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The effect of focused reappraisal strategies on emotional intensity

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ABSTRACT. The intensity of healthy positive emotions could determine our ability to savour our lives fully. Focused reappraisal strategies which are effective in reducing negative unhealthy emotions could also have the effect of down-regulating positive emotions. **Objective:** The aim of our study was to investigate the effect of the extensive use of reappraisal strategies on changes in overall levels of emotional intensity. **Methods:** Our sample consisted of 108 subjects. Based on our experimental design, images from NAPS were used as positive and negative emotional stimuli. The valence and arousal of the emotional responses were measured. The subjects' responses were categorised on the basis of which of the eight focused reappraisal strategies they applied. We used Linear Regression in order to test our hypothesis. **Results:** Based on our data, we identify justification and humour as reappraisal strategies that can lead to a decrease in the valence of positive emotions, with acceptance having an effect on the arousal of both negative and positive emotions. **Conclusions:** Our results suggest that in order to decrease unhealthy negative emotion, without at the same time reducing our ability to savour our lives by also decreasing the level of positive emotions, optimum levels of justification, humour and acceptance, used as reappraisal strategies, are needed. Limitations and recommendation for future research regarding emotional self-regulation interventions are identified and discussed.

Keywords: emotional regulation, reappraisal strategies, emotional intensity, emotional valence, quality of life.

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INTRODUCTION

Positive and negative emotions have important roles to play in our lives, from increasing the motivation required to attain our goals to helping to maintain meaningful relationships and improving cognitive flexibility (Gruber, 2011a, 2011b, Li et al., 2020, Newman & Nezlek, 2022). Consequently, applying inadequate emotional regulation strategies could lead to depression (Mueller et al., 2024, Vanderlind et al., 2020;) and other psychological disorders (Millgram et al., 2020, Watson & Naragon-Gainey, 2010). On a related note, studies that investigate the implication of applying emotional regulation strategies to positive emotions are limited. (Boemo et al., 2022, Mueller et al., 2024). In cases where someone experiences positive emotions such as joy, excitement, pride or happiness, we would think that no emotional regulation is needed or need be used. However, studies investigating the involvement of goals, expectations, social norms, and cultural differences on how people regulate their emotions, reveal that in many cases people are inclined to down-regulate their positive emotions (Boemo et al., 2022; Mueller et al., 2024; Tamir 2009, 2016; Tamir et al., 2007, 2015) Positive emotions can play an important role as a counterbalance to overall mood in the case of affective disorder (Boemo et al., 2022; Mueller et al.2024). Therefore, the down-regulation of intensely activated positive emotions (e.g., interest, excitement, desire, gladness, and joy) may result in the experience of less intense and potentially dysfunctional positive emotions (e.g., satisfaction, contentment, happiness, and fulfilment) (David et al. 2004; Ellis & & DiGiuseppe, 2003; Tiba & Szentagotai, 2005). This shift could impede efforts to achieve goals and reduce cognitive flexibility (Gruber, 2011a, 2011b; Li et al., 2020; Newman & Nezlek, 2022).

In this respect, studies on the up and down-regulation of positive and negative emotions could help us to understand and help guide effective interventions to improve and maintain our state of well-being (Farmer and Kashdan, 2012, Kanske et al., 2010, Li et al., 2020, Newman & Nezlek, 2022, Shafir et al., 2018).

Many studies in the scientific literature which investigate the effectiveness and the mechanisms used in reappraisal strategies and other emotional self-regulation modalities often use specific instructions to up or down-regulate positive and negative emotions and emotion eliciting stimuli. Kanske et al., (2010) obtained a significant decrease in the intensity of negative as well positive emotions in reappraisal conditions involving responses to negative, neutral and positive emotion eliciting images, using a procedure that asked the subjects to down-regulate all their emotional responses. The subjects also showed changes in neural network responses. Gunaydin et al., (2016) have shown through their experience sampling method study that trait reappraisal, or in other

words, the frequent use of reappraisal strategies, could be responsible for lower negative emotions, and also a lower overall intensity of positive emotions in everyday life.

