Kama Muta:

Conceptualizing and Measuring the Experience Often Labelled *Being Moved*

Across 19 Nations and 15 Languages

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Abstract

English-speakers sometimes say that they feel *moved to tears*, *emotionally touched, stirred*, or that something *warmed their heart;* other languages use similar passive contact metaphors to refer to an affective state. We propose and measure the concept of *kama muta* to understand experiences often given these and other labels. Do the same experiences evoke the same kama muta emotion across nations and languages? We conducted studies in 19 different countries, five continents, 15 languages, with a total of 3542 participants. We tested the construct while validating a comprehensive scale to measure the appraisals, valence, bodily sensations, motivation, and lexical labels posited to characterize kama muta. Our results are congruent with theory and previous findings showing that kama muta is a distinct positive social relational emotion that is evoked by experiencing or observing a sudden intensification of communal sharing. It is commonly accompanied by a warm feeling in the chest, moist eyes or tears, chills or piloerection, feeling choked up or having a lump in the throat, buoyancy and exhilaration. It motivates affective devotion and moral commitment to communal sharing. While we observed some variations across cultures, these five facets of kama muta are highly correlated in every sample, supporting the validity of the construct and the measure.

Keywords: being moved, kama muta, cross-cultural, communal sharing, empathy

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Imagine two Australian men reuniting with their lion friend after several years; a Thai man performing an exceptional altruistic deed; a Norwegian skier singing the national anthem; Indian and Pakistani childhood friends seeing each other again after decades apart. Stories like these have been shared millions of times on social media. Individuals watching these clips often describe them in vernacular English as *moving*, *touching*, or *heartwarming*, or post emojis such as a cat with heart eyes. One might wonder whether such experiences are distinct, occur across different cultures or languages and if so, whether they are experienced similarly or differ considerably in their phenomenology.

There is previous research exploring affective states that are often labeled *being moved*, or translations of that term, across a number of countries and languages: US English (Batson, Fultz, & Schoenrade, 1987; Oliver & Bartsch, 2011; Seibt, Schubert, Zickfeld, & Fiske, 2017), French (Cova & Deonna, 2014), German (Menninghaus et al., 2015), Japanese (Tokaji, 2003), Norwegian (Seibt, Schubert, Zickfeld, & Fiske, 2017), Mandarin, Hebrew, and Portuguese (Seibt, Schubert, Zickfeld, Zhu, et al., 2017). Most theorists have argued that experiences labeled *being moved* constitute a distinct emotion, and a number of researchers have reported evidence with regard to its valence, motivation, and characteristic appraisals (e.g., Cova & Deonna, 2014; Haidt, 2003; Menninghaus et al., 2015). Yet none of these theories has addressed its universality or cultural distinctiveness, and none have provided evidence that can be compared across cultures.

The *kama muta* framework (Fiske, Schubert, & Seibt, 2017; Fiske, Seibt, & Schubert, 2017) offers an integrated theory of experiences that are often (but not always and not entirely distinctively) labeled in vernacular English with words such as *being moved* or

touched. Kama muta is posited to occur in response to sudden intensifications of communal relationships (Fiske, 1991, 2004). It is theorized to be experienced as a positive feeling that people want to share together. According to the theory, it is labeled with language-specific metaphors often referring to passive motion of or within the body, or bodily contact (e.g. *moved*, *stirred*, *touched*), accompanied by physical sensations such as tears, warmth or other pleasant sensations in the center of the chest, and goosebumps or chills. It motivates affective devotion and moral commitment to communal relationships. The kama muta construct postulates that individuals possess a universal disposition to experience kama muta, but there is necessary and inherent cultural specificity in the particular communal relationships that intensify, the occasions on which they intensify, the signs of their intensification, and the actions that are culturally and situationally appropriate means of devotion and commitment.

To date few studies have investigated the cross-cultural occurrence of *being moved* experiences. Seibt, Schubert, Zickfeld, and Fiske (2017) investigated the occurrence of self-reported physical sensations in response to *being moved* experiences in a U.S. and a Norwegian sample and found generally higher ratings for their Norwegian participants. Seibt, Schubert, Zickfeld, Zhu and colleagues (2017) carried out a more comprehensive test consisting of similar studies across U.S., Norwegian, Chinese, Portuguese, and Israeli samples. They found very similar patterns of valence and self-reported sensations.

The validation of constructs goes hand-in-hand with the validation of methods. So the questions whether kama muta experiences are distinct or similar across cultures can only be answered in conjunction with the validation of some particular method(s). That is, we can only address the above questions by answering the question: Does a particular instrument measure the same emotion in different populations?

Hence, there are two major aims of the present investigation. First, we aim to validate and shorten a standardized self-report measure of kama muta across cultures. Second, based

on this measure and deriving predictions from the kama muta framework, we aim to test for cultural differences and similarities of *being moved* experiences in appraisal,[1] valence, labels, physical sensations, and motivation. To maximize the cross-language and cross-national validity of our research, we conducted a test including 3542 participants from the US, the United Kingdom, Australia, South Africa, India (all in English), and, in their respective languages, Norway, Germany, Poland, the Netherlands, Spain, Portugal, Hungary, Finland, Serbia, Croatia, Israel, Turkey, Japan, and China.

Kama Muta: Being Moved By Love

Reports of *being moved* experiences[2] go back as far as Darwin (1872) and James (1890) who noted lachrymation in response to *tender feelings*, and McDougall (1919) characterizing the *tender emotion* as one of seven basic emotions. Later, Panksepp (1995) explored such experiences of chills, while Frijda (2001) noted the occurrence of *being moved* with tears. However, until recently, few scholars have actively conceptualized *being moved* experiences, referring to the concept either as by its vernacular English label *being moved* (Cova & Deonna, 2014; Kuehnast, Wagner, Wassiliwizky, Jacobsen, & Menninghaus, 2014; Menninghaus et al., 2015; Oliver & Bartsch, 2011), or employing a technical term (e.g., *empathic concern*, Batson et al., 1987; *elevation*, Haidt, 2003).

The literature has identified at least four different aspects of such *being moved* experiences: valence, physical sensations, motivation or action tendencies, and appraisal patterns. Most conceptualizations of *being moved* experiences agree on its major components, except for its appraisal patterns. Researchers have posited that it is evoked by

[1] We use the term *appraisal* to refer to the general aspect that evokes the experience (in the case of kama muta the sudden intensification of communal relationships). Hereby, we refer to mental processes of perceiving, categorising and acknowledging this aspect. Our definition might not overlap entirely with classical *appraisal theories* (e.g., Moors, Ellsworth, Scherer, & Frijda, 2013).

[2] Throughout the manuscript, when using the terms *being moved experiences* or *being moved* we refer to the psychological studies of a concept using different theorizations (e.g., being moved, elevation, empathic concern), but often measured by asking about feeling *moved* or *touched*. We think that many of these studies have an overlap with the kama muta concept especially with regard to findings on valence, sensations and motivations. Therefore, we treat them as provisionally indicative of kama muta. Similarly, we use *feeling moved* in order to refer to self-reported feelings.

observing moral virtue (Algoe & Haidt, 2009; Thomson & Siegel, 2016), by transformations of negative to positive core values (Cova & Deonna, 2014), or by significant relationship events that are highly compatible with social norms (Menninghaus et al, 2015). However, operationalizations differ greatly; many measures only assess linguistic label(s), but no two measures use the same set of labels (Cova & Deonna, 2014; Menninghaus et al., 2015; Seibt, Schubert, Zickfeld, & Fiske, 2017; Wassiliwizky, Wagner, Jacobsen, & Menninghaus, 2015). Most conceptualizations do not have specific predictions regarding the cultural consistency or variability of these experiences, or ignore this factor altogether by equating vernacular linguistic labels with psychological constructs (see Schubert, Seibt, Zickfeld, Blomster, & Fiske, 2017, for a critique). The recently proposed *kama muta* framework provides a possible solution by proposing a distinct cross-cultural conceptualization and a clear-cut measurement approach that both incorporate all of the characteristic aspects of the emotion.

Based on ethnographies, historical sources, classic texts, interviews, surveys, participant observation, and experiments, *kama muta* theory accounts for experiences typically labeled as *moving* or *touching* in vernacular English, along with many other congruent experiences given other labels (Fiske, Schubert, et al., 2017; Fiske, Seibt, et al., 2017). Kama muta, the Sanskrit term for *moved by love*, is defined by the coherence of five different features.

First, it is evoked by the intensification of a communal sharing relationship between the participant and another individual or entity, or by observing third parties suddenly intensifying their communal sharing relationship (Schubert, Zickfeld, Seibt, & Fiske, 2016; Seibt, Schubert, Zickfeld, Zhu, et al., 2017; Seibt, Schubert, Zickfeld, & Fiske, 2017; see also Janicke & Oliver, 2017). Examples include people reuniting after a difficult separation, affectionate parent-child interactions, great kindness or self-sacrifice, observing or caring for cute puppies. Communal sharing relationships are a part of Relational Models Theory (RMT;

Fiske, 1991, 2004), which posits that four fundamental relational models organize virtually all social coordination among humans. Communal sharing consists of relationships based on something essential that participants in a dyad or group have in common. If they have resources in common, they use them as needed. If they face a problem, they decide by consensus how to deal with it and then work on it together, each contributing what s/he can. An intensification might be the formation of a new communal sharing relationship, the re-establishment of a former relation, or the contrast between the ground of loss or separation and the foregrounded figure of a distinct feeling or memory of love. An intensification often occurs including such a contrast with certain *difficulties* in the background, but it does not necessarily need to. The perception of sudden intensification of a communal sharing relationship comprises the *appraisal* (Fiske, Seibt, et al., 2017). Common occasions of intensification include the birth of a child, engagements and weddings, reunions, the feeling of being one with nature, union with divinity, extraordinary kindnesses received, and sacrifices for others. Nostalgic memories of friendship or love, and unexpected feelings of connection with strangers also evoke kama muta.

Second, kama muta has a positive valence (Fiske, Schubert, et al., 2017; Fiske, Seibt, et al., 2017; see also Menninghaus et al., 2015; Cova & Deonna, 2014). In a cross-cultural study, Seibt, Schubert, Zickfeld, Zhu and colleagues (2017) found that reports of feeling moved and touched by videos correlated with self-reported positive valence, while these labels correlated to a much smaller degree with negative affect. Other theories that started by analyzing the content of the folk concept *being moved* describe it as a mixed emotion involving a co-activation of joy and sadness (Hanich, Wagner, Shah, Jacobsen, & Menninghaus, 2014; Menninghaus et al., 2015). Similarly, Menninghaus and colleagues (2015) have argued that being moved is an overall positive emotion, while emphasizing that it often thrives on sadness. Previous studies have indeed reported an association between

feeling moved and sadness (Tokaji, 2003; Hanich et al., 2014; Vuoskoski & Eerola, 2017; Wassiliwizky et al., 2015) or observed increased corrugator supercilii activity, a facial muscle associated with negative affect, for peak moments of goosebumps and tears (Wassiliwizky, Jacobsen, Heinrich, Schneiderbauer, & Menninghaus, 2017; Wassiliwizky, Koelsch, Wagner, Jacobsen, & Menninghaus, 2017).

Kama muta may occur in the same episode as sadness, for example when people who have been separated (evoking sadness) are suddenly reunited (evoking purely positive kama muta) (Fiske, Seibt, et al., 2017). However, while both emotional categories may co-occur, sadness has been found to be distinct from kama muta (Seibt, Schubert, Zickfeld & Fiske, 2017). Indeed, continuous ratings of feeling moved or touched consistently correlated with ratings of happiness at the same moment, but not with ratings of sadness at that moment providing evidence that kama muta is a purely positive and not a mixed emotion (Schubert et al., 2016). Yet, Fiske, Seibt et al. (2017) noted that while kama muta in itself is purely positive, this does not mean that any given episode in which kama muta occurs is purely positive; other emotions, including negative ones, may occur before, after, or at the same time. In addition to participants reporting liking it and rating it as positive (Schubert et al., 2016; Seibt, Schubert, Zickfeld, & Fiske, 2017), people actively seek it out, want to give it to others, and want to experience it together with others. Furthermore, in many cultural circumstances the emotion is valued and at times even prescribed (Fiske, Seibt, et al., 2017).

Third, kama muta is often accompanied by a specific pattern of *bodily sensations*. When it is mild, people may report none of the physical sensations, but when it is intense enough many people have moist eyes or tears, chills or piloerection, a warm or other feeling in the center of the chest (typically described as in the ‘heart’), or feel choked up (or a lump in the throat) (Schubert et al., 2016; Seibt, Schubert, Zickfeld, & Fiske, 2017; Zickfeld, Schubert, Seibt, & Fiske, 2017). Previous research on *being moved* has also identified these

sensations (Benedek & Kaernbach, 2011; Konečni, 2005; Miceli & Castelfranchi, 2003; Schnall, Roper, & Fessler, 2010; Strick, de Bruin, de Ruiter, & Jonkers, 2015; Tan & Frijda, 1999; Vingerhoets & Bylsma, 2015; Wassiliwizky, Jacobsen et al., 2017; Wassiliwizky, Koelsch et al., 2017; Wassiliwizky et al., 2015; Zickfeld, 2015).

