

ADOLESCENTS' AND MOTHERS' AFFECT DURING THEIR DAILY INTERACTIONS:
AN EXAMINATION IN THE UNITED STATES AND CHINA

BY

CYNTHIA X. YUEN

THESIS

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Master's Committee:

Professor Eva M. Pomerantz, Chair
Assistant Professor Eva H. Telzer

ABSTRACT

Research conducted in the United States indicates that daily conflicts between parents and children show a modest increase across the transition to adolescence, along with heightened reciprocal negative affect. However, this mild “storm and stress” may be less typical in non-Western countries such as China. This is perhaps because East Asian cultures traditionally value minimization of emotional expression as a way to preserve social harmony, which may dampen the affect Chinese adolescents and mothers elicit in each other during their daily interactions. This study examined adolescents and mothers’ daily affective experiences in interacting with one another in the United States and China as a possible source of later differences in European American and Chinese adolescents’ emotional intensity. A second key endeavor was to elucidate the downstream implications of American and Chinese children’s affective experiences in interacting with mothers. Using daily interviews and longitudinal surveys among a sample of 80 European American mothers and their children ($n = 39$ girls, $M_{\text{age}} = 12.88$ years) and 71 Chinese mothers and their children ($n = 35$ girls, $M_{\text{age}} = 12.73$ years), I found that Chinese adolescents consistently experienced less intense emotions – both positive and negative – than did European Americans. The present findings suggest that, through their interactions with their mothers, adolescents acquire the rules governing emotion that are appropriate in their cultures, impacting their broader emotional experiences a year later. Thus, differences in the intensity of European American and Chinese adolescents’ later affective experiences may be partially learned in and sustained by their interactions with their mothers.

TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION.....	1
CHAPTER 2: METHODS.....	11
CHAPTER 3: RESULTS.....	17
CHAPTER 4: DISCUSSION.....	27
REFERENCES.....	36
TABLES AND FIGURES.....	45

CHAPTER 1

INTRODUCTION

Over the past several decades, evidence has mounted supporting the idea that a moderate increase in family conflict and emotionality is to be expected during adolescence (Laursen & Collins, 2010). However, some scholars (e.g., Arnett, 1999) have argued that this pattern is not as normative outside of Western cultures, where the majority of such research has been conducted. Indeed, recent studies have shown that Chinese adolescents' connectedness to their families does not go through the same decline as that of American adolescents' (Pomerantz, Qin, Wang, & Chen, 2009, 2011). One reason for this may be that adolescents' emotional experiences are governed by the cultural values into which they are socialized. Numerous studies across different developmental stages have revealed differences in emotional experience and expression in Western and East Asian societies, and researchers have proposed that these contrasts map on to disparate cultural values regarding affect (see Cole & Tan, 2007 for a review).

There is some evidence that values regarding emotions are learned and taught within the family context, and that they impact the emotions that families from different cultures experience (e.g., Camras, Shuster, & Fraumeni, 2014). However, almost all of the research has focused on emotion socialization during early childhood (Cole & Tan, 2007), overlooking how these processes might be manifest later in life. For instance, emotional processes in the family may undergo considerable shifts during adolescence, which is a period of significant social, cognitive, and behavioral change and maturation (Steinberg, 2005). Furthermore, much of the extant research has relied solely on traditional retrospective reports of emotional experience. Although such reports are informative, they do not capture the emotions that families experience together on a daily basis (Bolger, Davis, & Rafaeli, 2003).

The present study used daily interview methodology to uncover emotion socialization processes in European American and Chinese families of adolescents. The research was guided by three key aims. First, I investigated whether the everyday affect that mothers and their adolescents experience during their interactions with one another differ in the United States and China. Second, I examined whether the affect that mothers and adolescents experience with one another is shared within a day. Third, I explored the implications that the emotions adolescents experience in their interactions with their mothers have for their later, more general affect.

Emotions in Families of Adolescents

A substantial body of research has supported the notion that, in the West, adolescence is a time not only of marked physiological and neurological changes (Steinberg, 2005), but also of affective changes (Larson & Sheeber, 2008; Silk, Steinberg, & Morris, 2003). For instance, using daily experience sampling methods, Larson and colleagues (Larson & Lampman-Petratis, 1989; Larson, Moneta, Richards, & Wilson, 2002) found that American adolescents experienced less positive and more negative affect from middle to high school. Such emotional changes likely impact and are impacted by the emotional climate of the whole family. Parents report improvements in family relationships across early adolescence (Larson & Ham, 1993). However, their teenaged children report a decline in the warmth and closeness they feel with their families (Tsai, Telzer, & Fuligni, 2013), as well as an increase in negativity (Larson et al., 2002). Although the frequency of parent-adolescent conflict declines from early to late adolescence, the intensity of the negative affect experienced during these conflicts increases (for a review, see Laursen, Coy, & Collins, 1998). Together, such findings have led researchers to conclude that, although not necessarily severe, some storm and stress is normative for families of adolescents (Laursen & Collins, 2010).

Much of the extant research regarding adolescents has drawn from Western, and primarily American, populations. However, Arnett (1999) argued that storm and stress might not be the norm in some cultures outside of the West. For instance, recent longitudinal research in the United States and China has shown that Chinese children's transition to adolescence is not marked by the same declines in family relationship quality evident in the United States. American, but not Chinese, adolescents viewed their relationships with their parents as decreasing in both centrality and quality (Pomerantz et al., 2009). American adolescents also felt less responsible toward their families as they progressed through early adolescence, whereas Chinese adolescents' feelings of responsibility persisted (Pomerantz et al., 2011). A study of adolescents living in the United States found that family conflict was infrequent for adolescents from European and Asian backgrounds (Chung, Flook, & Fuligni, 2009). However, Asian American youth reported significantly less conflict than did European Americans. These findings suggest that the emotional nature of the parent-adolescent relationship differs in the United States and China.

Cultural Variations in Emotion Values

The emotions that people express and experience are shaped by the cultural milieu in which they are embedded (Mesquita & Leu, 2007), which may help explain why Chinese families of adolescents do not experience the same emotional disturbances considered to be normative in the United States. According to a functionalist perspective on emotion, emotions are inextricably bound to the cultural backdrop against which they occur (Campos, Mumme, Kermoian, & Campos, 1994). Culture itself "determines what a person is exposed to and becomes familiar with, defines events for the person, constrains response options, and generates sets of social expectations in the child" (Campos et al., 1994, p. 298). Thus, the emotions that

adolescents and mothers elicit in one another are implicitly guided by what is valued by their culture. These cultural values are frequently placed in the framework of individualism and collectivism (Markus & Kitayama, 1991; Triandis, 1989). Individualistic cultures tend to emphasize individuals' needs rather than those of a group's. In contrast, collectivistic cultures tend to prioritize group welfare over individual pursuits. Although there is considerable intra-cultural variability in people's relative orientation towards individualism or collectivism, Western cultures such as the United States tend to be more individualist and East Asian cultures such as China tend to be more collectivist.

Comparative studies of countries (e.g., Matsumoto et al., 2008) and people (e.g., Chen, Zhou, Main, & Lee, 2015) who differ in their cultural orientations have found different patterns of emotional experience, expressivity, and valuation. In general, individualist cultures allow for more emotional expressivity as part of an individual's independent, authentic emotional experience (Heine, 2010; for reviews, see Eisenberg & Zhou, 2000; Ford & Mauss, 2015; Trommsdorf & Heikamp, 2013; Tsai, 2007). In contrast, it is theorized that collectivistic cultures value emotion minimization (Matsumoto et al., 2008), leading to a dampening in overall *emotional intensity* relative to individualistic cultures. To maintain group harmony, members of collectivistic cultures might dampen both their positive and negative emotions, as extremes of either can be disruptive (Eid & Diener, 2001). Indeed, studies of adults have shown that, compared to European Americans, Asians value emotional regulation and the avoidance of distressed feelings, and engage in more emotional suppression accordingly (Ford & Mauss, 2015; Su, Wei, & Tsai, 2014). Such differences in emotional expression are present early in life; for instance, Chinese infants expressed less negativity and positivity than did European American infants in response to a stressful situation (Camras et al., 1998), and Japanese mothers

and their preschool children were observed to display less positivity during a dyadic interaction when compared to their American counterparts (Dennis, Cole, Zahn-Waxler, & Mizuta, 2002).

