Culture, Ethnicity, and Children’s Facial Expressions: A Study of European American, Mainland Chinese, Chinese American, and Adopted Chinese Girls

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This investigation extends previous research documenting differences in Chinese and European American infants’ facial expressivity. Chinese girls adopted by European American families, nonadopted Mainland Chinese girls, nonadopted Chinese American girls, and nonadopted European American girls responded to emotionally evocative slides and an odor stimulus. European American girls smiled more than Mainland Chinese and Chinese American girls and scored higher than Mainland Chinese girls for disgust-related expressions and overall expressivity. Adopted Chinese girls produced more disgust-related expressions than Mainland Chinese girls. Self-reported maternal strictness, aggression, positive expressiveness, and cultural identification correlated with children’s facial responses, as did number of siblings and adults in the home. Results suggest that culture and family environment influences facial expressivity, creating differences among children of the same ethnicity.

Keywords: culture, facial expression, Chinese, international adoption

Social scientists from a variety of disciplines have long concurred that emotion and emotional expression differ greatly across cultures. However, there is considerably less consensus regarding the sources of these differences. Anthropologists and cultural psychologists have emphasized the role of socialization in determining aspects of affect ranging from the management of expressive displays to the social construction of emotion itself (Harre, 1986; Kitayama & Markus, 1992; LaBarre, 1947; Sweder & Haïdt, 2000). Yet many psychologists currently believe that emotions are evolutionary adaptations rooted in the affective reactions of non-human mammalian species (e.g., Ekman, 1972; Panksepp, 1998; Plutchik, 2003). According to several evolutionary-oriented theorists, there exists a biologically based, species-universal set of human emotional facial expressions that provide the foundation for observed cultural differences that are indeed created through socialization processes (e.g., Ekman, 1972; Izard, 1971; Matsumoto, 2001). Taking a related perspective, some researchers (e.g., Freedman, 1974; Kagan & Fox, in press; Kagan, Kearsley, & Zelazo, 1978) have also proposed that ethnic differences in infants’ innate emotional reactivity provide the basis for some differences observed in expressive behavior. According to this view, the morphology of emotional facial expressions is the same for infants in different cultures. However, there are differences in the stimulus strength required to evoke emotions and thus differences in the frequency with which their corresponding facial expressions are displayed. In the current study, we explore these several proposals by examining expressive behavior of Chinese children adopted into European American families and comparing them to non-adopted European American, Chinese American, and Mainland Chinese children. Thus, we are able to study children of the same ethnic background (Chinese) developing within different culturally based expressive environments (American vs. Chinese families). In addition, we examine the expressive behavior of children from differing ethnic backgrounds (Chinese vs. European American) developing within the same culturally based expressive environment (European American families).

In support of the third position outlined above, over 25 years ago Freedman (1974) reported that European American neonates showed more reactivity and distress during infant testing procedures than did Chinese American infants. Freedman attributed
these findings to innate differences between the ethnic groups. Although additional cross-cultural studies of Chinese and European American neonates are virtually nonexistent, several subsequent investigations have also found Chinese or Chinese American infants to be less facially expressive than European American babies (Camras et al., 1998; Kagan et al., 1978, 1994; Kisilevsky et al., 1998; Kuchner, 1989).

Nevertheless, cultural differences in older infants might yet be due to social experience influences on expressivity (Cole & Tang, 1998; Parke, 1994; Saarni, 1999; Thompson, Easterbrooks, & Padilla-Walker, 2003) rather than innate differences in emotionality, as proposed by Freedman (1974). Studies of coherence among emotion response systems in adults have found considerable variability across participants in the degree of relationship between facial responding and other indexes of emotion (although studies of within-individual coherence across time have proven more promising; see Mauss, Levenson, McCarter, Wilhelm, & Gross, 2005). Such between-subjects variability suggests that individual differences in facial expressivity exist apart from differences in emotional reactivity itself. These individual differences in expressivity may plausibly be assumed to sometimes result from socialization processes. Similarly, cultural differences in facial expressivity might be due to experiential factors, including the socialization of emotional expression.

Consistent with this proposal, many studies of American families have found relationships between infants’ or children’s facial expressions and social experience factors, such as maternal expressive behavior, socialization practices, and/or reported family expressiveness (e.g., Camras et al., 1990; Cohn & Tronick, 1988; Eisenberg, Spinrad, & Cumberland, 1998; Halberstadt & Eaton, 2003). Mothers in diverse cultures differ in attitudes and behaviors that potentially could affect infants’ and children’s expressive development (Bornstein, 1991; Bornstein & Cote, 2004; Bornstein et al., 1998; Greenfield & Suzuki, 1998). For example, regarding attitudes toward expressivity, Chinese mothers are reported not to encourage the expression of emotion as much as do European American mothers (Chen, 2000; Kagan et al., 1978; Lin & Fu, 1990; Wu, 1996). Although there are no systematic studies to shed light on how such attitudes might influence children’s expressive development, one reasonable hypothesis is that Chinese mothers’ values regarding emotional expression are reflected in their own tendency to show emotional restraint and that their children are influenced through maternal modeling. Thus, the current investigation examines European American, Chinese, and Chinese American mothers’ self-reported emotional expressivity in relation to their children’s expressive behavior.

In addition to mothers’ emotional expressivity, other parenting variables might also affect children’s production of facial expressions. To investigate this in our study, we focused on several components of parenting generally thought to be important factors influencing children’s development: warmth, encouragement of autonomy, strictness, and aggravation (parenting stress). Chinese and Chinese American mothers have been reported to differ from American mothers on some of these variables (Chao, 1994; Ho, 1986; Jose, Huntsinger, Huntsinger, & Liaw, 2000). For example, Chinese and Chinese American mothers consistently score higher on measures of control or strictness than do European American mothers. However, there has been considerable debate as to whether instruments designed to measure parenting within Western cultures are meaningful representations of non-Western attitudes and practices. For example, Chao (e.g., Chao & Tseng, 2002) has argued that high scores on Western measures of parental control reflect involvement and concern in Chinese parents and thus do not result in the same negative outcomes for European American and Chinese American children. In contrast, Chen (2000; Chen, Dong, & Zhou, 1997) has reported that the relationships between measures of authoritarian and authoritative parenting practices and children’s social, school, and psychological adjustment were similar for both Chinese and Canadian school-age children. To resolve this debate, some researchers have attempted to distinguish between restrictive or domineering control and control reflecting concern and positive involvement (e.g., Bond et al., 1998; see also Zhou, Eisenberg, Wang, & Reiser, 2004, for related findings). However, standardized instruments for measuring parent attitudes may confound variants of control styles having different cultural origins and outcomes.

Because these issues regarding the meaning and measurement of parenting across cultures have not yet been resolved, we approached the question of parenting influences on emotional expression with caution. Nonetheless, we felt there was good reason to examine them in our study. From a cultural psychology perspective, differences in parenting practices that do exist have emerged to facilitate adaptive development within cultures that have different socialization values and goals (e.g., differential valuation of emotional expression). Thus, we might observe differences in Chinese versus American children’s facial expressivity that could be attributable to parenting differences captured by measurement instruments developed for studies of Western children.

