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Emily A. Butler, Tiane L. Lee and James J. Gross

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# Does Expressing Your Emotions Raise or Lower Your Blood Pressure?

## The Answer Depends on Cultural Context

Emily A. Butler

*University of Arizona*

Tiane L. Lee

*Princeton University*

James J. Gross

*Stanford University*

Emotion-expressive behavior is often but not always inversely related to physiological responding. To test the hypothesis that cultural context moderates the relationship between expressivity and physiological responding, the authors have Asian American and European American women engage in face-to-face conversations about a distressing film in same-ethnicity dyads. Blood pressure is measured continuously, and emotional expressivity is rated from reviewing videotapes. Results indicate that emotion-expressive behavior is inversely related to blood pressure in European American dyads, but the reverse was true in Asian American dyads in which there is a trend toward a positive association. These results suggest that the links between emotion-expressive behavior and physiological responding may depend on cultural context. One possible explanation for this effect may be that cultural contexts shape the meaning that individuals give to emotional expressions that occur during social interactions.

**Keywords:** *culture; emotion expression; blood pressure; Asian; European*

Nearly a century of research has found that individuals who openly express their emotions either verbally or nonverbally show reduced physiological responses to emotional stimuli relative to less expressive individuals (e.g., Buck, Savin, Miller, & Caul, 1972). This inverse relationship is not always observed, however, and in some cases, greater expressivity has actually been associated with greater physiological responses (Mendolia & Kleck, 1993). In this article, we test the hypothesis that cultural context is one factor that may contribute to these discrepant findings. In particular, we focus on the possibility that the social meaning of

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openly expressing emotion may differ across cultural contexts, with accompanying effects on the relationship between expression and physiological responding.

European American (EA) and Asian American (AA) cultural contexts provide a marked contrast with respect to emotional expressivity. EA culture values self-expression of most forms (Kim & Sherman, 2007). Children are encouraged to speak up, and emotional expression is condoned both with in-group and out-group members (Matsumoto, 1990). High levels of expressiveness are seen as signs of competence and likeability and, suppressing emotional behavior is associated with increased physiological responding and reduced affiliation (Butler et al., 2003; Gross & Levenson, 1993). In contrast, AAs rate the expression of negative emotions and emotion expression with casual acquaintances as less appropriate than EAs do (Matsumoto, 1993). Many educators have noted that AA college students are less expressive than EA students are, a fact that some have argued arises from Asian cultural traditions valuing emotional self-restraint and attentiveness to others (Kim & Markus, 2002). AAs are less likely to seek social support due to concerns that self-expression may have negative relationship consequences (Kim, Sherman, Ko, & Taylor, 2006) and AAs are more likely to suppress emotional expression than are EAs (Gross & John, 2003). Finally, some research suggests that many of these effects may be due to culturally relevant values; Individuals high on allocentrism (similar to collectivism) are more likely to mask their emotional expressions in the presence of an experimenter and show lower coherence between their expressions and experience (Matsumoto & Kupperbusch, 2001).

Based on the findings reviewed, we hypothesized that emotion expressions that occur during a social interaction should have a different meaning in EA versus AA cultural contexts, with accompanying differences in their physiological impact. Specifically, in most interactions between EAs, open expression would be normative and desirable, functioning as a marker of successful social interaction. As such, expressivity might be accompanied by physiological calming, which occurs during socially supportive interactions, (see for example: Lepore, Allen, & Evans, 1993). At the same time, if low levels of expressivity were the result of suppressing emotion expression, we would expect to see increased physiological responding, because this has been repeatedly shown to accompany emotion inhibition in EA samples (Butler et al., 2003; Gross & Levenson, 1993). In contrast, in many interactions between AAs, cultural sanctions might make emotion-expressive behavior a potentially negative stimulus in its own right, requiring careful consideration before engaging in it and extensive evaluation afterward to establish its social impact. If this were the case, such ambivalence may exacerbate physiological responding. At the same time, emotion suppression may be relatively normative and automated for AAs. In support of this, in an experimental study of suppression, the social consequences of inhibiting emotion were clearly negative when EAs suppressed them but were ameliorated when AAs did so (Butler, Lee, & Gross, 2007).