In contradistinction to this, Brans et al., (2013) examined two experience-sampling studies which aimed at investigating the use of six emotion regulation strategies found in the complexity of everyday life. In one of their studies they demonstrated that reappraisal was linked to an increase in the intensity of positive emotions. Unfortunately, they measured reappraisal by the extent to which the subjects applied this emotion regulation strategy. Secondly, positive emotions were operationalised using two categories (happiness and relaxation). Normally, it would be high arousal positive emotions which are the main target of down-regulation, emotions such as being enthusiastic, alert, happy, proud, or excited. Newman and Nezlek, (2022) make a clear distinction between positive activated and positive deactivated affects. Differences in operationalising emotional response could also be an important factor in understanding the source of a reported increase in positive emotion, as opposed to a decrease, resulting from applying reappraisal strategies. We find that valence and arousal ratings, as used in multiple studies of reappraisal strategies (Lalot et al., 2014, Lin et al., 2022, Neta et al., 2022, Vlasenko et al., 2024), could be an optimal way of identifying possible decreases in the overall levels of positive and negative emotions. Emotional flattening can be described as the experience of positive and negative emotions at low intensity, near a neutral state. Intense activated positive emotions (such as interested, excited, desiring, gladness, joy) can make a difference in the attainment of desired outcomes, when they are present before and during the process of working towards our goals (Tiba & Szentagotai, 2005). In a broader context, increasing and experiencing intense positive emotions could have a counterbalancing effect on psychopathologies (Garland et al., 2010; Millgram et al., 2020; Watson & Naragon-Gainey, 2010). In contrast to this, emotional flattening could deprive the subject of the above-mentioned benefits of activated positive emotions.

Buhle et al., (2014) meta-analysed 48 neuroimaging studies of reappraisal. The majority of the studies involved specific down-regulation instructions regarding emotional responses. Only 14 studies included measurements of positive emotions, which suggests a limitation in the comparison of the effects on positive and negative emotions of reappraisal strategies. Lalot et al., (2014) compare the effects of reappraisal, suppression and mindfulness on valence rating and facial expression for positive emotions when presented with positive video clips. Their results show that in the mindfulness and reappraisal cases subjects have a less intense emotional and facial response. Neta et al., (2022) tested whether activating the use of reappraisal strategies through a pre-test task could influence the valence rating of ambiguous stimuli (faces and scenes).

Their results showed that the use of reappraisal strategies for one task could be transferred to subsequent experiences, and that the valence ratings of ambiguous stimuli were lower in both their studies (Boemo et al., 2022, Neta et al., 2022).

The findings of Neta et al., (2022) suggest that in some circumstances reappraisal strategies could be applied spontaneously. Vlasenko et al., (2024) compared the difference between spontaneous reappraisal groups and instructed reappraisal groups in the frequency and type of reappraisal strategies used. Their results showed that subjects from the instructed group use more reappraisal tactics than those in non-instructed group (Vlasenko et al., 2024). In ecological settings, if the cognitive costs of the use of consciously intended reappraisal strategies is perceived as high (Troy et al., 2018, Sheppes et al., 2014, Ortner et al., 2016; Sheppes & Meiran, 2008, Suri et al., 2015, Brans et al., 2013), this could lead to a lower use of conscious reappraisal strategies. In their study, Suri et al., (2015) obtained a figure of only 16% for the use of reappraisal strategies. Studies that contain specific instructions to subjects to up or down-regulate their emotions have limitations when the results are generalised to everyday life and when used to predict the state of well-being of the participants (Kobylin´ska & Kusev, 2019, Brans et al.2013, Farmer & Kashdan, 2012, Neta et al., 2022, Yuan et al., 2015, Buhle et al., 2014, Kalokerinos et al., 2014).

Guassi Moreira et al., (2024) identify three types of approaches applied by their subjects to emotion regulation. Their results show that those regulators who selectively use cognitive reappraisal and situation selection, but who do not use expressive suppression, are often the most adaptive regulators. The study by Vlasenko et al., (2024) highlights the fact that some reappraisal strategies were used more frequently than others. More specifically, they showed that reality challenge and changing current circumstances were the most frequently used reappraisal strategies. Ruan et al., (2024) studied the use in close relationships of eight reappraisal strategies and their effect on relationship satisfaction. They identified situation modification as the most frequently used reappraisal strategy (Ruan et al., 2024).

