

Washington University in St. Louis

Washington University Open Scholarship

Arts & Sciences Electronic Theses and
Dissertations

Arts & Sciences

Summer 2021

Adapting to Context: Emotion Regulation Flexibility Across Adulthood

Tabea Springstein

Follow this and additional works at: https://openscholarship.wustl.edu/art_sci_etds

Recommended Citation

Springstein, Tabea, "Adapting to Context: Emotion Regulation Flexibility Across Adulthood" (2021). *Arts & Sciences Electronic Theses and Dissertations*. 2557.
https://openscholarship.wustl.edu/art_sci_etds/2557

This Thesis is brought to you for free and open access by the Arts & Sciences at Washington University Open Scholarship. It has been accepted for inclusion in Arts & Sciences Electronic Theses and Dissertations by an authorized administrator of Washington University Open Scholarship. For more information, please contact digital@wumail.wustl.edu.

Division of Psychological & Brain Sciences
Social & Personality Psychology

Adapting to Context:

Emotion Regulation Flexibility Across Adulthood

by

Tabea Springstein

A thesis presented to
The Graduate School
of Washington University in
partial fulfillment of the
requirements for the degree
of Master of Arts

August 2021
St. Louis, Missouri

© 2021, Tabea Springstein

Table of Contents

List of Tables	iv
Acknowledgments.....	v
Abstract.....	vi
1. Introduction	1
1.1 Emotion Regulation Flexibility.....	3
1.2 Emotion Regulation Flexibility as Context-Specific Variability	4
1.2.1 Defining Context.....	5
1.2.2 Context-based variability	6
1.3 Predictors of Emotion Regulation Flexibility	7
1.2.2 Age.....	8
1.2.3 Well-being.....	9
1.3 Present Research	11
2. Methods	12
2.1 Participants	12
2.2 Procedure.....	13
2.3 Measures.....	13
3. Results	15
3.1 Data Analytic Plan	15
3.2 Model Comparison.....	17
3.3 Age and Depression predicting ER Flexibility	20
4. Discussion.....	31
4.1 Age and ER Flexibility.....	32
4.3 Depression and ER Flexibility	35
4.4. Future Directions and Limitations.....	37
4.5 Conclusion.....	41
References.....	42
Appendix.....	52

List of Tables

Table 1:	Emotion Regulation Strategies Predicted by Context	18
Table 2:	Descriptives for Context Variables and their Associations with Age and Depression	22
Table 3:	Age and Depression predicting Residual Variance in ER Strategy Use when accounting for Location.....	25
Table 4:	Age and Depression predicting Residual Variance in ER Strategy Use when accounting for Activity.....	36
Table 5:	Age and Depression predicting Residual Variance in ER Strategy Use when accounting for Social Context	27
Table 6:	Age and Depression predicting Residual Variance in ER Strategy Use when accounting for Appraisals.....	29
Table 7:	Summary of Findings	30

Acknowledgments

First and foremost I want to thank my advisor Tammy English for her invaluable mentorship and guidance over the past two years, and for her unwavering support of my need to jump into new and complicated projects head first. I would also like to thank my committee members Joshua Jackson, Patrick Hill, and Renee Thompson for their feedback on this project and everything I have been able to learn from them. I would like to thank Aj Wright for her practical and emotional support during data analysis. Thank you to all my friends and family who have supported me along the way. Thank you to Stephen Antonoplis for his unconditional support, thoughtful feedback and all the homemade pizza. Thank you to my grandparents Linda and Eche for their continuing excitement about my adventures, and for making sure I can treat myself to a German beer every now and then.

Tabea Springstein

Washington University in St. Louis

August 2021

ABSTRACT

Adapting to Context: Emotion Regulation Flexibility Across Adulthood

by

Tabea Springstein

Master of Arts in Psychological and Brain Sciences

Social and Personality Psychology

Washington University in St. Louis, 2021

Tammy English, Chair

Individuals regulate their emotions across diverse situations in daily life. Theory suggests that the use and function of emotion regulation (ER) strategies are context-dependent and that flexibly adjusting ER based on environmental demands is beneficial for well-being. Individuals are thought to increase in their emotion regulation flexibility as they age. However, previous work has either only assessed variability in ER without considering context (which could capture random variability not tied to situational demands) or has not assessed person-based consistency of ER within contexts as a measure of flexible adaption. Adults ($N = 223$) aged 25 to 85 years were randomly prompted 6x/day for 10 days to report on their momentary use of 14 different ER strategies and several aspects of their situation (location, activity, social context, appraisals). We assessed context-based ER flexibility through the level of residual variability in 14 ER strategies after accounting for contextual variables using mixed-effects location scale modeling. We found that context-based emotion regulation flexibility was related to higher age for several strategies and was consistently related to lower depressive symptoms. This work extends prior findings on

ER flexibility across the lifespan by examining variability in a wide range of strategies while accounting for person-based adaption to contextual features, laying the foundation for future work on emotion regulation in daily life that explicitly considers contextual variation for improving well-being across the adult lifespan. submissions.

1. Introduction

The usefulness of emotion regulation strategies is expected to vary depending on the individual and the immediate context (Greenaway et al., 2018). Accordingly, when selecting emotion regulation strategies in daily life, individuals should take their immediate context into account and consistently select strategies in accordance with contextual demands. This perspective reflects the idea of *emotion regulation flexibility*, which involves adjusting one's strategy use to meet changing demands in the environment. Emotion regulation flexibility has been proposed to increase across the adult lifespan (Blanchard-Fields, 2007) and represent an essential skill for promoting well-being (Aldao et al., 2015; Gross, 2015). Assessing context-based emotion regulation flexibility (i.e., variability in emotion regulation once context is taken into account) can therefore provide meaningful insight into well-being across the lifespan.

As individuals age, their affective well-being has been shown to improve (Carstensen et al., 2011). This age-related improvement is often attributed to increases in emotion regulation abilities (e.g., Urry & Gross, 2010), but research so far has not shown that older adults use emotion regulation strategies to a different extent than younger adults (Allen & Windsor, 2019). Rather than using strategies to a different degree, older adults may deploy strategies more flexibly, adjusting their approach based on contextual features. Older adults typically have more experience regulating their emotions throughout their life and they can draw on this experience to tailor their emotion regulation strategy use to contextual affordances (Blanchard-Fields, 2007). Besides, context is expected to be more closely tied to emotional experiences as individuals get older (Charles & Luong, 2013), suggesting that incorporation of context into how emotions are

regulated could potentially be more common and more adaptive in regulating emotions as individuals age.

Thus far, attempts to assess emotion regulation flexibility can be broadly categorized into two different approaches. One approach has been to assess variability in strategy use in daily life using a person-level *SD* (e.g., Blanke et al., 2019). This approach assumes that the more variably a strategy is used in daily life, the more flexible the person adapts to contextual demands. The second approach is focused on mean-level differences in strategy use depending on specific contextual features, such as emotional context and the type of interaction partner (e.g., Benson et al., 2019). This approach assumes that if someone uses a specific strategy more when they are in a specific context, this person is regulating more flexibly. Both of these approaches to assessing emotion regulation flexibility provide unique strengths, including a) the assessment of variability over time and b) the consideration of contextual features. Leveraging these strengths jointly, however, could provide a more comprehensive assessment of emotion regulation flexibility

While fluctuation in strategy use can be an indicator of adapting strategies to contextual demands, it is not clear that variability indicates systematic covariation with contextual features. It is also possible, that variability indicates unsuccessful attempts of regulating emotion using a certain strategy or random use of emotion regulation strategies. We, therefore, propose assessing variability in strategy use while accounting for contextual demands.

To assess whether individuals adapt their emotion regulation strategy use to context, we can assess whether individuals use a certain strategy more when they are in a certain context (i.e., mean level use of emotion regulation strategies). When doing so it is important to take into account the possibility that how different individuals adapt their emotion regulation strategy use

to contextual features might vary. For example, someone might use suppression more when they are with a co-worker based on their past experiences that suggest that expressing emotions to their co-worker is associated with negative outcomes for them. Another person might suppress their emotions less when they are with a co-worker based on their experiences expressing their emotions in these contexts. If just assessing whether individuals across an entire sample use more suppression in a certain context (e.g., with their co-workers), these contradicting patterns might lead to inconclusive or null results. While there might be general patterns of adapting emotion regulation strategy use to the context that are typically adaptive (e.g., expressing your emotions to friends to increase relationship closeness, English et al., 2012), how people adapt their emotion regulation strategy use to context could vary across individuals. To assess context-based emotion regulation flexibility, we therefore propose accounting for person-specific random effects when repeatedly assessing ER strategy use over time within daily life contexts.

To summarize, we propose to leverage the unique strengths of previous attempts to assess emotion regulation flexibility by assessing variability in emotion regulation strategies across time while accounting for individual-based patterns in adapting to contextual demands. Using this approach, we aim to assess a) whether individuals in general adapt their emotion regulation to specific contextual characteristics, and b) whether adapting to contextual demands in a person-specific way is more common among older adults and individuals with higher well-being.

1.1 Emotion Regulation Flexibility

Emotion regulation researchers have called for the consideration of context when examining the use and effectiveness of strategies (Aldao, 2013; Greenaway et al., 2018). Supporting the context-specific use of emotion regulation strategies in daily life, studies have shown that, for example, individuals use expressive suppression more when they are with other people (English

et al., 2017) and in low-hierarchical situations (Catterson et al., 2017), while individuals distract more when they want to perform well on a task (English et al., 2017).

