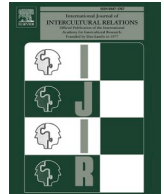




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## Examining acculturation at the daily level: Adding nuance to acculturation scholarship

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## ABSTRACT

The present article reviews the growing literature on micro-level (daily or situation-specific) acculturation processes and provides new empirical evidence regarding the link between macro-level (general) and micro-level acculturation indices. The review covers the evolution of acculturation theory and research to focus on separate heritage and destination cultural dimensions and on specific domains (e.g., practices, values, identifications), to include longitudinal research designs, and to incorporate daily diary methodologies. The empirical study includes 824 Hispanic college students in Miami (76.1 % female) who participated in a 12-day diary study. General (macro-level) acculturation measures were administered on Days 1 and 12, and daily (micro-level) acculturation measures were administered on Days 2–11. Each of six acculturation components (dimension-domain pairings) – U.S. practices, Hispanic practices, individualist values, collectivist values, U.S. identity, and ethnic identity – was assessed using full scales on Days 1 and 12 and using single items on Days 2–11. Daily means and daily fluctuations, computed as the standard deviation of Day 2–11 scores, were included during the daily portion of the study. Analyses examined the extent to which earlier macro-level acculturation scores would predict daily means and fluctuations, as well as the extent to which these daily means and fluctuations would predict later macro-level acculturation scores. For each acculturation component, daily means were related to Day 1 and Day 12 scores, though the strengths of these associations varied across components. Daily fluctuations were negatively associated with Day 1 and 12 scores for U. S. and Hispanic practices, but these associations were less consistent for the values and identifications components. These results are discussed in terms of the overlap between micro and macro level acculturation processes, and in terms of the future of acculturation research.

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The acculturation literature has been growing and expanding for nearly a century, ever since Redfield et al. (1936) published their initial memorandum for the study of acculturation. The title of the review published by Sam and Berry (2010) provides an essential backdrop and definition for acculturation – that is, when individuals and groups from different cultural backgrounds come into contact with one another. As applied to international migration, acculturation refers to how migrants adapt following their arrival in their new homelands (Berry, 2017). Such adaptation includes changes in language use, culinary preferences, and peer affiliations, among other domains. Although acculturation can also apply to host nationals who are immersed in immigrant cultural enclaves (Dandy et al., 2023) or to individuals exposed to Western cultures through media rather than through migration (Ferguson et al., 2016), here we refer to adaptation among migrants and their immediate descendants in a new destination country.

Early operationalizations of acculturation were primarily unidimensional, generally assuming that migrants discard their cultural heritage as they acquire the norms, behaviors, and values characteristic of the destination country or region (Gordon, 1964). As applied to the United States, Gordon assumed that migrants “became American” and that their ultimate goal was to “melt” into the unique mixture that characterized U.S. culture as a whole (see also Salins, 2023). Although this mixture was assumed to represent an amalgamation of the different cultural groups who had settled in the United States previously, the idea of migrants continuing to endorse and display their cultural heritage was not considered. Indeed, the assimilationist pressures in the United States during the 20th century likely contributed to the “melting pot” metaphor that Gordon discussed (Stepick et al., 2011).

Berry’s (2017; Sam & Berry, 2010) bidimensional model of acculturation, which was originally proposed in the early 1980s, represented a quantum leap for the field. Berry proposed that destination-culture acquisition and heritage-culture retention represent independent dimensions of acculturation. The fact that a given migrant (or migrant group) was oriented toward the destination culture did not necessarily mean that this migrant or group would (or would not) retain their cultural heritage. Berry’s approach introduced the possibility of biculturalism, where individuals can simultaneously endorse the destination culture *and* retain their cultural heritage. Berry’s model has inspired more than 40 years of acculturation research around the world (Badola & Agrawal, 2023). This research has led to an expansion of the contexts in which acculturation can occur, including residents of the destination country or region incorporating aspects of immigrant cultural streams (Dandy et al., 2023) and people acculturating to the destination culture before they immigrate via remote exposure to media from the destination culture (Ferguson et al., 2016). Other expansions of the acculturation concept have focused on the acculturation process itself, as described below.

The present article is intended to review newer acculturation models *and* to present new empirical results. Specifically, we outline issues of domain specificity, longitudinal research methods, and daily diary methodology – and then we present the results of an empirical study employing all of these advances. In so doing, we hope to contribute to the acculturation literature both theoretically and empirically. Specifically, we sought to examine the extent to which “macro” (overall) and “micro” (daily or specific) measures of acculturation are related to one another within the context of a daily diary study.

### Newer acculturation models and research designs

Despite his groundbreaking advances, Berry did not specify the content domains in which acculturation is assumed to occur. In recent years, newer models have been introduced to extend and add nuance and specificity to Berry’s approach (Schwartz et al., 2010; Ward & Szabó, 2019). These models have specified the domains in which acculturation is assumed to operate. Both models propose affective (e.g., identifications), behavioral (e.g., practices), and cognitive (e.g., values) components of acculturation. Here we focus on the Schwartz et al. model, which suggests that acculturation operates within the domains of cultural practices, values, and identifications. Practices refer to language use, choice of friends, and food preferences; values refer to individualistic and collectivistic attitudes; and identifications refer to attachments to one’s heritage and destination countries or regions. Drawing on the Affect, Behavior, and Cognition model introduced by Ward and Szabó, practices can be considered as a behavioral domain of acculturation, values as a cognitive domain, and identifications as an affective domain (Schwartz, Weisskirch, et al., 2011). Acculturation can proceed, and be characterized, differently across these domains – for example, someone can be strongly identified with their country of residence without speaking the language fluently, or vice versa (Bornstein, 2017; Portes & Rumbaut, 2014). Bornstein refers to these domain and setting influences as the “specificity principle” of acculturation.

The research designs utilized in acculturation research have also begun to evolve. Many early studies (and some current studies) have used cross-sectional designs where acculturation patterns, and sometimes comparison variables, were assessed at a single point in time. Cross-sectional designs allow for assessing associations among variables, but they do not permit us to draw directional or causal conclusions regarding how acculturation may predict or affect (or be predicted or affected by) other variables (O’Laughlin et al., 2018). As a result, the explanatory information that can be obtained from cross-sectional acculturation studies is somewhat limited. Indeed, acculturation is inherently developmental in that it refers to changes in cultural orientations across time.

