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US Immigrants' Patterns of Acculturation are Sensitive to Their Age, Language, and Cultural Contact but Show No Evidence of a Sensitive Window for Acculturation

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Abstract

Recent research observed a sensitive window, at about 14 years of age, in the acculturation rates of Chinese immigrants to Canada. Tapping an online sample of US immigrants (n=569), we tested these relationships in a broader population and explored connections with new potentially causally related variables: formal education, language ability and contact with heritage-culture and mainstream United States individuals, both now and at immigration. While we found that acculturation decreased with age at immigration and increased with years in the US, we did not observe a similar sensitive window (i.e., change in rate with age). We also present an exploratory path analysis, exposing the relationships in our sample between acculturation and the variables above. The novel relationships documented here can improve theorising about this rich and complex empirical phenomenon.

Keywords

acculturation – sensitive period – culture – immigration

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Introduction

Humans are an especially cultural species. To a degree not seen in other species, our adult behaviour is shaped by information transmitted socially from our peers rather than genetically from our parents. Consequently, there are many ways in which modern Mongolians behave similarly to each other, but not at all like Ancient Romans, despite only minor genetic differences. We refer to the processes by which individuals acquire a variant of the complex behavioural phenotypes (i.e. culture) of their societies as enculturation. In some cases these processes are transparent and straightforward. For instance, toothbrushing is probably transmitted largely by parents very deliberately modelling the skill for their children and then shaping incentive structures that encourage repetition. In other cases, though we can see that people in different cultures develop into behaviourally and cognitively very different adults, the processes by which these differences are transmitted between generations remain opaque to us. Well-documented examples include cultural differences in perception (Masuda and Nisbett, 2001), in self-perception (Markus and Kitayama, 1991), in preferred emotional states (Tsai, 2007), in response to failure (Heine et al., 2001), and in reactions to insult (Nisbett and Cohen, 1996). In many cases it is not at all clear how much contribution cultural transmission makes, relative to other processes like the convergent evocation of behaviour by particular ecologies (Heine and Norenzayan, 2006).

One way to disentangle these influences is to focus on cases of *acculturation*, where individuals initially expose to one culture, migrate to another and adopt local cultural norms of the new 'host' culture. By observing which behaviours and attitudes acculturate easily (i.e., the rapidly and reliably change to match a migrant's 'host culture'), which do not acculturate (i.e., remain similar to those of a migrant's original 'heritage culture'), and how these vary between cultures, ecologies and migrants' ages and developmental trajectories, we could begin to map out the influences that shape complex adult behaviour. However, to draw such inferences, we first need a clear understanding of underlying process of acculturation and its developmental trajectory. For instance, say we knew that mature adults acculturate far more slowly than children. Then we could observe differences in the distribution of behaviours among child vis-à-vis adult migrants and draw richer insights about how and when those behaviors are transmitted (e.g., by examining how acculturation curves change with age), to what extent they might be genetically encoded (e.g., if fully acculturated migrants behave like their culturally distant, but genetically similar relatives) or convergent reactions to particular ecologies (i.e., if any migrant to an ecology adopts a local behaviour, irrespective of age or cultural origin).

Our previous work began probing the developmental trajectory of acculturation (Cheung et al., 2011). By measuring a simple, domain-general index of acculturation across a sample that varied in both immigration-age and time spent in a host culture, we uncovered traces of a sensitive developmental window for acculturation. Our cross-sectional analyses suggested that younger Chinese immigrants to Vancouver, Canada acculturated faster than older immigrants. For immigrants who arrived after a critical age threshold, approximately 14 years of age, the rate at which their identification with Canadian culture increased per year in Canada became gradually slower. Eventually this rate even reversed: participants who immigrated in late adulthood reported identifying less with their host culture the longer they had spent in it.

