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**Segmentation of Mexican-Heritage Immigrants: Acculturation Typology
and Language Preference in Health Information Seeking**

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This is the author's manuscript of the article published in final edited form as:

Shin, Y., & Maupome, G. (2016). Segmentation of Mexican-Heritage Immigrants: Acculturation Typology and Language Preference in Health Information Seeking. *Journal of Immigrant and Minority Health*, 1-11.
<http://doi.org/10.1007/s10903-016-0401-7>

Abstract

With the fast growing number of Mexican immigrants in the United States, more attention is needed to understand the relationship between acculturation and language preference in health information seeking. Latent class analysis (LCA) provides one useful approach to understanding the diversity in sample of Mexican immigrants (N = 238). Based on 13 linguistic, psychological and behavioral indicators for acculturation, four discrete subgroups were characterized: 1) Less acculturated, 2) Moderately acculturated, 3) Highly acculturated, 4) Selectively bicultural. A chi-square test revealed that three sub-groups were significantly different in language preference when seeking health information. Less acculturated and moderately acculturated groups sought health information in Spanish, whereas the highly acculturated group preferred English for health information. Selectively bicultural group preferred bilingual health information. Implications for health campaign strategies using audience segmentation are discussed.

Keywords: acculturation, audience segmentation, latent class analysis, Mexican immigrants, health information seeking

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As the U.S. population is becoming increasingly heterogeneous in its racial and ethnic composition, public health scholars and practitioners need to make an effort to effectively reach out to diverse groups by developing the culturally appropriate health messages [1-3]. Of the total number of immigrant population, immigrants from Latin America (55%) are the largest ethnic group in the United States [4] and there has been a 37% increase in the Latino population since 2000 [5]. More specifically, the largest number of these Hispanics consists of Mexican immigrant households (65.5%) [6].

To increase the effectiveness of public health interventions, audience segmentation plays a key role in designing effective health messages [7-11]. When aiming the immigrants as the target audience for a public health campaign, researchers need to take into consideration Mexican immigrant families' transition to the United States and acculturation to the mainstream of American culture [3, 12]. During the process of acculturation, immigrants are highly likely to encounter a great deal of social, cultural, and institutional challenges and to face negative health consequences [2, 13-14]. Effects of acculturation on health outcomes vary depending on numerous factors such as the country of origin, race/ethnicity, age, and gender [15-17]. For example, greater acculturation is linked to poor mental health outcomes [18-20], substance use [21-24], and obesity [25-26]. A phenomenon called "the immigrant paradox" explains that as immigrants are acculturated to the mainstream American culture, they are more likely to deal with health concerns and challenges [19, 27-29]. Although a majority of past studies have provided evidence of predicting immigrants' health outcomes with regard to acculturation states, these findings are limited by assessing unidimensional (e.g., adaption to the host culture) and/or bidimensional measures (e. g, adaption to the host culture and retention to the culture of origin) of

acculturation. In this respect, utilizing multidimensional measures can broaden a comprehensive understanding of immigrants' acculturation typologies and further suggests practical implications for public health intervention. What is more, considering that acculturation plays an important role in determining immigrants' language preference in health information seeking behaviors [30], the present study attempts to identify the multidimensional characteristics of acculturation in Mexican immigrants and its association with language preference when seeking health information.

Conceptualization of Acculturation

Unidimensional conceptualization of acculturation has been widely used in previous literature. This approach limitedly focuses on individuals' adaption to the mainstream culture. Many scholars well recognize the limitation of the unidimensional concept and further argue that theoretical and operationalized definition of acculturation require improvement [14, 31-32]. For example, Berry's model of acculturation [33-34] conceptualizes the definition of acculturation using the dimension of the native culture and host culture. Based on the bidimensional approach, four types of acculturation are delineated. Assimilation occurs when immigrants are inclined to adapting to the host culture while giving up their native culture. By contrast, separation takes place when immigrants retain their native culture while refusing the host culture. Integration refers to immigrants who selectively adapt to the host culture while preserving their native culture. Lastly, marginalization represents immigrants who not only refuse the host culture but also deny their native culture. Using the bidimensional approach, evidence shows that orientation to American culture and orientation to the Hispanic culture each predicted different effects on Hispanic adolescents' substance use [22, 35] and HIV risk behaviors [36].

