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Does Expressing Your Emotions Raise or Lower Your Blood Pressure? The Answer Depends on Cultural Context

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Abstract

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, we had Asian American and European American women engage in face-to-face conversations about a distressing film in same-ethnicity dyads. Blood pressure was measured continuously and emotional expressivity was rated from videotapes. Results indicated that emotion-expressive behavior was inversely related to blood pressure in European American dyads, but the reverse was true in Asian American dyads who showed a trend towards a positive association. These results suggest that the links between emotion-expressive behavior and physiological responding may depend upon cultural context. One possible explanation for this effect may be that cultural contexts shape the meaning individuals give to emotional expressions that occur during social interactions.

Almost a century of research has found that individuals who openly express their emotions either verbally or non-verbally 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 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

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Other analyses of data from this study have been published (Butler et al., 2007; Butler, Wilhelm, & Gross, 2006) but the present results address an independent topic and have not been reported before.

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 do EAs (Matsumoto, 1993). Many educators have noted that AA college students are less expressive than EA students, a fact that some have argued arises from Asian cultural traditions valuing emotional self-restraint and attentiveness to others (Kim & Markus, 2002). AA 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) were more likely to mask their emotional expressions in the presence of an experimenter and showed lower coherence between their expressions and experience (Matsumoto & Kupperbusch, 2001).

Based on the findings reviewed above, 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, such as occurs during socially supportive interactions (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 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 had not met before. 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 which makes it sensitive to social contextual factors (Lepore et al., 1993). Emotion expression was rated from videotapes of the conversations, taking into account both verbal and non-verbal 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 EA and bi-cultural AA to do so, which would entail similar group levels of verbal and non-verbal 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 U.S. (one had parents born in Hungary and one in the Ukraine) and all but one were themselves born in the U.S. (one was born in Hungary but had lived in the U.S. 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 U.S.; One was born in China, but had lived in the U.S. for 13 years, and one was born in Malaysia and had only lived in the U.S. for 1 year. EAs reported speaking English at home significantly more often than did AAs (EA: $M = 4.9$, $S.D. = 0.6$; AA: $M = 4.1$, $S.D. = 1.0$; $t\ (30) = 3.17$, $p. < .01$) 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: $M = 3.7$, $S.D. = 0.4$; AA: $M = 3.2$, $S.D. = 0.5$; $t\ (30) = 2.70$, $p. < .05$). 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 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-minute nature film, which provided a baseline period, followed by an upsetting 11-minute 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 European and Asian American participants, given that both continents were involved in the historical events. To ensure 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 min.) and there were no differences in length based on ethnic background. Following the conversations we obtained self-reports of emotional experience to ensure 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 (MAP) 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, R. Levenson). Emotion expression was distinguished as being either negative or positive. Negative expression came both in the form of explicit statements and as non-verbal grimaces, frowns, and looks of distress. Due to the negative topic of conversation, positive expression almost exclusively took the form of agreement and non-verbal 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 non-independent 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 there were no ethnic group differences on these variables. Demographic variables and acculturation scores were also entered into the models but were not significantly related to the outcomes, nor did they alter the substantive findings, and so we do not discuss them further.

Prior to testing our hypotheses we predicted each variable from ethnic group to ensure 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; *SD*'s 0.1 – 0.2). In addition, all participants reported low levels of positive experience (means ranged from 0.7 to 0.8; *SD*'s 0.1 – 0.2). Importantly, there were no ethnic group differences in these responses (all *F*'s (1, 14) < 1.20, n.s.). 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, n.s.) 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, n.s.).

We predicted that emotion expression would be inversely related to blood pressure for EA dyads, but would be positively related to it for AAs. This hypothesis was confirmed for negative emotion expression. As shown in Figure 1, the predicted interaction of culture 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 towards 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, n.s.), 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 suggests that one such moderator may be cultural context. EAs who expressed their negative emotions about an upsetting film had smaller blood pressure increases that 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.

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 with AAs did so (Butler et al., 2007). These factors suggest that suppression may also entail less

physiological effort for Asian Americans. 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 which was limited to an ethnic group contrast, and its focus on a single interaction context. More importantly, 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 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 are monolithic entities. 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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References

Buck R, Savin VJ, Miller RE, Caul WF. Communication of affect through facial expression in humans. Journal of Personality and Social Psychology. 1972; 23:362–371. [PubMed: 5070318]

Butler EA, Egloff B, Wilhelm FH, Smith NC, Erickson EA, Gross JJ. The social consequences of expressive suppression. Emotion. 2003; 3:48–67. [PubMed: 12899316]

Butler EA, Lee TL, Gross JJ. Emotion regulation and culture: Are the social consequences of emotion suppression culture-specific? Emotion. 2007; 7:30–48. [PubMed: 17352561]