Multiple studies use specific reappraisal categories in order to identify variations in their efficacy and their impact on emotional responses in aversive situations (Gross and Thompson, 2007; McRae et al., 2012; Ruan et al., 2024, Vlasenko et al., 2024, Webb, et al., 2012, Wild et al., 2024). A disproportionate use of some reappraisal strategies over others could be explained by a variety of reasons: (a) the characteristics of the emotional stimuli; (b) emotional intensity; and (c) the perception of controllability (Deplancke et al., 2022; Ford et al., 2018, Gutentag et al., 2016, Petrova et al., 2023). Efficacy in reducing negative emotions was significantly improved for participants with high trait reappraisal and with beliefs about the controllability of emotional responses.

The reappraisal strategies found by previous studies to be more frequently used (Ruan et al., 2024, Vlasenko et al., 2024) could be considered to be reality focused reappraisal strategies. The description of specific reappraisal strategies (Gross and Thompson, 2007), based on the subject of the reappraisal (Webb et al., 2012) categorises reappraisal strategies into four main kinds: (a) emotional stimuli; (b) emotional response; (c) perspective taking; and (d) mixed approach. We could classify them as reality focused reappraisal strategies and emotion focused reappraisal strategies (Blanke et al., 2022).

If the conclusions of these studies are correct (Buhle et al., 2014, Gunaydin et al., 2016, Lalot et al., 2014, Li et al., 2020, Shafir et al., 2018, Kanske et al., 2010), this could suggest that the use of a high level of reality focused reappraisal strategies could result in a lowering of the intensity of all our emotions, which suggests they have the possibility of reducing our ability to savour or enjoy our lives fully (Neta et al., 2022, Yuan et al., 2015).

Purpose of the present study

Our study has as its main goal the aim of determining the relationship between different emotional regulation strategies and the level of decrease in the emotional response or emotional flattening. It focusses on assessing the predictive power of the reality-focused reappraisal as opposed to emotion-focused reappraisal. This is underpinned by our analysis of the scientific literature which relies on the level of reappraisal strategies used by the subjects (Brans et al., 2013, Buhle et al., 2014, Farmer & Kashdan, 2012, Lalot et al., 2014, Newman & Nezlek, 2022, Gunaydin et al., 2016). More specifically, our aim is to identify the level of reduced intensity of emotional response (emotional flattening) in those subjects with a high use of reappraisal strategies in general, and reality focused reappraisal in particular.

In pursuit of this objective, we have formulated two hypotheses. We expected that the frequency of employing emotion regulation strategies associated with reality-focused reappraisal can predict the extent of emotional flattening. Secondly, we expected that the frequency of employing emotion regulation strategies associated with emotional-focused reappraisal would not predict the extent of emotional flattening.

METHODS

Participants

Our experimental sample consists of 108 subjects. The number of subjects needed for our study was calculated to be 67, using a sample size calculator (for regression - significance level = 0.05, power 0.8, predictors = 2, medium effect,

effect size = 0.39). We choose a medium effect size based on the scientific literature (η^2_p = .35 for ANCOVA according to Kalokerinos et al., 2014, d = 0.36 for t test according to Neta et al., 2023) and on the smallest effect size, as described by Lakens, D. (2022). The subjects were between 19-67 years old (mean age = 42, SD = 9.6; 85,7% female and 14.3% male; 66% married, 17% not married, 12.3% divorced, 4.7% other status), from a wide variety of occupational backgrounds. Participants were selected using the snowball effect by inviting volunteers for the study to share a link to the study on social media. To obtain the volunteers used in this sample we offered as an incentive the opportunity to participate free of charge in a webinar. An information sheet and a consent form were included at the beginning of the study. The participants were informed that they could decide to withdraw at any time and that the information collected would be confidential and would be used solely for the purposes of the present study. Approval for the project was obtained from the appropriate review committees at the authors' institutions. The participants were members of the general public with no previous history of mental disorders.

