**ORIGINAL PAPER**

# The ease of experiencing positive emotions in negative contexts

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## Abstract

We introduce a novel concept of the 'ease of experience' of emotions, which captures individuals' subjective perception of how easily they feel they can intentionally experience a desired positive emotion. Study 1 compared lay-persons' beliefs in the ease of experiencing positive emotion in two cultural contexts (US and Japan, N = 226) and found significant variations in the ease of experiencing various positive emotions, across prior negative contexts and culture. Study 2 experimentally tested the ease of recalling positive experiences by manipulating the prior negative context and targeted positive emotion (US only, N = 1097). Depending on context, the regulatory goal as determined by the assigned positive emotion condition had differential results on the participants' overall mood or well-being. However, the variations of ease did not match up with lay-person beliefs as identified in Study 1. This gap in lay beliefs and 'actual' ease of experience has implications on how individuals should set emotional goals.

**Keywords** Emotion · Regulation · Context · Ease of experience

A wealth of research has gone into the effects of experiencing positive emotions (Fredrickson & Joiner, 2018). For someone in the midst of negative experiences, these may be particularly useful: individuals may cope through seeking positive emotional experiences, or even use positive emotions instrumentally to downregulate negative emotions (Waugh, 2020). However, just as how the pursuit of happiness can be difficult for some (Mauss et al., 2011), knowing the benefits of experiencing a positive emotion does not translate to experiencing it easily, especially since the need for emotion regulation may signal that the individual is in a less-than-ideal baseline state.

As an illustration, consider Daniel, who feels sad after a breakup. To cope with his sadness, he tries to experience a positive emotion. He can try and feel happy, but is happiness really the best emotion to regulate towards in this context? As an alternative, emotions like gratitude, or feeling moved, may

be comparatively more achievable. In this paper, we introduce the novel concept of 'ease of experience' of positive emotions, which we define as the degree to which individuals are able to feel a desired positive emotion, taking into account the effort, difficulty, speed, and timing of feeling a positive emotion whenever they want to. This differs from past research which focused on emotion regulatory strategies and efficacy (Webb et al., 2012), by focusing on the target outcome of such emotion regulation, the emotion goal, as a means for successful emotion regulation (Tamir & Milgram, 2017).

Accordingly, we examine: (1) What are the lay beliefs of 'ease' in lay people's attempts for (positive) emotion regulation, and (2) Does 'ease' differ according to combinations of the prior negative emotion context and positive emotion goal? These would have implications for instrumental goal pursuit (Tamir, 2009), as the usefulness of a target emotion goal may be bounded by the ease by which one can even experience it.

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## Positive emotion goal setting for emotion regulation

Given that emotions have various functions, based on beliefs on their benefits and harms, individuals in the midst of experiencing a negative emotion may decide to regulate their emotions towards a more desirable one. Such emotion

regulation can be either through the downregulation of the circumstantial negative emotion, or the upregulation of a positive emotion. The present research focuses on the latter, in improving intentional, intrinsic emotion regulation (see Gross, 2015). We specifically aim to examine how individuals can get out of their distress and feel better, by investigating what type of positive emotional goals one should set depending on its suitability, or how easily it is experienced in the specific (negative) context.

Following the process model of emotion regulation (Gross, 2015), most research on emotion regulation has focused on modifying individuals' external situations, attention, appraisals, and behavior, where individuals seeking to change their negative emotional states can choose from a variety of corresponding methods to regulate those emotions (see Koole, 2009). However, this view may be at risk of overgeneralising a one-size-fits-all approach in positive emotion upregulation: we posit that different positive emotions may be better or more easily experienced in different negative situations. These negative situations typically elicit an initial (negative) emotion response, such as anger or sadness, that we include when defining the overall negative context. Individuals are then subsequently motivated to emotionally regulate these negative emotions embedded within these negative contexts.

To this end, emotional goal setting, which is the activation of a desired emotion as an individual's goal (Tamir et al., 2020), becomes important. Depending on these negative emotions, we think that it may be efficacious for individuals to set different positive emotion goals (e.g., aiming to become happy or grateful) for upregulation. Emotion goal setting may contribute to higher-order motives in the individual's life such as achieving life satisfaction, and trigger lower-order behavior such as engaging in strategies for goal pursuit (Tamir et al., 2020). Emotion goal setting has also been shown to be influenced by individuals' valuations, personal beliefs, societal context and normative perceptions (Ford & Gross, 2018; Lively & Weed, 2014; Netzer et al., 2020). Maladaptive emotion goal setting can lead to untoward outcomes, such as seeking sadness, which has been found to exacerbate individuals' depression symptoms (Millgram et al., 2015). Yet, the activation of emotion goals in itself may sometimes be sufficient for successful emotion regulation (Tamir et al., 2019). If the desired emotion is easily experienced in a certain context, this might likewise provide a shortcut for successful emotion regulation.

Considering this line of research, positive emotion regulation may be made more efficient and effective if we can fit the targeted emotion goal to the individuals' present negative emotions and context. Accordingly, Wenzel et al. (2021) found that some emotion regulation strategies had more influence when directed towards a specific positive emotion goal. However, to our knowledge, no research has been conducted on how easily different positive emotions are experienced relative to a prior (negative) emotion context. Hence, we explore the underlying relationship between the starting emotion and ending goal within emotion regulation, independent of regulatory strategies, based on the subjective experience of the emotion. Our research aims to foundationally examine which emotions would be 'easier' and hence more accessible for positive emotion upregulation from various negative emotion contexts, which could subsequently be informative for such regulatory considerations.

## Ease of experience due to dimensional similarity

As a starting point, we posit that the ease of emotional experience differs between negative contexts, where certain emotions (including both positive and negative emotions) may simply feel 'closer' to each other due to shared appraisals, eliciting conditions or even expressions (Moors, 2014; Smith & Ellsworth, 1985). This is because in a given situation, individuals may glean cues and appraisals that are more relevant to certain emotions than others, as those emotions may have more adaptive benefits, and are more easily experienced together.

Research on the perceived closeness of positive emotions reveals that certain emotions indeed appear closer than others. Cowen and Keltner (2017) examined participants' emotional responses towards video clips and found 27 distinct emotions that varied smoothly along continuous gradients of affective dimensions. Some emotions appeared more closely grouped in affective space, such as admiration and joy, sharing high ratings of positive valence, safety, and control amongst others. However, only slight differences in ratings within the same appraisal dimensions (etc., lower control) seemed to differentiate the emotion of amusement from joy. Accordingly, emotions that are more similar in appraisal dimensions appear to be more easily elicited together (Tong & Jia, 2017), which might signify that the lay beliefs of the ease of experiencing certain emotions (as an intention emotional regulation) may also vary according to its actual dimensional closeness to the initial emotional state. However, these findings mainly shed light into how close positive emotions are together, as examining classifications by dimensions would mean that negative emotions will always be relatively further away in affective space as opposed to comparisons between positive emotions. Moreover, research on shared appraisals across emotions have largely been constrained to a handful of basic emotions or positive emotions (shown above), and to our knowledge, a similar unifying framework of positive and negative emotion appraisals does not exist. Nevertheless, shared appraisals may provide a means to interpret the ease of experience of discrete positive from negative emotion contexts. For example, anger and happiness share several similarities in dimensions (e.g., high power, other-agency, high control, high adjustment; Ellsworth & Scherer, 2003), so anger and happiness may be

experientially closer and it may be easier to transition from anger to happiness than sadness to happiness.

## Overview of the current research

In sum, we seek to improve the emotion valuation process by understanding which positive emotion is suitable or most easily accessed from various negative emotion contexts. This provides a new valuation system focusing on negative to positive emotionality change based on the accessibility or ease of emotional experience. Given the ambiguity of previous research on clear pathways of emotion switching between negative and positive emotions, our first aim is to investigate people's lay beliefs of the ease of emotional experience. This would inform us of which emotion goal would be more accessible and hence more appropriate in emotion regulatory strategies.

Some pairings may be more accessible (i.e. easy) for positive emotion upregulation as individuals may be more used to those pairings of mixed emotions in everyday life. While there is reason to expect some emotions to go together more easily according to past literature (etc., anger and happiness; sadness and feeling moved), we examine the relative ease in each negative–positive emotion pairing in an exploratory fashion without hypothesizing any specific pairings. Our research is not an attempt to examine the extent of positive and negative emotion blending (see Watson & Stanton, 2017); hence, we do not make any hypotheses about which specific emotion can occur together. We also offer preliminary explanations that are specific to negative–positive pairings with higher lay beliefs of ease in the general discussion.

In Study 1, we first examine lay beliefs of the ease of experiencing emotions (ease) through a series of self-report questionnaires conducted in two cultures, the US and Japan. This was to establish cross-cultural consistencies, given that emotion appraisals are sometimes different across cultural contexts (Imada & Ellsworth, 2011; Uchida et al., in press). We measured both general ease of emotional experience, and also ease in specific negative contexts, namely sad, angry and anxious situations. These negative contexts were chosen as they were more representative of the daily struggles that people have to overcome (Helliwell et al., 2019). We expect that beliefs of ease of experiencing positive emotion will vary by negative context, and also be moderated by culture.