To test the hypothesis that cultural context would moderate the relationship between expressive behavior and physiological responding, we conducted analyses of data collected from self-identified AA or EA women who had participated in the control group of one of our prior studies of emotion regulation (Butler et al., 2007). In this control group, female college students at an American university were randomly assigned to take part together with the stipulation that they must not have met prior to the situation. They first watched

an upsetting documentary war film and then discussed it. Physiologically, we focused on blood pressure, because it is one of the key regulated variables of the cardiovascular system that makes it sensitive to social contextual factors (Lepore et al., 1993). Emotion expression was rated from reviewing videotapes of the conversations, taking into account both verbal and nonverbal behaviors, and distinguishing between positive and negative expressions. Our expectation was that all participants would comply with the situational demands and engage in the same range of expressive behaviors, regardless of ethnic background. Specifically, the participants were explicitly asked to discuss their emotional responses to the film, and under such circumstances, we expected both EAs and bicultural AAs to do so, which would entail similar group levels of verbal and nonverbal emotion expression. For EA dyads, however, we predicted that such open expressivity would be normative and would be accompanied by smaller increases in blood pressure. In contrast, for AA dyads, we expected the same level of expression to represent the upper end of their typical behavior, to be experienced as potentially problematic, and to be accompanied by larger increases in blood pressure.

## Method

### Participants and Demographics

Thirty-two participants who reported their ethnicity to be either EA ( $n = 20$ ) or AA ( $n = 12$ ) were drawn from a larger sample (see Butler et al., 2007). All but two of the EAs had parents who were born in the United States (one had parents born in Hungary and one in the Ukraine), and all but one were themselves born in the United States (one was born in Hungary but had lived in the United States for 17 years). The parents of the AA participants were born in mainland China ( $n = 6$ ), Taiwan ( $n = 2$ ), Vietnam ( $n = 3$ ), and Malaysia ( $n = 1$ ). All but two were themselves born in the United States; one was born in China but had lived in the United States for 13 years, and one was born in Malaysia and had only lived in the United States for 1 year. EAs reported speaking English at home significantly more often than AAs did (EA:  $M = 4.9$ ,  $SD = 0.6$ ; AA:  $M = 4.1$ ,  $SD = 1.0$ ;  $t(30) = 3.17$ ,  $p < .01$ ) and scored significantly higher on a brief form of the American General Ethnicity Questionnaire, a 17-item measure of acculturation to American culture ( $\alpha = .85$ ; EA:  $M = 3.7$ ,  $SD = 0.4$ ; AA:  $M = 3.2$ ,  $SD = 0.5$ ;  $t(30) = 2.70$ ,  $p < .05$ ). There were 10 EA dyads and 6 AA dyads. The mean age of participants was 20.5 years ( $SD = 1.9$  years). Participants were paid \$40.00 for their participation.

### Procedures

On arrival at the laboratory, the women were briefly introduced to each other, and it was verified that they had never met before. They were then seated 2 meters apart on either side of a partition and were informed that physiological measures would be taken and that their conversation would be videotaped. The session began by attaching the blood pressure cuffs and other physiological recording sensors not relevant to the present analyses (i.e., EKG, skin conductance, respiration, ear and finger pulse). Participants then watched a 3-min. nature film, which provided a baseline period, followed by an upsetting 11-min. documentary war

film that provided a shared negative emotion experience that they could subsequently discuss. This film shows graphic footage of the aftermath of the bombing of Hiroshima and Nagasaki during World War II and elicits high levels of negative emotions as well as strong political and religious opinions (Butler et al., 2003). Although chosen for reasons unrelated to the present ethnic contrast, this film provided an ideal emotional stimulus in that we expected it to be equally relevant and upsetting to both EA and AA participants, given that both continents were involved in the historical events. To ensure that there were no ethnic group differences in emotional reactions to the film, however, we collected self-reports of emotional experience following it. The experimenter then removed the partition and asked participants to discuss their thoughts and feelings, the implications of the film for human nature, and its relevance to their religious and political beliefs. Participants were free to signal the end of the conversation when they so chose. Conversations ranged from 4.6 to 15 minutes ( $M = 8.8$  minutes), and there were no differences in length based on ethnic background. Following the conversations, we obtained self-reports of emotional experience to ensure that there were no ethnic group differences in strength or type of responses to interactions.

## Measures

*Blood pressure.* Participants' blood pressure was measured continuously during the baseline film and conversation using an Ohmeda 2300 Finapres. Systolic and diastolic pressures were highly correlated ( $r = .77$ ), and so we combined them into mean arterial blood pressure, following standard guidelines. Change scores were computed by subtracting mean baseline neutral-film values from mean conversation values.