Fourth, experiencing kama muta generates devotion and commitment to repair, sustain, strengthen, or engage in communal sharing relationships, or in other words to act communally, with kindness and compassion (Fiske, Seibt, et al., 2017; Steinnes, 2017; Zickfeld, 2015; Blomster, Seibt & Thomsen, 2018; see also Oliver et al., 2015; Schnall et al., 2010). In one study, communal identification with an individual was highest after listening to a story written to evoke kama muta, in contrast to stories written to evoke amusement or to evoke no emotion (Zickfeld, 2015). This constitutes the *motivation* aspect.

Finally, depending on language, dialect, culture, context, social class, and gender, people use a number of different *labels* for kama muta. In vernacular English, for example, one might use *moved*, *touched*, *heart-warming*, or *poignant* to describe the experience (Seibt, Schubert, Zickfeld, & Fiske, 2017). However, these lexemes do not always denote kama muta experiences, but are also sometimes used to label other emotions such as sadness or even righteous anger. Moreover, many languages have no lexemes for kama muta when certain kinds of communal sharing relationships intensify in some contexts, and some languages apparently have no lexeme at all for kama muta in any context—or at least no label that is accessible, prevalent, and consistently used. For example, English speakers do not have a definite name for the emotion when they see or hold cute kittens (Buckley, 2016; Steinnes, 2017)—though Uralic languages do name the emotion evoked by cuteness.

Thus, the *configuration* of all five aspects (appraisal, valence, sensations, motivation, and labels) constitutes experiencing kama muta (Fiske, Seibt, et al., 2017; Fiske, Schubert, &

Seibt 2017). All five aspects are often present, although not invariably. For example, when the experience is mild, some people may have no bodily sensations.

While many parts of the kama muta framework overlap with previous conceptualizations of *being moved* experiences, the theory is based on one particular model of relational models theory, thereby proposing a culturally grounded appraisal pattern and predicting cultural universality, as well as cultural and contextual specificity in contrast to other concepts of *being moved*. Perhaps the biggest difference to other conceptualizations is that we define kama muta independently of specific vernacular terms or folk concepts, and instead consider them as operationalisations of the concept that need to be validated. Our approach is thus somewhat orthogonal to theories of *being moved*. For instance, the approach elaborated by Menninghaus and colleagues (2015) takes the vernacular labels and the content of folk theories as its starting point. Because the English label *feeling moved* (and also its German equivalent) are applied to states beyond kama muta, their scientific concept *being moved* necessarily includes states outside of what we call kama muta. On the other hand, we surmise that there are kama muta states that are labeled with situation- or relation-specific terms (e.g., rapture), or no terms at all (e.g., seeing a very cute animal), and thus would not be immediately featured in *being moved*. Nevertheless, our review of the literature suggests that there is a large overlap of kama muta and being moved as identified by various theories and approaches, which is why we can build on evidence collected by them.

Kama Muta Across Cultures

Relational models theory (Fiske, 2004) posits that the four relational models, of which communal sharing is one, are universal, but cultures differ in their use of the relational models. The same holds for kama muta theory. First, the theory posits that individuals are universally and evolutionarily equipped to notice and respond to sudden intensifications of communal sharing relationships that are significant in their culture (Fiske, Seibt, et al., 2017;

Fiske, Schubert, & Seibt, 2017). However, there is considerable diversity and specificity in the situations that afford intensification, including the cultural practices that function specifically to evoke kama muta. More precisely, as Fiske, Seibt, and colleagues (2017, p. 11) put it, "emotions in general, and especially social emotions, are best understood as assemblies of evolutionarily-prepared mechanisms to react to environmental challenges *together with* culturally transmitted implementations and elaborations of such preparedness".

Assemblies means the interplay of all parts of an emotion: appraisal, valence, sensations, motivation, and labels. Kama muta theory predicts that these assemblies are universal across cultures: they are strongly associated with each other regardless of the culture, the context, the specific communal sharing that intensifies or how it intensifies. However, this does not preclude some variation in the magnitudes of the associations among the facets of kama muta across cultures and contexts.

This prediction is backed up by cross-cultural evidence. In one study, Seibt and colleagues (2017) showed kama muta-evoking, fear-evoking, happy, and sad video clips to US participants and Norwegian undergraduates. For both US and Norwegian participants, appraising sudden intensifications of *closeness* between the protagonists in the clip predicted how *moved or touched* they felt, but did not predict the other emotions. Self-reported *chills* and *goosebumps* predicted feeling *moved* or *touched* for Norwegian participants, but not for US participants in this study (though they do predict in other studies). The most comprehensive cross-cultural evidence today comes from an investigation of samples in five nations (Seibt, Schubert, Zickfeld, Zhu, et al., 2017). In all, 671 participants from Norway, the US, China, Israel, and Portugal, watched kama muta-evoking video clips. Valence, appraisals, sensations, and motivation were positively correlated with the kama muta labels in all five nations, though there was a high degree of heterogeneity between nations. Notably, the relationship between labels and self-reported warmth in the chest differed across

countries, with Norwegian (r = .21 [.11, .30]) and Portuguese (r = .24 [.13, .35]) participants showing the weakest association. Of course, this likely reflects differences in the meanings of the labels in the respective languages: *comovido* does not have exactly the same denotational field as *moving* or *touching*, nor does *rørt*, though they are the best translations one can find.

Measuring Kama Muta

Most recent studies involving kama muta or *being moved* experiences have employed self-report measurements, generally relying on emotion labels (e.g., Cova & Deonna, 2014; Menninghaus et al., 2015; Schubert et al., 2016; Seibt, Schubert, Zickfeld, & Fiske, 2017). A few have used physiological measurements (Benedek & Kaernbach, 2011; Wassiliwizky, Jacobsen et al., 2017; Wassiliwizky, Koelsch et al., 2017), most studies have used labels—but not the same label or set of labels. Studies of emotions should not rely only on labels (Weidman, Steckler, & Tracy, 2017), quite aside from the fallacy of assuming one-to-one equivalence of lexical labels across different languages. Further, using different sets of labels to measure the same emotion makes it impossible to make valid comparisons among studies. Coppin and Sander (2016) emphasize that emotions should be measured by assessing *all* of their components: appraisals, valence, sensations, motivations, and labels. Therefore a valid self-report instrument to identify kama muta should include items on sudden intensifications of communal sharing (appraisal); both positive and negative valence; sensations (moist eyes or weeping, goosebumps or chills, warmth in the chest, feeling choked up); communal motivations, and labels in the participant's language. The KAma Muta MUltiplex Scale (KAMMUS; e.g., Zickfeld et al., 2017) includes sections targeting each of these five components.

Overview of the Present Study

The current investigation has two major aims. First, we aimed to develop a standardized self-report measure to investigate kama muta—a measure that would be valid

across languages and nations. To develop a standardized version of our self-report scale we applied exploratory factor analysis and multi-group confirmatory factor analyses, enabling us to eliminate items that failed our criteria for measurement invariance across countries. Our self-report measure consisted of five different parts and we developed each part using a different method based on our prior theory and expectations.

Our main aim in developing the instrument was to include the same items across all countries in the final scale. By applying this approach we presumably lost cultural sensitivity, eliminating items that only worked in certain languages or countries. This can be seen as a general disadvantage of the applied method. We could also have constructed different scales for each country and then examined the effects on a country-by-country basis, not making any overall claims. Instead, we attempted to fit the same model across all countries, thereby permitting comparison of effects across countries.

Our second and concurrent aim was to use the KAMMUS to test kama muta theory and explore its predictions cross-culturally. Therefore, our first hypothesis (H1) was that the five aspects (appraisal, valence, bodily sensations, motivation, and labels) of kama muta should correlate positively ($r >= .40$) with each other across all sites. In order to provide divergent validity we predicted that all five aspects would be rated highest for the moving videos/episodes in contrast to the sad, amusing, and awe-inducing videos/episodes that we included for control purposes (H2). Finally, to assess convergent validity, we predicted kama muta would correlate positively ($r >= .20$) across all samples with measures of three related traits; empathic concern (Davis, 1980; see Zickfeld et al., 2017); nostalgia (Sedikides, Wildschut, Arndt, & Routledge, 2008); and trait kama muta (H3). H2 and H3 can be regarded as stages of scale validation, while H1-H3 serve testing of kama muta theory.

We expected effect sizes stronger than $r = .40$ for state-state rating relationships and effect sizes stronger than $r = .20$ for state-trait rating relationships based on previous studies

on kama muta (Zickfeld et al., 2017; Seibt, Schubert, Zickfeld, Zhu, et al., 2017) and general median effect sizes of the psychological literature (Szucs & Ioannidis, 2017).

In order to enhance the generalizability of our project we used similar study protocols across the US, the United Kingdom, Australia, South Africa, India (all in English), and, in their respective languages, Norway, Germany, Poland, the Netherlands, Spain, Portugal, Hungary, Finland, Serbia, Croatia, Israel, Turkey, Japan, and China. All together, there were 3542 participants (see Table 1 for an overview). Collaborators were recruited through personal contact or through a Many Labs project by IJzerman et al. (2017). The present collaboration was called the *KAVIAR Project* (KAma muta Validity Investigation Across Regions). All information, including detailed study protocols, questionnaires, data files, and analysis syntax, is available at our project page (https://osf.io/cydaw/). The main analyses of the KAVIAR project were pre-registered (https://osf.io/btpmr/) and additional analyses are explicitly denoted and reported here as exploratory. All studies were reviewed and approved by the respective institutional boards. Participants were always asked for informed consent.

Two different study protocol approaches were included in the project: collaborators were able to choose between the *video approach* and the *episodes approach*. The video approach consisted of participants viewing different film clips, while the episodes approach instructed participants to recollect an episode involving *positive tears*. Earlier research indicated that both techniques are effective for inducing kama muta and contrasting emotions (Seibt, Schubert, Zickfeld, & Fiske, 2017). Note that we did not directly ask for *moving* episodes in people's lives, in contrast to previous research (Cova & Deonna, 2014; Menninghaus et al., 2015) because we do not base our concept on lexemes as such. For most of the analyses we included only the kama muta cases (videos selected to evoke kama muta, or *positive tears* events), because as we added the other conditions for discriminant purposes

and did not predict that the five aspects of kama muta would cohere when people experience other emotions.

Method

Detailed information with regard to the pre-registered method, materials, and procedures is available at our project page (https://osf.io/cydaw/). In general both the video and the personal memories of tears approaches included the same measures. Twelve sites opted for the video approach: the US, the United Kingdom, India, Norway, Germany, Poland, Portugal, Hungary, Croatia, Israel, Turkey, and Japan. Seven sites chose the episodes approach: China, Serbia, the Netherlands, Australia, Finland, Spain, and South Africa (Table 1).

Sites and Translation. Sites were contacted to take part in the KAVIAR project at the beginning of September 2016. All sites were instructed to employ a back-translation method (Brislin, 1970) for all materials. More precisely, collaborators were instructed to have one bilingual speaker translate the material from the original English into the respective language, and then have another bilingual speaker independently translate the material back to English. The original version was then compared with the back translation and all differences discussed with one of the project leaders in order to ensure, as far as the languages and cultures allowed, that the translated version measured the same concepts.

Participants. Based on a general expected effect size of $r = .40$, a power of $1\text{-}\beta = .95$, and $\alpha = .05$, we obtained a site sample size recommendation of $N = 75$ from G*Power (Faul, Erdfelder, Lang, & Buchner, 2007). Considering literature on power and correlation stabilization (Schönbrodt & Perugini, 2013), we then opted for a minimum sample size of $N = 150$ for each site. The collection process was terminated either after more than 150 participants had been collected, or by mid-October 2017, whichever came first. For five of our samples we fell short of recruiting 150 participants who met criteria (China [131], South

Africa [45], Finland [142], Australia [98], Hungary [140]), but included them anyway, in order to maximize the diversity of the overall sample.

Collaborators were asked to conduct the study on students or on a comparable population. In some cases general adult populations were recruited. Participation in the study was always executed online and surveys were programmed using the survey platform *Qualtrics*. An overview of the different recruitment sites, information on the specific sample and incentives is provided in Table 1. After applying the a priori exclusion criteria the final sample consisted of 3542 participants (2236 female, 1125 male, 181 unspecified) ranging in age from 18 to 75 years (M = 26.79, SD = 9.51). In accordance with the pre-registered criteria, participants were excluded if they did not watch the full video (recorded with a timer) or did not provide an episode, respectively. Participants were also excluded if their self-reported nationality differed from the collecting site, or if they had more than 50% missing responses. Before analyzing the data we later added a post hoc exclusion criterion for participants, dropping those under the age of 18. As we used repeated measures all participants provided more than one response. A participant was only fully excluded if all cases (i.e. in the video approach: all four videos; in the episode approach: both episodes) were excluded based on the criteria stated above. Otherwise, responses were excluded for any video or remembered event that did not meet the a priori criteria.