To further advance the theoretical framework of acculturation, Portes and Zhou [37] propose segmented assimilation theory that highlights the distinction between individuals'

ability to adapt to the host culture as well as their preference to practice linguistic, social and cultural behaviors. According to the theory, the process of acculturation can be understood by examining individuals' attitudinal and behavioral choices to adapt to certain practices of the mainstream culture, in addition to using the bidimensional approach between the native culture and host culture. Segmented assimilation theory makes a contribution to the acculturation literature by shedding light on individuals' preference of specific acculturation dimensions. Moreover, from the multidimensional perspective, other researchers take into account cognitive, affective, and behavioural changes after immigration as indicators for acculturation, and suggest evidence indicating the relationship between acculturation and immigrants' health outcomes [38-41]. To delve into the evidence, we now turn to discuss acculturation in health contexts.

Acculturation in Health Contexts

Immigrant health research has investigated a wide range of topics from youth substance use [42-43], prescription drug information [44] to cancer information seeking behaviors [45-46]. To solve various health concerns of the underrepresented population, one must acknowledge that acculturation plays a critical role in immigrants' health status as well as their communication and comprehension of health information [47]. Linguistic acculturation as part of multidimensional measurement of acculturation has been used to investigate its relationship with health communication among immigrants. For instance, using the 2005 Health Information National Trends Survey, Clayman and colleagues [48] discovered that language proficiency plays a significant role in Hispanics' trust in media as health information sources. Their findings suggest that language barriers result in a lack of trust in media for health information. Among Korean American who sought health information about cancer, language proficiency predicted using different types of information channels (e.g., the ethnic magazine and newspaper vs. the internet) [49]. Evidence also shows

that language proficiency is one of the important predictors for immigrants' health condition and limited English proficiency is negatively related to self-rated health in Hispanics [31] and in African immigrants [17]. In addition to the significant association between language proficiency and immigrant health, other researchers consider language preference as a key indicator for immigrant health information seeking behavior. Recent study reveals that language preference of Chinese immigrants also predicted different uses of health sources when searching for health information online [30].

While language proficiency assesses individuals' objective, linguistic ability to read, speak, and write in foreign language, language preference deals with individuals' feelings of comfort in reading, speaking, and writing foreign language [50]. Recent studies note that language preference in interpersonal communication predicted the intention to use the Internet [46] and the actual use of the Internet among Latino immigrants when seeking health information [45].

Considering past studies examining language proficiency and its association with communication channels when seeking health information, less effort has been made to identify segments of immigrants based on their response to linguistic, psychological, and behavioral acculturation construct and its association with language preference in health information seeking. Although language proficiency is an important factor that represents immigrants' linguistic acculturation in health research [47, 49], language preference has not been fully examined in the context of health information seeking behavior. One exceptional study points out the language barriers in health care contexts for Latinos [51]. Guntzviller et al.'s study focused on communication apprehension in health care with three dimensions of acculturation including language use, media, and ethnic social relations. This study provided a comprehensive understanding of immigrants' communication anxiety in a medical context but its focus was on interpersonal communication, rather than health information seeking

behavior. The other research indicates that acculturation predicts the language choice of Chinese American's online health information seeking [30]. The findings discover that assimilated and integrated immigrants preferred English for online health information seeking and used U.S. health website whereas separated immigrants chose Chinese and accessed Chinese health website. These findings are limited in online health information seeking using the bidimensional measures of acculturation.

To fill a research gap, guided by segmented assimilation theory [37], the present study aims to classify acculturation typologies including linguistic, social, cultural, and behavioral constructs and its relationship on language preference in health information seeking behavior. The importance of audience segmentation using the multidimensional measures in public health research is discussed next.