Because adherence to Chinese cultural values may vary among Chinese American families, we also included questionnaires designed to measure mothers’ identification with both Chinese and American culture. In addition, many families of adopted Chinese children develop some affiliation with Chinese customs and traditions, believing that their daughter will benefit by acquiring a positive ethnic identity. Such customs and traditions are reflected in many items of cultural identification scales. Last, we examined several other social–ecological variables (e.g., number of siblings, SES) that might index social experience factors affecting children’s facial expressivity.

The adopted Chinese girls in our study were abandoned by their parents during early infancy and spent approximately 10 months in a Mainland Chinese institution before being adopted. Therefore, we must consider potential effects of early institutionalization on these children’s development. Studies of postinstitutionalized Eastern European children have found a variety of serious physical, intellectual, and attachment deficits (see Maclean, 2003, for review). It is surprising, however, that when these children are adopted into middle-class homes, remarkable recovery is seen in most children, depending in part on their age and the severity of their condition at the time of adoption (Groothues, Beckett, & O’Connor, 2001; Morrison, Ames, & Chisolm, 1995; Rutter & the English and Romanian Adoptees Study Team, 1998). Considerably less is known about the development of postinstitutionalized Chinese children (but see Camras, Perlman, Wismser Fries, & Pollak, 2004; Cohen, Pugliese, Lojkasek, & Zadeh, 2004). Anecdotal descriptions by adopting parents suggest that Chinese children do not manifest the degree of impairment observed in Eastern children do not manifest the degree of impairment observed in Eastern
European adoptees and may recover more quickly from their institutionalization experiences. This may be because Chinese children are typically adopted at somewhat younger ages than those Eastern European children who have demonstrated greater difficulties. Nevertheless, Nelson (2000) found adopted Chinese infants to also be delayed in their mental and motor development (as measured by the Bayley Scales of Infant Development; Bayley, 1993) when they arrived in the United States, although substantial catch-up occurred during the first 6 months. Developmental status may influence children’s appraisal of events in the environment and their subsequent emotional and expressive responses to such events (Campos, Kermoian, & Zumbahlen, 1992). Furthermore, children’s expressivity has been shown to decline with age in nonadopted children (who presumably are age typical in their development; Holodynski, 2004). Therefore, in our study, we took steps to ensure that the adopted children in our sample were comparable to the nonadopted children in their developmental status. We also included several anthropometric indexes in our study (Johnson, 2000).

With respect to expressive behavior, Nelson (2000) found that approximately 50% of the adopted Chinese infants in her study smiled during a peek-a-boo game both at the time of their arrival in the United States and also 6 months later. In contrast, Hiatt, Campos, and Emde (1979) observed smiling in 96% of the nonadopted European American infants who participated in their peek-a-boo procedure. This difference parallels results for smiling obtained in studies of nonadopted Chinese and European infants (e.g., Camras et al., 1998; Kislevsky et al., 1998). The present study examines whether the facial expressivity of adopted Chinese children might subsequently increase in response to their American expressive environment.

In summary, the current study investigates the influences of ethnicity and culturally based socialization on facial expressivity by comparing four groups of children: Chinese children adopted into European American families, nonadopted Mainland Chinese children, nonadopted Chinese American children, and nonadopted European American children. Our strategy was to identify group differences in facial behavior and then attempt to determine whether those differences could be accounted for by several measures designed to index potentially influential social experience factors.

On the basis of the considerations outlined above, we generated 10 hypotheses regarding group differences and interrelationships among the extensive set of variables we investigated. Hypotheses 1 and 2 predicted group differences in facial expressivity. Consistent with previous studies, we predicted that the European American children would be more expressive than the Mainland Chinese and Chinese American children (Hypothesis 1). We also predicted that the adopted Chinese children would be more expressive than the other two groups of ethnic Chinese children, thus demonstrating the influence of the cultural environment in which they were currently being raised (Hypothesis 2). However, we did not hypothesize that the adopted girls would be as expressive as European American children (because of their early experience with Chinese caretakers in orphanages or foster homes).

Hypotheses 3 through 7 focused on group differences in the social ecology, anthropometric, and parent attitude variables. For the social ecology variables, we predicted that differences would occur most often between the European American and Mainland Chinese families (e.g., for number of adults and siblings in the home; Hypothesis 3). However, we did not generate specific predictions for each variable because many have not been previously investigated for these groups (e.g., number of children seen per week). We predicted differences in anthropometric variables, with the adopted Chinese children scoring lower on growth indexes than the other groups of children (Hypothesis 4). We predicted that European American mothers would report higher levels of emotional expressivity than Mainland Chinese and Chinese American mothers (Hypothesis 5). On the basis of previous research, we tentatively predicted that Mainland Chinese and Chinese American mothers would score higher on parental strictness (control) than European American mothers (Hypothesis 6). However, because results have been inconsistent in past studies (see Sorkhabi, 2005, for review), we made no specific predictions about cultural differences for our other parenting variables. We predicted that Chinese American mothers would score higher on measures of identification with Chinese culture than mothers of European American children, with the mothers of adopted Chinese children falling between the other groups (Hypothesis 7).

Hypotheses 8 through 10 predicted relationships between several of these background measures and children’s facial expressivity. We hypothesized that mothers’ self-reported expressivity would be related to greater expressivity in their children (Hypothesis 8). Because Chinese culture values emotional restraint, we predicted that scores on the cultural identification measures would be negatively related to children’s facial expressivity scores (Hypothesis 9). We made no specific predictions regarding other relationships between children’s expressive behavior and the social ecology, anthropometric, and parent attitude variables. However, because of their potential influence on expressivity, we also included their analysis in our study. Although we acknowledge that both inherent influences and social experience factors may affect expressive behavior, we tentatively predicted that the latter would play a more important role during social interactions involving milder levels of children’s emotions. Thus, we predicted that expressivity differences between European American and ethnic Chinese children would not remain significant in analyses that took into account our background measures intended to index potentially relevant aspects of the children’s social experience (Hypothesis 10).

Method

Participants

Participants were four groups of 3-year-old girls: (a) nonadopted European American girls (n = 45), (b) Chinese girls adopted into European American families (n = 42), (c) nonadopted Chinese American girls (n = 31), and (d) nonadopted Chinese girls living in Mainland China (n = 45). All children were tested within 2 weeks of their 3rd birthday. Drawing from a slightly larger pool of potential participants, we analyzed data from those children who met our inclusion criteria. These criteria were as follows: (a) The child’s score on the Mental Scale of the Bayley Scales of Infant Development–2 (Bayley, 1993) was required to fall in the Within Normal Limits or Accelerated category, and (b) the adopted child must have resided with her American family for at least 18 months.