Procedure and Materials. In the video approach, four videos were presented and participants completed the KAMMUS after each video. For the episode approach, participants were asked to describe an episode of *positive tears* and an episode of *negative tears*. After writing about each episode, participants completed the KAMMUS. The general procedure was the same across both versions. After being provided with informed consent and accepting the terms by continuing with the survey, participants were presented with instructions about the experiment:

Video Approach: Each participant responded in an individually randomized order to all four emotion conditions: kama muta, awe, amusement, and sadness. For each condition a set of three different video stimuli was available, from which one was chosen randomly. The video stimuli were based on earlier research (Schaefer, Nils, Sanchez, & Philippot, 2010; Schubert et al., 2016; Seibt, Schubert, Zickfeld, & Fiske, 2017).[3] All countries used the same stimuli except for the Japanese sample that changed two videos, one of the three for sadness and one of the three for amusement, based on pilot tests showing that one of each failed to elicit the intended control emotions (see Supplementary Material). The Hungarian sample used only the three kama muta videos; they did not see the control videos.

Videos were selected in order to include control emotions that would induce many of the same physiological responses, as well as both positive and negative affect. Tears and negative affect are evoked by sadness (e.g., Seibt, Schubert, Zickfeld, & Fiske, 2017). Awe often evokes chills or goosebumps and pro-social motivations (e.g., Stellar et al., 2017). Amusement involves positive affect, along with smiling or a warm feeling the body (Zickfeld, 2015). That is, the video controls were chosen to evoke the three emotions that appear to be most similar to kama muta, and thus the strongest tests of discriminant validity.

Episodes Approach: Participants were asked to recall an episode in their lives in which they "*got MOIST EYES or even shed a TEAR because of a POSITIVE feeling"*. Similarly, participants were asked to write about a second episode in which "*they got MOIST EYES or even shed a TEAR because of a NEGATIVE feeling"* (emphasis with caps in the original instructions). For both episodes participants were instructed to describe a recent episode in at least 300 words. Order of type of episode was individually randomized; identical measures were completed immediately after the participant wrote each account.

[3] All videos can be accessed here: https://www.youtube.com/playlist?list=PLc8nlHQh9a0EfZZx--UHug1n04Q3SyhOM

After watching each of the four videos or writing about each of the two episodes, participants were presented with the KAMMUS, assessing the five aspects of kama muta with 50 items (see Supplementary Material for full scale). This scale was developed based on our on-going interviews, participant observation, ethnological comparisons of ethnographies and histories, diary studies, and experiments (Schubert et al., 2016; Seibt, Schubert, Zickfeld, Zhu, et al., 2017; Seibt, Schubert, Zickfeld, & Fiske, 2017).

The first part asked about sensations and physical reactions: *moist eyes; tears; goosebumps or hair standing up; chills or shivers; a warm feeling in the center of the chest; some feeling in the center of the chest; choked up; a lump in the throat; I had difficulty speaking; I put one or both hands to my chest; I took a deep breath or held my breath; I said something like 'awww'; (I felt) buoyant or light; (I felt) refreshed*, *energized or exhilarated*. In addition, the first part included three distractor items: *I giggled*, *I frowned*, and *I lowered my head*.

The second part consisted of 11 appraisal items such as *I observed an incredible bond*, and *I observed a phenomenal feeling of appreciating or being appreciated*. The section was complemented with two filler items (*I observed a connection that was broken*, and *I observed something comical)*. The episodes approach included two grammatically appropriate versions of the same appraisal items. After providing an episode, participants were asked whether they were themselves active in the recounted episode, or merely passive, which respectively resulted in being presented with the third or first person perspective form of the appraisal scale. (For example, For the episode approach the appraisal items were formulated from a first person perspective (e.g., *I felt a phenomenal feeling of appreciating someone or being appreciated,* while the third person appraisal items was *I observed a phenomenal* . . .[underlining added here, not in the original) The section was complemented

with two distractor items (*I observed [or felt] a connection that was broken*, and *I observed [or felt] something comical*).

The third part consisted of 7 motivational items such as *I wanted to hug someone*, and *I felt more strongly committed to a relationship*. In addition, we included two motivational distractor items (*I wanted to be consoled*, and *I felt like joking*).

The fourth part included two items on valence, respectively asking participants whether and to what extent they had *positive feelings* and *negative feelings*.

The final part assessed emotion labels: *heartwarming*, *moved*, *touched*, *nostalgic moment*, *poignant experience*, *felt a part of something larger than myself*, and *fell in love*. We added discriminant items asking for *sadness*, *awe*, *and amusement*.

All items in all five sections were rated on the same 7-point scale anchored at *0 = not at all* to *6 = a lot*. All items within each section were presented in individually randomized order; the order of the sections was kept constant.

In the video approach, participants were also asked whether they had any problem with video playback, whether they had seen the video clip before, and whether they listened to the sound.

At the end, participants were presented with the 28 items of the Interpersonal Reactivity Index (IRI; Davis, 1980). The IRI is a trait measure of empathy that consists of four subscales: *fantasy*, *personal distress*, *perspective taking* and *empathic concern*. The items were presented using a 5-point scale anchored at *does not describe me well* (1) to *describes me very well* (5). Whenever available, sites utilized a version of the IRI in their respective language that had been previously validated by other researchers (see Table 2). We also included the Kama Muta Frequency Scale (KAMF), a trait scale containing 7 items intended to measure a general proneness to kama muta. In addition, we included the Southampton Nostalgia Scale (SNS; Sedikides et al., 2008) for assessing the trait disposition

to experience nostalgia (see Supplementary Table 5 for scale reliabilities). The order in which these three scales were presented was individually randomized, although the order of the items within each scale was constant for all participants. For some sites, participants completed additional scales. These are listed in Table 2 and presented in their entirety in the Supplementary Material. Finally, participants completed demographic information about their gender, age, nationality, relationship status, number of children, and whether they had pets.

Results

Exploratory Scale Analysis and Construction. Before testing our main hypotheses, we conducted an extensive pre-registered exploration and reduction of the KAMMUS scale. This exploration was aimed to estimate the fit of each scale and reduce the scales by dropping non-fitting items. Based on previous literature we deemed model fit indices to be acceptable when they were above .95 for the CFI, lower than .10 for the RMSEA, and lower than .08 for the SRMR (Hu & Bentler, 1999). We sometimes accepted rather mediocre fit statistics that failed these criteria in order to fit the scales as similarly as possible across countries. Because we theorized that the subscales are causally related and thus not orthogonal, we estimated each subscale separately and not in a combined factor analytical approach (cf. Haslam & Fiske, 1999). Based on our main prediction, all subscales were estimated using only the cases of the *moving* condition (video approach: kama muta videos; episode approach: positive tears). Subscales were fitted without filler items. We used the *psych* and *lavaan* packages in *R* and *MPlus* (L. K. Muthén & Muthén, 2010) for all analyses.

As pre-registered, each subscale was fitted in a different manner based on previous observations and our theory. First, the *sensations* scale was constructed by conducting an exploratory factor analyses for each country separately. Based on these EFAs, we fitted the same confirmatory factor analysis for all countries, thereby including the same items across

countries. Second, item reduction for the *appraisal* and *motivation* scales was performed using a multigroup CFA framework. Based on these results we excluded items with a bad fit and conducted the same CFA model across all countries. The *valence* scale was assessed by only one item for each dimension therefore did not need to be fitted. Finally, for the *emotion label* scale we also employed a multigroup CFA framework, but included items on a country-by-country basis. For all subscales except the *emotion labels* scale we aimed at including the same items across countries. As the vernacular lexemes in different languages do not correspond precisely one-to-one, and the implicit folk taxonomies underlying vernacular lexemes differ from country to country, the items *cannot* be *the same* across languages or even dialects of, say, English (Fiske, Seibt, et al., 2017).

For most subscales we tested for *measurement invariance* of each item using a multigroup CFA framework; that is, we addressed the question: did each item and the underlying latent factors measure the same construct across countries? Are they interpreted in the same way by each sample? Measurement invariance is typically grouped into three different aspects: *configural invariance* (the same factor structure across groups), *metric invariance* (the same factor loadings across groups), and *scalar invariance* (same intercepts across groups). In order to achieve full measurement invariance and to meaningfully compare latent means and correlations across groups, scalar invariance is typically needed (Van de Schoot, Lugtig, & Hox, 2012). However, achieving scalar invariance is rather uncommon in practice and some scholars have instead suggested testing for *partial* measurement invariance (Asparouhov & Muthén, 2014; Marsh et al., 2017). As we expect participants in different nations and responding in different languages to anchor their responses differently (Peng, Nisbett, & Wong, 1997), we do not expect scalar invariance.

Therefore, we applied the alignment optimization procedure when testing for measurement invariance (see Asparouhov & Muthén, 2014, for a technical description). This

method tries to identify the optimal measurement invariance by examining invariance of factor loadings and intercepts simultaneously, unlike other measurement invariance approaches. The optimal measurement invariance is identified by rotation similar to an EFA method. In addition, it makes less stringent assumptions and rather tests for *approximate* measurement invariance. As suggested by Asparouhov and Muthén (2014), because we compared more than two groups we always employed the FREE alignment method first; in contrast to FIXED, FREE does not constrain the first group's mean factor and variance. As further recommended by Asparouhov and Muthén (2014), if the FREE method indicated problems we used the FIXED method; we set Spain (motivation scale) or Japan (feeling labels) as the reference group because their factor means and variance showed the least deviation from zero. We used maximum likelihood with robust standard errors (MLR) as the estimator. Invariance for each item was inspected using two fit indices: (1) a fit function contribution, and (2) R-square (Asparouhov & Muthén, 2014). A high fit function contribution ordinarily suggests non-invariance, while the same is true for a low R-square coefficient. In addition, we also inspected the factor loadings for each country separately and retained items showing a high factor loading across countries.

Sensations Scale. For the sensations subscale, an exploratory factor analysis (EFA) on the sensation items was conducted for each site separately (KAMMUS section 1: items 1–13, section 2: items 1–2). Based on previous research, we expected that at least three factors would emerge: (a) a 'tear' factor, (b) a 'chill' factor, and (c) a general bodily sensation factor (warm, light, energized). We used the EFA function of the *psych* package in R and used a parallel analysis to determine the number of factors to retain (Costello & Osborne, 2005). Factor extraction was based on an oblimin rotation and a minimum residuals (MINRES) extraction. Number of factors suggested by the parallel analysis ranged from three to six unique factors for different countries. For some countries (Norway, Turkey, Poland,

Hungary, and South Africa) we observed some factor loadings larger than 1. So for these countries we changed our method to a varimax rotation and MINRES extractions (Norway, Turkey, and Hungary) or to a varimax rotation with maximum likelihood (ML) estimation (Poland and South Africa). The initial factor loadings for each country are available in Supplementary Tables 1.1–1.19.

In most countries we identified a *tear* factor (*moist eyes* and *tears*); a *chills* factor (*goosebumps or hair standing up* and *chills or shivers*); a *warmth* factor *a warm feeling in the center of the chest* and *some feeling in the center of the chest*); a *choked up* factor (*choked up, a lump in the throat* and *difficulty speaking*); and an *exhilarated-buoyant* factor (*refreshed, energized, or exhilarated; buoyant or light;* and *I smiled*).

The other items were scattered across different factors in different countries. For example, *I took a deep breath or held my breath* sometimes loaded on the *chills* factor, but for other countries on the *tears* factor. *I put one or both hands to my chest* loaded on different factors in different countries, as did *I said something like Awww*. Therefore, we eliminated these items and exploratorily fitted an initial confirmatory factor analytic (CFA) model including the five factors mentioned above with their respective remaining items. Model fit indices for these models ranged from good (e.g., Finland) to mediocre (e.g., Netherlands) and rather poor (e.g., Germany). Table 3 provides an overview of model fit indices.

For each country we then constructed the same *tears*, *chills*, *warmth*, *choked up*, and *exhilaration* scales based on the country mean of each factor. A detailed overview of these final factors and their reliability indices is provided in Table 3.