Although individualistic cultures tend to be more emotionally expressive when compared to collectivist cultures, some evidence supports the idea that these differences might be *valence-specific* rather than an across-the-board endorsement or avoidance of expressivity. That is, these differences might be especially pronounced when considering positively- versus negatively-valenced emotions. For instance, in a study of American and Japanese adults' experiences of positive and negative emotions, Kitayama, Markus, and Kurokawa (2000) found that, consistent with the emotional intensity hypothesis, Americans felt both types of emotions more frequently. However, consistent with the valence-specific hypothesis, this effect was qualified such that American participants reported feeling considerably more positivity than negativity while Japanese participants reported no differences in their experience of the two types of emotions. Several studies have demonstrated that, although people from individualist cultures might be accepting of both positive and negative emotions, they particularly value positive emotions and hope to experience fewer negative emotions (Miyamoto & Ma, 2011; Sims, Tsai, Jiang, Wang, Fung, & Zhang, 2015). Sims et al. (2015) found that European Americans experienced mixed affect (i.e., simultaneously positive and negative affect) less frequently than did Chinese Americans, which was driven by European Americans' greater tendency to value positive more than negative emotions.

Collectivists generally do not place such a high value on positivity. Rather, they tend to view emotions as being dialectical, such that positivity and negativity can coexist and often follow one another (Miyamoto & Ma, 2011). This perspective led East Asian international students and Japanese students to “savor” their positive emotions and dampen their negative

emotions less than did European American students. Findings that European Americans differ from Asians and Asian Americans in terms of the relative value they place on positive and negative emotions support the idea that cultural differences in emotion experience might not be across-the-board. Rather, cultural differences might be moderated by valence, such that European Americans are particularly motivated to experience positive emotions and dampen negative ones whereas Chinese individuals might be less desirous of high positivity. Thus, Chinese individuals may experience less intense positive and negative emotions than European Americans do, but this difference could be especially pronounced for positive emotions.

Culture and Emotions in the Family Context

Cultural values regarding emotions shape how family members interact and the affect they experience during these interactions (for a review, see Camras et al., 2014). Through these interactions, children learn rules surrounding emotions that are consistent with their culture's values (Trommsdorff, Cole, & Heikamp, 2012). For instance, Chinese mothers and their preschool-aged children rated the emotions of other children in vignettes as being less intense than did European American dyads (Wang, 2003). Wang (2003) posited that this was consistent with a Chinese Confucian emphasis on affective moderation that might pervade the family's emotional climate. Cultural orientations also impact parents' expressivity in their families. When interviewed about their emotional experiences and expression, Japanese-born mothers frequently mentioned regulating and downplaying their experiences of happiness, sadness, and anger both in general and with their children (Denham, Caal, Bassett, Benga, & Geangu, 2004). In contrast, American-born mothers endorsed open expression and discussion. Similarly, Camras, Bakemen, Chen, Norris, and Cain (2006) compared European American three-year-old girls to ethnically Chinese age-mates, who were either non-adopted Mainland Chinese, nonadopted Chinese

American, or born in China and adopted by European American families. They found that, relative to European American mothers, Chinese mothers were lower in positive expressivity and higher in Chinese cultural orientation (e.g., stronger preference for associating with Chinese people), factors which were related to children's attenuated emotional expressiveness. In turn, both European American and ethnically Chinese girls raised in European American families were more expressive than were girls raised in Chinese families. Thus, different patterns of mothers' culturally-based attitudes toward emotion and their own expressivity fed into divergent patterns of child emotional expressivity, even among children of the same ethnicity.

More recently, in a sample of Chinese American parents of five- to nine-year old children, parents who were more American-oriented (i.e., had higher English proficiency, American media use, and friendships with White Americans) were also more emotionally expressive in their families, as assessed by a traditional retrospective questionnaire asking parents how frequently they expressed their feelings, and toward their children, as observed during a video-recorded puzzle task (Chen et al., 2015). In another study of emotional expression, European American families and children were more emotionally expressive, compared to their Chinese counterparts (Suveg, Raley, Morelen, Wang, Han, & Campion, 2014), and that European American children were less skilled at emotion regulation (e.g., reporting slamming doors when angry). The investigators argued that collectivism-oriented Chinese children were more practiced at regulating their emotional displays, which are less culturally accepted than those of European American children (Suveg et al., 2014).

The research to date on families' emotional climates has primarily focused on families of young children; relatively few studies have examined these processes during adolescence (for exceptions see Klimes-Dougan, Brand, Zahn-Waxler, Usher, Hastings, Kendziora, & Garside,

2007; Yap, Allen, & Ladouceur, 2008). However, adolescence is an important developmental stage for affective development as adolescents are tasked with individuating and becoming increasingly independent from the family, a sometimes conflictual process of negotiation that is often associated with heightened negativity (Larson & Ham, 1993; Larson, Richards, Moneta, Holmbeck, & Duckett, 1996). The affect experienced in parent-adolescent interactions likely contribute to adolescents' ongoing emotional socialization. Yet, to my knowledge, there is sparse research on families' emotion socialization during adolescence and none that takes into account the cultural setting in which these processes occur.

Implications for Adolescents' Later Emotional Experiences

Evidence from studies using American samples show that, indeed, adolescents' emotional experiences in the context of their families play a role in their later emotional experiences and well-being. Adolescents' daily negative experiences in the family have been associated with their depressed mood (Schneiders, Nicholson, Berkof, Feron, van Os, & deVries, 2006). Further, adolescents' negativity expressed with their mothers is reciprocated and compounds over time, resulting in even greater negativity (Kim, Conger, Lorenz, & Elder, 2001). Timmons and Margolin (2015, p. 255) propose "an iterative process" wherein "adolescents may...become locked in a negative feedback cycle involving daily negative mood, negative life events [e.g., conflict with parents], and the maintenance or intensification of psychological symptoms." Few studies have examined the role of adolescents' positive emotions; those that have often do so without considering the contexts in which emotional experiences take place (e.g., during interactions with family members, at school, etc.).

I suggest that, in part, cultural differences in emotions revealed in prior research might be founded on the emotional experiences that parents and children have with one another. Families

in the United States tend to value freely experiencing and expressing emotions. In contrast, Chinese families tend to be more emotionally restrained. These culturally-valued patterns of emotional response in the family might spill over into adolescents' emotional responses in other contexts such that adolescents who frequently feel more intensely positive or negative with their family members will have similarly heightened affect in general over time. By contrast, those adolescents who experience their interactions with their family members as being less emotional will have attenuated emotional responses in other situations. However, little is known about whether adolescents' emotions experienced in the contexts of their families carry over to their broader emotional experiences and the limited extant research has focused on Western families.

Overview of Current Study

The current study investigated adolescents' emotions in their interactions with their mothers in the United States and China, and how these affective experiences set the foundation for adolescents' later emotional experiences. I used daily interview methodology to capture the day-to-day phenomena of adolescents' emotions, situated in their interactions with their mothers. Unlike most prior research, which has relied primarily on traditional retrospective reports (e.g., Chen et al., 2015; Suveg et al. 2014), the daily methodology is subject to less recall bias and captures affect as a daily lived experience (Bolger et al., 2003). Much of the extant research has also focused exclusively on negative emotions without attention to positive emotions. A primary goal of this study was to examine both negative and positive emotions separately to test whether predicted differences in European American and Chinese adolescents' and mothers' emotional experiences are consistent with either an emotional intensity hypothesis (i.e., European Americans vs. Chinese have more intense negative and positive affect) or a valence-specific

hypothesis (i.e., European Americans vs. Chinese have more positive affect, with smaller or no differences in negative affect).