Audience Segmentation and Public Health Intervention

The importance of audience segmentation and its usefulness has been well documented in previous literature [8-10]. For example, to promote a health intervention using diffusion of innovation, Smith and Findeis [52] conducted a latent class analysis and identified five adopter categories such as local majority, social majority, early adopters, laggards, and externally connected. Based on the five types of the audience segmentation, the researchers proposed different goals and approaches to persuade the audience to prevent famine in rural Mozambique. Using the latent class analysis that allows segmenting the research participants based on their similar responses, another study examined risk perceptions about genetic threats to health efficacy and behavioral efficacy and classified four sub-groups as threatened, skeptics, activists, and controller [11]. By differentiating health audiences based on their response to stigma, health communication scholars can strategically design more effective anti-stigma campaigns by targeting those who hold stigma to become supporters [53]. These findings indicate that the public health audiences are

heterogeneous and segmentation of the audience is needed for effective public health interventions. More specifically, researchers should go beyond an intervention that only offers linguistic translations between English and native language by creating a culturally appropriate health intervention targeting immigrants in the United States [54-56].

To this end, the present study proposes to identify acculturation typologies of Mexican immigrants using multidimensional measures accounting for linguistic, psychological, and behavioral acculturation. Based on the classification of the distinctive subgroups, this study also examines subgroups' language preference when seeking health information. Two research questions are posited as following.

RQ1) What are the characteristics of acculturation among Mexican immigrants?

RQ2) Does Mexican immigrants' language preference in health information seeking differ depending on their sub-group membership of acculturation?

Methods

Participants and Procedure

Participants were urban-based adults of Mexican origin and first- or second-generation immigrants. They were recruited through announcements made in churches before and after the celebration of masses in Spanish, and Hispanic community organizations; through flyers and posters in the same locations; and through word of mouth. Participants had to be able to read and write Spanish or English. Ethical clearance was obtained from the hosting institution review board. Participation was subject to informed consent, explained verbally in person in Spanish or English, and followed by signing a letter in Spanish or English approved by Institutional Review Board. The study had additional protection through a Certificate of Confidentiality (CoC); besides explicitly not gathering data with regard to immigration status during advertisement or recruitment, the CoC helped to allay fears by participants or potential participants who may have been concerned about disclosing personal

information through their participation in the study. Participants were compensated for their time and transportation costs.

Questions from the Psychological-Behavioral Acculturation Survey (P-BAS) questionnaire [57-58] were adapted through deliberations of an advisory panel and pilot tests. The questions were derived from the behavioral component of P-BAS although they have often been used in other acculturation scales for Hispanics in the USA [25, 59]. The advisory panel then met focus groups. After iterative refinement and testing in focus groups with people of Mexican origin, Spanish-English translation and back translation was undertaken. The questionnaire was discussed by the advisory panel with a group of community members to verify literacy level, clarity, and relevance. Group participants were from similar backgrounds as the target population but did not take part in the main study. The validation of these measures was empirically tested in other study [66].

Questionnaires were self-administered in individual or group settings, in offices in churches or community organizations, or in private homes; space between group respondents was preserved to ensure confidentiality and not sharing responses. Study staff was available at all times to clarify questions. Sessions lasted 20-45 minutes, and were conducted in English or Spanish, according to participant preference.

A total of 332 Mexican immigrants participated in the survey. Sixty four percent respondents ($N = 214$) were females; the average age was 37 years (range from 18 years to 70 years). The respondents' education levels varied (from 20% elementary incomplete, 9% elementary complete, 43% middle school complete, 8% secondary complete, to 20% vocational and/or post-secondary complete). A majority of the respondents (58%) reported their incomes between \$20,000 and \$39,999. Others indicated less than \$10,000 (15%) and between \$40,000 and more (27%). All of the respondents indicated their parents were born in Mexico and 90% of the respondents ($N = 300$) reported they were born in Mexico. Due to the

nature of the latent class analysis requiring completed data, 94 incomplete responses were removed from the data analysis. In the present study we used 238 completed responses for statistical analyses.