Early research on emotion regulation focused on distinguishing adaptive strategies from maladaptive strategies (e.g. cognitive reappraisal as adaptive, expressive suppression as maladaptive; Gross & John, 2003). However, recent work suggests strategies cannot be neatly categorized as “adaptive” or “maladaptive”. For example, using cognitive reappraisal (e.g., looking at the bright side of a negative situation) might have negative consequences when the regulator could have changed the situation itself and not just their thoughts and feelings about it (Troy et al., 2013). Whether expressive suppression is related to negative outcomes also depends on context. Although suppression is generally associated with worse social functioning (English et al., 2012), it can be beneficial to hide emotions from others in competitive settings (Kalokerinos et al., 2014) and less detrimental to suppress emotions in low-hierarchy situations (Catterson et al., 2017).

1.2 Emotion Regulation Flexibility as Context-Specific Variability

In order to assess flexible use of multiple emotion regulation strategies, researchers have focused on emotion regulation variability in trait self-reports (Lougheed & Hollenstein, 2012) and in daily life using experience sampling methods (Blanke et al., 2019; L. Eldesouky & English, 2018). These studies have considered a) individuals’ repertoire of strategies, b) variability of use between strategies, and c) variability of use within-strategies. Importantly, studies on emotion regulation flexibility in trait reports and daily life assume that individuals vary in their emotion regulation strategy use based on variation in contextual demands, yet this has not been explicitly assessed. We propose that assessing variability in emotion regulation strategy use while directly

accounting for contextual variation can add a crucial piece to the conceptualization of flexible and adaptive emotion regulation.

1.2.1 Defining Context

Theoretical models suggest contextual features interact with emotion regulation on different levels broadly categorized into situational and person-specific contexts (Greenaway et al., 2018). Whereas situational context can be thought of as momentarily changing, person-specific context is defined as stable demographic or personality-based differences. Based on the assumption that person-specific contexts are less likely to differ within individuals, we focus on how emotion regulation strategy use is dependent on situation-specific variables in our assessment of flexibility.

The study of daily situations is still in its infancy, yet according to recent taxonomies, situations can be broadly assessed through more objective features and physical characteristics (Rauthmann et al., 2014). Objective features of the situation are, for example, where individuals are located, what activity they are engaged in, and whether other people are present. Beyond these objective characteristics, situations vary in how individuals perceive or appraise them. A type of situational appraisal that has often been studied with regard to emotion regulation strategy use is the controllability of situations (e.g. Haines et al., 2016), due to its prominent role in appraisal theories of emotions (Siemer et al., 2007) and past research on how to effectively cope with stressful events based on controllability (e.g., Valentiner et al., 1994). Research has shown that using reappraisal in more uncontrollable situations is associated with higher well-being (Haines et al., 2016; Troy et al., 2013), in line with the idea that it is more beneficial to change how you think about a situation if you cannot actually change the situation itself.

1.2.2 Context-based variability

To date, it has been largely unstudied how context might call for shifts in regulatory efforts when assessing emotion regulation flexibility (English & Eldesouky, 2020). While previous work has shown that people who vary in their strategy use over time show higher emotional well-being (Blanke et al., 2019), it is unclear whether and how these fluctuations in strategy use correspond to immediate contexts. If individuals are adapting their emotion regulation strategy use to contextual features then this would be evidenced by a) mean level differences in strategy use depending on whether people are in a certain context or not and b) less variability (or higher consistency) of using a strategy when accounting for being in a certain context vs. not. Previous work has focused on mean-level differences in strategy use (e.g., whether more reappraisal is used when contexts are less controllable (Haines et al., 2016). However, directional changes in emotion regulation strategies (i.e., using more reappraisal when at home) assume that the way in which individuals adapt their emotion regulation strategy use to context does not vary across people. This is, this approach does not take into account potential individual differences in how people tailor their strategy use to contexts. Assessing differences in residual variability when accounting for group- and person-level (random) effects of situational context (i.e., how much variance in strategy use is not explained by these variables) could therefore be useful when examining emotion regulation flexibility. From this perspective, flexibility would be captured by lower residual variability when emotion regulation strategy use is predicted by contextual factors. If there are individual differences in the way in which strategy use is adapted to contexts (i.e., person-level random effects for how people adapt to context), this approach does a better job of capturing flexibility than mean level effects of context on specific strategies (which, for example, assume that everyone will use reappraisal more when at home than when not at home).

Recent advances in statistical modeling, mixed effects location scale models (MELSM), enable researchers to model differences in variability of outcome variables based on certain predictors (Hedeker et al., 2012; Williams et al., n.d.). Using MELSM can help us advance the study of emotion regulation flexibility in daily life by explicitly assessing variability in strategy use once contextual factors are accounted for and by assessing whether this residual variability is associated with certain characteristics (e.g., well-being, age). This approach has been successfully used to study the variability of state personality within versus across situations and its association with traits (Geukes et al., 2017).

With regard to using binomial outcomes of strategy use, lower variability in strategies indicates that people either use or do not use a strategy more when they are in a certain situation. Including well-being or age as a predictor of this residual variability allows a test of whether this association between using a strategy more or less due to a situation is strengthened or weakened for older people or people with higher well-being.

1.3 Predictors of Emotion Regulation Flexibility

Based on theory, both age (Blanchard-Fields, 2007) and well-being (Aldao et al., 2015) should be associated with adapting emotion regulation strategy use to context. However, research on emotion regulation and predictors of adaption to context has so far either isolated specific context–strategy pairs as predictive of well-being (e.g., people with higher well-being use reappraisal more in uncontrollable situations (Haines et al., 2016), or has assessed the relationship between variability and age without considering contextual factors (Eldesouky & English, 2018).

1.2.2 Age

Across the lifespan, individuals are theorized to improve in their emotion regulation abilities through selecting and optimizing particular emotion regulation processes (e.g., choosing situation selection over cognitive reappraisal; Urry & Gross, 2010). A recent review of the empirical literature did not find support for age differences in mean-level strategy use (Allen & Windsor, 2019), suggesting that overall older adults do not reliably differ from younger adults in the kinds of strategies they employ in daily life. However, as individuals progress through life, they are able to experience a variety of different situations and learn how to effectively regulate their emotions across different contexts. This wisdom that is accrued across the lifespan can then be used to flexibly adjust their emotion regulation strategy use to context (Blanchard-Fields, 2007).

Notably, it is important to take into account potential age differences in situational contexts when testing this idea about flexibility. In a study assessing variability in strategy use, older adults did not show more categorical variability (i.e., using more distinct strategies within a day) and showed even less temporal variability (i.e., variability in strategy use across days) than younger adults (Eldesouky & English, 2018). If older adults experience less contextual variability than young adults, yet they use the same amount of strategies within that day and vary less within their use of specific strategies, then taking context into account may show that older adults are actually more flexible in their emotion regulation use. This example illustrates why comparing variability in strategies without taking situational covariation into account might not give an accurate depiction of emotion regulation flexibility, especially when considering flexibility across the lifespan. When accounting for context with regard to age, stress that people perceive in their daily situations might be differentially impacting how and when people regulate their

emotions and could potentially account for differences in emotion regulation flexibility by age. For example, differences in global perceived stress eliminate the association between age and negative affect in daily life (Scott et al., 2013). In addition, emotion variability differences do not persist when taking the stressfulness of life contexts into account (Brose et al., 2013). It is possible that older adults use strategies more consistently in certain environments because these situations are experienced as less stressful than the environments of younger adults, thus requiring less within-context changes to how emotions are regulated. Therefore, momentary stress experienced should be considered when assessing potential age effects on emotion regulation flexibility.

1.2.3 Well-being

Emotion regulation flexibility is expected to be associated with higher well-being (Aldao et al., 2015) and there is initial support for this idea in the emerging literature (e.g., Westphal et al., 2010). Research from laboratory experiments has shown that the ability to adapt emotion expression to contextual demands (i.e., instructions to express or suppress their emotions in a laboratory paradigm) is associated with higher self and other reported adjustment, particularly when individuals who performed well during the lab task were under high levels of cumulative life stress (Westphal et al., 2010). Additionally, the ability to express or suppress emotions when prompted to do so has been found to be negatively associated with psychopathology and positively associated with life satisfaction (Chen et al., 2018). When measuring strategy use in daily life, Blanke et al. (2019) showed that while there was inconsistent evidence that variability within strategies across time was associated with negative affect, how much people varied between strategies within the same occasion was associated with reduced negative affect across

different samples. It is possible that inconsistent results when observing variability within strategies are related to unobserved contextual variation.

With regard to observing contextual variables, studies in daily life show, for example, that using reappraisal in uncontrollable (versus controllable) situations is associated with higher well-being (Haines et al., 2016). Additionally, minimizing less controllable situations has been associated with more successful emotion regulation (Wenzel et al., 2020). On a daily level, reappraisal and suppression were more strongly associated with well-being if people experienced more negative events during the day, suggesting that emotion regulation strategies were more or less useful depending on the adversity of daily events (Newman & Nezlek, 2021). Overall, the strategies and types of contexts that have been observed in studies that assess the well-being correlates of flexible emotion regulation have so far been limited to a couple specific strategies (reappraisal or suppression) and limited aspects of context (controllability or adversity). Importantly, appraisals of the situation (like controllability and adversity) are themselves linked to the emotion experience of the situation and subject to regulation (e.g., through reappraising the adversity of the situation), potentially blurring the line between emotion regulation strategy selection and emotion regulation success when assessing these constructs and their relationship to well-being in daily life. This emphasizes the need to also include objective features of the environment that are less subjective to being the product instead of the antecedent of regulation attempts.