The second goal of the study was to investigate whether mothers and adolescents within dyads are similar in the emotions that they elicit in one another during their daily interactions. That is, when mothers feel positively or negatively about their interactions with their children, adolescents will share in these emotions in turn. In this way, adolescents' and mothers' emotional interactions might be a setting for adolescents' emotion socialization. By incorporating adolescents' daily rather than traditional retroactive reports, the study provides a novel perspective on how emotion socialization manifests in "real time." The third goal was to explore whether the emotions that adolescents experience in their interactions with their mothers reinforce and contribute to their more general emotional experiences of each valence later, leading to cultural differences in emotion intensity. I expected that adolescents from either country who experienced stronger positive and negative emotions in their interactions would have more intense emotions of each valence in general a year later. As adolescents' emotions specific to daily interactions with their mothers feed into their broader emotional experiences, expected differences in European American and Chinese adolescents' emotions would be perpetuated.

CHAPTER 2

METHODS

Participants

Data for this study were drawn from the University of Illinois Diverse Adolescent Pathways Project (see Ng, Pomerantz, & Deng, 2014; Qu, Pomerantz, & Deng, in press). There were two waves of data collection one year apart in the United States and China. Participants were 151 mothers and their adolescent children in sixth ($n = 49$), seventh ($n = 58$), and eighth ($n = 44$) grades. The American sample consisted of 80 European American mothers ($M = 42.76$ years, $SD = 5.35$, at Wave 1) and their adolescent children (39 girls; $M = 12.88$ years, $SD = 0.91$, at Wave 1). An additional four European American dyads were excluded from this report because at least one member of the dyad failed to complete the portion of the daily interview on their affect in interacting with the other member.¹ American dyads resided in a small urban area in the Midwest. Because the area is home to a major state university, a proportion of the residents are highly educated, but an even larger proportion come from working- and middle-class backgrounds. Mothers and children were recruited from three middle schools with achievement at the state average, with much variability within each school. In regard to mothers' highest educational attainment, only 1% of mothers did not have a high school diploma, 33% had completed high school, 30% had a Bachelor's degree, and 35% had a Master's degree or higher. This distribution of educational attainment is on par with that of the area, where only 8% of adults older than 25 had not completed high school and 41% had a Bachelor's degree or higher at

¹ The study originally included a sample of 60 African American mothers and their adolescent children (e.g., Ng et al., 2014; Qu et al., in press). However, no African American dyads completed all 12 telephone interviews regarding their affect in interacting with one another, with 55% completing two or fewer interviews. By comparison, only 25% of European American dyads and 3% of Chinese dyads completed two or fewer interviews. Due to this low rate of completion, the African American sample was dropped from the present analyses.

the time of the study (U.S. Census Bureau, 2011). Most (89%) mothers reported being married; 87% worked outside of the home at least part time. On average, American adolescents had 1.64 siblings ($SD = 1.06$).

The Chinese sample consisted of 71 mothers ($M = 41.68$ years, $SD = 6.38$, at Wave 1) and their adolescent children (35 girls; $M = 12.73$ years, $SD = 0.91$, at Wave 1). Chinese families resided in working- and middle-class areas in one of the largest urban areas on the east coast of Mainland China. Chinese families were recruited from two middle schools; one was below average in terms of achievement and the other was above average. In regards to mothers' highest educational attainment, 14% had less than a high school diploma, 66% had completed high school, 17% had a Bachelor's degree, and 3% had a Master's degree or higher (e.g., MD or PhD). This rate of educational attainment is slightly above the norm for the large urban area in which participants resided, where 57% of those 25 years and older had not completed high school and only 12% had a college education (National Bureau of Statistics of China, 2011). All mothers reported being married; 86% worked at least part-time outside the home. Due to China's One-Child Policy, almost all Chinese adolescents were only children (mean number of siblings = 0.14, $SD = 0.44$).

Procedure

Mothers and adolescents took part in two waves of data collection a year apart. At the first wave, they completed surveys along with a daily telephone interview; at the second wave they completed surveys. In the United States, surveys were completed at the laboratory, which was relatively easy to get to. In China, surveys were completed at home as it was relatively far to travel to the laboratory. At both waves, mothers and their adolescent children individually completed the surveys in private rooms. Adolescents completed the surveys with the assistance

of a trained native research assistant who explained how to answer each set of questions, with attention to how to use the rating scales. Mothers were given the option of such assistance but generally chose to complete the surveys on their own with the opportunity to ask questions about the surveys as needed. After completing the surveys at Wave 1, mothers and adolescents were shown the daily interview questions that they would be answering each evening at home and given the opportunity to ask any questions. They were also provided with a rating scale (1 = *not at all* to 5 = *very much*) to which they could refer when answering the interview questions.

The daily interviews began on a Monday approximately two weeks after mothers and adolescents completed the surveys and were conducted for 12 consecutive days. At the end of each day, a trained researcher interviewed mothers and adolescents about their days separately on the phone. If an interview was missed because mothers or adolescents were not reachable, every effort was made to have an additional interview at the end of the 12 days. Participants answered questions about the day they were interviewed rather than the day they had missed. On average, European American mothers provided reports of interactive affect on 9.13 days ($SD = 2.59$) and adolescents provided reports on 6.49 days ($SD = 3.48$). Chinese mothers provided reports on an average of 10.24 days ($SD = 2.45$) and adolescents provided reports on an average of 10.77 days ($SD = 2.03$). There were no significant country differences in the number of interviews completed by mothers, $t(151) = -0.64, p = .522$, or adolescents, $t(151) = -1.29, p = .201$. However, Chinese dyads provided complete data on more days (i.e., both the mother and adolescent completed a daily interview on the same day) than did American dyads ($M = 5.49$ days, $SD = 3.59$ days in the United States and $M = 9.76$ days, $SD = 2.77$ days in China), $t(151.83) = -8.35, p < .001$. American mothers received \$60 as a token of appreciation for participating; adolescents received a \$10 gift certificate at each of the two waves. Chinese

mothers received RMB280; adolescents received some stationery at each of the two waves. Attrition from Waves 1 to 2 was 6% in the United States and 9% in China. Adolescents and mothers who provided data at Wave 2 did not significantly differ on variables of interest from those who did not, $t_s < 1.90$.

Measures

The measures were initially created in English and translated into Chinese. Standard translation and back-translation procedures (Brislin, 1980) were followed by the team to generate the Chinese versions, with repeated discussion to modify the wording of items to ensure similarity in the meanings of the English and Chinese versions of the measures (Erkut, 2010). Moreover, linguistic factors were taken into account so that the measures were understandable to mothers and adolescents in both countries. The means, standard deviations, and internal reliabilities of the central measures are presented in Table 1 and bivariate correlations are presented in Table 2.

Daily interviews: Interactive affect. Each night during their daily telephone interviews, mothers indicated whether they had spent any time with their participating child that day. If so, they reported the extent (1 = *not at all* to 5 = *very much*) to which they had experienced three positive (i.e., fun, closeness, happiness) and three negative (i.e., annoyance, irritation, frustration) emotions during their interactions with them (for a similar method, see Pomerantz, Wang, & Ng, 2005). Adolescents responded to parallel questions about their interactions with their mothers. *Positive interactive affect* for both mothers and adolescents was the mean of each day's positive emotions experienced with one another, with higher scores indicating more positive affect that day. *Negative interactive affect* for both mothers and children was the mean of each day's negative emotions experienced with one another, with higher scores indicating

more negative affect that day. Each 3-item scale showed acceptable internal reliability when the mean of each of the three items was taken over the entire 12-day period to create a single scale (Table 1). The scales were generally internally reliable when calculated for each day of the daily interview period for both mothers (positive affect α s = .54-.86, M_α = .76, SD_α = .09 in the United States and α s = .81-.90, M_α = .85, SD_α = .03 in China; negative affect α s = .87-.96 M_α = .93, SD_α = .02 in the United States and α s = .66-.91, M_α = .80, SD_α = .08 in China) and adolescents (positive affect α s = .64-.93, M_α = .82, SD_α = .08 in the United States, and α s = .80-.94, M_α = .89, SD_α = .04 in China; negative affect, α s = .68-.97, M_α = .84, SD_α = .07 in the United States, and α s = .62-.90, M_α = .81, SD_α = .09 in China)².