In Study 2, we examined whether the beliefs found in Study 1 parallels actual ease of experience through an emotion induction task (recall) in a US sample. Participants were randomly assigned to recall a prior negative situation (negative context), and asked to feel an assigned positive emotion The ease of recalling a positive emotion is taken to represent the accessibility of the positive emotional memory given the prior negative context that participants had just previously recalled. We measured the success of experiencing positive

emotion (intensity) and the overall improvement or benefit (general change in positivity/negativity). We expect that the ease of recall, success, and overall improvement for each positive emotion will vary by negative context, and should reflect some of the patterns found in Study 1.

## Study 1

### Methods

#### Participants

226 participants from the US and Japan were recruited and reimbursed 84 pence and 100 Japanese yen online via Prolific.co and Lancers respectively for completing the survey. 17 participants were dropped from the analysis, for failing the attention checks and/or not following the experimental procedure. Data from the remaining 209 participants (56.0% males, mean age = 39.2, SD = 11.9, 107 Japanese) were used for analysis.[1]

#### Procedure and materials

All materials were first translated from English to Japanese and back-translated to English by respective native speakers who were blind to the purposes of the research. Any discrepancies were resolved through discussions by the translators and authors. Positive emotion words include: happy, awe, moved/touched, gratitude, hope, compassion, amused, excited, calm/relaxed and contentment, as well as an additional item on neutral/nothing. Negative emotion words refer to: sad, anxious and angry.

Participants were first informed that the study examined daily experiences and emotions. Upon clicking the survey link, they were directed to a page with further information about the study, and an option to provide informed consent before proceeding. Participants were asked to rate a series of questions based on their personal experiences, using slider scales from 0 (not at all) to 100 (extremely). They were also given a prompt clarifying that "experiencing an emotion easily" meant that participants could feel the emotion without much effort or difficulty, relatively quickly, whenever they wanted to. This prompt was provided at the start of every section.

In the first section, we measured participants' general ease of experiencing each emotion. Participants were asked, "In general, how easily do you feel [positive/negative emotion

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[1] Based on an effect size of f = 0.19 ($\eta^2_p$ = .036) from the interaction between general ease and culture, and α = .05, we obtain an observed power (1-β) = .99.

word]?", and rated all emotions once. All emotion words were presented in a random order.

In the second section, we measured participants' ease of experiencing each positive emotion given a negative context. There were 3 sets of negative emotion contexts: sad, anxious or angry. For each set, participants were first prompted to think about the times when they were feeling [negative emotion] or in a [negative emotion] mood, and were trying to feel better. They were asked to proceed to answer the questions only when they had something in mind, by checking a box when they were ready. Afterwhich, participants were asked "When you are feeling [negative emotion] or in a [negative emotion] mood, and are trying to feel better, how easily can you feel [positive emotion]?" and answered using the slider slides. For each positive emotion, moderate reliability was observed across the general measure and the three negative contexts (happy: $\alpha = 0.754$; awe: $\alpha = 0.799$; moved/touched: $\alpha = 0.773$; gratitude: $\alpha = 0.796$; hope: $\alpha = 0.803$; compassion: $\alpha = 0.813$; amused: $\alpha = 0.736$; excited: $\alpha = 0.633$; calm/relaxed: $\alpha = 0.689$; and contentment: $\alpha = 0.710$). The presentation of the sets, and the questions within each set were all randomly ordered. In the third section, we measured the frequency of experiencing each emotion. Participants were asked to evaluate the frequency of feeling each emotion using an 8-point Likert scale. Participants also answered a single item measure for ideal affect, "In general, how do you want to feel on a normal day?", using a slider scale from 1 (extremely negative) to 100 (extremely positive). In the last section, participants completed measures for Ego Resilience (Block & Kremen, 1996; Farkas & Orosz, 2015), dispositional optimism (LOT-R: Carver & Scheier, 2014) and implicit emotion beliefs (Tamir et al., 2007). As these measures were peripheral to the focal research question, the results are reported in Supplementary Materials Sect. 1. Lastly, participants also completed a demographics questionnaire.

## Results

### General ease of experience

A repeated measures ANOVA was conducted on the general ease of experience using each emotion as the repeated measure and culture as the between-subject factor. Due to violation of the sphericity assumption, the Greenhouse–Geisser correction was applied where needed. The results revealed a significant main effect of general ease, $F(6.92, 1431.76) = 21.92$, $p < 0.001$, $\eta^2_p = 0.096$, indicating that some emotions were easier experienced than others. The main effect of culture was not significant, $F(1207) = 0.0004$, $p = 0.984$. However, these results are quantified by the significant interaction between emotion and culture,

$F(6.92, 1431.76) = 7.84$, $p < 0.001$, $\eta^2_p = 0.036$, showing that the general ease of experience differed between the emotion experienced and culture (See Fig. 1).

Given the variety of combinations for comparisons, for interpretability, we first focus on pairwise cultural comparisons (Welch's) for each emotion. Means and standard deviations for each emotion are provided in Table 1. In general, US participants found it easier to experience gratitude, $t(188) = 3.23$, $p = 0.001$, 95% CI[3.01, 12.44], $d = 0.45$, hope, $t(184) = 2.61$, $p = 0.010$, 95% CI[1.66, 11.93], $d = 0.36$, and compassion, $t(207) = 6.10$, $p < 0.001$, 95% CI[9.57, 18.73], $d = 0.84$, than Japanese participants. In general, Japanese participants found it easier to experience calm, $t(180) = -2.33$, $p = 0.021$, 95%CI[$-12.76, -1.06$], $d = -0.32$, neutral, $t(178) = -4.06$, $p < 0.001$, 95% CI[$-25.37, -8.78$], $d = -0.56$, anxious, $t(199) = -2.72$, $p = 0.007$, 95% CI[$-17.35, -2.75$], $d = -0.38$, and angry, $t(207) = -3.13$, $p = 0.002$, 95% CI[$-17.24, -3.90$], $d = -0.43$. General ease of experiencing happiness, awe, moved, amused, excited, content and sad did not differ significantly between cultures, $p$s $> 0.078$.

As the purpose of the current research was to also identify possible alternatives for emotion goal seeking apart from the pursuit of happiness, we also conducted additional repeated-measures analyses using happy as the comparison emotion to other positive emotions while controlling for culture. Compared to being happy, participants significantly felt it was easier to experience gratitude $F(1207) = 28.92$, $p < 0.001$, $\eta^2_p = 0.123$, compassion, $F(1207) = 35.18$, $p < 0.001$, $\eta2p = 0.145$, amused, $F(1, 207) = 13.98$, $p < 0.001$, $\eta2p = 0.063$; and harder to experience awe, $F(1, 207) = 13.64$, $p < 0.001$, $\eta^2_p = 0.062$, hope, $F(1207) = 4.46$, $p = 0.036$, $\eta^2_p = 0.021$ and excited, $F(1207) = 8.09$, $p = 0.005$, $\eta^2_p = 0.038$. There were no significant differences from happiness in the general ease of experiencing being moved, $p = 0.416$.