The adopted children were recruited via invitations to potential participants by a Chicago area adoption agency and notices placed in the newsletter and on the Web site of the Chicago chapter of
Families With Children From China. European American children were recruited via notices distributed at preschools and day care centers and an ad placed in a local parenting magazine. Chinese American participants were recruited through community contacts who extended invitations to potential participants. Mainland Chinese participants were recruited from two cities (Beijing and Shenyang) to maximize the number of participants in this group. Participants from Shenyang were recruited by a local family (known to Linda A. Camras) with extensive contacts in preschools and day care centers throughout the city. Participants from Beijing were recruited by Yinghe Chen through Beijing Normal University’s preschool and other preschools in the area. Families in the United States were given a bookstore gift certificate as compensation for their participation. Families in Beijing were given monetary payment. Families in Shenyang were given a gift from the United States.

Materials and Procedures

Slide-viewing procedure. On the basis of a procedure used in previous studies of children’s expressive behavior (e.g., Buck, 1975, 1977), participants were videotaped while viewing 35-mm color slides of emotionally evocative stimuli. Three slides were pleasant or amusing (e.g., a rabbit wearing a Groucho Marx nose and glasses). Six slides were mildly negative (e.g., girl eating a worm, puppy in a dirty cage). Positive slides were part of a standard set developed by Buck (1975) for use with adults and older children. Negative slides from that set were deemed too disturbing for preschoolers and were replaced by slides from a set created by us to evoke milder degrees of negative emotions. During pilot testing, several mothers viewed the set of slides and selected the six that they judged to be most negative yet acceptable for preschool children. Because we could not ethically evoke very strong negative emotions, we included in our final set more negative slides than positive slides to maximize the likelihood that we would elicit some number of negative expressive responses.

Because children may show little expressive behavior while passively viewing mild emotion stimuli, we interviewed children about each slide following a standard script that involved a series of four prompts: (a) “What’s that?” (b) “That’s an X” (where X is the object shown in the slide), (c) “I think that X is Y” (where Y is the predictable emotion, e.g., “I think that puppy is sad”), and (d) “Do you think that X is Y or Z” (where Z is an emotion of the opposite valence). These prompts (spoken with emotion-appropriate prosody) were designed to encourage all children to similarly interpret the emotion content of the slides. However, because we were interested in differences among children in their facial expressivity, the experimenter did not display any emotional facial expressions. Between prompts, the experimenter waited a maximum of 5 s for the child to respond. If the child did not reply within that time interval, the experimenter proceeded to the next statement. If the child replied to the prompt, the experimenter waited until the child completed her response before proceeding.

Vinegar presentation. To supplement the slide-viewing procedure, we also examined children’s expressive responses to the direct presentation of a sensory stimulus. The experimenter dipped a cotton swab into a small container of distilled white vinegar (acidity 5%). Without producing any facial expression, she first placed the swab approximately 3 cm under her nose and then 3 cm under the child’s nose while saying, “Here’s something I’m going to smell. Can you smell it?” She held the swab for 3 s under the child’s nose.

Bayley Scales of Infant Development—2. This Piagetian-based, standardized instrument (Bayley, 1993) assesses mental and motor development of infants from 1 month to 42 months of age. Infants are administered a prespecified set of items according to their chronological age and additional items depending on their performance. The manual reports mean alpha coefficients of .88 for the Mental Scale and .84 for the Motor Scale.

Self-report measures. Mothers completed five self-report measures providing information about variables that might influence children’s facial expressivity and produce differences across the four groups (e.g., by resulting in enhanced or restricted opportunities for social interaction). The Demographic, Ecological, Medical, and Anthropometric (DEMA) Questionnaire was created for the purpose of this study to assess potentially relevant ecological factors (see Table 1). Anthropometric data (height, weight, and head circumference) were also collected via this questionnaire to allow us to assess whether expressiveness differences between the adopted and nonadopted children might be related to differences in physical stature resulting from the adopted children’s postinstitutionalized status.

The Self-Expressiveness Within the Family Questionnaire (SEFQ; Halberstadt, Cassidy, Stifter, Parke, & Fox, 1995) was included as an index of maternal expressive modeling. It consists of 40 items organized into four subscales: Positive Dominant (e.g., “showing contempt for another’s actions”), Negative Dominant (e.g., “showing contempt for another’s actions”), and Negative Submissive (e.g., “sulking over unfair treatment by a family member”). Mothers were asked to rate how frequently they engaged in the described action within their family on a 9-point Likert scale. Halberstadt et al. (1995) combined the two positive subscales and the two negative subscales for evaluation in a series

<table>
<thead>
<tr>
<th>Variable</th>
<th>European American</th>
<th>Adopted Chinese</th>
<th>Chinese American</th>
<th>Mainland Chinese</th>
<th>$\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$n$ M SD</td>
<td>$n$ M SD</td>
<td>$n$ M SD</td>
<td>$n$ M SD</td>
<td></td>
</tr>
<tr>
<td>SES (Hollingshead revised)</td>
<td>42 67.2 18.9</td>
<td>39 72.1 23.2</td>
<td>27 86.7 17.9</td>
<td>40 80.3 18.6</td>
<td>.12**</td>
</tr>
<tr>
<td>Maternal employment (hours/week)</td>
<td>43 8.6 14.3</td>
<td>41 25.8 18.7</td>
<td>26 21.7 19.6</td>
<td>40 32.6 18.4</td>
<td>.22**</td>
</tr>
<tr>
<td>Group care (hours/week)</td>
<td>41 7 10.3</td>
<td>37 17.6 19.4</td>
<td>27 16.1 18.2</td>
<td>44 37.6 13.3</td>
<td>.38**</td>
</tr>
<tr>
<td>No. siblings</td>
<td>43 1.2 0.7</td>
<td>42 0.6 0.8</td>
<td>28 0.8 0.6</td>
<td>45 0.1 0.3</td>
<td>.32**</td>
</tr>
<tr>
<td>No. adults in the home</td>
<td>43 2.0 0.3</td>
<td>42 1.8 0.5</td>
<td>27 2.4 0.6</td>
<td>43 3.0 0.9</td>
<td>.37**</td>
</tr>
<tr>
<td>No. adults seen per week</td>
<td>43 14.4 11.7</td>
<td>41 9.9 6.3</td>
<td>27 9.6 8.7</td>
<td>37 8.6 5.0</td>
<td>.07*</td>
</tr>
<tr>
<td>No. children seen per week</td>
<td>42 20.9 12.5</td>
<td>41 17.4 14.8</td>
<td>26 14.5 9.8</td>
<td>37 21.5 9.4</td>
<td>.05</td>
</tr>
<tr>
<td>Current height (inches)</td>
<td>34 36.6 2.6</td>
<td>42 35.8 1.8</td>
<td>23 37.0 3.5</td>
<td>44 37.7 1.7</td>
<td>.10**</td>
</tr>
<tr>
<td>Current weight (pounds)</td>
<td>39 32.2 3.7</td>
<td>42 29.3 4.9</td>
<td>27 32.5 4.6</td>
<td>44 33.0 4.5</td>
<td>.10**</td>
</tr>
<tr>
<td>Current head circumference (inches)</td>
<td>34 20.0 0.6</td>
<td>35 19.2 0.6</td>
<td>28 19.7 0.5</td>
<td>45 19.8 0.6</td>
<td>.22**</td>
</tr>
</tbody>
</table>

Note. $\eta^2$ is the proportion of variance accounted for by group membership. Means that share a common subscript do not differ significantly per a Tukey post hoc test, $p < .05$.