Daily interviews: General affect. To ensure that adolescents' daily interactive affect was not confounded with their general affect experienced in other contexts, we also assessed adolescents' *daily positive* and *daily negative general affect* via the daily telephone interviews. Each day, adolescents indicated how much (1 = *not at all* to 5 = *very much*) they had experienced four positive (i.e., happiness, joy, satisfaction, and pride) and four negative (i.e., sadness, loneliness, depression, and unhappiness) emotions drawn from Diener, Smith, and Fujita's (1995) measure. The mean of each day's positive and negative emotions were taken, with higher scores for each indicating heightened experience of that type of affect. Each 4-item scale was generally internally reliable when calculated for each day of the daily interview period (positive affect α s = .56-.89, M_α = .81, SD_α = .09 in the United States and α s = .81-.91, M_α = .85,

² An alternative way of calculating the reliability of daily measures is to standardize the daily reports within each individual then use these standardized values to obtain an overall reliability across all 12 days. When calculated this way, the scales also had acceptable daily reliability for mothers (positive affect: α = .67 in the United States and α = .65 in China; negative affect: α = .89 in the United States and α = .80 in China) and adolescents (positive affect: α = .62 in the United States and α = .67 in China; negative affect: α = .78 in the United States and α = .73 in China)

$SD_{\alpha} = .03$ in China; negative affect $\alpha s = .59-.88$, $M_{\alpha} = .76$, $SD_{\alpha} = .09$ in the United States and $\alpha s = .76-.88$, $M_{\alpha} = .82$, $SD_{\alpha} = .03$ in China)³.

Surveys: General affect. At both waves, adolescents reported on their *general positive* and *negative affect* in the context of the surveys, using emotions drawn from Diener and colleagues' (1995) measure. Adolescents indicated how often (1 = *never* to 5 = *very often*) in the past week that they experienced nine positive emotions (i.e., happy, joyful, satisfied, proud, calm, relaxed, caring, loving, and peaceful). The mean at each wave was taken as an index of adolescents' general positive affect at that wave, with higher numbers indicating more positive affect. Adolescents also indicated how often they experienced 11 negative emotions (i.e., nervous, depressed, worried, lonely, anxious, guilty, afraid, sad, disappointed, ashamed, and unhappy). The mean at each wave was taken as an index of children's general negative affect at that wave, with higher numbers indicating more negative affect.

³ Reliability was also acceptable when based on daily reports across the 12 days, standardized within the individual (positive affect: $\alpha = .61$ in the United States and $\alpha = .72$ in China; negative affect: $\alpha = .69$ in the United States and $\alpha = .72$ in China)

CHAPTER 3

RESULTS

I conducted five sets of analyses. First, I used the alignment method to establish measurement invariance between the United States and China. Second, I used mixed-model Multivariate Analyses of Variance (MANOVAs) to test whether mothers' and adolescents' affect varied between the United States and China. Third, I used multi-level modeling (MLM) to examine the extent to which mothers' and adolescents' daily interactive affect was shared, and whether this differed between the two countries. Fourth, I used hierarchical multiple regressions to explore the downstream implications of adolescents' daily affect in interacting with mothers on their general affect a year later, as measured by traditional retrospective surveys. Fifth, I used mediation analyses to examine whether adolescents' daily interactive affect explained the hypothesized country differences in their later general affect, as measured by traditional retrospective surveys.

Measurement Invariance

It is essential to establish metric and scalar invariance to ensure valid comparisons between the United States and China of the associations and means of measures, respectively (Little, 1997; Steenkamp & Baumgartner, 1998). The alignment method not only provides parameter estimates for each group (i.e., country), but it also identifies factor loadings or measurement intercepts that are significantly noninvariant between groups (for details see Asparouhov & Muthén, 2014). A Monte Carlo simulation indicated that alignment using the FIXED model option in Mplus is appropriate for two groups and that, when the level of invariance is low, biases due to small sample sizes are not large (Asparouhov & Muthén, 2014).

Thus, alignment is the ideal method for testing measurement invariance in the present study, given the relatively small samples of European American and Chinese dyads.

Following the recommendations of Asparouhov and Muthén (2014), I first established configural invariance for each measure separately (i.e., adolescent and mother daily interactive affect, adolescent daily general affect, adolescent survey general affect at Waves 1 and 2). That is, I confirmed that the indicators loaded on to the same factors within each country. To do so, I allowed factor loadings and measurement intercepts to vary freely between the United States and China but I loaded each item on the same factors for both groups. For all daily measures, individual items averaged across days were used to create factors representing positive and negative affect, which were allowed to correlate. Because adolescents' general affect measured in the surveys at Waves 1 and 2 was composed of more items, I created three random parcels each for negative and positive affect to reduce threats to power. These parcels were used as indicators for the latent constructs. Each parcel consisted of three to four items. Residual variances were allowed to correlate when suggested by the modification indices.

The fit for the configural models for the daily measures and adolescent survey general affect measures at both waves were acceptable (RMSEAs = .00-.08, CFIs = .99-1.00). I then proceeded to subject the configural models to alignment using a robust maximum likelihood estimator (Asparouhov & Muthén, 2014). These analyses indicated that the measures had substantial invariance. Metric (i.e., factor loadings) invariance was met for all measures. Thus, making comparisons of correlations between the United States and China was appropriate. However, the diagnostic report indicated that there was significant scalar (i.e., measurement intercept) noninvariance the “fun” item on the measure of mothers' daily interactive (Difference = 0.24, $SE = 0.06$, $p < .001$) as well as the “joy” item on the measure of adolescent daily general

(Difference = 0.42, $SE = 0.08$, $p < .001$). All other measurement intercepts were invariant, indicating that making comparisons of means using these items was appropriate. I reran the analyses involving mean-comparisons (see below) excluding the noninvariant items. The results were practically identical to the analyses using the complete scale. Hence, I retained the noninvariant items.

Do Mothers' and Adolescents' Affect Differ in the United States and China?

Daily interactive affect. To test whether mothers' and adolescents' affect during their daily interactions with one another differs in the United States and China, I conducted mixed-model MANOVAs on daily interactive affect (i.e., the average of reports over the 12 days of daily interviews), with country as a between-subjects factor and valence (i.e., positive and negative affect) as a within-subjects factor. Child gender and grade were included as between-subjects factors given prior research suggesting that affect varies with these factors (e.g., Hunter, Hessler, & Katz, 2009; Larson et al., 2002). I ran two additional sets of models that included mothers' educational attainment and the total number of days with both mother- and adolescent daily interviews as separate covariates, since these variables differed between the United States and China (see Methods). However, neither had an effect on either mothers' or adolescents' daily interactive affect, $F_s < 1$, ns ; thus, they were dropped from the present analyses.

The mixed-model MANOVA on mothers' daily interactive affect revealed a significant effect of valence, $F(1,139) = 1020.87$, $p < .001$, such that mothers in both countries reported experiencing more positive than negative affect in interactions with their adolescent children (see Table 3). There was also a main effect of country, $F(1,139) = 7.63$, $p = .01$: American mothers reported greater affect in interacting with their adolescent children than did Chinese mothers, which is consistent with the emotion intensity hypothesis. Contrary to the valence-specific

hypothesis, this difference was not moderated by valence, $F(1,139) = 2.27, p = .14$. There was also a main effect of grade, $F(2, 139) = 3.05, p = .05$, which was not moderated by valence, $F(2, 139) = 1.42, p = .25$, or country, $F(2, 139) < 1, ns$. Follow-up trend analysis revealed a linear decline, $F(1,148) = 5.63, p = .02$, such that mothers with older adolescents reported experiencing less extreme interactive affect ($M = 2.78, SD = 0.31$, for mothers of sixth graders; $M = 2.72, SD = 0.24$, for mothers of seventh graders; $M = 2.64, SD = 0.30$, for mothers of eighth graders). There were no other effects involving either grade or gender, $F_s < 2.01, p_s > .15$.