Gross JJ. Antecedent- and response- focused emotion regulation: Divergent consequences for experience, expression, and physiology. Journal of Personality and Social Psychology. 1998; 74:224–237. [PubMed: 9457784]

Gross JJ, John OP. Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. Journal of Personality and Social Psychology. 2003; 85:348–362. [PubMed: 12916575]

Gross JJ, Levenson RW. Emotional suppression: Physiology, self-report, and expressive behavior. Journal of Personality and Social Psychology. 1993; 64:970–986. [PubMed: 8326473]

Gross JJ, Levenson RW. Hiding feelings: The acute effects of inhibiting negative and positive emotion. Journal of Abnormal Psychology. 1997; 106:95–103. [PubMed: 9103721]

Kashy, DA.; Kenny, DA. The analysis of data from dyads and groups. In: Reis, H.; Judd, CM., editors. Handbook of research methods in social psychology. New York: Cambridge University Press; 1997. p. 451-477.

Kim, HS.; Markus, HR. Freedom of speech and freedom of silence: An analysis of talking as a cultural practice. In: Shweder, R.; Minow, M.; Markus, HR., editors. Engaging cultural differences: The multicultural challenge in liberal democracies. New York: Russell Sage Foundation; 2002. p. 432-452.

Kim HS, Sherman DK. "Express yourself": Culture and the effect of self-expression on choice. Journal of Personality and Social Psychology. 2007; 92:1–11. [PubMed: 17201538]

Kim HS, Sherman DK, Ko D, Taylor SE. Pursuit of comfort and pursuit of harmony: Cutlure, relationships, and social support seeking. Personality and Social Psychology Bulletin. 2006; 32:1595–1607. [PubMed: 17122173]

Lepore SJ, Allen KAM, Evans GW. Social support lowers cardiovascular reactivity to an accute stressor. Psychosomatic Medicine. 1993; 55:518–524. [PubMed: 8310112]

Matsumoto D. Cultural similarities and differences in display rules. Motivation and Emotion. 1990; 14:195–214.

Matsumoto D. Ethnic differences in affect intensity, emotion judgments, display rule attitudes, and self-reported emotional expression in an American sample. Motivation and Emotion. 1993; 17:107–123.

Matsumoto D, Kupperbusch C. Idiocentric and allocentric differences in emotional expression, experience, and the coherence between expression and experience. Asian Journal of Social Psychology. 2001; 4:113–131.

Mendolia M, Kleck RE. Effects of talking about a stressful event on arousal: Does what we talk about make a difference? Journal of Personality and Social Psychology. 1993; 64:283–292. [PubMed: 8433274]

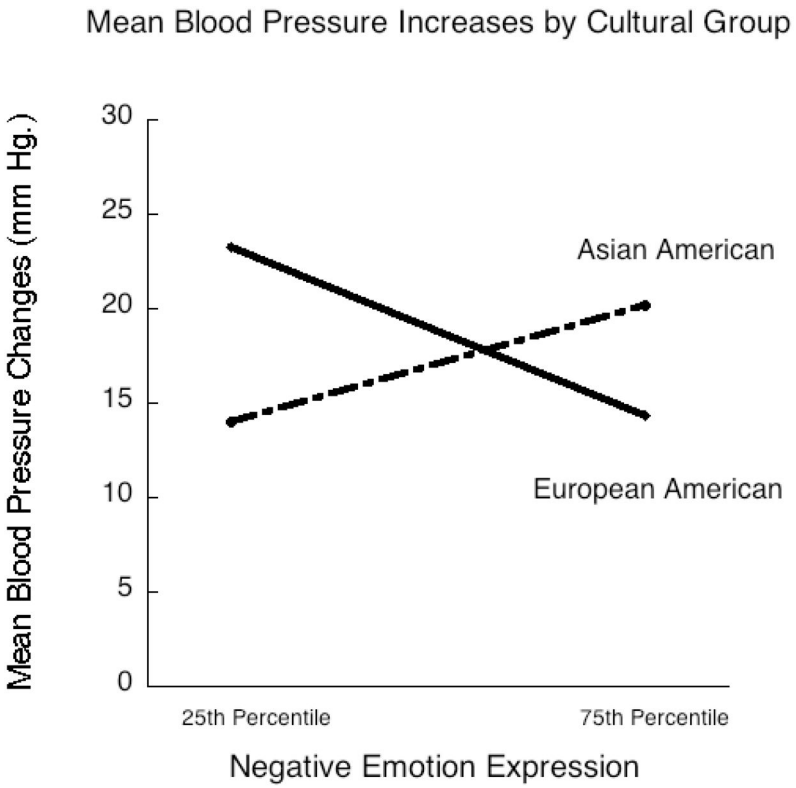

Figure 1.

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.