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

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of four psychometric studies and reported mean Cronbach’s alphas of .92 for the positive items (range = .90–.94) and .86 (range = .82–.92) for the negative items. Corresponding alphas for this sample were .85 and .90.

The Parent Attitudes Toward Child Rearing Questionnaire (PACR; Easterbrooks & Goldberg, 1990) is a 51-item instrument based on Block’s (1965) Child Rearing Practices Report and Kohler’s (1977) Maternal Attitudes Scale and was adapted to be appropriate for parents of young children, to fit a Likert format (6-point scale), and to be phrased in the first person. The questionnaire has four subscales: Warmth (10 items; e.g., “I find some of my greatest satisfaction with my child”), Independence (9 items, e.g., “I respect my child’s opinions and encourage her to express them”), Strictness (13 items; I feel that it is never too early to start teaching a child to obey commands”), and Aggravation (19 items; “I worry about the health of my child”). Easterbrooks and Goldberg (1990) reported Cronbach’s alphas for mothers’ subscale ratings of .58, .69, .67, and .69 for Warmth, Independence, Strictness, and Aggravation, respectively. Corresponding alphas for this sample were .47, .57, .76, and .76. Consequently, we only analyzed Strictness and Aggravation.

We included two measures to assess identification with Chinese culture by the Chinese American and European American mothers (of both the adoptees and the control children). We modified two existing measures, the Suinn-Lew Asian Self-Identity Acculturation Scales (SL-ASIA; Suinn, Rikard-Figueroa, Lew, & Vigil, 1987) and the Attitudes Toward Bi-Cultural Socialization Questionnaire (Tessler, Gamache, & Liu, 1999), by selecting items that might reasonably be presented to both European American and Chinese American respondents. Because no extant measure of cultural identification specifically queries attitudes about emotional expression, our measures indexed other aspects of cultural identification. Our modified version of the SL-ASIA consisted of 12 items related to language knowledge, social interaction and friendship, and cultural practices (e.g., holidays, food, and entertainment). For the SL-ASIA, the Cronbach’s internal consistency alpha was .97.

The Attitudes Toward Bi-Cultural Socialization Questionnaire originally was developed to assess the attitudes of parents who have adopted Chinese children toward integrating Chinese and American culture into their child’s socialization. For our modified version of this questionnaire, we selected seven items from the Chinese-related subset and seven items from the American-related subset and combined items within each subset to generate two separate scores.

We prepared both an English and a Chinese version of each measure. Measures were translated from English into written Chinese by a research assistant who was a native Mandarin speaker and back-translated by a second Chinese assistant who was both a native speaker and a psychology graduate student (Chapman & Carter, 1979). Both assistants reviewed the translations and resolved any disagreements. For the Attitudes Toward Bi-Cultural Socialization Questionnaire, the Cronbach’s internal consistency alphas were .94 and .44 for the Chinese culture and American culture subscales, respectively. Consequently, we only analyzed the Chinese culture scores.

**Administration of Procedures**

The children from Shenyang were tested in a quiet room at their preschool because home visits could not be arranged during the time period when research assistants were able to visit this city. All other children were tested in their home (typically the living room or family room). To minimize distractions, we did not allow siblings or pets to be present during the testing. A female European American experimenter administered the procedures in English to the European American and adopted Chinese participants. The Mainland Chinese children were tested in Mandarin by a female Chinese experimenter. Chinese American children were tested in either Mandarin (by a Chinese experimenter) or English (by a European American experimenter) according to the child’s preference (as assessed at the beginning of the session via consultation with both the child and her mother). A second research assistant was present at all sessions to assist with the video recording and monitor the protocol.

After introducing herself to the child, the experimenter spent several minutes in warm-up play while the second assistant set up the equipment. The slide-viewing procedure was administered first for all children. Slides were projected on a white wall or on a portable slide screen. The projector was positioned approximately 8 ft (2.44 m) from the wall or screen so that the images were projected in a standard size. The experimenter sat next to the projection area facing the child and cued the assistant, who ran the slide projector. The assistant also monitored the experimenter to ensure that she maintained appropriate vocal prosody but did not produce emotional facial expressions during the slide-viewing procedure and vinegar presentation.

To maximize children’s comfort level as they became more familiar with the experimenters, when viewing the first four slides, we had the child sit in the lap of her teacher (for the Shenyang children) or her mother (for all other participants). For the last five slides, the mother or teacher left the room. Following the slide-viewing procedure, the experimenter presented the vinegar stimulus while the child sat in the mother’s lap (again, to increase the child’s comfort during this potentially more stressful procedure). The experimenter then administered the Bayley Scales using the standard testing protocol. Mothers were allowed to be present in the room if they wished to observe the Bayley testing. During all parts of the procedure, mothers were instructed not to guide their children’s responses. The Mental Scale was administered first and was completed by all children included in the data analysis. However, 1 Chinese American child declined to participate in the Motor Scale testing.

All procedures were video recorded by a Sony DCR-TRV520 camera mounted on a tripod. The camera was focused on the child’s face for the slide-viewing procedure and vinegar presentation. During the Bayley testing, the camera included a view of both the child and the testing items. As the final step, the experimenter gave the questionnaire packet to the mother or to the teacher (who gave it to the mother). The mother either returned the completed questionnaires by mail or brought them to the school, where they were collected.

**Scoring**

**Bayley Scales.** We scored children’s Bayley Scale performance according to the standard criteria presented in the manual. The experimenter made an initial scoring during the time of testing. In addition, the videotape of the procedure was later reviewed by Katherine Norris (who had received the most intensive training on administration and scoring). Discrepancies in scoring were resolved after discussion with the experimenter and/or our Bayley Scales testing consultant. This procedure ensured that scoring was comparable across tests administered by different experimenters (including those in China). We used the standard scoring protocol described in the Bayley manual to determine index scores for each participant. On the basis of her index scores, each child was classified as Significantly Delayed (index score below 69), Mildly Delayed (index score 70–84), Within Normal Limits (index score 85–114), or Accelerated Performance (index score above 115) on the Mental Scale and the Motor Scale.

**Facial expressions.** The children’s facial behavior was coded by re-search assistants certified in Ekman and Friesen’s (1978) Facial Action Coding System (FACS). The FACS is an anatomically based system in which the coder identifies the facial muscle actions that have occurred to produce a facial expression. Each possible facial action (called an action unit [AU]) has a numerical code (e.g., AU1). However, FACS coding can produce a data set that is highly unwieldy. Furthermore, currently there is no comprehensive system for identifying all possible variants of discrete emotional expressions. Therefore, we developed a simplified coding system in which FACS AUs were grouped together if they are commonly considered to be of the same valence (positive, negative, or neutral/other) and involve the same region of the face. The resulting superordinate codes were (a) smile, (b) negative midface (disgust-related) movements (e.g., nose wrinkle), (c) single negative mouth movements (e.g., lip press), (d)
co-occurring negative mouth movements (e.g., lips pressed with mouth corners lowered), (e) neutral/other mouth movements (e.g., lips funneled), (f) negative brow movements (e.g., brow lowered), and (g) neutral/other brow movements (e.g., brow raised). Those codes identified as negative are components of prototypic negative emotional expressions described for adults (see Table 2 for FACS AUs corresponding to these facial expression variables). Although our decision to group together movements for different negative emotions resulted in a loss of information about specific affects, this procedure did not impact conclusions that we drew regarding group differences in children’s overall positive and negative expressivity.

