Research Article

PsychOpen GOLD

Social Psychological Bulletin

The Function of Feeling Kama Muta in Face of Collective Threat

Alethea H. Q. Koh[1,2], Masataka Nakayama[2], Kongmeng Liew[1], Yukiko Uchida[2]

[1] *School of Psychology, Speech and Hearing, University of Canterbury, Christchurch, New Zealand.* **[2]** *Institute for the Future of Human Society, Kyoto University, Kyoto, Japan.*

Social Psychological Bulletin, 2025, Vol. 20, Article e13457, https://doi.org/10.32872/spb.13457

Received: 2023-12-13 • **Accepted:** 2024-11-13 • **Published (VoR):** 2025-02-05

Handling Editor: Janis Zickfeld, Aarhus University, Aarhus, Denmark

Corresponding Author: Alethea H. Q. Koh, Institute for the Future of Human Society, Kyoto University, 46 Yoshida Shimoadachi-cho, Sakyo Ward, Kyoto, 606-8501, Japan. E-mail: koh.alethea.h70@kyoto-u.jp

Supplementary Materials: Code, Data, Materials, Preregistration [see Index of Supplementary Materials]

Abstract

Kama muta is a positive emotion that is commonly elicited against a backdrop of difficulties and reorients one's values towards priorities in life. Hence, we expect kama muta to cause similar beneficial shifts in attitudes, when exposed to collective threat such as natural disasters. In these contexts, kama muta may help to build individuals' resources for prosocial action, through mechanisms like reducing the perceived burden of their own personal problems. As such, the current research proposes that kama muta reduces negative attitudes towards one's personal problems (personal problem appraisals) and is simultaneously enhanced by exposure to collective threat. Across three studies on Japanese participants (N = 725), we found that participants' experiences of kama muta predicted alleviations in their personal problem appraisals, even after controlling for other positive emotions. However, kama muta was not enhanced by experimental manipulation of collective threat contexts, but was instead positively correlated with subjective perceptions of the societal impact of these threats.

Keywords

kama muta, feeling moved, collective threat, negative attitudes, personal problem appraisals

Highlights

- Kama muta, commonly known as the emotion of feeling moved, is associated with reductions in negative attitudes and appraisals from individuals' personal problems.
- Kama muta may sometimes be associated with situations of collective threat, particularly when these threats are perceived to have high societal impact.

Kama muta, often referred to colloquially as the emotion of feeling moved (Zickfeld, Schubert, Seibt, Blomster, et al., 2019), is a positive emotion that emerges from a sudden intensification of communal relationships. It is frequently induced by affirmation and re-affirmation of an individual's positive core values (on feeling moved; Cova & Deonna, 2014), with accompanying displays of moralistic qualities like love and courage. Cognitive appraisals include communal sharing, that is, the witnessing of increases (intensifications) in interpersonal closeness and connection in other people. Kama muta is also associated with strong physiological sensations, such as tears, goosebumps, and subjective feelings of warmth in the chest (Zickfeld et al., 2020). Often, kama muta is experienced in response to difficulties (Zickfeld et al., 2020), such as natural disasters and even the COVID-19 pandemic. With the increase in these globalized threats, it is important to understand the function of kama muta in human society: Based on past literature, we believe that it helps to build up an individual's resources for prosocial action, which would be societally adaptive in trying times. However, these functions of kama muta, especially in the context of collective threat, have not been studied much in past literature (Zickfeld, Schubert, Seibt, & Fiske, 2019). Our research therefore examines the notion that socially impactful collective threat can enhance experiences of kama muta, which may in turn alleviate individuals' attitudes towards personal troubles, thereby facilitating a broader prosocial function.

Kama Muta Reduces the Perceive Weight of Individual's Personal Problems

Like many other positive emotions, kama muta may function to help the individual overcome negative situations (Fredrickson et al., 2003), by building resilience through value-reorientation. This reduces the perceived weight of one's personal problems, enabling individuals to adopt new motivations or concerns for issues they might not have cared about before, increasing self-reflection and changes in what the individual perceives as meaningful (Landmann et al., 2019). This process of reorientation may then promote individuals' insight into their problems (Lyke, 2009) and improve well-being (Sagiv & Schwartz, 2000; Uchida et al., 2014). Accordingly, we posit that kama muta may exert a downward shift in the perspective of the seriousness of one's personal problems and anxieties; kama muta may positively reorientate individuals' existing negative attitudes

and appraisals towards their personal problems (henceforth labeled as 'personal problem' appraisals [PPA]; Hypothesis 1).

This can also be understood through cognitive reappraisal processes in emotion regulation (Gross & John, 2003), specifically in positive reorientation (Zhou et al., 2020), where individuals experiencing distress may cognitively re-interpret their negative situation in a positive light. Procedurally, this similarly involves meaning-making processes, such as the reappraising of negative events as (positively) meaningful in the 'greater scheme of things' (Stellar et al., 2017), which are linked to downstream effects of experiences of self-transcendental emotions like awe (the 'small self' effect, Piff et al., 2015) and kama muta (Pizarro et al., 2021). Contextually, this suggests that kama muta may help individuals find meaning through adversity, thereby reducing the negative attitudes and appraisals towards adverse events (personal problem appraisals).

Kama Muta and Collective Threat: The Context for Value Change

Relatedly, we attempt to determine the conditions by which kama muta can be enhanced, thereby facilitating reductions in personal problem appraisals. Exploratory studies on participants' descriptions of moving experiences have shown that natural disasters form a prototypical backdrop for moving experiences, especially in media (Menninghaus et al., 2015). Despite apparent harm, exposure to collective threat, such as natural disasters, may increase meaning-making processes (Nakayama & Uchida, 2020; Uchida et al., 2014), causing beneficial value shifts in the individual and building up resilience (Bonanno et al., 2010). Individuals exposed to a nation-wide natural disaster, even without experiencing direct harm, reported higher well-being and reevaluation of attitudes towards life, alongside increased commitment to meaning-related self-transcendent values and social connections (Uchida et al., 2014). Kama muta may also facilitate some of these changes, given that natural disasters consistently appear as a backdrop for feeling moved (Menninghaus et al., 2015; Note & Van Daele, 2016). Therefore, in this paper, we define collective threat to be a context in which large-scale threats have direct and indirect adverse consequences on a community of people (e.g., war, natural disasters, pandemic).

We think that kama muta most strongly emerges against a backdrop of difficulties. Kama muta requires some context-related knowledge (Tokaji, 2003), whereby the preciousness of one's relationships and values is brought to attention when it is threatened, in contexts such as separation or loss (Cullhed, 2020). For example, natural disasters, such as earthquakes, are typically associated with collective threat and loss of life, but juxtaposed within these negative events are often small stories of human connection: a mother reunited with a missing child, or rescue workers showing courage and bravery to save survivors. In these contexts, the sharp contrast between the triumph of positive core values (such as love and courage) and the prevailing adverse circumstances makes every positive action more salient and dearer to the individual (Cova & Deonna, 2014; Strick & van Soolingen, 2018). Witnessing intensifications of heartwarming social bonds

(Schubert et al., 2018) thereby leads to strong experiences of kama muta through activating appraisals on the sudden intensification of communal sharing (as an appraisal dimension of kama muta, Zickfeld, Schubert, Seibt, Blomster, et al., 2019). Seibt and colleagues (2023), for example, found that participants who read first-person accounts of a collective threat incident (typhoon) experienced more kama muta than participants who read neutral, fact-based reports of the same incident. Kama muta thus motivates individuals to show more empathic concern, and may be societally adaptive for promoting cooperation: theories from cultural evolution have argued that societies with stronger historical presence of collective threat (like natural disasters or pathogen prevalence) foster greater cooperation and social capital (Henrich & Muthukrishna, 2021; Varnum, 2014). Accordingly, collective threat may form the backdrop for kama muta (Hypothesis 2), allowing for the emergence of kama muta experiences that may, in turn, facilitate value change and meaning making processes.