Longitudinal studies of acculturation began to emerge in the late 2000s and early 2010s (Knight et al., 2009; Matsunaga et al., 2010). Some of these studies examined developmental trajectories of acculturation processes over time, whereas others investigated the extent to which acculturation processes would predict other variables (Meca et al., 2017). In either case, these longitudinal studies have helped to map the developmental course of acculturation in various populations, as well as to identify variables that predict, and that are predicted by, acculturation processes. These longitudinal studies can be considered as focusing on “macro-level” processes, meaning that they explore changes in acculturative processes across months and years – or acculturative processes “in general” (i.e., asking individuals to characterize themselves culturally in a general sense, rather than on a specific day or in a specific type of situation).

As an example of such a study, Schwartz et al. (2015) examined acculturation trajectories among recently immigrated Hispanic

adolescents in Miami and Los Angeles. These authors estimated growth mixture models (see Jung & Wickrama, 2008, for a review of this modeling approach) for each of the three acculturation domains proposed by Schwartz et al. (2010) – practices, values, and identifications. They found two trajectory classes within each domain – a class characterized by increases in both heritage and U.S. cultural orientations, and another class characterized by flat slopes over time in both heritage and U.S. cultural orientations. Schwartz et al. (2015) found that youth who increased in all three domains reported the most favorable family relationships and mental health at the final timepoint, and that youth who remained stable in all three domains reported the least favorable family relationships and mental health at the final timepoint.

As an example of a longitudinal study examining predictors and sequelae of acculturation components, Meca et al. (2017) examined the developmental interplay between personal identity (operationalized as separate indices of coherence and confusion) and cultural identity (operationalized as composite scores for ethnic and U.S. identity affirmation and commitment) among the same sample of recently immigrated Hispanic adolescents. Personal identity coherence was bidirectionally related to ethnic and U.S. identity affirmation and commitment, and ethnic and U.S. identity affirmation and commitment both predicted optimism, rule-breaking, and aggression indirectly through personal identity coherence. These results suggest that personal identity coherence and cultural identifications may be mutually reinforcing – a finding that would not have been possible to obtain using a cross-sectional design. Additionally, context is important to consider – such as a person’s more general acculturation profile influencing or predicting daily patterns of acculturation.

### Acculturation processes at the daily level

Individuals’ perceptions of their acculturation can vary depending on their momentary social contexts. For example, Hispanic college students might perceive their levels of acculturation differently when they are home with their immigrant parents vs. on campus with predominantly U.S.-born students. Early studies did not capture these short-term fluctuations, but some of the most recent advances in acculturation research involve daily diary designs. Some work has examined the predictive effects of cultural processes (such as ethnic identity or discrimination) on Day  $x$  on mental health outcomes on Day  $x + 1$  (Kiang et al., 2006; Torres & Ong, 2010). Doucerain et al. (2013) developed a method through which people could be asked to “reconstruct” their daily cultural experiences. Ferguson et al. (2017) operationalized cultural variability as the standard deviation of repeated assessments of cultural identity. These (and other) studies have suggested that acculturation and other cultural processes do indeed operate at the daily level (Ferguson et al.), and that these cultural experiences can predict symptoms of depression and anxiety (Kiang et al. and Torres & Ong) and may be predicted by interactions with culturally similar (e.g., other Hispanic people whose cultural orientations are similar to one’s own) and dissimilar (e.g., people from other cultural groups and/or with different cultural orientations) others (Douceain et al.).

In our work with acculturative processes at the daily level, we have sought to extend this prior work in at least three ways. First, we have endeavored to examine daily variations in acculturative processes across a 10-day period. Such examination represents an extension of prior work that has looked at cultural processes on one day as predictors of outcomes on the next day. That is, an intensive daily design provides information about the daily assessment period (in this case 10 days) as a whole, where such information may be valuable beyond what can be gleaned from examining acculturative experiences on a single day. Second, we have examined daily dynamics among a range of acculturation-related indicators, including cultural practices, cultural values, and cultural identifications. This expansive set of indicators has served to build upon prior work that focused primarily on ethnic identity. Third, we examined cultural stressors, such as discrimination and negative context of reception, as predictors of daily patterns of acculturative (and other) indices, with the expectation that greater levels of cultural stress would affect participants’ reports of these indices across the 10-day diary burst.

Our approach to the daily dynamics of acculturation represents an integration of prior daily diary work on acculturation with daily

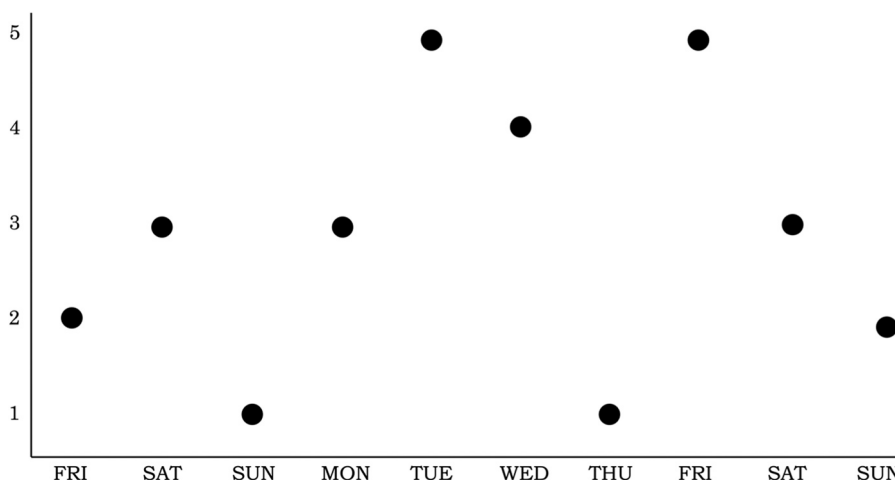


Fig. 1. Fluctuation Score Illustration.

diary work on personal identity. In their daily diary work on personal identity, Klimstra and colleagues (Klimstra, Hale III, et al., 2010; Klimstra, Luyckx, et al., 2010) examined daily fluctuations in personal identity commitment and reconsideration (i.e., evaluation of whether one’s current commitments are suitable for one’s present life). These fluctuation scores were computed as the standard deviation across a set of repeated assessments of the same variable (see Fig. 1 for an illustration). For example, fluctuations in identity commitments were operationalized in terms of variability in commitment scores across 5 days of daily diary assessment. These fluctuation scores were then examined as predictors of later assessments of depressive and anxiety symptoms. A general finding from this line of work was that fluctuation scores were generally predictive of negative mental health symptoms (see Schwartz, Klimstra, et al., 2011, for an example). That is, students who reported variability in their identity commitments across days appeared to be ambivalent about their sense of self, and reported greater symptoms levels of depression and anxiety at subsequent assessment time points.

