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Published in:
Cognition and Emotion

Publication date:
2002

[Link to publication](#)

Citation for published version (APA):
Becht, M. C., & Vingerhoets, A. J. J. M. (2002). Crying and Mood Change: a Cross-Cultural Study. *Cognition and Emotion*, 16(1), 87-101.

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Crying and Mood Change: A cross-cultural study

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Keywords: crying, mood change, cross-cultural differences, country characteristics

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Abstract

This study was designed to determine the influence of crying-related variables and country characteristics on positive mood change after crying. It was hypothesized that mood change would be positively associated to crying frequency, Individualism-Collectivism, and the extent of gender empowerment in a country. Masculinity-Femininity and shame were expected to have a negative relation with mood change. Participants were 1680 male and 2323 female students from 30 countries who provided self-report data on their crying behavior. Although bivariate associations yielded inconsistent results, in a regression analysis Masculinity-Femininity, national income, shame, and crying frequency emerged as significant predictors of mood change, all in the anticipated direction. The results suggest that how one feels after a crying episode depends on how common crying is in one's culture and general feelings of shame over crying. It also seems that (perceptions of) role patterns may play an important part in the experience of mood change.

Crying and mood change: A cross-cultural study

While recent research has taught us much about the antecedents and consequences of emotions and emotional behavior (cf. Frijda, 1986; Scherer, Wallbott, & Summerfield, 1986; Scherer, Matsumoto, Wallbott, & Kudoh, 1988), surprisingly little is known about crying. To date, basic questions concerning the nature, context, and functions of crying remain largely unanswered (see Vingerhoets, Cornelius, Van Heck, & Becht, in press). The popular press and clinicians have congruent assumptions about crying resulting in catharsis, mood improvement, and even better health (cf. Cornelius, 1986; Vingerhoets & Scheirs, in press). In the scientific literature it is not difficult to find authors who share this conviction. Here are a few examples. Menninger, Mayman, and Pruyser (1964) noted that crying may be considered as “perhaps the most human and universal of all relief measures” (p. 138); Mills and Wooster (1987) speak of crying as “a vital part of a healing or growing process, that should not be hindered” (p. 125); and Solter (1995) characterizes crying as an inborn healing mechanism. Thus it appears that the connection between crying and catharsis is deeply embedded in Western folk psychology, as well as in some more formal psychological theories (Cornelius, 1997, in press).

Whereas some theorists consider crying as a mechanism serving detoxification of the body (Frey, 1985), others regard it as a mere epiphenomenon, having no causal relationship with relief or mood improvement (e.g., Efran & Spangler, 1979). According to Frijda (1986), crying is the ultimate sign of powerlessness. In addition, several authors emphasize the communicative aspects of crying, signaling distress and the need for help (e.g., Kottler, 1996; Melinand, 1902; Murube, Murube, & Murube, 1999; Roes, 1990). The facilitation of attachment is also emphasized, because crying strengthens mutual bonds (Bekker & Vingerhoets, in press; Zeifman, in press) and induces social support.

Concerning the effects of crying on mood, empirical research has yielded some noteworthy discrepancies (see Cornelius, 1997 for a review). Retrospective studies in which subjects were asked to remember a recent crying episode generally suggest that crying improves mood (e.g., Bindra, 1972; Frey, Hoffman-Ahern, Johnson, Lykken, & Tuason, 1983; Kraemer & Hastrup, 1986). In contrast, laboratory studies in which participants are exposed to sad films consistently show that those who have cried feel worse and have more negative moods than those who have not shed any tears (e.g., Choti, Marston, Holston, & Hart, 1987; Gross, Fredrickson, & Levenson, 1994; Martin & Labott, 1991). The reasons for this discrepancy are unclear. Because positive effects of crying are generally expected, people's recollections of their own experiences may be biased. Alternatively, Cornelius (1997) has suggested that mood improvement after crying may be mediated by the reactions of the social environment. If others react positively with comfort, social support and maybe even the removal of the source of the distress, mood improvement is a very likely result. In addition, there are speculations about psychobiological processes (e.g., the release of endorphins; cf. Vingerhoets & Scheirs, in press) that may be held responsible for the positive effects of crying. These processes may need some time to manifest themselves, or may only be operational if one cries with a certain intensity, which could explain why these positive effects are not found in laboratory studies.