However, there are several reasons to think that this effect could be peculiar to Chinese immigrants to Vancouver. Research on acculturation suggests that immigrants from a culture with very distinct sex roles who migrate to a culture with greater gender equality often experience acculturative distress (Noels and Berry, 2006), in accordance with the cultural distance hypothesis (Kogut and Singh, 1988); immigrants who are lower on measures of neuroticism, or higher on conscientiousness, generally have better psychological adaptation (Ward et al., 2004); and the cultural fit hypothesis has also yielded some evidence that a match between a migrant's personality and that which is common in the host culture facilitates the process of acculturation (Ward and Chang, 1997). The migrant's new host culture can also influence this process. While many migrants ultimately adjust to their host culture (Gullahorn and Gullahorn, 1963; Lysgaard, 1955), this is less commonly in more homogeneous host cultures (Hsiao-Ying, 1995). And numerous examples highlight the importance of the fit between a migrant's background and the host culture (e.g., Armes and Ward, 1989; Berry and Annis, 1974; Ward and Kennedy, 1995). These effects suggest that acculturative processes can be sensitive to the peculiarities of a migrant's history and of their new home. To robustly infer that acculturation slows with age, one would need to test this hypothesis across far larger and more diverse samples.

Our present work, steps up to this challenge by measuring the developmental trajectory of acculturation in a broader, more international sample. In order to lay a stronger foundation for future inquiries into acculturation, we also measured several novel, potential explanatory variables: participants' host/heritage language ability both presently and at the time of arrival, and the proportion of time they spent interacting with host/heritage individuals at both time steps.

Methods

A total of 569 participants enrolled in our online study via Amazon's Mechanical Turk service. They all (a) were born outside of the USA, (b) had immigrated to the USA and (c) currently still resided in the USA. They ranged in age from 17 to 65 years (mean 29.8, SD 10). They had emigrated from countries all over the world. To make analysis tractable, we assigned these individuals to 7 major world regions, detailed in Table 1. Of particular importance are those individuals who originated in primarily English speaking countries that share the USA's British colonial cultural legacy (for brevity, Anglos). These 98 individuals may have had a very different acculturation experience than individuals from more linguistically and phylogenetically distinct cultures. So we repeated all analyses for just the non-Anglo subset of our participants.

Each participant answered several questions about their personal history and completed the Vancouver Index of Acculturation (VIA; Ryder et al., 2000). This validated scale (Huynh et al., 2009) assumes and assesses two orthogonal dimensions of acculturation: immigrants' identification with their host and heritage cultures. Typical items include "I enjoy typical North American jokes and humor", and "It is important for me to maintain or develop the practices of my heritage culture". Here, as in our earlier work (Cheung et al., 2011), we focus on identification with the host culture (host score) as a proxy for acculturation.

We also measured two additional variables which we suspected might explain participant's identification with their host culture. First we asked them to rate their English ability and heritage-language ability both now and when they first arrived in the U.S.A. For brevity, we refer to these language ratings with a capital L subscripted with time (*now*/*then*) and superscripted with culture (host/heritage; see Table 2). Second, we tried to glean who participants interact with now and in the months just after they immigrated. Specifically we asked:

> **Now:** Think about the people you spend time with, for example your friends, family or workmates. People can be part of many cultures at once, but for the next questions we will ask you to think about the main cultural group the people in your life identify with. In a normal week, how much time do you usually spend interacting with people who you'd identify as belonging to these cultural groups . . .
>
> **Then:** Try to remember your first few months after you first moved to America and the people you spent time with then (e.g., friends, family

TABLE 1 *Assignment of the individuals to 7 major world regions (sample size in parentheses)*

