsured (IRR = 0.57, $P < 0.01$). At the network level, increased average education among alters predicts fewer months since last visit (IRR = 0.88, $P < 0.05$). In contrast, egos who have spent a larger percentage of their life in the United States have significantly more months since their last visit, net of ego's age (IRR = 1.10, $P < 0.05$). Other variables in the model are nonsignificant.

Table 4 contains logistic regression results predicting the main reason for ego's last dental office visit: whether a checkup, prevention, or planned treatment ('preventive'), as opposed to a dental emergency or having never been ('emergency') (reference). In Model (1), increasing behavioral acculturation by 1 point (4-point scale) increases odds of ego having been for preventive care by a factor of 1.2 ($P < 0.05$); a 1-point increase in psychological acculturation increases odds of a preventive visit by a factor of 1.4 ($P < 0.001$). The acculturation effects are consistent in Model (2), which introduces control variables, including dental insurance coverage. Egos with insurance have more than 3 times the odds of having sought preventive care rather than seeking care for an emergency (OR = 3.4, $P <$

0.001). Older egos have lower odds of having been for preventive care (OR = 0.7, $P < 0.001$); education, sex, and percent of life in the United States have no significant effect on ego's reason for last dental visit. Model (3) introduces OHM network variables. After controlling for ego and network characteristics, greater psychological acculturation predicts significantly greater odds of having sought preventive care (OR = 1.2, $P < 0.05$), but behavioral acculturation is nonsignificant. Among the network variables, increased average alter education predicts significantly greater odds of ego having sought preventive care (OR = 1.2, $P < 0.05$). Network size, presence of members with dental insurance, and kin-only makeup of OHM are nonsignificant; other variables are consistent with model (2).

Discussion

Drawing on a network science perspective and measures of acculturation in one subgroup of Latinos, the present study began to shed light on three key dental health experiences that underlie oral health disparities. Our findings suggest that having better-educated oral health discussants in personal networks is associated with better experiences, controlling for one's own level of education (Tables 3 and 4). It is possible that higher levels of education are associated with having more knowledge or information about dental services or oral hygiene practices, which are transmitted to egos through discussion[43]. Similarly, more educated alters may shape oral health experiences through normative influence or diffusion of oral health behaviors. In turn, ascribing greater importance to good oral health may become the norm in personal social networks with higher mean levels of education. Moreover, we have shown that having any network member with dental insurance increases egos own odds of being insured (Table 2). This suggests an indirect effect of social networks on ego's oral health behaviors including seeking more frequent (Table 3) and preventive-oriented dental care (Table 4).

With respect to acculturation, we found that both behavioral acculturation and psychological acculturation predict oral health outcomes, albeit through different mechanisms. Both types of acculturation are modestly associated with dental insurance coverage (Table 2). However, behavioral acculturation is associated with more recent use of professional services (Table 3), whereas psychological acculturation predicts use of dental care for services generally considered to be associated with better long-term outcomes, such as planned and preventive care (Table 4). Notably, the findings in Tables 3–4 persist even when controlling for ego's dental insurance status. Furthermore, supplemental analyses using interaction terms provided no evidence to suggest that the effect of acculturation on the outcome variables is significantly different depending upon dental insurance status. These findings suggest that the observed effects of acculturation are not solely attributable to differences in access to care over the acculturation career.

These results offer an interesting contrast to other findings on acculturation and oral health. A study of Vietnamese migrants in Australia demonstrated complex relationships between behavioral and psychological acculturation and oral health attitudes and behaviors[40]. Specifically, strong acculturation in one domain often coexisted with superficial acculturation in the other[44], with a mixed pattern of association with various changes in oral health knowledge and patterns of dental visits[39]. In the present study, higher behavioral

acculturation was only moderately associated with how recently a dental office visit had taken place; but psychological acculturation predicted patterns of regular dental visits, therefore resembling those findings in Australia. This may be because behavioral acculturation is sometimes theorized to precede psychological acculturation, for example, in classic models of immigrant 'assimilation'[43]. Thus, use of planned and preventive dental visits may be associated with changes in oral health norms and values that are developed only at more advanced stages of acculturation. This is consistent with other findings presented here on the effects of percent of life spent in the United States, suggesting that utilization of dental services for nonemergencies may be more likely to occur at an advanced stage in the acculturation career. Changes in the frequency of dental visits may be due to a reduction in the likelihood of oral health problems at the individual level when that person has spent a larger proportion of his/her life in the United States. Future research would be necessary to characterize the exact effects of larger percentage of life in United States.