Previous studies have been dedicated to obviating general associations between other strategies and contexts (e.g., stressor intensity and use of distraction; Sheppes et al., 2011); social context and use of suppression (English et al., 2017)). However, no study has looked at both a variety of objective and subjective contexts and strategies at the same time when examining whether well-

being is related to emotion regulation flexibility. Doing so can help us comprehensively test the theory that adapting strategy use to context is associated with well-being.

1.3 Present Research

In the current study, we aim to address two main research goals. The first goal is to assess whether emotion regulation is accounted for by objective (location, activity, social context) and subjective (appraisals) situational features. The second goal is to assess whether individuals who show more context-based emotion regulation flexibility report are older and report higher well-being.

This project encompasses several novel contributions to the literature. While most prior work has focused on only a few isolated strategies in daily life, we assess fourteen strategies in order to more comprehensively capture emotion regulation efforts. Further, while the importance of context has been emphasized in recent literature, emotion regulation has yet to be tracked with regard to both physical and psychological characteristics of situations. Finally, we extend past research in this area investigating mean-level fixed effects (aiming at discovering the same pattern of adapting strategies to context across the sample) by modeling how individuals change in their use of specific strategies when in a certain situation (random effects). This enables us to see whether being in a certain situation is associated with either using a strategy more *or* less. Finally, we will assess context-based emotion regulation by examining person-level residual variability once fixed and random context effects are accounted for.

We propose that assessing context-based emotion regulation flexibility in a way that is agnostic to how exactly individuals adapt to daily situations is important as we assume that flexible emotion regulation involves adapting to context based on idiosyncratic experiences. For

example, Person A might have a romantic partner who is very responsive to them sharing negative emotions and other family members who are as responsive to social sharing. In consequence, Person A is more likely to use social sharing around their partner and less likely to use social sharing around their family. Person B might have a romantic partner who is not very responsive to social sharing, but other family members who are more responsive. Person B is more likely to use social sharing around family and less likely to use social sharing around their partner. These individuals show opposite patterns in terms of which strategies are adapted in which direction, yet both individuals exhibit what is defined here as context-based emotion regulation flexibility.

2. Methods

2.1 Participants

Thus far, $N=223$ individuals aged 25-84 years ($M = 52.81$, $SD = 15.93$) who were recruited in St. Louis for a larger study on cognitive and social aspects of emotion regulation have participated in the study (the aimed sample size of the study is $N= 300$). The study was approved by the Institutional Review Board at Washington University in St. Louis. The sample size was determined based on considerations for that larger study. The sample was collected so that gender, ethnicity, and SES were stratified across the six 10-year age intervals (e.g., 25-34). People were ineligible to participate if they did not read or speak English in their homes or they had cognitive impairment as indicated by a score of 2 or above in the telephone version of the Ascertain Dementia 8-item Questionnaire (AD8; Galvin et al., 2005). Participants were 62% Women and were representative of the racial diversity of the local area (70%

European/European-American; 26% African American, 2% Hispanic/Latin- American, 2% Asian-American).

2.2 Procedure

Participants completed a three-part study, which included two in-lab sessions that bookended a 10-day experience sampling period¹. Participants reported their age and well-being during the first lab session. Using an experience sampling approach, participants were randomly surveyed six times a day during a 12-hour window of their choice for 10 days. If they did not respond immediately, participants were reminded to respond to the survey after five minutes. Once they were prompted, participants had a 15-minute window to respond to the survey in which they first responded to a question about their emotion regulation and then provided information on their current context. Financial compensation was provided at the end of each session (\$15/hour), with experience sampling compensation (\$30) provided at the end of Session 2.

2.3 Measures

Depression. To assess well-being, individuals reported on their depressive symptoms during the past week using the Center for Epidemiological Studies - Depression scale (10 item version; Andresen et al., 1994). Sum scores were calculated and higher values indicated more depressive symptoms (i.e., lower well-being).

Emotion Regulation. At each experience sampling prompt, participants were asked “Did you use any of the following strategies to influence your emotions at the time of the prompt?” and indicated their current use of 14 strategies (*Yes/No*). The strategies presented were sampled from

¹ Under alternate operations due to COVID-19, participants completed an online survey with questionnaires before the experience sample portion then came into the lab for just one session.

across the emotion regulation process model (i.e., situation, attention, appraisal, response; Gross, 2015). In addition, strategies were explicitly chosen to include strategies focused on positive emotion (e.g., savoring) and negative emotions (e.g., rumination), as well as relational strategies (e.g., social sharing) and less relational strategies (e.g., positive reappraisal).

Overall, the strategies included were: selection-approach (i.e., "I sought out pleasant activities"), situation selection-avoidance (i.e., "I left or avoided an unpleasant situation"), positive reappraisal (i.e., "I thought about an unpleasant situation in a more positive way"), reminiscing (i.e., "I looked back on happy times in the past"), minimizing (i.e., "I minimized the importance of an unpleasant event"), distraction (i.e., "I distracted myself by thinking about something else"), situation acceptance (i.e., "I accepted the situation"), savoring (i.e., "I savored the moment"), rumination (i.e., "I dwelled on my feelings and problems"), social sharing (i.e., "I shared my negative feelings with others"), co-reappraisal (i.e., "I talked to someone else to get a new perspective"), capitalization (i.e., "I talked with another person about positive events"), suppression (i.e., "I kept my emotions to myself"), masking (i.e., "I tried to act differently than how I was feeling").

Immediate Context. People indicated current *physical location* ("Where were you at the time of the prompt? (select one)"). Response options were "home", "someone else's home", "work/school", "medical office", "other business setting", "outdoors", "in transit (e.g., car, bus)", or "other". They also indicated the *main activity* they were engaged in ("What was the main activity you were engaged in at the time of the prompt? (select one)"). Response options were "work/school", "engaged in media, tv, internet", "conversation/socializing", "eating or drinking", "physical activity", "hobby (not physical activity)", "errands/chores", "commuting/transportation", or "other".

To assess *social context*, participants indicated whether they were currently interacting with someone (“When was the last time you interacted with someone?” with one of the response options being “At the time of the prompt”). With regard to their most recent social interactions, participants were asked, “What is your relationship with the person/people you interacting with? (check all that apply)”. Participants were instructed during the ESM tutorial to only choose one relationship type per person but to choose several relationship types if multiple people were present and they were best described by different categories. The response options were “romantic partner”, “family member”, “friend”, “someone at work (e.g., supervisor, co-worker)”, “acquaintance (e.g., neighbor)”, or “stranger”.

Lastly, individuals were asked about their *appraisal of the situation* by indicating “How familiar is the situation you were in at the time of the prompt?” on a scale from *Not at all* (1) to *Extremely* (5), and “How much control did you have in the situation you were in at the time of the prompt?” on a scale from *Not at all* (1) to *A great deal* (5).

Covariate: Stress. Participants were asked to rate the item, “At the time of the prompt I felt stressed.” on a scale from *Not at all* (1) to *Very much* (7).

3. Results

3.1 Data Analytic Plan

All analyses were done in R version 4.0.3 (R Core Team, 2020). The models were fitted with the package *brms* (Bürkner, 2017, 2018), which serves as a front-end to the probabilistic programming language *Stan* (Stan Development Team, 2016). The fitted model included four chains of 3,000 iterations each, excluding a warm-up period of the same size. This number of

iterations provided parameter estimates for which the models converged with potential scale reduction factors R smaller than 1.1 (Gelman, 2006). Posterior distributions were summarized with the mean, standard deviation, a 95% equal-tailed credible interval (CrI) and probability of direction, which can be interpreted similarly to p -values in frequentist statistics, with a 97.5% probability of direction reflecting a p value of .05 in two-sided tests. As the posterior distribution does not change when additional comparisons are made there was no need for corrections for multiple comparisons across models (Kruschke, 2010).