Anglo	Europe	Middle East	South Asia	East Asia	Americas	Africa
Australia (7)	Austria (1)	Armenia (1)	Bangladesh (1)	Burma (1)	Argentina (2)	Africa (2)
Canada (34)	Belarus (2)	Azerbaijan (1)	India (54)	Cambodia (2)	Belize (1)	Algeria (1)
Ireland (6)	Bosnia (2)	Georgia (2)	Nepal (5)	China (30)	Bolivia (1)	Ethiopia (2)
New Zealand (2)	Bulgaria (6)	Iran (6)	Pakistan (9)	Hong Kong (9)	Brazil (3)	Ghana (1)
Scotland (2)	Cyprus (1)	Israel (2)	Sri Lanka (1)	Indonesia (3)	Chile (2)	Kenya (2)
UK (47)	Denmark (2)	Jordan (1)		Japan (4)	Colombia (2)	Morocco (1)
	Finland (3)	Lebanon (3)		Korea (15)	Costa Rica (1)	Nigeria (6)
	France (13)	Palestine (2)		Laos (1)	Cuba (9)	South Africa (7)
	Germany (30)	Saudi Arabia (1)		Malaysia (5)	Dominican Republic (5)	Sudan (1)
	Greece (3)	Syria (1)		Philippines (24)	El Salvador (3)	Zambia (1)
	Hungary (3)	Turkey (1)		Singapore (4)	Equador (2)	Zimbabwe (1)
	Italy (19)			Taiwan (6)	Guyana (3)	
	Macedonia (3)			Thailand (3)	Haiti (1)	
	Netherlands (3)			Vietnam (9)	Honduras (1)	
	Poland (7)				Jamaica (7)	
	Portugal (4)				Mexico (33)	
	Romania (8)				Nicaragua (2)	
	Russia (13)				Panama (1)	
	Serbia (3)				Paraguay (1)	
	Slovenia (1)				Peru (6)	

TABLE 2 *Variable name abbreviations*

Variable	Description	Form
host	Identification with the host culture	10-item scale
heri	Identification with the heritage culture	10-item scale
AoI	Age of Immigration to the USA	Single question
T_{USA}	Years lived in the USA	Single question
$L^{Eng.}_{Then}$ / $L^{Eng.}_{Now}$	English ability, then (at immigration) and now	5-point scale
L^{Heri}_{Then} / L^{Heri}_{Now}	Heritage language ability, then and now	5-point scale
C^{Host}_{Then} / C^{Host}_{Now}	Contact with North Americans, then and now	5-point scale
C^{Heri}_{Then} / C^{Heri}_{Now}	Contact with Heritage culture, then and now	5-point scale
Edu	Level of formal education at time of survey	12 options

> or workmates). In the months following your arrival, how much time did you usually spend interacting with people who you'd identify as belonging to these cultural groups . . .

For both host and heritage culture, participants could rate their contact as: (0) None; (1) I see them occasionally; (2) I meet them regularly; (3) I spend most of my time with them; (4) I spend almost all of my time with them. We refer to these variables with a capital C, subscripted for time and superscripted for culture (see Table 2).

Our study was designed with two goals in mind. The first is hypothesis testing. We wanted to see whether the patterns identified by Cheung et al. of the acculturation of Chinese samples to Vancouver would replicate with a broader sample in a different (though culturally similar) country.

Our second goal was exploratory. Acculturation is a complex process; to form even tentatively plausible hypotheses about its mechanisms we need to form clear and accurate intuitions about how it covaries with other relevant variables. We hoped to take a first step in this direction by using our large sample to test the relationship that language ability and cultural contact have with acculturation, as measured by the VIA.

Results

We considered the relationship between participants' self-reported identification with their host and heritage cultures, their age of immigration

TABLE 3 *Summary of the simple effects of age at immigration and years in the United States, on participants' identification with their host (first symbol) and heritage (second symbol) cultures, and the per-participant difference between these (i.e., host minus heritage; third symbol)*

	All	Non-Ang.	Anglo	Euro.	Mid. E.	S. Asia	E. Asia	C./S. Am.	Africa
AoI	⊖ ≈ −	⊖ ≈ ⊖	− − ≈	− ≈ −	≈ ≈ ≈	≈ ≈ ≈	− + ⊖	− ≈ ≈	≈ ≈ −
T_{USA}	⊕ ≈ ⊕	⊕ ≈ ⊕	⊕ ≈ ⊕	⊕ ≈ +	− ≈ ≈	+ ≈ ⊕	≈ ≈ ≈	+ ≈ ≈	≈ − ≈
Interaction	⊕ ≈ +	⊕ ≈ +	+ ≈ +	+ ≈ ≈	≈ + −	≈ ≈ ≈	≈ ≈ ≈	≈ ≈ ≈	⊕ + ≈
N	569	471	98	143	21	70	116	96	25