Based on these findings with personal identity, we (Meca et al., 2022; Schwartz et al., 2021) were interested in understanding whether (a) acculturation components would also fluctuate across days (following Ferguson et al., 2017), (b) whether such fluctuations would be predicted by variables assessed prior to the daily diary portion, and (c) whether fluctuations in acculturation components would predict variables assessed after the end of the daily diary portion. Put differently, if acculturation components fluctuate in a reliable way, then they should predict, and be predicted by, other theoretically related variables. For example, because daily fluctuations represent instability in one’s cultural sense of self, indicators of cultural stress, such as discrimination, negative context of reception (feeling excluded and marginalized from opportunities), and bicultural stress should theoretically predict greater daily variability in indices of acculturation (see Fig. 2). Specifically, cultural stressors are destabilizing and may predict greater instability in identity indices across days (Schwartz et al., 2024). Similarly, such daily variability in acculturation components would be expected to predict decreased well-being and increased symptoms of depression, anxiety, aggression, and rule-breaking – similar to findings that have emerged for daily fluctuations in personal identity (Klimstra, Luyckx, et al., 2010; Schwartz, Klimstra, et al., 2011).

Thus far, our work on daily fluctuations in acculturation components and related variables has been conducted with a sample of Hispanic college students in Miami. The study design consisted of 12 days. On Day 1, we assessed putative predictors of daily fluctuations in acculturation components (and in other related variables as well, such as personal identity and well-being). The diary burst occurred on Days 2–11, with students asked to provide daily reports (generally using single-item scales) of acculturation and related variables. Finally, on Day 12, we assessed variables that would be expected to serve as outcomes of daily fluctuations in acculturation components. (These same variables were also assessed on Day 1 so that we could control for baseline levels of outcome variables, as is required to draw directional and predictive conclusions (Schwartz, 2022)).

Here we will review some of our findings using this daily diary dataset, as well as present some new results. Our prior work has examined cultural stressors as predictors of fluctuations in acculturation components, and has examined these fluctuations as predictors of well-being, internalizing symptoms, and externalizing problems. As part of much of this work, we have examined acculturation fluctuations as *mediators* of the predictive effects of cultural stressors on outcome variables – and as such, the story has focused both on cultural stress and acculturation fluctuations. Indeed, these extant studies have allowed us to test a micro-level (daily) version of cultural stress theory *as well as* examining daily dynamics of acculturation. Further, because the daily variations we observed between Days 2–11 were likely occurring prior to Day 1, the predictive effects of daily variability on mental health outcomes may have

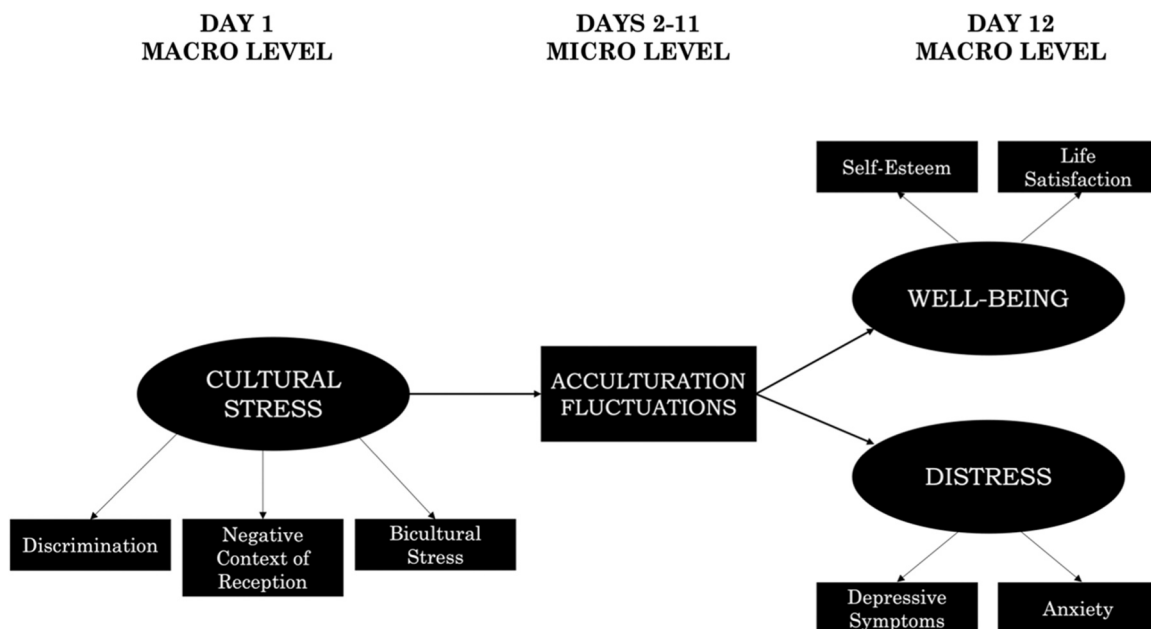


Fig. 2. Daily Acculturation Study Design for Prior Analyses.

been even greater than what we observed.

The new findings we present here test a different type of question – specifically, how do daily means and fluctuations in a given acculturation component relate to earlier (Day 1) and later (Day 12) scores on that *same* variable (see Fig. 3)? For example, how are fluctuations in ethnic identity predicted by, and predictive of, previous and subsequent levels, respectively, of ethnic identity? Means and fluctuations are important to examine together because they represent indices of central tendency and variability, respectively. This research question is important because it speaks directly to the links between macro- and micro-level acculturation indices and allows us to map associations for the *same* acculturation processes across multiple time scales. That is, how do earlier macro/overall levels of heritage-cultural practices (for example) predict average levels and fluctuations in heritage-cultural practices? Do first- and second-generation migrants who are more oriented toward their cultural heritage in general experience greater daily levels of, and fewer daily fluctuations in, this orientation? In practical terms, how do general and daily indices of acculturation map onto one another?

These new analyses reported here were conducted using the same daily diary dataset with Hispanic college students in Miami. We report analyses with daily means separately from those with daily fluctuations because these two sets of analyses answer somewhat different research questions (i.e., associations with average levels across days versus associations with daily variability). Specifically, analyses involving means allow us to examine whether daily *levels* of acculturation components fluctuate across days and are different from self-reported general levels of acculturation components (e.g., asking how ethnically identified someone is *in general* versus how ethnically identified that person is *today*). Analyses involving fluctuations allow us to examine whether individuals with lower general scores on acculturation components tend to fluctuate more across days on those same components (as well as on other components).

**Method**

*Sample*

We used a 12-day diary study conducted with 824 Hispanic college students (76.1 % female,  $M_{age} = 20.86$  years,  $SD = 2.80$ , range 18 to 29). The 12-day design allowed us to include two full weekends (4 weekend days) and 8 weekdays (Schwartz et al., 2019). Approximately 34.5 % of respondents were born outside of the US, and 65.5 % were born in the US but at least one of their parents was born abroad. Foreign-born participants had resided in the US for a mean of 12.50 years, with an average age of 9.26 at arrival in the US. The majority (71.3 %) of foreign-born participants had arrived in the US at age 12 or younger. Additional demographic information is provided in Table 1.