Measures

Emotional flattening. In our study, we treat emotional intensity as a dependent variable. To measure emotional intensity, we will ask participants to rate both their emotional valence and arousal using rating scales (Betella & Verschure, 2015, Kanske et al., 2010, Marchewka et al., 2013, Neta et al., 2022, Riegl et al., 2015). For emotional valence and arousal (reliability coefficients, r = 0.93 for arousal, and r = 0.98 for valence, Marchewka et al., 2013), participants will rate their feelings on a scale where the midpoint represents a neutral emotional state. The scale ranges from -5, indicating the maximum negative valence, to +5, indicating the maximum positive valence. To calculate the emotional intensity index for each trial, we will compute z-scores for both emotional valence (Zv) and arousal (Za). The average of these z-scores across all trials will represent each participant's emotional response. A higher mean score indicates less emotional flattening, meaning participants are experiencing a broader range of emotions. Conversely, a mean score approaching 0 suggests a greater degree of emotional flattening, indicating a narrower range of emotional experiences.

Reality-focused reappraisal strategies. Reality-focused reappraisal is an independent variable in our design and it comprises of the following sub-strategies: (a) acceptance, defined as a way of thinking about aversive situations in a non-judgmental and non-oppositional way, (b) justification, defined as finding an plausible explanation for the experienced situations, (c) normality check, defined as assessment regarding the degree to which the experienced

situation is expected based on reality based facts and norms, (d) responsibility assumption, defined as the acceptance of the consequences of a given situation resulting from one's own decisions, and (e) solution formulation, defined as the mental focus on finding coping strategies and solutions with a view to changing the experienced situation (Wild et al., 2024). These reappraisal focused strategies have been identified in previous studies (Gross, 2015, McRae et al., 2012, Vlasenko et al., 2024, Wild et al., 2024). In our study design, reality-focused reappraisal will be taken to be the total sum of frequencies in which participants indicate practicing the specific sub-strategies encompassed by it (m = 2.35, sd =1.66, Crombach α = 0.907).

Emotion-focused reappraisal strategies. Emotion-focused reappraisal is an independent variable in our design and it consists of the following sub-strategies: (a) humour, defined as the reinterpretation of the experienced situation in a humoristic way, (b) positive thinking, defined as the assessment of the experienced situation in order to find the present or future possible positive effects or expected outcomes, and (c) compensation, as distinct from positive thinking. Compensation focused on the positive benefits of the lessons extracted from the experienced situations, which may not necessarily be positive in nature (Wild et al., 2024, Gross, 2015, McRae et al., 2012, Vlasenko et al., 2024, Wild et al., 2024). Similar to the way in which we proceeded in the case of Reality-focused reappraisal, Emotion-focused reappraisal will be taken to be the total sum of frequencies in which participants indicate using the specific sub-strategies encompassed by it (m = 2.12, sd = 1.83, Crombach α = 0.887).

PROCEDURE

We used 16 images selected from the Nencki Affective Picture System (NAPS) (Marchewka et al., 2014, Michałowski et al., 2015, Riegel et al., 2016, Wierzba et al., 2015) as positive and negative emotional stimuli,[2] displayed in random order to each subject. The average valance for the selected negative images was m = 3.24; SD = 1.44, and m = 7.42; SD = 1.26 for the selected positive images. The valence values for the entire NAPS image data base ranging between m =1.33-8.54. Each image will be presented for 15 seconds followed by a reappraisal strategy assessment (spontaneous reappraisal) and emotional response scales (valence and arousal). The experiment was implemented using the gorilla experiment builder app.

[2] Images used: Animals 053, Faces 016, Faces 089, Faces 107, Faces 291, Faces 356, Faces 370, People 040, People 077, People 116, People 161, Object 003, Object 132, Object 261, Opposite sex couple 040, Landscapes 035

Statistical Analysis

We conducted the statistical analysis's with JAMOVI. In order to determine and test the relationship between variables we used the following calculation and statistical tests (to a 95 % Confidence Interval): (a) descriptive statistics including a distribution normality test; (b) for our hypotheses we used Linear Regression, with two dimensions of the dependent variable, namely (1) valence, and (2) arousal.

RESULTS

This section presents the findings concerning the influence of **reality-focused** and **emotion-focused reappraisal strategies** on emotional responses (valence and arousal) to positive and negative stimuli. Descriptive statistics for key variables, including valence, arousal, and reappraisal strategies, are summarized in Table 1. The results are organized into four subsections based on the analysis: reality-focused strategies for positive and negative emotions and emotion-focused strategies for positive and negative emotions.

Reality focused reappraisal strategies and positive emotions.