Measures

This study included a variety of indicators that captures acculturation of Mexican immigrants. Multidimensional measures were used to access language preference in general speaking, with family, friends, and media, time in the United States, ethnic identity, social affiliation, cultural practices, perception of Mexican family value and Mexican cultural value. All measures, except perceptions of Mexican family value and Mexican cultural value, used a single item with categorical response options. Six items were used to measure language preference: (1) in general speaking, (2) as a child, (3) with family, (4) with friends, (5) when watching television, and (6) when reading newspapers. The categorical response options were Spanish only, mostly Spanish, both Spanish and English, mostly English, and English only. For the analysis, these 5 response categories were re-coded as 1) Spanish dominant, 2) bilingual, and 3) English dominant responses.

Time in the United States asked a question of “How long have you stayed in the United States after immigration?”, with the open ended response option. The original responses were re-coded as 1) 1 year to 5 years, 2) 6 years to 10 years, 3) 11 years to 15 years, 4) 16 years to 20 years, 5) 21 years to 25 years, 6) 26 years to 30 years, 7) 31 years to 35 years, 8) 36 years to 40 years.

Single item of cultural preference in celebration asked respondents a question, “I would prefer celebration (weddings, birthday, etc.) to be ...” with three response options (1 = Mexican, 2 = no preference, 3 = American). Ethnic identification was used to access the respondents’ identification with certain culture (“Do you think yourself to be ...). The original response options for ethnic identification were 1) Mexican, 2) Mexican American but

more Mexican, 3) Mexican and American equally, 4) Mexican American but more American, and 5) American. For the analysis, these categories were collapsed to three responses as 1) Mexican, 2) bicultural, and 3) American identity.

Social affiliation and interpersonal relationship were also measured using a single item question, “What kind of clubs/social groups, etc. do you attend?” and “Are your close friends and acquaintances ...?” The original response options were 1) Mexican, 2) Mexican American but more Mexican, 3) Mexican and American equally, 4) Mexican American but more American, 5) American, 6) non applicable- does not attend clubs (for social affiliation), neither (for interpersonal relationship). These categories were collapsed to three responses as 1) Mexican, 2) equal, 3) American, and 4) did not attend/ neither.

Mexican cultural value was measured by three items asking about respondents’ agreement on the items ($\alpha = .71$). In addition, seven items of Mexican family value ($\alpha = .70$) was measured to assess the respondents’ agreement on Mexican value of family. The original response options (from 1 to 5) were first re-entered as a composite score and re-coded as a category response: 1) low (1-2.49), 2) moderate (2.5-3.49), 3) high (3.5-5).

A single item used to ask the respondents’ language preference in health information seeking [e.g., “What language do you use when seeking general health? (from the internet and any other source of information, such as books from a public library)]. Response options were 1) Spanish only, 2) mostly Spanish, some English, 3) Spanish and English equally, 4) mostly English, some Spanish, 5) English only, 6) not application-doesn’t search for general health information. Original responses were re-coded for the statistical analysis as 1) Spanish dominant, 2) bilingual, 3) English dominant, 4) no health information seeking.

Data Analytic Plan

Questionnaires were verified for completeness upon being returned to study staff, and subsequently verified before scanning into a computer system. Data were entered into SPSS

v.22 Data Editor and descriptive statistical analysis was performed using the same software program. To address our first research question (RQ₁), Mplus [60] was utilized to perform a series of latent class analyses (LCA) to identify sub-groups of Mexican immigrants based on 16 acculturation indicators including language preference with family, interpersonal relationship, and media, ethnic identity, social affiliation, cultural practices, perception of Mexican family value and cultural value. Latent class analysis enables researchers to identify patterns of responses based on similar characteristics of individual responses [61-62].

To identify the optimal model for the latent class, a series of latent class analyses were employed and compared (i.e., models with 1-class through n-class solutions), based on the model fit criteria. A smaller value of Akaike's Information Criterion (AIC) and the Bayesian Information Criterion (BIC), as well as higher entropy value (i.e., closer to one) and interpretability of results determines the optimal model fit [62]. Once the appropriate model solution was determined, class membership was identified using maximum rule assignment, which indicates that the highest conditional item response probability ultimately represents the class membership of each group [63]. The conditional probability is the likelihood of representing specific characteristics in each latent class and values closest to 1 suggest higher probability of defining characteristics of delivery quality in each latent class. In the present study, the average conditional probability for each class, ranging from .96 to 1, easily identified class membership considering .80 as an adequate conditional probability for each latent class [63].

