

UNIVERSAL INTRACULTURAL AND INTERCULTURAL DIMENSIONS OF THE RECALLED FREQUENCY OF EMOTIONAL EXPERIENCE

PETER KUPPENS

EVA CEULEMANS

Katholieke Universiteit Leuven

MARIEKE E. TIMMERMAN

University of Groningen

ED DIENER

University of Illinois, Urbana-Champaign

CHU KIM-PRIETO

The College of New Jersey

This study examined the relative contribution and the nature of dimensions underlying intracultural and intercultural differences in the recalled frequency of emotional experience. From 48 nations, 9,300 participants provided self-reports of the frequency of experienced emotions and several other variables relevant to emotional experience. The data were analyzed by means of multilevel component analysis, which decomposes the data into intracultural and intercultural components. The results showed that positive affect and negative affect emerged as universal dimensions underlying intracultural differences, accounting for the relatively largest part of variance in the data (40%). These dimensions were related to life satisfaction and other variables reflecting positive and negative affectivity. Two dimensions, reflecting positive emotions and interpersonal (negative) emotions, emerged as dimensions underlying nation-level differences, accounting for a smaller proportion of the variance (6%). Intercultural differences on these dimensions were related to nation-level life satisfaction, individualism, and the cultural appropriateness of experiencing corresponding emotions. Differences among individuals affect recalled emotional experience to a greater extent than differences among nations.

Keywords: universality versus specificity; structure of recalled emotional experience; intercultural and intracultural differences; emotion

For decades, universalists, on one hand, and culturalists (or social constructionists), on the other hand, have fiercely debated whether emotions are universal or culturally determined (e.g., Ekman, in Darwin, 1872/1998; Ekman, 1993; Manstead & Fischer, 2002; Scherer & Wallbott, 1994). As keenly noted by Kitayama (2001), the origins of this discussion may be situated in the fact that emotions are both biologically grounded and culturally shaped. Not surprisingly, then, the debate has now been settled more or less, with most authors acknowledging that there are both universal and culture-specific aspects to emotion (Fontaine, Poortinga, Setiadi, & Markam, 2002; Manstead & Fischer, 2002; Mesquita & Frijda, 1992; Scherer & Wallbott, 1994; Triandis & Suh, 2002).

Although this consensus may have settled the debate, it also gave rise to new challenges. In particular, two important questions remain. First, to what extent are emotions determined by culture-common (universal) and culture-specific factors? Second and even

more challenging, exactly in what ways are emotions universal, and in what respects do they vary across cultures? The present study deals with these two issues by examining from a dimensional viewpoint to what extent and how the recalled frequency of emotional experience is determined by universal person-level and culture-level differences. To this end, we will analyze data on the self-reported frequency of emotional experience that were taken from a large-scale study, the International College Survey 2001 (ICS 2001), administered to more than 9,000 college students from 48 nations.

In the remainder of this introduction, we will first briefly discuss the concept of the structure of emotions. Second, we will discuss cross-cultural research findings pertaining to the structure of emotional experience and formulate the research questions that underlie the presented research. Third, we will introduce the technique that will be used to analyze the data to answer these questions.

THE STRUCTURE OF EMOTIONS

The structure of emotions refers to an empirically derived or theoretically constructed organization of the realm of emotion. Various organizational systems have been proposed, in which two major traditions can be discerned: the discrete emotions approach and the dimensional approach. In the discrete approach, it is assumed that there are a number of (basic) discrete emotions that are qualitatively different in terms of antecedent conditions, physiological correlates, subjective experience, and/or expressive behavior (e.g., Ekman, 1999; Oatley & Johnson-Laird, 1990). The dimensional approach mainly focuses on subjective emotional experience in terms of state or trait level. It conceptualizes the organization of emotional

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experience in terms of a space that is defined by a limited number of underlying dimensions, in which different emotion labels take different positions (e.g., Russell, 1980; Watson, 2000). It is important to emphasize that the two approaches do not exclude each other but are rather complementary ways to conceptualize the structure of emotion (Scherer & Wallbott, 1994), both in terms of object (emotions as a multifaceted whole vs. the facet of subjective experience) and in terms of the nature of the underlying structure (categorical vs. dimensional). In the present article, we will examine the structure of the recalled frequency of emotional experience from a dimensional perspective. According to the dimensional approach, it is assumed that emotional experience may be parsimoniously organized by means of two dimensions (e.g., Russell & Feldman Barrett, 1999; Watson, 2000). Several proposals have been made about the nature of these two dimensions. In one proposal, researchers have identified the dimensions as positive affect (PA) and negative affect (NA; e.g., Watson, 2000; Watson & Tellegen, 1985). In another proposal, pleasantness-unpleasantness and arousal-sleepiness have been postulated as the relevant dimensions (Russell, 1980, 2003). There is general agreement, however, that the two proposals can be seen as more or less equivalent in that the two dimension pairs can be considered to be rotated versions of one another (for more elaborate discussions, see Russell & Feldman Barrett, 1999; Watson, 2000).

THE STRUCTURE OF EMOTIONAL EXPERIENCE: CROSS-CULTURAL FINDINGS

UNIVERSAL AND CULTURE-SPECIFIC DETERMINATION OF EMOTIONAL EXPERIENCE

In general, theorists differ in their views on the extent to which the experience of emotions is universally or culturally determined (Kitayama, 2001). Depending on the focus of the study, findings have been reported that highlight a high degree of similarity among cultures in emotional experience (e.g., Russell, 1983; Russell, Lewicka, & Niit, 1989), that emphasize intercultural differences (e.g., Markus, Kitayama, & Vandenbos, 1996; Mesquita & Walker, 2003), or that indicate both (e.g., Fontaine et al., 2002; Mesquita & Frijda, 1992; Mesquita, Frijda, & Scherer, 1997; Shaver, Wu, & Schwartz, 1992). With respect to the structure of emotional experience, previous research typically concludes that there is a considerable amount of similarity across cultures (Osgood, May, & Mirron, 1975; Russell, 1983; Shaver et al., 1992) but that there are also culture-specific aspects (e.g., Fontaine et al., 2002; Mesquita et al., 1997; Mesquita & Frijda, 1992; Shaver et al., 1992). Given the duality of such research findings, it is important to have an estimate of the degree to which emotional experience is universally and culturally determined. From the dimensional perspective we have adopted, this would be reflected in an estimate of the contribution of universal dimensions of individual differences, on one hand, and dimensions of cultural differences, on the other hand, to the total variance in emotional experience. Prior research that attempted to directly quantify the relative contributions of universal and culture-specific aspects to emotional experience is sparse. Adopting a different approach as the one outlined above, however, Scherer and Wallbott (1994) provided estimates for the degree to which several aspects—including subjective experience but also physiological symptoms and motor expression—of seven emotions are determined by nation differences (nation main effect), emotion differences (emotion main effect), and their interaction, based on a sample of 37 nations. They found that the emotion main effect largely exceeded the other factors, suggesting that with respect to the studied emotion aspects, the differences between emotions are stable across nations.

INTRACULTURAL AND INTERCULTURAL DIMENSIONS OF EMOTIONAL EXPERIENCE

Intracultural dimensions, capturing the individual differences structure of emotional experience within a nation, may be either universal or culture specific. In the former case, the intracultural dimensions are the same across nations, and in the latter case, the intracultural dimensions differ across nations. As will be discussed below, in the domain of the structure of emotional experience, similar findings usually have been obtained across different nations, suggesting that the intracultural dimensions underlying emotional experience may be universal. *Intercultural dimensions*, in turn, capture the structure of nation-level differences and thus reflect culture-specific aspects of emotional experience.

