

Research Article

Within-Person Changes in the Structure of Emotion

The Role of Cultural Identification and Language

Wei Qi Elaine Perunovic,¹ Daniel Heller,¹ and Eshkol Rafaeli²

¹University of Waterloo, Waterloo, Ontario, Canada, and ²Barnard College, Columbia University

ABSTRACT—*This study explored the within-person dynamic organization of emotion in East-Asian Canadian bicultural individuals as they function in two cultural worlds. Using a diary design, we examined under what conditions their emotional structure resembles that of Westerners or that of East Asians. As predicted, when these bicultural individuals identified with a Western culture or had recently spoken a non-Asian language, their positive and negative affect were inversely associated. When they identified with an Asian culture or interacted in an Asian language, this inverse association disappeared. This study shows that as bicultural individuals identify and communicate with members of one or the other cultural group, they may adopt a culturally congruent phenomenology, including a distinct affective pattern.*

Most studies of culture have used static, cross-sectional comparisons. Although this approach is useful for understanding differences between groups of distinct cultural backgrounds, it is limited in its ability to explain the experience of multicultural individuals. These individuals have been exposed to and might have adopted more than one culturally shared way of being and thinking (LaFromboise, Coleman, & Geraton, 1993). A new paradigm developed recently in culture research focusing on intraindividual cultural dynamics is particularly useful in studying such multicultural individuals (Hong & Chiu, 2001; Hong, Morris, Chiu, & Benet-Martínez, 2000). According to this approach, multicultural individuals are capable of switching between cultural frames on the basis of accessible cultural cues. This approach has been applied to the investigation of bicultural individuals' values, attributions, and cognitions (e.g., Hong

et al., 2000); personality (e.g., Heller, Watson, Komar, Min, & Perunovic, in press; Ramírez-Esparza, Gosling, Benet-Martínez, Potter, & Pennebaker, 2006); self-concept and emotions (e.g., Ross, Xun, & Wilson, 2002); well-being (Yip, 2005); and cooperative behavior (Wong & Hong, 2005).

In the first study to employ this approach, Hong et al. (2000) demonstrated that experimentally priming American or Chinese cultural icons (e.g., Mickey Mouse, the Chinese flag) influenced Chinese American bicultural individuals' attributions for an ambiguous behavior in culturally consistent ways. Similarly, language production may induce cultural-frame shifts. Ross et al. (2002) showed that bicultural Chinese Canadians experimentally assigned to respond in English or in Chinese produced self-descriptions that paralleled cross-sectional cultural differences. That is, bicultural individuals described themselves in ways that were consistent with the Western culture to a greater degree when responding in English than when responding in Chinese. Because these experiments involved random assignment in controlled laboratory settings, they provide compelling evidence for the causal effect of cultural context on bicultural individuals' responses.

Nevertheless, in their everyday lives, bicultural individuals encounter many contexts containing multiple cultural cues that can compete with one another for influence. Indeed, field research shows mixed findings regarding the relation between context and culturally congruent self-concept in bicultural individuals (Perunovic, Ross, & Wilson, 2005). Consequently, the current study focused on momentary variations in cultural experience as they unfold in bicultural individuals' everyday lives. Specifically, because of the demonstrated intimate connection between language, culture, and affect (Ross et al., 2002; Yip, 2005), we investigated the significance of cultural identification and language usage in the structure of day-to-day affective experiences of bicultural individuals.

The topic of affective structure, and of the dependence or independence of affective dimensions, has been of great interest

Address correspondence to W.Q. Elaine Perunovic, Department of Psychology, University of New Brunswick, Fredericton, New Brunswick, Canada E3B 6E4, e-mail: eperunov@umb.ca.

to emotion researchers (e.g., Rafaeli & Revelle, 2006). A growing number of studies have suggested that satisfactory models of core affect require at least two dimensions, which are identified in these models (e.g., Watson, Wiese, Vaidya, & Tellegen, 1999) as positive and negative affect or activation (PA and NA, respectively). On average (and across subjects), PA and NA tend to have a weak negative association in Western samples (e.g., Watson & Tellegen, 1999). However, contextual (Zautra, Reich, Davis, Potter, & Nicolson, 2000) and individual (Coifman, Bonanno, & Rafaeli, in press) differences have been shown to influence this average relationship.

