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Linguistic Predictors of Cultural Identification in Bilinguals

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Most of the world's population has knowledge of at least two languages. Many of these bilinguals are also exposed to and identify with at least two cultures. Because language knowledge enables participation in cultural practices and expression of cultural beliefs, bilingual experience and cultural identity are interconnected. However, the specific links between bilingualism and cultural identity remain largely unidentified. The current study examined which aspects of bilingualism relate to identification with first- and second-language cultures. Two hundred and nine bilinguals completed a questionnaire probing linguistic background and cultural affiliations. Regression analyses indicated that cultural identification was predicted by age of language acquisition, language proficiency, foreign accentedness, and contexts of long-term language immersion and current language exposure. Follow-up analyses revealed that the language–culture relations were mediated by the age and manner in which the second language was acquired. These findings are situated within a proposed framework of bilingual cultural identity. By identifying features of bilingualism that are relevant for cultural identity, the current research increases our understanding of the relationship between language and culture.

1. INTRODUCTION

Language is the road map of a culture.

Brown (1988)

The majority of the world's population is bilingual (Harris and McGhee-Nelson 1992; Marian and Shook 2012), a trend that continues to rise with increases in globalization and immigration. Many of these bilinguals have also been exposed to the beliefs and practices of two cultures. These phenomena—bilingual knowledge and use and bicultural exposure and identification—are known to be related (Pavlenko 2004; Dewaele and van Oudenhoven 2009; Schrauf 2009). By learning a second language, bilinguals gain access to a second culture, enabling them to learn about, participate in, and potentially identify with that culture (Tong and Cheung 2011). Moreover, acquisition of a second language can affect how bilinguals relate to their first-language culture, sometimes decreasing affiliation with the first-language culture (Noels and Clément 1996; Noels *et al.* 1996). While it is clear from previous research

that language is related to cultural identification in bilinguals, it remains unclear which aspects of bilingualism are relevant for cultural identity. In the current study, we analyze various aspects of bilingualism—including when bilinguals learned their two languages, how proficient they are in each language, and in which contexts they use each language—with the aim of identifying which linguistic factors predict identification with first-language and second-language cultures.

Although few studies have examined the linguistic predictors of cultural identification in bilinguals, extensive research in sociolinguistics and linguistic anthropology has identified linguistic predictors of cultural identification in *monolingual populations* (e.g. Trudgill 1972; Tannen 1981; Bucholtz 1999).[1] This research has demonstrated that phonological, lexical, syntactic, and discourse patterns are indicative of monolingual speakers' cultural affiliations. For example, in a classic study examining speech variations in English-speaking residents on the island of Martha's Vineyard in Massachusetts, USA, Labov (1972) reported that a distinct pronunciation of the diphthongs /ay/ and /aw/ as in 'mice' and 'mouse' was indicative of identity as Vineyarders (i.e. individuals who had a positive affiliation with the island and rejected mainland culture). In other work, Eckert (1989, 2000) analyzed students in various subcultural groups in Detroit, USA, and observed a relationship between students' group affiliations and their linguistic patterns, such as use of negation, vowel shifts in pronunciation, use of specialized vocabulary, and type of conversational greeting. Recent studies have extended this research and identified language–culture links in monolingual populations that speak other varieties of English (e.g. Pittsburghese; Johnstone *et al.* 2006) and monolingual populations that speak a language other than English (e.g. Chinese; Zhang 2008).

As with monolinguals, language–culture links have also been observed in bidialectals, who speak two distinct varieties of the same language. For instance, among African-Americans who speak both African-American English and Standard American English, usage patterns and perceptions of the two dialects have been linked to degree of affiliation with their respective cultures (DeBose 1992; White *et al.* 1998; Ogbu 1999). Furthermore, other studies have found that Caucasian-American and Asian-American speakers of Standard American English who adopt phonological, lexical, and grammatical features of African-American English often identify with an African-American music-based subcultural group (Chun 2001; Reyes 2005; Igoudin 2011). Collectively, this research with monolinguals and bidialectals demonstrates a strong link between a person's linguistic behavior and cultural group membership.

In the present study, we examine which aspects of *bilingual* language knowledge, use, and experience are indicators of cultural identity. Notably, unlike a bidialectal's two dialects, a bilingual's two languages are often mutually unintelligible and can differ greatly in their linguistic characteristics. Moreover, whereas a bidialectal's two cultures are often subcultures within the same larger culture, a bilingual's two cultures may be very different.[2] Despite the

differences among bilinguals and bidialectals, bilinguals are also likely to have linguistic indicators of cultural identification.

We propose a three-part framework for why language knowledge, use, and experience may relate to culture identification in bilinguals. According to the first account—to be referred to as *the cultural learning and participation through language account*—acquiring knowledge of the languages that are used in a culture may give bilinguals increased access to that culture (Tong and Cheung 2011). That is, by knowing these languages, bilinguals can learn about cultural practices through receptive media, like watching television, listening to the radio, and reading newspapers, magazines, and books, as well as through verbal interactions with friends, family, and other members of the cultural group. Linguistic knowledge also enables bilinguals to directly engage in the culture's practices, including religious, artistic, medical, dietary, and political activities. By learning about and participating in a culture via language use, bilinguals may come to identify more with the culture (or potentially less with the culture, depending on their perspective of the culture's beliefs and practices) (Brown 2009).

The second account can be referred to as *the self-reflection of language use account.* According to this account, bilinguals may introspectively analyze their language patterns and use this information as a way to understand themselves and decide on their identity (Grosjean 2014). That is, bilinguals may reflect on their language-related behaviors, like their accent and proficiency in each language, as a way to increase self-awareness and to identify their similarities and differences relative to others (Giles *et al.* 1991). Bilinguals may then use this information about their language behaviors to help them decide which cultural groups they fit into and to what extent.

The third account can be referred to as *the stylistic language use account.* According to this account, bilinguals may stylistically use their languages with the deliberate intention of conveying their identity to others (Bourhis and Giles 1977; Segalowitz *et al.* 2009). That is, bilinguals may choose to use one language over the other in a certain situation and may consciously speak with less of an accent in that language as a means by which to express their affiliation to a particular culture. For example, pronunciation in the L2 may be stylistically varied in order to demonstrate a retained L1 cultural identity or a shift to an L2 cultural identity (Sharma 2005; Rampton 2013). The idea that speakers employ stylistic language behavior to communicate their identity is well attested and is related to the concepts of style-shifting, audience design, communication accommodation, performance, and creative indexicality (Giles and Johnson 1981; Bucholtz and Hall 2005; Gallois *et al.* 2005).