The mixed-model MANOVA on adolescents' daily interactive affect also revealed a significant effect of valence, $F(1,139) = 858.50, p < .001$, with adolescents experiencing more positive than negative affect in their interactions with mothers. As with mothers, American adolescents reported greater interactive affect than did their Chinese counterparts, $F(1,139) = 17.98, p < .001$. Consistent with the emotion intensity hypothesis, this was not moderated by valence, $F(2, 139) = 0.29, p = .59$. There was also a Valence \times Grade interaction, $F(2, 139) = 4.64, p = .01$. A follow-up trend analysis indicated that younger adolescents experienced more positive affect in their interactions with their mothers than did their older counterparts, $F(1, 148) = 7.94, p = .01$ ($M = 4.01, SD = 0.66$, for sixth graders; $M = 3.95, SD = 0.78$, for seventh graders; $M = 3.59, SD = 0.68$, for eighth graders). Younger adolescents also reported experiencing less negative affect than did older adolescents during their interactions with mothers, but the trend was only marginal, $F(1, 148) = 2.86, p = .09$ ($M = 1.38, SD = 0.44$ for sixth graders; $M = 1.41, SD = 0.39$ for seventh graders; $M = 1.54, SD = 0.53$ for eighth graders). There were no other effects involving grade or gender, $F_s < 2.27, p_s > .11$.

Adolescents' daily general affect. As was the case for adolescents' interactive affect, the mixed-model MANOVA on adolescents' daily general affect indicated that they experienced

more positive than negative general affect on a day-to-day basis, $F(1,139) = 888.87, p < .001$. Also, consistent with the findings for adolescents' interactive affect, American adolescents reported more extreme affect than did their Chinese counterparts, $F(1, 139) = 3.83, p = .05$, a difference that was not moderated by valence, $F(2, 139) < 1, ns$. There were no effects involving grade or gender, $F_s < 2.32, p_s > .10$.

Adolescents' survey general affect. A Country \times Valence \times Wave (i.e., Waves 1 and 2) mixed-model MANOVA including child gender and grade was run on adolescents' survey general affect. Consistent with the findings for daily affect, adolescents reported experiencing more positive than negative general affect in the surveys, $F(1, 129) = 624.84, p < .001$. There was also an effect of country, $F(1,129) = 4.48, p = .001$, such that American adolescents reported more intense general affect than did their Chinese counterparts. This was not moderated by valence, $F(1,129) = 1.61, p = .21$. There was a significant Valence \times Grade interaction, $F(2, 129) = 3.99, p = .02$. A follow-up trend analysis revealed a quadratic trend, $F(1,148) = 4.95, p = .03$, such that adolescents' positive affect peaked in seventh grade ($M = 3.66, SD = 0.50$, for sixth graders; $M = 3.81, SD = 0.46$, for seventh graders; $M = 3.60, SD = 0.51$, for eighth graders). Adolescents' negative affect showed a marginal linear increase, $F(1, 148) = 3.03, p = .08$, such that younger adolescents reported experiencing less negative affect than did older adolescents ($M = 2.03, SD = 0.51$, for sixth graders; $M = 2.01, SD = 0.43$, for seventh graders; $M = 2.06, SD = 0.55$, for eighth graders). Follow-up trend analyses of a Country \times Gender \times Grade interaction, $F(2,129) = 4.00, p = .02$, revealed a significant quadratic effect only for Chinese girls, $F(1, 34) = 6.45, p = .02$, such that their affect was particularly heightened in the seventh grade ($M = 2.96, SD = 0.21$) relative to Chinese girls in the sixth ($M = 2.62, SD = 0.38$) and eighth grades ($M = 2.78, SD = 0.32$). As a consequence, seventh-grade Chinese girls reported significantly more

intense affect when compared to their male Chinese counterparts in the same grade ($M = 2.64$, $SD = 0.32$), $t(23)=3.00$, $p = .01$. No other gender differences emerged for other grades in either culture $|ts| > 1.34$, $ps > .18$. There were no other effects involving either grade or gender, $F_s < 3.22$, $ps > .07$.

Do Mothers' and Adolescents' Interactive Affect Covary from Day to Day?

To examine the extent to which mothers' and adolescents' interactive affect were shared on a day-to-day basis, I conducted MLMs. In these analyses, adolescents' daily interactive affect over the 12-day interview period was predicted by their mothers' interactive affect of the same valence on the same day, as well as key covariates. The general model was as follows:

$$\begin{aligned} \text{Adolescent's interactive affect}_{ij} = & b_{0j} + b_{1j}(\text{mother's interactive affect}_{i-1}) \\ & + b_{2j}(\text{adolescent's interactive affect}_{i-1}) \\ & + b_{3j}(\text{adolescent's general affect}) \\ & + b_{4j}(\text{mother's interactive affect}) + e_{ij}. \end{aligned}$$

An adolescents' (j) affect in interacting with their mother on a particular day (i) was modeled as a function of the individual adolescent's intercept (b_{0j}) and their mother's affect in interacting with them that day (b_{4j}). Both mothers' (b_{1j}) and adolescents' (b_{2j}) interactive affect on the previous day ($i-1$) were included as covariates to rule out the influence of their earlier interactive affect. I also controlled for adolescents' general affect on the same day (b_{3j}) to ensure that I were capturing their emotions specific to their interactions with their mothers, independent of the affect they had experienced in other contexts throughout the course of their day. This allowed us to assess the extent to which, within a day, mothers' and adolescents' interactive affect covaried independent of adolescents' other affective experiences. We first ran a model that included only the covariates as predictors (i.e., mother's and adolescent's interactive affect on

the previous day as well as adolescent's general affect on the same day). In a second model, we added mother's interactive affect, the association of interest. All predictor variables were centered within the individual (i.e., group-centered). Thus, the coefficients yield information about the effects of deviations each day from the individual's average affect over the 12 days of interviews. The error term (e_{ij}) represents variance unexplained by the model.

As shown in Table 3, mothers' positive interactive affect predicted adolescents' positive interactive affect on the same day, adjusting for adolescents' and mothers' prior-day interactive affect and adolescents' same-day positive general affect, $t(130) = 3.27, p < .001$. On days when mothers felt more positive than usual in their interactions with adolescents, adolescents also felt more positive in their interactions with mothers. A similar pattern was found for adolescents' negative interactive affect. Above and beyond the effects of adolescents' and mothers' prior-day negative interactive affect and adolescents' same-day general negative affect, mothers' heightened negativity in their interactions with adolescents predicted amplified negative affect among adolescents' interactions with mothers, $t(130) = 2.81, p = .01$.

The variance component of the association between mother's and adolescents' interactive affect on the same day were significant for both positive, $SD = .29, \chi^2(74) = 115.48, p = .002$, and negative affect, $SD = .24, \chi^2(56) = 109.91, p < .001$. Thus, I included country as a Level 2 (i.e., between-subjects) random effect to test whether the relation between mothers' interactive affect and adolescents' interactive affect varied with country (United States = -1; China = 1).

This was modelled using the following equation:

$$(\text{Slope})b_{4j} = c_{40} + c_{41}(\text{country}) + u_{4j}.$$

The slope represents the association between mother's interactive affect (b_{4j}) and adolescents' interactive affect of the same valence on the same day. Country did not moderate

the association between mothers' and adolescents' positive interactive affect ($b = 0.01$, $SE = .04$), $t(129) = 0.25$, $p = .80$, or negative interactive affect ($b = -0.04$, $SE = 0.04$), $t(129) = 0.17$, $p = .27$.

I next conducted parallel analyses in which adolescents' interactive affect was predicted by mothers' interactive affect of the opposite valence on the same day, controlling for adolescents' and mothers' interactive affect on the prior day and adolescents' daily general affect on the same day. On days when mothers felt particularly negatively toward their child, adolescents' positive interactive affect was dampened, $b = -0.09$, $SE = 0.04$, $t(130) = -2.56$, $p = .01$. Similarly, on days when mothers felt more positive than usual toward their child, adolescents in turn experienced less negative affect, $b = -0.09$, $SE = 0.05$, $t(130) = -1.99$, $p = .05$. Neither association was moderated by country, $t_s(129) < 1$, *ns*.