Results

The first research question asked about the distinctive characteristics of acculturation among Mexican immigrants. As a result of LCA, it was revealed that the four-class latent model provided a more optimal solution than the one-, two-, three-, five-class, or six-class models (AIC= 3972.037, BIC= 4440.794, Entropy= .962). That is, the four-class model

identified the most distinctive patterns of Mexican immigrants' acculturation based on 13 linguistic, psychological, and behavioral indicators. Table 1 presents the fit criteria for each model. To interpret the four typologies of acculturation, Table 2 presents latent class membership probabilities, class size, and conditional probabilities.

Class 1 (66.81%, $N = 159$) was characterized by individuals with *Spanish dominant* in all domains (i.e., general speaking, family, friends, media). A majority of Mexican immigrants in this sub-group reported their ethnic identity as Mexican. They also showed strong affinity toward Mexican social interaction (i.e., celebration, social affiliation, interpersonal relationship) and reported high levels of Mexican family value and Mexican cultural value. The probability of latent membership for class 1 was 99.2%. We labeled class 1 as the *less acculturated*.

Class 2 (9.66%, $N = 23$) was characterized by individuals who are either Spanish dominant or bilingual in all domains (i.e., general speaking, family, friends, media). Most of Mexican immigrants in this sub-group held their ethnic identity as Mexican yet others reported bicultural identity implying both Mexican and American identity. The respondents reported to prefer Mexican celebration or no cultural preference in celebration. Most of the respondents also equally engaged in social interaction with American and Mexican (i.e., social affiliation, interpersonal relationship) and reported the highest levels of Mexican family value and Mexican cultural value. The probability of latent membership for class 2 was 92%. We labeled class 2 as the *moderately acculturated*.

Class 3 (5.88%, $N = 14$) was characterized by individuals with bilingual dominant in general speaking, family and friends but English dominant in media. A majority of Mexican immigrants in this sub-group held their ethnic identity as Mexican yet others reported bicultural identity or American identity. Their social interaction differed depending on domains. All of the respondents in this sub-group reported no cultural preference in

celebration. Most of the respondents engaged in interpersonal relationship with Mexican and American equally or American only. Many of the respondents did not attend any social affiliation or joined club or social group affiliated with American and reported the lowest levels of Mexican family value and Mexican cultural value. The probability of latent membership for class 3 was 96.6%. We labeled class 3 as the *highly acculturated*.

Class 4 (17.65%, $N = 42$) was characterized by individuals with bilingual dominant in all domains (i.e., general speaking, family, friends, media). A majority of Mexican immigrants in this sub-group held their ethnic identity as Mexican yet others reported bicultural identity. Their social interaction differed depending on domains. The respondents in this sub-group reported no cultural preference or preference in Mexican celebration. Most of the respondents had interpersonal relationship with Mexican and American equally or Mexican only. Many of the respondents did not attend any social affiliation or joined club or social group equally in Mexican and American affiliation and reported high levels of Mexican family value and Mexican cultural value. The probability of latent membership for class 4 was 98.3%. We labeled class 4 as the *selectively bicultural*.

Second research question asked if Mexican immigrants' language preference in health information seeking differed, depending on sub-groups of acculturation. A chi-square test of independence was performed to test statistical differences of language preference in health information seeking among four sub-groups. Post-hoc analysis was followed to test individual group comparisons. Prior to conducting a chi-square test of independence to test the group differences, a descriptive analysis was first run. The results showed that a majority of Mexican immigrants in the less acculturated group (Class 1, $N = 159$) sought health information in Spanish (Spanish = 148; both Spanish and English = 9; English = 1; did not seek out information = 1). Most of the respondents in the moderately acculturated group (Class 2, $N = 23$) sought health information in Spanish (Spanish = 18; both Spanish and

English = 4; English = 1). A majority of the respondents in the more acculturated group (Class 3, $N = 14$) sought health information in English (both Spanish and English = 2; English = 12). The respondents in the selectively bicultural group (Class 4, $N = 42$) sought health information using language evenly (Spanish = 16; both Spanish and English = 15; English = 10; did not seek out information = 1).