These three accounts predict that language knowledge, use, and experience are related to cultural affiliation in bilinguals. However, certain aspects of language knowledge, use, and experience may be more relevant to cultural identification than others. That is, cultural identification may be marked by such factors as the contexts in which bilinguals use their two languages, their

proficiency in each language, their accent in each language, their age of learning each language, or more likely, a combination of these linguistic factors.

Preliminary research on this topic has identified some of the linguistic factors that relate to cultural identification in bilinguals. For example, language proficiency (and the closely related concept of linguistic self-confidence) is correlated with degree of cultural affiliation (Noels *et al.* 1996; Ellinger 2000; Gatbonton and Trofimovich 2008). Specifically, increased L2 proficiency is often linked to stronger affiliation with the L2 culture (and occasionally affiliation with the L1 culture). For instance, in a sample of bilinguals who spoke Chinese as their L1 and English as their L2, higher proficiency in English was related to stronger identification with Western culture (Chen *et al.* 2008). In addition to proficiency, foreign accentedness in pronouncing spoken words in the L2 has been linked to level of cultural affiliation (Gatbonton *et al.* 2005; Moyer 2007; Gluszek and Dovidio 2010). Specifically, less of an L2 accent has been linked to stronger identification with the L2 culture and weaker identification with the L1 culture. For example, in a diverse sample of L2 English speakers with a variety of L1s, a reduced L2 English accent was associated with stronger American cultural affiliation (i.e. L2 affiliation) (Gluszek *et al.* 2011). A reduced L2 English accent was also linked to weaker identification with the L1 culture in a study of Francophone bilinguals who spoke French (L1) and English (L2) and lived in Quebec (Gatbonton *et al.* 2011). In sum, previous work has identified proficiency and accent as two relevant linguistic indicators of cultural identification in bilinguals.

In the current study, we expand upon this previous work by considering additional facets of bilingualism through a comprehensive questionnaire. In addition to self-reported measures of L1 and L2 proficiencies and accents, we include self-reported measures of L1 and L2 current exposure contexts, long-term immersion contexts, and age of acquisition. The current study also includes a heterogeneous sample of bilinguals representing many different languages and cultures, with the aim of identifying reliable language–culture relations that transcend linguistic and cultural differences. Through regression analyses of the questionnaire data, we identify which linguistic factors predict cultural affiliation in bilinguals. Specifically, we determine which L1 and L2 factors are predictive of identification with the C1 (i.e. the L1 culture), as well as which L1 and L2 factors are predictive of identification with the C2 (i.e. the L2 culture). We then further examine the linguistic predictors of cultural identification by exploring whether they differ depending on age and context of second language acquisition. We focus on age and context of acquisition as mediating variables, because age and context of acquisition can influence language-learning outcomes (e.g. proficiency and accent; Johnson and Newport 1989; Flege *et al.* 2006), which may, in turn, affect affiliation with the language's culture (Chen *et al.* 2008; Gatbonton *et al.* 2011; Gluszek *et al.* 2011). Thus, in the present study, we compare language–culture relations in early L2 bilinguals versus late L2 bilinguals, and in bilinguals who acquired their L2 in an informal context (i.e. through friends and family) versus

bilinguals who acquired their L2 in a formal context (i.e. classroom learning). In addition to analyses of the questionnaire data, which are used to identify language–culture relations, we also include excerpts from case study interviews. Excerpts from the interviews are used to help provide explanations for the observed language–culture relations.

2. METHOD

2.1 Participants

2.1.1 Questionnaire participants

A total of 209 bilingual participants (140 female, 69 male; mean age = 27.4 years) took part in the current study. Bilinguals were recruited for the study through flyers and email. Inclusion criteria were knowledge of at least two languages and English as a first- or second-acquired language.

The 209 participants completed an English language version of the *Language Experience and Proficiency Questionnaire* (*LEAP-Q*; Marian *et al.* 2007). All participants were residing in an English-speaking country (USA) when they completed the questionnaire. Of the 209 participants, 42 indicated that they had immigrated to the USA. On average, participants reported having spent 22.6 years (standard deviation = 16.2 years) and 82.2 percent (standard deviation = 38.3 percent) of their lives in an English-speaking country. Additionally, participants reported having spent 6.76 years (standard deviation = 9.50 years) and 27.0 percent (standard deviation = 44.4 percent) of their lives in a country where their other (i.e. non-English) language was spoken. English was the L1 for 110 participants (four of whom indicated that they had immigrated to the USA); English was the L2 for the other 99 participants (38 of whom indicated that they had immigrated to the USA). L1/L2 status was defined based on age of acquisition (i.e. the first-acquired language was labeled the L1, and the second-acquired language was labeled the L2). The most common L1s and L2s apart from English were Spanish ($N = 101$), German ($N = 32$), and Mandarin ($N = 21$). The mean age of acquisition, language proficiency, years of immersion, and current exposure for the L1 and L2 are provided in Table 1.

Of the 209 participants, 73 of them started learning the L2 at or before age five and were considered early learners, whereas 136 participants started learning the L2 after age five and were considered late learners. Five years of age coincides with the beginning of kindergarten and is often used as a cut-off for early bilingualism (McDonald 2000; Kotz *et al.* 2008).

One hundred and three participants learned their L2 in an informal context, whereas 106 participants learned their L2 in a formal context. Participants were defined as either 'informal learners' or 'formal learners' based on the extent to which interactions with family and friends contributed to their learning of the language. Participants rated the contributions of interactions with

Table 1: Linguistic demographics of bilingual participants

Variable	L1 mean (SD)	L2 mean (SD)
Age of initial acquisition (years)	0.53 (0.84)	9.13 (6.35)
Years of immersion (years)[a]	20.92 (17.47)	8.44 (9.80)
Proficiency (0–10 scale)[b]	9.20 (1.14)	6.53 (3.12)
Current exposure (percentage)	61.28 (35.33)	37.31 (35.26)

[a]*Years of immersion* represents the number of years in a country in which that language is spoken.
[b]*Proficiency* is an average of speaking, listening, and reading proficiency.

family and with friends separately on a 0–10 scale, with 10 being the most important contributor and 0 being not a contributor (Page 2, Question 4 of the *LEAP-Q*; the full *LEAP-Q* is presented in Appendix A). A composite rating was calculated by averaging the family and friends ratings. Participants with composite ratings of 5 and above were called informal L2 learners, while participants with composite ratings below were called formal L2 learners.