Our models were run as linear probability models, using an underlying gaussian data generating process to ensure that the parameter sigma can be estimated. Generally, binomial models are preferred for dichotomous outcomes because they do not estimate predicted values outside of 0 and 1 and they tend to be more accurate for predicted values approaching 0 and 1. However, we accepted this pay-off in order to be able to estimate our construct of interest given that we were not focused on interpreting the specific effects of context on using emotion regulation strategies. The four types of contextual variables (location, activity, social context, appraisals) were tested individually as level-1 predictors for the 14 emotion regulation strategies, nested within person. Random slopes were included for all models. For each model, residual variability (sigma) was predicted by age and depression. Due to convergence issues, no random intercept was fit for sigma. To increase interpretability, continuous time-varying predictors at level 1 were person-centered and both between- and within-person predictors were entered into the model. Probabilities of direction were obtained for all model parameters. Across models,, we used weakly informative priors to ensure model convergence. Below we illustrate our approach for one dependent variable (positive reappraisal) and one type of contextual variable (appraisals):

$$\overline{\text{Positive Reappraisal} \sim \text{Normal}(\mu_{ij}, \sigma_{ij})}$$

$$\left| \begin{aligned} \mu_{ij} = & \gamma_{00} + \gamma_{01}\text{Familiar}_{pm,i} + \gamma_{02}\text{Familiar}_{pmc,i,j} + \gamma_{03}\text{Control}_{pm,i} + \gamma_{04}\text{Control}_{pmc,i,j} \\ & + U_{0i} + U_{1i}\text{Familiar}_{pmc,i,j} + U_{2i}\text{Control}_{pmc,i,j} + \epsilon_{ij} \end{aligned} \right.$$

$$\overline{\log(\sigma) = \eta_0 + \eta_1\text{Age}_i + \eta_2\text{Depression}_i}$$

$$\overline{\gamma_{00} \sim \text{Normal}(0,1)}$$

$$\overline{\gamma_{01}, \dots, \gamma_{04} \sim \text{Normal}(0,1)}$$

$$\overline{U_{0i}, \dots, U_{2i} \sim \text{Exponential}(1)}$$

$$\overline{\eta_0 \sim \text{Normal}(0,1)}$$

$$\overline{\eta_1, \eta_2 \sim \text{Normal}(0,1)}$$

3.2 Model Comparison

To assess whether context significantly contributes to variation in emotion regulation strategies, models without contextual predictors at Level-1 were compared to models with Level-1 predictors. Table 1 shows differences in elpd_{LOO} and standard errors. Models which differed from the null-model by two times the standard error were deemed a better fit. For appraisals, contextual variables contributed to predicting emotion regulation strategies across all of the strategies. For location, activity, and social context, contextual variables contributed to predicting at least half of the emotion regulation strategies. Which emotion regulation strategies the contextual variables contributed to varied by context type (e.g., positive reappraisal and minimizing were predicted by activity and appraisals, distraction was predicted by location, social context and appraisals but not by activity). Only models for which adding contextual variables improved fit were further inspected for age- and depression-related differences in variability.

Table 1

Emotion Regulation Strategies Predicted by Context

		Location	Activity	Social Context	Appraisals
Behavioral Activation	<i>elpd_{LOO} Diff.</i>	170.1	225.4	39.9	76.3
	<i>SE</i>	23.4	26.4	12.3	14.1
Situation Selection (Avoid)	<i>elpd_{LOO} Diff.</i>	36.8	20.7	3.7	125.4
	<i>SE</i>	18.4	18.2	9.1	30.5
Reminiscing	<i>elpd_{LOO} Diff.</i>	37.4	66.8	21.2	42.6
	<i>SE</i>	15.2	18.7	12.3	13.7
Acceptance	<i>elpd_{LOO} Diff.</i>	47.4	21.7	6.4	110.3
	<i>SE</i>	14.1	12.1	8.8	21.6
Savoring	<i>elpd_{LOO} Diff.</i>	149.4	184.9	89.7	161.5
	<i>SE</i>	22.9	24.7	17.7	21.2
Rumination	<i>elpd_{LOO} Diff.</i>	44.6	8.4	2.9	139.1
	<i>SE</i>	17.0	14.9	9.4	30.2
Capitalization	<i>elpd_{LOO} Diff.</i>	92.9	313.0	428.5	36.4
	<i>SE</i>	21.0	36.1	41.1	12.1
Sharing Negative	<i>elpd_{LOO} Diff.</i>	18.5	128.6	167.2	52.6
	<i>SE</i>	12.0	27.6	30.9	17.1
Distraction	<i>elpd_{LOO} Diff.</i>	42.0	24.9	30.1	65.4
	<i>SE</i>	14.7	12.6	11.6	16.7
Pos. Reappraisal	<i>elpd_{LOO} Diff.</i>	23.1	49.5	4.7	82.9
	<i>SE</i>	11.5	15.7	9.3	18.6
Minimizing	<i>elpd_{LOO} Diff.</i>	5.1	11.5	7.8	60.3
	<i>SE</i>	7.2	4.6	9.2	16.7
Co-Reappraisal	<i>elpd_{LOO} Diff.</i>	83.8	236.1	253.9	72.6
	<i>SE</i>	24.2	37.0	40.8	20.6
Suppression	<i>elpd_{LOO} Diff.</i>	61.1	166.4	172.4	71.3
	<i>SE</i>	14.9	23.0	23.4	14.5
Masking	<i>elpd_{LOO} Diff.</i>	72.1	63.0	62.7	181.1
	<i>SE</i>	19.2	18.0	18.4	28.3

Note. Comparing models without Level 1 predictors to models with context predictors included at Level 1. Model improvement is indicated by $\text{elpd}_{\text{LOO}2} \times \text{Standard Error}$ (bolded models)

3.3 Age and Depression predicting ER Flexibility

Before examining age- and depression-related differences in ER flexibility based on models including context, we assessed whether age and depression were related to differences in daily contexts. To this end, we ran generalized linear and linear multilevel models in which contextual variables were predicted by a) age and b) depression separately. Results can be found in Table 2. Higher age was associated with differences in probabilities for being in certain locations (e.g., older adults reported being at home more often), engaging in certain activities (e.g., older adults were more likely to be engaged in media, tv, or internet), or aspects of the social context (e.g., older adults were more likely to be alone). However, depression was only related to the probability of being engaged in physical activity (less likely in those reporting more depressive symptoms). In terms of appraisals, older people tended to perceive their daily contexts as more controllable and more familiar, whereas more depressed people perceived their daily contexts as less controllable and less familiar. Mean depression scores in our sample were below the suggested cut-off score (16) for clinical depression ($M = 6.92$, $SD = 5.21$, $Range = 0 - 27$). Age and Depression were moderately negatively related, with older adults reporting lower depressive symptoms ($r = -.22$, $p < .001$). Standardized age and standardized depression were added as predictors of ER Flexibility simultaneously, with results indicating associations between the predictor and ER flexibility at the mean level of the other predictor.

Location

In line with our predictions, older adults showed more flexibility in their location-based use (i.e., less residual variability after accounting for location predictors) of acceptance, rumination,

distraction, co-reappraisal, and masking. Contrary to our predictions, however, no age effect was found for behavioral activation and younger adults showed more location-based flexibility for

Table 2
 Descriptives for Context Variables and their Associations with Age and Depression

	Mean (SD)	Est.	Age (std.) 95%CrI	Pd	Est.	Depression (std.) 95%CrI	Pd
Location		<i>Probability</i>			<i>Probability</i>		
Home	0.52 (0.24)	0.62	0.59; 0.66	100%	0.50	0.47; 0.53	60.25%
Work/School	0.21 (0.22)	0.27	0.21; 0.34	100%	0.50	0.43; 0.58	51.85%
So. Else's home	0.05 (0.11)	0.39	0.33; 0.45	99.95%	0.50	0.43; 0.57	52.70%
Medical Setting	0.01 (0.02)	0.54	0.46; 0.62	84.60%	0.53	0.46; 0.60	77.55%
Transit	0.08 (0.07)	0.44	0.41; 0.47	100%	0.52	0.49; 0.55	86.40%
Outdoors	0.04 (0.06)	0.52	0.46; 0.58	71.40%	0.46	0.41; 0.53	88.10%
Other Business Setting	0.03 (0.04)	0.51	0.46; 0.56	65.95%	0.54	0.49; 0.58	95.20%
Activity							
Work/ School	0.23 (0.22)	0.23	0.19; 0.29	100%	0.54	0.48; 0.61	91.45%
Media	0.19 (0.18)	0.60	0.55; 0.64	100%	0.50	0.46; 0.55	61.25%
Conversation/Socializing	0.15 (0.13)	0.49	0.46; 0.52	76.40%	0.48	0.46; 0.52	80.15%
Errands	0.11 (0.10)	0.53	0.50; 0.56	94.55%	0.50	0.48; 0.54	70.40%
Eating/ Drinking	0.07 (0.07)	0.56	0.53; .0.59	100%	0.49	0.46; 0.52	66.05%
Commuting	0.05 (0.06)	0.44	0.40; 0.49	99.20%	0.51	0.46; 0.55	62.45%
Hobby	0.04 (0.06)	0.49	0.43; 0.55	65.75%	0.49	0.43; 0.55	66.05%
Physical Activity	0.04 (0.06)	0.54	0.48; 0.59	89.60%	0.44	0.38; 0.50	97.95%
Social Context							
Alone	0.66 (0.20)	0.56	0.52; 0.60	99.95%	0.52	0.48; 0.55	87.45%
With Romantic Partner	0.12 (0.13)	0.44	0.44; 0.38	96..90%	0.49	0.42; 0.55	56.75%
With Family	0.11 (0.13)	0.45	0.39; 0.51	94.35%	0.52	0.42; 0.54	79.80%
With Friend	0.06 (0.08)	0.47	0.43; 0.52	87.00%	0.48	0.43; 0.53	77.55%
With SO. From Work	0.06 (0.09)	0.34	0.28; 0.40	100%	0.50	0.44; 0.57	53.55%
With Stranger	0.03 (0.05)	0.49	0.44; 0.54	66.00%	0.46	0.41; 0.50	96.10%
With Acquaintance	0.02 (0.04)	0.50	0.45; 0.56	57.20%	0.50	0.44; 0.55	53.25%

Appraisals		<i>B</i>			<i>B</i>		
Familiar	4.38 (0.53)	0.14	0.08; 0.20	100%	-.07	-.14; -.02	99.50%
Controllable	4.13 (0.62)	0.17	0.10; 0.24	100%	-.12	-.20; -.04	100%
Covariate							
Stress	1.95 (0.79)	-0.24	-0.34; -0.14	100%	0.29	0.19; 0.38	100%

Note. Age and Depression were standardized, associations were analyzed separately. Significant probabilities (Pd > 97.5%) are bolded.