Appraisal Scale. For the appraisal scale we took a different approach in fitting and reducing the scale. We expected smaller differences between countries with regard to the appraisal scale than the sensations or emotion labels scales, because our theory posits that sudden intensification of communal sharing is the unique and universal appraisal that evokes

kama muta (Fiske et al, 2017a, 2017b). We first conducted a multi-group CFA (Marsh et al., 2017; Van de Schoot et al., 2012; van de Vijver & Tanzer, 2004). On the eleven items of the appraisal scale (section 3: 1–11) we applied the alignment method in MPlus using the FREE method. Results of the alignment approach are presented in Supplementary Tables 2.1–2.3. Fit indices indicated good fit (low fit function contribution and high R^2) for five items (3:1, 3:3, 3:5, 3:6, 3:8). Because feeling *appreciation* showed a lower R^2 (.53) than the other items, we dropped it. Thus, we fitted a CFA model for each country separately using four items (*…an incredible bond* (3:1)*, …an exceptional sense of closeness appear* (3:3)*, …a unique kind of love spring up* (3:5), and *…an extraordinary feeling of welcoming or being welcomed* (3:8)). The fit of the final model ranged from good for most countries (e.g., Japan) to rather poor for the UK, India, and Serbia. For each country we then constructed the same appraisal scale including the same items based on the country mean score (see Table 4 for fit and reliabilities).

Motivation Scale. Because our theory posits that kama muta invariably generates devotion and commitment to communal sharing (Fiske at al, 2017a, 2017b), we used the same procedure for the motivation scale as for the appraisal scale. First, a multi-group CFA model was fitted using alignment optimization. For this model the first five items from Section 4 were allowed to load on one factor and the two items from Section 5 on a second factor. The estimation showed metric invariance for all items (Supplementary Table 3.1). Based on the fit indices and the final factor loadings (Supplementary Table 3.2–3.3) we excluded three items (4:4, 5:1, 5:2). Hence, the final motivation scale included four items (*I felt like telling someone how much I care about them* (4:1), *I wanted to hug someone* (4:2), *I wanted to do something extra-nice for someone* (4:4), and *I felt more strongly committed to a relationship* (4:5)). The final model fit well in most countries, but rather poorly in Japan,

China, Hungary, and the US. For each country, we then constructed the same motivation scale based on the country mean score. See Table 4 for fit and reliabilities.

Emotion labels scale. Finally, we constructed an emotion labels scale by again applying a multi-group CFA framework. Even more that in the other scales, we expected that vernacular labels would not translate one-to-one; speakers of any language may have a number of context-dependent lexemes for kama muta, or none at all. Languages draw on different affective taxonomies to label emotions (Wierzbicka 1999). Using the alignment approximation, we fitted the first seven items from section 7 to one factor. The first three items (*It was heartwarming* (7:1), *I was moved* (7:2), and *I was touched* (7:3)) showed the best fit indices (Supplementary Table 4.1–4.3). Initially constrained to include all three of these items, sample-specific emotion labels scales were then created, to respect the fact that the denotations of label items differ in each different language—there are no neat one-to-one translations. We first inspected the invariance tests for the three items for each country separately (Supplementary Table 4.1). If the item loading or intercept showed invariance for a given country we inspected the factor loadings of this item (Supplementary Table 4.3). The factor loading was compared to the factor loading of the other two items. If the difference between the loadings was considerable (≥ .15) the item was finally excluded.

This resulted in 15 countries (Norway, Croatia, China, Israel, US, Portugal, Germany, the Netherlands, UK, Australia, Hungary, South Africa, Finland, Japan, and Spain) using all three items in their scale, Poland and Turkey using a scale consisting of items that were best translated as *moved* and *touched*, India using a scale made up of the English words *heartwarming* and *touched*, while Serbia used a scale composed of only one item, *Bio sam dirnut*, 'moved.' As most countries included three or fewer items for the emotion labels factor we did not conduct a CFA. Reliabilities for all countries including two or more items

are presented in Table 4; coefficients were adequate except for the Indian and Spanish samples.

Differences in Experiencing Kama Muta. Before testing our main predictions, we explored our data with respect to gender and age. Using the *lme4* package we fitted an exploratory multilevel model including gender, age, and their interaction as main factors. First, we used the emotion labels scale as the dependent variable and allowed intercepts to vary randomly according to country. We only used the kama muta cases of the dataset (excluding the sad, awesome, and amusing videos, or the negative tears episodes). We observed a main effect for gender, $F(1, 3342) = 23.97$, $p = < .001$, as well as age, $F(1, 1570) = 8.27$, $p = .004$, and also an interaction between gender and age, $F(1, 3345) = 5.01$, $p = .03$. In order to inspect the direction of the effect and test for differences between countries we calculated a difference score between women and men for the emotion labels scale for each country separately and combined all effects in a random effects meta-analysis using the *metafor* package (Viechtbauer, 2010) and a restricted maximum likelihood (REML) method. The overall standardized mean difference was significant, $d = .31$ [.21, .40]: the mean of women's reports of kama muta labels was higher than the mean of men's reports (Supplementary Figure 1). This effect did not vary significantly across the different samples, $Q(18) = 26.17$, $p = .10$, $I^2 = 35.10$ [0, 66.95].

In addition, we computed a random effects model of the relationship between the emotion labels scale and the age of the participant; contrary to the multilevel result there was no association between label score and age, $r = .02$ [-.01, .06] (Supplementary Figure 2). This (lack of) association between labels and age did not differ significantly across countries, $Q(18) = 20.54$, $p = .30$, $I^2 = 17.42$ [0, 58.64].

Finally, we tested whether the experience of the bodily sensations (*tears*, *chills*, *warmth in the chest*, *feeling choked up*, and *a feeling of exhilaration*) differed between

genders, and whether these reports differed by age. We repeated the same model as above with each of the bodily sensation subscales as the dependent variable in each respective model. Experiencing *tears* differed by gender, $F(1, 3259) = 8.71$, $p = .003$, and by age, $F(1, 3217) = 6.60$, $p = .01$. The interaction was not significant. We then calculated a random effects model including each sample as a separate effect. The overall effect size for the mean difference between genders was significant, with women reporting higher mean levels of *tears*, $d = .32$ [.24, .40] (Supplementary Figure 3). This effect was homogeneous across countries, $Q(18) = 14.90$, $p = .67$, $I^2 = 0$ [0, 43.15]. On the other hand, in contrast to the multilevel results, we again did not observe an effect of age on self-reported *tears*, $r = .02$ [-.03, .07] (Supplementary Figure 4). We repeated the same model for *chills*, but found no difference by the gender or age of the participant. There were gender differences in reports of *warmth in the chest*, $F(1, 3340) = 10.04$, $p = .002$, but no age differences. In order to find the direction of the effect and check for difference across countries we ran a random effects model. We observed an overall significant difference between gender: women reported higher mean levels of *warmth in the chest*, $d = .31$ [.21, .40] (Supplementary Figure 5). This gender effect did not vary significantly across countries, $Q(18) = 29.04$, $p = .05$, $I^2 = 30.89$ [0, 79.16]. For the model using *choked up* as the dependent variable, we found a significant effect for age, $F(1, 3122) = 14.76$, $p < .001$, but not for gender. We ran a random effects model on the correlation between feeling choked up and reported age and found a very small overall effect, $r = .04$ [.01, .08] (Supplementary Figure 6). Finally, experiencing *exhilaration* did not vary according to either gender or age.

The interaction between gender and age was not significant in the models of any sensations subscale.

We repeated the same model for the appraisal and motivation scales. For the appraisal scale, we observed an effect of gender, $F(1, 3348) = 6.77$, $p = .01$, but not age. The same was

true for the motivation scale: $F(1, 3342) = 12.42$, $p < .001$. Running a random effects model, we found that women reported on average higher scores on the appraisal scale, $d = .18$ [.10, .26] (Supplementary Figure 7) and motivation scale, $d = .21$ [.09, .33] (Supplementary Figure 8) than men. The effect for the appraisal scale did not differ by country, $Q(18) = 23.27$, $p = .18$, $I^2 = 12.04$ [0, 73], while it did for the motivation scale, $Q(18) = 41.24$, $p = .001$, $I^2 = 55.93$ [23.86, 83.12]. The interaction between gender and age was not significant in both models.

Hypothesis I: Correlations Among the Five Aspects of Kama Muta. In order to test the first hypothesis, we computed correlations across the different emotion parts including the different sensations subscales, the appraisal scale, the motivation scale, the two items assessing positive and negative valence, as well as the emotion labels scale. Again, we used only the kama muta cases of our dataset, excluding control conditions. We computed each correlation separately for the different countries and then derived a meta-analytic effect size by using the *metafor* package (Viechtbauer, 2010) and a REML method. For each correlation we specified a random effects model. An overview of all meta-analytic effects across countries is provided in Table 5. A visualization of the relationship between each pair of scales for each country separately is provided at the following link: https://janisz.shinyapps.io/kaviar_project/.

Correlations among the different subscales (without the item on negative valence) were consistently but not invariably positive. In all 19 countries the emotion label scale correlated positively and significantly with the appraisal scale (overall $r = .54$ [.49, .59]) and with the motivation scale (overall $r = .55$ [.52, .59]). Overall, the labels scale was also positively associated with all sensation subscales (tears: $r = .43$ [.37, .49]; chills: $r = .32$ [.25, .39]; warmth: $r = .53$ [.47, .60]; choked up: $r = .37$ [.30, .44]; exhilaration: $r = .39$ [.33, .46]). However, in some countries there was no significant correlation between labels and particular

sensations: Spain (tears); China (chills, choked up); India (chills); Serbia (chills, choked up); and South Africa (choked up). In all countries the emotion label scale correlated with positive valence across all countries; overall r = .55 [.47, .62]. As predicted, we found no overall correlation between the emotion labels scale and negative valence, r = -.07 [-.15, .01]. Performing an exploratory equivalence test for the overall effect size, setting d = .15 as the minimum effect size of interest using the *TOSTER* package (Lakens, 2017), we confirmed the absence of a meaningful overall effect of labels on negative valence, z = 1.86, p = .03.

Overall, all sensation subscales correlated positively with each other. We found a strong association between *tears* and *choked up:* r = .62 [.56, .68], and small overall associations among some of the other sensation subscales, (e.g., between *choked up* and *exhilaration:* r = .13 [.07, .20]; *tears* and *exhilaration:* r = .18 [.13, .23]).

Overall, the motivation scale correlated positively with all sensations (ranging from r = .31 [.24, .38] for *chills* to r = .47 [.42, .52] for *warmth*). Motivation also correlated with positive valence (r = .39 [.33, .46]), and the appraisal scale (r = .60 [.55, .64]).

Negative valence correlated positively with *tears* (r = .13 [.07, .18]), *chills* (r = .10 [.05, .15]), and *feeling choked up* (r = .21 [.16, .26]), but not with *warmth* (r = -.02 [-.08, .04]) or *motivation* (r = -.04 [-.09, .01]). Negative valence correlated negatively with *exhilaration* (r = -.28 [-.35, -.21]), *appraisal* (r = -.11 [-.16, -.05]), and positive valence (r = -.37 [-.45, -.29]).

In general, there was significant heterogeneity across countries for all associations among factors (see heterogeneity tests in the visualization tool: https://janisz.shinyapps.io/kaviar_project/). However, this heterogeneity was greater among the sensations and valence items, while heterogeneity was typically lower for the motivation and appraisal scales. A considerable amount of heterogeneity was present for the relationship between the emotion labels and positive valence (I^2 = 92.47 [86.40, 96.52]). While some

countries such as Japan, Hungary, and Norway showed strong effects (*r*'s between .65 and .77), in other countries (the Netherlands and India) the magnitudes of the significant correlations between labels and positive affect were lower (*r*'s between .25 and .35).

We also tested for differences in the effects when taking into account the evoking stimulus (video vs. personal episode) and gender of the participants. We found a moderating effect of participant's gender for the relationship between emotion labels and the appraisal, as well as emotion labels and motivation. For both relationships, effect sizes were stronger for women. There was a moderating effect of stimulus type for the relationships between sensations and other factors, as well as between positive valence and other factors. Mean effect sizes were stronger in the video approach.

In an exploratory fashion we also tested for the relationship between the emotion labels scale and the items assessing self-reported sadness, awe, and amusement. We found small positive overall correlations of emotion labels with *sadness* (r = .14 [.06, .23]) and *amusement* (r = .14 [.07, .21]). Overall kama muta labels were correlated with the *awe* factor (r = .47 [.41, .54]). For all three effects there was high heterogeneity among the 19 countries.

Hypothesis II: Kama Muta is Different from Other Emotions. In order to test whether kama muta differs from other emotions, we tested whether self-report ratings of kama muta differed across the different emotion conditions. For the video approach, we used four set of videos to induce feelings of amusement, sadness, awe, and kama muta, respectively. In the episodes approach we distinguished between two conditions: *moist eyes or tears because of a POSITIVE feeling* was intended to elicit a kama muta experience, while *moist eyes or tears because of a NEGATIVE feeling* was intended to evoke a contrasting emotion (valence was capitalized in the original items). For the video approach we included 11 out of 12 countries in the final analysis (the Hungarian sample used only kama muta

videos). Analyses of the episodes approach included all 7 of the countries that used this method.