Mood change may also be related to crying frequency. Schlosser's (1986) findings revealed that those persons who cry more frequently are most likely to report mood improvement. Labott and Teleha (1996) further demonstrated that frequent (female) criers felt more happy with the instruction to let their tears flow, whereas women who reported crying only seldom felt better in the condition in which they were requested to withhold their tears.

The findings reviewed above suggest a positive relationship between crying frequency and positive mood change after crying. We further hypothesize that the effects of crying on mood are mediated by cultural factors. As has been made clear by several authors (e.g., Georges, 1995;

Wellenkamp, 1995), in some cultures the expression of intense emotions, such as crying, is disapproved of, or only allowed in very specific and well-defined situations. For example, the Balinese are not allowed to cry during the whole period of mourning after the death of a loved one (Rosenblatt, 1976).

Georgas, Van de Vijver, and Berry (2000) have identified country specific ecosocial indices which represent the cultural background according to the ecocultural model of Berry, Poortinga, Segall, and Dasen (1992). These indices appear to be closely related to psychological variables when analysing scores of several cultures, and offer more possibilities to determine the nature of cultural differences than a comparison across nations, like often operationalized cross-cultural research is. However, in order to be able to use country-level variables (forming one value per country) appropriately, one should be aware that the psychological measures should also be at the country level. The sample should therefore consist of quite a range of cultures, which is often not the case.

One important country-level variable is masculinity-femininity (Hofstede, 1980, 1983). In countries scoring low on masculinity, men are expected to feel less ashamed of their crying than in countries scoring high on masculinity. Consequently, we expect less mood improvement in masculine countries compared to more feminine countries.

In collectivistic societies like Indonesia and Japan (Hofstede, 1980), in which common interests prevail over individual goals, the display of intense emotions is regarded as less appropriate than it is in individualistic cultures (Matsumoto, 1990). It can thus be hypothesized that people from collectivistic countries report less mood improvement after crying than people from individualistic societies.

In countries favoring stereotypic gender roles, more substantial sex differences in crying are expected. The extent to which a country favors sex-stereotypical roles is reflected by the extent of women's participation in political and economical life, which is reflected in the Gender Empowerment Measure (GEM; United Nations Development Programme, 1997).

Additional country characteristics measured in the present study are national income and mean annual temperature. Wealthier countries appear to be more individualistic (Georgas, Van de Vijver, & Berry, 2000), so national income should also contribute to positive mood change, paralleling the effect of individualism. The choice of temperature as a possible relevant variable was prompted by Pennebaker, Rimé and Blankenship (1996), who found that a warm climate promotes the expression of emotions. However, rather than finding higher crying frequencies in warmer countries, the opposite appears to be true: Crying frequency is negatively related to average annual temperature (Becht, Poortinga, & Vingerhoets, in press). In the present study we will expand on these relationships by focusing on the relationship with mood change.

To summarize, the objectives of the present study are to obtain insight into cultural differences in self-reported mood change after crying. It is generally expected that the more people cry, the more they report a positive mood change after crying. However, this relation is assumed to be mediated by (expectations about) the reactions from the social environment. Thus, the more people feel ashamed of crying, the less positive should be their mood change. This implies that people from collectivistic and masculine countries and from countries with a low GEM will show less mood improvement after crying than people from individualistic and feminine countries, and from countries with a high GEM. Finally, we will explore the relationship between mood change after crying and national income and mean annual temperature.

Method

Respondents

This study formed part of the International Study on Adult Crying (ISAC), a large international study in which several aspects of crying are investigated. The ISAC project started in 1996. In every country an attempt was made to obtain data of at least 50 male and 50 female respondents, mainly

students. For the analyses reported here, data were available from 2181 men and 2915 women living in 35 countries. To improve sample homogeneity, only young adults aged between 16 and 28 years were included in the data analyses. Moreover, only data from countries with at least 30 participants of each sex were included. Fifty-four respondents indicated they had not cried since they were 17 years of age. Because they comprised only 1.3% of the sample, scattered over many countries, their data were removed from the sample and not further considered. The final data set consisted of 4003 respondents from 30 countries (2323 women, 1680 men), with a mean age of 21.3 years (men 21.9; women 20.8). Sample information per country is summarized in Table 1.