These are expressed as either a positive (⊕, +), or a negative (⊖, −) effect. Effects are printed colored and in a circle (⊕, ⊖) when distinguishable from sampling error within conventional bounds of significance ($p < 0.05$), uncoloured (+, −) when at least one standard error from zero, or expressed as approximately no effect (≈). Full model details are available in the supplemental materials.

(AoI) to their host culture, the amount of time they had lived in the host culture (T_{USA}), and the interaction of the latter two. A summary of these results is presented in Table 3, while full regression model details are available in Tables 4 and 5. Controlling for participant's sex and education level did not qualitatively change the relationships reported here.

Did Younger Immigrants Report More Acculturation?

Yes: Immigrants who had arrived at a younger age reported being more acculturated, controlling for T_{USA}, sex and education. This effect was particularly strong in our non-Anglo sub-sample, but was almost entirely absent for Anglos (see Table 4).

Did Immigrants Feel More Acculturated with Time?

Yes: Across the entire sample, for Anglos and for non-Anglos years spent in the USA was a strong predictor of identification with the host culture, controlling for AoI, education and sex. Only our small Middle-Eastern sample trended in the other direction, but this was within the bounds of sampling error (see Table 4).

Was There Evidence for a Sensitive Window of Acculturation?

No. If anything, we saw hints of the reverse.

TABLE 4 *OLS regressions of host cultural indentification on listed regressors*

	All	Non-Ang.	Anglo	Euro.	Mid. E.	S. Asia	E. Asia	C./S. Am.	Africa
Intercept	6.89	6.91	6.70	6.76	6.64	6.45	7.18	6.58	7.20
	(0.11)***	(0.12)***	(0.29)***	(0.25)***	(0.50)***	(0.30)***	(0.24)***	(0.27)***	(0.53)***
AoI	−0.10	−0.12	−0.04	−0.14	−0.24	0.27	−0.13	−0.32	−0.36
	(0.06)*	(0.07)*	(0.14)	(0.12)	(0.36)	(0.23)	(0.14)	(0.17)*	(0.27)
T_{USA}	0.20	0.17	0.29	0.20	−0.38	0.34	0.08	0.08	−0.59
	(0.05)***	(0.06)***	(0.13)**	(0.10)**	(0.29)	(0.18)*	(0.11)	(0.12)	(0.42)
Female?	0.07	0.03	0.45	0.04	−0.27	−0.15	−0.10	0.01	0.37
	(0.09)	(0.10)	(0.22)**	(0.19)	(0.49)	(0.28)	(0.19)	(0.23)	(0.44)
Edu.	−0.05	−0.09	0.15	0.15	−0.12	−0.25	−0.26	0.42	0.07
	(0.08)	(0.09)	(0.18)	(0.20)	(0.36)	(0.23)	(0.18)	(0.21)*	(0.48)
AoI $*T_{USA}$	0.11	0.11	0.09	0.13	−0.23	−0.06	0.03	0.01	1.29
	(0.05)**	(0.06)*	(0.11)	(0.11)	(0.31)	(0.21)	(0.12)	(0.12)	(0.50)**

Results are coefficients (standard errors), per sub-sample. Immigration Age (AoI) and Years in USA (T_{USA}) are centred about their means and scaled such that coefficients represent rates per decade. Female? is one for female participants, zero otherwise. Education (Edu.) is coded as durations of formal schooling approximately equal to high school (0), bachelor's degree (1), post-graduate degree (2). * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Our previous work observed an interaction between AoI and T_{USA}, such that Chinese immigrants who had arrived in Canada younger acculturated more quickly (i.e., had a stronger relationship between time in Canada and host-identification). In the present study we saw the opposite interaction, though the effect was small – just detectable at conventional bounds using our full sample (569 individuals). That is, individuals who immigrated to Canada when they were older seemed to acculturate more quickly (see Table 4). This effect was particularly strong in the African sub-sample.