Because facial coding (even via our simplified system) is labor intensive and because the duration of the slide-viewing procedure varied considerably among children, we identified two 5-s intervals for each slide during which we scored the children’s facial expressions. These were the 5 s immediately following each of the last two prompts (i.e., “I think that X is Y,” and “Do you think that X is Y or Z?”) These intervals were selected because informal inspection of the videotapes indicated that they evoked the most expressive behavior. Coders scored each facial expression variable as being present or absent during each coding interval. Because children’s faces were sometimes obscured, mean scores consisted of the percentage of codable intervals during which the facial code was present. For the vinegar procedure, we scored each facial movement category as a percentage of codable intervals during which the facial code was present. For neutral/other mouth.

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Training and Reliability

Linda A. Camras and three research assistants (two Chinese Americans and one European American) were trained in administering the Bayley Scales by a clinical consultant with extensive experience in training and testing with this measure. Linda A. Camras and a Chinese American assistant subsequently trained a graduate student at Beijing Normal University to administer the test to the Chinese participants. As indicated above, Katherine Norris reviewed the experimenter’s initial scoring to maintain quality control and consistency in the scoring of all children. In addition, to assess reliability, we had Katherine Norris (who tested all European American and adopted Chinese children) and one of the Chinese American research assistants (who tested the majority of Chinese American children) independently score the videotapes of 10 participants. Reliability (i.e., agreements divided by agreements and disagreements) was .94 on the Mental Scale and .84 on the Motor Scale. These are comparable to reliability statistics reported in the Bayley Scales manual (i.e., .96 for the Mental Scale and .75 for the Motor Scale).

Three research assistants were trained and certified in FACS to code the facial expression data. We assessed reliability for coding the materials and modified coding system used in this study by having these coders score 320 intervals randomly selected from the videotapes. Each coder’s scoring was compared with a criterion scoring subsequently established by all of the coders working together and reviewed by Linda A. Camras (see Camras et al., 1990). Mean reliability scores (i.e., agreements divided by agreements and disagreements) for the three coders were .85, .92, and .92, with no score for any facial expression variable falling below .70. Mean kappas were .93, .93, and .94, with no score for any facial expression variable falling below .80.

Data Reduction

Initially, we computed facial expression variable scores separately for positive and negative slides. However, inspection of the videotapes indicated that the children often were amused by our mildly negative stimuli, and because informal inspection of the videotapes indicated that they evoked the most expressive behavior, Coders scored each facial expression variable as being present or absent during each coding interval. Because children’s faces were sometimes obscured, mean scores consisted of the percentage of codable intervals during which the facial code was present. For the vinegar procedure, we scored each facial movement category as a percentage of codable intervals during which the facial code was present.

Table 2

Means and Group Comparisons for Facial Expression Variables

<table>
<thead>
<tr>
<th>Facial expression variablea</th>
<th>European American</th>
<th>Adopted Chinese</th>
<th>Chinese American</th>
<th>Mainland Chinese</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mb</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Smile</td>
<td>56b</td>
<td>32</td>
<td>44,ab</td>
<td>31</td>
</tr>
<tr>
<td>Negative midface (disgust related)</td>
<td>30b</td>
<td>24</td>
<td>29b</td>
<td>25</td>
</tr>
<tr>
<td>Single negative mouth</td>
<td>36</td>
<td>19</td>
<td>33</td>
<td>20</td>
</tr>
<tr>
<td>Co-occurring negative mouth</td>
<td>15</td>
<td>15</td>
<td>12</td>
<td>14</td>
</tr>
<tr>
<td>Neutral/other mouth</td>
<td>65</td>
<td>21</td>
<td>54</td>
<td>25</td>
</tr>
<tr>
<td>Negative brow</td>
<td>29</td>
<td>31</td>
<td>36</td>
<td>33</td>
</tr>
<tr>
<td>Neutral/other brow</td>
<td>40</td>
<td>26</td>
<td>40</td>
<td>31</td>
</tr>
<tr>
<td>Overall expressivity</td>
<td>39b</td>
<td>10</td>
<td>35,ab</td>
<td>10</td>
</tr>
</tbody>
</table>

Note. n = 45, 42, 31, and 45 for the European American, adopted Chinese, Chinese American, and Mainland Chinese groups, respectively (save n = 41 for adopted Chinese neutral/other brow because of missing data).

a FACS action units (AUs) corresponding to the facial movement variables were as follows: (a) smile = 12abc ± 9a, 10a; (b) negative midface = 9bc, 10bc ± 12a; (c) single negative mouth movement = 11abc/14abc/15abc/17bc/19bc/20bc/23abc/24abc; (d) co-occurring negative mouth movements = two or more of the single negative mouth movements; (e) neutral/other mouth = 8abc, 16abc, 17a, 18abc, 19a, 20a, 22abc, 24a, 28abc, 25, 26, 27; (f) negative brow = 4 ± 1, 2, 3; (g) neutral/other brow = 1, 2, 3. Intensity of facial actions is indicated by letters a through c. Alternative AUs are indicated by a slash. Optional AUs are indicated by the plus or minus sign. Commas designate an “and/or” relationship. Because some girls habitually wrinkle their nose while smiling (AU 12 + 9; Ekman, 2005), we categorized this combination of movements according to the most intensely produced facial action. Although the presence or absence of cheek lifting (AU6) is thought to distinguish between social smiles and smiles of genuine emotion (Ekman, Davidson, & Friesen, 1990), this movement could not be reliably assessed on our videotapes.

b For the first seven facial variables, scores are percentage of 5-s intervals coded present (as opposed to absent), whereas the score for overall expressivity is the average percentage for the seven. Means that share a common subscript do not differ significantly per a Tukey post hoc test, p < .05.

* p < .05. ** p < .01.
especially those slides related to disgust. In fact, the scores for positive and negative slides were significantly correlated: Correlations were .79, .76, .66, .54, .56, .80, and .78 for smile, negative midface (disgust-related) movement, neutral/other mouth, single negative mouth movement, co-occurring negative mouth movement, negative brow movements, and other/neutral brow movements, respectively, p < .001 for all. Moreover, preliminary analyses showed essentially similar group differences for scores associated with positive and negative slides. Consequently, we computed the percentage of all 18 intervals (2 for each of 9 slides) during which each facial variable was present and used these scores in the data analyses.

## Results

As a partial manipulation check, we analyzed children’s verbal responses to the last experimenter prompt, which queried their interpretation of the slides’ emotional content. A series of one-way analyses of variance yielded no significant group differences for the nine slides.