Overview of Current Studies

Across three studies, we utilize the KAMMUS-Two scale (Zickfeld, Schubert, Seibt, Blomster, et al., 2019), which measures physiological, affective responses and action tendencies of kama muta (Petersen & Martin, 2021).

We examined the effect of feeling kama muta on participants' personal problem appraisals (stronger experiences of kama muta predicts decreased personal problem appraisals; Hypothesis 1) and the effect of collective threat on kama muta (threat elicits stronger experiences of kama muta; Hypothesis 2). We first establish a connection between collective threat, kama muta and personal problem appraisals, using experimental manipulation (Study 1) and an ongoing natural disaster (Study 2) as the collective threat contexts.

Study 3 then focused on examining the effect of different forms of collective threat on kama muta and replicating the effect of kama muta on personal problem appraisals. We also measured the perceived societal impact of collective threat in each condition as a gauge of the potential consequence of such threat on society. To this end, we manipulated the degree of collective threat via the saliency of societal impact (Study 3). Across all three studies, measures of awe, happiness and gratitude were also included for all studies to examine if feeling moved exerted a unique effect apart from other similarly functioning positive emotions (Koh et al., 2019; Maeura et al., 2020; Stellar et al., 2017).

All studies were approved by the institutional review board of Kyoto University. Portions of the studies were pre-registered (Study 1: Koh, 2019a; Study 3: Koh, 2019b). Unless otherwise stated, all analyses were conducted in jamovi (v1.6.23), and significance testing used alpha = .05. Data, analysis scripts, descriptive statistics, and power analyses are available for all studies in the OSF repository (see Liew & Koh, 2023).

Study 1

Method

Participants

322 Japanese participants were recruited through an online crowdsourcing platform (*Lancers* [lancers.jp]) and reimbursed 200 yen for participating. Sample sizes were limited by available funding at the time of the study. 20 participants were dropped from the analysis, for failing the attention checks and/or not following the experimental procedure, resulting in a final $N = 302$ (51% males, mean age = 40.5, $SD = 9.34$). Participants were assigned to one of three conditions: Threat+Kama muta ($N = 104$), Neutral+Kama muta ($N = 103$), and Threat-only ($N = 95$).

Procedure and Materials

Participants were presented with detailed study information before providing informed consent. They were then prompted to describe in detail up to three different problems that they were currently struggling with. The problems could be anything they were concerned about and had been troubled with. Participants then rated how troubled, worried, difficult, severe and confident in overcoming (reverse-coded) their problems they were, using a slider scale from 1 (not ___ at all) to 100 (extremely ___), for each respective item. All slider scales were initially anchored from the left at 0. The average rating formed the measure for their personal problem appraisals at Time 1 (*ProbT1*, $\alpha = .83$). They also rated how common they thought their problems were and their current mood. As these were exploratory measures, further analyses are included in the supplementary materials and will not be discussed within this paper (See Supplementary Materials, Section 2: Problem Commonality and Mood Analyses, Liew & Koh, 2023).

Next, participants proceeded to the threat and feeling moved manipulation tasks according to their assigned condition ("Threat+Kama muta", "Neutral+Kama muta", "Threat-only"). Participants assigned to the focal condition, Threat+Kama muta, first watched a video depicting collective threat, that comprised clips of thunderstorms, rain and rolling dark clouds (links are in Supplementary Materials, Section 4, Liew & Koh, 2023). Next, they watched a second video depicting social connection: A Japanese commercial, depicting the opening of a new train line connecting towns and prefectures physically and emotionally/psychologically (e.g., celebrating the new train line together), where people of all ages came together to cheer on the passing train. This was used as the kama muta target stimuli as it allowed participants to observe human connection and bonding without depicting any unfortunate circumstances.

Participants assigned to the Neutral+Kama muta condition, as a control condition for collective threat, first watched a neutral video consisting of a feather resting on a patch of grass, swaying slightly in the breeze. The neutral video was chosen to include nature

without its threatening aspects. Participants then watched the commercial described above as the target for kama muta.

Participants assigned to the Threat-only condition, as a control for the kama muta stimuli, watched only the collective threat video before moving on to the next part of the study.

All participants then rated their experiences of kama muta, using the KAMMUS-Two scale, with 24-items (α = .94) from 0 (not at all) to 6 (very much), which were averaged to form the kama muta measure (for alternative calculations see Supplementary Materials: Section 3, Liew & Koh, 2023). They also rated the extent they felt awe[1], grateful and happy using the same Likert scale.

Lastly, they were asked to recall the problems they listed earlier and briefly list them again. They rated their personal problems using the same items at Time 1, forming the measure ProbT2. They also completed other unrelated questions[2] and a demographics questionnaire.

KAMMUS-Two

The KAMMUS-Two scale is our main measure of kama muta used in this project. It measures the five aspects of kama muta experiences by asking participants about their experiences across five different factors (Zickfeld, Schubert, Seibt, Blomster, et al., 2019): 1) Bodily sensations (12 items; e.g., "*To what extent... (the participant experienced) tears*"), 2) (appraisals on) intensification of communal sharing relationships (4 items; e.g., "*I felt/observed an incredible bond*"), 3) social motivation (4 items; e.g., "*I wanted to do something extra-nice for someone*"), positive valence (1 item; "*I had positive feelings*"), and vernacular labels (3 items; e.g., "*I was moved*"). All items were rated on a scale from 0 (not at all) to 6 (a lot).

Results

Manipulation Checks

The video stimuli were tested in a separate study to prevent demand characteristics. 55 Japanese participants watched and rated the collective threat and neutral video using a 7 point-Likert scale, from 1 (not at all) to 7 (extremely). A repeated measure analysis revealed that the collective threat video (M = 4.50, SD = 2.06) was significantly higher in threat than the neutral video (M = 1.29, SD = 0.88), $F(1,102) = 215$, $p < .001$, $\eta_p^2 = 0.68$.

1) Analyses for awe as a single-item dependent variable from Studies 1 to 3 are described in the Supplementary Material, Section 5 (see Liew & Koh, 2023).

2) These measures included the Kama Muta Frequency Scale (KAMF; Zickfeld, Schubert, Seibt, Blomster, et al., 2019), the Inclusion of Community in Self Scale (Mashek et al., 2007), and the Interpersonal Sympathy Scale (Uchida & Kitayama, 2001).

Outcomes on Personal Problem Appraisals (Hypothesis 1)

ProbT2 was regressed on kama muta and ProbT1, $R^2 = 0.74$, $F(2,299) = 430$, $p < .001$. Kama muta significantly and negatively predicted ProbT2 even after controlling for ProbT1 (see Table 2). The stronger the individuals' experiences of kama muta, the lower the personal problem appraisals. Participants' ratings of awe, gratitude and happiness were then entered as additional controls, $R^2 = 0.74$, $F(5,296) = 172$, $p < .001$. Only ProbT1 emerged as a significant predictor (see Table 2). A one-way ANOVA also showed no effect of condition on ProbT2, $F(2,299) = .037$, $p = .964$, $\omega^2 = -.006$.