All participants indicated affiliation with at least one culture. The L1 and L2 of each participant were linked to their respective culture (e.g. Spanish language to Mexican culture and Mandarin language to Chinese culture). In cases where one language was related to multiple cultures (e.g. if a participant listed Spanish language with Mexican culture and Spanish culture), we linked the language to the culture with the highest cultural identification value (based on their response to Question 6 in the *LEAP-Q* about culture identification). Thus, if a participant listed Spanish as a language, Mexican as a culture with a cultural identification value of 1, and Spanish as a culture with a cultural identification value of 10, then the Spanish language was linked to Spanish culture and its cultural identification value of 10. In cases where multiple languages were related to the same culture (e.g. if a participant listed Mandarin and Cantonese languages with Chinese culture), we linked the dominant language to the culture (based on their response to Page 1, Question 1 in the *LEAP-Q* about language dominance). Thus, if a participant listed Mandarin and Cantonese as their languages and marked their knowledge and use of Mandarin as being more dominant than Cantonese, then Mandarin was selected as the language to be linked with Chinese culture.

The number of participants who identified with their first-language culture or second-language culture is presented in Table 2. Of the 209 participants, 202 listed identification with a culture that linked to their first-acquired language (i.e. a C1). The C1 was US-American culture for 101 of the 202 participants (and a non-US-American culture for the other 101 of the 202 participants). Of the 202 participants who listed identification with a C1, 80 participants also listed identification with a culture that linked to their second-acquired

Table 2: Cultural demographics of bilingual participants

	N
Total number of bilinguals with a reported L1 cultural identity (C1)	202
• C1 was US-American	101
• C1 was not US-American	101
Total number of bilinguals with a reported L2 cultural identity (C2)	87
• C2 was US-American	58
• C2 was not US-American	29

C1 represents the culture related to the L1; C2 represents the culture related to the L2.

Table 3: Linguistic predictor variables included in regression and correlational analyses

Category	Measures
Current exposure contexts	Current exposure through friends
	Current exposure through family
	Current exposure through language-lab/self-instruction
	Current exposure through reading
	Current exposure through media
Immersion contexts	Years immersed in country
	Years immersed in family
	Years immersed in school/work environment
Proficiency	Speaking, listening, and reading proficiency
Accent	Perceived accent
Age of acquisition	Age of initial acquisition
	Age of initial reading acquisition

language (i.e. a C2). In addition, seven participants listed identification with a C2 without listing identification with a C1, resulting in 87 participants who listed identification with a C2. The C2 was US-American culture for 58 participants (and a non-US-American culture for the other 29).

In terms of the number of cultures with which participants identified, 129 were monocultural bilinguals and identified with one culture and 80 were bicultural bilinguals and identified with two cultures. In the subset of 129 unicultural bilinguals, 92 identified with US-American culture (the other 37 identified with a culture other than US-American). Among the 80 bicultural bilinguals, 74 identified with US-American culture as one of their two cultures (the other six identified with two cultures that were not US-American).

Twenty monocultural bilinguals and 22 bicultural bilinguals indicated that they had immigrated to the USA. Participants may have identified with a culture that linked to additional languages as well (e.g. an L3), but these additional languages were not considered in the current study because of the small number of participants with an L3.

2.1.2 Interview participants

Four bilinguals (one from the sample of 209 participants and three participants from outside of this sample) were interviewed about their linguistic and cultural background.[3] *Bilingual A* was a Spanish–English bilingual who learned the L2 (English) late and informally and who identified with both Mexican-American culture (with an identification value of 7 out of 10) and US-American culture (with an identification value of 9 out of 10). *Bilingual B* was an English–Spanish bilingual who learned the L2 (Spanish) early and informally and who identified with both Belizean culture (with an identification value of 9 out of 10) and US-American culture (with an identification value of 9 out of 10). *Bilingual C* was a Serbian–English bilingual who learned the L2 (English) late and informally and who identified with both Serbian culture (with an identification value of 10 out of 10) and US-American culture (with an identification value of 6 out of 10). *Bilingual D* was a Korean–English bilingual who learned the L2 (English) late and formally and who identified with both Korean culture (with an identification value of 10 out of 10) and US-American culture (with an identification value of 7 out of 10). These four interviewees were selected to be representative of our survey participants. Specifically, the early L2 learners, the late L2 learners, the informal L2 learners, and the formal L2 learners of the survey sample were each represented by at least one interviewee. Moreover, two of the four interviewees were Spanish-speaking, thereby representing the large subset of Spanish-speaking bilinguals ($N = 101$) in the survey analyses.

2.2 Materials

2.2.1 Questionnaire materials

The *LEAP-Q* (Marian *et al.* 2007) was used to collect self-reported data about linguistic and cultural background (a full version of the *LEAP-Q* appears in Appendix A). Participants completed the questionnaire either in the lab by using Microsoft Word or MATLAB with the Psychophysics Toolbox or remotely by using Microsoft Word and emailing the completed questionnaire. The *LEAP-Q* queried multiple aspects of a participant's language history, including (i) *current exposure contexts*, (ii) *immersion contexts*, (iii) *proficiency*, (iv) *accent*, and (v) *age of acquisition*.[4]

(i) *Current exposure contexts*: Participants rated on a 0–10 scale the extent to which they were currently exposed to the language in each of the following contexts: interacting with friends, interacting with family,

watching television, listening to radio/music, reading, and language-lab/self-instruction.

(ii) *Immersion contexts*: Participants marked the number of years they had spent in a country in which the language was spoken, in a family in which the language was spoken, and in a school and/or working environment in which the language was spoken. Note that the current use of the term 'immersion' differs from the way the term is used in an educational context, in which 'immersion' often refers to the use of an L2 as the medium of classroom instruction.

(iii) *Proficiency*: Participants assessed their speaking, listening, and reading ability in each language on a 0–10 scale.[5]

(iv) *Accent*: Participants rated the extent to which they perceived themselves to have a foreign accent (i.e. self-perceived accent) using a 0–10 scale. They also judged on a 0–10 scale the frequency with which other people have identified them as being a non-native speaker of the language based on their accent (i.e. others-perceived accent). Participants rated their self-perceived and others-perceived accent for all of the languages they listed on the *LEAP-Q*.

(v) *Age of acquisition*: Participants provided the age at which they began acquiring the language (age of initial acquisition), the age at which they became fluent in the language (age of fluency), the age at which they began reading in the language (age of initial reading), and the age at which they became fluent in reading the language (age of reading fluency).

In addition to linguistic background, participants also provided data on their cultural identities. Participants listed the name of all of the cultures with which they identified. For all cultures listed, the extent of identification with each culture was rated on a 0–10 scale (0 = no identification, 10 = complete identification).