We analyzed scores for each of the seven facial variables coded during the slide-viewing procedure, as well as the average across all seven variables (which we term the overall expressivity score), in a set of one-way analyses of variance with participant group as the independent variable (see Table 2 for means, Table 3 for intercorrelations). Results were significant (α = .05) for smile, negative midface (i.e., disgust-related) movements, and overall expressivity (and marginally significant for neutral/other mouth, p = .053; see Table 2). Consistent with Hypothesis 1, European American children scored significantly higher than Mainland Chinese children for smiles, negative midface (disgust-related) movements, and overall expressivity (Tukey post hoc tests, p < .05). In addition, European American children scored higher than Chinese American children on all three variables, although the differences reached a conventional level of significance only for smiles. As predicted by Hypothesis 2, adopted Chinese children scored significantly higher than Mainland Chinese children for negative midface (disgust-related) movements. Although their scores were higher than those of both other Chinese groups for smiles and overall expressivity, these differences were not significant. Adopted Chinese children were not significantly different from European American children on any facial variable, although their scores were lower than those of the European American group. We analyzed scores for the vinegar presentation using nonparametric Kruskal–Wallace analyses of variance. In contrast to our predictions, we found no significant differences for any of the facial expression scores (ps = .96, .87, .42, .10, .67, .59, and .33 for the facial expressions listed in Table 2, respectively).

Because our Mainland Chinese participants came from different cities and were tested under somewhat different circumstances, we reanalyzed our data after eliminating the 15 children composing the smaller subgroup (i.e., children from Shenyang). The analyses of variance for the slide-viewing data again were significant for smiles, negative midface movements, and overall expressivity, with the pattern of means remaining the same across the four groups of participants. To evaluate the possible effect of experimenter ethnicity, we compared the facial responses of Chinese American children tested in Mandarin by a Chinese experimenter (n = 19) to those tested in English by a European American experimenter (n = 9). We obtained no significant differences. In summary, we obtained partial support for the first two hypotheses in our study, although we did not obtain group differences for all facial variables.

In accord with Hypothesis 3, group differences were found for a number of social ecology variables (see Table 1). Hollingshead SES scores (based on education and occupation of both parents; Wasser, 1992) were lowest for families with European American children and highest for Chinese American families. Mothers of European American children worked less outside the home than mothers in the other three groups, and their children were in fewer hours of group care per week than adopted Chinese or Mainland Chinese children. Mainland Chinese children were in group care for the most hours per week. The European American children had more siblings than either adopted Chinese or Chinese American children, who, in turn, had more siblings than Mainland Chinese children. European American children did not differ from either adopted Chinese or Chinese American children in the number of adults in the home, but children in all three groups had fewer adults in the home than Mainland Chinese children. European American

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1 We also directly compared the facial responses of the two subgroups of Mainland Chinese girls in a set of one-way analyses of variance. Shenyang girls produced more negative midface movements, more co-occurring negative mouth movements, and fewer neutral/other brows than did Beijing girls, Fs(1, 44) = 5.50, 7.14, and 4.96 respectively, ps < .05. However, means for both Mainland Chinese subgroups were lower than the means for European American and adopted Chinese girls on negative midface movements (the facial variable for which significant differences across the four major comparison groups were found).
children were reported to see significantly more adults outside the home per week than Mainland Chinese children, but the groups did not differ in the number of children seen outside the home per week. Consistent with Hypothesis 4, regarding the anthropometric variables, the adopted Chinese children were significantly shorter than the Mainland Chinese children and significantly lower in weight and head circumference than children in the other three groups (see Table 1).

As predicted by Hypothesis 5, European American mothers (of both adopted and nonadopted children) reported expressing significantly more positive emotion than Mainland Chinese mothers on the SEFQ (see Table 4). However, Chinese American mothers also scored significantly higher than Mainland Chinese mothers for positive expressivity and did not significantly differ from European American mothers. In addition, the groups did not differ on reports of expressing negative emotion. In accord with Hypothesis 6, Mainland Chinese and Chinese American mothers scored significantly higher on the Strictness subscale than European American mothers on the PACR (see Table 4). In addition, both groups of Chinese mothers scored significantly higher on the Aggravation subscale. Consistent with Hypothesis 7, Chinese American mothers scored significantly higher on both cultural attitudes scales than the European American mothers of the adopted Chinese children, who themselves scored significantly higher than the Chinese American mothers of the nonadopted children (see Table 4).

To explore possible social experience sources underlying group differences in children’s facial behavior (related to Hypotheses 8–10), we computed correlations between the three facial variables that showed group differences and the social ecology, anthropometric, and attitudinal variables (see Table 5). Consistent with Hypothesis 8, mothers’ self-reported positive expressiveness on the SEFQ was significantly correlated with their children’s negative midface movements and overall expressivity scores. However, mothers’ negative expressiveness was unrelated to their children’s facial behavior. As predicted by Hypothesis 9, mothers’ scores on both measures of cultural identification correlated negatively with all three children’s facial expressions (although results did not achieve significance for one of the six correlations). Beyond our specific predictions, we found other relationships between our social experience variables and the children’s expressive behavior. Both aggravation and strictness were negatively related to all three facial expression variables (although results did not reach significance for one of the six correlations). In addition, number of siblings was significantly and positively correlated with both smiles and negative midface movements, whereas number of adults in the home was significantly negatively correlated with negative midface movements and overall expressivity.

To investigate our last hypothesis, regarding the influence of social experience on European American and Chinese children’s facial expressivity, we conducted further analyses to determine whether group differences in facial behavior would remain after we took into account our variables intended to index potentially relevant aspects of the children’s social experience. We performed three hierarchical multiple regressions, each with a different outcome variable (smile, negative midface, or overall expressivity score). As predictors, we included those nonfacial variables that correlated significantly with one or more facial expression scores. We entered these variables in two blocks, beginning with those measures that included items directly related to emotion or emotional expression. Thus, in the first step for each regression, we entered the three attitudinal variables that were associated with the facial variables in the full sample (i.e., aggravation, strictness, and positive expressiveness). In the second step, we added two social ecology variables (number of siblings and number of adults in the home). In the third step, we added three dummy-coded variables representing participant group. The $R^2$ for the first step was statistically significant in all three equations (see Table 6). Strictness was itself a significant individual predictor of the negative midface and overall expressivity scores. For smile, strictness and aggravation were more balanced as predictors, although neither was itself significant ($p_s = .07$ and .13, respectively). Neither the social ecology variables nor the participant-group variables accounted for significant additional variance (for the social ecology variables, $\Delta R^2 = .01$, .01, and .01; for dummy-coded group variables, $\Delta R^2 = .02$, .00, and .02 in the smile, negative midface, and overall expressivity regressions, respectively).