The relationship between reality-focused reappraisal strategies and emotional responses to positive stimuli was analysed using linear regression. Notably, the strategy of justification demonstrated significant negative effects on the valence (B = -0.2955, $p < .001$) and significant positive effects on the arousal (B = 0.2556, $p = .002$) of positive emotions. These findings indicate that while justification as a strategy reduces the perceived positivity (valence) of emotions, it simultaneously heightens emotional arousal.

Conversely, the acceptance strategy had a significant negative effect on emotional arousal (B = -0.1268, $p = .003$) but did not affect emotional valence ($p > .05$). This result suggests that acceptance contributes to emotional flattening by reducing arousal intensity without altering the perceived positivity of the experience. Taken together, justification and acceptance accounted for approximately 18% of the variation in the emotional response to positive stimuli (adjusted $R^2 = 0.18$, $F = 4.47$, $p = .001$).

Reality focused reappraisal strategies and negative emotions.

In response to negative stimuli, acceptance was the sole reality-focused reappraisal strategy to significantly influence emotional responses. Acceptance increased the valence of negative emotions (B = 0.0944, $p = .029$) and reduced

their arousal (B = -0.0981, p = .022). These results suggest that acceptance effectively moderates the intensity of negative emotions, consistent with its role in promoting adaptive emotion regulation.

Other strategies, such as justification, solution formulation, responsibility assumption, and normality check did not significantly predict changes in either valence or arousal of negative emotions (p > .05). Acceptance alone accounted for 11.2% of the variation in arousal-related outcomes (adjusted R^2 = 0.11, F = 2.56, p = .031), indicating its effectiveness in diminishing emotional intensity.

Emotion focused reappraisal strategies and positive emotions.

For emotion-focused reappraisal strategies, linear regression analyses revealed the contrasting effects of humour and positive thinking on positive emotions. Humour was negatively associated with the valence of positive emotions (B = -0.1499, p = .024), suggesting it dampens the perceived positivity of the emotional experience. In contradistinction to this, positive thinking positively influenced valence (B = 0.1095, p = .015), enhancing the subjective experience of positive emotions. Both strategies accounted for approximately 9.3% of the variation in valence-related outcomes (adjusted R^2 = 0.093, F = 3.58, p = .017).

However, neither humour nor positive thinking had significant effects on the arousal of positive emotions (p > .05). Similarly, the strategy of compensation showed no significant relationship with either valence or arousal (p > .05).

Emotion-Focused Reappraisal Strategies and Negative Emotions

As hypothesized, emotion-focused strategies had no significant effects on the valence or arousal of negative emotions. None of the analysed strategies (humour, positive thinking, or compensation) demonstrated predictive power in reducing the intensity of negative emotions (p > .05). These findings confirm the limited applicability of emotion-focused strategies in moderating responses to negative stimuli.

SUMMARY

The results highlight distinct effects of reality- and emotion-focused reappraisal strategies on emotional responses to positive and negative stimuli. Reality-focused strategies, particularly justification and acceptance, play a critical role in modulating both valence and arousal across emotional contexts, with differing effects on emotional intensity. Emotion-focused strategies, such as humour and positive thinking, appear more relevant to positive emotional

contexts, influencing valence but not arousal. These nuanced findings underscore the importance of strategy selection in achieving desired emotional outcomes.

DISCUSSION

Our research started from the question to what extent could effective reappraisal strategies not only decrease negative emotions, but also contribute to an overall low intensity for all emotional experiences, including positive emotions. This would lead to a cost in applying reappraisal extensively, the cost being a reduction in the ability to savour our lives. More specifically, we hypothesised that there could be differences in this effect, depending on which kinds of strategies were used, reality focused or emotion focused reappraisal strategies (Blanke et al., 2022).

Reappraisal and negative emotions

The effect identified on negative emotion of reality focused and emotional focused reappraisal strategies was the basis of our hypotheses. Similar to the results of Ruan et al., (2024) and Vlasenko et al., (2024) which show that some reappraisal strategies are not only used more frequently than others, but are also more effective, such as (a) situational modification and savouring (Ruan et al., 2024), and (b) reality challenge and change current circumstances (Vlasenko et al., 2024), we obtained significant results only for acceptance. This suggests that acceptance as a reality focused reappraisal strategy could be the most effective approach in decreasing negative unhealthy and unwanted emotions. A limitation of this result could consist in the fact that acceptance was the second most frequently used reappraisal strategy after solution formulation (85.2 % of participants used acceptance, 92.6% used solution formulation, and other strategies were used between 78.7% - 26.9% for negative emotions), and it is possible that a significantly larger sample could have shown lower levels of effects.