In the following subsections, we will discuss previous research that pertains to intracultural and intercultural dimensions of emotional experience. Furthermore, we will respectively discuss person-level and nation-level variables that may be related to such dimensions. The study of such variables will allow us to validate and gain insight into the factors that determine intracultural and intercultural differences in emotional experience.

Universal aspects of emotional experience: Universal intracultural dimensions. Previous research pertaining to intracultural differences in emotional experience in different cultures has yielded converging findings in that the same intracultural dimensions have generally been obtained in a variety of cultures around the world, suggesting that these intracultural dimensions may be universal. As mentioned above, these dimensions correspond to the dimensions of PA and NA or equivalent solutions (Huang, Yang, & Li, 2003; Joiner, Sandin, Chorot, Lostao, & Marquina, 1997; Rodriguez & Church, 2003; Russell et al., 1989; Terraciano, McCrae, & Costa, 2003; some studies also identified a third additional dimension, namely potency, MacKinnon & Keating, 1989; Osgood et al., 1975). An individual's position on these traits reflects his or her tendency to experience different emotions of the same valence. According to appraisal theories of emotions, the quality of an emotion is determined by several evaluations or appraisals of one's circumstances. One of such basic appraisal processes reflects an evaluation in terms of pleasant-goal conducive or unpleasant-goal obstructive, which differentiates between the experience of positive and negative emotions (Scherer, 1993; Smith & Lazarus, 1993). So a person who is predisposed by temperament or life circumstances to evaluate events as pleasant or goal conducive (or unpleasant or goal obstructive) is characterized by a propensity to feel an array of pleasant (or unpleasant) feelings. PA and NA have also been assumed to be grounded in biological behavioral systems (e.g., Elliot & Thrash, 2002). Therefore, PA and NA can be considered to be likely candidates for dimensions that capture the universal structure of the recalled frequency of emotional experience.

PA and NA may be expected to be correlated with several person-level variables. As mentioned above, PA and NA depend in part on the dispositions to experience emotions of positive and negative valence. According to trait-state theories of emotions, emotion traits influence the frequency and intensity with which the corresponding emotions are experienced. Therefore, we expect that trait levels of PA and NA are positively related to state levels of PA and NA.

Furthermore, PA and NA may be expected to be associated with alternative measures of positivity and negativity. In previous research, positive and negative mood have been related to memory bias for positive and negative information (Bower, 1981; Isen, Shalker, Clark, & Karp, 1978; Parrott & Spackman, 2000; Snyder & White, 1982). Also, according to state-trait theory, high levels of PA and NA should be reflected in more frequent experiences of emotions of the corresponding valence. Apart from state measures of PA and NA, the ICS

2001 also included instructions to recall as many positive and negative events as possible in 1 minute; it may be expected that individual differences in PA and NA are related to the number of recalled instances of corresponding valence.

Culture-specific aspects of emotional experience: Intercultural dimensions. The term *intercultural dimensions* refers to dimensions that underlie differences between nations. In the present context, such differences can be meaningfully studied by using nation-level averages of variables relevant to emotional experience; such measures have proven to provide useful and valid information on the emotional climate of nations (Manstead & Fischer, 2002). For instance, Basabe et al. (2002) examined how nations may differ from each other in average affect balance (the relative frequency of positive and negative emotions) and related this intercultural variable to societal and cultural factors such as individualism, masculinity, and so on. Van de Vliert, Huang, and Parker (2004) related nation-level happiness to climate and wealth. This study will examine which dimensions underlie such nation-level differences in recalled frequency of the experience of emotions. In addition, we will relate the obtained dimensions to other nation-level variables that can be expected to be relevant to emotional experience.

First, satisfaction with life has been used as a nation-level variable reflecting the emotional climate of a nation (e.g., Inglehart & Klingemann, 2000). It is considered to be a strong indicator of subjective well-being, which is related to the experience of positive and negative emotions (Diener, Oishi, & Lucas, 2003; Veenhoven, 2000).

Second, the most widely used dimension of cross-cultural differences is individualism-collectivism (Triandis, 1995). This dimension refers to the priority given to the person or to the group or collective. Empirical studies have shown that individualism is positively correlated with subjective well-being across nations (Diener, Diener, & Diener, 1995) and with affect balance (Basabe et al., 2002). Therefore, individualism-collectivism was included to examine how it is related to the obtained intercultural dimensions of recalled emotional experience.

Finally, another possibly relevant type of intercultural variable refers to emotion norms (see also, feeling rules; e.g., Hochschild, 1983; Shaver et al., 1992), which reflect the appropriateness to experience specific emotions in one's culture. Research has shown that there are important cultural differences in such emotion norms. Furthermore, it has been demonstrated that such differences are related to actual emotional experience (Eid & Diener, 2001), making them potentially relevant to gain insight in cross-cultural differences in recalled emotional experience.

To summarize, with the present study, we aim to assess the extent to which intracultural and intercultural dimensions determine recalled emotional experience. To this end, we will examine the structure of the self-reported frequency of the experience of different emotions within and across nations; the retrospective assessment of emotional experiences is frequently used as a method to measure trait emotionality, mood, or personality (e.g., Watson, Clark, & Tellegen, 1988). Also, we aim to identify the dimensions that underlie intracultural differences of recalled emotional experience, verify whether they are of a universal or culture-specific nature, and identify the dimensions that underlie intercultural differences in recalled emotional experience. Obtained dimensions will be related to individual-level and nation-level correlates, respectively, to interpret and validate the obtained dimensions.

The present study goes beyond most previous cross-cultural research on emotional experience in several respects. First, as mentioned above, we aim to directly assess and quantify the relative contribution of intracultural and intercultural dimensions to subjective emotional

experience. Second, cross-cultural research usually includes only a limited number of nations (e.g., Eid & Diener, 2001; Fontaine et al., 2002; MacKinnon & Keating, 1989; Russell et al., 1989), whereas studies that include a large number of nations are less frequent. In the present study, we used data from 48 nations. Apart from obvious advantages of including a large number of nations (in terms of representativity, subtler discriminations), this is especially important if one wants to assess the relative contribution of intracultural and intercultural components and the nature of these contributions in a reliable way. Third, we propose a recently developed technique to analyze the data, which deals with several drawbacks of other techniques used in cross-cultural research. We will now discuss this technique in more detail.

A METHOD TO OBTAIN INTRACULTURAL AND INTERCULTURAL DIMENSIONS: MULTILEVEL COMPONENT ANALYSIS (MLCA)

One of our research aims is to verify the existence of universal intracultural dimensions; this issue is concerned with so-called structural equivalence (van de Vijver & Leung, 1997) of emotional experience across cultures or, stated differently, with the question whether (and to what degree) the interrelations among emotions are similar across nations. Moreover, we aim to determine on what characteristics cultures may differ from one another in this respect.

Previous research dedicated to the comparison of cultures or nations with respect to the intracultural structure of a set of variables mostly relied on a comparison of separate analyses per culture. In replicatory factor analysis (as proposed to be used in a cross-cultural context by Ben-Porath, 1990), the factor analytic structure obtained from data sets from different cultures is compared by means of congruence coefficients. In confirmatory factor analysis (as proposed to be used in a cross-cultural context by van de Vijver & Leung, 1997), a reference structure (obtained via an exploratory factor analysis of data from a reference nation or of the pooled data from a list of nations) is imposed on data from a specific nation, allowing researchers to assess how well the reference structure fits the data from the specific culture. To be sure, such techniques provide very valuable information. However, several drawbacks are inherent to the use of these techniques. First, because such techniques do not take both intra- and intercultural variability into account, they make it hazardous to draw firm conclusions about the degree of cross-cultural similarities and differences. Second, and most important, such techniques do not yield direct information on the nature of the dimensions on which cultures themselves may vary from one another.