### Ease of experience in negative contexts

A repeated measures ANOVA was conducted on the ease of experience using each emotion and negative context as repeated measures and culture as the between subject factor. Due to violation of the sphericity assumption, the Greenhouse–Geisser correction was applied where needed. The results revealed a significant main effect of emotion, $F(6.11, 1264.64) = 28.70$, $p < 0.001$, $\eta^2_p = 0.122$. The main effects of negative context, $F(1.00, 207.00) = 0.0008$, $p = 0.978$, and culture, $F(1207) = 0.001$, $p = 0.970$, were not significant. However, these results are quantified by the significant 3-way interaction between emotion, negative context and culture, $F(13.73, 2842.28) = 8.88$, $p < 0.001$, $\eta^2_p = 0.041$. The 2-way interactions between emotion and culture, and also between emotion and negative context were significant,
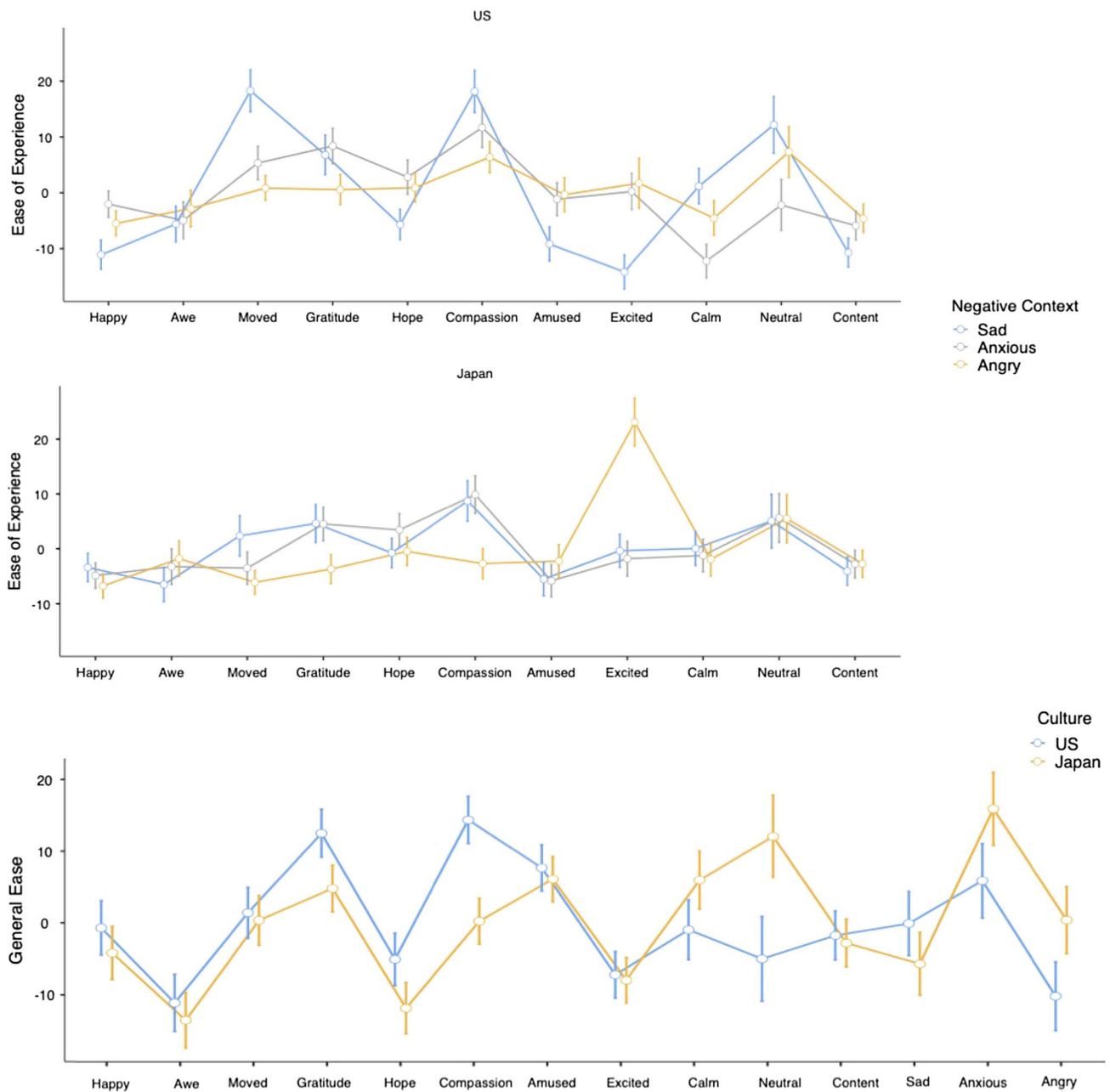
**Fig. 1** Relative ease of experience of positive emotions across negative contexts and general ease between the US and Japan

$p$s < 0.001. The results show that the ease of experience differed between the emotion and negative context experienced, and culture (See Fig. 1).

For interpretability, we conducted separate analyses for the ease of experience for each emotion, with negative context as the repeated measure and culture as the between subject variable. A summary of the relative ease of experience between negative contexts is displayed in Table 2, and detailed analyses results (from repeated measures ANOVAs and post-hoc t-tests) and descriptives are in the OSF repository (https://osf.io/9jgbe/), including an additional model

adjusted for general frequency of (specific) positive emotion experience. We also note main effects of culture within each negative context for the following: compared to US participants, Japanese participants felt that it was easier to experience happiness t(207) = 4.122, $p$ < 0.001 and excited t(270) = 6.32, $p$ < 0.001 in sad contexts. They also felt excited in angry contexts more easily, t(270) = 6.78, $p$ < 0.001; and calm in anxious contexts, t(207) = 5.14, $p$ < 0.001. Conversely, US participants felt that it was easier to feel moved in sad, t(270) = 5.96, $p$ < 0.001, anxious, t(270) = 4.17, $p$ < 0.001, and angry contexts, t(270) = 4.44, $p$ < 0.001; and

**Table 1** Descriptives of general ease of positive/negative emotion experience, centered around individual means

| Emotion | Culture | Mean (SD) |
|---|---|---|
| Happy | US | − 0.67 (20.6) |
| | Japan | − 4.17 (18.1) |
| Awe | US | − 11.1 (22.0) |
| | Japan | − 13.5 (18.5) |
| Moved | US | 1.41 (19.6) |
| | Japan | 0.366 (16.7) |
| Gratitude | US | 12.5 (19.4) |
| | Japan | 4.81 (14.7) |
| Hope | US | − 5.05 (21.4) |
| | Japan | − 11.8 (15.6) |
| Compassion | US | 14.4 (17.9) |
| | Japan | 0.244 (15.6) |
| Amused | US | 7.70 (17.1) |
| | Japan | 6.11 (16.2) |
| Excited | US | − 7.19 (18.8) |
| | Japan | − 7.95 (14.1) |
| Calm | US | − 0.940 (24.7) |
| | Japan | 5.97 (17.3) |
| Neutral | US | − 4.98 (35.3) |
| | Japan | 12.1 (24.2) |
| Content | US | − 1.73 (20.6) |
| | Japan | − 2.78 (13.8) |
| Sad | US | − 0.070 (24.2) |
| | Japan | − 5.68 (21.5) |
| Anxious | US | 5.88 (28.7) |
| | Japan | 15.9 (24.5) |
| Angry | US | − 10.2 (25.0) |
| | Japan | 0.394 (23.9) |

to experience compassion in sad, $t(207) = 3.53$, $p = 0.007$, and angry contexts, $t(207) = 4.58$, $p < 0.001$. No other significant differences were observed.

To understand how these emotions compare with each other across the same negative context, we additionally conducted separate analyses for each negative context, with emotion as the repeated measure and culture as the between subject variable. Due to violation of the sphericity assumption, the Greenhouse–Geisser correction was applied where needed. Comparisons were made with happiness as the reference group due to one theoretical goal being finding alternative positive emotions to happiness (for regulation).

*Sad Context.* There was a significant main effect of emotion, $F(7.01, 1450.72) = 41.0$, $p < 0.001$, $\eta^2_p = 0.165$, but not for culture, $p = 1.00$. However, the 2-way interaction between emotion and culture was significant, $F(7.01, 1450.72) = 11.5$, $p < 0.001$, $\eta^2_p = 0.053$. Post-hoc tukey comparisons revealed that for US participants in sad contexts, relative to happiness, it was easier to feel moved, $t(207) = − 11.05$,

$p < 0.001$, gratitude, $t(207) = − 7.45$, $p < 0.001$, compassion, $t(207) = − 11.12$, $p < 0.001$, calm, $t(207) = − 5.88$, $p < 0.001$, and neutral, $t(207) = − 7.62$, $p < 0.001$. For Japanese participants, compared to happiness it was easier to feel compassion, $t(207) = − 4.71$, $p < 0.001$.

*Anxious Context.* There was a significant main effect of emotion, $F(7.23, 1496.57) = 19.43$, $p < 0.001$, $\eta^2_p = 0.086$, but not for culture, $p = 0.989$. However, the 2-way interaction between emotion and culture was significant, $F(7.23, 1496.57) = 5.73$, $p < 0.001$, $\eta^2_p = 0.027$. Post-hoc tukey comparisons revealed that for US participants in anxious contexts, comparing to happiness, it was easier to feel moved, $t(207) = -3.76$, $p = 0.034$, gratitude, $t(207) = − 5.37$, $p < 0.001$, and compassion, $t(207) = − 5.78$, $p < 0.001$. It was harder to feel calm than happiness, $t(207) = 5.15$, $p < 0.001$. For Japanese participants, compared to happiness it was easier to feel gratitude, $t(207) = − 4.95$, $p < 0.001$, hope, $t(207) = − 4.49$, $p = 0.002$, compassion, $t(207) = − 6.39$, $p < 0.001$, and neutral, $t(207) = − 3.67$, $p = 0.046$.

*Angry Context.* There was a significant main effect of emotion, $F(6.60, 1365.73) = 20.3$, $p < 0.001$, $\eta^2_p = 0.090$, but not for culture, $p = 0.894$. However, the 2-way interaction between emotion and culture was significant, $F(6.60, 1365.73) = 11.6$, $p < 0.001$, $\eta^2_p = 0.053$. Post-hoc tukey comparisons revealed that for US participants in angry contexts, comparing to happiness, it was easier to feel moved, $t(207) = − 3.83$, $p = 0.027$, compassion, $t(207) = − 6.10$, $p < 0.001$, and neutral, $t(207) = − 4.67$, $p = 0.001$. For Japanese participants, compared to happiness it was easier to feel excited, $t(207) = − 11.39$, $p < 0.001$, and neutral, $t(207) = − 4.58$, $p = 0.002$. A summary of the relative ease of experience within negative contexts is displayed in Table 3.