Next, a chi-square test of independence was employed to examine the group differences. The results for the tests were significant, $\chi^2 = (9, N = 238) = 152.56, p < .001$. A post hoc analysis revealed that there were statistically significant differences of sub-groups in language preference when seeking health information. Highly acculturated group was statistically different from the rest of the three groups. Selectively bicultural group was also found to be statistically different from the rest of the three groups. However, there were no significant differences in language preference between the less acculturated group and moderately acculturated group when seeking health information.

Discussion

As a result of the latent class analysis, the present study identified four-distinctive sub-groups of Mexican immigrants by examining their response patterns of 16 linguistic, psychological, and behavioral indicators. Guided by segmented assimilation theory [37] four typologies of Mexican immigrants' acculturation were classified as less acculturated, moderately acculturated, highly acculturated, and selectively bicultural.

In terms of the characteristics of acculturation typologies, the study found that the groups of less acculturated and moderated acculturated preferred Spanish in general speaking, with family, with friends, and in media whereas the selectively bicultural group preferred bilingual in general speaking, with family, with friends, and in media. It was also revealed that the highly acculturated group preferred bilingual in general speaking, with family, and with friends, yet preferred English in media. When comparing the language preference

between the groups of selectively bicultural and highly acculturated, the selectively bicultural group tended to use more Spanish in general speaking, with family, with friends, and in media than the highly acculturated group, in spite of the fact that more individuals in the selectively bicultural group reported their preference of general speaking in bilingual than that of the acculturated group. Individuals in the highly acculturated group, on the other hand, reported that they preferred bilingual in interpersonal relationship, with the exception of watching television or reading newspaper in English.

These findings show distinctive differences between the selectively bicultural group and highly acculturated group in that Mexican immigrants in the selectively bicultural group preferred more use of Spanish in interpersonal interaction and media consumption than English, although a majority of individuals in this group are bilingual themselves in Spanish and English. In contrast, all of Mexican immigrants in the highly acculturated group chose English when using mass media. Different language preference in interpersonal communication and mass media suggests that health scholars should consider appropriate language choice based on the target audience's acculturation typology and their preference to use certain language, rather than simply using language proficiency as a determinant to design a health message.

Cultural preference in celebration appeared to be consistent with the previous literature documenting that more acculturation to the mainstream American culture is linked to less cultural practices of the native culture [2, 16, 64]. Less acculturated, moderately acculturated, and selectively bicultural groups preferred birthday or wedding celebration according to Mexican cultural practices, whereas the highly acculturated group reported no preference in such celebration.

In terms of social interaction, the less acculturated group preferred social affiliation and interpersonal relationship with Mexican, whereas the moderately acculturated group

tended to engage in social relationship with both Mexican and American equally. Similar to the moderately acculturated group, a majority of highly acculturated and selectively bicultural groups preferred interpersonal relationship with Mexican and American equally but more numbers of individuals in the highly acculturated group were likely to interact with American than the selectively bicultural group. With regard to social affiliation, a number of the respondents in the highly acculturated group did not attend social club whereas a few joined social affiliation in American, American and Mexican equally, or American. Likewise, respondents in the selectively bicultural group also reported that they did not attend social club while a few affiliated with social club in American and Mexican equally, or Mexican. These results suggest that interpersonal relationship and social affiliation among Mexican immigrants vary depending on their acculturation typology. It provides practical implications that health researchers and practitioners should take account of social interaction and participation as a key indicator for the acculturation typologies of the target audience and promote health campaigns using the most appropriate dissemination method.