Values below 50% = less likely, above 50% = more likely

situation selection (avoidance), reminiscing, savoring, capitalization, and suppression. As expected, higher scores in depression were associated with less location-based flexibility for all strategies. Detailed results for residual variability in ER strategy use based on physical location can be found in Table 3.

Activity

In line with our predictions, older adults showed more activity-based flexibility for social sharing, co-reappraisal, and masking. Contrary to our predictions, however, younger adults showed more activity-based flexibility for reminiscing and capitalization, and age was not associated with activity-based flexibility for behavioral activation, savoring, positive reappraisal, minimizing, and suppression. As expected, higher scores in depression were associated with less activity-based flexibility for all strategies. Detailed results for emotion regulation flexibility based on activity can be found in Table 4.

Social Context

In line with our predictions, older adults showed more social-context-based flexibility for social sharing, distraction, co-reappraisal, and masking. Contrary to our predictions, however, younger adults showed more social-context based flexibility for capitalization, and age was not associated with social context-based flexibility for behavioral activation, savoring, and suppression. As expected, higher scores in depression were associated with less social context-based flexibility across all strategies. Detailed results for flexibility in ER strategy use based on social context can be found in Table 5.

Table 3

Age and Depression predicting Residual Variance in ER Strategy Use when accounting for Location

	Age				Depression			
	Est	SE	95%CrI	Pd	Est	SE	95%CrI	Pd
Behavioral Activation	0.00	0.01	-0.02;0.01	54.60%	0.07	0.01	0.05;0.08	100%
Situation Selection (Avoid)	-0.05	0.01	-0.06; -0.03	100%	0.07	0.01	0.05; 0.08	100%
Reminiscing	0.04	0.01	0.03;0.06	100%	0.04	0.01	0.03;0.06	100 %
Acceptance	-0.16	0.01	-0.18;-0.14	100. %	0.03	0.01	0.02;0.05	100 %
Savoring	0.01	0.01	-0.01;0.02	85.77%	0.02	0.01	0.01;0.04	99.88%
Rumination	-0.09	0.01	-0.10;-0.07	100%	0.13	0.01	0.11;0.14	100 %
Capitalization	0.03	0.01	0.01;0.05	99.99%	0.05	0.01	0.03;0.07	100 %
Sharing Negative	/	/	/	/	/	/	/	/
Distraction	-0.06	0.01	-0.08;-0.05	100 %	0.08	0.01	0.07;0.10	100%
Pos. Reappraisal	/	/	/	/	/	/	/	/
Minimizing	/	/	/	/	/	/	/	/
Co-Reappraisal	-0.02	0.01	-0.04;-0.01	99.28%	0.03	0.01	0.02;0.05	100%
Suppression	0.01	0.01	-0.00; 0.03	94.09%	0.05	0.01	0.03; 0.06	100%
Masking	-0.07	0.01	-0.08; -0.05	100%	0.07	0.01	0.06; 0.09	100%

Note. 95%CI = 95% Credibility Interval, Pd = Probability of Direction. Probability of Direction can be transformed to a p-value

$ptwo-sided=2*(1-pd)$, with 97.5% corresponding to a p-value of .05 in a two-tailed test. Models without estimates reported reflect models for which adding context variables was not contributing to model fit.

Table 4

Age and Depression predicting Residual Variance in ER Strategy Use when accounting for Activity

	Age				Depression			
	Est	SE	95%CrI	P _d	Est	SE	95%CrI	P _d
Behavioral Activation	0.00	0.01	-0.01;0.02	63.28%	0.07	0.01	0.05;0.08	100%
Situation Selection (Avoid)	/	/	/	/	/	/	/	/
Reminiscing	0.04	0.01	0.03; 0.06	100%	0.04	0.01	0.03; 0.06	100%
Acceptance	/	/	/	/	/	/	/	/
Savoring	0.01	0.01	-0.01;0.02	80.93%	0.02	0.01	0.01; 0.04	99.52%
Rumination	/	/	/	/	/	/	/	/
Capitalization	0.03	0.01	0.01; 0.04	99.96%	0.05	0.01	0.04;0.07	100%
Sharing Negative	-0.07	0.01	-0.09;-0.06	100%	0.04	0.01	0.03; 0.06	100%
Distraction	/	/	/	/	/	/	/	/
Pos. Reappraisal	-0.01	0.01	-0.02;-0.03	81.78%	0.04	0.01	0.03; 0.06	100%
Minimizing	0.00	0.01	-0.01;0.02	72.75%	0.04	0.01	0.03; 0.06	100%
Co-Reappraisal	-0.02	0.01	-0.04;-0.01	99.85%	0.04	0.01	0.03; 0.06	100%
Suppression	0.01	0.01	-0.01; 0.02	83.22%	0.04	0.01	0.03; 0.06	100%
Masking	-0.07	0.01	-0.08; -0.05	100%	0.07	0.01	0.06; 0.09	100%

Note: 95%CI = 95% Credibility Interval, PD = Probability of Direction. Probability of Direction can be transformed to a p-value

$ptwo-sided=2*(1-pd)$, with 97.5% corresponding to a p-value of .05 in a two-tailed test. Models without estimates reported reflect

models for which adding context variables was not contributing to model fit.

Table 5

Age and Depression predicting Residual Variance in ER Strategy Use when accounting for Social Context

	Age				Depression			
	Est	SE	95%CrI	P _d	Est	SE	95%CrI	P _d
Behavioral Activation	0.00	0.01	-0.02; 0.01	68.73%	0.06	0.01	0.05; 0.08	100%
Situation Selection (Avoid)	/	/	/	/	/	/	/	/
Reminiscing	/	/	/	/	/	/	/	/
Acceptance	/	/	/	/	/	/	/	/
Savoring	0.01	0.01	-0.01; 0.03	88.18%	0.02	0.01	0.00; 0.03	98.77%
Rumination	/	/	/	/	/	/	/	/
Capitalization	0.02	0.01	0.01; 0.04	99.85%	0.05	0.01	0.04; 0.07	100%
Sharing Negative	-0.08	0.01	-0.10; -0.07	100%	0.04	0.01	0.03; 0.06	100%
Distraction	-0.06	0.01	-0.08; -0.04	100%	0.08	0.01	0.07; 0.10	100%
Pos. Reappraisal	/	/	/	/	/	/	/	/
Minimizing	/	/	/	/	/	/	/	/
Co-Reappraisal	-0.04	0.01	-0.05; -0.02	100%	0.04	0.01	0.03; 0.06	100%
Suppression	0.01	0.01	-0.01; 0.02	76.82%	0.04	0.01	0.03; 0.06	100%
Masking	-0.07	0.01	0.06; 0.09	100%	0.07	0.01	0.06; 0.09	100%

Note: 95%CI = 95% Credibility Interval, PD = Probability of Direction. Probability of Direction can be transformed to a p-value

$ptwo-sided = 2 * (1 - pd)$, with 97.5% corresponding to a p-value of .05 in a two-tailed test. Models without estimates reported reflect

models for which adding context variables was not contributing to model fit.

Appraisals

In line with our predictions, older adults showed more appraisal-based flexibility for situation selection, acceptance, rumination, social sharing, distraction, co-reappraisal, and masking.

Contrary to our predictions, younger adults showed more appraisal-based flexibility for reminiscing and capitalization, and age was not associated with appraisal-based flexibility for behavioral activation, savoring, positive reappraisal, minimizing, and suppression. As expected, higher scores in depression were associated with less appraisal-based flexibility across all strategies. Detailed results for flexibility in ER strategy use based on appraisals can be found in Table 6. All results for age are summarized in Table 7.

Robustness checks

Mean levels. Including mean level effects of age and depression into the models in addition to contextual predictors did not change the probability of direction beyond the interpreted cut-offs of any of the effects reported. Results based on models including age and depression to predict mean strategy use can be found in the supplementary materials.

Stress. Including stress into the models in addition to contextual predictors did not change the probability of direction beyond the interpreted cut-offs for any of the findings previously reported. Results based on models including stress can be found in the supplementary materials

Table 6

Age and Depression predicting Residual Variance in ER Strategy Use when accounting for Appraisals

	Age				Depression			
	Est	SE	95%CrI	P _d	Est	SE	95%CrI	P _d
Behavioral Activation	-0.01	0.01	-0.02; 0.01	86.48%	0.06	0.01	0.04; 0.07	100%
Situation Selection (Avoid)	-0.05	0.01	-0.07; -0.04	100%	0.07	0.01	0.05; 0.09	100%
Reminiscing	0.05	0.01	0.03; 0.06	100%	0.04	0.01	0.02; 0.06	100%
Acceptance	-0.16	0.01	-0.18; -0.15	100%	0.03	0.01	0.01; 0.04	100%
Savoring	-0.00	0.01	-0.02; 0.02	52.64%	0.02	0.01	0.00; 0.03	97.67%
Rumination	-0.10	0.01	-0.12; -0.08	100%	0.12	0.01	0.10; 0.13	100%
Capitalization	0.04	0.01	0.02; 0.05	100%	0.05	0.01	0.03; 0.06	100%
Sharing Negative	-0.07	0.01	-0.08; -0.05	100%	0.04	0.01	0.03; 0.06	100%
Distraction	-0.06	0.01	-0.08; -0.05	100%	0.08	0.01	0.07; 0.10	100%
Pos. Reappraisal	-0.01	0.01	-0.02; 0.01	83.11%	0.04	0.01	0.02; 0.05	100%
Minimizing	0.00	0.01	-0.01; 0.02	59.19%	0.04	0.01	0.02; 0.06	100%
Co-Reappraisal	-0.02	0.01	-0.03; -0.00	98.80%	0.04	0.01	0.03; 0.06	100%
Suppression	0.01	0.01	-0.00; 0.03	95.11%	0.04	0.01	0.03; 0.06	100%
Masking	-0.07	0.01	0.06; 0.09	100%	0.07	0.01	0.06; 0.09	100%

Note. 95%CI = 95% Credibility Interval, PD = Probability of Direction. Probability of Direction can be transformed to a p-value $ptwo-sided=2*(1-pd)$, with 97.5% corresponding to a p-value of .05 in a two-tailed test. Models without estimates reported reflect models for which adding context variables was not contributing to model fit.