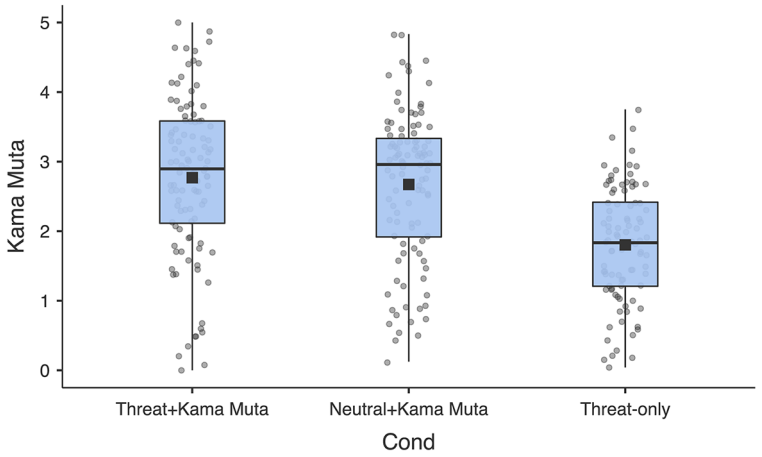
ProbT2 was then regressed on Cond and ProbT1, $R^2 = 0.73$, $F(3,292) = 271$, $p < .001$, with the Threat-only stimuli as the reference level. No significant effect was observed for Threat+Kama muta nor Neutral+Kama muta (see Table 2).

Collective Threat and Kama Muta (Hypothesis 2)

A Welch's ANOVA on the experience of kama muta as a function of context was significant, $F(2,198) = 32.4$, $p < .001$, $\omega^2 = .172$. Post-hoc Games-Howell tests revealed higher experiences of kama muta in the Threat+Kama muta condition than the Threat-only condition, $t(187) = 6.93$, $p < .001$, Cohen's $d = 0.97$ (95% CI [0.66, 1.28]). Kama muta was also higher in the Neutral+Kama muta condition than the Threat-only condition, $t(189) = 6.40$, $p < .001$, Cohen's $d = 0.91$ (95% CI [0.59, 1.20]). The Threat+Kama muta and Neutral+Kama muta conditions did not differ, $p = .80$ (see Figure 1).

Figure 1

The Effect of Condition on Kama Muta



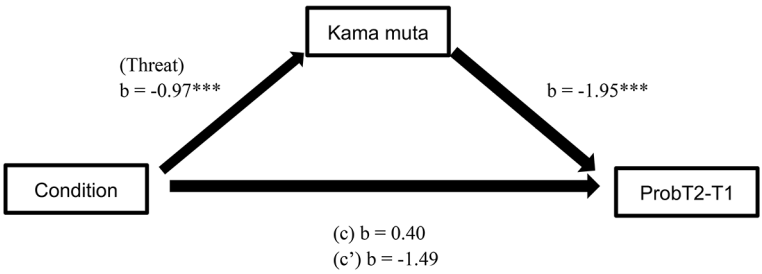
Note. Rated kama muta (KAMMUS-Two scale) after watching the video stimuli ("Threat+Kama muta", "Neutral+Kama muta", "Threat-only"). Central tendencies are represented by the medians (line) and means (square). Boxes indicate 25th and 75th percentiles, and whiskers indicate upper and lower boundaries at 1.5 times the interquartile range.

Function of Kama Muta

As an exploratory step, kama muta was tested as a mediator between condition and change in personal problem appraisals (as a difference score of ProbT2-T1). Condition was dummy coded. Neutral+Kama muta contrast coded the Neutral+Kama muta condition as 1 and the others as 0. Threat-only contrast coded the Threat-only condition as 1 and the others as 0. The Threat-only contrast significantly predicted kama muta (b = -0.97, SE = .14, 95% CI [-1.22, -0.68], B = -.40, Z = -7.04, p < .001), which in turn predicted change in personal problem appraisals (b = -1.95, SE = 0.55, 95% CI [-3.04, -0.88], B = -.22, Z = -3.52, p < .001). The indirect effect of Threat-only contrast on change in personal problem appraisals, mediated by kama muta, was significant (b = 1.89, SE = .63, 95% CI [0.81, 3.25], B = 0.09, Z = -3.00, p = .003). The effect of Neutral+Kama muta contrast was not significant: Neutral+Kama muta contrast did not significantly predict kama muta (b = -1.14, Z = -0.94, p = .35), which did not predict change in personal problem appraisals (b = -1.49, Z = -0.93, p = .35), and the indirect effect was not significant (b = .19, Z = 0.60, p = .55). This suggests that the Kama muta stimuli conditions (Threat+kama muta, Neutral+Kama muta), over the Threat-only condition, significantly predicted kama muta ratings, which then significantly predicted reduced PPAs. Confidence intervals were based on a bootstrapped model with a resampling size of 5000 (see Figure 2).

Figure 2

Kama Muta Mediates Threat and PPA



Note. Significant mediation effect of kama muta on the relationship between Threat-only contrast and change in personal problem appraisals. All coefficients reported are unstandardized. Note that total effects (c) and direct effects (c') were not significant.
***p < .001.

Discussion

Higher ratings of kama muta were associated with lower personal problem appraisals, and this effect remained after controlling for other positive emotions of happiness, gratitude and awe. However, this was dependent not on the threat or kama muta video stimuli, but on the perceived extent to which participants subjectively felt kama muta.

Our mediation analysis provides some evidence of the effect of kama muta on PPA: A significant indirect effect of kama muta stimuli conditions was observed on reductions in PPA as mediated by perceived kama muta. To some extent, we think that these results may support Hypothesis 1.

In contrast to Hypothesis 2, no significant effect of threat was observed: no significant difference was observed between threat and neutral videos preceding kama muta induction. One possibility could be the remoteness of the threat to the individual, such that the 'perceived' danger of the threat was not salient. Accordingly, we conducted Study 2, which used similar materials and methods as Study 1, but with an *actual* threat context—participants were recruited in the midst of an ongoing nationwide natural disaster.

Study 2

To test the effects of threat on kama muta induction in an ecologically valid context (Hypothesis 2), we conducted a study using an ongoing natural disaster as the threat context, as opposed to video stimuli as presented in Study 1. Additionally, we examined the reorientation effect of kama muta on negative attitudes towards personal problems (Hypothesis 1), to replicate the findings found in Study 1.

Method

Participants

135 Japanese participants were recruited through the same online platform during an ongoing natural disaster, involving landslides, heavy rainfall and flooding (Chappell, 2019). Due to the time-sensitive nature of the study, our sample size was limited to participants who responded to the recruitment collateral during the natural disaster. They were reimbursed 200 Japanese yen for their participation. 16 participants were dropped from the analysis for the same reasons mentioned in Study 1, resulting in a final sample of $N = 119$ (51.3% males, mean age = 39.2, $SD = 10.8$).

Procedure

Unlike Study 1, which was a between-subjects experiment, all participants underwent the same emotion induction procedure as the Neutral+Kama muta condition in Study 2, watching both the neutral and kama muta video stimuli described above. Additionally, after the Time 2 measures, they also rated how much they had been thinking about the ongoing natural disaster and associated damage recently, from 1 (not at all) to 5 (constantly) adapted from previous research (Uchida et al., 2014). The frequency of participants' thoughts about the ongoing natural disaster represented the salience of the threat context and served as Study 2's measure of threat in an ecological manner.