Most recently, the examination of variations in affective structure has made its way into culture research. Extending the idea of an Asian “dialectical self” (Peng & Nisbett, 1999) that accepts opposite cognitions as not necessarily contradictory, a series of studies has shown that as a group, East Asians are also more dialectical in their emotional experience than their Western peers (Bagozzi, Wong, & Yi, 1999; Kitayama, Markus, & Kurokawa, 2000; Perunovic et al., 2005; Schimmack, Oishi, & Diener, 2002; Scollon, Diener, Oishi, & Biswas-Diener, 2005). For instance, the pioneering study by Bagozzi et al. (1999) showed that momentary assessments of PA and NA are less negatively associated in China and Korea than in the United States (and at times are positively associated in China and Korea). More recently, Scollon et al. (2005), using experience-sampling methodology, examined this association at different levels of analysis. They found that (a) at the between-subjects level, PA and NA were positively correlated in Asians, but uncorrelated among Westerners, and (b) at the within-subjects level, all the cultural groups studied demonstrated negative associations between PA and NA, although there was a non-significant trend for a weaker negative association among Asian than among non-Asian groups. These findings seem to suggest that whereas, on average, PA and NA can be positively correlated, at a given moment they tend to be negatively correlated for all cultural groups. However, we propose that in bicultural individuals, this momentary-based negative correlation may depend on changes in cultural experience detectable only if both affect and culture are monitored within person.

Previous research on the relation between culture and the PA-NA association has relied on between-groups comparisons, rather than on within-person fluctuations in cultural identification over time. The current research explored the rich daily emotional experiences of East-Asian Canadian bicultural individuals. We examined the conditions under which their organization of emotions resembles that of Westerners or that of East Asians. Using a diary design—a design in which “self-report instruments are used repeatedly to examine ongoing experiences” (Bolger, Davis, & Rafaeli, 2003, p. 580)—we investigated the moderating role of fluctuations in cultural identification and language usage in the within-individual association between PA and NA. To the extent that bicultural individuals are capable of switching their self-based cultural

systems (Hong et al., 2000; Perunovic et al., 2005), their emotional experience should reflect their current cultural mind-set. Accordingly, we predicted that identification with a Western culture or interaction in a Western language would yield a negative PA-NA association, whereas identification with an Asian culture or interaction in an Asian language would yield independence or even a positive association between PA and NA. Finally, we compared the between- and within-individual PA-NA associations among bicultural individuals with the associations found among European Canadian monocultural individuals (Schimmack et al., 2002; Scollon et al., 2005).

METHOD

Subjects

The subjects were 177 undergraduate students at a Canadian university who volunteered to enroll in a large diary study. The students were compensated with either one or two credits toward their introductory psychology course or either \$10 or \$20, depending on the length of their participation. In addition, all subjects were entered into a drawing to win one of two \$50 gift certificates.

The European Canadian group consisted of 91 students (mean age = 20.14, range: 17–20; 70% female) who indicated in an earlier mass testing that they were born in Canada and were European or White by ethnicity. The East-Asian Canadian subjects were 86 students (mean age = 19.96, range: 18–25; 66% female) who indicated that they were East Asian by ethnicity; 50 were born in Canada, and 36 were born in mainland China, Hong Kong, or Korea (average length of time in country of birth = 14.6 years, range: 7–23 years).

Procedure

All subjects first completed an initial on-line questionnaire that included various trait measures. Shortly afterward (no more than 3 weeks later), subjects were asked to participate in a large diary study in which they would complete a self-report emotional-experience questionnaire on the Internet three times a day for 10 days (including weekends), starting on a Monday. Specifically, they completed the diaries (a) between 11 a.m. and 2 p.m., (b) between 4 p.m. and 7 p.m., and (c) between 9 p.m. and 12 a.m. each day. To ensure subjects’ compliance with instructions, we made it possible for them to log on only during the specified times. Subjects also received reminder e-mails, including the diary instructions, every morning during the diary-recording period.