What is the Role of Adolescents' Daily Interactive Affect in their General Affect?

To test whether adolescents' daily affect in their interactions with mothers predicts their general affect a year later, I ran hierarchical multiple regressions with adolescents' daily interactive affect predicting their Wave 2 general affect (assessed in the survey) of the same valence, adjusting for their Wave 1 general affect (assessed in the survey). In Step 1, I controlled for Wave 1 survey general affect and country (US = -1; China = 1). In Step 2, I added adolescents' daily interactive affect. In Step 3, I included the Country \times Interactive Affect interaction to determine whether the effects of adolescents' interactive affect differed by country. In terms of positive affect, adolescents who reported more positive daily interactions with their mothers experienced more general positive affect a year later, even when accounting for their Wave 1 general positive affect (Table 4). Regressions predicting negative affect produced parallel findings; adolescents who experienced more negative emotions during their daily

interactions with their mothers had heightened general negative affect a year later. These effects of adolescents' interactive affect did not vary by country, β s < .11, p s > .15.

I also examined whether adolescents' daily interactive affect was predicted by their affect experienced in interacting with their mothers of the opposite valence. Adjusting for adolescents' general affect at Wave 1 and country, adolescents' daily interactive affect did not predict their Wave 2 general affect of the opposite valence for either general positive ($B = 0.01$, $SE = 0.06$, $\beta = .02$), $t = 0.22$, $p = .83$, or negative affect ($B = -0.13$, $SE = 0.11$, $\beta = -.09$), $t = -1.10$, $p = .28$.

Does Interactive Affect Explain Country Differences in General Affect?

I next examined whether European American (vs. Chinese) adolescents' tendency toward experiencing more intense general affect, as measured by traditional retrospective surveys, was due in part to their relatively more intense affect in interacting with their mothers. To do so, I utilized 1000 bias-corrected bootstrap resamples (Hayes, 2015; Preacher & Hayes, 2008) to test the indirect pathway between country and Wave 2 survey general affect, including adolescents' daily interactive affect of the same valence as a mediator. Although adolescents' survey general affect of either valence did not significantly change across waves, $F(129) < 1$, ns , I included Wave 1 survey general affect as a covariate to ensure that the prospective links between adolescents' interactive affect and survey general affect at Wave 2 were independent from the concurrent relations between interactive affect and survey general affect at Wave 1.

Positive and negative affect were examined in separate models. For negative affect, the indirect path from country to daily interactive affect to Wave 2 survey general affect, controlling for Wave 1 general affect (see Figure 1A), was significant, 95% CI: [-0.08, -0.003]. This suggests that European American (vs. Chinese) adolescents' tendency to experience more intense negative emotions their interactions with their mothers partially explained their tendency to

experience more intense general affect a year later. However, the indirect effect from country to Wave 2 positive survey general affect (Figure 1B) was nonsignificant as the bias-corrected 95% confidence interval contained 0, 95% CI: [-0.05, 0.01]. This non-significant indirect effect was driven by the lack of a significant path from country to positive daily interactive affect.

CHAPTER 4

DISCUSSION

The findings of the present research provide insight into how the emotional socialization processes in European American and Chinese families of adolescents manifest day-to-day and over the course of a year. Consistent with prior research suggesting that adolescence in China is not as emotionally fraught in the context of family relationships, as is often considered normative in the West (e.g., Pomerantz et al., 2009), I found that Chinese adolescents and their mothers experienced less intense emotions than did their European American counterparts, supporting the emotional intensity hypothesis. Notably, this effect was seen for both positive and negative emotions. Although European American (vs. Chinese) adolescents and their mothers had more intense affect overall, the extent to which their daily interactive affect was shared was similar between the two countries. These daily emotional interactions appeared to matter for adolescents' later emotional experiences: In both countries, the intensity of adolescents' affect in interacting with their mothers predicted the intensity of their general emotions of the same valence a year later, as assessed by traditional retrospective surveys.

Support for the Emotional Intensity Hypothesis

A unique contribution of the current research was that both adolescents and their mothers reported on their affect specific to their daily interactions with one another. These rich daily interviews captured emotions as daily-lived experiences, providing a level of specificity absent from some prior studies of emotional socialization in the family in which parents reported how expressive they were with their families (Camras et al, 2006; Camras, Kolmodin, & Chen, 2008; Chen et al., 2015) or how expressive their families were in general (Suveg et al., 2014). This nuanced daily approach is particularly important since cultural values exert a stronger influence

on general retrospective, compared to daily, reports of emotions and emotionally-relevant constructs (Scollon, Howard, Caldwell, & Ito, 2009). For instance, Oishi (2002) found that Asian Americans' daily reports of life satisfaction over a week were congruent with their overall retrospective ratings of their life satisfaction over the same week. However, European Americans retrospectively reported higher overall life satisfaction than was evidenced by their daily reports, perhaps due to the Western preference for relatively more intense emotional experiences. Thus, the current study's daily and longitudinal survey methodologies provide new and important insight on culture and emotional socialization during adolescence.

Cultural differences in emotional intensity found in the present study were consistent across methods and domains. Chinese adolescents' and mothers' dampened emotions relative to their European American counterparts were consistent with the emotional intensity hypothesis (Matsumoto et al., 2008). That is, Chinese adolescents and their mothers reported less intense positive and negative affect when compared to European Americans. Notably, the pattern of dampened emotional intensity for Chinese adolescents was consistent across three different types of emotional experience: in the contexts of (1) daily family interactions, (2) daily emotions in general, and (3) longer-term emotional experiences in general. There was no support for the valence-specific hypothesis that differences in affective intensity are amplified for positive, but not negative, emotions. Rather, adolescents and their mothers in both countries experienced substantially more positive than negative emotions, but the intensity of these experiences was dampened among Chinese dyads. It is possible that Chinese families' emotional experiences were guided by a collectivistic cultural preference for emotional restraint in an effort to maintain social equilibrium (Eid & Diener, 2001). In contrast, European American adolescents and mothers may be culturally "trained" to attend to and fully experience their emotions – even

amplifying them – consistent with an individualist emphasis on emotions as part of one’s authentic experience (Heine, 2010).

Normative Grade-Related Changes in Adolescents’ and Mothers’ Affective Experiences?

The current research uncovered grade-related trends in adolescents’ and mothers’ affective intensity that illustrate similarities between the changing parent-adolescent emotional environments in the United States and China. Of particular note, adolescents’ positive, but not negative, affect during interactions with their mothers declined with grade in both countries. This is consistent with prior research showing that American adolescents’ general affect becomes less positive across grades (Larson et al., 2002), an effect that is driven by decreasing positivity rather than increasing negativity (Weinstein, Mermelstein, Hankin, Hedeker, & Flay, 2007). Given evidence that European American adolescents begin to psychologically distance themselves from their parents while Chinese adolescents maintain or even increase their psychological closeness to their parents over time (Pomerantz et al., 2009, 2011), one might expect that American adolescents’ affect specific to their interactions with their mothers would be particularly subject to change during this time. That the present findings generally showed no country moderation of the grade differences in adolescents’ interactive affect suggests that the emotional quality of adolescents’ interactions with their mothers may be somewhat separate from the process of psychological individuation.

Interestingly, mothers’ daily interactive affect of both valences became less intense, an effect that was equivalent in the United States and China. One possible explanation could be that mothers of older adolescents are more accustomed to the nature of their daily interactions and are therefore less emotionally reactive to both positive and negative interactions. Prior longitudinal research provides partial support for this notion: Although mothers perceive that their

interactions with their children become more dysfunctional across early adolescence, their distress associated with parenting does not increase during this time (Putnick, Bornstein, Hendricks, Painter, Suwalsky, & Collins, 2010). These findings suggest that mothers may become more skilled over time at regulating their emotions in response to their adolescent children. Although interesting and generally consistent with prior literature, the grade effects found in the current research and lack of moderation of these differences by country should be interpreted with caution due to low power.