In terms of Spanish-speaking ability, 63 % of participants characterized themselves as fluent, 23 % as semi-fluent, and 10 % as being able to have a basic conversation. Only 4 % of participants indicated that they were not at least conversational in Spanish. Not surprisingly, these percentages differed significantly by immigrant generation,  $X^2(4) = 134.52, p < .001, Cramér's V = .42$ . The overwhelming majority (90 %) of first-generation immigrants, compared to 48 % of second-generation immigrants, characterized themselves as fluent Spanish speakers. The percentages of individuals characterizing themselves as semi-fluent (32 % versus 7 %) and as conversational (14 % versus 2 %) were far higher among second-generation immigrants than among first-generation immigrants. Only 5 % of second-generation immigrants, and 1 % of first-generation immigrants, reported not being at least conversational in Spanish.

When asked to characterize their ethnicity in their own words, 70 % of those participants ( $n = 757$ ) who answered the question provided a pan-ethnic label (e.g., Hispanic, Latino), 15 % provided a specific nationality (e.g., Colombian, Cuban), 3 % characterized themselves as American or White, and 12 % provided responses that were not specific to ethnicity (e.g., human, citizen of the world). Of participants providing a pan-ethnic label, 94 % characterized themselves as Hispanic, 4 % as Latina/o, and 2 % as Hispanic/Latino. The predominance of the term “Hispanic” is typical of Miami-area samples (Aranda, Hughes, & Sabogal, 2014).

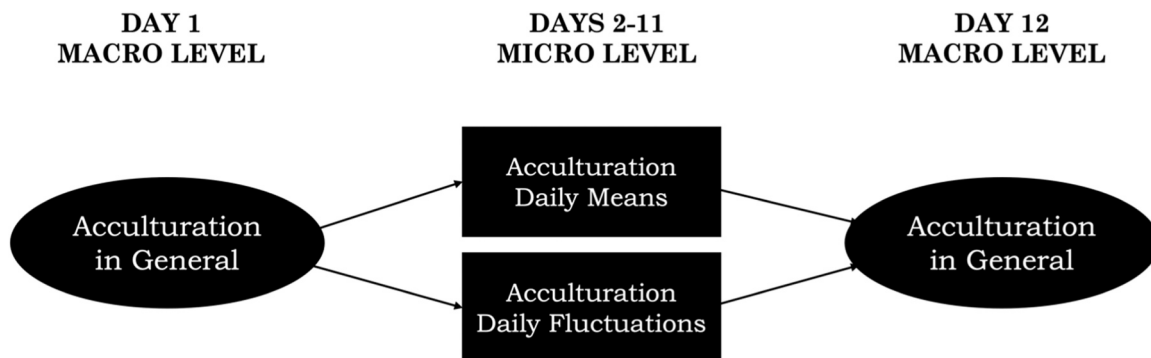


Fig. 3. Daily Acculturation Study Design for Current Analyses.

**Table 1**  
Summary of General Acculturation Measures and Psychometric Properties.

Construct	Measure Name	Number of Items on Subscale	Sample Item	Cronbach's Alpha
U.S. Practices (language use and other behaviors)	Bicultural Involvement Questionnaire (Szapocznik et al., 1980)	12	"I am comfortable speaking English at home."	.86
Hispanic Practices (language use and other behaviors)	Bicultural Involvement Questionnaire	12	"I am comfortable speaking Spanish at work or school."	.91
Horizontal Individualism	Individualism-Collectivism Scales (Triandis & Gelfand, 1998)	4	"I'd rather depend on myself than others"	.77
Vertical Individualism	Individualism-Collectivism Scales	4	"Competition is the law of nature"	.77
Horizontal Collectivism	Individualism-Collectivism Scales	4	"I feel good when I collaborate with others"	.74
Horizontal Collectivism	Individualism-Collectivism Scales	4	"Family members should stick together, no matter what sacrifices are required"	.78
U.S. Identity	American Identity Measure (Schwartz et al., 2012)	12	"I have a lot of pride in the United States."	.91
Ethnic Identity	Multi-Group Ethnic Identity Measure (Roberts et al., 1999)	12	"I am happy that I am a member of my ethnic group"	.86

## Procedure

Participants were recruited from a psychology department participant pool at a public university in Miami where approximately 65 % of students are Hispanic. Only participants who self-identified as Hispanic were eligible to participate. Data were collected between September and November 2015, across ten weekly cohorts of approximately 90 participants each. Data collection included a range of measures targeting acculturation, personal identity, beliefs about government and civic responsibility, well-being, and internalizing symptoms (see Meca et al., in press, for additional information). The baseline and final-day surveys took approximately one hour to complete, and the daily (Day 2–11) surveys took 15–20 min to complete. In exchange for their participation, participants received credit toward a university research requirement.

For each cohort, data collection started on a Thursday and ended on a Monday (see Fig. 1). Results indicated no significant differences across cohorts in any of the study variables. Completion rates across the study days ranged from 80 % to 90 %; and across all measurements, 13.3 % of data were missing. Little's (1988) Missing Completely at Random test indicated that data were missing completely at random [ $\chi^2(8608) = 8458.44, p = .87$ ], suggesting that our results were not biased because of missing values. Nonetheless, missing data methodologists (e.g., Enders, 2010; Graham, 2012; Little, 2013) recommend using all available data and not dropping cases with missing data. As a result, in creating the fluctuation scores, we used all of the available data points (where every case has a fluctuation score as long as they provided data for at least two of the daily assessments).

The daily survey link was sent out at 3 AM each day, giving students a full 24 h to complete the survey. Participants completed a longer battery on the first and last days consisting of demographic questions as well as closed-ended measures of identity, acculturation, well-being, and psychosocial functioning. On days 2–11, participants received a shorter survey with selected, closed-ended items from the questionnaire battery (one item per construct). The use of such single-item measures is standard in daily diary studies of identity processes (Klimstra et al., 2010, 2016; Schwartz et al., 2011). There is also some evidence that single-item identity measures are valid and reliable (Postmes, Haslam, & Jans, 2013). As part of the item selection process for the measures in the current study, we conducted confirmatory factor analyses on the Hispanic subsample from an earlier large, multi-site college student study (Castillo & Schwartz, 2013). The highest loading item from each measure or subscale was then selected and reworded to reflect individuals' daily experiences (see Table 2). Given earlier findings that language use represents the strongest component of cultural practices (Kang, 2006), it is not surprising that language use items were associated with the strongest loadings in the earlier study and were used as daily items in the present study.