--Insert Table 1 about here--

Measures

The ISAC questionnaire (Vingerhoets, 1995) is based on several existing questionnaires (e.g., the Weeping Frequency Scale, Labott & Martin, 1987; the Crying Frequency Scale, Kraemer & Hastrup, 1986; Crying Questionnaire, Williams, 1982; Williams & Morris, 1996), and has been further extended in consultation with the international collaborators. The aim was to develop a relatively context-free instrument, which means that it uses concepts that are universally applicable, as far as can be established (Berry et al., 1992). The basic questionnaire was written in English. To produce translations into different languages, the collaborators from non-English spoken countries were instructed to use the back-translation procedure described by Brislin (1980). The following variables included in this questionnaire were used to address the present research questions:

Mood change was assessed using a scale including the following seven mood states: (1) relaxed, (2) in control, (3) happy, (4) relieved, (5) tense, (6) depressed, and (7) sad. The respondents indicated whether they generally experienced more, the same, or less of the specified mood after a crying episode, as compared to before. For each mood indicator, a positive change was scored with +1 ("more" for

mood states 1 to 4, “less” for mood states 5 to 7), no change was scored as 0, and a negative change was scored as -1 . The scale yields a total score (Mood Change Score: MCS) ranging between -7 and $+7$, with -7 indicating a maximum deterioration of one’s mood after crying, and $+7$ a maximum positive mood change. Cronbach’s alpha for this scale was .77.

Shame was assessed by the extent to which the respondent agreed with the following item: “I feel ashamed when I am crying”. A 7-point Likert scale yielded a minimum score of 0 (I do not agree) and a maximum of 7 (I agree).

Estimated Crying Frequency (ECF) is the (recollected) number of times the respondent has cried in the last four weeks. Most of the respondents cried between zero and 10 times; the responses of the 2.7 percent of respondents who reported crying more than 10 times were treated as missing.

Apart from these questionnaire variables, we made use of the following country characteristics.

Individualism-Collectivism and *Masculinity-Femininity* are country characteristics distinguished by Hofstede (1980, 1983). In his operationalization, Individualism-Collectivism refers to free time and freedom and independency from the organization one is affiliated to. Masculinity-Femininity refers to the importance of material and status aspects of the job and the company and the relative unimportance of social relations between colleagues and secondary aspects like living area. Unfortunately, Hofstede did not report data for 10 of the countries included in our data set. To avoid the loss of data, we followed Fischer and Manstead (2000) by using Taiwanese data for China, West-African data for Ghana and Nigeria, East-African data for Kenya, Norwegian data for Iceland, and (former) Yugoslavian data for Lithuania, Romania, Poland and Bulgaria.

The *Gender Empowerment Measure* (GEM) of the United Nations Development Program (1996) is an index of the degree of participation of women in economic and political life. It tracks the percentage of women in parliament and in administration and management, the percentage of female professional and technical workers, and women’s earned income share as a percentage of that of men. Data for five

specific countries were lacking, namely Ghana, Kenya, Lithuania, Nepal, and Nigeria. For these countries values were substituted from the closest neighboring country (Togo, Sudan, Estonia, India, and Cameroon, respectively).

National income is operationalized by using the gross domestic product per capita (GDPpc), which is a calculation of the buying power of a country per capita in US dollars, derived from the World Factbook (CIA, 1998). The figures were mostly based on the year 1996, except for the countries Bulgaria, China, Finland, Malaysia, Peru, Poland, Romania, and Turkey, for which estimates from 1998 were used.

Mean Annual Temperature (MAT) was retrieved from the database of Georgas (see Georgas, Van de Vijver, & Berry, 2000). Data for Lithuania and Iceland were missing and were substituted by Polish and Norwegian data, respectively.

