



## Immigrant generation and physical activity among Mexican, Chinese & Filipino adults in the U.S.

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### ABSTRACT

Migrant studies of physical activity (PA) can provide insight into the prevention of chronic disease. It is unclear, however, whether PA increases or decreases the longer migrants live in their host country. In the US, studies on immigrants' length of residence in the US and PA are inconclusive and many studies do not adequately consider the role of socioeconomic status (SES). Using California data, we examine relationships between immigrant generation and physical activity (PA) among Mexican, Chinese and Filipino adults, who represent the three largest immigrant groups in the US, and the extent to which the relationships are confounded by SES. Data from the 2000 US Census was linked with data on adults 18 years and older from the 2005 California Health Interview Survey. PA was measured in three different domains: leisure time (LTPA), non-leisure time (NLTPA) and any PA. Logistic regression was used to examine whether a wide range of SES factors, measured at the respondent and neighborhood levels, influenced the relationship between immigrant generation and PA in all domains and in different ethnic origin groups.

Generation was significantly associated with LTPA among Mexican and Chinese adults and with NLTPA among all 3 ethnic origin groups; however the nature of the relationships varied. After adjusting for individual and neighborhood SES factors, a positive association between generation and LTPA remained among Mexican adults, and negative association between generation and NLTPA remained among Chinese and Filipino adults. These results underscore the importance of comparative studies of immigrant generation and PA and consideration of SES factors to identify pathways linking generation to PA. In the context of increasing rates of chronic disease, the study of transitions in PA among immigrants will continue to be critical to promoting the public health of diverse populations in countries such as the US.

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### Introduction

Globally, rapid changes in exposures in migrant populations, relative to the native populations in their host countries, provide insight into the epidemiology and prevention of chronic disease. Depending on characteristics of the migrant population and the social and cultural environment in the host country, the chronic disease risk profile of migrants may worsen or improve the longer they live in their new host country (Dawson, Sundquist, & Johansson, 2005; Salmond, Prior, & Wessen, 1989; Williams, 1993). In the US, there is evidence that the risk of diabetes, hypertension and cancer among selected immigrant populations increases with greater time in the US (Ahmed et al., 2009; Moran et al., 2007; West et al., 2002;

Ziegler et al., 1993). To better understand the factors that might be responsible for the increasing risk of chronic disease with time among US immigrants, it is necessary to examine how the underlying determinants change following migration.

Understanding determinants of morbidity among immigrants in the US is a public health concern for its general population given demographic trends. Between 1990 and 2000, the foreign-born population in the US increased from 19.8 million to 31.1 million, an increase of 57%, compared with an increase of 9.3% for the native population (Malone, Baluja, Costanzo, & Davis, 2003). It is projected that 87% of the population growth between 2005 and 2050 will be driven by immigrants and their US-born children (Passel & Cohn, 2008), warranting an epidemiological perspective that centers on the migrant experience and behavioral changes that follow migration.

Physical activity (PA) is an important determinant of morbidity from cardiovascular disease, diabetes, and cancer (DHHS, 1996,

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2000) and it is also a modifiable behavior. This study examines how physical activity changes across generations among adults from Mexico, China and the Philippines, who represent the three largest immigrant groups in the US constituting 29.5%, 4.9% and 4.4% of the foreign born respectively (Malone et al., 2003). Determinants of PA among these groups remain under-explored and according to studies of Latino and Asian populations, it is unclear whether PA levels increase or decrease with greater time in the US.

#### *Length of residence in the US and physical activity*

Studies in the aggregate Latino adult population provide evidence of a positive association between length of residence in the US and the likelihood or level of leisure-time physical activity (LTPA) (Abraido-Lanza, Chao, & Florez, 2005; Cantero, Richardson, Baezconde-Garbanati, & Marks, 1999; Crespo, Smit, Carter-Pokras, & Andersen, 2001). These results are consistent with studies of language acculturation measures and LTPA (Berrigan, Dodd, Troiano, Reeve, & Ballard-Barbash, 2006; Perez-Stable, Marin, & Marin, 1994). Although studies that examine non-leisure time PA (NLTPA), defined as occupational, transportation-related, and household-related PA, have not used time measures, they generally find a negative association with language acculturation (Berrigan et al., 2006; Ham, Yore, Kruger, Heath, & Moeti, 2007; Slattery et al., 2006; Wolin, Colditz, Stoddard, Emmons, & Sorensen, 2006).

Studies of Asians also have mixed findings. One population-based study examining years in the US and LTPA among Asians as an aggregate group found a positive association in stratified analyses of men and women, a result consistent with a study among Korean adults using a multi-dimensional measure of acculturation (Kandula & Lauderdale, 2005; Lee, Sobal, & Frongillo, 2000). In contrast, a third study (Huang et al., 1996) found a negative association between US nativity and levels of total PA among Japanese men in Hawaii.