Table 7
 Summary of Findings

	Age		
	More Flexibility	No difference	Less Flexibility
Location	Acceptance Rumination Distraction Co-Reappraisal Masking	Behavioral Activation Situation Selection Savoring Suppression	Reminiscing Capitalization
Activity	Sharing Negative Co-Reappraisal Masking	Behavioral Activation Savoring Positive Reappraisal Minimizing Suppression	Reminiscing Capitalization
Social	Sharing Negative Distraction Co-Reappraisal Masking	Behavioral Activation Savoring Suppression	Capitalization
Appraisal	Situation Selection Acceptance Rumination Sharing Negative Distraction Co-Reappraisal Masking	Behavioral Activation Savoring Positive Reappraisal Minimizing Suppression	Reminiscing Capitalization

4. Discussion

The aims of the current study were to identify whether contextual features were predictive of emotion regulation strategy use and subsequently identify whether differences in context-based emotion regulation flexibility were associated with higher age and lower depression. Older adults showed higher context-based flexibility in use of some, but not all, emotion regulation strategies. In accordance with our hypothesis, depression consistently predicted less flexible context-based emotion regulation strategy use. These results for age and depression remained unchanged when accounting for mean effects of age or depression (i.e., whether age or depression generally influence the probability of using a certain strategy) and momentary stress.

Overall, our results indicate that both subjective and objective features of the context were tied to strategy use. Contextual factors like location, main activity, and social partners contributed to predicting ER strategy use for most strategies, and appraisals of the context (controllability and familiarity) contributed to predicting all fourteen emotion regulation strategies included in our study. Literature on emotion and emotion regulation has called for accounting for contexts in daily assessments of emotion and emotion regulation (English & Eldesouky, 2020; Greenaway et al., 2018). The current work demonstrates that contextual variables contribute to determining how individuals regulate their emotions in daily life. Appraisals of the familiarity or controllability of the immediate situation were most consistently related to emotion regulation strategy use. This suggests that whether or not individuals generally engage in certain emotion regulation strategies may be most consistently dependent on the appraisals of the situation than

objective contextual features, potentially because appraisals are closely tied to individuals' emotional experiences (Siemer et al., 2007).

For objective features, some more specific strategy-context pairings emerged. For example, whether people were currently alone and who they were interacting with meaningfully contributed to more socially-oriented strategies (e.g., co-reappraisal, social sharing, suppression, masking), but not intra-personal strategies (e.g., reappraisal or minimizing). This pattern of findings is aligned with previous work showing that individuals engage in more suppression when they are with others but engagement in reappraisal and distraction does not vary based on whether individuals are alone or with others (English et al., 2017).

Our results suggest that appraisals are the contextual features that are most predictive of strategy use. While we only assessed two kinds of appraisals it is likely that including appraisals beyond controllability and familiarity could have contributed even more to the prediction of emotion regulation strategy use, a caveat to assessing appraisals is that these are tightly linked to emotional experience (Siemer et al., 2007). When assessing appraisals and emotion regulation in the same moment in daily life, it is possible that the appraisals themselves are a product and not an antecedent of emotion regulation (e.g., reappraising an adverse situation should reduce the appraised adversity). In this case, links between strategy use and appraisals could be indicative of the effectiveness of ER use and not the strategy selection.

4.1 Age and ER Flexibility

We predicted that older individuals should use emotion regulation strategies more flexibly.

Findings were somewhat mixed with regard to age and emotion regulation flexibility, with support for the prediction for seven out of 14 strategies. The most robust age-related increases in

flexibility were found for co-reappraisal and masking, showing a similar pattern across all the contextual features (location, activity, social context, appraisals). Additionally, age predicted more flexible use of situation selection, acceptance, rumination, sharing negative emotions, and distraction in certain context-based models. The effects of age on flexibility did not differ in direction across models with different context types as predictors (i.e., even though there are some strategies for which older adults show more flexibility they were consistently less flexible for these across different types of context). This aligns with the idea that older adults throughout their lifespan have learned when to use these specific strategies and might apply them more systematically within given contexts (Blanchard-Fields, 2007). Previous studies have shown that older adults show less variability in situation selection, distraction, positive reappraisal, and suppression than younger adults (Benson et al., 2019; Eldesouky & English, 2018). The current study suggests that lower variability in these strategies could partly (at least for situation selection and distraction) be explained by more systematic adaption to context in older age than in younger adulthood (i.e., the fluctuation in younger adults could be more random as opposed to a reflection of contextual adaption). Our results show the importance of taking context into account when assessing variability in strategy use in order to interpret whether or not strategies are adapted to contextual demands or fluctuate based on other factors that might not indicate higher flexibility. Future research is needed to confirm the robustness of these strategy specific associations,

Co-reappraisal describes the process of getting a new perspective on something through talking about it with someone else. As individuals rely more on their social contexts to support their emotion regulation as they age, it is possible that older adults are more deliberate in which contexts they use co-reappraisal in than younger adults. Older adults are theorized to be more

selective in how their social contexts (Carstensen et al., 2003) and other features of their environment are set up to benefit their emotional well-being (Charles & Luong, 2013). Choosing to co-reappraise might come at the cost of unsuccessful reappraisal attempts by the co-reappraisal partner which could increase undesired negative emotions. Cognitive reappraisal is thought of as a cognitively demanding strategy (Sheppes & Meiran, 2008). While the specific cognitive costs of engaging in reappraisal with another person are not clear, engaging in co-reappraisal might still require cognitive effort, which might make older adults particularly cautious about when, where, and with whom to engage in co-reappraisal. As conflict avoidance increases with age potentially due to older adults' fear of disrupting relationships (Oberhauser et al., 2017), using masking (i.e., expressing an emotion different from what is felt) in accordance with context could be particularly relevant for older adults. Different contexts could present different potential for conflict, so using masking systematically could help older adults reach their goal of preserving harmony and avoiding conflict. Although one might make a similar prediction about expressive suppression because this strategy often gets deployed to avoid rejection from others, its use is not generally associated with wanting to maintain others' well-being or maintaining relationships with them (Eldesouky & English, 2019).

There were a couple of strategies for which younger adults showed more flexible adaption: reminiscing (in models based on location, activity, and appraisals) and capitalization (in models based on location, activity, social context, and appraisals). It is possible that there are contextual sources for reminiscing and capitalization that are relevant to older adults that have not been accounted for in our study (such as whether a positive stimulus like an old photograph or a specific person is encountered or whether the conversation with someone contains a topic that triggers memories of the past). However, reminiscing has been shown to be beneficial across

samples of older adults (Bohlmeijer et al., 2007), so older adults might engage in reminiscing more spontaneously, less dependent on contextual factors. Importantly, controlling for mean differences in reminiscing across the lifespan did not change the effect on variability, suggesting that this effect is not just due to older adults engaging in more reminiscing in their daily life. In addition, accounting for the appraised familiarity of the context also did not show that older adults adapt their use of reminiscing to the context more flexibly.

As older adults selectively narrow their social networks to increase their positive emotions (English & Carstensen, 2014), younger adults might interact with more people in daily life that do not necessarily contribute to their positive well-being, therefore causing them to adapt their capitalization attempts more closely to different relationship types. For older adults, factors like the topic of conversation might be more relevant to whether or not capitalization is used in order to achieve their goal of increasing and maintaining a positive mood (Riediger et al., 2009).

4.3 Depression and ER Flexibility

Depression was consistently predictive of less flexible adaption to context. These findings align with theoretical conceptualizations of emotion regulation flexibility that propose that individuals with higher flexibility should show higher well-being (Aldao et al., 2015). Our work adds to the existing empirical research on this issue. In addition, our work provides potentially stronger evidence by a) explicitly testing this theory with regard to contextual variation, and b) accounting for random variation in how people adapt to context while also including a large number of strategies. Individuals who report more depressive symptoms may use emotion regulation strategies more randomly in daily life and may be less successful at using strategies, therefore varying more in whether or not they use a strategy in a given context. Research on

emotion regulation strategy use in laboratory settings suggests there are no differences in emotion regulation success based on depression (for a review see Liu & Thompson, 2017), but more research in naturalistic contexts is needed to determine whether more depressed people implement strategies less successfully in daily life.