Procedure

The procedure of data collection varied somewhat among countries. In some countries (e.g., The Netherlands) the questionnaire was taken home to be completed. Elsewhere (e.g., Greece), it was administered during lectures. At some universities students were summoned to co-operate, in other cases they participated in order to fulfill course requirements or to earn a small sum of money, and in still other cases cooperation was entirely on a voluntary basis. Data collected from more than one location within a country (e.g., Belgium, Brazil, Greece, India) were pooled. Data entry, coding and analyses were carried out at Tilburg University (The Netherlands).

Results

Crying frequency

Estimated crying frequency (ECF) differed significantly between the sexes. Men reported having cried 1.0 times on average in the previous four weeks, whereas women reported an average of 2.7 times

($F_{(1,3663)} = 437.9, p \leq .001, \eta^2 = .10$). Differences were also found among countries ($F_{(29,3663)} = 5.5, p \leq .001$). The USA scored on average 2.7, whereas China scored .9 (see Table 2 for the means of all countries). The η^2 for country was .04, and for the (significant) interaction between country and sex .02 ($F_{(29,3663)} = 2.3, p \leq .001$).

--- Insert Table 2 about here ---

Mood change after crying

Both men and women indicated that they generally felt better after crying ($M = 3.3$ and 3.7 , respectively; $F_{(1,3722)} = 18.4, p \leq .001$), with sex hardly explaining any variance ($\eta^2 < .01$). Differences among countries were also found ($F_{(29,3722)} = 5.6, p \leq .001, \eta^2 = .04$), with Finnish respondents scoring highest ($M = 4.8$) and Nigerian lowest ($M = 2.3$; see Table 2 for the means of all countries). There was a small interaction effect between sex and country ($F_{(29,3722)} = 1.5, p = .052, \eta^2 = .01$).

Shame

Men felt more ashamed while crying than women did ($M = 4.1$ and $3.7, SD = 2.1$ and 2.0 , respectively; $F_{(1,3870)} = 21.5, p \leq .001$), but the percentage of variance explained by sex was low ($\eta^2 < .01$). Feelings of shame while crying were also significantly different among countries ($F_{(29,3870)} = 5.8, p \leq .001; \eta^2 = .04$). The highest average scores were found in Finland, the lowest in Switzerland (see Table 2). There was no significant interaction between sex and country.

Mood change, crying frequency and shame

MCS at country level was negatively associated with shame, but significantly so only for men ($r = -.45, p \leq .05$, for men; $r = -.27$, n.s., for women). ECF related neither to MCS (r 's = $.07$ and $.21$, n.s., for men and women, respectively), nor to shame (r 's = $-.07$, and $-.05$, n.s., for men and women, respectively).

Mood change, crying-related variables, and country characteristics

Pearson's correlations between MCS, ECF, shame, and the recorded country characteristics are shown in Table 3. Significant associations for women were found between MCS, GEM and MF, and between ECF and IC, GDPpc, and MAT. For men, significant links were found between MCS and GDPpc, GEM, and MAT, between shame and MAT, and between ECF and IC, MF, and GDPpc.

--- Insert Table 3 about here ---

Finally, a stepwise regression analysis was performed with MCS as the dependent variable and sex, shame, ECF, and the country indices as independent variables. Significant predictors were ECF, shame, and the country indices MF and GDPpc (see Table 4). This indicates that in more feminine and wealthier countries, and in countries where the average crying frequency is relatively high and feelings of shame are relatively low, crying generally results in a (reported) positive mood change.

--- Insert Table 4 about here ---

Discussion

The aim of the present study was to obtain more insight into the determinants of mood change after crying. We proposed that -- independent of whether mood change is a principally socially determined effect, or has a more biological basis -- it can be expected that reported mood change after crying is strongly affected by social and cultural factors. To investigate the role of these factors, we focused on associations between certain country characteristics and mood change.

The present study revealed significant differences both between sexes and between countries for crying frequency, shame over crying, and mood change after crying. Corroborating previous findings

(see Vingerhoets & Scheirs, 2000 for an overview) women reported crying more frequently. In addition, they reported less shame over crying and a slightly better mood after crying than men, but these differences were hardly significant. Generally, for both men and women in all countries, a positive mood change after crying was found.