Did Identification with Heritage Culture Change?

No: Across all analyses and all sub-samples, we saw no evidence of any change in participants' self-reported identification with their heritage culture with respect to AoI or immigration duration, beyond what would be expected by sampling error alone. This is the same pattern we observed in our Vancouver sample (Cheung et al., 2011).

We did, however, observe that females identified more strongly with their heritage culture than males, and less-educated participants identified more strongly than more-educated participants, in both the Anglo and non-Anglo samples (see Table 5). This pattern suggests that identification with one's heritage culture may be independent of the speed at which one acculturates (cf., Ryder et al., 2000).

How Did Language Ability and Cultural Contact Affect Acculturation?

Rather than testing specific hypotheses about these variables, we considered this an early exploratory foray to provide fodder for future hypothesis generation. Here we focus on expounding the relationships we observed in our data.

The simplest way to do this is to present the full correlation matrix of all our variables, and their standard deviations (Table 6).

There are interesting structural relationships between these variables which can further sharpen our understanding. We asked participants to report their language ability and cultural contact, both now and when they first arrived in the United States. *Prima facie* we could expect the variable earlier in time to cause, but not be caused by, later ones (e.g., L^{Eng}_{Then} .preceded L^{Eng}_{Now}). Of course this is not entirely straightforward, since participants were merely recalling their past. Their state of mind today may have influenced their recall. However, if we grant that their recall was at least somewhat accurate, their self-reports should contain some information about the past's causal influence on the present.

TABLE 5 *OLS regressions of heritage cultural indentification on listed regressors*

	All	Non-Ang.	Anglo	Euro.	Mid. E.	S. Asia	E. Asia	C./S. Am.	Africa
(Intercept)	6.90	6.95	6.69	6.69	6.69	6.61	7.52	6.57	7.65
	(0.13)***	(0.14)***	(0.33)***	(0.27)***	(0.82)***	(0.36)***	(0.33)***	(0.29)***	(0.56)***
AoI	−0.00	0.06	−0.18	−0.04	0.49	−0.03	0.29	−0.27	0.04
	(0.07)	(0.08)	(0.15)	(0.13)	(0.58)	(0.27)	(0.20)	(0.19)	(0.29)
T_{USA}	−0.05	−0.02	−0.15	0.03	0.48	−0.20	0.04	−0.06	−0.95
	(0.06)	(0.07)	(0.14)	(0.10)	(0.48)	(0.21)	(0.15)	(0.13)	(0.44)**
Female?	0.44	0.37	0.68	0.41	0.96	0.45	0.13	0.47	−0.10
	(0.11)***	(0.12)***	(0.25)***	(0.21)**	(0.79)	(0.33)	(0.26)	(0.25)*	(0.46)
Edu.	−0.24	−0.22	−0.29	0.04	−0.21	−0.11	−0.78	0.21	0.27
	(0.10)**	(0.11)**	(0.21)	(0.21)	(0.58)	(0.27)	(0.25)***	(0.24)	(0.50)
AoI * T_{USA}	0.00	0.01	−0.08	0.08	0.85	−0.08	−0.16	−0.07	1.03
	(0.06)	(0.07)	(0.12)	(0.12)	(0.50)*	(0.25)	(0.17)	(0.13)	(0.53)*

Results are coefficients (standard errors), per sub-sample. Immigration Age (AoI) and Years in USA (T_{USA}) are centred about their means and scaled such that coefficients represent rates per decade. Female? is one for female participants, zero otherwise. Education (Edu.) is coded as durations of formal schooling approximately equal to high school (0), bachelor's degree (1), post-graduate degree (2). * $p < 0.01$, ** $p < 0.05$, *** $p < 0.01$.