The present study is novel, but has important limitations. We used a nonrandom sample, most of whom attended Catholic churches. Although findings are generalizable only to the American Midwest and to one subgroup of Latinos, some extrapolations may be warranted if limited to urban locations. Our conclusions may not extend to other, dissimilar groups such as agricultural workers, rural communities, or indigenous aboriginals from Mexico. Finally, we use an individual acculturation framework as one factor in oral health disparities, but acknowledge that this strategy omits an investigation of important structural influences (e.g., health systems, public policies)[7,27].

Despite these limitations, this study makes important contributions to our understanding of the interconnected role of social networks and acculturation in oral health. Latinos tend to have densely knit, female-centered networks of kin and fictive kin that reside in close proximity[45]. Family obligations, kinship support, and use of family as referents are key aspects of the social organization of Mexican American life[46]. Informal networks play a critical role in facilitating Mexican American migration and providing expedient access to material and social resources upon arrival, including health services. For example, English-speaking surrogates have been shown to seek general health information on behalf of monolinguistic Latinos in their networks, helping them overcome structural and individual access barriers[47].

Cultural 'brokering' is essential for recent immigrants, who typically have limited access to formal health care in the United States. However, informal network involvement may also impede use of formal services, particularly because cultural norms around oral health in Mexican culture prescribe a more reactive orientation to dental care[48]. Larger, more supportive networks may decrease the use of formal and preventive healthcare services in Latino communities and delay entry into the health sec-tor[49]. Consistent with this idea, in the present study we found that having larger and more kin-centered networks reduces the odds of ego having dental insurance (Table 2).

In conclusion, our results suggest that social network effects on health behaviors may present interesting contradictions wherein networks can be both beneficial and constraining, and this may change across the acculturation career. Indeed, our findings suggest that more

acculturated egos have qualitatively different dental care experiences when compared to their less acculturated peers, perhaps because they rely less intensely on in-group advice and support about oral health. We call for additional longitudinal research to further illuminate the multiple and dynamic roles of social networks and acculturation in promoting oral health[50].

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1.

Descriptive statistics for dependent and independent variables

	Mean (%)	SD	Min	Max
Dependent variables				
Ego has dental insurance (1 = Yes)	(0.4)		0	1
Ego's months since last dental office visit[1]	72.1	89.5	0	420
Ego's last visit was for planned or preventive care (1 = Yes)	(0.4)		0	1
Independent variables				
Ego characteristics				
Behavioral acculturation	2.4	0.9	1	5
Psychological acculturation	−1.5	1.4	−4.2	3.2
High school graduate or more (1 = Yes)	(0.4)		0	1
Female (1 = Yes)	(0.6)		0	1
Age (years)	36.6	12.2	18	70
Percent life in United States	51.0	28.0	0	100
Oral Health Matters network characteristics				
Size	2.7	1.9	0	9
Any member has dental insurance (1 = Yes)	(0.5)		0	1
Kin-only (1 = Yes)	(0.4)		0	1
Average education	4.5	1.9	1	9

301 observations.

[1]284 observations for this variable.

Table 2.