Table 4

<table>
<thead>
<tr>
<th>Variable</th>
<th>European American</th>
<th>Adopted Chinese</th>
<th>Chinese American</th>
<th>Mainland Chinese</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$M$</td>
<td>$SD$</td>
</tr>
<tr>
<td>Aggravation (PACR)</td>
<td>2.7</td>
<td>0.6</td>
<td>2.7</td>
<td>0.5</td>
</tr>
<tr>
<td>Strictness (PACR)</td>
<td>2.3</td>
<td>0.4</td>
<td>2.4</td>
<td>0.5</td>
</tr>
<tr>
<td>Negative expressiveness (SEFQ)</td>
<td>3.6</td>
<td>0.9</td>
<td>3.4</td>
<td>0.9</td>
</tr>
<tr>
<td>Positive expressiveness (SEFQ)</td>
<td>7.2</td>
<td>0.8</td>
<td>6.9</td>
<td>0.9</td>
</tr>
<tr>
<td>SL-ASIA score</td>
<td>1.4</td>
<td>0.2</td>
<td>1.9</td>
<td>0.4</td>
</tr>
<tr>
<td>Chinese culture</td>
<td>1.5</td>
<td>0.6</td>
<td>3.1</td>
<td>0.7</td>
</tr>
</tbody>
</table>

Note. $n = 44, 28, 42,$ and 45 for the European American, Chinese American, adopted Chinese, and Mainland Chinese groups, respectively ($n = 40$ for European American Chinese cultural attitudes). $\eta^2$ is the proportion of variance accounted for by group membership. Means that share a common subscript do not differ significantly per a Tukey post hoc test, $p < .05$.

** $p < .01$.
As a final exploration, we conducted a second set of regressions, for which the cultural identification measures (SL-ASIA and Chinese culture scores) constituted the second step, followed by the two social ecology variables (Step 3) and finally by the group variables (Step 4). These regressions excluded the Mainland Chinese group, for whom no SL-ASIA and Chinese culture scores were collected. Representing the influence of the attitudinal variables, the $R^2$ for the first step was .09, .10, and .08, for smile, negative midface, and overall expressivity, respectively ($p < .01$ for all), and regression coefficients were similar to those shown in Table 6. None of the subsequent steps accounted for significant additional variance, including the step that added the SL-ASIA and Chinese culture scores.

In summary, the mothers’ reported strictness and aggravation were the strongest predictors of smiles, and the mothers’ reported strictness was the strongest predictor of negative midface (disgust-related) movements and overall expressivity. These attitudinal variables alone were sufficient to account for variability in facial expressivity; the proportion of additional variance accounted for by knowing other variables, including participant group, was both small and statistically insignificant. Thus, in accord with Hypothesis 10, expressivity differences between European American and ethnic Chinese children did not remain significant in analyses that took into account our measures designed to index potentially relevant aspects of the children’s social experience.

**Discussion**

This study explores the influences of ethnicity, culture, and family environment on children’s facial expressivity. Consistent with Hypothesis 1 and with the results of previous studies (Camras et al., 1998; Freedman, 1974; Kagan et al., 1994; Kisilevsky et al., 1998), European American children were more expressive in the slide-viewing procedure than Chinese American or Mainland Chinese children. Also as we predicted (Hypothesis 2), the adopted Chinese children generally fell between the European Americans and the other Chinese groups and differed significantly from the Mainland Chinese and Chinese American children for the negative midface (disgust-related) facial expression. This latter finding demonstrates that the culturally based family environment can significantly affect children’s facial expressivity, creating differences among children of the same ethnicity. At the same time, we did not always find differences among groups in facial expressivity. For example, the ethnically Chinese and European American children did not differ in their facial responses to the sensory stimulus (vinegar swab). This finding further suggests that when group differences do occur, they may reflect situation-specific influences of culture and socialization rather than inherent global differences in overall emotional reactivity and expressiveness.

To explore aspects of the children’s environment that might influence facial expressivity and create differences across cultures, we examined several social–ecological, anthropometric, and attitudinal variables. As predicted by Hypotheses 3–7, we found group differences for many of these potential influences on children’s expressive behavior. For example, mothers of Mainland Chinese and Chinese American children scored higher on strict-

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**Table 5**

*Correlations of Social Ecology, Anthropometric, and Attitudinal Measures With Selected Facial Expression Variables*

<table>
<thead>
<tr>
<th>Variable</th>
<th>$n$</th>
<th>Smile $R^2$</th>
<th>Negative midface $R^2$</th>
<th>Overall expressivity $R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>SES</td>
<td>148</td>
<td>.03</td>
<td>-.15</td>
<td>-.07</td>
</tr>
<tr>
<td>Maternal employment (hours/week)</td>
<td>150</td>
<td>-.09</td>
<td>.01</td>
<td>-.04</td>
</tr>
<tr>
<td>Group care (hours/week)</td>
<td>149</td>
<td>-.13</td>
<td>-.07</td>
<td>-.09</td>
</tr>
<tr>
<td>No. siblings</td>
<td>158</td>
<td>.18**</td>
<td>.17*</td>
<td>.05</td>
</tr>
<tr>
<td>No. adults in the home</td>
<td>155</td>
<td>-.10</td>
<td>-.21**</td>
<td>-.16**</td>
</tr>
<tr>
<td>No. adults seen per week</td>
<td>148</td>
<td>.05</td>
<td>.10</td>
<td>.15</td>
</tr>
<tr>
<td>No. children seen per week</td>
<td>146</td>
<td>-.00</td>
<td>.00</td>
<td>.08</td>
</tr>
<tr>
<td>Current height (inches)</td>
<td>143</td>
<td>-.04</td>
<td>-.08</td>
<td>-.05</td>
</tr>
<tr>
<td>Current weight (pounds)</td>
<td>152</td>
<td>.09</td>
<td>.02</td>
<td>.06</td>
</tr>
<tr>
<td>Current head circumference (inches)</td>
<td>142</td>
<td>.10</td>
<td>-.03</td>
<td>-.01</td>
</tr>
<tr>
<td>Aggravation (PACR)</td>
<td>159</td>
<td>-.26**</td>
<td>-.23**</td>
<td>-.14</td>
</tr>
<tr>
<td>Strictness (PACR)</td>
<td>159</td>
<td>-.27**</td>
<td>-.34**</td>
<td>-.25**</td>
</tr>
<tr>
<td>Negative expressiveness (SEFQ)</td>
<td>159</td>
<td>.01</td>
<td>-.02</td>
<td>.05</td>
</tr>
<tr>
<td>Positive expressiveness (SEFQ)</td>
<td>159</td>
<td>.08</td>
<td>.17*</td>
<td>.18*</td>
</tr>
<tr>
<td>SL-ASIA score</td>
<td>110</td>
<td>-.24*</td>
<td>-.20*</td>
<td>-.25**</td>
</tr>
<tr>
<td>Chinese culture</td>
<td>110</td>
<td>-.27**</td>
<td>-.12</td>
<td>-.26**</td>
</tr>
</tbody>
</table>

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

---

**Table 6**

*Regression Coefficients for Selected Attitudinal Variables Associated With Facial Expression Variables*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Smile $\beta$</th>
<th>Negative midface $\beta$</th>
<th>Overall expressivity $\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggravation (PACR)</td>
<td>-.15</td>
<td>-.03</td>
<td>.03</td>
</tr>
<tr>
<td>Strictness (PACR)</td>
<td>-.19</td>
<td>-.30**</td>
<td>-.23**</td>
</tr>
<tr>
<td>Positive expressiveness (SEFQ)</td>
<td>.09**</td>
<td>.06</td>
<td>.11</td>
</tr>
</tbody>
</table>

*Note. $N = 159$. $R^2$ is for Step 1; see text for details.  ** $p < .01$.  * $p < .05$.**
ness and lower on self-reported positive expressivity than Euro-
pean American mothers (although we found no differences for
negative expressivity). Also as predicted, cultural identification
scores were highest for Chinese American mothers, followed by
the mothers of adopted Chinese children and finally by the Euro-
pean American mothers. However, only some variables appeared
to significantly influence children’s production of facial
expressions.