Indeed Diener et al. (2003) emphasized that cross-cultural research should take into account both within- and between-culture variation. In this respect, they advocated the need for

models that provide an analysis of the homogeneity of the structure of variables across individuals within cultures, as well as revealing how groups of individuals are similar and different across cultures . . . a technique that can reveal elements of universality across cultures, as well as variation within the cultures. (pp. 418-419)

In other words, techniques are needed that model both (and thus are able to disentangle) intra- and intercultural differences in cross-cultural data.

In response to this need, Eid and Diener (2001; Eid, Langeheine, & Diener, 2003) recently introduced multigroup latent class analysis for the analysis of cross-cultural data. In short, multigroup latent class analysis is a method designed for categorical data that allows the

researcher to (a) model intracultural differences because it yields typologies of persons for each nation under study, with the types being characterized by specific response patterns, and (b) statistically compare the typologies from the included nations. It is clear that this technique meets the need to consider both intra- and intercultural differences. However, the technique is limited in various respects. First, the data need to be of a categorical nature. Although many types of data may fulfill this need (e.g., religion, occupation), many others do not. Moreover, in the present context, data on emotional experience are typically viewed as numerical data (i.e., frequency of experienced emotions or affects). Second, the technique assumes and imposes a latent typological structure underlying the data. Again, although such an assumption is straightforward in some domains of study, it is not in all; foremost, in the present context, we seek to examine the dimensional, not typological, structure that underlies emotional experience. Finally, this method does not yield a direct comparison of nations describing the intercultural differences and similarities. As a result, multigroup latent class analysis may be considered to be less appropriate in the context of the current study.

Therefore, we use a recently developed technique (MLCA; Timmerman, *in press*; see also Jansen, Hoefsloot, van der Greef, Timmerman, & Smilde, 2005) that does not suffer from the drawbacks characterizing the classical techniques, that analyzes both intracultural and intercultural differences, and that is suited for deriving latent dimensional structures from numerical data. In essence, MLCA performs, depending on the type of analysis (see below), either separate intracultural principal components analysis (PCA) per nation or one simultaneous components analysis (SCA) over all nations (see Timmerman & Kiers, 2003) on the centered data from the different nations (i.e., for each nation and each variable, the nation average is subtracted from the data from that nation). MLCA also performs a weighted (i.e., taking the number of participants per nation into account) PCA analysis on the average nation scores. As such, it yields (a) an intracultural dimensional structure underlying the variables of interest that is culture specific in the case of separate PCA analyses or universal in the case of SCA analysis and (b) an intercultural dimensional structure that describes the differences between the nations with respect to the same variables. Regarding the intracultural dimensions, structural equivalence (universality) may be assessed by comparing the combined fit of the separate intracultural PCA analyses with the fit of the overall SCA analysis. If these fit values are comparable, there is no evidence against structural equivalence (analogous to obtaining similar factor analytic solutions based on pooled data and nation-specific data), indicating that a common structure underlies the data in all nations or, in other words, that the intracultural dimensions can be considered to be universal.

In addition, because of the modeling of both intra- and intercultural differences, the technique yields an estimate of the proportion of variance in the data that is determined by the intracultural components and by the intercultural components, respectively.

METHOD

The data that were used for this study were collected in the context of the ICS 2001. This large-scale, questionnaire-based study was initiated by the Subjective Well-being Laboratory at the University of Illinois under the supervision of Ed Diener and colleagues, and as many as 69 researchers from around the world collaborated to collect the data. The study mainly focused on subjective well-being and its determinants but also included items concerning related variables such as emotions. For reasons of parsimony, we will further report only on those parts of the ICS 2001 study that were used for the current research.

PARTICIPANTS

A total of 10,018 participants took part in the ICS 2001 study, stemming from 48 different nations. Participants with missing data on the emotion frequency ratings were removed from further analyses, resulting in a total number of 9,300 participants who were included in the present study. A list of the nations that were involved in the study and the number of participants from each nation can be found in Table 1. As can be derived from this table, the list comprises nations from all continents: The list includes 7 nations from Africa and 15 nations from Asia (of which 4 are from the Middle East region), 17 nations from Europe, 2 nations from Oceania, 3 nations from North America, and 4 nations from South America. Of the participants, 5,611 (60%) were women and 3,680 (40%) were men; 9 participants did not report their gender. With respect to the age of the participants, 175 (2%) were younger than 18 years of age, 2,337 (25%) were 18 or 19 years of age, 3,245 (35%) were 20 or 21 years, 1,703 (18%) were 22 or 23 years, 769 (9%) were 24 or 25 years, 369 (4%) were 26 or 27 years, and 691 (7%) were 28 years or older (11 participants did not report their age). All participants were college students and were recruited by the local collaborators of ICS 2001.

MATERIALS

The majority of the variables was taken or derived from the data obtained via the ICS 2001 questionnaire, although some nation-level variables were taken from previous cross-cultural research (see below). For the ICS 2001 study, a paper-and-pencil questionnaire that included various scales and measures was constructed in English and translated to several other languages (e.g., Japanese, Korean, and Spanish) by the main initiators of the study. The questionnaire was sent to the various collaborators from the different participating nations (mostly university professors of personality or social psychology). Subsequently, if necessary, the local collaborators arranged for the questionnaire to be translated into their native language (which was the case for 31 nations). Following the decentering approach to translation in cross-cultural research—in which priority is given to loyalty of meaning and equal familiarity instead of loyalty to the source language (van de Vijver & Leung, 1997; Werner & Campbell, 1970)—the initiators of the study did not explicitly require a strict translation and back translation procedure from the collaborators. Instead, it was emphasized that the translation of the materials should be done primarily respecting the former concerns.

For the present study, a first group of variables consists of variables that are situated at the person level: frequency of experienced emotions, self-reported current mood, and positive and negative event recall. A second group of variables is situated at the nation level: satisfaction with life, individualism, and specific emotion norms.

Person-Level Variables

Frequency of experienced emotions. For a list of 14 emotions, participants were asked to rate how often they had felt each emotion in the past week. The list consisted of the following emotion labels: pleasant, happy, cheerful, pride, gratitude, love, unpleasant, sad, anger, guilt, shame, worry, stress, and jealousy. The list of emotion terms was designed to cover a broad array of emotional experience. The items were selected such that each of the discrete emotion categories from the personality structure of affect as proposed by Diener, Smith, and Fujita (1995) was represented by one or more items: love (love, gratitude), joy (happy, cheerful, pride), fear (worry, stress), anger (anger), shame (shame, guilt), and sadness (sad).