We first fitted two global multilevel models for the video and episodes approaches, respectively. Participants were nested within country and included as random effects. The factor coding for type of video or type of episode was used as the independent variable and we used the emotion labels scale as the dependent variable. For the video approach, the emotion labels scale differed significantly across the four video types (Table 6). Inspection of means revealed that self-reported emotion labels of kama muta were highest for the kama muta videos and significantly different from each of the ratings for the sadness, awe, and amusement video. Similar findings were obtained for the episodes datasets, where the analysis also indicated a main effect for type of episode (Table 7). Again the emotion labels rating was higher in the kama muta condition, in contrast to the sadness condition (Table 7). We repeated each model for the different countries separately. For all models intercepts were allowed to vary randomly across participants and video version. An overview of results is provided in Table 8. In each country the highest emotional labels scale score was observed in the kama muta condition with lower label scores for each of the other emotion types – except for the Turkish sample.

We repeated exploratory models comparing the video and episode approaches, assessing the appraisal, motivation, valence and sensations of kama muta. All models were computed for the overall effects and not for the separate samples. An overview of results is provided in Table 9 for the video approach and Table 10 for the episode approach. Whether evoked by videos or memories of personal events, the proposed appraisal pattern of kama muta—the sudden intensification of a communal sharing relationship—was highly distinctive for kama muta in contrast to *sadness*, to *awe*, and to *amusement*. The same was true for both approaches for the motivation to share communally, which significantly differed between

kama muta and each of the other emotions. In addition, whether evoked by videos or memories of personal events, kama muta events were perceived as more *positive* than the other conditions, and also less *negative* than the sad events, but not different from either awe or amusement in *negativity*. Finally, we observed in both approaches that *tears* were most closely associated with kama muta events and with sad events, while *warmth in the chest* was also highest for kama muta, whether evoked by videos or recalling life events. Feeling exhilarated was rated highest for the kama muta videos and episodes and the amusement videos. In both sad videos and negative tears events, *chills* and feeling *choked up* were rated higher that each of the other conditions. Interestingly, we found that the kama muta videos produced more reports of tears than the sad videos, while participants reported more tears recalling personal events of negative tears than recalling events of positive tears.

Hypothesis III: Kama Muta is related to similar constructs. Finally, we tested whether kama muta showed convergent validity with other concepts ostensibly assessing similar concepts. Again, we computed correlations between the KAMMUS scales and the three trait measures (trait empathic concern, trait kama muta, and trait nostalgia) for each country separately and combined them in a random effect meta-analysis. An overview of the results is provided in Table 11 and in the visualization tool (https://janisz.shinyapps.io/kaviar_project/).

First, as predicted, we observed a positive correlation between self-reported state emotion labels and the empathic concern trait measure, r = .32 [.28, .37].[4] This association is very similar to an association between these two variables in a meta-analysis of 16 of our previous studies (r = .35 [.29, .41]; Zickfeld et al., 2017). We observed a significant effect for all countries except the South African sample (r = .01 [-.28, .31]). The empathic concern measure also showed small to medium associations with the scales for the other aspects of

[4] As preregistered, we analyzed only the empathic concern subscale of the IRI.

kama muta, ranging from r = .11 [.05, .18] for chills to r = .28 [.24, .32] for motivation. There was homogeneity across nations in the relationship between trait empathic concern and the warmth, exhilaration, appraisal, and motivation subscales.

Second, overall, and in most countries, we observed a positive correlation between state kama muta as assessed by the emotion labels scale and self-reported trait kama muta: r = .29 [.24, .34]. There was no significant positive correlation between this trait and emotion labels in the Spanish and Indian samples. Trait kama muta also showed small to medium positive effects for the other scales (ranging from r = .15 [.10, .19] with positive valence to r = .32 [.28, .35] with tears). We found homogeneity for the relationship between trait kama muta with *tears*, *warmth*, feeling *choked up*, *exhilaration*, negative valence, and the appraisal scale.

Finally, we also observed a significant overall positive effect size between the emotion labels scale and the SNS measure assessing trait nostalgia, r = .20 [.16, .24]. This effect was heterogeneous: six out of the 19 countries did not show a significant correlation between trait nostalgia and labels in the videos or the episodes. Trait nostalgia also showed small to medium positive correlations with the other scales (ranging from r = .11 [.07, .15] for positive valence to r = .28 [.24, .32] for motivation). We observed homogenous effects for the relationship of trait SNS with feeling *choked up*, *exhilaration*, positive and negative valence, and the appraisal scale.

Including gender of the participant and type of approach as potential moderators, we repeated the three models of the effects of empathic concern, trait kama muta, and nostalgia on the KAMMUS subscales. We observed no moderating effect of gender for the three models, while type of episode moderated the relationship between the emotion labels scale and trait empathic concern. Overall, the association between labels and empathic concern was

greater when participants watched kama muta videos, compared to when they recalled positive tears.

General Discussion

Across 19 countries, 15 languages, and five continents the present study comprehensively tested kama muta theory and the KAMMUS instrument using videos or memories of real events. As predicted by previous evidence and kama muta theory, we found that the five aspects of kama muta cohere in every nation: there are consistent and distinctive correlations among sudden intensifications of communal sharing; labels such as *heartwarming*, *moving* or *touching;* positive affect but not negative affect; the motivation to devote and commit to communal sharing relationships; and a combination of bodily sensations including warmth in the chest, tears, chills, feeling choked up, and exhilaration. Providing divergent validity for the kama muta concept, we found that the experience of kama muta is characterized by bodily sensations, appraisal patterns, valence, motivation, and labels that differ from sadness, amusement, awe, and remembering personal moments of tears about something negative. In addition, we obtained convergent validity by showing moderate but consistent relationships between the state of kama muta and trait measures that have been theoretically and empirically related.

Most effects were rather consistent across all countries. However, we always observed a certain level of heterogeneity for the effects, indicating variation across the different samples. We will first discuss the general implications of our findings and then consider cultural variations and differences in more detail.

The final KAMMUS Two scale derived from our analyses consists of 22 to 24 items, depending on the language (numbers of labels vary; see Appendix A). Five subsections measure appraisal, bodily sensations, motivation, valence, and emotion labels of kama muta,

respectively. In general, we reduced our scale to less than half of the original items, while obtaining quite good fit statistics

Replicating previous studies (e.g., Seibt, Schubert, Zickfeld, & Fiske, 2017), our two induction approaches were successful at eliciting feelings of kama muta. This is especially noteworthy for the personal episodes approach, which used *positivity* and *tears* as cues to elicit recall of events; recall of these events in seven countries was consistently characterized by coherence among the five facets of kama muta, just as in the video approach, though sometimes with lower coefficients. Not surprisingly, positive tears have been theoretically and empirically linked to kama muta (Schubert et al 2016; Gračanin, Bylsma, & Vingerhoets, 2017; Fiske, Seibt et al., 2017). Indeed, in relevant contexts, people perceiving tears attribute them to kama muta (Zickfeld & Schubert 2018).

The Kama Muta Construct

We replicated previous findings by Seibt, Schubert, Zickfeld, Zhu et al. (2017); Seibt, Schubert, Zickfeld, and Fiske (2017); and Schubert et al. (2016) showing that kama muta is strongly related to the observation of or the direct participation in sudden intensifications of communal sharing relations. It should be noted that our present evidence is essentially correlational, therefore, we cannot conclude that sudden CS intensifications in fact causes kama muta. However, in every one of the 19 studies we experimentally manipulated kama muta through selected stimuli or recall instructions, and observed that it occurred most strongly where we predicted.

We also found evidence for a strong association between feeling kama muta and being motivated to care for other individuals. These findings are consistent with the many studies using similar videos to evoke the *elevation* construct (Pohling & Diessner, 2016; Thomson & Siegel, 2016). Our findings also show that the communal sharing motivation may generalize beyond the persons whose relationship intensified, that is, the characters of

the video clips. Similarly, Oliver et al. (2015) observed an increased overlap between self and humanity and Blomster et al. (2018) found an increase of humanizing the protagonist's group after watching *moving* video clips.

Participants across the 19 countries also experienced kama muta as a positive emotion, while it was not generally experienced as negative. This largely supports previous findings (e.g., Cova & Deonna, 2014) and the conceptualization by Menninghaus and colleagues (2015) who have regarded being moved as an overall positively evaluated emotional state. Nevertheless, to the extent that kama muta is similar to their category of being *joyfully moved*, we believe the current findings are at odds with their more detailed suggestion that "joyfully moving episodes coactivate significant levels of negative emotional ingredients and negative affect" (p. 24). The present studies strongly suggest that kama muta is distinct from sadness, especially with regard to its valence, appraisal, and motivation aspects, confirming the time series analyses of Schubert et al., (2016). Many kama muta moments are not at all sad. Our findings are consistent with our theorization (Fiske Seibt, & Schubert 2017; Fiske, Schubert, & Seibt 2017a, 2017b) that kama muta often – but not generally or necessarily – occurs immediately after, or simultaneously with, other emotions, including emotions with a negative valence. This occurs, for example, when a sad separation is followed by a heartwarming reunion. However, kama muta also occurs, for example, an entirely happy person encounters cute kittens (Steinnes 2017), attends a rave, or feels one with nature. Our findings are consistent with the fact that the vernacular lexeme *moved* (as well as many other approximate synonyms) is sometimes used for episodes that are, overall, negative (Menninghaus et al., 2017; Schubert et al., 2017). However, we stress that the results of the current studies and others we have published, as well as our participant observation, interviews, and ethnological research, makes it clear that a great many instances

of kama muta are purely positive and neither preceded by nor concurrent with anything negative.

We replicated previous findings that have shown that kama muta often involves tears, chills, and warmth in the chest (Schubert et al., 2016; Seibt, Schubert, Zickfeld, Zhu, et al., 2017; Seibt, Schubert, Zickfeld, & Fiske, 2017; Wassiliwizky et al., 2015; Wassiliwizky, Jacobsen et al., 2017). In the present study, experiencing warmth (or another feeling) in the chest had the strongest and most consistent effect size with respect to labels, while the relationship of tears to labels was consistent but a bit weaker. Chills or goosebumps, on the other hand, showed high variability in relation to labels across the samples, and the weakest overall effect. We also found that feeling choked up and feelings of exhilaration and buoyancy are related to kama muta, as theorized previously (Fiske, Seibt, et al., 2017). It is intriguing why such a positive experience as kama muta is accompanied by displaying tears, since tears are often regarded as indexing negative states. Research investigating the reasons why individuals shed tears has discussed helplessness and being overwhelmed with emotion (Vingerhoets & Bylsma, 2015). Other researchers have proposed that tears reflect a release of tension (Tokaji, 2003) or mark prosocial tendencies (Gračanin et al., 2017). We have speculated that the evolved function of tears may be to solicit compassionate care by evoking kama muta (Fiske, 2018). In any case, the prevalent assumption that tears reliably or generally index sadness is empirically wrong; we have found that tears of joy in kama muta experiences are very common, and tearful individuals are often perceived as happily experiencing kama muta (Zickfeld & Schubert, 2018).

Experiencing tears and feeling choked up discriminated kama muta from amusement or awe, but also occurred for sadness. Warmth in the chest was rated highest for kama muta, making it a good index for it. While feeling exhilarated discriminated kama muta from sadness, it was also reported with amusement. Finally, feeling chills discriminated kama muta

from awe and amusement. In the present studies we did not find evidence that kama muta induced more chills or goosebumps than feeling sadness or recounting negative tears. This appears inconsistent with previous findings that chills are distinctive of *being moved*, in contrast to sadness and joy (Wassiliwizky et al., 2015). In general, we replicated previous findings (Seibt, Schubert, Zickfeld, & Fiske, 2017) that kama muta is not accompanied by any one distinctive bodily sensation, but can be well distinguished by its unique *configuration* of sensations. No other emotion appears to have the same sensation gestalt.

Feeling kama muta was also related to trait measures that have been previously associated with the concept. We replicated the findings (Zickfeld et al., 2017) that state feelings of kama muta is associated with trait empathic concern as measured by the IRI (Davis, 1980). This supports Zickfeld and colleagues' suggestion that the concept of empathic concern may in fact measure the trait tendency to experience kama muta in response to needy or vulnerable others. Of course, this does not imply, and it is not the case, that kama muta is most commonly (let alone necessarily) evoked by need or vulnerability, in particular; there are many other common routes to sudden intensification of communal sharing relationships. We confirmed our theorizing (Fiske, Schubert, & Seibt, 2017; Fiske, Seibt, & Schubert, 2017b) that kama muta state responses are related to trait nostalgia (Wildschut, Sedikides, Arndt, & Routledge, 2006). We found a positive and consistent though weak relationship between the two concepts.