Depressed individuals are less differentiated in their emotional experiences (Willroth et al., 2019), which can contribute to less successful use of emotion regulation strategies (Kalokerinos et al., 2019). If individuals higher in depression are not experiencing the benefits of successful regulation in a context-specific way, they might not be more or less likely to use certain strategies flexibly. Clinically depressed individuals are also more likely to ruminate (Nolen-Hoeksema et al., 2008), so their emotions could be more likely to be evoked by thoughts about past situations rather than the current context, therefore leading more depressed people to adapt their strategy use to thoughts about past situations more than objective or subjective features of the present situation.

Our results have both theoretical and practical implications. Our work provides between-person evidence for the potential adaptiveness of flexible, context-based emotion regulation with individuals higher in depression showing less flexible adaption to context. Theoretically, our result aligns with the notion that higher well-being is associated with more flexible emotion regulation (Aldao et al., 2015), focusing particularly on context-sensitive strategy selection (Chen & Bonanno, 2021). Practically, our results provide evidence for the role of objective and subjective everyday contexts in emotion regulation and mental health. With an increasing interest in intervening on individuals' emotion regulation in daily life (Addington et al., 2019) our work provides initial evidence that interventions on emotion regulation in daily life could be aimed at facilitating context-sensitive emotion regulation strategy use.

4.4. Future Directions and Limitations

Context in our study was limited to location, activity, social context, and appraisals. While the general amount of contextual features included an extension of previous work, only two kinds of appraisal (familiarity and controllability) were assessed, leaving room for other appraisals of the immediate context that were not assessed (e.g., importance, goal congruence (Kalokerinos et al., 2017) to play a role in how people regulate their emotions. Relatedly, assessing how individuals adapt their emotion regulation to psychological situations (Rauthmann et al., 2014) could provide more information about the adaptations of regulation processes to peoples' daily lives. Future work should also assess the role of emotion regulation motives and how individuals adapt their emotion regulation strategy use to specific motives across the lifespan. Similar to psychological situations, motives present an internal feature of the individual's situation that could vary within more objective situations. Work in college students has shown that individuals use suppression more when they have certain instrumental goals (wanting to avoid conflict, keep up appearances; English et al., 2017), but individual differences might exist within and across age groups for how well people adapt their emotion regulation strategy use to their motives.

In addition, research could assess context in a more person-based way by collecting, for example, information about the specific individuals people are interacting with. Research has shown that people distribute their emotion regulation needs across very specific relationships in their life (Cheung et al., 2015) which could extend to differentiating between specific friends or family members. As our study only assessed family member or friend as broad categories, we might not have been able to pick up on the nuances of how people adapt their ER to their social context. Our location and activity measure relied on broader categorizing as well which might

have obscured contextual nuances (e.g., which person's house the participant is visiting, how many people are around). To overcome this issue of not having enough detail, future research could make use of passively sensed mobile phone data which could provide more nuanced information about the momentary location or how many people are around (Harari et al., 2015).

While our study used intensive longitudinal data, our main analyses on emotion regulation flexibility and its predictors (age and depression) were cross-sectional in nature. With regard to age differences in emotion regulation flexibility, our findings could be due to cohort effects, with people who are of older age now differing from younger adults based on the historical context in which they developed rather than due to the developmental process of growing wiser with age (Blanchard-Fields, 2007). With regard to the findings for depressive symptoms, the cross-sectional data does not enable inferences about the directionality of the relationship between depressive symptoms. It is possible that lower ER flexibility precedes the development of depressive symptoms or that lower ER flexibility emerges as individuals develop depressive symptoms. It is also possible that a third variable can account for this relationship.

Future research should investigate emotion regulation flexibility over time to assess whether individuals become more flexible as they develop and to assess the temporal relationship between emotion regulation flexibility and depression. It is possible that the ability to flexibly regulate emotions in accordance with context is an emotional skill (Soto et al., 2020) that reflects the individual's ability to use strategies that are perceived as most appropriate in the moment. This skill could be acting as a protective factor in times of high stress and prevent declines in mental health as indicated by, for example, higher levels of depression. Future work should investigate whether emotion regulation flexibility can act as a protective factor for psychopathology as taught through interventions or therapy. Work in coping flexibility has

shown that people who are able to adapt their coping strategies more flexibly to contextual demands show more resilience in the face of adversities (Galatzer-Levy et al., 2012). Assessing whether emotion regulation flexibility can be intervened on through, for example, laboratory-based manipulations could be fruitful for mobile-based interventions on emotion regulation strategies in daily contexts(e.g., Addington et al., 2019) in the future.

More depressed individuals differ from less depressed individuals in how they construe psychological situations, as indicated by research on differences in appraisals based on depression status (Bylsma et al., 2011). Similarly, older adults could show differences in how they psychologically make sense of the contexts they are in and differ in the amount of perceived adversity they experience, as indicated by laboratory studies (e.g., (Luong & Charles, 2014). As both age and depression have been shown to be associated with differences in how stressful situations are appraised (Bylsma et al., 2011; Luong & Charles, 2014), we took a first step towards accounting for this by controlling for how stressed participants felt in the moment. Controlling for stress did not change any of the effects, suggesting that differences in the stressfulness of contexts are not accounting for differences in emotion regulation flexibility across age and depression. Additionally, all effects were robust to mean level differences in how likely individuals were to use a certain strategy, suggesting that effects are not based on older adults or depressed individuals generally engaging in strategies more or less.

Our statistical method was well-suited to detect variability that was not related to context as indicating low levels of adapting to contexts, thereby approaching the question of emotion regulation flexibility in a novel way. We did not explicitly assess the amount of between-situation variability as separate from within-situation variability due to limitations of the estimation software. However, because we accounted for mean level effects of age and

depression in secondary analyses, it is unlikely that consistency across situations (e.g., older adults using a specific strategy consistently across all situations) would fully explain the lack of residual variability within situations which we classified as emotion regulation flexibility.

In our community sample, we did not have insight into potential clinical diagnoses of individuals and participants were not recruited with regard to psychopathology. Assessing whether differences in emotion regulation flexibility exist between clinically diagnosed depressed individuals and healthy controls could help test the robustness of our results. Further, as in previous studies, older adults tended to be less depressed than younger adults in our sample (Erskine et al., 2007) so more emotion regulation flexibility work is needed particularly targeted towards depression in older age. It is possible, for example, that older adults with higher depressive symptoms adapt their strategy use more to context than younger adults but do so in ways that are ultimately not adaptive (e.g., not expressing their emotions in contexts where it would actually be helpful for them to express them).

Importantly, while our study was intended to capture individual patterns of adapting to context, it is not clear that the ways in which individuals flexibly adapt their strategies to context are actually beneficial with regard to the goals individuals are pursuing, as individuals might also adapt to their environment in ways that could be maladaptive for them. There is consistent evidence that, for example, suppression use is related to lower relationship quality (e.g., English & John, 2013) which suggests that individuals who choose to suppress their emotions more when with a certain social partner could risk potential negative consequences. How and whether flexible adaption to context can be associated with negative consequences should be subject to future research. However, it is important to take a lifespan perspective on the question of adaptiveness. People across the lifespan change in the kinds of goals they pursue (Heckhausen et

al., 2010), potentially influencing what exactly constitutes adaptive emotion regulation. While resolving conflicts could be adaptive for younger adults in order to reach their specific goals of increasing closeness in relationships over a longer period of time, not engaging in conflicts and preserving harmony could be more beneficial for older adults who have and perceive less time remaining with their loved ones (Carstensen et al., 1999).

4.5 Conclusion

The present study shows that emotion regulation flexibility differs based on age and depressive symptoms. Momentary location, activity, social context, and appraisals contribute to predicting emotion regulation strategy use. When accounting for these contextual factors using mixed effect location scale modeling, older adults were more flexible in some strategies but less flexible or equally flexible in others. Individuals higher in depression consistently showed less flexible adaption of emotion regulation to context. Effects remained when accounting for the stressfulness of contexts and for mean effects of age and depression, demonstrating the robustness of our results. Our results provide evidence for the role that context plays in emotion regulation across the lifespan, laying the foundation for research on improving mental health by encouraging flexibility across the lifespan that takes person-specific contexts into account.