Daily Experiences of Interactive Affect

The current study's novel daily interview methods and specific focus on affect during interactions between adolescents and their mothers further advance knowledge on emotion socialization by elucidating how adolescents' and mothers' affective experiences during their daily interactions are shared. One important way in which children learn cultural rules regarding emotional experiences and expression is from their family interactions (Trommsdorf et al., 2012). Thus, adolescents' daily interactions with their mothers represent a possible, although certainly not only, setting wherein adolescents may learn to regulate their emotional experiences in a manner similar to that of their mothers and consistent with their cultural environments. A primary goal of the study was to examine the extent to which these mothers' daily interactive affect predicted their adolescent children's interactive affect.

In both countries, adolescents' and mothers' daily interactive affect was shared within a day. When mothers felt more positive in their interactions with their children than usual, adolescents experienced a similar boost to their positivity and a decrease in negativity. The same pattern was found when examining negative emotions. Notably, this finding held when accounting for adolescents' and mothers' interactive affect on the prior day, as well as

adolescents' general affect on the same day. Thus, this finding of shared affect was not just an artifact of adolescents' feeling especially positive or negative on a particular day. These effects were equivalent across the United States and China, suggesting that prior mean-level differences in affective intensity are perpetuated through parallel processes of mother-adolescent daily interactions. Interestingly, neither adolescents' nor mothers' interactive affect impacted adolescents' interactive affect on the next day. This suggests that, overall, adolescents are taking their daily interactions with their mothers one day at a time. Adolescents and their mothers may have good or bad days with one another, but adolescents' emotions elicited during daily interactions with their mothers appear to be contained within that day. However, over a longer period, adolescents' cumulative affect in interacting with their mothers may exert a stronger impact on their emotional experiences.

Implications of Daily Interactive Affect

The current study also investigated whether adolescents' affect during their interactions with their mothers contributes to their more general affective experiences a year later, as measured by traditional retrospective reports. I further hypothesized that this process is one way in which cultural differences in general survey affect intensity arise. Adolescents who felt more positive in their daily interactions with their mothers experienced increased positive affect a year later, controlling for their baseline affect. The results were parallel for negative affect. However, there was no effect on affect of the opposite valence; adolescents' positive interactive affect had no effect on their later experiences of survey negative general affect and negative interactive affect was unrelated to later survey positive general affect. This is consistent with adult research showing that the frequency and intensity of daily pleasant and unpleasant emotions are strongly associated with positive and negative general affect, respectively (Scollon, Deiner, Oishi, &

Biswas-Diener, 2004). One possible explanation is each of an adolescent's interactions with their mother is generally colored by affect of only one valence, as evidenced by the negative correlations between positive and negative interactive affect. These interactions may subtly shape adolescents' awareness of culturally-appropriate rules regarding affect of that valence, which may accumulate to influence their more general affect of the same valence in later years. For example, a Chinese adolescent may practice tamping down their negative affect during disagreements with their mother. Over time, he or she may learn to tamp down negative affect in other contexts as well. A similar but separate process may occur during pleasant interactions with their mother.

As in the multilevel daily analyses, the longitudinal relations between adolescents' daily interactive affect and later survey general affect were similar across the United States and China. It is possible that adolescents' and their mothers' daily interactive affect is one mechanism by which established cultural differences in emotional experiences are perpetuated. European American adolescents' family environments are more emotionally intense compared to Chinese adolescents' family environments, where affect tends to be dampened. Because interactive affect has similar downstream consequences on general affect, the family emotional environment perhaps predisposes adolescents to and maintains these different profiles of emotional experience down the line. Partial support of this is seen in the results from the mediation analyses: European American (vs. Chinese) adolescents experienced more intense negative interactive affect, which explained their tendency to experience more intense negative survey general affect a year later. However, the indirect effect from country to later survey general affect via interactive affect was nonsignificant for positive affect. Although adolescents' positive interactive affect significantly predicted their later positive survey general affect, country differences in interactive affect were

not strong enough, resulting in an insignificant direct effect. These findings suggest that adolescents' interactions with their mothers are an important setting for the socialization of their later emotions in a culturally-appropriate . Indeed, in the case of negative emotions, interactive affect significantly accounted for country differences in survey general affect. Taken together, the daily and longitudinal results shed light on how culture might systematically shape emotional processes during adolescence, which may contribute to the robust findings that Asians experience less intense affect relative to Westerners.

Limitations and Future Directions

This study had some limitations that provide opportunities for future research. First, all of the measures focused solely on adolescents' and mothers' experiences of positive and negative emotions. I argue that the findings indicating that Chinese adolescents and mothers experience less intense emotions than their European American counterparts are consistent with long-established differences in the cultural values endorsed by Westerners and Asians, which have in turn been found to contribute to divergent attitudes toward emotions (Ford & Mauss, 2015). Although there is substantial research showing that European Americans are more individualistic and less collectivistic while Chinese are more collectivistic and less individualistic (e.g., Oyserman, Coon, & Kemmelmeier, 2002), participants in the current study did not explicitly report their cultural values (e.g., individualism and collectivism). Thus, I do not have direct evidence that adolescents and their mothers in the United States and China actually endorsed these values to different extents. To better explicate the relations between cultural values and actual emotional experiences, future research should include measures of general cultural orientations as well as measures of individuals' attitudes regarding which emotions are appropriate to experience and express.

Second, I did not have a daily measure of events that occurred in the family. A notable strength of the study was that it included reports of adolescents' and mothers' emotions specific to their daily interactions with one another rather than solely relying on traditional retrospective questionnaires asking about their entire family's general emotional climate. However, I was not able to assess whether positive and negative interactive affect co-occurred with certain events. For example, I found that both European American and Chinese adolescents' and mothers' positive and negative interactive affect were shared within a day. However, I do not know whether adolescents and mothers felt negative in their interactions because they had an overt conflict or because of negative "spillover" effects from other domains (e.g., adolescents' daily school problems predict their subsequent reports of experiencing family stress; Flook & Fuligni, 2008). I also could not discern whether a dyad felt positive because, for instance, they engaged in a shared positive activity or because one person had done something kind for the other.

Third, I asked only about emotion experience but not expression. Asking about experiences was a key contribution of our study since prior research of culture and emotion socialization has focused on expression (e.g., Chen et al., 2015; Suveg et al., 2014). However, it is possible that adolescents and mothers did not express the emotions that they were feeling toward each other. For instance, a mother could feel irritated by her child but not communicate her irritation. Thus, the current findings do not explicate the mechanisms through which emotions were or were not communicated, resulting in a shared emotional climate between adolescents and mothers.

Finally, although I had rich daily interview data and two waves of surveys, our samples were small. Further, although the samples were relatively representative of the specific

geographical locations from which they were drawn, they were not representative of the tremendous heterogeneity of the United State and China as a whole.

Conclusions

The current study sheds new light on how differences in European American and Chinese adolescents' emotional intensity manifest. Chinese adolescents consistently experienced less intense emotions – both positive and negative – than did European Americans. Notably, this was seen both in adolescents' daily reports affect elicited during interactions with their mothers as well in longitudinal surveys capturing adolescents' more general affective experiences. Further, the findings suggest that, through their interactions with their mothers, adolescents acquire the rules governing emotion that are appropriate in their cultures, impacting their broader emotional experiences a year later. Thus, differences in the intensity of European American and Chinese adolescents' later affective experiences may be partially learned in and sustained by their interactions with their mothers.