*Cultural Classification using Lasso Regression.* While the above analyses shed some light into cultural variation in the ease of experience, we are yet unable to identify the key emotion-negative context pairs that differ the most between cultures. Utilizing a Lasso regression, we classified each participants' membership into their respective cultures using the emotion-negative context pairs as features (predictor variables) on the model. This allows us to identify the key pairings within the model that contributes to the highest classification accuracy, or the greatest difference between countries. The lasso regression shrinks the variances according to a penalty function, λ, which we determined through tenfold cross validation for an optimal $\lambda = 0.043$. We split the data into training and test subsets along a 3:1 ratio. The model achieved a moderate classification accuracy on the test set (AUC $= 0.8245$, Approx. Cohen's d $= 1.32$, $p < 0.001$, 95% CI[0.72, 0.88]), and model interpretation highlighted 9 pairs that predicted participants' cultural membership. Specifically, US participants were more likely to report higher ease of experience than Japanese participants, for feeling

**Table 2** Summary of the relative ease of experience of each emotion between negative contexts

| Positive emotion | Culture | Sad [mean (SD)] | Anxious [mean (SD)] | Angry [mean (SD)] | Comparison | SE | df | t | p |
|---|---|---|---|---|---|---|---|---|---|
| Happy | US | − 11.1(15.2) | − 2.02(13.9) | − 5.48(12.4) | **Anx > Sad** | **1.46** | **207** | **6.24** | **<.001** |
| | | | | | **Ang > Sad** | **1.40** | **207** | **4.02** | **.001** |
| | Japan | − 3.41(11.7) | − 4.88(9.96) | − 6.78(10.3) | | | | | |
| Awe | US | − 5.61(16.2) | − 4.93(15.2) | − 2.82(16.1) | Sad > Ang | 1.32 | 207 | 2.84 | .014 |
| | Japan | 6.51(16.5) | − 3.26(18.4) | − 1.81(17.5) | | | | | |
| Moved | US | 18.3 (22.6) | 5.33 (17.7) | 0.857 (13.6) | **Sad > Anx** | **2.15** | **207** | **6.02** | **<.001** |
| | | | | | **Sad > Ang** | **1.96** | **207** | **8.86** | **<.001** |
| | | | | | Anx > Ang | 1.52 | 207 | 2.93 | .043 |
| | Japan | 2.33 (15.5) | − 3.53(12.7) | − 6.11(8.67) | **Sad > Ang** | **1.92** | **207** | **4.40** | **<.001** |
| Gratitude | US | 6.78 (21.4) | 8.38 (17.7) | 0.563 (15.6) | **Sad > Ang** | **1.88** | **207** | **3.30** | **.014** |
| | | | | | **Anx > Ang** | **1.74** | **207** | **4.49** | **<.001** |
| | Japan | 4.59 (14.4) | 4.49 (14.6) | − 3.71(11.8) | **Sad > Ang** | **1.84** | **207** | **4.51** | **<.001** |
| | | | | | **Anx > Ang** | **1.70** | **207** | **4.83** | **<.001** |
| Hope | US | − 5.69(15.5) | 2.80 (16.2) | 0.916 (15.3) | **Sad > Anx** | **1.71** | **207** | **4.98** | **<.001** |
| | | | | | **Sad > Ang** | **1.66** | **207** | **3.97** | **.001** |
| | Japan | − 0.77(12.4) | 3.41 (15.1) | − 0.497(11.1) | | | | | |
| Compassion | US | 18.1 (21.9) | 11.7 (18.8) | 6.38 (17.0) | Sad > Anx | 1.91 | 207 | 3.40 | .010 |
| | | | | | **Sad > Ang** | **2.05** | **207** | **5.75** | **<.001** |
| | Japan | 8.69 (16.7) | 9.87 (17.6) | − 2.71(11.2) | **Sad > Ang** | **2.00** | **207** | **5.70** | **<.001** |
| | | | | | **Anx > Ang** | **1.97** | **207** | **6.38** | **<.001** |
| Amused | US | − 9.18(16.1) | − 1.14(16.7) | − 0.329(17.4) | **Anx > Sad** | **1.55** | **207** | **5.18** | **<.001** |
| | | | | | **Ang > Sad** | **1.78** | **207** | **4.96** | **<.001** |
| | Japan | − 5.53(15.4) | − 5.84(13.6) | − 2.25 (13.7) | | | | | |
| Excited | US | − 14.2 (13.0) | 0.235 (18.6) | 1.72 (19.2) | **Anx > Sad** | **1.96** | **207** | **7.39** | **<.001** |
| | | | | | **Ang > Sad** | **2.66** | **207** | **13.81** | **<.001** |
| | Japan | − 0.289(18.1) | − 1.82(14.4) | 23.1 (25.7) | **Ang > Sad** | **2.60** | **207** | **9.02** | **<.001** |
| | | | | | **Ang > Anx** | **2.63** | **207** | **9.46** | **<.001** |
| Calm | US | 1.19 (18.3) | − 12.3(15.8) | − 4.53 (15.4) | **Sad > Anx** | **1.91** | **207** | **7.03** | **<.001** |
| | | | | | **Ang > Anx** | **1.90** | **207** | **4.07** | **<.001** |
| | Japan | 0.0314 (13.9) | − 1.23(15.2) | − 1.93 (16.4) | | | | | |
| Neutral | US | 12.2 (30.4) | − 2.19(25.9) | 7.30 (27.8) | **Sad > Anx** | **2.32** | **207** | **6.17** | **<.001** |
| | | | | | **Ang > Anx** | **2.31** | **207** | **4.11** | **<.001** |
| | Japan | 5.04 (20.7) | − 5.60(20.9) | 5.47 (17.5) | | | | | |
| Content | US | − 10.7 (15.4) | − 5.88(14.7) | − 4.57 (15.2) | **Anx > Sad** | **1.08** | **207** | **2.84** | **.014** |
| | | | | | **Ang > Sad** | **1.10** | **207** | **3.41** | **.002** |
| | Japan | − 4.07 (11.2) | − 2.80(11.4) | − 2.67 (10.3) | | | | | |

*P*-values from post-hoc tukey-corrected pairwise comparisons. Only significant differences are reported here. Bold font indicates significant effects after controlling for general frequency of experience of emotion. Detailed results for frequency-controlled models (self-reported frequency of emotion as covariate) are in our OSF repository

**Table 3** Summary of the relative ease of experience of each emotion compared to happiness, within negative contexts

| | | Happy | Awe | Moved | Gratitude | Hope | Compassion | Amused | Excited | Calm | Neutral | Content |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sad | US | – | ✓ | ✓ | – | ✓ | – | – | – | ✓ | ✓ | – |
| | Japan | – | – | – | – | ✓ | – | – | – | – | – | – |
| Anxious | US | – | ✓ | ✓ | – | ✓ | – | – | – | ✗ | – | – |
| | Japan | – | – | ✓ | ✓ | ✓ | – | – | – | – | ✓ | – |
| Angry | US | – | ✓ | – | – | ✓ | – | – | – | – | ✓ | – |
| | Japan | – | – | – | – | – | – | ✓ | – | ✓ | – | – |

Ticks show that the target positive emotions are significantly easier than happiness, while crosses are significantly harder than happiness

moved, B = 0.46, and neutral, B = 0.05, in sad contexts; moved, B = 0.17, and amused, B = 0.03, in anxious contexts, and moved, B = 0.03, in angry contexts. Japanese participants were more likely to report higher ease of experience than US participants for feeling happy, B = 0.17, and excited, B = 0.47, in sad contexts; calm, B = 0.35, in anxious contexts; and excited, B = 0.85, in angry contexts. Of note is the ease of experiencing feeling moved, which consistently differentiated cultural membership for all 3 negative contexts.

## Discussion

Study 1 highlights the importance of the concept of ease of experience, by showing that differences exist between the general ease and frequency of experiencing various emotions. Consistent with our expectations, while happiness may be as frequently experienced by participants compared to most other positive emotions, it may not be as easily experienced (e.g., focusing on comparisons with gratitude and compassion). This study is also the first to also show differences in ease of experiencing positive emotions in negative contexts. Particularly in negative contexts, the more consistent patterns of ease of positive emotion experience (e.g., moved, gratitude and compassion in sad contexts) seem to follow patterns of mixed emotions, where such emotions also have a slight negative quality to it. Mixed emotions occur when people experience a variety of emotions, usually of differing valence (positive and negative emotions), at the same time (Miyamoto et al., 2010). While not commonly experienced in daily life, these negative–positive mixed emotions may nevertheless inform individuals' attempts to regulate negative emotions towards positive emotion goals, and the corresponding ease of experiencing the target positive emotion. In these situations, some conflicting appraisals, or complex cognitions during the processing of an appraisal, may lead to experiences of mixed emotions (Shuman et al., 2013), and the rest of the situation may be appraised similarly across both emotions. Some notable mixed emotion pairs researched previously include disgust and amusement (Hemenover & Schimmack, 2007; Kreibig et al., 2015), and fear and excitement. This supports our proposition that the ease of experience of positive emotions may be linked to the shared elicitation stimulus or appraisals, such that more close or similar emotions are more easily experienced in those contexts.

However, this tended to be reflected mainly in US participants, where most theoretical emotion research has been based on. Whereas for Japanese participants, there seemed to be much less variation in the ease of experience in negative contexts. This might be due to the higher acceptance of the duality of positive and negative emotions (Miyamoto & Ryff, 2011), such that positive emotion experiences would

be equally easy regardless of the closeness of the pattern of emotion to the negative context. Given that these two different cultural samples were used to examine the cross-cultural generalizability of positive and negative emotion pairings in 'ease of experience', we note the presence of cultural differences, and one explanation could be that these mirror cultural differences in the experience (and possibly appraisals) of the emotions studied here. For example, in considering the appraisals of positive valence for feeling moved and happiness between the US and Japan, we note that feeling moved is more positive in Japan than the US (Zickfield et al., 2019). In turn, this could represent a larger distance between feeling moved and negative emotion contexts in Japanese participants (as compared to American participants, who had closer pairings between feeling moved and the three negative emotions). Likewise, happiness is more negative in Japan than the US (Uchida, 2010), which could account for its increased accessibility in sad contexts in Japan. While not the focus of this paper, we think that this presents an exciting area for follow-up research.