**Table 2**  
Daily items for each acculturation component.

Component	Daily Item
US Practices	Today, how comfortable did you feel speaking English at home? Today, how comfortable did you feel speaking English at work or school?
Hispanic Practices	Today, how comfortable did you feel speaking Spanish at home? Today, how comfortable did you feel speaking Spanish at work or school?
Individualist Values	Today, I have relied on myself most of the time, and rarely relied on others.
Collectivist Values	Today, I felt good when I collaborated with others.
US Identity	Today, I have a strong sense of belonging to the United States.
Ethnic Identity	Today, I have a strong sense of belonging to my own ethnic group.

## Measures

All measures were administered using a 5-point Likert-type scale anchored by 1 = *strongly disagree* and 5 = *strongly agree*. Mental health variables are included in our models at Day 12, with controls for Day 1 values – so in this article we describe the full measures administered on those days. Acculturation components are included in our models at the daily level, so we describe the daily measures here in this article.

### Demographics

We included a number of demographic items in our survey, including own, mother's, and father's birthplace; gender; skin color; and neighborhood ethnic composition. The gender question included only male and female as responses (which was common practice in 2015, when these data were collected.) As detailed in the Participants section, we asked participants to indicate whether they, their mother, and their father were born in the United States (excluding U.S. territories such as Puerto Rico). Skin color, which is important in shaping acculturation among Hispanics (e.g., López, 2008), was measured using a "thermometer" that included nine skin tones ranging from extremely light to extremely dark. There was considerable variability in responses: 91 % of participants rated their skin color between 2 (very light) and 7 (moderately dark). The skin color variable approximated a normal distribution (skew = 0.80, kurtosis = 0.37).

We controlled for neighborhood ethnic composition because environmental factors such as community ethnic density may influence levels of acculturation (Birman et al., 2005; Jurcik et al., 2013). For neighborhood ethnic composition, we asked participants to indicate the extent to which the neighborhood where they currently lived was comprised almost exclusively of people from their own ethnic group (1), comprised largely of people from their own ethnic group (2), evenly mixed between their own and other ethnic groups (3), comprised largely of people from other ethnic groups (4), or comprised almost exclusively of people from other ethnic groups (5). The neighborhood ethnic composition variable also approximated a normal distribution (skewness = 0.41, kurtosis = -0.38).

### General acculturation

On Days 1 and 12, we administered full measures of each acculturation component. Given our multidimensional perspective on acculturation, we assessed Hispanic and U.S. cultural practices, individualist and collectivist values, and Hispanic and U.S. identity. *Cultural practices* were assessed using the Bicultural Involvement Questionnaire (Guo et al., 2009; Szapocznik et al., 1980), which was designed specifically for Hispanics. This measure assesses comfort with Hispanic and U.S. cultural behaviors, such as language use. *Individualism* and *collectivism* were assessed using corresponding scales developed by Triandis and Gelfand (1998). *Cultural identifications* were assessed using the Multi-Group Ethnic Identity Measure (Roberts et al., 1999) for Hispanic heritage-cultural identifications and the American Identity Measure (Schwartz et al., 2012) for U.S. identifications. These two measures use parallel item structures and identical response scales; the only difference between them is whether the items refer to "my ethnic group" or "the United States." Detailed information on these measures can be found in Table 1.

### Daily acculturation

Daily acculturation items are presented in Table 2. The cultural practices items were taken from the Bicultural Involvement Questionnaire. The cultural values items were taken from the Individualism and Collectivism Scales). The cultural identifications items were taken from the Multi-Group Ethnic Identity Measure and the American Identity Measure. We used two daily items, rather than one, for cultural practices so that we were able to index language use both at home and at school or work (see Valenzuela & Schwartz, 2022).

Per Klimstra, Luyckx, et al. (2010), reliability for all single-item measures was calculated using mean Heise (1969) reliability estimates, an estimate of test-retest reliability that separates true change from measurement error. Given three days of measurement – Days 1, 2, and 3 – Heise reliability coefficients are calculated using the following equation:  $r_{xx} = (r_{12} \times r_{23})/r_{13}$ . As there were 10 days of single-item measurement, 8 Heise estimates were calculated for each construct. It should be noted that Heise coefficients may be somewhat lower than traditional Cronbach's alpha coefficients because high Heise coefficients indicate the presence of little variability across daily measurement occasions. However, there should nonetheless be a balance between over-time fluctuations and reliability

**Table 3**  
Heise coefficients for acculturation components.

Component	Mean Heise Coefficient	Lowest Heise Coefficient	Highest Heise Coefficient
US Practices	.75	.56 (Days 2-4)	.84 (Days 4-6)
Hispanic Practices	.88	.78 (Days 2-4)	.92 (Days 8-10)
Individualist Values	.50	.46 (Days 5-7)	.58 (Days 7-9)
Collectivist Values	.51	.46 (Days 6-8)	.65 (Days 4-6)
US Identity	.69	.64 (Days 2-4)	.75 (Days 8-10)
Ethnic Identity	.67	.56 (Days 2-4)	.72 (Days 6-8)

coefficients, such that there is enough stability to produce acceptable reliability coefficients.

Heise coefficients are provided in Table 3. The highest values (mean = .88, range .78–.92) emerged for Hispanic practices, indicating a great deal of stability in comfort with Hispanic practices across days. The lowest Heise coefficients emerged for individualist (mean = .50, range .46–.58) and collectivist (mean = .51, range .46–.65) values, indicating a considerable amount of variability across days in values-based acculturation. For the practices and identifications components of acculturation, the lowest Heise coefficients emerged for Days 2–4, suggesting increased consistency of responses during earlier parts of the study period. Daily items for each of the six acculturation components are presented in Table 2. Note that we used two items for US practices and two for Hispanic practices (to capture language use at home and at work or school), but only one item apiece for each of the other four components.

**Results**

We estimated two path models – one for daily means and another for daily fluctuations (standard deviations). In the means model, we specified each of the Day 1 acculturation components as predictors of each Day 2–11 acculturation daily mean. We also specified each Day 2–11 daily mean as a predictor of each Day 12 acculturation score, controlling for the corresponding Day 1 acculturation scores. In so doing, we estimated both macro → micro and micro → macro directionality. Finally, we examined the extent to which daily means would mediate the predictive effect of Day 1 acculturation scores on corresponding Day 12 acculturation scores. For example, would daily means for Hispanic practices mediate the predictive effect of Day 1 Hispanic practices on Day 12 Hispanic practices? Such mediated effects would speak directly to the interplay between micro and macro-level acculturation processes. We then estimated a similar model with daily fluctuations in place of daily means.