The findings also revealed that a majority of less acculturated and highly acculturated groups reported their ethnic identity as Mexican, whereas moderately acculturated and selectively bicultural groups reported Mexican or bicultural identity. This finding was unexpected and not consistent with past research documenting that as immigrants acculturate to the mainstream American culture, the likelihood of ethnic identity with the culture of origin decreases [33]. We speculate the possible reason that considering all of the respondents in this study were born in Mexico and brought to the United States as children of Mexican immigrant families, their ethnic identity may be different from those who were born in the United States. Because language plays a significant role to shape and socialize one's identity throughout the developmental period of time [64], it may be assumed that the respondents in the current study had already established their ethnic identity as Mexican,

before their immigration to the United States. For example, all of the four groups reported that they spoke Spanish as a child at home, which substantially influenced their identity during childhood and adolescence. We believe that the characteristics of respondents in this study showed a unique representation of Mexican immigrants. Specifically, we discover that the selectively bicultural group was characterized by immigrants who were mostly bilingual and strongly identified themselves as Mexican in relation to their ethnic identity. A majority of immigrants in this group reported the linguistic ability to adapt to the host culture, yet their psychological and behavioral practices of the host culture was less preferable. This acculturation typology is distinctly different from other three groups and demonstrates a group of outliers who do not follow the traditional approach to the acculturation status such as “marginalized acculturation group” who neither identifies themselves as their culture of origin nor the host culture [33, 34]. That is, the selectively bicultural group shows the unique characteristics of acculturation typology in terms of their ability in adapting to the host culture and their preference of practicing the host culture, whereas the marginalized group indicates those who not only refuse to sustain their culture of origin, but also reject to adapt to the host culture during their acculturation process.

In order to better understand the characteristics of this particular acculturation typology, future research needs to further delve into investigating immigrants’ preference of performing linguistic, social, cultural, and behavioral practices and their motivation of why and how they prefer certain dimensions of acculturation. Also, based on the findings, future researchers should consider creating a new terminology for this unique typology of acculturation.

Perceptions of Mexican family value and Mexican cultural value showed the decreases from the less acculturated group to the highly acculturated group. That is, the respondents in the highly acculturated group were more likely to report higher levels of

Mexican family value and Mexican cultural value than the less acculturated group. It was also found that the selectively bicultural group reported higher levels of Mexican family value and Mexican cultural value than the highly acculturated group.

Given that three groups reported the similar range of their time spent in the United States (1 year to 40 years) with the exception of the highly acculturated group (1 year to 25 years), this indicator did not provide substantial different information to distinguish the latent classes. In other words, time spent in the United States was not a discrete indicator of acculturation in this study.

When seeking health information, Mexican immigrants used particular language based on their level of acculturation. The findings suggest that there is a significant difference among all of the group comparisons, except the comparison between the less acculturated group and the moderately acculturated group. These findings indicate that acculturation does influence Mexican immigrants' language preference in health information seeking, and therefore, health researchers should account for acculturation typologies identified by LCAs when analyzing audience segmentation. The present study contributes to the scholarship by using multidimensional measures of acculturation and employing LCA analysis, which allows researchers to gain better understandings of Mexican immigrants as the target audience of health campaigns and create the effective health messages accordingly.

Although the present study makes a substantive contribution, it is not without limitations. We acknowledge there is no universal agreement on the features that accurately specify greater or lower acculturation [39, 65]. The research was conducted in a broadly representative but not random sample of the Mexican immigrant population. We only collected data from largely Catholic churches. Other communities may be less religious in other Mexican immigrant enclaves, or in different churches, and be different as far as where in the acculturation process of change they are located. Our findings are directly relevant only

to the Midwest geographic location. Some flexibility in terms of relevance may be granted when using this tool in other locations in the USA – as long as they are urban locations. The conclusions may not be relevant in those Mexican immigrant groups distant from the set of assumptions we have made – cases in point being migrant agricultural workers, rural communities, or enclaves of aboriginals from Mexico. On the other hand, the present research appears to be one of the few studies investigating health information seeking behavior in present-day urban-based Mexican immigrants; our finely grained distinction across acculturation typologies adds to the current state of knowledge. In addition, future research should consider various demographic variables including generation, gender, age, education, and household income as influential factors for the latent class membership of acculturation typologies. Adding these variables as covariates for LCA will allow more accurate and advanced statistical analysis for audience segmentation.