In sum, our findings support the kama muta construct, which posits correlations among the five aspects of the emotion in every culture. Most of the effects were significant across all samples, suggesting that kama muta occurs in all 19 nations.

Cultural Differences. Fiske et al. (2017b) posited that kama muta, while universal, is necessarily and always informed by culture. Consistent with this theory, most of our effects showed some heterogeneity, most notably the relation between labels and valence, as well as

between labels and bodily sensations. Although we observed some variation for the relationship between labels and both appraisal and motivation, there was a significant positive effect in all 19 nations. We predicted that all of the associations among the five facets should exceed a correlation of .40. This was true for the overall effect and most of the countries. While the estimates of the association between labels and the appraisal of sudden intensifications of communal sharing were smaller in Croatia, Poland, and Portugal, all confidence intervals included .40. The relation between labels for kama muta and motivation to devote and commit to communal sharing was always .40 or stronger.

We observed the highest heterogeneity among nations ($I^2 = 92.47$) for the relationship between labels and positive valence. Although kama muta label ratings were positively and significantly correlated with positive valence in all countries, the correlations were higher in some countries (especially Hungary and Japan) than in other countries (especially the Netherlands and Serbia). There was less heterogeneity in the correlations between labels and bodily sensations, although in some countries there was no definite correlation between labels and tears (Spain), chills (China, India, Serbia), or feeling choked up (China, Serbia, South Africa). This variation might be explained by the differences between rating videos in 12 nations, compared to rating memories of personal events in 7 nations, including Spain, China, Serbia, and South Africa. The fact that we still observed all of the effects in the aggregate and in most of the 19 countries in both these two very different approaches provides important support for the generalizability of our findings and the validity of both the construct and the measure.

We believe that the heterogeneity among national samples probably is not simply or entirely a measurement problem or any other methodological artifact; it reflects true differences among the nations and languages. Recent studies have indicated that the bodily sensations accompanying kama muta differ somewhat across countries (Seibt, Schubert,

Zickfeld, Zhu, et al., 2017; Seibt, Schubert, Zickfeld, & Fiske, 2017). As Fiske and colleagues (2017) argue, some individuals might experience several types of sensations while others might ordinarily experience few or none. This may also extend to a cultural or linguistic level. For example, the Serbian or Mandarin languages might use the terms that translated the English *chills* or *goosebumps* primarily in other contexts such as negative emotional states, so that this sensation is not cognized with regard to kama muta. That is, Mandarin *起鸡皮疙瘩或头发竖起* and *颤栗或颤抖,* or Serbian *Kostrešenje ili podizanje kose na glavi* and *Drhtavica ili groznica,* may mean 'chills/goosebumps when one is afraid.' Compare this with the meanings of the English vernacular *smile*, which denotes a facial expression *when one is happy,* but excludes the same or similar expressions of uncertainty, appeasement, anxiety, or fear.

Based on the present findings we can only conclude that while there is a high concordance of effects across countries, there also exist variations. However, it seems that aspects of kama muta such as appraisal and motivation processes are very similar or the same across countries, while the phenomenological experience, including valence and bodily sensations, is more informed by cultural and situational factors. For example, our Norwegian and Japanese participants felt kama muta when observing sudden intensifications of communal sharing, which moved to them be motivated to commit and devote to communal sharing. But Norwegian participants tended to report not just the cross-nationally-typical high level of positivity in their kama muta experiences, but also small levels of negativity. Does this primarily reflect the semantics of the Norwegian lexemes *negativ* or *rørt?* That is, is it about *the colloquial definitions of the words* in relation to the Norwegian implicit folk taxonomy of emotions? Or does it mean that there is a mildly negative hue to the phenomenology of Norwegian kama muta experience itself—at least when watching this sort of video?

Gender differences. We found that women tend to report higher levels of kama muta than men, replicating earlier findings by Seibt, Schubert, Zickfeld, Zhu, et al. (2017) in their Norwegian, US, Portuguese, Israeli, and Chinese samples. In addition, women also reported higher levels of tears and feelings of warmth in their kama muta experiences. The general finding that women report higher levels of tears replicates previous cross-cultural studies (van Hemert, van de Vijver, & Vingerhoets, 2011; Vingerhoets, 2013). We also found that women made higher appraisals of sudden intensifications of communal sharing, and of the motivation to attend to communal sharing relationships. However, we were only able to meaningfully infer an overall gender effect, but not a country X gender interaction, because some samples included only a small fraction of male or female participants.

Limitations

Although the present approach provides a comprehensive validation of the kama muta construct and the KAMMUS measure across 19 countries and 15 languages, it has some weaknesses and limitations. First, most of our samples came from European countries; we were unable to include South or Central American countries. In addition, as in most psychological research, our participants were from highly literate populations, many of them students. In order to more deeply address the universality and cultural specificity of the construct and the instrument, we would need to also sample cultures with lower levels of education, less participation in market economies, lower income, and less urbanization. As of now, our sample is hardly typical of *Homo sapiens* (see Henrich, Heine, & Norenzayan, 2010). To fully validate the construct and the measure, our studies also ought to be replicated with entirely different stimuli, studying kama muta beyond videos and recall of personal events. We also note that, as is always the case, the shortened KAMMUS Two must be tested and validated with new samples in order to confirm the CFA results.

Likewise, our studies relied on self-report measures. Scholars have argued that emotions should be assessed by a number of different approaches including physiological, observational, behavioral, or neurophysiological methods (Scherer, 2005). Recent studies have started to successfully measure piloerection in a more objective fashion (Benedek & Kaernbach, 2011; Wassiliwizky, Jacobsen et al., 2017; Wassiliwizky, Koelsch et al., 2017). Validation of constructs and methods requires convergent and discriminant validation using methods affected by different kinds of measurement error and bias (Campbell & D. W. Fiske, 1959). We have shown discriminant and convergent validity using two methods, but both methods rely on self-report. We should also note that the present video approach collected ratings *after* each stimulus. Thus, the ratings do not reflect moment-to-moment experiences, but some sort of overall response. However, our findings are highly similar to previous findings employing moment-to-moment ratings for some of the same as well as other video clips (Schubert et al., 2016).

A majority of countries used videos to induce different emotional responses. Although video stimuli previously have been successfully employed to induce kama muta (e.g., Seibt, Schubert, Zickfeld, Zhu, et al., 2017) they often featured complexly scripted fictional events. For example, previous research indicated that film features such as perspective or camera distance were able to induce different levels of self-reported tears in moving stimuli (Wassiliwizky, Jacobsen et al., 2017). In addition, most video clips featured music, which has been shown to induce and augment feelings of *being moved* (Strick et al., 2015; Vuoskoski & Eerola, 2013, 2017). Nevertheless, in seven countries we studied memories of real life personal experiences. Results from those seven samples of recollections of everyday life are completely concordant with the results from the video studies.

Finally, our studies cannot provide definitive evidence for any causal process of kama muta. The present data cannot establish that a sudden intensification of communal sharing

induces the sensations, labels, valence and motives of kama muta. The processes could operate in the other direction, or through a complex web of effects of any of the five features on any of the others. If possible, future studies should directly manipulate intensifications of communal sharing and test whether these evoke the other four aspects of kama muta.

The KAMMUS Two

Appendix A is the *KAMMUS Two* that results from the analyses reported above. It consists of 22–24 items, distilled from the 50 items in the original KAMMUS. We intend to use the KAMMUS Two in our future studies, and recommend it to others who want to measure the kama muta construct. The likelihood that a given psychological state is kama muta is reflected in the coherence of the component scales. We therefore recommend against using an overall kama muta score that would result from averaging or summing all five aspects together. To verify that there is a relationship between kama muta and another construct, that relationship should be shown for *each* of the five aspects separately, *and* those five aspects should be highly correlated with each other in the condition where kama muta is predicted (though not necessarily in any other condition).

The present approach aimed to construct a *universal* measurement instrument. However, we need to stress that the KAMMUS Two is not an exhaustive measure of kama muta. For some languages additional items might be included, depending on the types of communal sharing relationships that intensify, how they intensify, what actions are appropriate to perform to devote and commit to communal sharing, and what it means for different kinds of participants, informants, or respondents to experience kama muta in the given situation(s). Our measure works for sudden intensification of communal sharing evoked by watching videos or recalling personal events, but other items may be more appropriate for studying sudden intensification of communal sharing evoked by reunions, religious practices, speaking with deceased relatives through a spirit medium, dancing,

playing or listening to music, playing on or rooting for a sports team, delivering a baby, oratory, national identity rituals, or participation in rallies. Until we use the KAMMUS Two to study kama muta in a great variety of situations, we won't know how it works in them. As we mentioned, the present study tried to focus on commonalities among the different countries, which necessarily resulted in a loss of cultural sensitivity. Future research might eventually aim to develop culturally tuned, context-sensitive, language specific versions of the KAMMUS, or versions that are sensitive to the age, gender, religion, or social class of the respondents.

Any use of the KAMMUS Two must take into account two facts. First, while kama muta often occurs alone, it may also occur in conjunction with other, quite distinct emotions—either in succession, or simultaneously. For example, in the best loved narrative of all time, two people who love each other are separated by circumstances, and each may come to doubt whether the other has survived, or still loves him (Fiske, Schubert, & Seibt 2017a). The narrator intends this uncertainty to evoke anxiety, frustration, amusement, sadness, even anger in the reader—which maximizes the reader's kama muta in the final moments of the narrative when the couple are finally reunited. Likewise, anger at a child's going off and getting lost and fear about possible harm coming to the child are suddenly succeeded by kama muta when the child is found safe—but the anger may not entirely disappear. What this implies for measurement is that participants' ratings of those final seconds of a narrative will reveal kama muta, but ratings of the entire event or narrative as a whole will be diluted and confounded by the other emotions that occur in the course of the event or narrative. More generally, the longer and more complex the stimulus or episode that a participant rates, the more likely it is that the ratings will encompass multiple affects, in addition to the few seconds of any kama muta experience. Even when instructions request ratings of just the precise seconds during which a person feels kama muta, these rating may

be diluted by the difficulty of mnemonically isolating those seconds. And, to reiterate, the fact that a person is experiencing kama muta does not suggest that the person is *not* experiencing other emotions at the same time. For example, a person may be embarrassed, disgusted, or proud to be experiencing or displaying kama muta. A person may be feeling kama muta at the sudden surge of memories or feelings of love for someone whose loss or separation causes ongoing sorrow concurrent with the kama muta moment.

Conclusion

Kama muta seems to be a distinct positive social relational emotion that is evoked by observing or participating in sudden intensifications of communal sharing. It is frequently accompanied by feelings of warmth in the chest, tears, feeling choked up, buoyancy and exhilaration, and often chills. It motivates devotion and commitment to communal sharing, and English speakers often label is *moving*, *touching*, *heartwarming*, with more or less corresponding sets of lexemes in most (but not all) other languages. Our findings suggest that the same emotion is evoked by remembering when one shed tears due to positive feelings, and by observing two Australian men reuniting with their lion, a Thai man helping others, a Norwegian skier singing the national anthem, and Indian and Pakistani childhood friends' reunion after decades apart. That distinctive emotion is kama muta.

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Author contributions

JZ, TS, BS, JB, and AF conceived and designed the studies. AF drafted the KAMMUS, which was then collaboratively revised. All authors conducted the studies. JZ conducted the statistical analyses and wrote the first draft. All authors reviewed and revised the final manuscript.

Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Tables

Table 1. Overview of different sample locations.