TABLE 6 *Standard deviations (top row) and correlations (subsequent rows) among study variables*

	T_{USA}	AoI	L^{Heri}_{Now}	$L^{Eng.}_{Now}$	C^{Host}_{Now}	C^{Heri}_{Now}	C^{Heri}_{Then}	C^{Host}_{Then}	L^{Heri}_{Then}	$L^{Eng.}_{Then}$	host
SD	1.1	0.97	1.41	0.63	0.92	1.07	1.23	1.13	1.55	1.38	1.11
AoI	−0.539										
L^{Heri}_{Now}	−0.2421	0.1532									
$L^{Eng.}_{Now}$	0.2179	−0.2193	−0.3315								
C^{Host}_{Now}	0.1501	−0.1375	−0.1708	0.3271							
C^{Heri}_{Now}	−0.1438	−0.0925	0.2562	−0.1119	−0.2771						
C^{Heri}_{Then}	0.0449	−0.2305	0.1957	−0.0383	−0.1536	0.5884					
C^{Host}_{Then}	0.0639	0.0558	−0.156	0.224	0.4973	−0.2262	−0.4252				
L^{Heri}_{Then}	−0.267	0.2432	0.8356	−0.3509	−0.1428	0.2092	0.1912	−0.1416			
$L^{Eng.}_{Then}$	−0.3246	0.3629	−0.2218	0.3119	0.1417	−0.0754	−0.2223	0.2325	−0.137		
host	0.2367	−0.2121	−0.0858	0.2272	0.3919	0.0042	0.1019	0.2031	−0.0583	−0.0849	

AoI and T_{USA} have been scaled to decades (i.e., divided by 10).

To tease out this information, we present a simple 'temporally-constrained' structural model. We separated our variables into two sets: past ($L^{\text{Eng}}_{\text{Then}}$, $L^{\text{Heri}}_{\text{Then}}$, $C^{\text{Host}}_{\text{Then}}$, $C^{\text{Heri}}_{\text{Then}}$) and present ($L^{\text{Eng}}_{\text{Now}}$, $L^{\text{Heri}}_{\text{Now}}$, $C^{\text{Host}}_{\text{Now}}$, $C^{\text{Heri}}_{\text{Now}}$). We specified a statistical model where all past variables predict all present variables (i.e., we fit regression coefficients for these relationships) and all present variables in turn predict a participant's VIA host score. We also included our key explanatory variables (AoI and T_{USA}) as predictors of host score, and AoI alone as a predictor of both the 'past' and 'present' variables. These relationships (and remaining covariances) were fit to the data to maximise likelihood. However, the resulting model fit the data poorly ($\Pr(\chi^2(\text{df} = 4) > 17.98) = 0.001$).

To distill a clearer picture we followed a simple model simplification procedure. We considered each relationship in turn, from weakest relative to its own standard error, to strongest. We removed the focal relationship and tested whether the fit of the model had decreased significantly (chi-squared test of difference in residual deviance), using a conservative criterion ($p < 0.1$). If it had not, we assumed the relationships was actually zero and considered the next weakest relationship. The data were far more plausible under the resulting 'parsimonious model' ($\Pr(\chi^2(\text{df} = 13) > 16.05) = 0.246$) which is depicted in Figure 1. Note that alternate model simplification procedures (e.g., removing relationships from weakest to strongest in absolute magnitude, both standardised and unstandardised) produced almost identical parsimonious models.

We reiterate that this model has not been tested, but rather suggested by our data. Cross-validation, by applying the same simplification procedure to half our sample and fitting the resulting model to the other half, produced inconsistent results. Nevertheless, the pattern of relationships in our full data set represents our best current information about the relationships between cultural contact, language ability, age of immigration and years of residence for any large cross-national sample of immigrants to a foreign nation. We believe this information may provide valuable insights to other researchers, and so report here both a full description of our data (Table 6), and summary of our best-fitting parsimonious model (Figure 1). Several interesting features of this model bear mention.