The main focus of the present study was on the relationship between mood change after crying and country characteristics. In order to examine these relationships, we calculated bivariate correlations between the variables and a regression analysis with mood change as the dependent variable and crying-related variables and country characteristics as predictors. These two types of analyses yielded dissimilar findings, which reflects the relatively strong interrelations between the predictors. One therefore needs to be careful when interpreting the extent to which our hypotheses were supported.

Focusing on the bivariate findings, a negative association between shame and mood change was anticipated, but this association was only significant for men. Contrary to expectations, no significant relation between mood change and crying frequency was revealed. In addition, the associations with the country characteristics were not always as anticipated. In correspondence with our hypotheses was the positive association between mood change and the extent to which women participated in public life. However, the data failed to show a correlation between Individualism-Collectivism and mood change. The negative association of mood change with Masculinity-Femininity was in line with our hypothesis, but was only significant for women. For men there was a positive relation between mood change and national income, but not for women. Mood change appeared to be negatively associated with mean annual temperature, contrary to expectations, but was only significant for men. In summary, the pattern of findings of the bivariate relationships only partially supports our hypotheses. In the regression analysis, we found a significant influence of crying frequency and shame on mood change, and Masculinity-Femininity and national income emerged as important country variables. These associations

were all in accordance with our expectations. Moreover, sex did not appear to make a significant difference.

Recapitulating, the analyses at bivariate level yielded inconclusive results, which could be due to the mutual relationships between variables. Multivariate analyses yielded a clearer pattern of results: in more feminine and wealthier countries where one cries relatively often and one experiences little shame over crying, people generally report more positive mood change after crying. Although some slight sex differences were found, the general pattern of findings was consistent for both men and women. Since the Masculinity-Femininity dimension is not directly related to differences between men and women, but rather to constructs created by experiences and expectations (Fischer, Bekker, Vingerhoets, Becht, & Manstead, in press), our findings suggest that it is the perception of role patterns which influences the appraisal of mood change, rather than the actual status of women in society or biologically based sex differences. In particular the idea that crying is not appropriate for the masculine repertoire seems important. Even if crying were to result in mood improvement, other experienced or anticipated consequences (e.g., loss of face) may have a counter-effect, nullifying any positive change.

These results are in line with the notion that the degree to which one reports relief or mood improvement after crying depends on sociocultural factors. The present macro-level data indirectly lend support to Cornelius' (1997) hypothesis that mood improvement after crying is a consequence of how present others react to the crying. From the psychological point of view, it is important to examine whether the associations reported here also hold at the micro-level. Until now, little research has been done, but the findings presented here, together with the preliminary data reported by Cornelius (1997), and the findings of Labott and Teleha (1996) and Schlosser (1986), emphasize the need to examine mood change after crying in relation to experienced shame, the presence of others, and how appropriate crying in that specific situation is perceived by one's peers.

The fact that experienced mood improvement is also dependent on cultural factors does not necessarily imply that psychobiological factors have no role to play. In several other psychobiological phenomena, including premenstrual syndrome and “maternity blues”, a complex interaction between biological and sociocultural factors has been suggested (e.g., Eugster, Horsten, & Vingerhoets, in press), showing that such an interaction is by no means exceptional. Apart from paying more attention to person characteristics, specific context variables, and the broader sociocultural setting, we also argue that the investigation of psychobiological processes should not be neglected in future studies of crying and mood change.

For an adequate evaluation of the findings of cross-cultural studies, one needs to be aware of the possible role of confounds and bias. The present study is vulnerable to the same general problems as those outlined by Scherer (1997) in his cross-cultural ISEAR project. First, it is entirely based on self-reports, which are (besides their well-known general weaknesses) especially vulnerable to response bias. If respondents in some countries tend to score high on all measures and participants in other countries generally obtain low scores, this will result in positive correlations between variables. A replication of the findings reported here using observational methods would be highly desirable. Secondly, the samples (university students) are, of course, not representative of the general population of the respective countries. There can even be cross-cultural differences in the representativeness of students for a national population. On the other hand, as Scherer (1997) has pointed out, the use of student samples makes the datasets more homogeneous across countries, and thus more appropriate for purposes of comparison. It should also be noted that because the data were pooled to create country specific scores, the sample was relatively small, although pooled data are generally more stable than individual cases. A further limitation of this study is the substitution of country characteristics when certain information about a specific country was missing. Data from neighboring countries concerning weather indices are likely to be reasonably valid, but whether psycho-cultural characteristics can be

substituted from one country to another is more debatable. Finally, there is the issue of whether a single index can adequately represent the wide variety of cultural groups within some countries.