In conclusion, the current study identified 4 typologies of acculturation in Mexican immigrants from the multidimensional approach and further examined sub-group differences of language preference when seeking health information. The study findings indicate the importance of audience segmentation accounting for multifaceted dimensions of acculturation and provide practical implications for public health campaigns.

Acknowledgements

Grant support for this research was provided by NIDCR grant DE022096-01A1 and by two Project Development Teams within the Indiana University Center for Urban Health and ICTSI NIH/NCRR Grant Numbers RR025761 and UL1TR001108. Data collection and processing by Odette Zero (Indiana University School of Dentistry), Anita Ohmit, and Siqi Dai (Indiana Minority Health Coalition) are gratefully acknowledged.

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Table 1. Fit Comparison of Models with Different Numbers of Latent Classes

Model	Log Likelihood	k	AIC	BIC	Entropy
1-Class	-2157.202	33	4380.405	4494.990	N/A
2-Class	-1924.859	67	3983.719	4216.361	.937
3-Class	-1884.660	101	3971.320	4322.019	.933
4-Class	-1851.345	135	3972.689	4441.446	.967
5-Class	-1822.936	169	3983.872	4570.686	.879
6-Class	-1802.494	203	4010.989	4715.860	.925

Table 2. Four-Class Solution: Latent Class Probabilities, Class Size, and Conditional Probabilities

Indicator	Total n = 238	Class 1 (n=159, 66.81%) Less acculturated	Class 2 (n=23, 9.66%) Moderately Acculturated	Class 3 (n=14, 5.88%) Highly acculturated	Class 4 (n=42, 17.65%) Selectively bicultural
V1: General speaking	Spanish	81.9	61.3	0	7.5
	Bilingual	17.5	34.1	71.7	88.2
	English	0.6	4.6	28.3	4.2
V2: Speaking as a child	Spanish	99.4	100	90.6	87.1
	Bilingual	0	0	0	12.9
	English	0.6	0	9.4	0
V3: Speaking at family gathering	Spanish	87.9	71.4	16.7	47.1
	Bilingual	10.2	28.6	73.9	52.9
	English	10.9	0	9.4	0
V4: Speaking with friends	Spanish	84.9	74.7	0	29.5
	Bilingual	15.1	20.6	64.5	59.4
	English	0	4.7	35.5	11.1
V5: Media television	Spanish	94.1	52.2	0	2.7
	Bilingual	5.9	31.6	0	84.9
	English	0	16.2	100	12.4
V6: Media newspaper	Spanish	94.2	87.9	0	17.1
	Bilingual	2.6	12.1	0	58.4
	English	3.2	0	100	24.5
V7: Time spent in the U.S.	1-5 yrs	6.3	13.5	9.4	0
	6-10 yrs	22.3	19.7	8.3	13.8
	11-15 yrs	42.3	29.8	45.0	39.9
	16-20 yrs	13.9	21	18.9	21.9
	21-25 yrs	10.1	0	18.4	15
	26-30 yrs	3.8	7.1	0	5.1
	31-35 yrs	0.6	8.9	0	2.2
36-40 yrs	0.6	0	0	2.2	
V8: Preference in celebration	Mexican	58.7	52.1	0	43.7
	Neither	40.7	47.9	100	54.1
	American	0.6	0	0	2.1
V9:	Mexican	99.4	73.1	81.1	80.7

Ethnic Identity	Bicultural	0	26.9	9.4	17.2
	American	0.6	0	9.4	2.1
V10: Club/ social group	Mexican	65.1	24.2	18.9	22.4
	Equal	4.6	71.5	17.8	34.0
	American	0	4.3	28.3	4.4
	Did not attend	30.3	0	35	39.2
V11: Close friendship	Mexican	94.6	0	9.4	40.8
	Equal	4.1	100	81.7	50.5
	American	0.6	0	18.8	6.6
	Neither	0.6	0	0	2.1
V12: Mexican family value	Low	1.3	0	9.4	0
	Moderate	6.3	0	18.9	0
	High	92.4	100	71.7	100
V13: Mexican cultural value	Low	0.6	0	9.4	0
	Moderate	15.1	8.1	18.9	17.6
	High	84.2	91.9	71.7	82.4