One hundred forty-one subjects completed at least one diary recording of momentary affect. East-Asian Canadians and European Canadians were equally likely to complete a diary recording (81% vs. 79%, respectively, of the initial pool), $\chi^2(1, N = 177) = 0.14, p = .70, p_{\text{rep}} = .36$. There were no significant differences in trait PA, trait NA, or age between subjects who did

and did not provide any diary recordings. The latter group, however, had a greater proportion of males than the former, $\chi^2(1, N = 177) = 7.90, p < .005, p_{\text{rep}} = .97$. The total number of diary recordings was 2,123 (an average of approximately 15 recordings per person, $SD = 7.68$), which is equivalent to an overall response rate of approximately 50%. The overall response rate was computed as the ratio of the number of recordings received (2,123) to the maximum number of possible recordings (10 days \times 3 recordings per day \times 141 subjects = 4,230). On average, the East-Asian Canadian subjects completed slightly more diary recordings than their European Canadian peers ($M = 16.22$ and $M = 14$, respectively), $t(139) = 1.73, p = .09, p_{\text{rep}} = .89$, Cohen's $d = 0.30$.

Measures

Trait Affectivity

In the initial on-line questionnaire, subjects completed the 20-item Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The PANAS assesses both trait PA ($\alpha = .90$) and trait NA ($\alpha = .88$) by asking subjects to indicate for 10 positive and 10 negative emotions (e.g., determined, enthusiastic, jittery, afraid), "To what extent you generally feel this way, that is, how you feel on the average?" Responses are made on a 5-point scale (1 = *very slightly or not at all*, 2 = *a little*, 3 = *moderately*, 4 = *quite a bit*, 5 = *extremely*).

State Affect

During each of the diary recordings, subjects again completed the 20-item PANAS (Watson et al., 1988). However, they were instructed to complete these items on the basis of their current momentary thoughts and feelings, "the extent to which each adjective describes your mood right now, that is, at the present moment." The mean (across recordings) coefficient alphas for state PA and state NA were .93 and .90, respectively.

Cultural Identification

During each of the diary recordings, subjects were asked, "During the past 2 hr, which specific cultural group did you most identify with?" The responses were categorized as identifying with either an Asian culture (e.g., Chinese, Korean, Asian) or a Western culture (e.g., Canadian, Western).

Language Spoken

During each of the diary recordings, subjects were asked, "During the past 2 hr, think of the person or group you spent most of the time with. What language did you speak most of that time?" The languages were categorized as either an Asian (e.g., Chinese, Cantonese, Mandarin, Korean) or a non-Asian (e.g., English) language.

Data Analyses

Because the data in this study have a multilevel structure (i.e., each diary recording of momentary mood can be considered a lower-level unit nested under the upper-level unit, persons), we used multilevel modeling techniques. Multilevel modeling can be understood intuitively as a two-stage series of iterative regressions (Bryk & Raudenbush, 1992). At the first level of analysis (Level 1), the relationship between state PA and state NA was investigated by regressing state NA on state PA for each person in the study. At the second level (Level 2), the parameters estimated at Level 1 (intercepts and slopes) were regressed either onto a unit vector or onto person-level variables (e.g., culture). Random error terms were introduced in the Level 2 equation for the intercept and the Level 2 equation for the slope; these terms represent the random-effect component of the model that enables generalizations beyond the sample of this study.

We used Proc Mixed (SAS Institute, 1999; see also Heller, Watson, & Ilies, 2006; Singer, 1998) to test the hierarchical models. In all multilevel models, Level 1 predictors were centered around the individuals' means (i.e., person or group mean centering; Bryk & Raudenbush, 1992). Group mean centering was used in order to eliminate between-individuals variance in the predictors when estimating the pooled or average within-individual parameters. Finally, for all models, we specified the AR(1) option in Proc Mixed (SAS Institute, 1999). This option specifies a first-order autoregressive within-person variance-covariance error structure, which takes into account time dependencies.

RESULTS

The bicultural subjects identified with an Asian culture 66% of the time and reported speaking an Asian language 21% of the time. Ninety-six percent of the bicultural subjects reported identifying with an Asian culture at least once during the recording period, and 41% reported speaking an Asian language at least once during the recording period.