TABLE 1
Number of Participants and Component Scores on the Intercultural Components of
the Nations Included in the Study

<i>Nation</i>	<i>n</i>	<i>Component 1</i>	<i>Component 2</i>
Australia	173	0.50	-0.64
Austria	121	-0.08	-0.52
Bangladesh	92	-1.06	1.90
Belgium	114	0.36	-1.11
Brazil	245	1.06	0.71
Bulgaria	127	-0.96	-0.54
Canada	103	1.27	-2.06
Cameroon	105	-0.13	0.58
Chile	354	1.43	-0.07
China	345	-2.04	-1.20
Columbia	354	0.93	0.25
Croatia	138	-0.53	-0.24
Cyprus	93	-0.95	0.74
Egypt	126	-0.45	1.99
Georgia	105	-0.34	-0.30
Germany	146	-0.29	-0.66
Ghana	141	0.20	-0.72
Greece	217	-1.08	-0.61
Hong Kong	185	-1.16	1.27
Hungary	543	-0.55	-1.26
India	115	-0.01	-0.68
Indonesia	238	1.05	0.71
Iran	179	-1.59	2.14
Italy	290	-1.01	0.76
Japan	167	-1.34	1.69
Kuwait	72	0.91	2.81
Malaysia	370	0.56	1.16
Mexico	323	2.17	0.09
Nepal	99	-0.47	0.43
Nigeria	282	1.08	-0.25
Philippines	193	1.06	0.89
Poland	549	-0.81	-0.89
Portugal	225	-0.14	-0.80
Russia	105	-0.76	-0.52
Singapore	90	-1.19	1.02
Slovakia	102	-1.05	0.26
Slovenia	274	0.46	-1.54
South Africa	27	1.74	-0.03
South Korea	181	-0.34	-0.04
Spain	330	0.60	0.06
Switzerland	142	-0.05	-1.85
Thailand	190	-0.04	1.53
The Netherlands	39	-0.10	-1.40
Turkey	121	-1.40	1.91
Uganda	113	-0.66	0.07
United States	353	0.39	0.01
Venezuela	201	1.43	-0.19
Zimbabwe	103	0.23	0.60

Furthermore, the labels *pleasant* and *unpleasant* were included as well. This was done to accurately label found dimensions of recalled emotional experience and to evaluate to what degree the other emotions are experienced as pleasant or unpleasant in the different cultures. It was decided not to include culture-specific emotion terms for each nation because this would complicate a clear-cut comparison of cultures and because prior research suggests that the inclusion of culture-specific terms does not substantially alter obtained emotion structures (meaning that such terms generally tend to cluster with general emotion terms; Fontaine et al., 2002; Scollon, Diener, Oishi, & Biswas-Diener, 2004). Participants had to indicate the experienced frequency of each emotion by means of a 9-point scale ranging from 1 (*not at all*) to 9 (*all the time*).

Current mood. Current mood was assessed separately for positive and negative mood by means of single-item measures. One item asked, "How positive or pleasant are you feeling right now?" This had to be rated on a 9-point scale ranging from 1 (*not at all positive/pleasant*) to 9 (*extremely positive/pleasant*). The other item asked, "How negative or unpleasant are you feeling right now?" This also had to be rated on a 9-point scale ranging from 1 (*not at all negative/unpleasant*) to 9 (*extremely negative/unpleasant*).

Positive and negative event recall. Two items assessed how many recently experienced positive and negative events the participants were able to recall in a limited amount of time. One item asked to recall as many good events as possible from the past week in the time frame of 1 minute. During recall, they had to write down a one-word description of each event. Subsequently, they were asked to count the number of events and indicate how many events they had been able to recall on a 9-point scale ranging from 1 (*0 events*) to 9 (*more than 7 events*). A second item asked participants to recall as many bad events as possible, using the same instructions and response format.

Nation-Level Variables

Satisfaction with life. In the ICS 2001 questionnaire, satisfaction with life was measured with the Satisfaction With Life Scale developed by Pavot and Diener (1993). The scale consists of five items such as "I am satisfied with my life" and "So far I have gotten the important things I want in life." These have to be rated on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The average score across the five items forms a satisfaction with life score. The scale proved to be internally consistent ($\alpha = .93$). To obtain a nation-level score, the scale score was averaged across participants for each nation separately.

Individualism. In the study by Diener et al. (1995), individualism scores of a list of 55 nations were reported. The scores were obtained from a leading expert in the area of individualism-collectivism, Harry C. Triandis, who rated the 55 nations on a 1 to 10 scale on which 1 was the most collectivistic and 10 the most individualistic. The obtained individualism scores proved to be a valid indicator of individualism as they were strongly related to other measures of individualism and showed predictable correlations with various other nation-level variables (Diener et al., 1995).

Emotion norms. Comparable to the method used by Eid and Diener (2001), emotion norms were assessed by asking ICS 2001 participants for the appropriateness in their nation

of a list of emotion terms. The list consisted of the same emotions as those used for the emotion frequency ratings, with two exceptions: (a) The more general emotion terms *pleasant* and *unpleasant* were not included and (b) the emotion term *contentment* was added to the list (the latter was done for specific research questions not relevant to the current research). The participants were asked to rate for each emotion term, "How appropriate and valued is each of the following emotions in your society? Do people approve of this emotion?" They did so using a 9-point scale ranging from 1 (*not at all*) to 9 (*very much*). For each emotion, the scores were then averaged across participants to form nation-level variables.

PROCEDURE

In each nation, the participants received the ICS 2001 questionnaire instructions in the language of the college they attended (which assures as much as possible that each participant received a questionnaire in his or her native language or at least mastered the questionnaire language). In several of the multilanguage nations involved (e.g., Hong Kong, India), the data were collected from subsamples in different languages. At the start of the questionnaire, the participants were asked to read each item carefully and to indicate their answer by filling in the corresponding circle on a standard answer sheet (which enabled subsequent computerized data input). The participants were reminded that there were no right or wrong answers and were requested to be open and honest in their responding. After the administration of the questionnaire, the local collaborators sent the completed answer sheets to the main organizers of the ICS 2001 study. When all data were processed, the individual collaborators received the complete data from all nations.

ANALYSIS

MLCA: INTRACULTURAL AND INTERCULTURAL STRUCTURE OF RECALLED EMOTIONAL EXPERIENCE

As explained above, the ICS 2001 survey yielded a 9,300 participants by 14 emotion frequency data matrix D , with each participant belonging to one of 48 nations. In the present study, D was analysed by means of MLCA (Timmerman, in press) to obtain (a) intracultural dimensions that underlie person-level differences in recalled emotional experience once nation averages have been removed from the data and (b) intercultural dimensions that underlie nation-level differences. To this aim, the standardized data matrix D (i.e., analogously to the common procedures in ordinary PCA, the data are centered and standardised per variable over all 9,300 participants) is first split into two matrices D^{intra} and D^{inter} , of which the elements are defined as

$$d_{jk}^{\text{intra}} = d_{jik} - d_{ik}^{\text{inter}} \quad (1)$$

$$d_{ik}^{\text{inter}} = \frac{\sum_{j=1}^{J_i} d_{jik}}{J_i} \quad (2)$$

where i denotes the i th nation, j_i denotes the j th participant from nation i , k denotes the k th emotion term, and J_i denotes the number of participants from nation i .

Subsequently, to obtain intracultural dimensions, two different types of models can be fitted to D^{intra} . The first type of model consists of separate PCA models to the D_i^{intra} submatrices of the 48 nations, which yield culture-specific intracultural dimensions:

$$d_{jik}^{\text{intra}} \approx \sum_{q_i=1}^Q a_{jiq_i}^{\text{intra}} b_{kq_i}^{\text{intra}} \quad (3)$$

where q_i denotes the q th intracultural component of nation i , Q denotes the total number of intracultural components (which is chosen to be equal for all nations), $a_{jiq_i}^{\text{intra}}$ denotes the score of the j th participant of nation i on the q th component of nation i , and $b_{kq_i}^{\text{intra}}$ denotes the loading of the k th emotion term on the q th component of nation i . The second type of model is a SCA model to the complete D^{intra} matrix, which yields universal intracultural dimensions:

$$d_{jik}^{\text{intra}} \approx \sum_{q=1}^Q a_{jiq}^{\text{intra}} b_{kq}^{\text{intra}} \quad (4)$$

where q denotes the q th universal intracultural component, Q denotes the total number of universal intracultural components, a_{jiq}^{intra} denotes the score of the j th participant of nation i on the q th component, and b_{kq}^{intra} denotes the loading of the k th emotion term on the q th component. One may consider four different SCA models (SCA-P, SCA-IND, SCA-PF2, and SCA-ECP) that differ with respect to the restrictions that are imposed on the variances and covariances of the Q intracultural components (see Table 2, where the models are listed from least to most restrictive; for a detailed discussion of the different models, see Timmerman & Kiers, 2003).