Although children’s expressivity correlated significantly with
mothers’ positive SEFQ scores (in accord with Hypothesis 8), maternal self-reported expressivity did not predict children’s ex-
pressive behavior as strongly as the more general parenting mea-
sures (which we discuss below). Although meta-analytic reviews
of previous studies (Halterstadt & Eaton, 2003) have shown that
family expressiveness does significantly influence children’s ex-
pressive responding, this conclusion is based on investigations
using a variety of methods for measuring expressive behavior. The
subset of studies that have specifically examined the SEFQ and
children’s directly observed emotional behavior have not always
yielded significant results (e.g., Cassidy, Parke, Butkovsky, &
Braungart, 1992). In contrast, investigations that have compared
mothers’ and children’s objectively coded facial behavior have
more often yielded significant findings (e.g., Camras et al., 1990;
Cassidy et al., 1992; Denham, 1989; Isely, O’Neil, Clatfelter, &
Parke, 1999). This pattern of results suggests that children’s facial
expressivity may be influenced by a relatively narrow range of
experiences—that is, their exposure to facially expressed emotion
rather than emotional expression in general. In addition, perhaps
children are more attentive to facial expressions directed toward
themselves rather than toward others.

As we predicted in Hypothesis 9, mothers’ scores on both
measures of cultural identification correlated negatively with chil-
ren’s facial expressions. Nevertheless, these scores contributed
little to the prediction of children’s expressive behavior after we
took parent attitude variables into account. Similarly, number of
siblings and number of adults in the home correlated with facial
expression variables but contributed little to the prediction of
children’s facial behavior.

Although we offered no specific a priori hypotheses about the
effects of parenting attitudes on children’s expressivity, we found
that scores on the Strictness and Aggravation subscales of the
PACR most strongly predicted children’s facial expressions in the
regression analyses. These findings suggest that mothers’ self-
reported aggravation and strictness translate into behaviors that
encourage or discourage their children’s production of emotional
facial expressions. Inspection of the specific items on the S-
strictness subscale appears to further support this conclusion. Of the 13
items on this subscale, 5 items directly address children’s emo-
tional expressiveness, and some of these refer specifically to
socialization practices (e.g., “I teach my child to keep control of
her feelings at all times”). Items on the Aggravation subscale focus
on stresses associated with child rearing rather than emotional
expression. However, mothers scoring high on this subscale also
may engage in practices that discourage the expression of emotion
in their children. In general, results of the regressions supported
our last (and most important) hypothesis: Social experience factors
were more important than inherent ethnic differences in influen-
cing children’s expressivity during social interactions involving
mild levels of emotion.

In accord with Hypothesis 10, expressivity differences between
European American and ethnic Chinese children did not remain
significant in analyses that took into account our measures de-
signated to index potentially relevant aspects of the children’s social
experience. Thus, to some extent, our conclusions differ from
those of Freedman (1974) and Kagan and Fox (in press), who
proposed innate ethnic differences on the basis of their studies of
young infants. In particular, Freedman reported differences in
neonates’ distress responses during Brazelton testing, findings that
cannot be attributable to socialization factors. However, it is pos-
sible that innate ethnic differences do exist early on but are not a
significant determinant of expressive behavior at older ages under
most circumstances. One possibility is that such differences
emerge at older ages only when the intensity of distress or negative
emotion is considerably greater than we could ethically induce in
our study. Alternatively, perhaps inherent ethnic differences in
emotional reactivity simply diminish at older ages, such that later
group differences in emotional expression are only found in re-
sponse to sociocultural factors.

Several limitations of this study should be addressed in future
research. One is the relatively small sample sizes. Because facial
scoring is extremely labor intensive, this limitation frequently
characterizes research involving FACS-based coding systems.
Nonetheless, the overall pattern of our results (i.e., group differ-
ences in facial behavior related to differences in parenting atti-
tudes) suggests a reasonable account of the origin of cultural
differences in facial expressivity that merits further investigation.
Like all such accounts, ours remains to be confirmed in future
research.

A second potential limitation of our study involves possible
group differences in the children’s interpretations of and emotional
reactions to the slides due to cultural differences in children’s
experiences (e.g., familiarity) with the slides’ contents (e.g., bunny
with Groucho Marx glasses). However, we believe this explana-
tion is rendered less plausible by the fact that some group differ-
ences we obtained replicate results of previous research utilizing
very different procedures. In addition, because we were interested
in the expressive component of children’s emotional reactions, we
deliberately attempted to guide children’s interpretations by means
of our verbal prompts and evaluate our success by analyzing their
verbal responses. Nonetheless, it is possible that biases in chil-
ren’s verbal responses masked underlying differences in their
emotional reactions and that these produced the differences in
facial behavior that we observed. This possibility again points to
the importance of obtaining converging evidence for our position
in future studies. At the same time, we acknowledge that differ-
ences in expressivity resulting from cultural socialization may
indeed have an influence on emotional experience. Within a dy-
namical systems framework (Camras, 1992; Fogel et al., 1992;
Fogel & Thelen, 1987; Lewis & Granic, 2000), emotion is viewed as
a system of responses whose components may be synergistically
related and indeed have reciprocal influences on each other.

Other limitations of our study include restricting our sample to
female participants (mothers and daughters) and Chinese adoptees
raised in the United States, obtaining cultural identification mea-
sures only for American participants, utilizing parent attitude mea-
sures developed for Western samples, and assessing maternal
expressivity via self-report rather than direct observation. Unfor-
luckily, including Chinese boys in adoption studies may not be
feasible because few Chinese boys without special needs are available for adoption. Similarly, studying adopted Chinese girls raised in China is difficult because adoption currently is less common in Mainland China than in the United States. Although we obtained a coherent and readily interpretable pattern of results using parenting measures developed for Western samples, researchers might obtain additional findings of interest if they used measures developed on the basis of Asian parenting attitudes. In addition, future research might address the issue of cultural influences on facial expressivity using nonadopted samples (e.g., by comparing first-, second- and third-generation Chinese American children). Direct observation of expressive behavior by both parents also should be included in future studies.

In conclusion, the current study shows that facial expressivity is a flexible system that is responsive to aspects of the family environment that differ across cultures. Subsequent observational studies of Chinese and European American families should explore how attitudes about emotion and emotional expression are translated into behaviors that affect children’s expressivity. Further research also may determine whether the facial expressivity of adopted children continues to increase as they get older and have spent more time with their European American family.

References