Within-Subjects Analyses

In the first two analyses, we examined the predicted link between within-person momentary fluctuations in cultural identification or language usage and the PA-NA association among our East-Asian Canadian bicultural subjects.¹ We tested two models in which state NA was the criterion, and state PA, identification with Asian culture or language spoken, and the interaction of state PA with identification or language were entered simultaneously.

The basic diary-recording Level 1 (within-person) model was

$$NA_{ij} = \beta_{0j} + \beta_{1j}(PA_{ij}) + \beta_{2j}(\text{identification}_{ij} \text{ or language}_{ij}) + \beta_{3j}(PA_{ij} \times \text{identification}_{ij} \text{ or language}_{ij}) + r_{ij}$$

¹We report findings from the combined sample of Canadian-born and East-Asian-born bicultural subjects because the pattern of results was identical for the two groups.

NA_{ij} and PA_{ij} are the NA and PA scores for person j on diary recording i , β_{0j} is a coefficient representing the intercept for person j , β_{1j} is the slope for PA, β_{2j} is the slope for identification or language, β_{3j} is the slope for the interaction term, and r_{ij} represents the error term. At Level 2 (the person level), we developed the following model:

$$\text{Intercept: } \beta_{0j} = \gamma_{00} + U_{0j}$$

$$\text{PA: } \beta_{1j} = \gamma_{10} + U_{1j}$$

$$\text{Identification or language: } \beta_{2j} = \gamma_{20} + U_{2j}$$

$$\text{Interaction term: } \beta_{3j} = \gamma_{30} + U_{3j}$$

In this model, γ_{00} represents the mean intercept, and γ_{10} , γ_{20} , and γ_{30} represent the mean PA, identification or language, and interaction slope, respectively. In the initial analyses, all slopes were modeled as random coefficients; however, because the models did not converge, the effects for the dichotomous variables identification and language and the interactions were modeled as fixed.

First, we examined the moderating role of identification in the relation between state PA and state NA among our East-Asian Canadian subjects. We found a marginal negative main effect for state PA, $b = -0.08$, $t(923) = -1.90$, $p = .06$, $p_{\text{rep}} = .91$, effect size (ES) $r = .06$, but no main effect for identification, $b = 0.02$, $t < 1$, ES $r = .02$. That is, an increase in state PA was associated with a decrease in state NA. Of greater importance, we obtained a marginally significant interaction between identification and state PA, $b = 0.11$, $t(922) = 1.83$, $p = .07$, $p_{\text{rep}} = .90$, ES $r = .06$. When our East-Asian Canadian subjects identified most with a Western culture, the familiar Western pattern emerged in the form of a significant negative association between PA and NA, $b = -0.16$, $t(922) = -2.63$, $p < .01$, $p_{\text{rep}} = .97$, ES $r = .09$. In contrast, when subjects identified most with an Asian culture, this relation disappeared, $b = -0.05$, $t(922) = -1.00$, $p = .32$, $p_{\text{rep}} = .76$, ES $r = .03$.

Next, we examined the moderating role of language spoken² in the relation between state PA and state NA among our East-Asian Canadian subjects. A significant main effect for PA was found, $b = -0.10$, $t(821) = -2.05$, $p < .05$, $p_{\text{rep}} = .93$, ES $r = .07$, and the effect of language was not significant, $b = 0.01$, $t < 1$, ES $r = .01$. That is, an increase in state PA was related to a decrease in state NA. Of greater importance, a significant interaction between language spoken and PA was found, $b = 0.22$, $t(820) = 2.54$, $p < .05$, $p_{\text{rep}} = .96$, ES $r = .09$. Whereas recently speaking a non-Asian language was associated with a negative slope, $b = -0.15$, $t(820) = -2.94$, $p < .005$, $p_{\text{rep}} = .98$, ES $r = .10$, a nonsignificant positive slope was found for the times when subjects had spoken an Asian language, $b = 0.07$, $t < 1$, ES $r = .03$ (see Fig. 1). Taken together, these analyses support our hypotheses that within-person fluctuations in cultural identification

²In a within-person analysis, when bicultural subjects had recently used an Asian language, they were more likely to identify with an Asian, rather than a Western, culture, $r = .22$, $t(911) = 6.81$, $p < .0001$, $p_{\text{rep}} < .996$.