We evaluated the fit of both models using standard structural equation modeling fit indices (see Kline, 2023, for a more extensive review). The comparative fit index (CFI) and root mean square error of approximation (RMSEA) are the two most widely used such indices (Lai & Green, 2016), and these are the indices we used to evaluate fit. The CFI reflects the extent to which the fit of the specified model is superior to the fit of a null model with no paths. The RMSEA reflects the extent to which the covariance structure implied by the model deviates from the covariance structure observed in the data. Adequate model fit is generally defined as CFI ≥ .90 and RMSEA ≤ .08. The chi-square index is reported, but not used in interpretation, because it tests the null hypothesis of perfect model fit (which is rarely tenable in all but the simplest models).

To test for mediation, we used the asymmetric distribution of products test (MacKinnon, 2012). This test computes a 95 % confidence interval for the product of the individual paths that comprise the hypothesized mediated effect. If this confidence interval does not include zero, then mediation is assumed at  $p < .05$ . In the present article, we report mediated effects as standardized coefficients for ease of interpretation.

**Means model**

The means model provided an adequate fit to the data,  $X^2(44) = 186.18, p < .001$ ; CFI = .960; RMSEA = .067 (90 % CI = .057 to .078). Path coefficients are provided in Tables 4 and 5. For all six acculturation components, Day 1 scores significantly predicted Day 2–11 daily means, with the strongest such effect ( $X = .74$ ) emerging for Hispanic practices. Some “off-diagonal” (i.e., one Day 1 variable predicting daily means for a different variable) paths were also statistically significant. Most prominently, Day 1 ethnic identity predicted daily means for all six acculturation components, with positive predictive effects on daily means for Hispanic practices, collectivist values, U.S. identity, and ethnic identity and negative predictive effects for U.S. practices and individualist values. Day 1 U.S. identity positively predicted daily means for collectivist values, U.S. identity, and ethnic identity. Day 1 collectivist values positively predicted daily means for collectivist values and ethnic identity, and negatively predicted the daily mean for individualist values. Day 1 individualist values positively predicted daily means for U.S. practices, individualist values, and U.S. identity. Day 1 U.S. practices positively predicted daily means for U.S. practices and negatively predicted daily means for Hispanic practices. Day 1 Hispanic practices positively predicted daily means for Hispanic practices and negatively predicted daily means for U.S. practices.

Similarly, controlling for corresponding Day 1 scores, Day 2–11 daily means for each acculturation component significantly

**Table 4**  
Day 2–11 Daily acculturation means by day 1 acculturation scores.

Day 2-11 Daily Mean	Day 1 variable					
	US Practices	Hispanic Practices	Individualist Values	Collectivist Values	US Identity	Ethnic Identity
US Practices	.47 ***	-.17 ***	.05	-.06	.08	-.03
Hispanic Practices	-.13 **	.74 ***	.01	.00	-.04	.02
Individualist Values	.13 **	-.02	.28 ***	.05	-.03	.13 *
Collectivist Values	.07	.01	-.08 *	.34 ***	.07	.19 ***
US Identity	-.02	.02	-.07	.16 **	.45 **	.12 **
Ethnic Identity	-.19 ***	.21 ***	-.11 *	.13 **	.18 ***	.34 ***

\*  $p < .05$   
 \*\*  $p < .01$   
 \*\*\*  $p < .001$



**Table 5**  
Day 12 Acculturation scores by day 2–11 daily acculturation means<sup>a</sup>.

Day 12 Score	Day 2-11 daily mean					
	US Practices	Hispanic Practices	Individualist Values	Collectivist Values	US Identity	Ethnic Identity
US Practices	.35 ***	.09 *	.05	.16 ***	.01	-.05
Hispanic Practices	.06	.44 ***	-.01	.07 *	-.04	.10 *
Individualist Values	.00	-.05	.30 ***	-.06	.14 *	-.07
Collectivist Values	.05	.10 *	.03	.31 ***	.07	-.01
US Identity	.03	.07	.04	.11	.54 ***	-.21 ***
Ethnic Identity	.04	.17 ***	.03	.05	.16 **	.22 **

<sup>a</sup>Controlling for Day 1 scores for the corresponding Day 12 outcome variable.

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

predicted Day 12 scores for that component (see Table 5). The mean such path coefficient was .38, with a range of .30 (individualist values) to .59 (U.S. identity). A small number of off-diagonal path coefficients were also statistically significant: daily means for U.S. practices significantly and positively predicted Day 12 scores for Hispanic practices and collectivist values; daily means for Hispanic practices predicted Day 12 scores for collectivist values (and vice versa); daily means for individualist values predicted Day 12 scores for U.S. identity; daily means for U.S. identity significantly and negatively predicted Day 12 scores for ethnic identity (and vice versa); and daily means for ethnic identity significantly predicted Day 12 scores for Hispanic practices (and vice versa). Except for the coefficient for U.S. identity daily means predicting Day 12 ethnic identity scores, all of these significant path coefficients were positive.

When we tested for mediation, we found that daily means for each acculturation component partially mediated the predictive effects of Day 1 scores for that component on Day 12 scores for that component. Standardized mediated path coefficients ranged from .08 to .33, with a mean of .17. Given that mediated path coefficients involve multiplying numbers that are between 0 and 1, the mediated path coefficients that we found can be considered to be fairly strong.

In terms of significant covariate effects, nativity (foreign-born) significantly predicted daily means for U.S. practices ( $\beta = -.15, p = .001$ ) and Hispanic practices ( $\beta = .11, p = .001$ ), as well as Day 12 scores for individualist values ( $\beta = .08, p = .025$ ). Darker skin color predicted Day 12 scores for both U.S. identity ( $\beta = .09, p = .01$ ) and ethnic identity ( $\beta = .07, p = .009$ ). Neighborhood ethnic composition predicted Day 12 U.S. identity ( $\beta = -.07, p = .024$ ). Being female predicted Day 12 scores for Hispanic practices ( $\beta = .06, p = .025$ ), individualist values ( $\beta = -.10, p = .002$ ), and ethnic identity ( $\beta = .08, p = .012$ ).

**Fluctuations model**

The fluctuations model provided an adequate fit to the data,  $X^2(42) = 320.05, p < .001$ ; CFI = .911; RMSEA = .096 (90 % CI = .087 to .106). Path coefficients are provided in Tables 6 and 7. For U.S. practices, Hispanic practices, collectivist values, and ethnic identity, Day 1 scores significantly and negatively predicted Day 2–11 fluctuation scores. The corresponding path coefficient was positive for U.S. identity and nonsignificant for individualist values. A small number of off-diagonal path coefficients were statistically significant: Day 1 U.S. practices negatively predicted fluctuations in Hispanic practices; Day 1 U.S. practices negatively predicted fluctuations in Hispanic practices; Day 1 Hispanic practices positively predicted fluctuations in U.S. practices; Day 1 individualist values positively predicted fluctuations in ethnic identity; and Day 1 ethnic identity negatively predicted fluctuations in U.S. practices.