To obtain intercultural dimensions, a weighted PCA analysis is applied to D^{inter} :

$$\sqrt{J_i} d_{ik}^{\text{inter}} \approx \sum_{p=1}^P a_{ip}^{\text{inter}} b_{kp}^{\text{inter}} \quad (5)$$

where p denotes the p th intercultural component, P denotes the total number of intercultural components, a_{ip}^{inter} denotes the score of nation i on the p th component, and b_{kp}^{inter} denotes the loading of the k th emotion term on the p th component. Similar to standard PCA analysis, interpretations of the culture-specific intracultural or universal intracultural and intercultural dimensions of recalled emotional experience are obtained by considering which features characterize the emotion terms with the highest loadings.

Regarding fit, the total variance of the data can be divided into an intracultural and intercultural part. The magnitude of both parts gives an indication of the extent to which the differences in recalled emotional experience are determined by intracultural and intercultural factors. In the MLCA model, fit values are calculated for both the intracultural and intercultural part of the model; these values thus reflect how much of the respective parts of variance in the data can be accounted for by the obtained intracultural and intercultural dimensions, respectively. To check the assumption of structural equivalence—which is necessary for deriving universal intracultural dimensions—the combined fit value of the separate PCA analyses is compared with the SCA analysis fit value. If the much more constrained SCA models have fit values comparable in size with the PCA, the interpretation of the separate

TABLE 2
The Restrictions That the Four SCA Models Impose on the
Covariances and Variances of the Intracultural Components

<i>Model</i>	<i>Covariances</i>	<i>Variances</i>
SCA-P	Free	Free
SCA-PF2	Equal across nations	Free
SCA-IND	Equal to 0	Free
SCA-ECP	Equal across nations ^a	Equal across nations

NOTE: SCA = simultaneous component analysis.

a. In the case of orthogonal rotation (e.g., varimax), equal to 0.

PCAs will not differ substantially from the SCA model, which implies no evidence that the assumption of structural equivalence is violated. To decide whether the fit values of the separate PCAs and SCA are comparable, one may check whether the difference between both is considerably smaller than the fit difference between SCA analyses with Q and $Q + 1$ components, as this indicates that allowing for an additional universal intracultural component (SCA analysis with $Q + 1$ components) yields a better description of the data than allowing for Q culture-specific intracultural dimensions (separate PCAs).

Note that, in practice, one will fit PCA and the four types of SCA models with varying values for P and Q and select the models that best describe the data on the basis of the fit values, the results of split-half stability analyses, and interpretability (for details about model selection, see Timmerman, in press).

RELATION WITH PERSON-LEVEL AND NATION-LEVEL VARIABLES

The intracultural and intercultural dimensions obtained from the MLCA were further related to the possibly relevant person-level variables, which were centered per nation, and nation-level variables. To this end, correlations were computed between the dimensions and the variables in question.

RESULTS

FIT RESULTS AND SELECTION OF MLCA MODEL

A first inspection of the data revealed that 91% of the total variance in the emotion frequency data was determined by intracultural differences (and error variance) and 9% by intercultural differences. Regarding intracultural differences, the fit results of the MLCA analyses are plotted in Figure 1. Applying a scree test to Figure 1 shows an elbow at the two-component solutions, indicating the selection of a solution with two intracultural components ($Q = 2$). A further inspection of the fit values reveals that the combined fit value of the separate two-component PCA models for the submatrices of each nation (CA) was highly comparable to the fit values of the various SCA solutions with two components; furthermore, the fit values of the SCA solutions with three components are considerably better than the combined fit value of the separate PCA models with two components. On the basis of these results (see above), it can be concluded that there is no evidence against structural equivalence, indicating that the obtained intracultural dimensions are common or universal across nations.

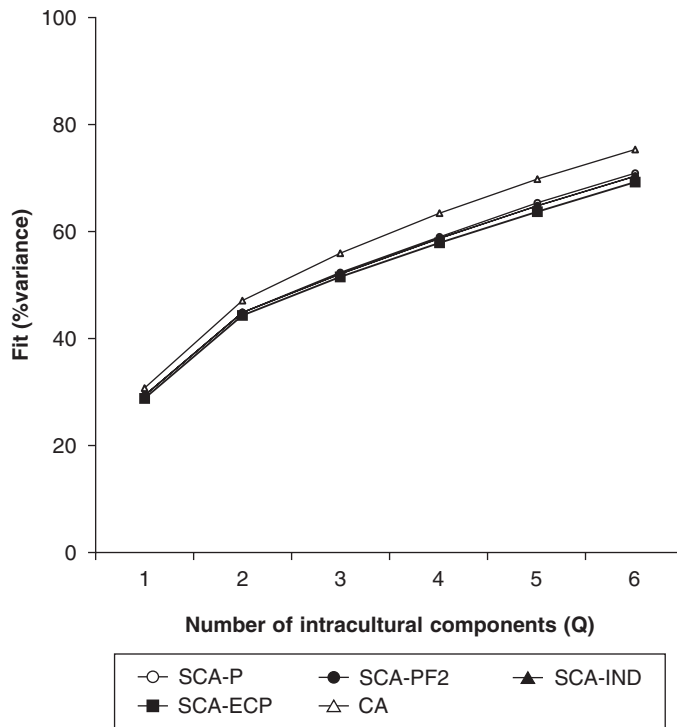


Figure 1: Fit Values (Percentage of Variance of Intracultural Differences Accounted for) of SCA-P, SCA-PF2, SCA-IND, and SCA-ECP Solutions of the MLCA and of the CA Solution for Different Numbers of Intracultural Components

NOTE: SCA-P = model with no restrictions on variances and covariances of components; SCA-PF2 = model with covariances of components restricted to be equal across nations; SCA-IND = model with covariances of components restricted to be equal to zero; SCA-ECP = model with variances and covariances of components restricted to be equal across nations; MLCA = multilevel component analysis; CA = separate principal component analysis solutions per nation.

Considering the fit values of the different SCA solutions with two components in more detail, the fit value of the most restrictive SCA solution—that is, the SCA-ECP solution—is almost equal to those of SCA models that impose fewer restrictions (see Figure 1). Therefore, we selected the SCA-ECP solution because it provides an optimal balance between (good) fit and (low) complexity; the solution accounts for 44% of the intracultural variance in recalled emotional experience, corresponding to 40% of the total variance in the data. This SCA-ECP solution is varimax rotated (see Table 2). As this is an orthogonal rotation, the intracultural components are uncorrelated in all nations. Furthermore, the variances of the component scores are equal across nations. Finally, split-half reliability analyses revealed that this solution is extremely stable, indicating that the current results likely are valid for the entire population.

Regarding intercultural differences, Figure 2 displays the fit values for increasing numbers of components (P). The results favor a two-component solution. Moreover, split-half stability analyses also indicated that the two-component model provided the most stable solution. This solution accounts for 62% of the intercultural variance in recalled emotional experience, corresponding to 6% of the total variance in the data.