Based on our results, a second line of thought that emerges is the necessity to understand why other reappraisal strategies appear to have limited or no effect on emotional response. Is there a possibility that reappraisal strategies could fulfil multiple roles in the emotional self-regulation process? In our previous research, Wild et al., (2024), we identified reappraisal strategies that functioned to enhance the self-regulation process. Other studies identified the role of activated beliefs and thought processes that could increase the overall use of reappraisal strategies (Deplancke et al., 2022, Ford et al., 2018, Gutentag et al., 2016, 2022, Petrova et al., 2023). It would be useful for future

studies to investigate the possibility of direct and indirect roles of different reappraisal strategies through structural equation modelling (SEM) studies, in the same way that multiple studies investigated the mindfulness-to-meaning theory (Hanley et al., 2021, Cheung et al., 2020, Garland et al., 2017, Pagnini & Langer, 2015) and identified that awareness increases the use of reappraisal.

Reappraisal and valence of positive emotions

The effect of reappraisal strategies identified in the cases of positive emotion seems more complex. Mueller et al., (2024) show that the effectiveness of reappraisal strategies could depend on the characteristics of the context, more specifically they identified a difference between positive and negative events. In the case of positive situations, reappraisal and problem-solving were associated with low intensity emotional responses and the possibility of increased symptoms of depression (Mueller et al., 2024). Similar to their results, we identified justification as a reality focused reappraisal strategy and humour as an emotion focused reappraisal strategy as having significant negative effects on the valence rating of positive emotions, implying that a high use of these reappraisal strategies leads to low intensity in positive emotions, suggesting a high cost in terms of quality of life, through decreasing the subjective intensity of positive emotions. These results could support the possible need for an optimal or moderated extent in the use of these types of reappraisal.

In contrast to justification and humour reappraisal strategies, positive thinking as an emotion focused reappraisal strategy shows a positive relation to positive emotion, an indication of the effect of increasing the valence rating of positive emotion. This result could appear confusing at first sight, but positive thinking as a reappraisal strategy is perhaps the only one which focuses on the alteration of the valence rating of an emotion, as defined in the scientific literature (McRae et al., 2012, Vlasenko et al., 2024). The question that emerges from these results is to what extent the heterogeneous results in the scientific literature regarding the efficacy of reappraisal strategies are due to the fact that different reappraisal strategies modulate the emotional response differently, with some producing an emotional flattening while others do not. Only future studies can provide answers to this.

Reappraisal and arousal of positive emotions

As is the case with humour and positive thinking, which showed opposite effects on emotional valence, acceptance and justification as reality focused reappraisal strategies show opposite effects on the arousal ratings of positive emotion. Our results concur with those of Hofmann et al., (2009) which show that acceptance didn't affect the subjective rating of anxiety, suggesting that acceptance is effective in reducing the physiological effect of positive emotions.

Even if at first glance a calmer state could be seen as a positive state, low intensity arousal could come at a cost, that of a decrease in activated positive emotions such as enthusiasm, alertness, happiness, pride, or excitement. (Newman & Nezlek, 2022). There is an apparent contradiction between our results and those of Mueller et al., (2024), who, measuring positive emotion using a discrete way of operationalising positive emotions (happiness, pride, interest), showed an acceptance effect on improving positive emotion. The fact that the author used discrete emotions, which also included deactivated positive emotions such as interested, could partially explain the differences in the results obtained. Similar to justification in relation to valence rating, acceptance presented a flattening effect on the arousal of positive emotions, suggesting two possibilities (a) acceptance could be seen, as shown in multiple studies (Boemo et al., 2022), as another emotional regulation method different from reappraisal strategies, and (b) we can speak about reappraisal strategies with different effects on the valence and arousal rating of positive emotion, and therefore with costs on our experience of savouring our lives.