Two shortcomings of this study are that (1) we did not measure the extent to which participants who recalled negative emotions actually experienced those emotions. This discounted the possibility that participants induced to feel a target negative emotion (e.g., sadness), may have felt a different emotion (e.g., anxiety) either in place of, or in addition to the target emotion. Consequently, this may have biased their perceptions on the ease of positive emotion experience from the induced negative emotions. (2) Our study only reflected people's lay beliefs of the ease of experience, and not whether such ease is experienced in actual situations. Hence, in Study 2, we experimentally manipulated prior negative contexts and emotion goals to examine if actual ease follows the lay beliefs found in Study 1, focusing only on the US, and included manipulation checks for evaluating the effectiveness of the emotion induction methods.

## Study 2

In Study 2, we used the ease of recalling a past emotional experience, after a prior (negative) context manipulation, as an approximation of how easily participants were able to experience a target positive emotion. We assumed that more accessible emotional memories were associated with positive emotions that were easier and more readily experienced by participants for intentional emotion regulation. Going beyond self-report ratings of ease, we also distinguish between the intensity/success of experiencing the emotion (i.e. how much of the target emotion is felt), the overall efficacy of experiencing the emotion (i.e. the improvement general positivity and negativity mood after experiencing this emotion) and the subjective ease of experiencing the
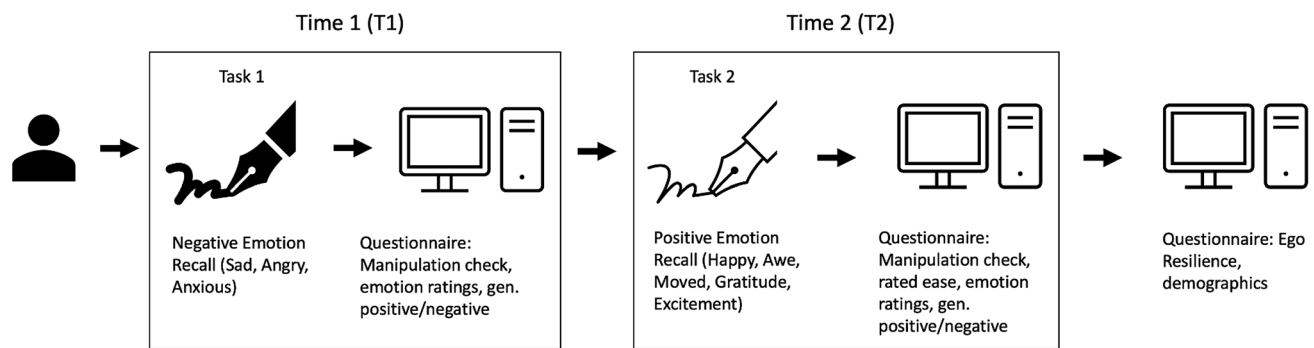
Fig. 2 A visualization of the experimental procedure

emotion (i.e. how easily it was felt). We also focused on US participants and chose a subset of the positive emotions measured in Study 1 to reduce the number of conditions due to funding constraints.

## Methods

### Participants

A total of 1109 participants from the US were recruited and reimbursed £1.01 online via Prolific.co. 12 participants were dropped from the analysis for failing the attention checks and/or not following the experimental procedure resulting in 1097 remaining participants (48.8% males, mean age = 33.1, SD = 11.0).[2]

### Procedure and materials

All participants were randomly assigned to a prior negative context, and a subsequent positive emotion, such that each pairing formed one condition. In total, there were 20 conditions, consisting of 4 negative contexts (sad, anxious, angry, neutral) and 5 positive emotions (happy, awe, moved, gratitude, excitement[3]).

Participants provided informed consent before proceeding to the first negative context recall task (task 1), where they were asked to describe a time when they felt their assigned negative experience. They were instructed to recall as many details as they could, picturing the situation in their minds and describe their experience in a free-response format. Participants were also provided question prompts such as, 'What happened in this situation to make you feel (target

_____
[2] A power sensitivity analysis showed that our study, with α = .05, and N = 1097, had sufficient power (1-β = .8) to detect an effect size f = .11.

[3] Data for compassion was also collected, but later excluded due to an experimenter error in the survey design

emotion)?', 'How did you feel?', and 'What went through your mind?'. There was no time or word limit imposed on participants. After the first recall task, participants rated their emotions, general positive and negative states at Time 1 (T1) on a Likert scale of 1(Not at all) to 7(Extremely), to reflect their subjective emotional improvement or change, amongst other manipulation checks.

Participants then moved on to the second recall task, where they were asked to recall and describe their assigned positive emotion experience (task 2). Instructions were identical to task 1, with only changes to the target emotion word. Afterwhich, specific to task 2, participants rated their ease of recalling the experience, using a slider from 0 (not at all) to 100 (extremely). This measure of ease was derived from the definition used in Study 1, where participants rated how easy, effortful (reverse-coded), quickly, long (reverse-coded), difficult (reverse-coded) it was to recall the experience. The average of these 5 items indicated the ease of recalling the positive emotion experience (α = 0.81). Participants also rated their current experience of positivity, negativity and other emotions (similar to the questions asked after task 1) at Time 2 (T2). Participants then answered demographics and other questions unrelated to the current research. Figure 2 visualizes the flow of the experiment.

## Results

### Manipulation checks

Context conditions. *sad context.* A Welch's ANOVA revealed a significant main effect of context condition for participants' sad ratings at T1, $F(3,602) = 49.7$, $p < 0.001$. Games-Howell post hoc tests showed higher reported sadness in the sad context condition (M = 3.79, SD = 1.89) than in the anxious [M = 2.72, SD = 1.74, $t(542) = 6.88$, $p < 0.001$], angry [M = 2.88, SD = 1.89, $t(552) = 5.64$, $p < 0.001$] and neutral [M = 2.06, SD = 1.46, $t(530) = 12.15$, $p < 0.001$] conditions. *Anxious context.* A Welch's ANOVA revealed a significant

main effect of context condition for participants' anxious ratings at T1, $F_{(3,602)} = 19.2$, $p < 0.001$. Games-Howell post hoc tests showed higher reported anxiety in the anxious context condition (M = 3.43, SD = 1.87) than in the angry [M = 3.00, SD = 1.77, $t_{(526)} = 2.74$, $p = 0.032$] and neutral [M = 2.40, SD = 1.67, $t_{(522)} = 6.70$, $p < 0.001$] conditions, but did not significantly differ with the sad context condition [M = 3.32, SD = 1.86, $t_{(538)} = 0.67$, p = 0.908]. *Angry context.* A Kruskal–Wallis H test was conducted on participants' anger ratings at T1, which was slightly skewed (skewness = 1.21, SE = 0.07; kurtosis = 0.33, SE = 0.15). It revealed a significant main effect of context condition, H(3) = 137, $p < 0.001$. DSCF pairwise comparisons showed higher reported anger in the angry context condition (M = 3.26, SD = 2.00) than in the sad (M = 2.22, SD = 1.56, W = 8.86, $p < 0.001$), anxious (M = 1.94, SD = 1.44, W = 11.51, $p < 0.001$) and neutral (M = 1.59, SD = 1.16, W = 15.28, $p < 0.001$) conditions.

## Intensity/success of experiencing positive emotion in all positive emotion conditions

We conducted separate repeated measures ANOVAs for each positive emotion condition to examine the effect of each positive recall task, and to account for possible baseline positive emotions felt at T1 during the context task. We subsetted participant data according to positive emotion conditions, and examined the effect of time on specific emotion intensity scores, focusing on only the intensity of experiencing the relevant target emotion (etc., happy ratings at T1 and T2 for the happy condition). Results for the main effect of time also serve as manipulation checks for the target emotion condition. Intensity for all positive emotions (happiness, awe, moved, gratitude, excitement) were significantly higher (all $p$s < 0.001) at T2 than T1 for the respective positive emotion conditions. For gratitude, we also observed a significant 2-way interaction between time and context, $F_{(3,176)} = 2.99$, $p = 0.033$, $\eta^2_p = 0.05$: gratitude was noticeably higher at T2 than T1 for participant previously in the angry condition (mean difference = 1.95, $p < 0.001$) than the anxious (mean difference = 1.07, $p = 0.004$), sad conditions (mean difference = 1.00, $p = 0.004$), or neutral conditions (mean difference = 0.93, $p = 0.014$).

Next, we considered the effect of the target positive emotion above and beyond the effect of possible co-occurring positive emotions, by including all positive emotions (and calmness) as covariates in repeated measures ANOVAs. Again, we were interested in the temporal difference in the target positive emotion from T1 to T2, so difference scores for other positive emotions (T2–T1) were included as covariates. A breakdown of results by positive emotion is available on our OSF repository.

*Happiness* (N = 191), was higher in T2 than in T1, $F_{(1182)} = 5.41$, $p = 0.021$, $\eta^2_p = 0.03$. However, this did not appear to change by negative context, $F_{(3182)} = 0.85$, $p = 0.470$, nor was there a significant interaction between time and negative context, $F_{(3182)} = 1.22$, $p = 0.304$. From the covariates, significant effects were observed from gratitude, $F_{(1182)} = 9.87$, $p = 0.002$, $\eta^2_p = 0.05$, and excitement, $F_{(1,812)} = 4.78$, $p = 0.030$, $\eta^2_p = 0.03$. No other significant effects were observed.