In terms of Day 2–11 fluctuation scores predicting Day 12 scores (with controls for Day 1 levels of these outcomes), fluctuations in U.S. practices, Hispanic practices, collectivist values, and U.S. identity significantly predicted corresponding Day 12 scores. Only the path coefficient involving U.S. identity was positive. Only two off-diagonal path coefficients emerged as statistically significant – fluctuations in Hispanic practices (negatively) and U.S. identity (positively) significantly predicted Day 12 ethnic identity scores,

**Table 6**  
Day 2–11 daily acculturation fluctuations by day 1 acculturation scores.

Day 2-11 Daily mean	Day 1 Variable					
	US practices	Hispanic practices	Individualist values	Collectivist values	US identity	Ethnic identity
US Practices	-.32***	.15 * **	.06	-.01	.05	-.16 * *
Hispanic Practices	-.12**	-.19 * **	.03	-.06	.03	-.05
Individualist Values	-.01	-.03	.06	-.01	.03	.01
Collectivist Values	-.01	-.06	.18 * **	-.10 *	-.06	-.02
US Identity	-.07	.00	.04	.06	.18 * **	-.01
Ethnic Identity	-.02	-.04	.10 *	-.01	-.02	-.17 * *

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

**Table 7**  
Day 12 acculturation scores by day 2–11 daily acculturation fluctuations<sup>a</sup>.

Day 12 Score	Day 2-11 Daily Fluctuations					
	US Practices	Hispanic Practices	Individualist Values	Collectivist Values	US Identity	Ethnic Identity
US Practices	-.21 * **	-.08	.06	.03	.08	-.01
Hispanic Practices	-.01	-.13 * *	.03	.02	.03	-.05
Individualist Values	-.07	.04	-.08	.02	.07	.07
Collectivist Values	-.05	-.07	.05	-.09 *	-.05	.00
US Identity	-.08	-.03	-.03	-.06	.18 * **	-.02
Ethnic Identity	.05	-.11 *	.03	-.04	.10 *	-.07

<sup>a</sup>Controlling for Day 1 scores for the corresponding Day 12 outcome variable.

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

controlling for Day 1 ethnic identity. When we tested for mediation, significant mediated effects emerged for only three of the six acculturation components: U.S. practices,  $\beta = .07, p < .001$ ; Hispanic practices,  $\beta = .02, p < .02$ ; and U.S. identity,  $\beta = .03, p < .002$ .

In terms of significant covariate effects, nativity (foreign-born) significantly predicted fluctuation scores for Hispanic practices ( $\beta = -.09, p = .021$ ) and U.S. identity ( $\beta = .11, p = .006$ ). Darker skin color predicted fluctuations in U.S. identity ( $\beta = .10, p = .013$ ). Neither gender nor neighborhood ethnic composition predicted any of the fluctuation scores. Covariate effects on Day 12 acculturation scores were identical as those reported in the means model.

## Discussion

The present study was conducted to add to the emerging literature on daily acculturation processes by mapping associations of macro-level (i.e., largely characterological) and micro-level (daily) indices of acculturation. Daily dynamics can be operationalized in a number of ways, including daily means (as an index of central tendency) and daily fluctuations (as an index of variability). We examined both daily means and fluctuations in relation to macro-level acculturation scores before and after the daily diary portion of the study, as well as ascertaining the extent to which daily means and fluctuations may have mediated the autoregressive effect of earlier macro-level scores on later macro-level acculturation scores.

The present empirical findings add to the growing literature on daily assessments of acculturation, and on daily acculturative processes in general. Whereas prior work has focused on cultural stressors as predictors of daily acculturation means and fluctuations, and on well-being, internalizing symptoms, and externalizing problems as outcomes, in the present work we concentrated on linking the *same* acculturation components across the macro (general) and micro (daily) time scales. Such work has the potential to directly connect longer-term and daily approaches to measuring and studying acculturation.

We found that daily means emerged as strong mediators of the autoregressive effects for macro-level scores among acculturation scores across all six domains, with this mediated effect especially strong for U.S. identity. Individuals identifying closely with the United States generally were highly likely to report high levels of U.S. identity at each daily assessment – but, interestingly, individuals identifying strongly with the United States on the earlier and later macro assessments were also likely to fluctuate more in U.S. identity across the daily assessments. Such participants may have been fluctuating around a high daily mean such that their daily scores were generally high but varied somewhat. It is not entirely clear why strong endorsement of U.S. identity would have predicted increased daily fluctuations – this pattern did not emerge for any of the other acculturation components. Further, a similar pattern emerged for daily fluctuations in U.S. identity predicting higher subsequent macro-level U.S. identity scores – a finding that again did not emerge for any other acculturation component. Future qualitative or mixed method research will be necessary to explore this finding in greater detail. However, it is possible that the experience of U.S. identity in a Hispanic enclave such as Miami might have involved considerable daily fluctuations in the extent to which one identifies with the United States.

It should also be noted that Day 1 Hispanic practices strongly predicted daily means for this component ( $\beta = .74$ ), but the predictive effect of daily means on Day 12 Hispanic practices was far weaker ( $\beta = .44$ ). Further, high Day 1 scores for Hispanic practices were negatively predictive of daily fluctuations in Hispanic practices across the diary portion of the study, and such fluctuations were negatively predictive of Day 12 scores for Hispanic practices. Contrary to what we found for U.S. identity, high macro-level scores for Hispanic practices predicted high daily means, as well as less variability around those means, during the daily portion of the study. Hispanic students who reported engaging strongly in heritage cultural practices (such as speaking Spanish) on the first and last study days may have done so consistently, and with relatively little variation, across days during the daily diary burst. Within a Hispanic ethnic enclave such as Miami, where individuals can often live their lives predominantly or completely in Spanish, students who choose to do so at the general level may also follow such a pattern at the daily level.

Not surprisingly, daily fluctuations were less closely related to macro-level means than daily means were. The significant (for all components) associations between macro-level scores and micro-level daily means suggest that the Hispanic students in our sample appear to characterize their acculturation similarly across days as they do in general. However, the general means that participants reported for each component on Days 1 and 12 were only modestly related to daily fluctuations for the same component during the daily diary portion of the study. Macro-level scores and daily fluctuations were not significantly related at all for individualist values,

and daily fluctuations in ethnic identity did not predict Day 12 ethnic identity scores.