Results

Outcomes on Personal Problem Appraisals (Hypothesis 1)

ProbT2 was regressed on kama muta, ProbT1, R^2 = 0.79, F(2,116) = 214.5, p < .001. Replicating Study 1, kama muta significantly predicted ProbT2 after controlling for ProbT1. When awe, grateful and happiness were entered as additional controls, R^2 = 0.79, F(5,113) = 85.2, p < .001, kama muta remained a significant predictor, but none of the other 3 emotion predictors emerged significant (awe: b = -0.15, p = .84; happy: b = 1.16, p = .23; grateful: b = -0.56, p = .50).

Collective Threat and Kama Muta (Hypothesis 2)

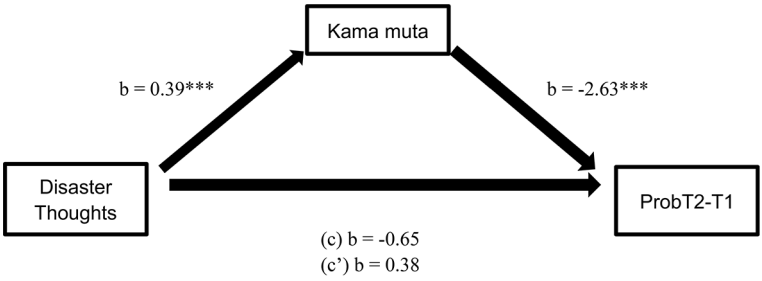
Participants' disaster thoughts significantly predicted kama muta, b = .391, t(117) = 3.34, p = .001, 95% CI [.159, .624]. Participants who thought more about the ongoing natural disaster around that week felt more kama muta while watching the commercial.

Function of Kama Muta

Kama muta was tested as a mediator between disaster thoughts and change in personal problem appraisals. The regression coefficients between disaster thoughts and kama muta (b = .39, SE = .11, 95% CI [.16, .60], B = .29, Z = 3.50, p < .001) and between kama muta and change in personal problem appraisals (b = -2.63, SE = 0.93, 95% CI [-4.51, -.86], B = -.28, Z = -2.82, p = .005) were significant. The indirect effect of disaster thoughts on change in personal problem appraisals, mediated by kama muta, was significant (b = -1.03, SE = .50, 95% CI [-2.30, -.28], B = -.08, Z = -2.04, p = .041). Confidence intervals were based on a bootstrapped model with a resampling size of 5000 (see Figure 3).

Figure 3

Kama Muta Mediates Disaster Thoughts and PPA



Note. Significant mediation effect of kama muta on the relationship between disaster thoughts and change in personal problem appraisals. All coefficients reported are unstandardized. Note that total effects (c) and direct effects (c') were not significant.
***p < .001.

Discussion

As with Study 1, subjecting ratings of kama muta were associated with participants' personal problem appraisals as hypothesized (Hypothesis 1) even after controlling for happiness, gratitude and awe. Additionally, Study 2 showed that kama muta mediated reductions in the burden of personal problems, when collective threat was more salient (Hypothesis 2). Unlike Study 1, in Study 2, the salience of real-life collective threat was associated with increased experiences of kama muta, suggesting that some aspects of collective threat may nevertheless be involved in heightened experiences of kama muta.

Study 3

One explanation could be that the inconsistent effect of threat in Study 1 may be due to differences in saliency of the harmful consequences of collective threat on society. Hence, we asked participants in the threat conditions to additionally read an article showing the direct consequence of the threat on humans (Human Life Threat) or as a general natural phenomenon (Nature Threat). We measured participants' perceptions of the societal impact of the article as an indication of collective societal threat. We expected social impact to be more salient in the Human Life Threat condition than the Nature Threat condition, and kama muta to be correspondingly enhanced in the former. While already identified in Studies 1 and 2, we again tested if the effects of kama muta on personal problem appraisals (Hypothesis 1) could be consistently replicated.

Method

Participants

347 Japanese participants were recruited and reimbursed similar to Study 1. Sample sizes were limited by available funding at the time of the study. 43 participants were dropped from the analysis, for the same reasons mentioned in Study 1. The remaining 304 participants (49.7% males, mean age = 40.9, *SD* = 9.67) were assigned to one of the three conditions; Human Life Threat (N = 105), Nature Threat (N = 99) and Neutral (N = 100).

Procedure and Materials

All participants completed the same problem listing task and personal problem appraisal measures as in Study 1. Participants then proceeded to the collective threat manipulation task according to their assigned condition. Participants in both the Human Life and Nature Threat conditions first watched a thunderstorm video (from Study 1). Next, they were presented with an ostensible news article, with instructions to read it and answer related questions later on in the survey. In the Human Life Threat condition, participants read about several human victims who were injured or killed by lightning during a

recent thunderstorm, to direct their focus to specific consequences of the collective threat. Participants in the Nature Threat condition read an article about the properties and potential effects of a thunderstorm like flooding and landslides, in order to direct their focus to the general consequences of the collective threat.

Participants in the Neutral condition watched the same neutral video from Study 1. They then read an article about the properties of raindrops, which have natural elements close to a thunderstorm but without its threatening aspects. This was to rule out possible societal impact due to scientific applications of natural phenomenon. All articles were of a similar length.

All participants proceeded to briefly describe the article they had read, and also indicated how much impact they thought the article's content had on society using a slider scale from 0 (not at all) to 100 (extremely impactful) to measure perceived social (societal) impact. All participants then watched the moving commercial and completed the rest of the procedure described in Studies 1 and 2.

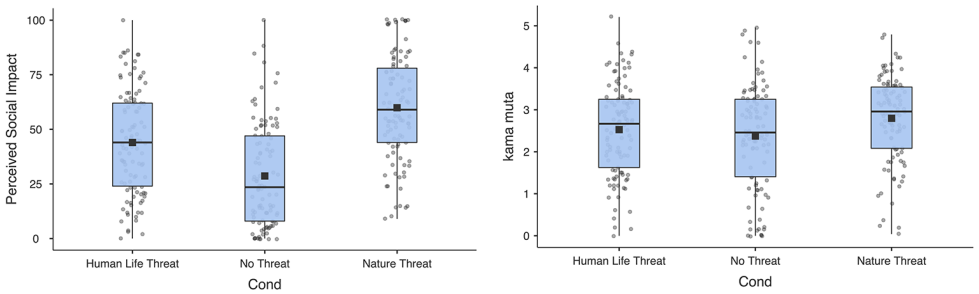
Results

Manipulation Check: Societal Impact

A one-way ANOVA revealed a significant effect of condition, $F(2,301) = 42.6$, $p < .001$, $\omega^2 = .215$. Contrary to our prediction, post-hoc Tukey tests showed that participants in the Nature Threat condition rated their article significantly higher in societal impact than participants in the Human Life Threat condition, $t(301) = -4.76$, $p < .001$, Cohen's $d = -0.67$ 95% CI [-0.95, -0.38]), and was also rated significantly higher in societal impact than the Neutral condition, $t(301) = -9.24$, $p < .001$, Cohen's $d = -1.30$ (95% CI [-1.63, -0.97]) (see Table 2; Figure 4: left).

Figure 4

The Effects of Condition on Societal Impact and Kama Muta



Note. Left: Participants' perceived societal impact (of collective threat) after watching the video stimuli and article reading. Right: Rated kama muta (KAMMUS-Two scale) after watching the video stimuli and article reading. Boxes indicate 25th and 75th percentiles, and whiskers indicate upper and lower boundaries at 1.5 times the interquartile range.