Country	Language	Approach (Stimulus)	N (female/male)	Age	Sample Characteristics	Sample Location	Compensation
Norway	Norwegian	Video	278 (192/70/16)	19-44 (*M* = 22.57, *SD* = 4.09)	Psychology undergraduate students	University of Oslo	Partial course credits for participation
Turkey	Turkish	Video	243 (188/47/8)	18-36 (*M* = 21.53, *SD* = 1.90)	Undergraduate students	Middle East Technical University	
Croatia	Croatian	Video	155 (112/40/3)	19-46 (*M* = 21.57, *SD* = 3.78)	Psychology students and their acquaintances	University of Rijeka; Non-psychology students participated on-site, at the university.	Course credits for direct participation or for recruitment
China	Chinese	Episode	131 (81/45/5)	18-49 (*M* = 19.29, *SD* = 2.94)	Psychology students and other students	Tsinghua University, Hubei University, Wenzhou University	¥5
India	English	Video	173 (46/120/7)	19-69 (*M* = 32.19, *SD* = 8.03)	Amazon MTurkers with at least 95% approval rate	Amazon MTurk	$3.33
Israel	Hebrew	Video	228 (108/114/6)	19-34 (*M* = 26.02, *SD* = 3.22)	Jewish Israeli students	Midgam Project Web Panel (midgampanel.com)	19 NIS
Serbia	Serbian	Episode	243 (197/44/2)	18-48 (*M* = 20.15, *SD* = 2.82)	Psychology students and students from other disciplines	University of Belgrade, University of Novi Sad	-
Poland	Polish	Video	153 (135/8/10)	18-38 (*M* = 21.70, *SD* = 2.71)	Undergraduate students	Jagiellonian University	Partial course credits for participation
USA	English	Video	239 (102/132/5)	18-68 (*M* = 34.03, *SD* = 9.90)	Amazon MTurkers with at least 95% approval rate	Amazon MTurk	$3.70
Portugal	Portuguese	Video	194 (116/67/11)	18-70 (*M* = 28.34, *SD* = 11.97)	Psychology students and normal adults	Instituto Universitário de Lisboa (ISCTE-IUL) and Social Media	Course credits for student participants

(Table continued)

Country	Language	Approach (Stimulus)	N (female/male)	Age	Sample Characteristics	Sample Location	Compensation
Germany	German	Video	332 (185/93/54)	18-62 (*M* = 24.71, *SD* = 5.70)	General student sample, normal adults	University of Duisburg-Essen, Social Media, clickworker.com, surveycircle.com	Course credits for student participants, 4.50€ (clickworker); lottery (10€ Amazon gift card)
Netherlands	Dutch	Episode	271 (199/60/12)	18-68 (*M* = 24.38, *SD* = 9.64)	undergraduates, normal adults	Tilburg University, Social Media, Prolific.ac	£1.60 (Prolific.ac)
UK	English	Video	168 (122/46)	18-62 (*M* = 33.10, *SD* = 9.12)	normal adults	Prolific.ac	£4.70
Australia	English	Episode	98 (53/41/4)	18-67 (*M* = 30.70, *SD* = 10.05)	normal adults	Prolific.ac, Amazon MTurk	£1.60/$2
Hungary	Hungarian	Video	140 (102/27/11)	18-75 (*M* = 37.05, *SD* = 14.05)	normal adults	Social Media, University Lists	lottery (one $10 Amazon gift card)
Finland	Finish	Episode	142 (114/16/12)	19-56 (*M* = 26.30, *SD* = 6.90)	normal adults	Prolific.ac, Social Media, University of Jyväskylä	lottery (movie tickets), £1.60 (Prolific.ac)
South Africa	English	Episode	45 (24/11/10)	19-58 (*M* = 31.86, *SD* = 11.27)	undergraduates	University of South Africa	-
Japan	Japanese	Video	153 (60/92/1)	18-73 (*M* = 40.66, *SD* = 10.25)	normal adults	Lancers (lancers.jp)	$2.50
Spain	Spanish	Episode	156 (100/52/4)	18-64 (*M* = 26.50, *SD* = 9.67)	undergraduates and normal adults	Universidad de Madrid, Prolific.ac	£1.50 (Prolific.ac)
Overall	15 languages	12x Video; 7x Episode	3542 (2236/1125/181)	18-75 (*M* = 26.79, *SD* = 9.51)			

Table 2. Additional measures and sources of IRI translation across the samples.

Country	Additional Measures (see Supplement)	IRI Scale
Norway	Empathy & Humanness Scale	-
Turkey	Empathy & Humanness Scale	-
Croatia	Empathy & Humanness Scale	(Pokrajac-Bulian & Tatalović, 2001)
China	-	(Zhang, Dong, Wang, Zhan, & Xie, 2010)
India	Empathy & Humanness Scale	(Davis, 1980)
Israel	Empathy & Humanness Scale	(Shamay-Tsoory, Tomer, Goldsher, Berger, & Aharon-Peretz, 2004)
Serbia	Delta-20, BFI-10	-
Poland	-	(Kaźmierczak, Plopa & Retowski, 2007)
USA	Empathy & Humanness Scale	(Davis, 1980)
Portugal	Empathy & Humanness Scale	(Limpo, Alves, & Castro, 2010)
Germany	Empathy & Humanness Scale, KSE-G	(Paulus, 2009)
Netherlands	-	-
UK	Empathy & Humanness Scale	(Davis, 1980)
Australia	-	(Davis, 1980)
Hungary	-	(Szebeni, 2010)
Finland	-	(Myyrya, Juujärvi, & Pesso, 2010)
South Africa	-	(Davis, 1980)
Japan	Empathy & Humanness Scale	(Himichi et al., 2017)
Spain	-	(de Paúl Ochotorena, Etxebarria, Álvarez, de Albéniz Iturriaga, & Montes, 2003)

Table 3. Fit indices and descriptive statistics of sensations subscales.

Country	Overall Model Fit			Sensations		Chills		Warmth		Exhilaration		Choked up	
	CFI	RMSEA	SRMR	Mean (SD)	α	Mean (SD)	α	Mean (SD)	α	Mean (SD)	α	Mean (SD)	α
Norway	.96	.09 [.07, .10]	.05	1.58 (1.95)	.88	1.99 (2.04)	.90	3.33 (1.77)	.82	1.27 (1.46)	.79	2.79 (1.66)	.84
Turkey	.95	.08 [.07, .10]	.05	2.02 (2.07)	.88	2.14 (1.82)	.76	3.04 (1.78)	.84	1.58 (1.61)	.80	2.68 (1.71)	.78
Croatia	.93	.09 [07, .11]	.06	1.96 (1.91)	.80	1.57 (1.54)	.54	3.42 (1.69)	.82	.97 (1.13)	.65	2.44 (1.67)	.86
China	.91	.09 [.07, .12]	.08	3.85 (1.64)	.82	2.08 (1.55)	.56	4.17 (1.33)	.61	2.34 (1.41)	.69	3.53 (1.73)	.79
India	.96	.07 [.04, .09]	.05	3.48 (1.88)	.78	2.60 (1.76)	.67	4.20 (1.50)	.72	2.67 (1.70)	.80	4.26 (1.21)	.63
Israel	.97	.07 [.05, .09]	.04	1.71 (1.90)	.86	1.80 (1.84)	.83	2.28 (1.82)	.82	1.42 (1.61)	.87	2.12 (1.70)	.82
Serbia	.93	.07 [.05, .09]	.06	3.77 (1.79)	.81	.94 (1.36)	.52	3.83 (1.70)	.61	1.32 (1.33)	.62	4.74 (1.46)	.83
Poland	.92	.10 [.08, .13]	.08	2.25 (2.21)	.87	1.27 (1.79)	.85	3.17 (1.68)	.55	1.80 (1.87)	.86	2.44 (1.51)	.69
US	.95	.10 [.08, .11]	.06	1.88 (2.07)	.89	1.40 (1.73)	.84	3.03 (1.87)	.86	1.77 (1.70)	.85	3.06 (1.74)	.87
Portugal	.96	.07 [.04, .09]	.05	1.86 (2.04)	.90	1.38 (1.60)	.64	2.23 (1.83)	.76	1.27 (1.45)	.76	2.73 (1.65)	.77
Germany	.91	.11 [.10, .13]	.08	2.21 (2.04)	.86	2.38 (1.71)	.60	3.29 (1.70)	.80	1.73 (1.64)	.82	2.35 (1.58)	.78
Netherlands	.85	.10 [.08, .11]	.09	3.67 (1.79)	.76	2.18 (1.64)	.61	3.09 (1.70)	.64	2.19 (1.46)	.61	3.84 (1.21)	.42
UK	.94	.10 [.08, .12]	.08	2.52 (2.10)	.91	2.22 (1.74)	.81	3.38 (1.56)	.75	2.61 (1.72)	.84	3.20 (1.47)	.71
Australia	.91	.09 [.06, .12]	.10	3.82 (1.48)	.70	1.85 (1.81)	.68	3.65 (1.61)	.66	2.48 (1.58)	.76	4.31 (1.53)	.81
Hungary	.93	.10 [.07, .12]	.07	2.45 (2.26)	.89	2.25 (2.05)	.84	4.29 (1.63)	.67	2.59 (1.86)	.83	2.84 (1.54)	.65
South Africa	.87	.12 [.06, .17]	.11	3.90 (1.88)	.84	2.17 (2.01)	.72	3.67 (2.11)	.75	2.86 (1.99)	.80	4.26 (1.57)	.64
Finland	.94	.08 [.05, .10]	.07	3.91 (1.50)	.73	1.98 (1.76)	.76	3.67 (1.73)	.65	2.38 (1.77)	.80	4.50 (1.45)	.84
Japan	.95	.10 [.07, .12]	.07	2.24 (1.95)	.93	1.64 (1.53)	.77	3.84 (1.59)	.85	2.45 (1.57)	.80	2.61 (1.74)	.91
Spain	.94	.07 [.04, .09]	.07	4.01 (1.67)	.76	2.56 (1.86)	.68	3.76 (1.68)	.99	2.75 (1.72)	.72	4.39 (1.34)	71

Table 4. Fit indices and descriptive statistics for the appraisal, motivation, and labels scales.

Country	CFI	RMSEA	SRMR	Mean (SD)	α	CFI	RMSEA	SRMR	Mean (SD)	α		Mean (SD)	α
	Appraisal Scale					Motivation Scale					Labels Scale		
Norway	.99	.08 [.00, .16]	.03	4.33 (1.34)	.77	1	0 [0, .11]	.01	2.91 (1.76)	.88	all	4.11 (1.64)	.91
Turkey	.99	.08 [0, .17]	.02	4.03 (1.63)	.87	.99	.09 [0, .18]	.02	3.59 (1.75)	.85	7:2, 7:3	4.34 (1.64)	.89
Croatia	.99	.09 [0, .20]	.02	4.55 (1.41)	.87	1	.06 [0, .18]	.02	3.27 (1.73)	.86	all	4.37 (1.47)	.86
China	1	.05 [0, .19]	.02	4.39 (1.17)	.80	.97	.14 [.04, .26]	.04	4.42 (1.18)	.76	all	4.71 (1.19)	.88
India	.98	.12 [.03, .22]	.04	4.74 (1.04)	.79	1	0 [0, 0]	.003	4.64 (1.25)	.81	7:1, 7:3	4.88 (1.02)	.55
Israel	1	0 [0, .12]	.01	3.90 (1.72)	.87	1	0 [0, .10]	.01	2.63 (1.88)	.89	all	4.31 (1.70)	.93
Serbia	.97	.18 [.11, .26]	.05	3.80 (1.80)	.85	.99	.08 [0, .17]	.02	3.83 (1.72)	.76	7:2	4.41 (1.87)	-
Poland	.99	.06 [0, .18]	.03	4.46 (1.38)	.74	1	.02 [0, .16]	.02	2.69 (1.85)	.84	7:2, 7:3	4.22 (1.81)	.85
US	.99	.10 [.02, .18]	.02	3.67 (1.73)	.87	.99	.12 [.05, .20]	.02	2.95 (1.96)	.91	all	4.44 (1.63)	.95
Portugal	1	0 [0, .09]	.01	4.10 (1.41)	.75	1	0 [0, .08]	.004	3.17 (1.98)	.89	all	4.05 (1.68)	.83
Germany	1	0 [0, .08]	.01	4.12 (1.35)	.78	.99	.08 [.01, .16]	.02	2.65 (1.77)	.89	all	4.36 (1.56)	.91
Netherlands	1	.07 [0, .16]	.02	3.82 (1.80)	.87	1	0 [0, .11]	.01	3.33 (1.74)	.80	all	4.32 (1.43)	.77
UK	.93	.23 [.14, .33]	.06	4.29 (1.37)	.81	1	0 [0, .14]	.01	3.62 (1.70)	.87	all	4.97 (1.19)	.90
Australia	.99	.11 [0, .26]	.03	3.38 (1.78)	.86	1	.04 [0, .21]	.01	3.39 (2.01)	.90	all	4.37 (1.63)	.84
Hungary	1	.02 [0, .17]	.02	4.13 (1.51)	.77	.96	.17 [.08, .28]	.04	2.40 (1.78)	.80	all	4.66 (1.52)	.90
South Africa	1	0 [0, .12]	.01	3.59 (2.02)	.86	.99	.09 [0, .33]	.03	3.81 (2.01)	.82	all	4.16 (1.96)	.88
Finland	1	0 [0, .10]	.01	3.88 (1.71)	.81	1	.04 [0, .18]	.02	3.76 (1.81)	.81	all	4.70 (1.26)	.79
Japan	1	.07 [0, .19]	.02	3.80 (1.41)	.84	.98	.16 [.07, .26]	.02	2.97 (1.63)	.88	all	3.90 (1.81)	.96
Spain	.99	.06 [0, .18]	.03	4.17 (1.44)	.78	.99	.07 [0, .18]	.02	4.15 (1.53)	.72	all	4.36 (1.40)	.68

Table 5. Correlation coefficients and 95% confidence intervals of all scales for all 19 countries together using only the kama muta cases.