Because of the large number of linguistic variables, many of which are naturally correlated, we reduced the number of predictors included in our regression analysis by creating composite variables for predictors that were highly correlated and conceptually similar. We created a composite 'proficiency' variable by taking the average of speaking, listening, and reading proficiency (all correlations among these three variables were above $r = .60$ for the L1 and the L2, all $ps < .05$; Cronbach's alpha for L1 = .89; Cronbach's alpha for L2 = .96). A composite 'perceived accent' variable was created by taking the average of self-perceived and other-perceived accent ratings (correlations between these variables were above $r = .60$ for the L1 and the L2; $ps < .05$; Cronbach's alpha for L1 = .79; Cronbach's alpha for L2 = .90). We also combined current exposure to television and to radio/music into a composite 'current exposure through media' score (correlations between these variables were above $r = .70$ for the L1 and the L2; $ps < .05$; Cronbach's alpha for L1 = .86; Cronbach's alpha for L2 = .92). Furthermore, we did not include age of acquiring speaking fluency and age of acquiring reading fluency, because they were highly correlated with age of initial acquisition (for L2, r was above .70, $p < .05$; for L1, r was .22,

$p < .05$) and age of initial reading acquisition (r was above .60 for the L1 and the L2, $ps < .05$), respectively, and because many participants did not indicate the age at which they reached fluency (likely because they did not consider themselves to be completely fluent). After creating composites of highly correlated and conceptually similar variables and excluding variables with missing data, there were twelve predictor variables for each language (L1 and L2). Table 3 provides a list of the final set of variables that were entered into the regression analyses.

Interview materials. The case study interviews were conducted to complement findings from the *LEAP-Q* analyses. While analyses on the questionnaire data indicated which linguistic factors relate to cultural identification, interviews provided information on how and why certain linguistic factors may relate to cultural identification. Specifically, the interviews were designed to provide illustrative examples of how the three accounts laid out in Section 1—*the cultural learning and participation through language account*, *the self-reflection of language use account*, and *the stylistic language use account*—may explain the roles of language experience in cultural identity. The interviews were guided by a set of questions (see Appendix B for examples of the types of questions that were asked), but were conducted in an unscripted scaffolding manner, such that interviewee questions built upon the interviewee's previous responses. Excerpts from these interviews are included in Section 4 to support explanations for why certain aspects of language experience are relevant for cultural affiliation. Readers interested specifically in a case-study approach to the relationship between language and culture in bilinguals are referred to Smolicz (1992), Schecter and Bayley (1997), Mills (2001), Martínez-Roldán (2003), Mah (2005), and Brown (2009).

2.3 Data analysis

Two multiple regression analyses were conducted on the *LEAP-Q* questionnaire data. In the first analysis, L1 and L2 factors were considered as predictors of C1 identification. This analysis included the 202 participants who listed identification with a C1. In the second analysis, we again considered L1 and L2 factors, but this time as predictors of C2 identification. The 87 participants who listed identification with a C2 were included in the second analysis.

In regression analyses of C1 and C2 identification, the 12 linguistic factors listed in Table 2 were included for both the L1 and L2. Thus, there were 24 linguistic predictor variables. The to-be-predicted dependent measure was the degree of identification with the culture (ranging from 0 to 10). Although we reduced the set of predictor variables using principled variable reduction (as described above), some of the remaining predictors were still correlated, which can lead to problems of multicollinearity and can negatively impact the validity of the regression results (Marquardt 1970; Neter *et al.* 1989; Menard 1995). To identify cases of multicollinearity, we computed variance inflation factors (VIFs). Then, to reduce multicollinearity in the model, we iteratively removed

the predictors with the highest VIF until all predictors were below three (Mansfield and Helms 1982). For the C1 regression analysis, the following L1 predictor variables were removed due to high VIFs: current exposure through reading, years immersed in school/work, years immersed in country, and age of initial reading acquisition. The following L2 predictor variables were also removed: current exposure through friends, current exposure through reading, years immersed in country, proficiency, and age of initial reading acquisition. For the C2 regression analysis, the following L1 predictor variables were removed due to high VIFs: current exposure through friends, years immersed in country, years immersed in family, and age of initial reading acquisition. The following L2 variables were also removed: current exposure through friends, current exposure through reading, current exposure through media, years immersed in family, years immersed in country, and proficiency. After the reduction procedure, we ran a simultaneous regression analysis on the remaining predictor variables. The predictors that reached significance ($p < .05$) are reported in Section 3. The beta weights (β), which indicate the strength of the relationship, are provided for each significant predictor variable. Note that the beta weights for predictors of C1 and predictors of C2 are not directly comparable with each other because they are based on different regression equations.[6] Also note that, while the current sample size of 209 participants is large enough to yield accurate regression results according to recent analyses (Austin and Steyerberg 2015), the sample size is nevertheless relatively small; therefore, the results should be interpreted with some degree of caution.

After determining the subset of significant predictors, follow-up correlational analyses were conducted to assess the extent to which the identified language–culture relations (as determined by the regression analyses) differ depending on *when* and *how* bilinguals learned their L2. Pearson's bivariate correlations between the significant L2 predictors and C1/C2 identification values were computed separately for early L2 learners and late L2 learners, as well as separately for informal L2 learners and formal L2 learners. Then, through Fisher's r-to-z transformations, we statistically compared correlation strengths in early L2 learners versus late L2 learners and in informal L2 learners versus formal L2 learners. (It should be noted that Fisher's r-to-z transformations are dependent on sample size; thus, studies with smaller or larger samples may yield different statistical conclusions.)

3. RESULTS

The linguistic factors that significantly predicted cultural identification in the regression analyses are presented and interpreted below. Figure 1 depicts the significant factors and their beta weights organized by C1–C2 status and by variable category.