Outcome on Personal Problem Appraisals (Hypothesis 1)

ProbT1 and kama muta were first regressed onto ProbT2 in Step 1, R^2 = 0.83, F(2,301) = 722, p < .001, followed by awe, happy and grateful in Step 2, R^2 = 0.83, F(5,298) = 292, p < .001. Replicating Studies 1 and 2, kama muta significantly predicted ProbT2 when controlling for ProbT1, and also for other positive emotions and ProbT1. Awe, happiness and gratitude did not emerge as significant predictors, with the closest being Awe, b = 0.82, t(298) = 3.77, 95% CI [-.01, 1.65], p = .053.

Effect of Collective Threat on Kama Muta (Hypothesis 2)

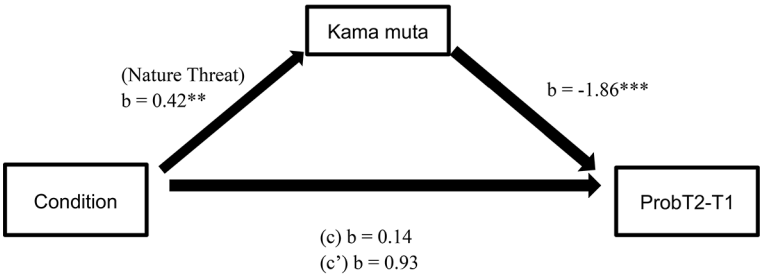
A one-way ANOVA revealed a significant effect of condition, F(2,301) = 3.61, p = .028, ω^2 = .017. Post-hoc Tukey tests showed that participants felt more kama muta in the Nature Threat condition (M = 2.80, SD = 1.03) than Neutral condition (M = 2.37, SD = 1.25), t(301) = -2.65, p = .023, Cohen's d = -0.37 (95% CI [-0.65, -0.09]). All other comparisons were not significant (Human Life Threat – Neutral: t(301) = 0.98, p = .14; Human Life Threat – Nature Threat: t(301) = -1.71, p = .20; see Figure 4: right).

Function of Kama Muta

Kama muta was tested as a mediator between condition and change in personal problem appraisals. Condition was dummy coded. Human Life Threat contrast coded the Human Life Threat condition as 1 and the others as 0. Nature Threat contrast coded the Nature Threat condition as 1 and the others as 0. The Nature Threat contrast significantly predicted kama muta (b = .42, SE = .16, 95% CI [.10, .73], B = .18, Z = 2.61, p = .009), which in turn predicted change in personal problem appraisals (b = -1.86, SE = 0.44, 95% CI [-2.75, -1.003], B = -.24, Z = -4.19, p < .001). The indirect effect of Nature Threat contrast on change in personal problem appraisals, mediated by kama muta, was significant (b = -.79, SE = .35, 95% CI [-1.66, -.24], B = -.04, Z = -2.25, p = .025). However, the effect of Human Life Threat contrast on kama muta was not significant (b = 0.15, Z = -0.94, p = .35), and no significant indirect effect was observed for the effect of Human Life Threat contrast on change in personal problem appraisals (b = -0.28, Z = -0.92, p = .36) (see Figure 5).

Figure 5

Kama Muta Mediates Nature Threat and PPA



Note. Significant mediation effect of kama muta on the relationship between Nature Threat contrast and change in personal problem appraisals. All coefficients reported are unstandardized. Note that total effects (c) and direct effects (c') were not significant.
***$p < .001$.

Given that perceived societal impact differed between the Nature and Human Life Threat conditions, we additionally explored if perceived societal impact influenced kama muta and subsequently the change in personal problem appraisals. Societal impact significantly predicted kama muta (b = .005, SE = .003, 95% CI [.00008, .01], B = .12, Z = 2.04, p = .041). However, the indirect effect of societal impact on change in personal problem appraisals, mediated by kama muta, was not significant (b = -.009, SE = .005, 95% CI [-.02, -.001], B = -.029, Z = -1.85, p = .064).

Discussion

On one hand, Study 3 again finds that participants who experienced stronger feelings of kama muta were also more likely to positively reorientate their prevailing negative attitudes towards their own problems (Hypothesis 1). Although the elicitor of collective threat was different from what we initially expected, collective threat with higher perceived societal impact was associated with enhanced experiences of kama muta, which was in turn associated with lower personal problem appraisals, somewhat supporting Hypothesis 2. This aligns with the proposed function of kama muta in lessening individuals' mental burden in threatening situations. On the other hand, the effect of threat on kama muta was not significant, suggesting that any impact on kama muta ratings or personal problem appraisals did not directly result from our experimental threat conditions. Contrary to our hypothesis, participants who read the Nature Threat article perceived higher societal impact, and then felt more kama muta than those who read the neutral article. Here, what constituted societal impact differed from our initial predictions: the specificity and rarity of the victims' plight in the Human Life Threat article may have narrowed the threat's perceived impact on humanity, while the Nature Threat article

was more effective in prompting the effect on society (Moreton et al., 2019). In any case, our experimental manipulation of societal impact, which measured its saliency to the participant, did not have a robust effect on kama muta.

Single Paper Metanalysis

Table 1

Group Descriptives for Kama Muta (KAMMUS-Two) Across All Three Studies

			Kama muta		Societal impact	
Study	**Condition**	***N***	***M***	***SD***	***M***	***SD***
1	Threat + Kama muta	104	2.77	1.14		
	Neutral + Kama muta	103	2.67	1.08		
	Threat-only	95	1.80	0.82		
2	n/a	119	2.59	1.05		
3	Nature Threat	99	2.80	1.03	59.9	24.2
	Human Life Threat	105	2.53	1.10	44.0	23.6
	Neutral	100	2.37	1.25	28.6	23.8

Table 2

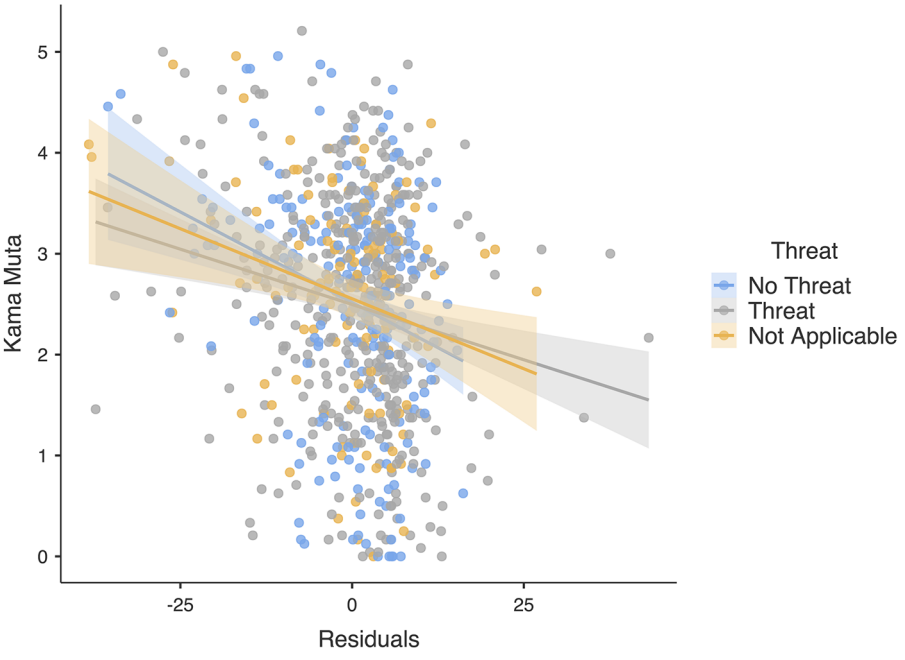
PPA at T2 Regressed on Kama Muta and Condition (Studies 1 and 3) With T1 as a Covariate