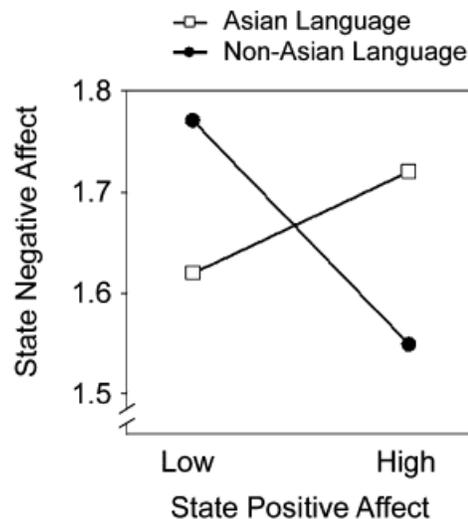


Fig. 1. The within-person association between state positive affect and negative affect as a function of language spoken among East-Asian Canadians. Low positive affect and high positive affect were defined as being 1 standard deviation below and above the mean, respectively.

and language usage among bicultural individuals are linked to differential associations between positive and negative affective experiences.

We also examined the moderating role of cultural heritage in the within-individual PA-NA association. Unlike the previous analyses, which included only bicultural subjects of East Asian heritage, the next set of analyses compared the two cultural groups (East-Asian Canadians vs. European Canadians). We entered state NA as the criterion, and state PA, subjects' cultural heritage, and the interaction of state PA and cultural heritage simultaneously. Our findings indicated a significant negative main effect for PA, $b = -0.15$, $t(1922) = -5.87$, $p < .0001$, $p_{\text{rep}} > .99$, ES $r = .13$, and no main effect for culture, $b = 0.11$, $t(139) = 1.16$, $p = .25$, $p_{\text{rep}} = .79$, ES $r = .10$. That is, the greater subjects' experience of PA, the less likely they were to experience NA. More interestingly, a marginally significant cross-level interaction was obtained, $b = 0.10$, $t(1921) = 1.89$, $p = .06$, $p_{\text{rep}} = .91$, ES $r = .04$. Whereas for European Canadians, an increase in PA was associated with a steep decrease in NA, $b = -0.20$, $t(1921) = -5.56$, $p < .0001$, $p_{\text{rep}} > .99$, ES $r = .13$, for East-Asian Canadians, a more moderate negative association was found, $b = -0.10$, $t(1921) = -2.72$, $p < .01$, $p_{\text{rep}} = .97$, ES $r = .06$ (see Fig. 2).³

³We also analyzed the data differently by ipsatizing each person's NA and PA scores and computing a correlation across all subjects and diary records. Findings for all within-subjects analyses resembled closely those obtained via multilevel modeling. For example, we found a significant negative correlation between state PA and state NA for both European Canadians, $r = -.25$, $t(1029) = -8.28$, $p < .0001$, $p_{\text{rep}} < .996$, and East-Asian Canadians, $r = -.12$, $t(1082) = -3.98$, $p < .0001$, $p_{\text{rep}} < .996$; the negative correlation was significantly stronger for European Canadians than for East-Asian Canadians, $z = 3.10$, $p < .01$, $p_{\text{rep}} = .99$.

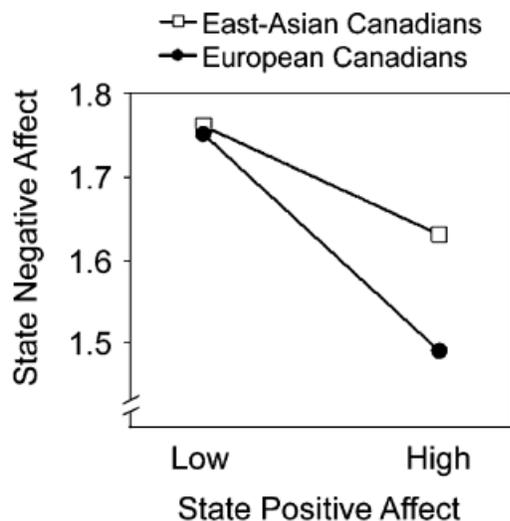


Fig. 2. The within-person association between state positive affect and negative affect as a function of cultural heritage. Low positive affect and high positive affect were defined as being 1 standard deviation below and above the mean, respectively.