*Emotion expression.* Participants were videotaped using two hidden cameras, and the videos were scored for emotion-expressive behavior using custom software (CodeBlue, provided for the present research by R. Levenson). Emotion expression was distinguished as being either negative or positive. Negative expression came in the form of both explicit statements and nonverbal grimaces, frowns, and looks of distress. Due to the negative topic of conversation, positive expression almost exclusively took the form of agreement and nonverbal expressions such as smiling. Because conversations differed in length, we used proportions for all analyses. Two raters coded all tapes, and the mean of the ratings was used for analyses. Reliabilities were excellent (negative expression: average  $r = .97$ ; positive expression: average  $r = .95$ ).

*Emotion experience in response to the film and during the conversation.* Following the film, participants reported how much they had felt each of a set of positive and negative emotions while they were watching it. Similarly, following the conversation, they reported how much they had felt each of the same set of emotions during the discussion. Five positive emotions were assessed (amused/entertained, happy/contented, loving/affectionate/caring, interested/engaged, positive; film alpha = .65, conversation alpha = .60) along with 10 negative emotions (angry/irritated/annoyed/frustrated, disgusted, self-conscious/embarrassed, afraid/scared, guilty/ashamed, sad, lonely/isolated/ignored, impersonal/distant/cold, anxious/nervous/tense, negative; film alpha = .74, conversation alpha = .82). The scales ranged from 0 (*none*) to 3 (*lots*).

## Results

To test our hypotheses we used Kenny's Actor-Partner Interdependence Model, which deals appropriately with nonindependent data (Kashy & Kenny, 1997). Self-reports of emotional experience in response to the film and during the conversation were included as covariates in the model after having established that there were no ethnic group differences on these variables. Demographic variables and acculturation scores were also entered into the models, but they did not alter the substantive findings and were not significantly related to the outcomes; so we do not discuss them further.

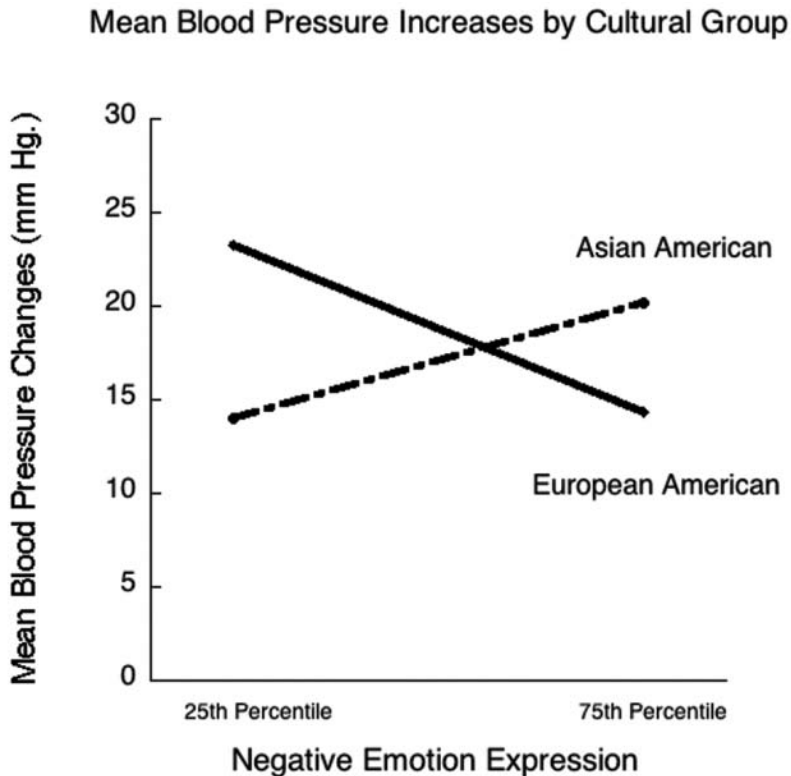
Prior to testing our hypotheses, we predicted each variable from the ethnic group to ensure that there were no overall differences in emotional experience, expression, or blood pressure. Both EAs and AAs reported moderate levels of negative experience during both the film and the conversation (means ranged from 1.2 to 1.7; *SDs* ranged from 0.1 to 0.2). In addition, all participants reported low levels of positive experience (means ranged from 0.7 to 0.8; *SDs* ranged from 0.1 to 0.2). Importantly, there were no ethnic group differences in these responses (all  $F_s(1, 14) < 1.20$ , *ns*). Similarly, there were no overall ethnic differences in levels of emotion expression (EA positive = 5.6%, *SD* = 0.4; EA negative = 20.4%, *SD* = 2.1; AA positive = 6.7%, *SD* = 1.3; AA negative = 23.0%, *SD* = 3.7; both  $F_s(1, 14) < 1.0$ , *ns*) or in blood pressure changes from baseline to the conversation (EA = 17.0, *SD* = 2.9; AA = 18.1, *SD* = 3.7;  $F(1, 14) < 0.10$ , *ns*).