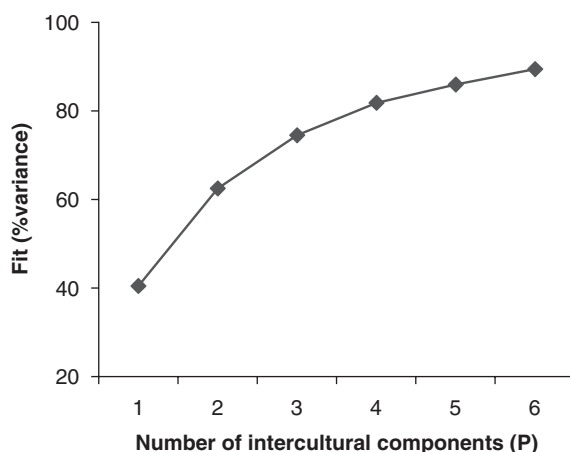


Figure 2: Fit Values (Percentage of Variance of Intercultural Differences Accounted for) for Different Numbers of Intercultural Components

Combined, the retained MLCA solution thus comprises two universal intracultural and two intercultural dimensions, which together account for 46% of the total variance in the data. We will now discuss the two sets of dimensions, along with their relations with the corresponding person-level and nation-level variables.

UNIVERSAL INTRACULTURAL DIMENSIONS OF RECALLED EMOTIONAL EXPERIENCE

The component loadings of the emotion terms on the two universal intracultural components can be found in Table 3. The two components can be interpreted as NA and PA, as one component (Component 1) is clearly characterized by high component loadings for emotions with a negative valence, whereas the other component (Component 2) is characterized by high component loadings for emotions with a positive valence.

Subsequently, correlations were calculated between the component scores of the participants on each of the two universal intracultural components, on one hand, and their current mood and the number of positive and negative events they had recalled, on the other hand. Because person-level scores of the Satisfaction With Life Scale were available as well, we also correlated the component scores with this scale score. The results can be found in Table 4 and show that the dimension reflecting negative emotions is positively correlated (above .20) with unpleasant mood and negative event recall and negatively correlated with pleasant mood and satisfaction with life; conversely, the dimension reflecting positive emotions is positively correlated with pleasant mood, positive event recall, and satisfaction with life.

INTERCULTURAL DIMENSIONS OF RECALLED EMOTIONAL EXPERIENCE

The component loadings of the emotion terms on the two intercultural components can be found in Table 5. On Component 1, all the emotions with a positive valence load highly. On Component 2, the interpersonal negative emotions of shame, guilt, and jealousy have the highest loadings, but also gratitude has a high loading on this component. Therefore,

TABLE 3
Loadings of the Emotion Terms on the Universal Intracultural Components

	<i>Component 1 (NA)</i>	<i>Component 2 (PA)</i>
Pleasant	-.31	.69
Happy	-.25	.75
Cheerful	-.23	.69
Pride	.07	.46
Gratitude	.13	.52
Love	.07	.60
Unpleasant	.57	-.37
Sad	.67	-.26
Anger	.58	-.07
Guilt	.62	.06
Shame	.55	.04
Worry	.66	-.09
Stress	.60	-.09
Jealousy	.44	.15

NOTE: NA = negative affect; PA = positive affect. Values higher than .40 are displayed in bold.

TABLE 4
Correlations Among Intracultural Components Negative Affect (NA) and Positive Affect (PA) and Nation-Centered Mood State, Recalled Positive and Negative Events, and Satisfaction With Life (With 95% Confidence Intervals, CIs)

	<i>Component 1 (NA)</i>	<i>95% CI</i>	<i>Component 2 (PA)</i>	<i>95% CI</i>
Pleasant mood	-.27	-.28/-.25	.35	.33/.37
Unpleasant mood	.22	.20/.24	-.15	-.17/-.13
Positive event recall	-.11	-.13/-.08	.23	.21/.25
Negative event recall	.22	.20/.24	-.08	-.10/-.06
Satisfaction with life	-.26	-.28/-.24	.41	.39/.43

NOTE: $N > 8,800$, depending on missing data. All correlations are significant at $p < .0001$.

we label the components as reflecting positive emotions and (mainly negative) interpersonal emotions. Note that when comparing the universal intracultural component loadings (Table 3) with the intercultural component loadings (Table 5), it can be seen that the loadings on the intercultural components are generally lower than those reported for the intracultural components. This reflects the fact that the intracultural dimensions explain a higher proportion of the total variance than the intercultural dimensions.

The component scores of the 48 nations on the two intercultural components are reported in Table 1; a graphical representation is given in Figure 3. These component scores were further correlated with the nation-level variables of satisfaction with life, individualism, and emotion norms for specific emotions. The results can be found in Table 6. The first component is positively correlated with satisfaction with life, and emotion norms referring to positive emotions. The second component is negatively associated with satisfaction with life, individualism, and the emotion norms for love and positively with the emotion norms for anger, shame, and jealousy. In line with our interpretation of this latter

TABLE 5
Loadings of the Emotion Terms on the Intercultural Components

	<i>Component 1</i>	<i>Component 2</i>
Pleasant	.21	-.06
Happy	.26	.02
Cheerful	.27	.02
Pride	.30	.08
Gratitude	.34	.19
Love	.22	.02
Unpleasant	-.10	.15
Sad	-.05	.16
Anger	-.02	.17
Guilt	.03	.23
Shame	.06	.28
Worry	.05	.16
Stress	-.06	.10
Jealousy	.06	.19

NOTE: Values higher than .20 are displayed in bold.

component, it seems to have higher correlations with emotion norms referring to more interpersonal emotions such as love, anger, shame, and jealousy as compared with noninterpersonal emotions.

Finally, it could be argued that the used list of emotion terms is unbalanced in the sense that some emotion categories are represented by more terms than are others and that the inclusion of the terms *pleasant* and *unpleasant* may push the dimensional solution in a particular direction. Therefore, we performed an additional analysis including only a subset of the emotion terms—happy, sad, anger, love, guilt, shame, and worry—such that each of the major emotion categories in the personality structure of affect as proposed by Diener et al. (1995) is represented by one emotion term only (both shame and guilt were included, however, as research has demonstrated that they reflect different emotion categories; Smits, De Boeck, Kuppens, & Van Mechelen, 2002) and by omitting the terms *pleasant* and *unpleasant*. In brief, the results of this analysis were highly similar to those from the original analysis including all emotion terms: Two universal intracultural and two intercultural dimensions were obtained, with loadings highly similar to those of the matching emotion terms in the original analysis (supporting identical interpretations of the dimensions).