							95% CI		
Study	**Predictor**	**Model Covariates**	**Model R^2**	***b***	***t***	***df***	**Upper**	**Lower**	***p***
1	Kama muta	T1	0.74	-1.78	-3.56	299	-2.77	-0.80	< .001
	Kama muta	T1, awe, gratitude, happiness	0.74	-0.81	-0.76	296	-2.90	1.29	.450
	Condition: Threat+Kama muta	T1	0.73	-0.39	-0.28	298	-3.14	2.35	.778
	Condition: Neutral+Kama muta	T1	0.73	-1.29	-0.93	298	-4.05	1.46	.356

Study	Predictor	Model Covariates	Model R^2	*b*	*t*	*df*	95% CI Upper	95% CI Lower	*p*
2	Kama muta	T1	0.79	-2.53	-2.96	116	-4.22	-0.84	.004
	Kama muta	T1, awe, gratitude, happiness	0.79	-3.09	-2.05	113	-6.09	-0.10	.043
3	Kama muta	T1	0.83	-1.81	-4.15	301	-2.67	-0.95	< .001
	Kama muta	T1, awe, gratitude, happiness	0.83	-1.71	-2.13	298	-3.29	-0.13	.034

Figure 6

Kama Muta and PPA Across All Studies



Note. Significant negative relationship between kama muta and (residualized) change in personal problem appraisals from all three studies, split by threat. Data from Study 2 is marked as "not applicable" due to the absence of experimental threat induction. Confidence bands show standard errors.

We conducted a participant-level single paper metanalysis to examine if kama muta would predict a reduction of participants' personal problem appraisals (Hypothesis 1) and if collective threat predicted participants' experiences of kama muta (Hypothesis 2). We initially followed the recommended protocol for Single Paper Metanalyses using hierarchical (multilevel) regressions as recommended by McShane and Böckenholt (2017), but as we only had 3 studies (and 2, for the effect of threat conditions on kama muta), we used a fixed effects only model, where study number was included as a control variable. For threat, study conditions that presented threat-inducing stimuli (Study 1: Threat+Kama Muta, Threat-only conditions; Study 3: Nature Threat and Human Life Threat conditions) were scored as 'threat-induction' conditions, and the remaining conditions were scored as 'no-threat' conditions. In examining the effect of self-reported kama muta on personal problem appraisals, we observed a significant and negative association with PPA at T2, controlling for PPA at T1 and study number (Hypothesis 1; model R^2 = 0.79, B = -0.106, SE = 0.31, 95% CI [-0.14, -0.07], t = -6.12, p < .001). Regardless of the follow-up kama muta induction, no significant effect was observed for threat (stimuli) on kama muta (Hypothesis 2; model R^2 = 0.004, B = -0.04, SE = 0.10, t = -0.43, p = .67) (see Figure 6).

General Discussion

Our results demonstrate that experiences of kama muta were consistently associated with reductions in participants' negative attitudes and appraisals towards their personal problems. It joins a larger body of positive emotion, such as awe and gratitude (Gander et al., 2013; Koh et al., 2019), that function towards reducing negative affect or attitudes. Given that kama muta also strengthens the sense of connectedness, this result converges with past research, which has shown that a sense of connectedness can alleviate psychological distress (Aanes et al., 2010; Lee et al., 2001), reduce loneliness (Satici et al., 2016), increase positive affect (Adventure-Heart & Proeve, 2017), and improve well-being (Brown et al., 2012). However, one important caveat is that these effects were not observed as an effect of the condition, but as a correlation between participants' ratings of kama muta, threat, and PPA. This limits any causal claims that can be made from this paper: the causal nature of Hypotheses 1 and 2 were not supported, and the directional effects observed between collective threat, kama muta, and personal problem appraisals only reflect an association between these variables. Nevertheless, there is some indirect evidence that participants induced to feel kama muta (in Study 1) subjectively experienced more intense kama muta, which was then associated with stronger reductions in PPA.

We think that kama muta may inform the individual about what he/she perceives as meaningful (meaning making), which can guide the individual to self-reflect and change their priorities in life (Bartsch et al., 2014; Cova & Deonna, 2014; Landmann et al., 2019).

Hence, kama muta may alleviate the negative perceptions of one's personal problems, as the individual senses his/her connection with society and reframes their state of mind. We think that unpacking the specific psychological mechanisms behind the relationship between kama muta and personal problem appraisals would be an area ripe for future research, and that the literature on the cognitive reappraisal processes facilitated by self-transcendent emotions (such as kama muta) may be a good start: kama muta may encourage individuals to cognitively re-appraise their negative situation in a positive light, possibly through finding meaning from adversity and rendering one's personal problems as less important overall.

However, we also posited that meaning making processes would be enhanced by negative contexts. While we see some evidence for this assertion, in that perceived social impact of collective threat predicted kama muta experiences in Study 3, and that participants concerned about the ongoing natural disaster were more likely to have stronger experiences of kama muta in Study 2, these were based on largely subjective ratings. Direct experimental manipulations of threat had no significant influence on participants' kama muta ratings through Studies 1 and 3, and the single paper metanalysis showed no significant effects. Our interpretation is that collective threat may exert a multifaceted, and complex effect on the individual, and may not directly affect kama muta ratings. Rather, it is the perceived societal impact of collective threat situations that predicts elicitation of kama muta. Such an explanation would be congruent with past theories on the role of adversity in human society and in forging community and building social capital (see Henrich & Muthukrishna, 2021). However, our experimental evidence remains weak, and as we cannot rule out the presence of confounding factors, the role of threat in heightening kama muta experiences yet remains inconclusive.

Limitations and Future Directions

While we experimentally varied kama muta induction in Study 1, these were linked to threat contexts, meaning that we did not directly examine if adjusting kama muta videos would result in reduced personal problem appraisals. For Studies 2 and 3, only threat was manipulated, and all participants watched the same kama muta eliciting stimulus. This limited scope of the videos used in the induction tasks is especially problematic for the current paper. For Studies 1 and 3, the content from the threat-inducing stimuli used were conceptually unrelated to the content of the kama muta-inducing stimuli. As a result, our manipulation examined generalized and decontextualized videos of intensification of communal sharing and prosocial behaviors that had little to do with the collective threat instances portrayed in our stimuli. Assuming that collective threat does indeed contribute to heightened kama muta experiences, the lack of contextual similarity across threat and kama muta-inducing scenarios in our experiments may have marred our experimental ability to comprehensively investigate Hypothesis 2.

Moreover, kama muta ratings tended to be low across our studies: kama muta is sensitive to the emotional intensity of the video (Kimura et al., 2019). On one hand, this is similar to previous research on feeling moved (Strick & van Soolingen, 2018), where low ratings are acceptable when focusing on differences between conditions. On the other hand, this may also suggest an issue with the experimental stimuli in inducing kama muta, in that a decontextualized one-minute video in an online experiment setting may not be enough to reliably induce high levels of kama muta.

Next, most of the mediation analyses used in this paper follow "measurement of mediation" designs, which cannot provide proof of causal processes (see Pirlott & MacKinnon, 2016). Furthermore, our mediation analyses also used difference scores between two timepoints as outcome variables in examining mediation models of threat and kama muta on PPA, and there are known issues with this methodology (see Edwards, 2001).