Between-Subjects Analyses

Finally, we examined whether the two cultural groups differed in their associations between trait PA and trait NA. The main effects for both PA, $b = -0.04$, $t < 1$, $ES\ r = .04$, and culture, $b = 0.12$, $t(172) = 1.10$, $p = .27$, $p_{rep} = .78$, $ES\ r = .08$, were not significant. More important, a significant crossover interaction was obtained, $b = 0.30$, $t(171) = 2.05$, $p < .05$, $p_{rep} = .93$, $ES\ r = .15$. For European Canadians, there was a marginal negative association between PA and NA, $b = -0.18$, $t(171) = -1.77$, $p = .08$, $p_{rep} = .89$, $ES\ r = .13$; whereas for East-Asian Canadians, there was a nonsignificant positive association, $b = 0.12$, $t(171) = 1.15$, $p = .25$, $p_{rep} = .79$, $ES\ r = .09$.⁴

DISCUSSION

This study is the first to examine the moderating effect of within-individual fluctuations in cultural identification and language usage on the PA-NA association. We have extended previous cross-cultural comparisons of the PA-NA association (e.g., Bagozzi et al., 1999; Schimmack et al., 2002) by showing that different patterns of emotional experience emerge across different occasions among bicultural individuals. When East-Asian Canadian bicultural individuals identify with a Western culture or speak a non-Asian language, PA and NA are negatively correlated. When they identify with an Asian culture or interact in an Asian language, this negative correlation disappears. This novel demonstration that naturally occurring shifts

⁴In a similar fashion, there was a marginally significant negative correlation between trait PA and trait NA for European Canadians, $r = -.20$, $t(89) = -1.93$, $p = .06$, $p_{rep} = .91$, but a nonsignificant positive correlation for East-Asian Canadians, $r = .12$, $t(82) = 1.09$, $p = .28$, $p_{rep} = .78$. The two correlations were significantly different from each other, $z = 2.10$, $p < .05$, $p_{rep} = .93$.

in cultural experience are closely associated with bicultural individuals' emotional patterns extends previous research on the effects of cultural-frame shifts on bicultural individuals' thoughts, feelings, and behaviors (e.g., Hong et al., 2000; Ross et al., 2002; Wong & Hong, 2005).

The findings regarding the moderating effects of both identification and language on the PA-NA association in bicultural individuals raise a question regarding the relative strength of these two moderators. Our data suggest that their strength is similar: The identification-by-PA interaction effect on NA remained marginally significant when the effect of the language-by-PA interaction and the main effect of language were partialled out from the model, $b = 0.13$, $t(814) = 1.89$, $p = .06$, $p_{rep} = .91$, $ES\ r = .07$. Similarly, the language-by-PA interaction effect on NA remained marginally significant when the moderating effect of identification was partialled out, $b = 0.17$, $t(814) = 1.88$, $p = .06$, $p_{rep} = .91$, $ES\ r = .07$.⁵

The current study also replicates previous cross-cultural findings showing that individual differences in cultural heritage moderate the relation between PA and NA at the between-subjects level (e.g., Scollon et al., 2005). We found that European Canadians, but not East-Asian Canadians, showed a marginal negative between-subjects association between PA and NA. Furthermore, we observed a greater negative NA-PA within-person association for European Canadians than for East-Asian Canadians (for a similar trend, see Scollon et al., 2005). Taken together, our analyses converge nicely to demonstrate the congruence between the interindividual effect of cultural heritage and the intraindividual effect of cultural context.