*Awe* (N = 183), was higher in T2 than in T1, $F_{(1174)} = 43.9$, $p < 0.001$, $\eta^2_p = 0.20$. This did not appear to change by negative context, $F_{(3174)} = 1.42$, $p = 0.239$, nor was there a significant interaction between time and negative context, $F_{(3174)} = 1.09$, $p = 0.354$. From the covariates, significant effects were observed from happiness, $F_{(1174)} = 20.4$, $p < 0.001$, $\eta^2_p = 0.11$, and gratitude, $F_{(1174)} = 7.87$, $p = 0.006$, $\eta^2_p = 0.04$. No other significant effects were observed.

*Moved* (N = 166), was higher in T2 than in T1, $F_{(1157)} = 55.7$, $p < 0.001$, $\eta^2_p = 0.26$. However, this did not appear to change by negative context, $F_{(357)} = 2.06$, $p = 0.107$, nor was there a significant interaction between time and negative context, $F_{(3157)} = 2.57$, $p = 0.056$. No other significant effects were observed.

*Gratitude* (N = 180), was higher in T2 than in T1, $F_{(1171)} = 10.9$, $p < 0.001$, $\eta^2_p = 0.06$. While the base model (without covariates) had a significant interaction between time and negative context, with the addition of covariates, gratitude did not appear to change by negative context, $F_{(3171)} = 1.99$, $p = 0.117$, nor was there a significant interaction between time and negative context, $F_{(3171)} = 1.08$, $p = 0.361$. From the covariates, significant effects were observed from awe, $F_{(1171)} = 7.70$, $p = 0.006$, $\eta^2_p = 0.04$. No other significant effects were observed.

*Excitement* (N = 194), was higher in T2 than in T1, $F_{(1186)} = 9.91$, $p < 0.002$, $\eta^2_p = 0.05$. This did not appear to change by negative context, $F_{(3186)} = 1.04$, $p = 0.376$, nor was there a significant interaction between time and negative context, $F_{(3186)} = 1.44$, $p = 0.232$. From the covariates, significant effects were observed from gratitude, $F_{(1186)} = 4.53$, $p = 0.035$, $\eta^2_p = 0.02$. No other significant effects were observed.

We then examined specific emotion ratings across positive emotion conditions to assess the overall success in the experience of the specific positive emotion between context conditions. We conducted separate regression analyses using the negative context conditions (dummy coded with the neutral condition as reference) to predict each emotion measure at Time 2, controlling for Time 1. This allows us to examine the relative change (increment or decrement) in the experience of specific positive emotions in the negative relative to neutral context conditions.

**Table 4** Descriptive statistics (Mean and SD) of overall positive emotion experience at T1 and T2

| Positive Emotion | Angry [Mean (SD)] | | Anxious [Mean (SD] | | Neutral [Mean (SD)] | | Sad[Mean (SD)] | |
|---|---|---|---|---|---|---|---|---|
| | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 |
| Happy | 3.06 (1.78) | 4.25 (1.86) | 3.77 (1.85) | 4.56 (1.73) | 4.04 (1.76) | 4.45 (1.75) | 3.15 (1.83) | 4.25 (1.90) |
| Awe | 1.80 (1.25) | 2.72 (1.85) | 2.28 (1.58) | 3.11 (1.98) | 2.03 (1.55) | 2.78 (1.93) | 2.15 (1.56) | 3.06 (1.98) |
| Moved | 2.28 (1.68) | 3.63 (1.99) | 2.54 (1.67) | 3.85 (1.94) | 2.50 (1.77) | 3.50 (2.05) | 3.20 (1.87) | 3.96 (1.81) |
| Gratitude | 2.93 (1.91) | 4.25 (1.92) | 3.75 (1.97) | 4.55 (1.89) | 3.70 (1.98) | 4.29 (2.02) | 3.51 (2.01) | 4.49 (2.00) |
| Excited | 2.50 (1.68) | 3.28 (2.02) | 3.01 (1.80) | 3.59 (1.99) | 2.68 (1.71) | 3.22 (1.95) | 2.46 (1.64) | 3.28 (1.96) |

*Overall happiness.* The regression model was significant, $R^2 = 0.26$, $F(4,1093) = 98.0$, $p < 0.001$. Controlling for happiness at T1, participants significantly felt happier at T2 in the angry compared to the neutral context, $b = 0.30$, $SE = 0.14$, $t(1093) = 2.23$, $p = 0.026$, 95%CI[0.04,0.57]; other comparisons $p$s > 0.056.

*Overall awe.* The regression model was significant, $R^2 = 0.24$, $F(4,1093) = 84.9$, $p < 0.001$ There were no significant differences for any negative contexts compared to the neutral contexts, $p$s > 0.156.

*Overall feeling moved.* The regression model was significant, $R^2 = 0.28$, $F(4,1093) = 106$, $p < 0.001$. Controlling for feeling moved at T1, participants significantly felt more moved at T2 in the anxious compared to the neutral context, $b = 0.33$, $SE = 0.14$, $t(1093) = 2.28$, $p = 0.023$, 95%CI[0.05,0.62]; other comparisons $p$s > 0.066.

*Overall gratitude.* The regression model was significant, $R^2 = 0.31$, $F(4,1093) = 124$, $p < 0.001$. Controlling for gratitude at T1, participants significantly felt more gratitude at T2 in the sad compared to the neutral context, $b = 0.30$, $SE = 0.14$, $t(1093) = 2.20$, $p = 0.028$, 95%CI[0.03,0.57], and in the angry compared to the neutral context, $b = 0.39$, $SE = 0.14$, $t(1093) = 2.76$, $p = 0.006$, 95%CI[0.11,0.66], but not for the anxious context, $p = 0.10$.

*Overall excitement.* The regression model was significant, $R^2 = 0.30$, $F(4,1093) = 118$, $p < 0.001$. There were no significant differences for the negative compared to the neutral contexts, $p$s > 0.132.

A summary of the descriptives of overall positive emotion experience for negative compared to neutral contexts can be found in Table 4. These results remained robust even after the inclusion of age and gender as control variables (see Supplementary Materials Sect. 2).

## Efficacy and benefit (general positivity and negativity) across positive emotions

Given the theoretical motivation of the current study, we conducted separate analyses to examine participants' general positivity and negativity within each positive emotion condition (e.g., happy condition). Overall, we found that participants experienced higher general positivity at T2 in the moved positive emotion conditions following any of the three negative emotion contexts than the other four positive emotion conditions. They also experienced higher general positivity at T2 in the excited positive emotion condition following two negative emotion contexts (angry and sad); in the awe and gratitude conditions following one negative emotion context (angry); and the happy emotion condition following one negative emotion context (sad). Participants experienced lower general negativity for moved, and excited conditions following any negative emotion context (excluding the neutral conditions), awe and gratitude, following sad and angry negative contexts, and the happy condition for the anxiety and sad negative contexts. No significant differences were observed between timepoints for the neutral condition. These results are summarized in Tables 5 & 6. We also observed that for all positive emotions, general positivity increased ($p < 0.001$) and general negativity decreased ($p < 0.001$) between T2 and T1. Full results are in our OSF repository (https://osf.io/9jgbe/).

## Ease of recalling positive emotion

A two-way ANOVA was applied with context condition and positive emotion condition as between subject factors and reported ease as the dependent variable. The main effect of positive emotion condition was significant, $F(4895) = 3.59$, $p = 0.006$, $\omega^2 = 0.011$, but not for negative context condition, $F(3895) = 0.20$, $p = 0.894$, $\omega^2 = -0.003$. The 2-way interaction was not significant, $F(12,895) = 0.92$, $p = 0.525$, $\omega^2 = -0.001$. This suggests that negative contexts did not appear to significantly affect the ease of subsequently recalling positive emotions. We then examined pairwise comparisons for the main effect of positive emotion on ease of experience. Across negative contexts, participants in the awe condition had significantly lower reported ease of recall compared to those in the happy condition, Mean difference = 7.41, $t(895) = 3.53$, $p < 0.001$, $d = 0.37$, 95%CI[0.16,0.57] and excited condition, Mean difference = 5.13, $t(895) = 2.44$, $p = 0.015$, $d = 0.25$ 95% CI[0.04,0.46]. Participants in the happy condition had significantly higher reported ease compared to those in the moved condition, Mean difference = 6.32, $t(1074) = 3.01$,