Practical Implications

The findings of this study offer valuable insights into the practical applications of emotion regulation strategies in real-world contexts, particularly in enhancing well-being and emotional balance. Firstly, the significant role of reality-focused strategies such as justification and acceptance highlight their utility in specific scenarios. For instance, justification, while effective in amplifying emotional arousal, may not be ideal in situations requiring heightened positivity or savouring of experiences, such as celebrations or moments of personal achievement. This suggests that individuals aiming to maximize the positive impact of joyful experiences may need to moderate their use of justification. Conversely, acceptance proves highly effective in mitigating emotional intensity—both for negative emotions by reducing arousal, and for positive emotions by tempering overly activated responses. This makes acceptance a practical strategy for contexts requiring emotional composure, such as conflict resolution or professional environments demanding neutrality and control (Hofmann et al., 2009; Gross, 2015).

Secondly, the contrasting effects of humour and positive thinking as emotion-focused strategies for positive emotions suggest tailored applications. Positive thinking emerges as a powerful tool for enhancing the perceived positivity of experiences, making it particularly valuable in interventions aimed at building resilience or fostering optimism in personal and professional growth programs (McRae et al., 2012). Humour, while often associated with relief in negative contexts, demonstrates a diminishing effect on the valence of positive emotions, indicating that its application should be context-sensitive to

avoid unintended emotional flattening. These findings could benefit from the integration of humour styles, as described by Martin and Ford (2018), as integrating into broader emotional regulation frameworks may provide practical pathways for emotional regulation.

To enhance emotional regulation, interventions should encourage adaptive humour styles like affiliative and self-enhancing humour to build resilience and strengthen relationships. Strategies can include humour-based workshops and cognitive-behavioural techniques to identify and reduce reliance on maladaptive styles, such as aggressive or self-defeating humour. Combining humour training with emotional intelligence programs can improve self-awareness and prevent inappropriate humour use. Tailoring interventions to cultural and age-specific needs ensures effectiveness across diverse groups (Jiang et al., 2020, Kalokerinos et al., 2014, Martin & Ford, 2018, Schneider et al., 2018, Tamir, 2016).

Finally, the limited efficacy of emotion-focused strategies in modulating negative emotions underscores the importance of strategic prioritization. Individuals managing high-stress or negative emotion-laden environments may benefit more from reality-focused approaches, such as acceptance, which directly address the intensity of such emotions (Boemo et al., 2022, Vlasenko et al., 2024). Together, these insights can guide clinicians, educators, and organizational leaders in crafting nuanced, evidence-based interventions that improve emotional regulation while safeguarding emotional richness and quality of life.

Limitations of our study

The design of our study has some limitations in terms of generalising our results, and there is a need for future studies to retest our findings. The first limitation consists in our sample size, which limited us in performing structural equation modelling (SEM) analysis in order to identify the answer to our question regarding those reappraisal strategies with different roles in the emotional regulation process. The second limitation consisted in the emotion eliciting stimuli that we used in order to test the spontaneous use of reappraisal strategies (Neta et al., 2022, Vlasenko et al., 2024). The results could show significant differences from results obtained by measuring the emotional response or use of reappraisal strategies in ecological settings through experience sampling methods or other momentary assessment studies (Newman & Nezlek, 2022). A third limitation could emerge from the fact that the participants were asked to recognise the type of reappraisal strategies that they used. This could have led to a prospective effect of previous activation of reappraisal strategies, as shown by Boemo et al., (2022), increasing the manifestation of reappraisal strategies compared to the real life spontaneous use of reappraisal strategies.

To sum up, our first hypothesis, that the frequency of employing emotion regulation strategies like reality-focused reappraisal can predict the extent of emotional flattening, was partially confirmed. Justification contributed to a flattening of the valence rating of positive emotions, while acceptance showed an effect on the arousal of positive emotions. Our second hypothesis, in which we expected that the frequency of employing emotion regulation strategies such as emotion-focused reappraisal would not predict the extent of emotional flattening, was confirmed for negative emotions, but not for the valence rating of positive emotions. Humour as an emotion focused reappraisal strategy appeared to contribute to the emotional flattening of positive emotions.

Conflict of Interest

The authors declare that they have no conflict of interest.

Data availability statement

The data that support the findings of this study are available from the corresponding author upon request.