Conceivably, bicultural subjects show a greater negative association between PA and NA when they are in a Western, compared with an Asian, psychological state because they experience greater stress in the former context. Previous research, conducted on Westerners, shows that under stressful conditions, PA and NA become more negatively associated (Zautra et al., 2000). If stress is the proximal causal agent, then one would expect bicultural individuals to report reduced PA and increased NA when in a Western, compared with an Asian, psychological state. Examination of within-individual mean differences in PA and NA, however, indicates that this alternative explanation is unlikely: Bicultural individuals in our sample did not differ in their mean level of NA as a function of cultural identification or language usage, $b = 0.02$, $t < 1$, $ES\ r = .02$, and $b = 0.04$, $t < 1$, $ES\ r = .02$; neither did they fluctuate in their level of PA as a function of cultural identification or language usage, $b = 0.08$, $t(924) = 1.44$, $p = .15$, $p_{rep} = .85$, $ES\ r = .05$, and $b = -0.09$, $t(822) = -1.17$, $p = .24$, $p_{rep} = .80$, $ES\ r = .04$. It is also unlikely that the European Canadians experienced more stress than the East-Asian Canadians in

⁵We thank James Cutting and an anonymous reviewer for suggesting this analysis.

general: The two cultural groups did not differ in levels of trait NA, $t(174) = 1.12, p = .27, p_{rep} = .79, d = 0.17$, and European Canadians had higher levels of trait PA than East-Asian Canadians, $t(174) = 3.21, p < .01, p_{rep} = .99, d = 0.48$. Similarly, we found no significant differences between the groups in aggregated daily NA, $b = 0.08, t < 1, ES r = .07$, and European Canadians had higher levels of aggregated daily PA than East-Asian Canadians, $b = 0.33, t(139) = 3.05, p < .005, p_{rep} = .98, ES r = .25$. Furthermore, we do not believe that demand characteristics or heuristic information can account for the effect of cultural context or language because the subjects are unlikely to have formulated a sophisticated hypothesis regarding the dynamic nature of the structure of emotion.

This study contributes to the emotion literature by adding an interesting twist to the issue of variability in affective structure. Specifically, it provides evidence of *intraindividual* variability, above and beyond *interindividual* variance in the organization of affect. It is particularly interesting that such intraindividual fluctuations in the experience (or construction) of affect are associated with fluctuations in cultural contexts, such as language. This association may indicate that as bicultural individuals identify and communicate with members of one or the other cultural group, they adopt a culturally congruent phenomenology, including a distinct affective pattern. It is also possible that the shifts in emotional organization occur spontaneously in bicultural individuals and that these shifts serve to guide their choice of interactions and cultural identification. Convergence in affective pattern between social actors may be important in facilitating interactions between bicultural individuals and members of their two cultural groups. We hope our study will stimulate new work that further explicates the nature, sources, and consequences of intraindividual variations in additional bicultural samples' psychological experiences as they function in two cultural worlds.

To conclude, emotion researchers have long been concerned with the organization of human emotional experience. Recent research indicated that this question may be fruitfully framed in terms of the conditions that influence the magnitude and nature of the association between PA and NA, such as individual differences in cultural heritage. Our study shows that understanding of emotional experience may be further advanced by looking within bicultural individuals as they fluctuate in their cultural identification and language usage over time. Human affective experience may be more malleable in its organization than originally thought.

Acknowledgments—This research was supported by a grant from the Social Sciences and Humanities Research Council of Canada to the second author. We thank Michael Ross and David Watson for their helpful comments on an earlier version of this manuscript, Erik Woody for his statistical advice, and Penny

Deeth, Jennifer Komar, and Shawn Komar for their assistance with conducting the study.