**Table 5** Comparison of overall benefit (over time) within positive conditions for angry and anxiety contexts

| Positive Emotion | Pos/Neg | Angry [Mean (SD)] | | SE | df | t | p | Anxiety [Mean (SD)] | | SE | df | t | p |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T1 | T2 | | | | | T1 | T2 | | | | |
| Happy | P | 3.85 (1.67) | 4.69 (1.81) | 0.241 | 1074 | 3.52 | .212 | 4.00 (1.94) | 4.89 (1.85) | 0.269 | 1074 | 3.44 | .260 |
| | N | 3.04 (1.81) | 1.85 (1.29) | 0.225 | 1074 | 3.55 | .193 | **2.73 (1.66)** | **1.69 (1.10)** | **0.241** | **1074** | **4.33** | **.014** |
| Awe | P | **3.04 (1.73)** | **4.20 (1.83)** | **0.259** | **1074** | **4.47** | **.008** | 4.28 (1.82) | 4.74 (1.68) | 0.256 | 1074 | 1.79 | 1.00 |
| | N | **3.36 (1.97)** | **1.87 (1.24)** | **0.241** | **1074** | **− 6.17** | **<.001** | 2.54 (1.75) | 1.83 (1.45) | 0.239 | 1074 | 3.01 | .605 |
| Moved | P | **3.55 (1.73)** | **4.68 (1.73)** | **0.281** | **1074** | **4.02** | **.044** | **4.20 (1.85)** | **5.27 (1.64)** | **0.259** | **1074** | **4.13** | **.030** |
| | N | **3.37 (1.95)** | **1.95 (1.35)** | **0.263** | **1074** | **4.48** | **.007** | **2.84 (1.72)** | **1.67 (0.95)** | **0.241** | **1074** | **4.88** | **.001** |
| Gratitude | P | **3.17 (1.72)** | **4.88 (1.88)** | **0.268** | **1074** | **6.41** | **<.001** | 4.26 (1.80) | 4.77 (1.59) | 0.264 | 1074 | 1.87 | .999 |
| | N | **3.14 (1.73)** | **1.62 (0.96)** | **0.250** | **1074** | **6.10** | **<.001** | 2.81 (1.89) | 2.09 (1.49) | 0.247 | 1074 | 2.92 | .678 |
| Excited | P | **3.15 (1.93)** | **4.87 (1.73)** | **0.238** | **1074** | **7.21** | **<.001** | 4.16 (1.82) | 5.00 (1.60) | 0.285 | 1074 | 2.93 | .663 |
| | N | **3.89 (1.94)** | **1.96 (1.43)** | **0.222** | **1074** | **6.50** | **<.001** | **3.00 (1.72)** | **1.86 (1.29)** | **0.266** | **1074** | **4.26** | **.018** |

Bold values are statistically significant effects

**Table 6** Comparison of overall benefit (over time) within positive conditions for angry and anxiety contexts

| Positive Emotion | Pos/Neg | Neutral [Mean (SD)] | | SE | df | t | p | Sad [Mean (SD)] | | SE | df | t | p |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T1 | T2 | | | | | T1 | T2 | | | | |
| Happy | P | 4.47 (1.85) | 4.91 (1.95) | 0.238 | 1074 | − 1.82 | 1.00 | **3.22 (1.93)** | **4.66 (1.78)** | **0.271** | **1074** | **5.31** | **<.001** |
| | N | 1.79 (1.26) | 1.45 (0.95) | 0.222 | 1074 | 1.53 | 1.00 | **3.27 (1.98)** | **1.98 (1.25)** | **0.253** | **1074** | **5.11** | **<.001** |
| Awe | P | 4.73 (1.75) | 5.09 (1.53) | 0.234 | 1074 | 1.55 | 1.00 | 3.73 (1.79) | 3.48 (1.74) | 0.285 | 1074 | 2.75 | .809 |
| | N | 2.36 (1.88) | 1.64 (1.18) | 0.218 | 1074 | 3.33 | .333 | **3.03 (1.80)** | **1.78 (1.11)** | **0.266** | **1074** | **4.67** | **.003** |
| Moved | P | 3.97 (1.84) | 4.40 (2.05) | 0.293 | 1074 | 1.46 | 1.00 | **3.60 (1.95)** | **4.94 (1.66)** | **0.250** | **1074** | **5.33** | **<.001** |
| | N | 2.09 (1.42) | 1.69 (1.25) | 0.274 | 1074 | 0.63 | 1.00 | **2.81 (1.57)** | **1.69 (1.17)** | **0.234** | **1074** | **4.81** | **.002** |
| Gratitude | P | 4.63 (1.55) | 4.74 (1.71) | 0.256 | 1074 | 0.43 | 1.00 | 3.51 (2.00) | 4.43 (1.96) | 0.248 | 1074 | 3.71 | .124 |
| | N | 1.91 (1.38) | 1.59 (1.13) | 0.239 | 1074 | 1.37 | 1.00 | **3.53 (1.77)** | **2.33 (1.65)** | **0.231** | **1074** | **5.25** | **<.001** |
| Excited | P | 4.55 (1.60) | 5.02 (1.52) | 0.268 | 1074 | 1.78 | 1.00 | **3.35 (1.59)** | **4.27 (1.62)** | **0.219** | **1074** | **4.21** | **.022** |
| | N | 2.10 (1.49) | 1.62 (1.40) | 0.250 | 1074 | 1.91 | 1.00 | **3.44 (1.75)** | **2.00 (1.24)** | **0.204** | **1074** | **7.08** | **<.001** |

Reported pairwise comparisons correspond to t-values from Tukey-corrected pairwise comparisons of the general positivity or negativity (row) at T2 compared to T1, for each positive emotion condition, per negative context condition

Bold values are statistically significant effects

p = 0.032, d = 0.31, 95% CI[0.51,0.11]. All other comparisons, ps > 0.141.

Finally, despite a non-significant interaction between positive emotion and negative context, we examined pairwise comparisons of negative contexts with positive emotions, as specific differences in ease could still emerge within certain emotion pairings. However, no significant results were observed. These comparisons of ease across positive emotions and negative contexts is visualized in Fig. 3.

## Discussion

Unlike the variations found in lay beliefs of ease from Study 1, there was much less differentiation in the intensity/success and ease of experience of positive emotion in negative contexts. For ease, we did not observe any significant variation

in positive emotions from negative contexts, despite baseline differences in the experience of positive emotions (participants found it harder to recall awe experiences than happy or excited experiences, and moved experienced than happy experiences). However, these effects could be confounded by frequency of experience, where emotions more commonly experienced in daily life could be more easily retrieved and accessed, thus scoring higher on our rating system for ease of experience.

Similarly, when we examined the intensity of the emotion, which we think corresponds to the success of improving their affective state towards the direction of the recalled positive emotion, improvements were observed post-recall (of positive emotions), but these again did not appear to change by specific negative context. Rather, in considering the global effect of an emotion (beyond the immediate recall task), participants tended to experience comparable

**Fig. 3** A visualization of perceived ease of positive emotion experience by negative emotion contexts
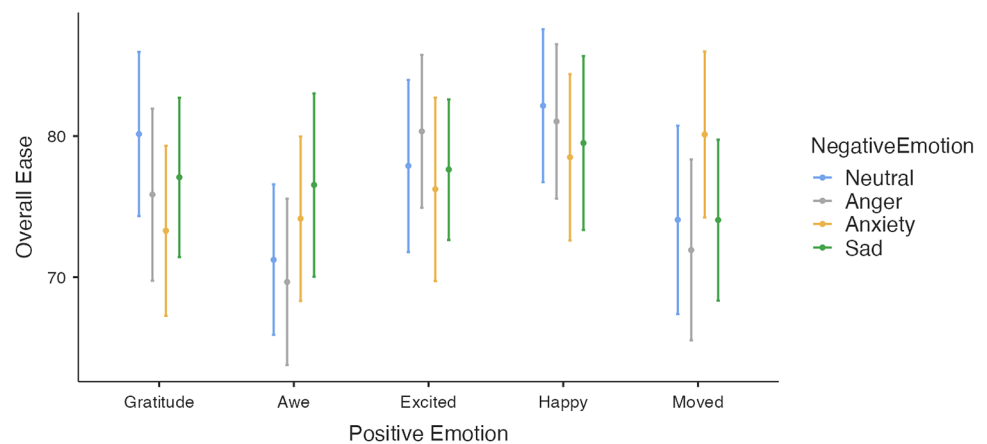


intensities of positive emotions across negative contexts, and showed differences between negative context conditions only when examined based on overall emotion ratings rather than by positive emotions. Specifically, participants' reported happiness, feeling moved and gratitude showed the most variation in actual experience between contexts. As with the ease of experience, it did not vary between contexts but only between positive emotion conditions, with mainly participants reporting higher ease in the happy condition.

Lastly, in evaluating the efficacy of positive emotion upregulation, we consider the overall 'benefit' (increase in positivity or decrease in negativity) of the positive emotions varying between contexts. This is different from the intensity of a positive emotion, which examines the specific improvements in that target emotion, in examining a broader effect of the positive emotion upregulation task on overall mood. Depending on context, the regulatory goal as determined by the assigned positive emotion condition had differential results on the participants' overall mood. Taking gratitude for example, while there was no difference in the ease of experience between negative contexts, participants gleaned more benefit (i.e., reduced negativity or increased positivity) from the gratitude recall manipulation in sad and angry but not anxious contexts. This is consistent with the results from intensity of overall emotion experience, where participants experienced more increment in gratitude in sad and angry than anxious contexts.