Despite these weaknesses, the present study has yielded some intriguing findings that should help to promote the development of more specific hypotheses about the role of cultural factors in crying and its relation to health and well-being. The present data suggest that how one feels after a crying episode is influenced by how crying is appraised and what the (expected) reactions from the social environment are. If crying is considered an adequate or justified reaction, others may offer comfort and emotional support; however, if the shedding of tears is regarded as inappropriate, it is more likely to lead to disapproval and anger. Such reactions may in turn be determined by whether or not cultural (display) rules are violated or complied with. Whatever the case, crying appears to be a universally strong social stimulus which seldom leaves one own's mood and behavior, or that of others, unaffected. Future studies should seek to unravel the factors that exert an influence on crying behavior and its effect on the mood of individuals in specific situations.

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Table 1

Sample size and mean age per country

| | Country | Women | | Men | | Total | |
|----|-----------|-------|----------|-----|----------|-------|----------|
| | | N | mean age | N | mean age | N | mean age |
| 1 | Australia | 174 | 19.0 | 59 | 20.3 | 233 | 19.7 |
| 2 | Belgium | 125 | 28.5 | 31 | 33.6 | 156 | 31.0 |
| 3 | Brazil | 178 | 27.5 | 145 | 23.7 | 323 | 25.6 |
| 4 | Bulgaria | 32 | 30.5 | 32 | 29.5 | 64 | 30.0 |
| 5 | Chile | 52 | 21.4 | 52 | 22.1 | 104 | 21.7 |
| 6 | China | 92 | 21.8 | 56 | 22.2 | 148 | 22.0 |
| 7 | Finland | 31 | 27.5 | 39 | 26.9 | 70 | 27.2 |
| 8 | Germany | 45 | 22.2 | 32 | 24.3 | 77 | 23.3 |
| 9 | Ghana | 40 | 27.1 | 39 | 27.6 | 79 | 27.4 |
| 10 | Greece | 76 | 21.5 | 34 | 22.9 | 110 | 22.2 |
| 11 | Iceland | 154 | 24.7 | 126 | 24.4 | 280 | 24.6 |
| 12 | India | 85 | 25.7 | 116 | 28.3 | 201 | 27.0 |
| 13 | Indonesia | 105 | 21.3 | 36 | 27.0 | 141 | 24.2 |
| 14 | Israel | 48 | 22.1 | 47 | 23.3 | 95 | 22.7 |
| 15 | Italy | 78 | 20.1 | 35 | 19.7 | 113 | 19.9 |
| 16 | Kenya | 71 | 22.2 | 85 | 21.1 | 156 | 21.7 |
| 17 | Lithuania | 135 | 19.7 | 53 | 19.9 | 188 | 19.8 |
| 18 | Malaysia | 48 | 21.9 | 39 | 21.5 | 87 | 21.7 |
| 19 | Nepal | 45 | 22.8 | 49 | 23.4 | 94 | 23.1 |

| | | | | | | | |
|----|-------------|------|------|------|------|------|------|
| 20 | Netherlands | 75 | 21.1 | 82 | 22.6 | 157 | 21.9 |
| 21 | Nigeria | 36 | 19.8 | 51 | 22.0 | 87 | 20.9 |
| 22 | Peru | 48 | 21.0 | 43 | 21.2 | 91 | 21.1 |
| 23 | Poland | 56 | 19.4 | 52 | 20.6 | 108 | 20.0 |
| 24 | Portugal | 59 | 23.0 | 60 | 23.1 | 119 | 23.1 |
| 25 | Romania | 90 | 21.9 | 69 | 21.8 | 159 | 21.8 |
| 26 | Spain | 50 | 20.2 | 49 | 20.6 | 99 | 20.4 |
| 27 | Sweden | 30 | 26.8 | 28 | 27.9 | 58 | 27.4 |
| 28 | Switzerland | 59 | 21.9 | 40 | 25.4 | 99 | 23.6 |
| 29 | Turkey | 50 | 21.6 | 50 | 22.1 | 100 | 21.8 |
| 30 | USA | 156 | 18.4 | 51 | 18.4 | 207 | 18.4 |
| | Total | 2323 | 20.8 | 1680 | 21.9 | 4003 | 21.3 |