r [95% CI]:	Tears	Chills	Warmth	Choked Up	Exhilaration	Appraisal	Motivation	Positive Valence	Negative Valence	Labels
Tears	1	.40 [.34, .45]	.40 [.35, .46]	.62 [.56, .68]	.18 [.13, .23]	.23 [.20, .27]	.33 [.27, .38]	.20 [.15, .26]	.13 [.07, .18]	.43 [.37, .49]
Chills	.40 [.34, .45]	1	.39 [.33, .45]	.48 [.42, .54]	.23 [.16, .30]	.22 [.17, .27]	.31 [.24, .38]	.16 [.10, .23]	.10 [.05, .15]	.32 [.25, .39]
Warmth	.40 [.35, .46]	.39 [.33, .45]	1	.44 [.38, .50]	.44 [.38, .49]	.42 [.38, .46]	.47 [.42, .52]	.38 [.32, .45]	-.02 [-.08, .04]	.53 [.47, .60]
Choked Up	.62 [.56, .68]	.48 [.42, .54]	.44 [.38, .50]	1	.13 [.07, .20]	.23 [.19, .27]	.33 [.26, .40]	.13 [.06, .20]	.21 [.16, .26]	.37 [.30, .44]
Exhilarated	.18 [.13, .23]	.23 [.16, .30]	.44 [.38, .49]	.13 [.07, .20]	1	.39 [.35, .44]	.42 [.36, .47]	.56 [.50, .62]	-.28 [-.35, -.21]	.39 [.33, .46]
Appraisal	.23 [.20, .27]	.22 [.17, .27]	.42 [.38, .46]	.23 [.19, .27]	.39 [.35, .44]	1	.60 [.55, .64]	.45 [.39, .50]	-.11 [-.16, -.05]	.54 [.49, .59]
Motivation	.33 [.27, .38]	.31 [.24, .38]	.47 [.42, .52]	.33 [.26, .40]	.42 [.36, .47]	.60 [.55, .64]	1	.39 [.33, .46]	-.04 [-.09, .01]	.55 [.52, .59]
Positive Valence	.20 [.15, .26]	.16 [.10, .23]	.38 [.32, .45]	.13 [.06, .20]	.56 [.50, .62]	.45 [.39, .50]	.39 [.33, .46]	1	-.37 [-.45, -.29]	.55 [.47, .62]
Negative Valence	.13 [.07, .18]	.10 [.05, .15]	-.02 [-.08, .04]	.21 [.16, .26]	-.28 [-.35, -.21]	-.11 [-.16, -.05]	-.04 [-.09, .01]	-.37 [-.45, -.29]	1	-.07 [-.15, .01]
Labels	.43 [.37, .49]	.32 [.25, .39]	.53 [.47, .60]	.37 [.30, .44]	.39 [.33, .46]	.54 [.49, .59]	.55 [.52, .59]	.55 [.47, .62]	-.07 [-.15, .01]	1

Table 6. Descriptive statistics and inferential tests for differences in self-report ratings of the labels scale for the four types of videos

Video Type	Kama Muta	Sadness	Awe	Amusement	Overall			
Rating	*M* [95% CI]				F	df1	df2	p
Emotion Labels	4.41 [4.11, 4.72]	2.65 [2.35, 2.96]	1.60 [1.30, 1.90]	.74 [.44, 1.04]	3475.2	3	6372	< .001
Sadness	1.99 [1.81, 2.18]	4.09 [3.91, 4.28]	.50 [.32, .69]	.53 [.35, .72]	2718.5	3	6398	< .001
Awe	2.81 [2.47, 3.15]	1.77 [1.43, 2.11]	2.73 [2.39, 3.07]	.72 [.38, 1.06]	769.9	3	6407	< .001
Amusement	1.45 [1.07, 1.84]	.49 [.10, .88]	1.45 [1.07, 1.84]	3.43 [3.04, 3.81]	1243.6	3	6491	< .001

Table 7. Descriptive statistics and inferential tests for differences in self-report ratings of the labels scale in the recall of personal episodes approach

Episode Type	Positive Tears	Negative Tears	Overall			
Rating	*M* [95% CI]		F	df1	df2	p
Emotion Labels	4.34 [3.96, 4.71]	2.40 [2.03, 2.78]	749.2	1	1106	< .001
Sadness	1.40 [1.18, 1.62]	5.11 [4.89, 5.33]	2992.5	1	2178	< .001

Table 8. Descriptive statistics and inferential tests for differences in self-report ratings of the labels scale for the four types of videos or for the two types of episodes, by country.

Rating	KM Emotion Labels	Sadness	Awe	Amusement	Overall			
Country	*M* [95% CI]				*F*	df1	df2	*p*
Norway	4.12 [3.44, 4.78]	1.83 [1.18, 2.47]	1.04 [.38, 1.71]	.29 [-.37, .96]	615.9	3	767	< .001
Turkey	4.36 [3.81, 4.90]	4.03 [3.53, 4.54]	1.44 [.94, 1.95]	.27 [-.24, .78]	372.7	3	425	< .001
Croatia	4.37 [4.12, 4.62]	2.28 [2.02, 2.54]	1.33 [1.08, 1.58]	.38 [.13, .64]	370.6	3	443	< .001
China	4.71 [4.44, 4.97]	3.14 [2.88, 3.40]			81.5	1	138	< .001
India	4.91 [4.56, 5.25]	3.80 [3.46, 4.15]	3.48 [3.14, 3.82]	2.30 [1.96, 2.64]	105.8	3	515	< .001
Israel	4.32 [3.95, 4.70]	2.29 [1.92, 2.76]	1.15 [.77, 1.52]	.35 [-.03, .72]	457.6	3	624	< .001
Serbia	4.41 [4.15, 4.67]	2.34 [2.08, 2.61]			134.6	1	243	< .001
Poland	4.21 [3.67, 4.76]	3.07 [2.53, 3.61]	1.30 [.76, 1.84]	.19 [-.35, .73]	307	3	424	< .001
US	4.45 [4.26, 4.64]	2.06 [1.86, 2.26]	1.29 [1.10, 1.48]	.60 [.42, .79]	417.3	3	686	< .001
Portugal	4.05 [3.62, 4.48]	2.26 [1.83, 2.68]	1.14 [.71, 1.56]	.51 [.09, .94]	356.4	3	552	< .001
Germany	4.38 [3.97, 4.79]	2.46 [2.06, 2.86]	1.48 [1.07, 1.89]	.70 [.28, 1.11]	614.5	3	927	< .001
Netherlands	4.32 [4.15, 4.49]	3.21 [3.04, 3.37]			90.4	1	274	< .001
UK	4.97 [4.47, 5.48]	3.08 [2.58, 3.58]	1.84 [1.33, 2.34]	.80 [.30, 1.31]	384.9	3	481	< .001
Australia	4.37 [4.04, 4.71]	1.59 [1.25, 1.93]			144.7	1	93	< .001
Hungary	-	-	-	-	-	-	-	-
South Africa	4.18 [3.61, 4.74]	1.45 [.93, 1.97]			58.0	1	50	< .001
Finland	4.71 [4.45, 4.96]	1.72 [1.47, 1.97]			315.9	1	138	< .001
Japan	3.89 [3.40, 4.38]	2.13 [1.64, 2.61]	2.03 [1.54, 2.51]	1.30 [.81, 1.79]	114.1	3	415	< .001
Spain	4.36 [4.10, 4.61]	2.58 [2.33, 2.84]			102.9	1	155	< .001

Table 9. Descriptive statistics and inferential tests for the other scales in the video approach across the 11 countries using this approach (Hungary is excluded as it only used the kama muta video type).

Video Type	Kama Muta	Sadness	Awe	Amusement			
Rating	*M* [95% CI]				F	df2	p
Appraisal	4.20 [3.91, 4.49]	1.80 [1.50, 2.09]	1.37 [1.07, 1.66]	.57 [.28, .87]	3881.8	6365	< .001
Motivation	3.13 [2.74, 3.52]	2.23 [1.84, 2.62]	.87 [.48, 1.26]	.62 [.23, 1.01]	2336.4	6235	< .001
Positive Valence	4.80 [4.54, 5.06]	1.37 [1.11, 1.63]	3.26 [3.00, 3.52]	3.38 [3.12, 3.63]	1529.4	6487	< .001
Negative Valence	1.26 [1.12, 1.41]	3.84 [3.69, 3.99]	1.21 [1.07, 1.36]	1.31 [1.16, 1.46]	1414.8	6391	< .001
Tears	2.18 [1.85, 2.50]	1.53 [1.21, 1.86]	.39 [.06, .71]	.33 [.01, .66]	1115.1	6257	< .001
Chills	1.95 [1.64, 2.25]	1.75 [1.44, 2.06]	1.46 [1.15, 1.77]	.52 [.21, .83]	526.3	6287	< .001
Warmth	3.31 [2.90, 3.71]	2.05 [1.64, 2.46]	1.63 [1.23, 2.04]	.94 [.54, 1.35]	1447.5	6324	< .001
Choked Up	1.85 [1.45, 2.26]	2.11 [1.71, 2.52]	.92 [.51, 1.32]	.49 [.08, .89]	956.6	6290	< .001
Exhilaration	2.80 [2.46, 3.15]	.50 [.15, .84]	2.12 [1.77, 2.46]	2.66 [2.32, 3.01]	1200.8	6424	< .001

Table 10. Descriptive statistics and inferential tests for the other scales in the episodes approach across the seven countries using this approach.

Episode Type:	Positive Tears	Negative Tears			
Rating	*M* [95% CI]		*F*	df2	*p*
Appraisal	3.85 [3.32, 4.38]	1.86 [1.33, 2.39]	817	1088	< .001
Motivation	3.79 [3.40, 4.18]	2.90 [2.52, 3.29]	200.1	1101	< .001
Positive Valence	5.24 [4.97, 5.51]	1.36 [1.09, 1.63]	3421.3	2177	< .001
Negative Valence	1.30 [1.06, 1.55]	4.96 [4.72, 5.21]	3044.9	2172	< .001
Tears	3.81 [3.65, 3.96]	4.79 [4.63, 4.94]	310.6	1091	< .001
Chills	1.89 [1.49, 2.28]	2.05 [1.65, 2.44]	6.48	1102	.01
Warmth	3.69 [3.40, 3.98]	2.50 [2.21, 2.78]	457.9	1090	< .001
Choked Up	2.27 [1.83, 2.71]	3.72 [3.29, 4.16]	646.2	1089	< .001
Exhilaration	4.23 [4.13, 4.33]	.90 [.80, 1]	3222.2	2186	< .001

Table 11. Correlation coefficients and 95% confidence intervals of all scales for all 19 countries
with three traits; the empathic concern subscale of the IRI, the KAMF, and the SNS; using only the kama muta cases.

r [95% CI]	Empathic Concern	KAMF	SNS
Tears	.18 [.12, .23]	.32 [.28, .35]	.15 [.11, .20]
Chills	.11 [.05, .18]	.23 [.18, .27]	.14 [.09, .19]
Warmth	.23 [.20, .26]	.30 [.26, .33]	.19 [.14, .23]
Choked-Up	.13 [.07, .19]	.25 [.21, .28]	.16 [.12, .19]
Exhilarated	.16 [.12, .19]	.17 [.14, .20]	.13 [.09, .16]
Appraisal	.21 [.17, .24]	.19 [.15, .22]	.20 [.16, .24]
Motivation	.28 [.24, .32]	.31 [.26, .35]	.28 [.24, .32]
Positive Valence	.20 [.16, .25]	.15 [.10, .19]	.11 [.07, .15]
Negative Valence	-.05 [-.10, .0]	.06 [.03, .09]	.06 [.02, .10]
Labels	.32 [.28, .37]	.29 [.24, .34]	.20 [.16, .24]

Appendix A – KAMMUS Two

[In all sections, Likert scales, 0 = “not at all” to 6 = “a lot”]

Section 1:

Please indicate whether you experienced any of the following sensations, feelings, or actions, and if so, to what extent:

Moist eyes.
Tears.
Goosebumps or hair standing up.
Chills or shivers.
A warm feeling in the center of the chest.
Some feeling in the center of the chest.
Choked up.
A lump in the throat.
Difficulty speaking.
I smiled.
Buoyant or light.
Refreshed, energized, or exhilarated.

Section 2:

Please rate to what extent each of the following statements are true:
I felt/I observed…

An incredible bond
An exceptional sense of closeness appear
A unique kind of love spring up
An extraordinary feeling of welcoming or being welcomed

Section 3:

Please indicate whether you had each of the following feelings just afterwards, and if so, to what extent:

I felt like telling someone how much I care about them.

I wanted to hug someone.

I wanted to do something extra-nice for someone.

I felt more strongly committed to a relationship.

Section 4:

Please rate to what extent each of the following statements are true:

I had positive feelings.

Section 5:

Please indicate whether each of the following was true, and if so, to what extent:

It was heartwarming.

I was moved.

I was touched.