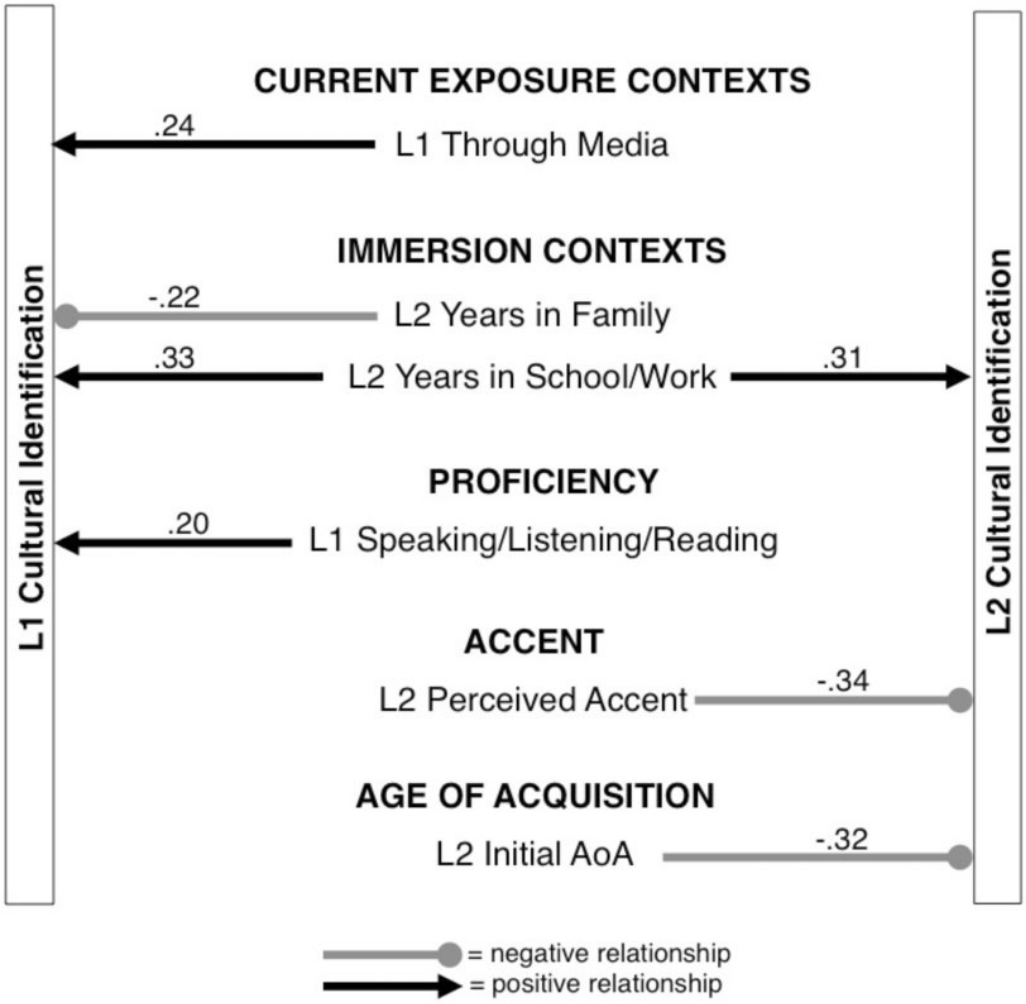

Figure 1: Linguistic predictors that were significant ($p < .05$) in the best fitting models. Numbers above each line represent beta weights.

3.1 L1 and L2 predictors of C1 identification

The left side of Figure 1 displays the significant predictors of C1. Identification with C1 was reliably predicted by two L1 variables and two L2 variables. An L1 *current exposure context* (i.e. increased L1 exposure through media; $\beta = .24$) and increased L1 *proficiency* ($\beta = .20$) predicted higher C1 identification. In addition, two L2 *immersion contexts*, that is, fewer years immersed in an L2 family context ($\beta = -.22$) and more years immersed in an L2 school/work context ($\beta = .33$), were predictive of higher C1 identification. (C1 identification was not reliably predicted by any of the *accent* or *age of acquisition* variables.)

The significant linguistic predictors of C1 identification came from three categories—immersion contexts, current exposure contexts, and proficiency—indicating that specific circumstances of language use and

attained language competency are relevant to identification with the first-language culture.

3.2 L1 and L2 predictors of C2 identification

The right side of Figure 1 displays the significant predictors of the C2. While no L1 factors predicted C2 identification, three L2 factors predicted C2 identification. An L2 *immersion context* (i.e. more years immersed in an L2 school/work context; $\beta = .31$), a lower L2 *perceived accent* ($\beta = -.34$), and a measure of L2 *age of acquisition* (i.e., earlier initial L2 acquisition; $\beta = -.32$) all predicted increased C2 affiliation. (None of the *current exposure contexts* or *proficiency* measures reliably predicted C2 identification.)

The significant linguistic predictors of C2 identification came from three categories—immersion contexts, accent, and age of acquisition—indicating that circumstances of language use, pronunciation, and onset of language learning are relevant to affiliation with the second-language culture.

3.3 Comparing predictors of C1 identification and C2 identification

A comparison of the linguistic predictors of C1 identification versus C2 identification reveals notable similarities and differences. Regarding similarities, both C1 and C2 identification were predicted by immersion contexts. Specifically, more years immersed in an L2 school/work context was related to higher C1 and C2 identification. Regarding differences, proficiency and current exposure contexts were related to C1 (but not C2) identification, while accent and age of acquisition were related to C2 (but not C1) identification.

A further difference between C1 and C2 identification was the extent to which they were predicted by cross-linguistic measures. While L2 factors predicted C1 identification, no L1 factors predicted C2 identification. These findings suggest that acquiring an L2 may influence affiliation not only with the second-language culture, but also with one's first-language culture; whereas the influence of L1 is limited primarily to affiliation with one's first-language culture.

3.4 L2 predictors of cultural identification as a function of context and age of L2 acquisition

Regression analyses revealed a strong predictive value of L2 linguistic factors in cultural identification for both C1 and C2. To further assess the relationship between L2 and cultural identification, correlations between the significant L2 predictors and C1/C2 identification were calculated separately for early L2 learners and late L2 learners, as well as separately for informal L2 learners and formal L2 learners. We then statistically compared the strengths of these correlations across our subgroups using Fisher's r-to-z transformations; these analyses enabled us to determine whether the relationship between L2 factors

and cultural identification was significantly stronger in early L2 learners versus late L2 learners and in informal L2 learners versus formal L2 learners.

The correlations for early and late L2 learners are displayed in Table 4. The correlations for informal and formal L2 learners are presented in Table 5. These values indicated that all of the L2 measures were correlated with cultural identification in the same direction for both the early and late learning groups, and for both the informal and formal learning groups. That is, if the relationship was positive in one group, it was also positive in the other group. The fact that all correlations were in the same direction for both groups suggests that the pattern of results from the regression analyses holds regardless of when and how bilinguals acquired their second language. While in the same direction, in some cases, the relationship was significantly stronger in one group versus the other. In comparisons between the early and late L2 groups, the relationship between C1 identification and L2 years in school/work was stronger in early learners ($p < .05$), while the relationship between C2 identification and both L2 years in school/work and L2 perceived accent was stronger in late learners ($ps < .05$). In comparisons between the informal and formal L2 groups, the relationship between C2 identification and L2 years in school/work was stronger in informal learners ($p < .05$), while the relationship between C2 identification and L2 perceived accent was stronger in formal learners ($p < .05$). The varying strengths of language–culture relations suggests that the degree of importance of L2 variables for cultural identification may differ depending on age and context of second language learning.

4. DISCUSSION

The current study revealed linguistic factors that predict cultural identification in bilinguals. As illustrated in Figure 1, a number of relevant linguistic factors were identified: proficiency, current exposure contexts, and immersion contexts were indicative of first-language cultural affiliation, while accent, age of acquisition, and immersion contexts were indicative of second-language cultural affiliation. These results provide some of the first quantitative evidence that current exposure contexts, immersion contexts, and ages of acquisition are relevant to cultural identification. The results also reinforce previous findings that proficiency and accent are relevant to cultural identification (Chen *et al.* 2008; Gatbonton *et al.* 2011; Gluszek *et al.* 2011). The current analyses also provide evidence for the strong impact of L2 factors on cultural affiliation, as L2 measures were related to *both* first- and second-language cultural identification. The influence of some of the L2 measures differed based on whether the bilingual learned the L2 early or late and in an informal or formal context. Specifically, the degree to which L2 accent and L2 immersion contexts correlated with cultural affiliation was dependent on both age and context of acquisition.