Table 2

Average country scores for mood change, estimated crying frequency, and shame

| Country | MCS | | ECF | | Shame | |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | men | women | men | women | men | women |
| | M (SD) | M (SD) | M (SD) | M (SD) | M (SD) | M (SD) |
| Australia | 2.7 (3.6) | 2.7 (3.4) | 1.5 (1.7) | 2.8 (2.2) | 4.5 (1.9) | 3.8 (2.0) |
| Belgium | 4.0 (2.4) | 3.7 (2.9) | 1.3 (2.2) | 3.3 (2.6) | 4.4 (1.7) | 4.5 (1.9) |
| Brazil | 3.3 (2.9) | 4.2 (2.6) | 1.0 (1.5) | 3.1 (2.6) | 4.2 (2.0) | 3.4 (2.1) |
| Bulgaria | 2.4 (2.8) | 2.8 (3.0) | .3 (0.6) | 2.1 (2.0) | 4.0 (2.5) | 3.3 (1.9) |
| Chile | 4.5 (2.4) | 4.1 (2.4) | 1.2 (1.4) | 3.6 (2.3) | 3.5 (2.0) | 3.2 (1.7) |
| China | 3.0 (2.7) | 3.6 (2.5) | .4 (0.6) | 1.4 (1.5) | 3.4 (2.1) | 3.0 (2.0) |
| Finland | 4.7 (2.4) | 4.9 (2.5) | 1.4 (2.2) | 3.2 (2.5) | 2.9 (1.8) | 3.0 (1.9) |
| Germany | 3.7 (2.7) | 3.8 (2.3) | 1.6 (1.9) | 3.3 (2.6) | 2.8 (1.8) | 3.4 (1.9) |
| Ghana | 2.5 (2.8) | 4.2 (2.5) | .7 (1.4) | 1.7 (2.1) | 3.7 (2.2) | 3.6 (1.7) |
| Greece | 3.6 (2.2) | 3.7 (2.7) | 1.1 (1.5) | 2.8 (2.5) | 4.1 (2.2) | 3.9 (2.2) |
| Iceland | 3.6 (2.9) | 4.6 (2.7) | .6 (1.4) | 1.9 (1.9) | 3.9 (2.0) | 3.7 (1.9) |
| India | 3.6 (2.8) | 3.1 (3.4) | 1.0 (2.0) | 2.5 (2.2) | 3.8 (2.1) | 3.4 (2.0) |
| Indonesia | 2.4 (3.3) | 3.8 (2.8) | 1.0 (1.4) | 2.1 (2.0) | 4.8 (2.4) | 4.2 (1.9) |
| Israel | 2.8 (3.2) | 2.7 (3.1) | 1.3 (1.5) | 2.7 (2.3) | 3.5 (2.1) | 3.2 (1.7) |
| Italy | 2.9 (3.5) | 3.1 (2.5) | 1.7 (2.7) | 3.2 (3.2) | 4.1 (2.0) | 3.6 (2.2) |
| Kenya | 3.9 (3.5) | 3.9 (3.3) | 1.3 (1.9) | 2.1 (2.2) | 4.8 (2.4) | 3.7 (2.5) |
| Lithuania | 3.0 (3.0) | 4.5 (2.0) | .8 (1.2) | 3.1 (2.7) | 4.1 (2.1) | 3.5 (2.0) |
| Malaysia | 2.3 (2.8) | 3.8 (3.0) | .6 (1.0) | 2.1 (2.1) | 4.9 (2.2) | 3.9 (1.8) |
| Nepal | 2.0 (3.0) | 1.3 (3.2) | 1.9 (2.9) | 2.0 (2.4) | 4.3 (2.2) | 4.5 (2.1) |