REFERENCES

- Bagozzi, R.P., Wong, N., & Yi, Y. (1999). The role of culture and gender in the relationship between positive and negative affects. *Cognition and Emotion, 13*, 641–672.
- Bolger, N., Davis, A., & Rafaeli, E. (2003). Diary methods: Capturing life as it is lived. *Annual Review of Psychology, 54*, 579–616.
- Bryk, A.S., & Raudenbush, S.W. (1992). *Hierarchical linear models: Applications and data analysis methods*. Thousand Oaks, CA: Sage.
- Coifman, K.G., Bonanno, G.A., & Rafaeli, E. (in press). Affect dynamics, bereavement and resilience to loss. *Journal of Happiness Studies*.
- Heller, D., Watson, D., & Ilies, R. (2006). The dynamic process of life satisfaction. *Journal of Personality, 74*, 1421–1450.
- Heller, D., Watson, D., Komar, J.A., Min, J., & Perunovic, W.Q.E. (in press). Contextualized personality: Traditional and new assessment procedures. *Journal of Personality*.
- Hong, Y., & Chiu, C. (2001). Toward a paradigm shift: From cross-cultural differences in social cognition to social-cognitive mediation of cultural differences. *Social Cognition, 19*, 181–196.
- Hong, Y., Morris, M.W., Chiu, C., & Benet-Martínez, V. (2000). Multicultural minds: A dynamic constructivist approach to culture and cognition. *American Psychologist, 55*, 709–720.
- Kitayama, S., Markus, H.R., & Kurokawa, M. (2000). Culture, emotion, and well-being: Good feelings in Japan and the United States. *Cognition and Emotion, 14*, 93–124.
- LaFromboise, T., Coleman, H.L., & Geraton, J. (1993). Psychological impact of biculturalism: Evidence and theory. *Psychological Bulletin, 114*, 395–412.
- Peng, K., & Nisbett, R.E. (1999). Culture, dialectics, and reasoning about contradictions. *American Psychologist, 54*, 741–754.
- Perunovic, W.Q.E., Ross, M., & Wilson, A.E. (2005). Language, culture, and conceptions of the self. In R.M. Sorrentino, D. Cohen, J.M. Olson, & M.P. Zanna (Eds.), *Culture and social behavior: The Ontario symposium* (Vol. 10, pp. 165–180). Mahwah, NJ: Erlbaum.
- Rafaeli, E., & Reville, W. (2006). A premature consensus: Are happiness and sadness truly opposite affects? *Motivation and Emotion, 30*, 1–12.
- Ramírez-Esparza, N., Gosling, S.D., Benet-Martínez, V., Potter, J.M., & Penebaker, J.W. (2006). Do bilinguals have two personalities? A special case of cultural frame switching. *Journal of Research in Personality, 40*, 99–120.
- Ross, M., Xun, W.Q.E., & Wilson, A. (2002). Language and the bicultural self. *Personality and Social Psychology Bulletin, 28*, 1040–1050.
- SAS Institute. (1999). *SAS/STAT user's guide, Version 7*. Cary, NC: Author.
- Schimmack, U., Oishi, S., & Diener, E. (2002). Cultural influences on the relation between pleasant emotions and unpleasant emotions: Asian dialectic philosophies or individualism-collectivism? *Cognition and Emotion, 16*, 705–719.
- Scollon, C.N., Diener, E., Oishi, S., & Biswas-Diener, R. (2005). An experience sampling and cross-cultural investigation of the relation between pleasant and unpleasant affect. *Cognition and Emotion, 19*, 27–52.
- Singer, J.D. (1998). Using PROC MIXED to fit multilevel models, hierarchical models, and individual growth models. *Journal of Educational and Behavioral Statistics, 24*, 323–355.

- Watson, D., Clark, L.A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, *54*, 1063–1070.
- Watson, D., & Tellegen, A. (1999). Issues in dimensional structure of affect—effects of descriptors, measurement error, and response formats: Comment on Russell and Carroll (1999). *Psychological Bulletin*, *125*, 601–610.
- Watson, D., Wiese, D., Vaidya, J., & Tellegen, A. (1999). The two general activation systems of affect: Structural findings, evolutionary considerations, and psychobiological evidence. *Journal of Personality and Social Psychology*, *76*, 820–838.
- Wong, R.Y., & Hong, Y. (2005). Dynamic influences of culture on cooperation in the prisoner's dilemma. *Psychological Science*, *16*, 429–434.
- Yip, T. (2005). Sources of situational variation in ethnic identity and psychological well-being: A palm pilot study of Chinese American students. *Personality and Social Psychology Bulletin*, *31*, 1603–1616.
- Zautra, A.J., Reich, J.W., Davis, M.C., Potter, P., & Nicolson, N.A. (2000). The role of stressful events in the relationship between positive and negative affects: Evidence from field and experimental studies. *Journal of Personality*, *68*, 927–951.

(RECEIVED 7/9/06; REVISION ACCEPTED 8/25/06;
FINAL MATERIALS RECEIVED 9/1/06)