Why did linguistic measures, like accent, immersion contexts, current exposure contexts, proficiency, and age of acquisition predict cultural

Table 4: Correlations between L2 predictors and cultural identification for early and late learners

	C1 identification Early L2 learners	C1 identification Late L2 learners	Comparisons between groups
L2 years immersed in family	−.12	−.16	n.s.
L2 years immersed in school/work	.18	.03	$p < .05$
	C2 identification Early L2 learners	C2 identification Late L2 learners	Comparisons between Groups
L2 years immersed in school/work	.26*	.46*	$p < .05$
L2 perceived accent	−.07	−.48*	$p < .05$
L2 age of initial acquisition	−.28*	−.28	n.s.

Asterisks indicate correlations that were significant at the .05 level.

Table 5: Correlations between L2 predictors and cultural identification for informal and formal learners

	C1 identification Informal L2 learners	C1 identification Formal L2 learners	Comparisons between groups
L2 years immersed in family	−.17	−.09	n.s.
L2 years immersed in school/work	.04	.14	n.s.
	C2 identification Informal L2 learners	C2 identification Formal L2 learners	Comparisons between groups
L2 years immersed in school/work	.47*	.10	$p < .05$
L2 perceived accent	−.25*	−.52*	$p < .05$
L2 age of initial acquisition	−.33*	−.35*	n.s.

Asterisks indicate correlations that were significant at the .05 level.

identification in bilinguals? In Section 1, we proposed three general accounts for the relationship between language experience and cultural identification in bilinguals. Specifically, we proposed that language experience relates to cultural identity through cultural learning and participation via language use, through self-reflection of language use, and through stylistic language use.

We now discuss these three accounts in more depth and consider which linguistic measures are consistent with the proposed accounts.

The *cultural learning and participation through language account* implies that the cultural richness of the activities that bilinguals take part in, the ability to participate in these cultural activities, and the amount of time spent in culturally rich activities should be relevant to cultural identification. In line with this view, cultural identification in the current study was predicted by exposure to language in culturally rich immersion and current exposure contexts, by higher language proficiency enabling cultural participation, and by earlier age of language acquisition allowing for more cumulative time spent participating in cultural activities.

Among the immersion and current exposure contexts, language exposure through media, school/work, and family were predictive of cultural identification. Media is a rich source of cultural information, with television, music, and radio shaping and reflecting a culture's beliefs and practices (Joiner 1974; Lull 1987; Bennett 2000). For instance, many television shows are 'slice of life' shows and expose viewers to daily life in different cultures. Additionally, shared exposure to popular sitcoms, talk shows, and movies provides a common ground that connects members of a culture group. For example, in our interview with Bilingual C, a Serbian–English bilingual who spent her childhood in Serbia and moved to the USA as an adult, Bilingual C noted that her American colleagues often reminisce about television shows that they watched as children, but that she cannot participate in the discussions because she did not watch those shows. While recollection of these shows is a source of cultural bonding for Bilingual C's colleagues, her limited participation in this cultural activity may be a potential impediment to her feeling of belonging in the cultural group.

Family is also known to shape cultural affiliation (Phinney *et al.* 2001). The role of familial interactions in cultural affiliation was echoed in our interviews. For example, Bilingual B, an English–Spanish bilingual who identified her Spanish-speaking family as a major influence in shaping her Belizean identity during her childhood, noted that by virtue of being raised by Belizean parents, she 'grew up celebrating Belizean holidays and customs, traditions, prayer services and meals'. As was the case with Bilingual B, through language socialization, families verbally introduce children to practices and instill beliefs that relate to many aspects of culture, including education, religion, politics, diet, gender roles, and recreation (Schieffelin and Ochs 1986). During language socialization, bilingual families can decide which language(s) to use when speaking with their children. Families who hope to maintain the first-language culture in their children often think that L1 use is the best way to maintain that identity (Zhang 2004). Conversely, families who chose to use the L2 over the L1 may be making an effort to assimilate to the second-language culture, thereby lowering affiliation with the first-language culture. However, a family's decision to use the L1 or L2 (and its effect on cultural identification) may depend on the specific make-up of the family, such as

which language(s) the parents speak, which language(s) the children speak, and the relative dominance of each language.

In addition to interactions with family, interactions with peers at school/work are influential in cultural identity formation (Phinney *et al.* 2001). Interactions with peers at school/work may lead bilinguals to adopt some aspects of their peers' culture (i.e. the L2 culture), while becoming aware of and embracing unique aspects of the L1 culture. For example, in our interview, Bilingual C recounted that she noticed a difference between Serbian and American cultures when attending work parties with her American colleagues. She realized that unlike Serbian parties, American parties are more structured, with a set start and end time and with rules for how to greet attendees, what kinds of gifts are appropriate, and how to express gratitude for a gift (i.e. through a thank-you note). Her unfamiliarity with these American customs was likely due to her late immersion into American culture (immigrating at 27 years of age). Through her interactions with American colleagues, she learned how American customs differ from Serbian ones, which, in turn, may have impacted her feeling of affiliation with Serbian culture (while also potentially influencing her feeling of affiliation with US-American culture).

The ability to participate in culturally rich activities (like interacting with others at school and work) may require sufficient language proficiency (Tong and Cheung 2011). For example, Bilingual C noted that improving her English-language skills has enabled her to more easily understand English-language television programs, which are a source of rich cultural information. Indeed, the results of the present study indicated that language proficiency was related to cultural identification. This finding is consistent with prior work showing that speakers with higher proficiency demonstrate a better understanding of cultural knowledge and values (Cho *et al.* 1997; Cho 2000). However, the use of sufficient language abilities to participate in cultural activities may strengthen cultural affiliation only if the activities are rich in cultural information (i.e. if high language proficiency is used to participate in activities that are limited in their cultural relevance, then high language proficiency may not lead to stronger cultural identification).

Additionally, more time spent participating in culturally rich activities may lead to increased cultural identification. Consistent with this view, earlier age of acquisition, which enables more cumulative time engaging in culturally rich practices, was predictive of higher cultural affiliation.