Across both daily means and fluctuations, U.S. and Hispanic practices evidenced the most consistent findings in terms of links between macro-level and daily indices of acculturation. Students who were more comfortable speaking English at home and on campus at the macro level (i.e., in general) were also more likely to report such comfort across days, as well as less likely to fluctuate across days, during the daily diary portion of the study. Similar findings emerged for Hispanic practices. Because cultural practices were assessed in terms of language comfort, students may have remained similarly comfortable in English and Spanish (a) at a general level and (b) on each of the individual days within the daily diary portion of the study. Had language use been assessed in terms of *use* of English and Spanish, more fluctuation might have been observed.

Although findings for *means* suggested strong relationships between general and daily acculturation variables, findings for *fluctuations* were somewhat weaker and more tentative. The present pattern of results suggests that students may fluctuate across days in their acculturation patterns for reasons that are largely unrelated to their general macro-level levels of acculturation. Students may move between U.S. oriented and Hispanic oriented contexts multiple times during a given day or week. Lee et al. (2023), for example, found that some students' acculturation patterns differed between weekdays and weekends – assumedly because many urban Hispanic college students spend weekdays on U.S.-oriented university campuses and weekends with their more heritage-oriented family members and friends. Such variations are consistent with the specificity principle in acculturation as proposed by Bornstein (2017). Students may experience some degree of discomfort with potential cultural incompatibilities between their collectivist-oriented cultural heritage and the largely Eurocentric and individualistic U.S. campus culture (Cano et al., 2014). Such discomfort may be triggered by specific events occurring on certain days (Torres & Ong, 2010) and may not necessarily be linked with a student's general acculturative profile.

### Integrating the present findings into the daily acculturation literature

The present findings add to the larger daily acculturation literature in a number of ways. First, prior work (Lee et al., 2021) suggests that culturally stressful experiences may predict more daily fluctuations in comfort speaking both English and Spanish (i.e., daily linguistic biculturalism). The present findings indicate that students with low levels of comfort with English and/or Spanish may also be likely to fluctuate more in these comfort levels across days. Further, greater fluctuations in comfort with both English and Spanish have been shown to be predictive of later depressive symptoms (Lee et al., 2021), and the present findings suggest that such fluctuations also contraindicate future comfort with both languages.

Tying the present results back to earlier research on biculturalism, the present findings appear to speak to biculturalism in the practices domain, whereas prior work has focused primarily on the identifications domain. In the present results, fluctuations in U.S. and Hispanic practices negatively predicted one another's subsequent macro-level scores – suggesting a bicultural interplay between comfort with English and with Spanish. Daily variability in comfort with either language appears to interfere with later general comfort with both languages – a phenomenon that Lee et al. (2021) have referred to as linguistic biculturalism.

In contrast, our results for the identifications domain appear inconsistent with prior work on biculturalism in the identifications domain. Fluctuations in both U.S. and ethnic identity appear to be *positively* predictive of later U.S. identity scores – a finding that did not emerge for any other acculturation component – and fluctuations in ethnic identity did not significantly predict subsequent U.S. or ethnic identity scores. It is not immediately clear what these findings signify for the interplay of daily and macro-level acculturation dynamics in the identifications domain. Both the bicultural identity integration (Benet-Martínez & Haritatos, 2005) and cultural identity styles (Ward et al., 2018) models are premised upon the assumption that ethnic and national identity can be integrated into a coherent whole. The findings for daily *means* support this premise – indeed, daily means for U.S. identity predicted subsequent macro-level scores for ethnic identity, and vice versa. However, findings for daily *fluctuations* are far less consistent with models of bicultural identity. It is important for future research to examine, and potentially rectify, this potential discrepancy.

### Limitations and future directions

The present findings should be interpreted in light of at least six important limitations. First, the inclusion of only college students suggests that our results should be generalized to other segments of the population with caution. Prior work (Crocetti et al., 2015) suggests important differences between college students and other segments of the population in terms of identity-related processes (a heading that includes acculturation). Second, we included only a brief (10-day) diary period and only two macro-level assessment points. It may be advisable for future studies to include repeated diary periods and macro-level assessments across a number of months or years (Becht et al., 2016). Third, the inclusion only of individuals residing in the United States suggests that the present findings may not be generalizable to other countries. It is essential to replicate our findings in other settings as well. Fourth, although the U.S. Hispanic population includes individuals from many different national backgrounds, there are both advantages and disadvantages to aggregating these individuals into a single group. It may be advantageous to ascertain the extent to which the present findings may (or may not) have differed across students identifying as Cuban, Colombian, Venezuelan, et cetera. Indeed, in the present sample, group sizes for nationalities other than Cuban were likely not large enough to estimate the study model reliably within national origin groups. Future work should purposefully sample large enough numbers of people from multiple national origin groups within larger pan-ethnic categories such as Hispanics or Middle Easterners. It is also essential for future work to examine how interacting with Hispanics from different backgrounds (e.g., Cuban students interacting with Colombians) would impact daily acculturation patterns. These kinds of “within-Hispanic” interactions, and potential stressors, have not been widely examined – and have not been examined at all in relation to daily acculturation dynamics. Fifth, the fit for the study models were not ideal, especially for the fluctuations model – suggesting

some degree of misspecification. The present results should therefore be interpreted with some degree of caution. Finally, although the U.S. Hispanic population includes both foreign-born and U.S.-born individuals, studying these two groups together may obscure or cloud the findings from acculturation-related studies. Indeed, acculturation may carry different meanings for individuals born in the destination country than it does for individuals who were born elsewhere and migrated to the destination country.

Despite these and other limitations, the present findings help to expand the literature on daily acculturation processes and their links with macro-level acculturation. Indeed, examining daily means and fluctuations can help to ascertain the ways in which daily dynamics of acculturation can, to some extent, serve as “building blocks” for longer-term acculturation processes. We hope that the present results inspire additional work in this direction.

## Note

Seth J. Schwartz is Editor-in-Chief of the *International Journal of Intercultural Relations*. Appropriate blinding procedures have been undertaken to assure that this article was reviewed and handled objectively and without bias.

## CRediT authorship contribution statement

**Jaimee Stuart:** Writing – review & editing. **Byron L. Zamboanga:** Writing – review & editing. **Jennifer B. Unger:** Writing – review & editing. **Alan Meca:** Writing – review & editing. **Miguel Ángel Cano:** Writing – review & editing. **Cory L. Cobb:** Writing – review & editing. **Seth J. Schwartz:** Writing – original draft, Formal analysis, Data curation, Conceptualization. **Elma I. Lorenzo-Blanco:** Writing – review & editing. **José Szapocznik:** Writing – review & editing.

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