Based on the studies reviewed, a pattern emerges: length of time in the US or acculturation is positively associated with LTPA and negatively associated with NLTPA. Yet, these studies are not without limitations. First, studies of Latino populations do not consider potential difference by ethnic origin. Those of Asians have not included Chinese and Filipino populations, the two largest Asian ethnic groups in the US. Third, it is difficult to ascertain the relationship between length of time in the US and combined levels of LTPA and NLTPA. Consideration of both types of PA is important because each type of PA may be influenced by a different set of factors resulting in potential differences in rates across ethnic groups (Berrigan et al., 2006; Evenson, Rosamond, Cai, Pereira, & Ainsworth, 2003). On the issue of disease prevention, we are concerned with the cumulative amount of PA, regardless of type, that produces the maximum health benefits (Haskell et al., 2007). Moreover, many of the studies do not adequately consider the role of socioeconomic status (SES) and in particular, whether it confounds the association between time in the US or acculturation measures and PA (Hunt, Schneider, & Comer, 2004).

#### *Theoretical framework: segmented assimilation*

This study is informed by segmented assimilation theory, which encompasses both dimensions of acculturation and SES. Segmented assimilation theory views immigrant generation as a central variable conceptualized broadly as a time dimension reflecting increasing exposure to US social and cultural norms (Portes, 1996). More specifically, this theory emerged from the extensive study of the children of recent immigrants from Asia

and Latin America, known as the “new second generation” (Portes, 1996). While classical theories of assimilation have argued that the length of residence in the US leads to the progressive narrowing of socioeconomic differentials with the native-born population, and gradual adoption of the traits of the host culture with a loss of those from their home country (Alba & Nee, 1997; Gordon, 1964), segmented assimilation proposes a less uni-directional path. Instead, it proposes diverse paths of acculturation and social mobility from one generation to the next.

The diverse paths experienced by US immigrants are dictated by a complex set of factors, including the presence or absence of an ethnic enclave, political context in the US at the time of migration and prejudices and values of the receiving community, particularly receptivity of or discrimination against the immigrant group (Portes, 1996). Alternative paths to classical assimilation may resemble selective assimilation, characterized by economic advancement with deliberate preservation of the immigrant community's values and traditions; or downward assimilation, a process that leads to greater identification with a minority sub-culture and permanent poverty (Portes & Zhou, 1993). On the issue of language proficiency and ethnic identity, which are acculturation measures used in existing health literature (Afable-Munsuz & Brindis, 2006; Lara, Gamboa, Kahramanian, Morales, & Bautista, 2005), segmented assimilation theory does not assume uni-directional change toward the norm. Rather, it proposes that immigrant groups selectively adapt traits/norms of the host culture and retain those of their culture of origin depending on their context. Thus, depending on how ethnic identities, socioeconomic factors and social norms change from one generation to the next, assimilation may lead to higher or lower levels of physical activity.

While several studies have applied segmented assimilation theory to health outcomes (Acevedo-Garcia, Pan, Jun, Osypuk, & Emmons, 2005; Finch & Lim, 2004; Frank, Cerda, & Rendon, 2007; Nagasawa, Qian, & Wong, 2001), we are not aware of any that have applied this framework to physical activity among adults. It is possible that diverse assimilation experiences of different ethnic groups will have differential implications for PA. Further, previous research suggests racial and ethnic differences exist in barriers to PA (Heesch, Brown, & Blanton, 2000) suggesting that aggregate analyses may mask important ethnic-specific patterns. To this end, and to our knowledge, this study is the first US population-based study to examine physical activity in Mexican, Chinese and Filipino adults in a comparative manner, and includes measures of leisure, non-leisure and a combination of both types of physical activity together.

#### **Hypotheses**

Following segmented assimilation theory, we conceptualize immigrant generation as reflecting one's level of acculturation and degree of social mobility. We expect lower levels of total PA with each successive generation due to an upward SES shift from active to more sedentary occupations; upward mobility also encompasses more time constraints, and therefore, immigrants will have less time for both non-leisure and leisure activities. However, we also recognize that the opportunities for and social norms regarding physical activity vary by ethnic origin, potentially leading to differential associations between generation and physical activity by ethnic origin. We will examine these hypotheses with the following research questions: 1) What is the nature of the relationship between generation and levels of different types of PA? 2) Does the relationship vary by ethnic origin? 3) Do individual and neighborhood-level SES factors attenuate the relationship between generation and PA level?

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