Finally, as kama muta was the focal emotion, awe, happiness, and gratitude were measured using single-item measures and may not be as fully captured. The current comparisons with other individual positive emotions are only preliminary, given that they were intended as controls in assessing the effect of kama muta and that there were no control conditions without the kama muta induction for Studies 2 and 3. Future research can utilize more direct manipulations of various positive emotions and include additional controls when focusing on differentiating the effects between these emotions.

In conclusion, our main finding is that kama muta may be functional in relieving the individual's negative attitudes and appraisals from their personal problems, and to some extent, may be enhanced by collective threat with perceived societal impact. However, the exact relationships between threat and kama muta remains unclear. Nevertheless, our research presents a series of preliminary studies into the role of threat in facilitating individuals' capacity to help others through the emotion of kama muta, and we hope that our results and data can aid like-minded researchers with elucidating these effects. Future studies may examine the specific mechanisms by which kama muta decreases personal problem appraisals, and how (or if) collective threat enhances experiences of kama muta.

Funding: This research was supported by Japan Society for the Promotion of Science (JSPS) KAKENHI Grants Number 22H20300 awarded to Dr. Koh and 19K14471 awarded to Dr. Nakayama.

Acknowledgments: Separate portions of this research were presented at the Society for Affective Science 2020 and International Positive Psychology Association 2021 virtual conferences.

Competing Interests: The authors have declared that no competing interests exist.

Author Contributions: *Alethea H. Q. Koh*—Conceptualization | Methodology | Funding acquisition | Data analysis | Writing – original draft. *Masataka Nakayama*—Conceptualization | Methodology | Funding acquisition. *Kongmeng Liew*—Data analysis | Writing – original draft. *Yukiko Uchida*—Supervision.

Ethics Statement: All studies were approved by the institutional review board of Kyoto University. Informed consent has been obtained from all respondents prior to their participation in the study.

Preregistration: Portions of the studies were pre-registered.

Data Availability: All data and analysis scripts are available in OSF repository (see Liew & Koh, 2023).

Supplementary Materials

Supplementary files include preregistrations for Study 1 (see Koh, 2019a) and Study 3 (see Koh, 2019b), all data and analysis scripts, codebooks, additional descriptive statistics, arranged by study (see Liew & Koh, 2023). Analysis scripts also included awe (as the dependent variable). The supplementary document includes information on sensitive power analyses, problem commonality and mood analyses, results from an alternative recoding of the KAMMUS Two scale where scores are averaged over subscales, results from awe as the dependent variable, and links to the video stimuli used in the studies (see Liew & Koh, 2023).

Index of Supplementary Materials

Koh, A. H. Q. (2019a). *Kamamuta and threat CM study* [Study 1 Preregistration]. OSF Registries. https://osf.io/yjpgq

Koh, A. H. Q. (2019b). *Kamamuta and threat CM study* [Study 3 Preregistration]. OSF Registries. https://osf.io/r5byt

Liew, K., & Koh, A. H. Q. (2023). *The function of feeling kama muta in face of collective threat* [Data, analysis scripts, descriptive statistics, power analyses]. OSF. https://osf.io/hj3zf

References

Aanes, M. M., Mittelmark, M. B., & Hetland, J. (2010). Interpersonal stress and poor health. *European Psychologist, 15*(1), 3–11. https://doi.org/10.1027/1016-9040/a000003

Adventure-Heart, D. J., & Proeve, M. (2017). Mindfulness and loving-kindness meditation. *Psychological Reports, 120*(1), 102–117. https://doi.org/10.1177/0033294116685867

Bartsch, A., Kalch, A., & Oliver, M. B. (2014). Moved to think: The role of emotional media experiences in stimulating reflective thoughts. *Journal of Media Psychology, 26*(3), 125–140. https://doi.org/10.1027/1864-1105/a000118

Bonanno, G. A., Brewin, C. R., Kaniasty, K., & Greca, A. M. L. (2010). Weighing the costs of disaster: Consequences, risks, and resilience in individuals, families, and communities. *Psychological Science in the Public Interest: A Journal of the American Psychological Society, 11*(1), 1–49. https://doi.org/10.1177/1529100610387086

Brown, K. M., Hoye, R., & Nicholson, M. (2012). Self-esteem, self-efficacy, and social connectedness as mediators of the relationship between volunteering and well-being. *Journal of Social Service Research, 38*(4), 468–483. https://doi.org/10.1080/01488376.2012.687706

Chappell, B. (2019, July 3). Heavy rains force evacuation orders for more than 1 million people in Japan. *NPR*. https://www.npr.org/2019/07/03/738424247/heavy-rains-force-evacuation-orders-for-more-than-1-million-people-in-japan

Cova, F., & Deonna, J. A. (2014). Being moved. *Philosophical Studies, 169*(3), 447–466. https://doi.org/10.1007/s11098-013-0192-9

Cullhed, E. (2020). What evokes being moved? *Emotion Review, 12*(2), 111–117. https://doi.org/10.1177/1754073919875216

Edwards, J. R. (2001). Ten difference score myths. *Organizational Research Methods, 4*(3), 265–287. https://doi.org/10.1177/109442810143005

Fredrickson, B. L., Tugade, M. M., Waugh, C. E., & Larkin, G. R. (2003). What good are positive emotions in crises? A prospective study of resilience and emotions following the terrorist attacks on the United States on September 11th, 2001. *Journal of Personality and Social Psychology, 84*(2), 365–376. https://doi.org/10.1037/0022-3514.84.2.365

Gander, F., Proyer, R. T., Ruch, W., & Wyss, T. (2013). Strength-based positive interventions: Further evidence for their potential in enhancing well-being and alleviating depression. *Journal of Happiness Studies, 14*(4), 1241–1259. https://doi.org/10.1007/s10902-012-9380-0

Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology, 85*(2), 348–362. https://doi.org/10.1037/0022-3514.85.2.348

Henrich, J., & Muthukrishna, M. (2021). The origins and psychology of human cooperation. *Annual Review of Psychology, 72*, 207–240. https://doi.org/10.1146/annurev-psych-081920-042106

Kimura, K., Haramizu, S., Sanada, K., & Oshida, A. (2019). Emotional state of being moved elicited by films: A comparison with several positive emotions. *Frontiers in Psychology, 10*, Article 1935. https://doi.org/10.3389/fpsyg.2019.01935

Koh, A. H. Q., Tong, E. M. W., & Yuen, A. Y. L. (2019). The buffering effect of awe on negative affect towards lost possessions. *The Journal of Positive Psychology, 14*(2), 156–165. https://doi.org/10.1080/17439760.2017.1388431

Landmann, H., Cova, F., & Hess, U. (2019). Being moved by meaningfulness: Appraisals of surpassing internal standards elicit being moved by relationships and achievements. *Cognition and Emotion, 33*(7), 1387–1409. https://doi.org/10.1080/02699931.2019.1567463

Lee, R. M., Draper, M., & Lee, S. (2001). Social connectedness, dysfunctional interpersonal behaviors, and psychological distress: Testing a mediator model. *Journal of Counseling Psychology, 48*(3), 310–318. https://doi.org/10.1037/0022-0167.48.3.310

Lyke, J. A. (2009). Insight, but not self-reflection, is related to subjective well-being. *Personality and Individual Differences, 46*(1), 66–70. https://doi.org/10.1016/j.paid.2008.09.010