DISCUSSION

UNIVERSAL INTRACULTURAL AND INTERCULTURAL DETERMINATION OF RECALLED EMOTIONAL EXPERIENCE

The present study sought to examine the relative contribution and nature of within- and between-cultural factors in determining the recalled frequency of particular emotional experiences. For this purpose, we adopted a dimensional approach to the structure of emotions in which it is assumed that the realm of emotional experience can be grasped by

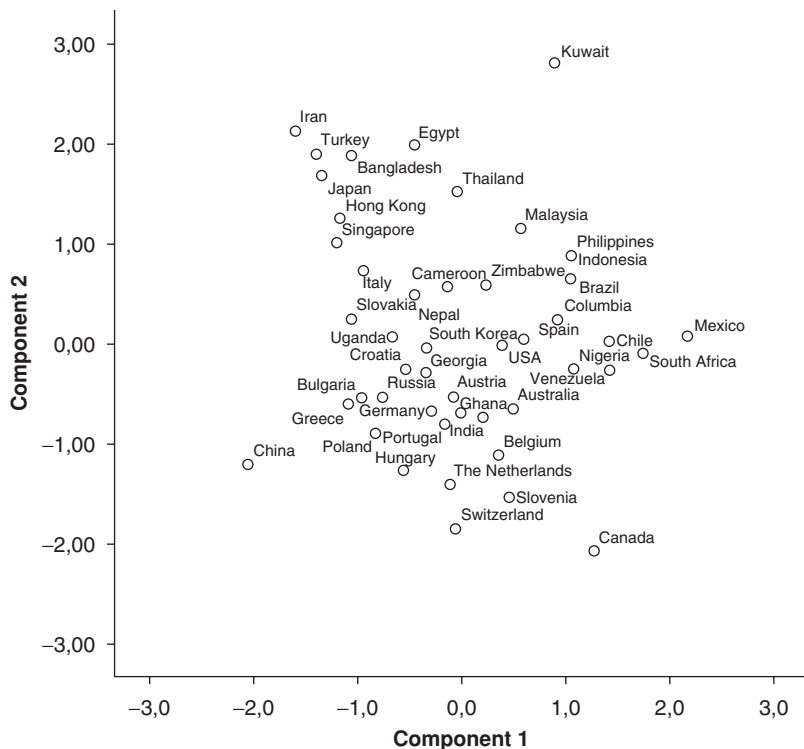


Figure 3: Component Scores of the Nations on the Intercultural Components PA (Component 1) and (Negative) Interpersonal Emotions (Component 2)

means of a limited number of underlying dimensions. The results indicated that the recalled frequency of emotional experiences of an individual is determined by both the individual's position on universal dimensions of emotional experience and the individual's nation's position on intercultural dimensions. Consistent with current thinking our results thus demonstrate that emotions are both universally grounded and culturally shaped (Fontaine et al., 2002; Kitayama, 2001; Manstead & Fischer, 2002; Mesquita & Frijda, 1992; Scherer & Wallbott, 1994; Triandis & Suh, 2002).

Recalled emotional experience was found to be determined to a greater extent by universal person-level factors and to a smaller extent by intercultural nation-level factors, however. Although it cannot be ruled out that some part of the intracultural variance that is captured by the SCA model may reflect error variance, the substantial difference between explained intracultural variance (40%) and intercultural variance (6%) strongly suggests that individual differences affect the frequency of emotional experiences to a greater extent than do nation-level differences. As already noted by Triandis and Suh (2002), given that all humans are one species and personality has genetic roots (Riemann, Angleitner, & Strelau, 1997), the similarities among cultural groups are indeed likely to be greater than the differences. This finding does not imply that emotional experience is highly similar for all individuals from around the world, of course. It is important to emphasize that we identified universal dimensions of individual differences in recalled

TABLE 6
Correlations Among Intercultural Components and Nation-Level
Scores for Satisfaction With Life, Individualism, and Emotion
Norms (With 95% Confidence Intervals, CIs)

	<i>Component 1</i>	<i>95% CI</i>	<i>Component 2</i>	<i>95% CI</i>
Satisfaction with life	.63***	.42/.77	-.40**	-.62/-.14
Individualism	.17	-.19/.49	-.49***	-.71/-.17
Emotion norms				
Happy	.53***	.29/.71	-.19	-.45/.10
Cheerful	.52***	.27/.70	-.15	-.42/.14
Pride	.39**	.12/.61	-.02	-.30/.27
Gratitude	.48***	.23/.67	.22	-.07/.48
Love	.57***	.34/.74	-.48***	-.67/-.23
Contentment	.38**	.11/.60	-.14	-.41/.15
Sad	-.20	-.46/.09	.27 ^a	-.02/.52
Anger	-.14	-.41/.15	.38**	.11/.60
Guilt	.06	-.23/.34	.24	-.05/.49
Shame	-.01	-.30/.27	.42***	.15/.63
Worry	.17	-.12/.43	.09	-.20/.37
Stress	-.09	-.37/.20	.07	-.22/.35
Jealousy	-.07	-.35/.22	.40***	.13/.62

NOTE: $N = 48$; $N = 33$ for correlations with individualism.

a. $p = .06$.

* $p < .05$. ** $p < .01$. *** $p < .005$.

emotional experience. Thus, our results seem to emphasize the importance of intracultural differences relative to intercultural differences in the domain of emotional experience.

UNIVERSAL INTRACULTURAL DIMENSIONS OF RECALLED EMOTIONAL EXPERIENCE

Consistent with previous research, two uncorrelated dimensions underlying person-level differences in recalled emotional experience emerged and can be labeled as PA and NA. This result emerged when considering either the complete or a selected set of emotion terms in the analysis. The interpretation of the dimensions in terms of PA and NA was further corroborated by their relation to other measures of positive and negative affectivity such as current mood state (pleasant and unpleasant) and the recollection of positive and negative events. As discussed in the introduction, the emergence of PA and NA as the dimensions underlying recalled emotional experience reflect that if a person is inclined to experience a particular emotion, this person is also more inclined to experience other emotions of the same valence.

Moreover, these dimensions were found to be universal—based on the comparable fit values of the solutions of SCA and separate PCA analyses per nation (structural equivalence)—and to play a basic role in the recalled frequency of emotional experience—based on the magnitude of the intracultural and intercultural variance components. Thus, our results show that the frequency of emotional experience from a dimensional perspective is structured to a considerable extent by means of PA and NA in a wide range of nations across the world. This universal basis of emotional experience may thus well be biologically grounded; proposals for biologically based systems for PA and NA have indeed been made, for instance, by Gray (1990), Carver and White (1994), and Elliot and Thrash (2002).

The finding of universal intracultural dimensions underlying emotional experience implies that emotions similarly covary in different cultures. As recently demonstrated by Kuppens, Van Mechelen, Smits, and De Boeck (2004), emotion covariation is strongly related to overlap between the emotions' underlying patterns of appraisals, which are assumed to be the proximal elicitors of emotions (e.g., Scherer, Schorr, & Johnstone, 2001). Thus, our results suggest that the degree of overlap between two emotions' appraisal patterns may be similar across cultures as well: If two emotions are characterized by highly similar (respectively different) appraisal patterns in one culture, it can be expected that they will be characterized by similar (respectively different) patterns in another culture as well. This does not imply, however, that the appraisal patterns themselves are similar across cultures (i.e., the hypothesis of universal contingencies; Mesquita & Ellsworth, 2001). Although similarities in emotion-eliciting appraisal patterns have been described, consistent differences between cultures have been found as well (Scherer, 1997a, 1997b). Moreover, even within the same culture, variations in the appraisals that are associated with a particular emotion have been described (Kuppens, Van Mechelen, Smits, & De Boeck, 2003).

Finally, it is important to emphasize that the obtained solution in terms of PA and NA may be considered equivalent to a solution in terms of the dimensions pleasantness-unpleasantness and arousal-sleepiness. In fact, the currently obtained loadings of the emotion terms *pleasant*—positive on PA and negative on NA—and *unpleasant*—positive on NA and negative on PA—directly indicate a pleasantness-unpleasantness dimension, bisecting those of PA and NA. Furthermore, the locations of other emotion labels after a 45-degree rotation of the current solution also correspond to what would be expected in a solution in terms of pleasantness-arousal (Russell & Feldman Barrett, 1999). Pride, for instance, would have a positive loading for both pleasantness and arousal, sadness would mainly have a negative loading for pleasantness, anger and stress would have a negative loading on pleasantness and a positive on arousal, and so forth. A possible reason why a solution in terms of PA and NA—and not pleasantness and arousal—was eventually obtained in the present study may lie in the selection of emotion terms. Most of the included emotion items referred to activated pleasant (love, pride) or unpleasant (anger, guilt, stress, jealousy) emotional states rather than to deactivated pleasant (e.g., calm, relaxed) or unpleasant (e.g., depressed, gloomy) states. As a result, the used emotion labels may have induced a PA-NA solution rather than a pleasantness-arousal solution.