First, VIA *host* score showed the strongest evidence of relationships to T_{USA}, $C^{\text{Heri}}_{\text{Now}}$ and $C^{\text{Host}}_{\text{Now}}$. As expected, greater time in the U.S.A. and contact with Americans predicted more acculturation. Perhaps more interestingly, increased contact with heritage-culture individuals also predicted greater acculturation to the host culture. This may suggest that more socially active people acculturate faster (e.g., Searle and Ward, 1990).

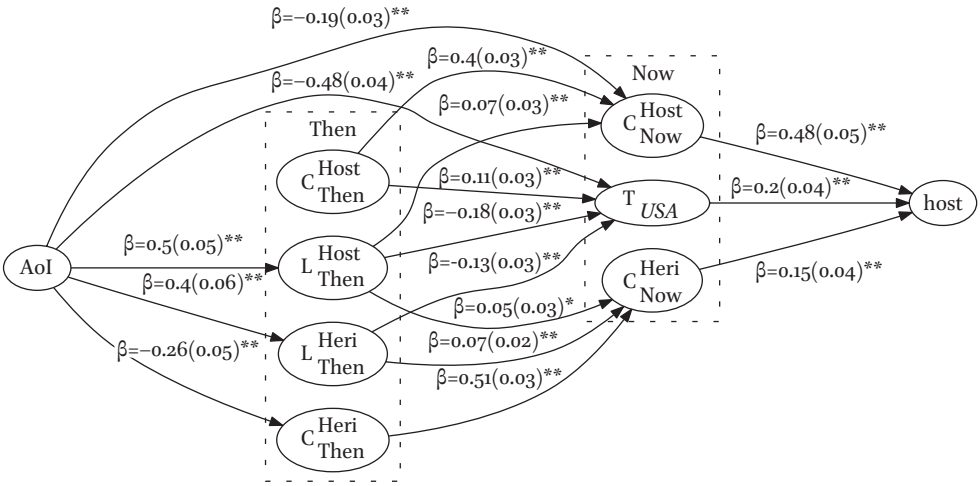

FIGURE 1 *Parsimonious, exploratory model of the relationships in our data. This model was developed by assuming that only 'Now' variables directly influenced participants' host score, and were in turn influenced by temporally precedent 'Then' variables. Age of Immigration (AoI) was assumed to influence every other variable, including host score. Relationships were removed, from those smallest relative to their standard errors to those largest, until the model fit decreased beyond a conservative significance bound ($p < 0.1$). Above each relationship we have printed a likelihood maximising regression coefficient and standard error, all relationships here are significant by conventional standards ($p < 0.05$). *$p < 0.05$; **$p < 0.01$.*

Second, age of immigration does not have an appreciable direct relationship with acculturation, but rather exerts its T_{USA}-independent effects via $C^{\text{Host}}_{\text{Now}}$. That is, younger immigrants have more contact with host-culture individuals, leading to greater acculturation.

Third, as expected, contact with host/heritage culture individuals in the past is a clear predictor of contact in the present.

Fourth, perhaps surprisingly, neither proficiency in English nor one's heritage language had a substantial effect on acculturation, beyond their impact how much contact one had with individuals from each culture. That is, social contact seems to be essential for acculturation, not merely the possibility of accessing language-encoded cultural information.

Discussion

The first hypothesis-testing branch of our endeavour produced a clear answer. Using a larger, more diverse sample, not only did we not reproduce the sensitive window effect observed by Cheung et al. (2011), we saw some evidence

of the opposite effect. There are several possible explanations for this difference.