The *self-reflection of language use account* predicts that subjective variables requiring introspection, like self-rated accent and proficiency measures, will be related to cultural identification. Both accent and proficiency were associated with cultural affiliation in the current analyses. A potential reason why these measures relate to culture identification is that bilinguals may reflect on their accent and proficiency and conclude that if they can effectively communicate with members of the cultural group (i.e. have sufficient proficiency) and if they sound like members of that group (i.e. have less of an accent), then they fit into that cultural group (Grosjean 2014). Self-reflection may be especially relevant when

answering questions about one's linguistic and cultural background (as in the *LEAP-Q* questionnaire and interviews in the current study), because answering questions about language knowledge and use and cultural affiliation may require some contemplation of one's thoughts and behaviors. For example, Bilingual B noted that when deciding on the cultures that she identifies with and the extent of identification with those cultures, she reflected on her experiences during childhood, particularly her participation in Belizean cultural practices.

The *stylistic language use account* implies that linguistic factors that are under some degree of self-control (and therefore can be deliberately altered by the speaker) will be related to cultural identification. In line with this notion, accent was predictive of cultural affiliation. Bilinguals may intentionally try to improve their pronunciation or speak with less of an accent to sound more like groups with which they identify (Segalowitz *et al.* 2009). For example, Bilingual A, a Spanish–English bilingual, noted that when speaking English with Mexican-Americans, she occasionally would deliberately try to sound like a Spanish speaker (i.e. speak with less of an American English accent and with more Spanish-like pronunciation) to convey her affiliation to Mexican culture. Bilingual D, a Korean–English bilingual similarly noted that she changes her accent in English when interacting with Korean speakers of English versus American speakers of English. In addition to altering one's accent, a bilingual may try to increase proficiency in a language in order to demonstrate affiliation with a cultural group.[7] For example, Bilingual B mentioned that she continues to improve her Spanish language skills, which enables her to express her Belizean identity. Furthermore, bilinguals may choose one language over another when listening to music, watching television, and speaking with friends to demonstrate their affiliation to a particular culture. While bilinguals may sometimes consciously decide which language to speak and whether to speak that language with more or less of an accent, a less conscious process by which speakers naturally adapt to their conversational partner (by speaking whichever language their partner is using and by converging onto their partner's accent) may also contribute to cultural identification (Giles and Johnson 1981; Gallois *et al.* 2005).

Of the three accounts described above, *the cultural learning and participation account* may have the most explanatory power, serving as an explanation for why immersion contexts, current exposure contexts, language proficiency, and age of acquisition predict cultural identification. The other two accounts can also account for identified linguistic predictors, with both *the self-reflection of language use account* and *the stylistic language use account* explaining why accent and proficiency relate to cultural affiliation.

While these three accounts vary in how well they explain each linguistic predictor, they are likely interconnected, and understanding their relations to each other may provide the fullest explanation for why certain linguistic factors relate to cultural identification. The interconnections among the accounts may occur through a temporal sequence. That is, first, acquiring knowledge of a language may enable a bilingual to learn about and participate in a certain aspects of a culture (i.e. the *cultural learning and participation through language*

account). In other words, language may give an individual increased access to different parts of a culture. Secondly, after gaining access to the culture, a bilingual may then reflect on his or her behavior as a member of that culture, including linguistic behavior; this reflection may be used to help a bilingual form his or her cultural identities (i.e. *the self-reflection of language use account*). Thirdly, after forming their cultural identities, these identities may then be intentionally expressed to others through language (i.e. *the stylistic language use account*). A consideration of all three accounts within this temporal sequence may be most effective in explaining why particular linguistic factors relate to cultural identity. For a specific example, consider language proficiency. Proficiency may relate to cultural identity because sufficient proficiency in the primary language of the culture may be necessary for learning about and participating in aspects of that culture; then, after becoming more involved in the culture and, as a result, gaining more proficiency in its primary language, proficiency may be reflected upon when deciding whether one is a legitimate member of that cultural group; subsequently, one may intentionally try to further improve proficiency in the language to demonstrate to others that one is a bona fide member of the cultural group.

These three accounts and the interconnections among them should be further tested through follow-up studies. The accounts are amenable to verification because they make predictions about other untested aspects of linguistic experience that may relate to cultural identification. For example, the *cultural learning and participation account* would predict that knowledge of specialized vocabulary necessary for particular cultural customs influences degree of cultural affiliation. Additionally, the *self-reflection account* would predict that aspects of pronunciation that are available to conscious awareness are more related to cultural affiliation than aspects of pronunciation that are unavailable to conscious awareness. Finally, the *stylistic language use account* would predict that degree of affiliation is related to the pronunciation of speech sounds that are malleable and prototypical of group membership. All three of these predictions provide fertile ground for future research.

Additional research is also necessary to address some of the limitations of the current study. For example, the current study included a wide range of bilinguals, who varied in age of L2 acquisition (early versus late), in context of L2 acquisition (informal versus formal), in L2 proficiency (high versus low), and in the L2 language itself (English versus non-English).[8] Including a wide range of bilinguals was necessary in order to assess many of the linguistic factors, such as the role of age of L2 acquisition in cultural identification. Without both early and late bilinguals, it would not have been possible to assess the contribution of age of acquisition to cultural affiliation. However, because the analyses were conducted across a range of bilinguals, the results may not fully capture the unique relationships between language and culture for a specific type of bilingual. For instance, if only early bilinguals or only late bilinguals are considered, the relationships between language and culture may be subtly different. As a first attempt at determining how the language–culture relations may change

depending on the specific type of bilingual, we conducted follow-up correlational analyses separately for early versus late learners and for informal versus formal learners. The analyses indicated that the direction of the relationships between language experience and cultural identification patterned the same way for both early and late learners and informal and formal learners, but that the strength of the relationships varied based on age of acquisition and context of acquisition. In addition to variability in the linguistic characteristics of the bilinguals, there were also many different cultures represented in the current sample. Future work should compare different cultures directly to determine the extent to which language–culture relations vary from culture to culture.

Another consideration for future work is possible variability in participants' interpretation of the questions in the *LEAP-Q*, including the question addressing cultural identification. Because cultural identification is multidimensional, there are several different aspects of culture that participants may have considered when interpreting the question, and participants may have varied in which aspects they considered. Follow-up research should include multiple questions targeting various aspects of cultural identification.

5. CONCLUSION

In the current study, we have identified aspects of bilingualism that are relevant for cultural identification, including age of language acquisition, language proficiency, foreign accentedness, contexts of long-term language immersion, and contexts of current language exposure. To explain these linguistic correlates of cultural identification, we have proposed the foundations of a theoretical framework, composed of three parts: the cultural learning and participation through language account, the self-reflection of language use account, and the stylistic language use account. By identifying language–culture relations and providing a framework to explain these relations, the current research enhances our understanding of the interactivity between language and culture and of the role that language plays in sociocultural contexts.

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NOTES

1 These studies focused on monolingual speakers and either did not include bilinguals or did not assess or report whether some participants also spoke a second language.