Logistic regression predicting that ego has dental insurance (1) relative to ego is uninsured (0)

	(1) Odds ratio (Lower, Upper)	(2) Odds ratio (Lower, Upper)	(3) Odds ratio (Lower, Upper)
Ego characteristics			
Behavioral acculturation	1.05 (0.93,1.18)	1.31† (0.96,1.79)	1.40† (0.99,1.98)
Psychological acculturation	1.32*** (1.13,1.55)	1.19† (0.99,1.42)	1.21† (0.99,1.47)
High school graduate		2.39** (1.39,4.09)	2.21* (1.21,4.04)
Female		1.60† (0.95,1.11)	1.01 (0.90,1.12)
Percent life in United States		0.99 (0.90,1.11)	1.01 (0.90,1.13)
Age (logged)		0.64*** (0.52,0.79)	0.70* (0.52,0.93)
OHM network characteristics			
Size			0.83* (0.70,0.98)
Any member has dental insurance			3.55*** (1.93,6.55)
Kin-only			0.47* (0.25,0.88)
Average education			0.92 (0.78,1.08)

301 observations. Exponentiated coefficients (ORs), 95% confidence intervals in parentheses.

$^{\dagger}P < 0.10$

$^{*}P < 0.05$

$^{**}P < 0.01$

$^{***}P < 0.001$.

Crude estimates are available upon request.

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Table 3.

Negative binomial regression predicting number of months since ego's last dental office visit

	(1) Incidence rate ratio (Lower, Upper)	(2) Incidence rate ratio (Lower, Upper)	(3) Incidence rate ratio (Lower, Upper)
Ego characteristics			
Behavioral acculturation	0.69 *** (0.58,0.28)	0.76 * (0.60,0.97)	0.76 * (0.59,0.97)
Psychological acculturation	0.93 (0.83,1.03)	0.93 (0.84,1.03)	0.95 (0.85,1.07)
Has dental insurance		0.55 *** (0.40,0.76)	0.57 ** (0.41,0.80)
High school graduate		0.67 * (0.48,0.95)	0.79 (0.55,1.13)
Female		0.86 (0.63,1.18)	0.91 (0.67,1.25)
Percent life in United States		1.10 * (1.01,1.20)	1.10 * (1.01,1.20)
Age (logged)		1.63 (0.91,2.93)	1.65 (0.90,3.04)
OHM network characteristics			
Size			1.02 (0.92,1.13)
Any member has dental insurance			0.89 (0.61,1.30)
Kin-only			0.90 (0.63,1.29)
Average education			0.88 * (0.80,0.98)
Alpha (lower, upper)	1.71 (1.48,1.97)	1.60 (1.38,1.84)	1.56 (1.35,1.80)

284 observations. Exponentiated coefficients (IRRs), 95% confidence intervals in parentheses.

† $P < 0.10$

* $P < 0.05$

** $P < 0.01$

*** $P < 0.001$.

Crude estimates are available upon request.

Table 4.

Logistic regression predicting last dental office visit was for planned or preventive care (1) rather than an emergency or never been (0)

	(1) Odds ratio (Lower, Upper)	(2) Odds ratio (Lower, Upper)	(3) Odds ratio (Lower, Upper)
Ego characteristics			
Behavioral acculturation	1.15 * (1.01,1.30)	1.39 * (1.00,1.92)	1.33 (0.93,1.89)
Psychological acculturation	1.41 *** (1.20,1.66)	1.23 ** (1.02,1.48)	1.21 * (1.00,1.47)
Has dental insurance		3.41 *** (2.01,5.80)	3.28 *** (1.88,5.73)
High school graduate		1.56 (0.89,2.72)	1.24 (0.68,2.27)
Female		0.98 (0.58,1.66)	0.98 (0.57,1.69)
Percent life in United States		0.97 (0.87,1.08)	0.96 (0.86,1.08)
Age (logged)		0.69 *** (0.58,0.85)	0.58 *** (0.43,0.78)
OHM network characteristics			
Size			0.91 (0.78,1.07)
Any member has dental insurance			1.29 (0.71,2.37)
Kin-only			1.31 (0.72,2.40)
Average education			1.20 * (1.02,1.42)

301 observations. Exponentiated coefficients (ORs), 95% confidence intervals in parentheses.

† $P < 0.10$

* $P < 0.05$

** $P < 0.01$

*** $P < 0.001$.

Crude estimates are available upon request.