| | | | | | | |
|-------------|-----------|-----------|-----------|-----------|-----------|-----------|
| Netherlands | 4.4 (2.3) | 4.3 (2.3) | .9 (1.6) | 3.4 (2.4) | 4.9 (2.0) | 4.5 (1.6) |
| Nigeria | 1.9 (3.5) | 3.0 (3.6) | 1.0 (2.1) | 1.4 (2.4) | 4.8 (2.4) | 3.9 (2.4) |
| Peru | 1.7 (4.5) | 3.1 (4.5) | .6 (1.0) | 1.6 (2.1) | 4.3 (1.9) | 4.5 (1.5) |
| Poland | 2.3 (2.5) | 3.5 (2.9) | .9 (1.8) | 3.1 (2.3) | 4.5 (2.2) | 4.4 (2.0) |
| Portugal | 3.9 (2.4) | 3.6 (2.7) | .6 (1.1) | 2.3 (2.1) | 3.6 (2.1) | 3.6 (2.0) |
| Romania | 2.7 (3.2) | 3.8 (2.8) | .9 (1.4) | 2.4 (2.5) | 4.0 (2.2) | 3.5 (2.1) |
| Spain | 3.8 (2.9) | 3.6 (2.3) | .6 (1.1) | 2.8 (2.3) | 3.7 (2.1) | 3.2 (2.0) |
| Sweden | 4.4 (2.3) | 4.9 (2.2) | .8 (1.2) | 2.8 (1.9) | 3.3 (1.7) | 3.5 (1.7) |
| Switzerland | 2.8 (3.2) | 3.5 (2.9) | .7 (1.4) | 3.3 (2.9) | 4.8 (2.0) | 4.7 (2.1) |
| Turkey | 3.2 (2.7) | 3.3 (2.8) | 1.1 (1.6) | 3.6 (3.1) | 4.4 (2.4) | 3.4 (2.2) |
| U.S. | 2.7 (3.4) | 3.0 (3.1) | 1.9 (2.2) | 3.5 (2.8) | 3.9 (2.3) | 3.7 (2.0) |
| Total | 3.3 (3.0) | 3.7 (2.9) | 1.0 (1.7) | 2.7 (2.5) | 3.7 (2.0) | 4.1 (2.2) |

Note. MCS = Mood Change Score; ECF = Estimated Crying Frequency; Shame = feeling ashamed when crying

Table 3

Correlations between country-level variables and mood change, shame, and crying frequency

| | IC | MF | GDPpc | GEM | MAT |
|--------------|--------|--------|--------|------|-------|
| Women | | | | | |
| MCS | -.01 | -.53** | .18 | .37* | -.23 |
| Shame | .10 | .20 | .05 | -.02 | .12 |
| ECF | .56*** | .09 | .58*** | .43* | -.46* |
| Men | | | | | |
| MCS | .35 | -.32 | .38* | .42* | -.42* |
| Shame | -.14 | .14 | -.22 | -.33 | .38* |
| ECF | .50** | .47** | .32 | .00 | -.07 |

Note. MCS = Mood Change Score; Shame = feeling ashamed when crying;

ECF = Estimated Crying Frequency; IC = Individualism-Collectivism;

MF = Masculinity-Femininity; GDPpc = Gross Domestic Product per capita;

GEM = Gender Empowerment Measure; MAT = Mean Annual Temperature.

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

Table 4

Summary of stepwise regression of mood change on scores averaged per country

for each sex ($n = 60$)

| Variable | B | SE B | β | |
|----------|---------|------|---------|----|
| Shame | -.402 | .160 | -.275 | * |
| MF | -.019 | .005 | -.417 | ** |
| GDPpc | .000024 | .000 | .243 | * |
| ECF | .187 | .092 | .226 | * |

Note. $R^2 = .423$. Shame = feeling ashamed when crying;

MF = Masculinity-Femininity; GDPpc = Gross Domestic

Product per capita; ECF = Estimated Crying Frequency.

* $p \leq .05$. ** $p \leq .001$.