2 While a bilingual's two cultures may be very different, it has been suggested that cultures are becoming increasingly more similar due to globalization (Pieterse 2009).

3 We thank the anonymous reviewers for suggesting case study interviews to complement the quantitative analyses of language–culture relations.

4 A sixth aspect of language background—manner of acquisition—was also assessed through the *LEAP-Q* but was not included in the final regression analyses. Preliminary analyses did not yield any predictive value of the manner of acquisition measures. To maximize statistical power by limiting the number of variables entered into the analyses, the non-predictive manner of acquisition measures were excluded. A possible reason why manner of acquisition measures were not predictive is a lack of variability in these measures, due to the fact that most participants grew up in the USA and all were living in the USA at the time of the study.

5 Writing proficiency was not included in the *LEAP-Q* (and therefore not included in the current study), because in the creation of the survey, the developers found that writing proficiency was highly predictable from reading proficiency and thus did not provide any unique information beyond that already provided by reading proficiency (see the developers' rationale on page 951 of the manuscript; Marian *et al.* 2007).

6 Also note that the range of C1 values was more restricted than the C2 values (because most people identify more with their C1 culture), likely contributing to lower beta weights for the C1 predictors relative to the C2 predictors.

7 Note that the relationship between accent/proficiency and cultural identity is likely bidirectional. While decreasing one's accent and increasing one's proficiency may strengthen cultural identification, the opposite may also be true: stronger cultural identification may result in a reduced accent and higher proficiency. That is, stronger cultural identification may lead to more interactions with members of the cultural group; these interactions may improve one's vocabulary and pronunciation in the culture's language.

8 As noted in Section 2.1.1, 99 of the bilinguals had English as an L2 (and a non-English language as an L1), while the other 110 bilinguals had a non-English language as an L2 (and English as an L1). To examine the extent to which these two groups of bilinguals differed in their language–culture relationships, we used Fisher's r-to-z transformations to compare correlation values for each of the seven predictors identified in the regression analyses. Of the seven identified predictors, only one (i.e. L1 proficiency predicting C1 identification) significantly differed between the two groups, with L1 proficiency relating to C1 identification more strongly in the bilinguals who had English as an L2 and a non-English language as an L1 (relative to the bilinguals who had a non-English language as an L2 and English as an L1).

APPENDIX A

Northwestern Bilingualism and Psycholinguistics Research Laboratory

Please cite Marian *et al.* (2007). The Language Experience and Proficiency Questionnaire (LEAP-Q): Assessing language profiles in bilinguals and multilinguals. *Journal of Speech Language and Hearing Research* 50(4): 940–67.

Language Experience and Proficiency Questionnaire (LEAP-Q)

Last Name		First Name		Today's Date	
Age		Date of Birth		Male ☐	Female ☐

(1) Please list all the languages you know **in order of dominance**:

1	**2**	**3**	**4**	**5**

(2) Please list all the languages you know **in order of acquisition** (your native language first):

1	**2**	**3**	**4**	**5**

(3) Please list what percentage of the time you are *currently* and *on average* exposed to each language. (*Your percentages should add up to 100%*):

List language here:					
List percentage here:					

(4) When choosing to read a text available in all your languages, in what percentage of cases would you choose to read it in each of your languages? Assume that the original was written in another language, which is unknown to you.
(Your percentages should add up to 100%):

List language here					
List percentage here:					

(5) When choosing a language to speak with a person who is equally fluent in all your languages, what percentage of time would you choose to speak each language? Please report percent of total time.
(*Your percentages should add up to 100%*):

List language here					
List percentage here:					

(6) Please name the cultures with which you identify. On a scale from zero to ten, please rate the extent to which you identify with each culture. (Examples of possible cultures include US-American, Chinese, Jewish-Orthodox, etc.):

List cultures here					
	(click here for sc	(click here for sc	(click here for sc	(click here for sc	(click here fc

(7) How many years of formal education do you have? _____ _____

Please check your highest education level (or the approximate US equivalent to a degree obtained in another country):

☐ Less than High School ☐ Some College ☐ Masters
☐ High School ☐ College ☐ Ph.D./M.D./J.D.
☐ Professional Training ☐ Some Graduate School ☐ Other:

(8) Date of immigration to the USA, if applicable ___ _____
If you have ever immigrated to another country, please provide name of country and date of immigration here.
_____ _____
___

(9) Have you ever had a vision problem ☐, hearing impairment ☐, language disability ☐, or learning disability ☐ ? (Check all applicable). If yes, please explain (including any corrections):
_____ _____
___

Language:

This is my (please select from pull-down menu) language.

All questions below refer to your knowledge of .

(1) Age when you…:

began acquiring :	*became fluent* in :	*began reading* in :	*became fluent reading* in :

(2) Please list the number of years and months you spent in each language environment:

	Years	Months
A country where is spoken		
A family where is spoken		
A school and/or working environment where is spoken		

(3) On a scale from zero to ten, please select your *level of* ***proficiency*** in speaking, understanding, and reading from the scroll-down menus:

Speaking	(click here for	Understanding spoken language	(click here	Reading	(click here for sc

(4) On a scale from zero to ten, please select how much the following factors contributed to you learning :

Interacting with friends	(click here for pull-dow	Language tapes/self instruction	(click here for pu
Interacting with family	(click here for pull-dow	Watching TV	(click here for pu
Reading	(click here for pull-dow	Listening to the radio	(click here for pu

(5) Please rate to what extent you are currently exposed to in the following contexts:

Interacting with friends	(click here for pu	Listening to radio/music	(click here for pull-dow
Interacting with family	(click here for pu	Reading	(click here for pull-dow
Watching TV	(click here for pu	Language-lab/self-instruction	(click here for pull-dow

(6) In your perception, how much of a foreign accent do you have in ?

(click here for pull-down scale)

(7) Please rate how frequently others identify you as a non-native speaker based on your accent in :

APPENDIX B: EXAMPLE INTERVIEW QUESTIONS

1 Sample questions relating to the ***cultural learning and participation through language account***:

- When engaging in culture-specific activities, how often do you interact with *friends* in language X? When engaging in culture-specific activities, how often do you interact with *family* in language X?
- As your ability in language X improved, did you change your frequency of participation in activities associated with culture X? If so, please describe which activities you participated in more or less frequently than before.

2 Sample questions relating to the ***self-reflection of language use account***:

- When you were thinking about your cultural identity, did you consider when and where you use each of your languages? If so, please explain.

- When you were thinking about your cultural identity, did you consider how effective you are at communicating in each of your languages? If so, please explain.

3 Sample questions relating to the ***stylistic language use account***:

- Do you ever change your accent when talking to different groups of people? If so, why do you think you change your accent?
- Have you ever tried to improve your skills in a language to increase your belonging to a culture? If so, please explain.

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