Maeura, N., Nakayama, M., & Uchida, Y. (2020). The discriminability and commonality between awe and "kando" (being emotionally moved) in Japan. *Cognitive Studies, 27*(3), 262–279. https://doi.org/10.11225/cs.2020.036

Mashek, D., Cannaday, L. W., & Tangney, J. P. (2007). Inclusion of community in self scale: A single-item pictorial measure of community connectedness. *Journal of Community Psychology, 35*(2), 257–275. https://doi.org/10.1002/jcop.20146

McShane, B. B., & Böckenholt, U. (2017). Single-paper meta-analysis: Benefits for study summary, theory testing, and replicability. *The Journal of Consumer Research, 43*(6), 1048–1063. https://doi.org/10.1093/jcr/ucw085

Menninghaus, W., Wagner, V., Hanich, J., Wassiliwizky, E., Kuehnast, M., & Jacobsen, T. (2015). Towards a psychological construct of being moved. *PLoS One, 10*(6), Article e0128451. https://doi.org/10.1371/journal.pone.0128451

Moreton, S., Arena, A., & Tiliopoulos, N. (2019). Connectedness to nature is more strongly related to connection to distant, rather than close, others. *Ecopsychology, 11*(1), 59–65. https://doi.org/10.1089/eco.2018.0063

Nakayama, M., & Uchida, Y. (2020). *A path from collective threat to eudaimonia: Mediating role of awe.* PsyArXiv. https://doi.org/10.31234/osf.io/yt3c4

Note, N., & Van Daele, E. (2016). Meaningfulness, volunteering and being moved: The event of wit(h)nessing. *Foundations of Science, 21*(2), 283–300. https://doi.org/10.1007/s10699-014-9388-5

Petersen, E., & Martin, A. J. (2021). Kama muta (≈ being moved) helps connect people in and to nature: A photo elicitation approach. *Ecopsychology, 13*(1), 37–47. https://doi.org/10.1089/eco.2020.0032

Piff, P. K., Dietze, P., Feinberg, M., Stancato, D. M., & Keltner, D. (2015). Awe, the small self, and prosocial behavior. *Journal of Personality and Social Psychology, 108*(6), 883–899. https://doi.org/10.1037/pspi0000018

Pirlott, A. G., & MacKinnon, D. P. (2016). Design approaches to experimental mediation. *Journal of Experimental Social Psychology, 66*, 29–38. https://doi.org/10.1016/j.jesp.2015.09.012

Pizarro, J. J., Basabe, N., Fernández, I., Carrera, P., Apodaca, P., Man Ging, C. I., Cusi, O., & Páez, D. (2021). Self-transcendent emotions and their social effects: Awe, elevation and kama muta promote a human identification and motivations to help others. *Frontiers in Psychology, 12*, Article 709859. https://doi.org/10.3389/fpsyg.2021.709859

Sagiv, L., & Schwartz, S. H. (2000). Value priorities and subjective well-being: Direct relations and congruity effects. *European Journal of Social Psychology, 30*(2), 177–198. https://doi.org/10.1002/(SICI)1099-0992(200003/04)30:2<177::AID-EJSP982>3.0.CO;2-Z

Satici, S. A., Uysal, R., & Deniz, M. E. (2016). Linking social connectedness to loneliness: The mediating role of subjective happiness. *Personality and Individual Differences, 97*, 306–310. https://doi.org/10.1016/j.paid.2015.11.035

Schubert, T. W., Zickfeld, J. H., Seibt, B., & Fiske, A. P. (2018). Moment-to-moment changes in feeling moved match changes in closeness, tears, goosebumps, and warmth: Time series analyses. *Cognition and Emotion, 32*(1), 174–184. https://doi.org/10.1080/02699931.2016.1268998

Seibt, B., Zickfeld, J. H., & Østby, N. (2023). Global heart warming: Kama muta evoked by climate change messages is associated with intentions to mitigate climate change. *Frontiers in Psychology, 14*, Article 1112910. https://doi.org/10.3389/fpsyg.2023.1112910

Stellar, J. E., Gordon, A. M., Piff, P. K., Cordaro, D., Anderson, C. L., Bai, Y., Maruskin, L. A., & Keltner, D. (2017). Self-transcendent emotions and their social functions: Compassion, gratitude, and awe bind us to others through prosociality. *Emotion Review, 9*(3), 200–207. https://doi.org/10.1177/1754073916684557

Strick, M., & van Soolingen, J. (2018). Against the odds: Human values arising in unfavourable circumstances elicit the feeling of being moved. *Cognition and Emotion, 32*(6), 1231–1246. https://doi.org/10.1080/02699931.2017.1395729

Tokaji, A. (2003). Research for determinant factors and features of emotional responses of "kandoh" (the state of being emotionally moved). *The Japanese Psychological Research, 45*(4), 235–249. https://doi.org/10.1111/1468-5884.00226

Uchida, Y., & Kitayama, S. (2001). Development and validation of a sympathy scale. *Shinrigaku Kenkyu, 72*(4), 275–282. https://doi.org/10.4992/jjpsy.72.275

Uchida, Y., Takahashi, Y., & Kawahara, K. (2014). Changes in hedonic and eudaimonic well-being after a severe nationwide disaster: The case of the great east Japan earthquake. *Journal of Happiness Studies, 15*(1), 207–221. https://doi.org/10.1007/s10902-013-9463-6

Varnum, M. E. W. (2014). Sources of regional variation in social capital in the United States: Frontiers and pathogens. *Evolutionary Behavioral Sciences, 8*(2), 77–85. https://doi.org/10.1037/h0098950

Zhou, Y., Daukantaitė, D., Lundh, L. G., Wångby-Lundh, M., & Ryde, A. (2020). Adolescents' emotion regulation strategies questionnaire: Initial validation and prospective associations with nonsuicidal self-injury and other mental health problems in adolescence and young adulthood in a Swedish youth cohort. *Frontiers in Psychiatry, 11*, Article 462. https://doi.org/10.3389/fpsyt.2020.00462

Zickfeld, J. H., Arriaga, P., Santos, S. V., Schubert, T. W., & Seibt, B. (2020). Tears of joy, aesthetic chills and heartwarming feelings: Physiological correlates of Kama Muta. *Psychophysiology, 57*(12), Article e13662. https://doi.org/10.1111/psyp.13662

Zickfeld, J. H., Schubert, T. W., Seibt, B., Blomster, J. K., Arriaga, P., Basabe, N., Blaut, A., Caballero, A., Carrera, P., Dalgar, I., Ding, Y., Dumont, K., Valerie, G., Gracanin, A., Gyenis, R., Hu, C. P.,

Kardum, I., Lazarevic, L. B., Mathew, L., . . .Alan, P. F. (2019). Kama muta: Conceptualizing and measuring the experience often labelled being moved across 19 nations and 15 languages. *Emotion, 19*(3), 402–424. https://doi.org/10.1037/emo0000450

Zickfeld, J. H., Schubert, T. W., Seibt, B., & Fiske, A. P. (2019). Moving through the literature: What is the emotion often denoted being moved? *Emotion Review, 11*(2), 123–139. https://doi.org/10.1177/1754073918820126

PSPS Polish Social Psychological Society

Social Psychological Bulletin (SPB) is an official journal of the Polish Social Psychological Society (PSPS).

leibniz-psychology.org

PsychOpen GOLD is a publishing service by Leibniz Institute for Psychology (ZPID), Germany.