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Table 1. *Descriptive statistics for each variable*

Variabile	Mean	SD	Range
Valence poz.	2,83	1,33	-0,875 - 5,00
Valence neg.	-1,63	1,50	-5,00 - 3,50
Arousal poz.	-2,42	1,52	-5,00 - 3,50
Arousal neg.	1,64	1,44	-2,75 - 5,00
Reality focused reappraisal - poz.	2,08	1,63	0 - 40
Reality focused reappraisal - neg.	2,65	1,79	0 - 39
Emotional focused reappraisal - poz.	2,26	1,89	0 - 24
Emotional focused reappraisal - neg.	1,76	1,94	0 - 24

Note. N=108, poz. - positive stimuli / situations, neg. - negative stimuli/ situations, Shapiro-Wilks was used as distribution normality test

Table 2.

Reality Reappraisal and Z scor for Valence pozitive stimuli

			95% CI		
Effect	**Estimate**	**SE**	**Lower**	**Upper**	**p**
Intercept	-0,2128	0,222			0,340
Acceptance	0,0470	0,043	-0,094	0,326	0,277
Solution	-0,0869	0,082	-0,502	0,151	0,289
Justification	-0,2955	0,082	-0,592	-0,171	< .001
Responsability	0,1001	0,063	-0,063	0,568	0,115
Normality	0,0509	0,051	-0.1187	0,361	0,319

Note. R^2 for Zv poz = 0,146; F=3,44 p=0,007

Reality Reappraisal and Z scor for Arousal pozitive stimuli

			95% CI		
Effect	**Estimate**	**SE**	**Lower**	**Upper**	**p**
Intercept	0,6208	0,218			0,005
Acceptance	-0,1268	0,042	-0,517	-0,106	0,003
Solution	0,0761	0,080	-0,167	0,473	0,345
Justification	0,2556	0,080	0,123	0,535	0,002
Responsability	-0,0708	0,061	-0,487	0,131	0,255
Normality	-0,0419	0,049	-0,334	0,135	0,403

Note. R^2 for Za poz = 0,181; F=4,47 p=0,001

Table 3.

Reality Reappraisal and Z scor for Valence negative stimuli

Effect	Estimate	SE	95% CI Lower	95% CI Upper	p
Intercept	0,0348	0,205			0,866
Acceptance	0,0944	0,043	0,027	0,4814	0,029
Solution	0,0087	0,057	-0,260	0,3032	0,879
Justification	-0,0752	0,058	-0,376	0,0798	0,201
Responsability	-0,0084	0,075	-0,307	0,2739	0,911
Normality	-0,0744	0,065	-0,506	0,1363	0,256

Note. R^2 for Zv neg = 0,092; F=2,07 p=0,076

Reality Reappraisal and Z scor for Arousal negative stimuli

Effect	Estimate	SE	95% CI Lower	95% CI Upper	p
Intercept	-0,0694	0,203			0,733
Acceptance	-0,0981	0,042	-0,489	-0,040	0,022
Solution	-0,054	0,057	-0,292	0,265	0,925
Justification	0,0712	0,058	-0,085	0,366	0,220
Responsability	-0,0177	0,074	-0,322	0,253	0,813
Normality	0,1042	0,064	-0,059	0,577	0,109

Note. R^2 for Za neg = 0,112; F=2,56 p=0,031

Table 4.

Emotion Reappraisal and Z scor for Valence pozitive stimuli

Effect	Estimate	SE	95% CI Lower	95% CI Upper	p
Intercept	-0,2596	0,154			0,095
Humor	-0,1499	0,066	-0,483	-0,0346	0,024
Compensation	0,0326	0,051	-0,165	0,3213	0,527
Pozitive thinking	0,1095	0,044	0,060	0,5304	0,015

Note. R^2 for Zv poz = 0,0935; F=3,58 p=0,017

Emotion Reappraisal and Z scor for Arousal pozitive stimuli

Effect	Estimate	SE	95% CI Lower	95% CI Upper	p
Intercept	0,2613	0,157			0,098
Humor	0,1097	0,067	-0,039	0,415	0,103
Compensation	-0,0550	0,052	-0,378	0,116	0,294
Pozitive thinking	-0,0820	0,045	-0,458	0,019	0,070

Note. R^2 for Za poz = 0,0696; F=2,59 p=0,056