We predicted that emotion expression would be inversely related to blood pressure for EA dyads but positively related to it for AAs. This hypothesis was confirmed for negative emotion expression. As shown in Figure 1, the predicted interaction of ethnicity and negative expression was significant,  $F(1, 23) = 6.29$ ,  $p < .02$ . Simple slopes analysis revealed that blood pressure was inversely related to expressing negative emotions for individuals in EA pairs ( $b = -0.69$ ,  $t(20) = -2.40$ ,  $p < .03$ ). In contrast, blood pressure showed a trend toward a positive association with negative expression for individuals in AA dyads ( $b = 0.41$ ,  $t(24) = 1.74$ ,  $p < .09$ ). Finally, we found no main or interaction effects for positive expression,  $F_s(1, 23) < 2.1$ , *ns*, a fact that may be accounted for by the very low levels of positive expressivity in this context.

## Discussion

Inconsistent findings regarding links between emotion-expressive behavior and physiological responding suggest the possibility that there are as-yet unappreciated moderators of this relationship. The present results suggest that one such moderator may be cultural context. EAs who expressed their negative emotions about an upsetting film had smaller blood pressure increases than those who were less expressive. In contrast, negative expressivity and blood pressure were somewhat positively related for members of AA dyads. This differential relationship could not be accounted for by overall group levels of experience, expression, or blood pressure. These findings are in accord with our hypothesis that emotion expression is culturally condoned in most EA contexts but may be socially problematic for AAs, and that this results in different physiological response patterns when such expression does occur.

**Figure 1**  
**Model Estimates of Mean Blood Pressure Increases From Baseline to Conversation as a Function of Negative Emotion Expression in European American and Asian American Dyads**



Our finding that blood pressure was differentially related to emotion expression in different cultural contexts may be explained by divergent cultural meanings attached either to open expression or to emotion suppression. Extensive prior research has shown that suppressing emotional behavior is associated with increased physiological responding, at least in predominantly EA samples (Butler et al., 2003; Gross & Levenson, 1993, 1997). For AA women, however, suppression may be relatively normative and automated. In support of this, in an experimental study of suppression during conversations, the social consequences of inhibiting emotion were clearly negative when EAs suppressed but were ameliorated when AAs did so (Butler et al., 2007). These factors suggest that suppression may also entail less physiological effort for AAs. Although suppression may have contributed to our present findings, either in addition to the effects of open expression or in place of them, no direct measures of emotion suppression were included and so a test of this hypothesis awaits future research.

The present study is limited by its small, single-sex college sample, its reliance on one marker of physiological responding, its assessment of culture that was limited to an ethnic group contrast, and its focus on a single interaction context. More important, because this study involved a reanalysis of existing data, we were unable to directly test our hypothesis that the results are driven by culturally divergent meanings of emotion expression. An important direction for future research, therefore, is to conduct studies that include measures of participants' interpretations of their own and their partners' expressivity. This would allow for a direct assessment of whether cultural evaluations of emotion expression mediate differential relationships between expression and physiology in different ethnic groups. Nevertheless, the present results are in accord with this hypothesis and demonstrate that openly expressing one's emotions does not always result in reduced physiological responding. We take from this that neither emotion expression nor cultural background is a monolithic entity. Expressive behaviors can serve many purposes and have many outcomes, both for the individual and the larger social unit. Similarly, cultural effects manifest themselves not only as overall group differences but also in different patterns of relationships among other variables. Research that addresses these complexities will be critical for understanding emotions and social interactions in our increasingly multicultural world.

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**Emily A. Butler** is an assistant professor in the department of Family Studies & Human Development at the University of Arizona. Her research investigates the interface between health, emotions, and relationships. One current focus is on emotion regulation, eating, and relationship processes in couples struggling with obesity. Other topics of interest include the social and physiological consequences of emotion regulation, the links between emotional physiology and experience, and cultural differences in emotion regulation.

**Tiane L. Lee** is a graduate student in the Psychology Department at Princeton University. Her research interests include personality, relationships, and culture.

**James J. Gross** is an associate professor of psychology at Stanford University and director of the Stanford Psychophysiology Laboratory. His research focuses on emotion and emotion regulation, using both experimental and individual-difference methods.