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TABLES AND FIGURES

Table 1

Descriptive statistics of central measures

Measure	United States			China			Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	α	<i>M</i>	<i>SD</i>	α	
Adolescents' general affect (surveys)							
Wave 1 positive emotions	4.03	0.54	.77	3.79	0.42	.73	0.50
Wave 1 negative emotions	3.99	0.52	.79	3.70	0.46	.81	0.59
Wave 2 positive emotions	2.07	0.52	.84	1.95	0.52	.83	0.23
Wave 2 negative emotions	2.11	0.54	.87	2.01	0.51	.88	0.19
Adolescents' daily affect (daily interviews)							
Positive interactive	3.96	0.68	.94	3.76	0.78	.97	0.27
Negative interactive	1.56	0.46	.85	1.30	0.39	.93	0.61
Positive general	3.81	0.65	.93	3.73	0.67	.92	0.12
Negative general	1.50	0.40	.88	1.39	0.38	.94	0.28
Mothers' daily affect (daily interviews)							
Positive interactive	3.95	0.53	.95	3.91	0.66	.97	0.07
Negative interactive	1.60	0.49	.69	1.39	0.45	.85	0.45

Table 2

Bivariate correlations between central measures

	1	2	3	4	5	6	7	8	9	10
Adolescents' general affect (surveys)										
1. Wave 1 positive emotions	–	-.33**	.43***	-.12	.33**	-.21	.50***	-.34**	.27*	-.30**
2. Wave 1 negative emotions	-.21	–	-.14	.46***	-.26*	.45***	-.40***	.58***	-.25*	.29**
3. Wave 2 positive emotions	.29*	-.01	–	-.26*	.29*	-.12	.31**	-.16	.10	-.03
4. Wave 2 negative emotions	.06	.46***	-.06	–	-.08	.37**	-.16	.48***	-.10	.14
Adolescents' daily affect (daily interviews)										
5. Positive interactive	.12	-.02	.38**	-.03	–	-.49***	.66***	-.38***	.47***	-.31**
6. Negative interactive	-.24*	.36**	-.22	.29*	-.46***	–	-.43***	.62***	-.47***	.42***
7. Positive general	.23	-.03	.40***	-.07	.69***	-.29*	–	-.58***	.42***	-.32**
8. Negative general	.01	.35**	-.16	.24	-.36**	.53***	-.52***	–	-.37***	.41***
Mothers' daily affect (daily interviews)										
9. Positive interactive	.00	-.05	.24*	.07	.57***	-.28*	.39***	-.16	–	-.34**
10. Negative interactive	-.22	.05	-.20	.05	-.38***	.37**	-.25*	.12	-.61***	–

Note. Correlations for European Americans are presented above the diagonal; those for Chinese are presented below the diagonal.

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

Table 3
Daily covariance between mothers' and adolescents' interactive affect

Predictor	Adolescents' positive interactive affect				Adolescents' negative interactive affect			
	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Model 1								
Mothers' interactive affect ($i-1$)	-0.01	0.05	-0.29	.78	-0.04	0.03	-1.18	.24
Adolescents' interactive affect ($i-1$)	0.03	0.04	0.69	.49	-0.01	0.04	-0.33	.75
Adolescents' general affect	0.31	0.04	8.65	< .001	0.31	0.06	5.42	< .001
Model 2								
Mothers' interactive affect ($i-1$)	0.01	0.05	0.11	.91	-0.02	0.03	-0.67	.50
Adolescents' interactive affect ($i-1$)	0.00	0.04	0.08	.94	-0.04	0.04	-0.89	.37
Adolescents' general affect	0.28	0.04	6.63	< .001	0.30	0.06	5.34	< .001
Mothers' interactive affect	0.16	0.05	3.27	< .001	0.11	0.04	2.81	.01

Note. The predictors are of the same affective valence as the dependent variables (e.g., mothers' and adolescents' positive affect is predicting adolescents' positive interactive affect). General affect refers to adolescents' daily reports of their general affect. Subscript: ($i-1$) = prior day.

Table 4

Adolescents' daily interactive affect predicts their later survey general affect

Effect	Adolescents' positive survey general affect (Wave 2)				Adolescents' negative survey general affect (Wave 2)				
	<i>B</i>	<i>SE</i>	β	<i>p</i>	<i>B</i>	<i>SE</i>	β	<i>p</i>	
Step 1									
Adolescents' survey general affect (Wave 1)	0.39	0.09	.35	< .001	0.49	0.08	.46	< .001	
Country	-0.08	0.05	-.13	.10	0.00	0.05	.00	.98	
Step 2									
Adolescents' survey general affect (Wave 1)	0.32	0.09	.29	< .001	0.42	0.09	.39	< .001	
Country	-0.08	0.05	-.13	.11	0.02	0.05	.04	.61	
Adolescents' daily interactive affect	0.22	0.07	.26	.001	0.24	0.12	.18	.04	
Step 3									
Adolescents' survey general affect (Wave 1)	0.33	0.09	.30	< .001	0.42	0.09	.39	< .001	
Country	-0.08	0.05	-.12	.11	0.02	0.05	.04	.62	
Adolescents' daily interactive affect	0.21	0.07	.25	< .001	0.23	0.12	.17	.05	
Adolescents' daily interactive affect \times Country	0.08	0.06	.10	.19	-0.01	0.11	-.01	.90	

Note. The independent affect variables are of the same valence as the dependent affect variables (e.g., the predictors for Wave 2 positive survey general affect are positive survey general affect and positive daily interactive affect). Country: US = -1; China = 1.

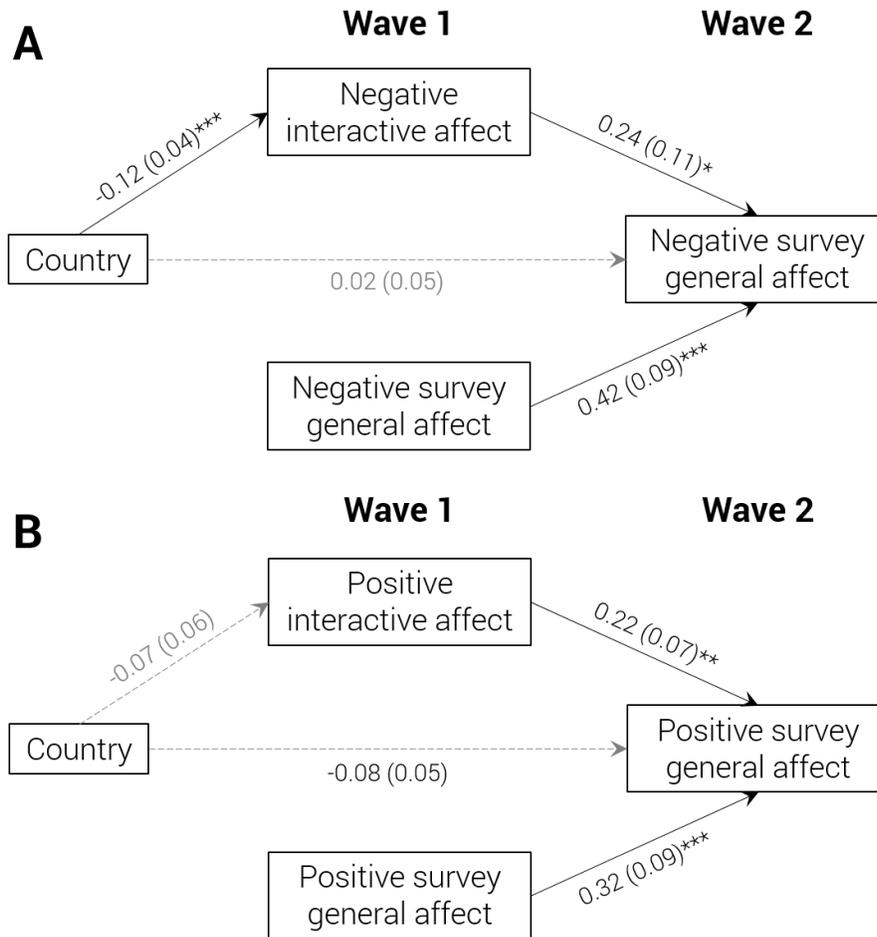


Figure 1. The role of adolescents' interactive affect in explaining country differences in survey general affect. Country is coded as -1 = United States, 1 = China. Coefficients are unstandardized estimates. Standard errors are presented in parentheses.
 * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$