In sum, Study 2 shows that the ease of experience, and intensity or success of experiencing the positive emotion has separate patterns from the efficacy and benefits of experiencing the positive emotion. For example, participants might feel subjectively better trying to feel moved than awe, but these might not correspond to the ease of experiencing the emotion of feeling moved compared to awe nor the success and intensity of actually feeling these emotions. At the same time, we note several methodological issues with Study 2: our lack of control for everyday frequency of emotion experience, the induction tasks for negative and

positive emotions being decontextualized and uncoupled, and the lack of differentiation in anxiety levels with regard to sad and anxious recall tasks for negative context. These may have hindered the effectiveness of the experimental design in accurately quantifying the ease of experience of positive emotions, though the available evidence nevertheless suggests that perceptions of ease of experience, when reporting on one's current evaluations of the ease of recall, may not reflect the instrumental 'ease' by which the emotion is able to influence and improve the individuals' emotional state dependent on the context.

## General discussion

We introduce the concept of ease of positive emotion experience in relation to emotion regulation, in proposing that the accessibility of emotions may vary due to negative emotion contexts (Studies 1 and 2). We first demonstrated in Study 1 that lay-concepts of ease varied widely between positive emotions and negative contexts, and also that such variations differed between individuals' cultural background. In Study 2, we experimentally manipulated negative contexts and positive emotion conditions (as the regulatory goal), and found that reports of ease and emotion intensity did not vary between negative contexts like in Study 1, but rather the benefits/efficacy of the targeted positive emotion differed depending on prior negative contexts. Given that participants in Study 1 innately showed differences in lay-beliefs about the concept of ease despite the lack of variation in actual reported ease by participants in Study 2, our findings also highlight that the concept of ease may be more of a subjective evaluation rather than an objective difference between emotions.

Furthermore, the contrast between the fine differentiation in the ease of experience in Study 1, and the lack of differentiation in actual ease in Study 2, highlights the discrepancy between lay theories of the accessibility or success in attaining positive emotion experiences versus actual rates of

success. Expanding on research on the process and impact of setting emotion regulatory goals (Tamir & Millgram, 2017), our findings suggest that the ease of experience may play an important part of the emotion goal setting process, whereby individuals may be guided by faulty lay beliefs of ease, which may in turn influence later success or failure in regulation. Nonetheless, the results for the efficacy (overall benefits) of positive emotion experience (general positivity and negativity in Study 2) suggests that the fit between prior contexts and positive emotion goal may be influenced not only by the lay-beliefs of ease by individuals (Study 1) but also by the actual beneficial impact of the emotion. In other words, some emotions may be thought to be more easily experienced, and also more beneficial in certain negative contexts than others, which would be important considerations for emotional goal setting.

To highlight some notable pairings observed across both studies, on one hand, some positive emotions showed similarities between subjective evaluations of ease (Study 1) and objective differences in corresponding benefits of induced emotions (Study 2). Consistent with past literature (Menninghaus et al., 2015), feeling moved appeared to be more closely associated with sadness than anger or anxiety: Participants in Study 1 rated feeling moved and sadness as closer than anger and anxiety, and participants in Study 2 induced to feel sadness before feeling moved had the greatest reduction of negativity (largest mean difference compared to anger and anxiety). On the other hand, most emotions showed differing patterns between Studies 1 and 2. For example, gratitude was subjectively closer to sadness than anxiety, and anxiety than anger (Study 1), but participants first induced to feel anger showed the strongest increase in positivity and decrease in negativity after induced gratitude, whereas only negativity showed a significant decrease for gratitude, and no significant changes were observed for anxiety (Study 2). Similar discrepancies were also observed for awe, excitement, and happiness, highlighting the prevailing gap between lay theories on accessibility of specific positive emotions for emotion regulation, and of the actual benefits of these positive emotions for these (regulatory) purposes.

While we introduced the notion that shared appraisals may determine the closeness of these positive–negative emotions, that in turn affects the ease of experience of positive emotions from negative contexts, this may be true of only lay theories in Study 1. For example, in considering arousal as an appraisal dimension, some results suggest that negative emotions are more closely associated with positive emotions with matching arousal levels: Sadness (low arousal) is matched more closely with moved, gratitude, and compassion (low arousal) while anger (high arousal) is matched more closely with happiness and excitement (high arousal). Yet, in Study 2, arousal levels no longer seem to predict experiences of corresponding positive emotions

nor their positive/negative benefits. Given that appraisals are inherently cognitive (Scherer, 1999), we think that they may better reflect lay theories on positive–negative emotion similarities, and may be insufficient for explaining the ease of actually experiencing positive emotions from negative contexts (at least for our example of arousal). However, our research did not examine specific similarities in appraisal dimensions across positive and negative emotions, and presents an area for future research.

## Challenges and future directions

As our research involves the novel concept of ease, we faced several challenges in quantifying the concept through the experimental research used in this paper. We had originally expected actual experiences of ease in Study 2 to differ according to individuals' lay-beliefs in Study 1. This was largely not the case, and we surmised earlier in the discussion that ease may be more of a perceptual evaluation of positive emotion experience than an actual one. Alternatively, Study 2 suggests that our definitions of ease (defined as difficulty, effort, speed, and timing) provided to participants may also be biased towards more commonly experienced emotions, with happiness, for example, rated as easier to experience than awe and moved, that past research has suggested are rarely felt (Konečni, 2011, 2015). Additionally, participants in Study 2 may have had ample time to complete the positive emotion recall task, which might have diminished cross-emotion differences in the intensity of a target emotion. Some participants might have taken more time in comparatively difficult contexts, but once recalled, the intensity of the emotional experience itself becomes on par with easier contexts.

One direction could then be to revise the definition of 'ease' of positive emotion experience. Our results suggested that efficacy and benefit results in Study 2 appeared to mirror somewhat the negative–positive emotion pairings identified through lay-person intuitions in Study 1. Consequently, ease could be defined through corresponding benefits on mood regulation, that would be in-line with our initial aims of seeking alternative 'easier' emotions compared to the pursuit of happiness for everyday emotion regulation. Such a definition would also tap into the lay beliefs of individuals, assuming that various emotion lay-theories and ideals of how emotion can be experienced, and which emotion should be experienced, may be inherent in lay beliefs of the ease of experience.

However, efficacy and benefit may only offer indirect measurements of the concept of ease, that approximate the underlying construct of ease. One method to address this could be to use more direct measures of ease, such as quantifying the time taken to experience the emotion, rather than intensity. This would be a behavioral measure less prone to

fallacious lay beliefs or higher-order cognitive appraisals, in measuring (comparatively) automatic reactions to emotion-eliciting situations, given that the high variability of ease in Study 1 may be due to biases from using global reconstructions of emotional states which may be more polarized than daily measures reflecting real-time experiences of ease (Newman et al., 2021). Yet, this definitions would not account for the effect of frequency of emotion experience in everyday life. For example, as observed in Study 2, happiness may be more familiar as a regulatory goal and hence also easier retrieved than other emotions. Hence, what individuals know to feel, and what individuals are used to feeling may be different, which has implications on the ease of experience and regulatory decisions. This could then be additionally measured through ecologically valid methodology like experience sampling to find out moment by moment experiences of ease. Nonetheless, the current findings highlight the importance of considering the context when deciding emotional goals during regulation, and may even suggest that using recall as a regulation strategy might not benefit from differentiated ease of experience as per individuals' lay-beliefs.

Finally, given the cultural differences in patterns of ease in Study 1, future studies would need to investigate culture differences more in depth to determine if ease of experience reflects societal expectation/norms and hence also familiarity of experience of emotion, or an actual inherent attribute of the emotion. These can also include examinations of individual differences (e.g., personality) that may modulate this relationship to establish boundaries and contextual influences of ease.

Despite these limitations, the current findings can have various implications in therapeutic settings, such as in cases of emotional inertia (Kuppens et al., 2010), where an individual's emotional state can be resistant from change, even from self-motivated, internal regulatory efforts. Emotion inertia can lead to psychological maladjustment, fatigue, and counterproductive behavior, especially for negative emotional states (De Longis et al., 2021). This difficulty in switching from one emotion to another may be less dependent on the individuals' beliefs about the emotion and more influenced by innate qualities of the emotion in context that influences the ease of experiencing the emotion. In other words, a person with high emotional inertia may still be better off trying to emotionally regulate towards an easier experienced emotion in the context, which might have innate qualities that facilitate experience. If emotion goals are too difficult (i.e., success might be improbable), the intensity of motivation towards the emotion goal pursuit might waver (Gendolla, 2014). Having more informed choices of which emotion would be easier to regulate towards might improve the success of regulation and self-efficacy (Gross, 2015). Hence, further research to pinpoint the factors contributing to the discrepancy between lay beliefs and actual ease of emotion experience will be needed in order to improve emotion goal setting. These may also benefit from going beyond the negative-to-positive emotion regulation examined here to explore other forms of positive-to-positive or even positive-to-negative emotion transitions.

## Conclusion

Our research introduces the concept of ease of experience by showing variations between the experience of positive emotion in negative contexts and cultures. Given the discrepancy between lay beliefs about ease in Study 1 and actual experiences of ease in Study 2, our findings highlight the importance of considering lay-constructs of emotional experience which may have implications on emotion regulatory decisions. While we suggest general trends of ease of experience by emotion, we do not assert that the patterns shown in this paper are fixed, but rather our focus is on the existence of variation between ease between positive emotions and negative contexts. To truly determine which positive emotion goals would be truly suitable specific to prior negative contexts, we encourage future research to focus on comparisons between selected emotions as informed by our current findings.

## Declarations

**Conflict of interest** The authors declare no conflicts of interest.

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