First, the host-countries in the two studies differed: USA and Canada. These two cultures may be sufficiently different that they foster very different acculturative experiences. One relevant difference between the USA and Canada that is their endorsement of policies of cultural integration versus assimilation (i.e., 'melting-pot'). Canada has generally adopted a policy of encouraging integration into a cultural mosaic (Burgess, 2005). In fact, such a perspective is explicitly stated in the Canadian Charter of Rights and Freedoms (Canadian Charter of Rights and Freedoms, 1982). The USA, meanwhile, popularly endorses an assimilationist attitude towards immigration dating back a little over a century ago, and arguably longer (Coan, 1875) (readers should note that, despite the popularity of this distinction, its validity has been the subject of debate: Palmer, 1975).

Another key difference is access to a large heritage community in the host country. Vancouver is known for its large Chinese community – the second largest outside of Asia (Burgess, 2005), while participants in the present study were from across the USA. It is possible that the presence of a large heritage-community causes a sensitive window for acculturation by allowing older immigrants to live full, active lives while avoiding contact with host-culture individuals if they choose.

Third, our immigrants (and their respective heritage cultures) also differed. Cheung et al. (2011) exclusively studied immigrants from China, and the results from that study may be a by-product of that specific cultural heritage acculturating in a specific host environment. This possibility is particularly important in the context of cultural distance hypothesis (Kogut and Singh, 1988) and cultural fit hypotheses (Ward and Chang, 1997). These theories specify how the relationships between an individual's personality, their heritage and host cultures might impact their acculturative experience. It is possible that something about Chinese migrants, or Canada or America as destinations promotes or inhibits the emergence of a sensitive window. We encourage proponents of these theories to propose explanations of our data.

Fourth, our study was conducted exclusively online, in English, using an online recruitment service. This may have selected for an especially well-acculturated sample of older individuals. Furthermore, there is much evidence that bilinguals will respond differently to a measure depending on the language version of the measure due to a language priming effect (Ji et al., 2004). We departed from our earlier work (Cheung et al., 2011) by presenting our materials exclusively in English, where previously participants had the option of engaging in their host language (i.e., Chinese). While this was necessary to

feasibly tap a more culturally diverse sample, it may have restricted our access to just those less-acculturated older migrants whose existence demonstrates the sensitive window.

Lastly, it is possible that our previous observation of a sensitive window was a statistical false positive ($p = 0.012$). Conversely, it may be that this study lacked the power to appropriately detect a sensitive window. Despite having over 500 participants in the present study, it is of note that Cheung et al. (2011)'s study found a sensitive period that was significant by conventional standards for one cultural group with 232 participants. In comparison, the present study had, at most 143 participants from one cultural group (i.e., Europe). With non-English-speaking cultural groups numbering between 21 and 116 participants, it may have been difficult to reliably detect more nuanced sensitive windows in participants originating from different heritage locations. The weighted evidence of future research will adjuicate the validity and robustness of a sensitive window for acculturation.

Our exploratory branch, meanwhile, provides novel clues as how the acculturative process unfolds. Acculturation, as measured by the VIA, seems particularly sensitive to how much contact an individual has with members of the host culture. This in turn is shaped by an individual's age of immigration. Younger individuals, especially those who arrive at an age where formal schooling forces them into the regular company of host-culture peers, may have a unique opportunity to form the social bonds that foster acculturation.

Whether children acculturate more quickly remains an outstanding question. While this research did not replicate Cheung et al.'s (2011) initial result, both studies contribute to a growing database of results which we hope will eventual provide a clear answer.

This emerging understanding of typical acculturation patterns can be of great practical value. In an increasingly mobile global economy, information on how, when and at what age immigrants adopt local norms can improve public policy and the design of immigrant support programs. This is particularly important given existing research on the far-reaching impact of acculturation on the lives of migrants. This includes intergenerational conflict (Kwak and Berry, 2001), physical health and psychological well-being (Berry and Annis, 1974; Marmot et al., 1975), and school performance (Suinn, 2009). This emerging understanding can also inform students of cultural change (e.g., Mesoudi, 2009; Chudek and Henrich, 2011), by constraining hypotheses about how much cultural knowledge is transmitted to whom and when.

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