DIMENSIONS OF INTERCULTURAL DIFFERENCES IN RECALLED EMOTIONAL EXPERIENCE

Recalled emotional experience was found to be determined to a smaller but non-negligible degree by culture-specific factors. Two dimensions emerged on which nations differed. One dimension had high loadings for the included positive emotions and was related to satisfaction with life and positive emotion norms; it can be interpreted as a dimension reflecting PA. Thus, nations differ from one another in their average level of PA, and these differences are related to nation-level differences in aspects relevant to life satisfaction and the cultural appropriateness of experiencing positive emotions (see also Eid & Diener, 2001).

The other dimension was characterized by higher loadings from primarily negative interpersonal emotions (guilt, shame, jealousy) but also from gratitude, and this dimension correlated highest with interpersonal emotion norms. As a result, we labeled this dimension as reflecting (primarily negative) interpersonal emotions. These results thus reveal that nations also differ from one another with respect to how frequently, on average, their inhabitants recall experiencing interpersonal emotions. Interestingly, these differences were found to be

negatively related to nation-level differences in individualism, suggesting that individuals from collectivist nations experience interpersonal emotions more frequently as opposed to individuals from more individualist nations. It may be that the focus and reliance on the collective that characterizes individuals from collectivist cultures leads them to more likely experience those emotions that find their origin in interpersonal events. As such, this finding extends prior research on the implications of interdependent versus self-dependent self-construal that are thought to characterize individuals from collectivistic versus individualistic cultures (e.g., Markus & Kitayama, 1991). The finding that nations seem to vary with respect to interpersonal emotions seems to further suggest that primarily interpersonal experiences and behaviors may be regulated by cultural factors, instead of more internally caused experiences. An explanation for this finding may be that culture itself mainly emerges through the interaction among individuals, forming a collective set of values and behavioral rules that function to regulate the interactions among individuals in the society.

The obtained correlations with emotion norms indicate that the cultural appropriateness of particular emotions may play a role in cultural differences in (the recall of) how often particular emotions are experienced. Emotion norms may shape expectancies for particular emotions to be experienced or not, influencing the emotion-eliciting appraisal process (e.g., by focusing on or ignoring specific types of emotion-relevant information). Furthermore, emotion norms may cause individuals to seek situations that elicit culturally appropriate emotions and to avoid situations that elicit culturally inappropriate emotions.

MLCA: A DATA-ANALYTIC TOOL FOR CROSS-CULTURAL RESEARCH

MLCA is specifically designed to analyze nested data, which are typically encountered in cross-cultural research (participants nested in cultures). This method may thus be useful for examining a wide variety of cross-cultural research questions that pertain to the structure of numerical data. Examples are examining the cross-cultural structural equivalence of personality-measuring instruments (questionnaires, etc.) or examining structural equivalence of a specific class of variables (as in the current study) and/or simultaneously extracting dimensions of intracultural and intercultural differences underlying a set of variables of interest and estimating their relative contribution.

The different MLCA models that can be fitted and compared with one another correspond to different substantive assumptions that can be made about the structure of the data. As was done in the present study, it can be evaluated whether intracultural dimensions that underlie individual differences of a set of variables can be assumed to be universal across nations or not (by comparing combined PCA solutions with SCA solutions). Furthermore, it can be evaluated whether nations differ with respect to the amount of intracultural variance of a particular characteristic or dimension (by comparing SCA-ECP solutions with other SCA solutions); such an assumption corresponds to the notion of “tight” versus “loose” cultures (Triandis & Suh, 2002). In addition, it can be evaluated whether dimensions of intracultural differences are similarly or differently intercorrelated in different nations (by comparing SCA-P solutions to other SCA solutions).

Comparable to standard PCA analysis, a sufficient number of cultural groups is needed to obtain reliable estimates of the intercultural components. One way to check whether the obtained results can be trusted is by performing split-half analyses (see above). Of course, one should always take into account that reliable and meaningful results can only be obtained if the selected sample of cultural groups is representative for the population in which one is interested.

LIMITATIONS AND CONCLUSIONS

A limitation of the present study may be its exclusive reliance on college students. An advantage of studying the same demographic type of participants in each nation, however, is that this reduces the possibility that differences between nations are because of differences between the particular samples of the different nations. Nonetheless, the conclusions of this research should be interpreted in the light of the selected sample of participants. A second possible limitation of the present study pertains to language and translation equivalence. Indeed, it is not straightforward to assume that translating emotion words always yields equivalent meaning across languages (Mesquita & Frijda, 1992). Therefore, the conclusions drawn from data obtained via a translated set of stimuli should be made with some caution. A strong indication, however, that in the present study the translated emotion terms had much the same meaning after translation is given by the fact that highly similar emotion structures across nations and languages were obtained. Incorrect translations would have added error to the data, resulting in differences between samples of different languages instead of similarities, which does not reflect our findings. Finally, as our study relied on self-reported frequency ratings, it cannot be ruled out that the data are affected by memory or self-representational biases or that some participants counted a similar event only once whereas others did not. The large amount of research in the domain of emotion and personality that relies on these or comparable methods to study trait emotional experience or other facets of personality, however, points to considerable reliability and validity of their use.

The main conclusions of the present study can be summarized as follows: Two universal dimensions underlying person-level differences in the recalled frequency of emotional experience across a wide range of nations were identified and could be interpreted as PA and NA. Both dimensions correlated in a predicted way with other measures reflecting positive and negative affectivity. These dimensions accounted for the larger part of variance (40%) in emotion frequency reports. In addition, two dimensions on which nations differ from one another with respect to the recalled frequency of emotional experience were identified. These dimensions could be interpreted as reflecting PA and (negative) interpersonal emotions and were related meaningfully to nation-level satisfaction with life, individualism, and the appropriateness of experiencing specific corresponding emotions. These dimensions, however, accounted for only a smaller part of the variance (6%).

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Peter Kuppens, PhD, is a postdoctoral researcher at the Research Group for Quantitative and Personality Psychology at the Katholieke Universiteit Leuven, Belgium. His research interests include appraisal theories of emotion, anger and aggression, inter- and intraindividual differences, and cultural differences in emotional experience. He is a research fellow of the Flemish Fund for Scientific Research, Belgium.

Eva Ceulemans, PhD, is a postdoctoral fellow of the Flemish Fund for Scientific Research, Belgium, at the Research Group for Quantitative and Personality Psychology, Katholieke Universiteit Leuven, Belgium. Her research interests include hierarchical classes analysis and three-way methods and the application of these techniques in various research domains.

Marieke E. Timmerman, PhD, is an assistant professor of methods for data analysis at the Department of Psychology, University of Groningen, the Netherlands. Her main research interests are in component analysis, functional data analysis, and longitudinal data analysis, with a special focus on applications in psychology.

Ed Diener, PhD, is Alumni Distinguished Professor of Psychology at the University of Illinois, Urbana-Champaign. His research interests center around the examination and measurement of subjective well-being, including its relation to income, culture, and temperament.

Chu Kim-Prieto is an assistant professor of psychology at The College of New Jersey. She received her PhD from the University of Illinois, Urbana-Champaign. Her research interests include cross-cultural psychology and emotion.