References

- Addington, E. L., Cheung, E. O., Bassett, S. M., Kwok, I., Schuette, S. A., Shiu, E., Yang, D., Cohn, M. A., Leykin, Y., Saslow, L. R., & Moskowitz, J. T. (2019). The MARIGOLD study: Feasibility and enhancement of an online intervention to improve emotion regulation in people with elevated depressive symptoms. *Journal of Affective Disorders*, 257, 352–364. <https://doi.org/10.1016/j.jad.2019.07.049>
- Aldao, A. (2013). The future of emotion regulation research: Capturing context. *Perspectives on Psychological Science*, 8(2), 155–172. <https://doi.org/10.1177/1745691612459518>
- Aldao, A., Sheppes, G., & Gross, J. J. (2015). Emotion regulation flexibility. *Cognitive Therapy and Research*, 39(3), 263–278. <https://doi.org/10.1007/s10608-014-9662-4>
- Allen, V. C., & Windsor, T. D. (2019). Age differences in the use of emotion regulation strategies derived from the process model of emotion regulation: A systematic review. *Aging & Mental Health*, 23(1), 1–14. <https://doi.org/10.1080/13607863.2017.1396575>
- Andresen, E. M., Malmgren, J. A., Carter, W. B., & Patrick, D. L. (1994). Screening for depression in well older adults: Evaluation of a short form of the CES-D. *American Journal of Preventive Medicine*, 10(2), 77–84.
- Benson, L., English, T., Conroy, D. E., Pincus, A. L., Gerstorf, D., & Ram, N. (2019). Age differences in emotion regulation strategy use, variability, and flexibility: An experience sampling approach. *Developmental Psychology*, 55(9), 1951–1964. <https://doi.org/10.1037/dev0000727>

- Blanchard-Fields, F. (2007). Everyday problem solving and emotion: An adult developmental perspective. *Current Directions in Psychological Science, 16*(1), 26–31.
<https://doi.org/10.1111/j.1467-8721.2007.00469.x>
- Blanke, E. S., Brose, A., Kalokerinos, E. K., Erbas, Y., Riediger, M., & Kuppens, P. (2019). Mix it to fix it: Emotion regulation variability in daily life. *Emotion*.
<https://doi.org/10.1037/emo0000566>
- Bohlmeijer, E., Roemer, M., Cuijpers, P., & Smit, F. (2007). The effects of reminiscence on psychological well-being in older adults: A meta-analysis. *Aging & Mental Health, 11*(3), 291–300. <https://doi.org/10.1080/13607860600963547>
- Brose, A., Scheibe, S., & Schmiedek, F. (2013). Life contexts make a difference: Emotional stability in younger and older adults. *Psychology and Aging, 28*(1), 148–159.
<https://doi.org/10.1037/a0030047>
- Bürkner, P.-C. (2017). brms: An R package for bayesian multilevel models using stan. *Journal of Statistical Software, 80*(1), 1–28. <https://doi.org/10.18637/jss.v080.i01>
- Bürkner, P.-C. (2018). Advanced bayesian multilevel modeling with the R package brms. *The R Journal, 10*(1), 395–411. <https://doi.org/10.32614/RJ-2018-017>
- Bylsma, L., Taylor-Clift, A., & Rottenberg, J. (2011). Emotional reactivity to daily events in major and minor depression. *Journal of Abnormal Psychology, 120*, 155–167.
<https://doi.org/10.1037/a0021662>
- Carstensen, L. L., Fung, H. H., & Charles, S. T. (2003). Socioemotional selectivity theory and the regulation of emotion in the second half of life. *Motivation and Emotion, 21*.

- Carstensen, L. L., Isaacowitz, D. M., & Charles, S. T. (1999). Taking time seriously: A theory of socioemotional selectivity. *American Psychologist*, *54*(3), 165–181.
<https://doi.org/10.1037/0003-066X.54.3.165>
- Carstensen, L. L., Turan, B., Scheibe, S., Ram, N., Ersner-Hershfield, H., Samanez-Larkin, G. R., Brooks, K. P., & Nesselroade, J. R. (2011). Emotional experience improves with age: Evidence based on over 10 years of experience sampling. *Psychology and Aging*, *26*(1), 21–33. <https://doi.org/10.1037/a0021285>
- Catterson, A. D., Eldesouky, L., & John, O. P. (2017). An experience sampling approach to emotion regulation: Situational suppression use and social hierarchy. *Journal of Research in Personality*, *69*, 33–43. <https://doi.org/10.1016/j.jrp.2016.04.004>
- Charles, S. T., & Luong, G. (2013). Emotional experience across adulthood: The theoretical model of strength and vulnerability integration. *Current Directions in Psychological Science*, *22*(6), 443–448. <https://doi.org/10.1177/0963721413497013>
- Chen, S., & Bonanno, G. A. (2021). Components of emotion regulation flexibility: Linking latent profiles to depressive and anxious symptoms. *Clinical Psychological Science*, *9*(2), 236–251. <https://doi.org/10.1177/2167702620956972>
- Chen, S., Chen, T., & Bonanno, G. A. (2018). Expressive flexibility: Enhancement and suppression abilities differentially predict life satisfaction and psychopathology symptoms. *Personality and Individual Differences*, *126*, 78–84.
<https://doi.org/10.1016/j.paid.2018.01.010>
- Cheung, E. O., Gardner, W. L., & Anderson, J. F. (2015). Emotionships: Examining people’s emotion-regulation relationships and their consequences for well-being. *Social*

Psychological and Personality Science, 6(4), 407–414.

<https://doi.org/10.1177/1948550614564223>

Eldesouky, L., & English, T. (2018). Another year older, another year wiser? Emotion regulation strategy selection and flexibility across adulthood. *Psychology and Aging*, 33(4), 572–585. <https://doi.org/10.1037/pag0000251>

Eldesouky, Lameese, & English, T. (2019). Regulating for a reason: Emotion regulation goals are linked to spontaneous strategy use. *Journal of Personality*, 87(5), 948–961. <https://doi.org/10.1111/jopy.12447>

English, T., & Carstensen, L. L. (2014). Selective narrowing of social networks across adulthood is associated with improved emotional experience in daily life. *International Journal of Behavioral Development*, 38(2), 195–202. <https://doi.org/10.1177/0165025413515404>

English, T., & Eldesouky, L. (2020). Emotion regulation flexibility. *European Journal of Psychological Assessment*, 36(3), 456–459. <https://doi.org/10.1027/1015-5759/a000581>

English, T., & John, O. P. (2013). Understanding the social effects of emotion regulation: The mediating role of authenticity for individual differences in suppression. *Emotion*, 13(2), 314–329. <https://doi.org/10.1037/a0029847>

English, T., John, O. P., Srivastava, S., & Gross, J. J. (2012). Emotion regulation and peer-rated social functioning: A 4-year longitudinal study. *Journal of Research in Personality*, 46(6), 780–784. <https://doi.org/10.1016/j.jrp.2012.09.006>

English, T., Lee, I. A., John, O. P., & Gross, J. J. (2017). Emotion regulation strategy selection in daily life: The role of social context and goals. *Motivation and Emotion*, 41(2), 230–242. <https://doi.org/10.1007/s11031-016-9597-z>

- Erskine, J. A. K., Kvavilashvili, L., Conway, M. A., & Myers, L. (2007). The effects of age on psychopathology, well-being and repressive coping. *Aging & Mental Health, 11*(4), 394–404. <https://doi.org/10.1080/13607860600963737>
- Galatzer-Levy, I. R., Burton, C. L., & Bonanno, G. A. (2012). Coping flexibility, potentially traumatic life events, and resilience: A prospective study of college student adjustment. *Journal of Social and Clinical Psychology, 31*(6), 542–567. <https://doi.org/10.1521/jscp.2012.31.6.542>
- Galvin, J., Roe, C., Powlisha, K., Coats, M. A., Muich, S. J., Grant, E., Miller, J., Storandt, M., & Morris, J. (2005). The AD8: A brief informant interview to detect dementia. *Neurology, 65*, 559–564. <https://doi.org/10.1212/01.wnl.0000172958.95282.2a>
- Gelman, A. (2006). Prior distributions for variance parameters in hierarchical models (comment on article by Browne and Draper). *Bayesian Analysis, 1*(3). <https://doi.org/10.1214/06-BA117A>
- Geukes, K., Nestler, S., Hutteman, R., Kűfner, A. C. P., & Back, M. D. (2017). Trait personality and state variability: Predicting individual differences in within- and cross-context fluctuations in affect, self-evaluations, and behavior in everyday life. *Journal of Research in Personality, 69*, 124–138. <https://doi.org/10.1016/j.jrp.2016.06.003>
- Greenaway, K. H., Kalokerinos, E. K., & Williams, L. A. (2018). Context is everything (in emotion research). *Social and Personality Psychology Compass, 12*(6), e12393. <https://doi.org/10.1111/spc3.12393>
- Gross, J. J. (2015). Emotion regulation: Current status and future prospects. *Psychological Inquiry, 26*(1), 1–26. <https://doi.org/10.1080/1047840X.2014.940781>

- Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology, 85*(2), 348–362. <https://doi.org/10.1037/0022-3514.85.2.348>
- Haines, S. J., Gleeson, J., Kuppens, P., Hollenstein, T., Ciarrochi, J., Labuschagne, I., Grace, C., & Koval, P. (2016). The wisdom to know the difference: Strategy-situation fit in emotion regulation in daily life is associated with well-being. *Psychological Science, 27*(12), 1651–1659. <https://doi.org/10.1177/0956797616669086>
- Harari, G. M., Gosling, S. D., Wang, R., & Campbell, A. T. (2015). Capturing situational information with smartphones and mobile sensing methods. *European Journal of Personality, 29*(5), 509–511. <https://doi.org/10.1002/per.2032>
- Heckhausen, J., Wrosch, C., & Schulz, R. (2010). A motivational theory of life-span development. *Psychological Review, 117*(1), 32. <https://doi.org/10.1037/a0017668>
- Hedeker, D., Mermelstein, R. J., & Demirtas, H. (2012). Modeling between-subject and within-subject variances in ecological momentary assessment data using mixed-effects location scale models. *Statistics in Medicine, 31*(27), 3328–3336. <https://doi.org/10.1002/sim.5338>
- Kalokerinos, E. K., Erbas, Y., Ceulemans, E., & Kuppens, P. (2019). Differentiate to regulate: low negative emotion differentiation is associated with ineffective use but not selection of emotion-regulation strategies. *Psychological Science, 30*(6), 863–879. <https://doi.org/10.1177/0956797619838763>
- Kalokerinos, E. K., Greenaway, K. H., Pedder, D. J., & Margetts, E. A. (2014). Don't grin when you win: The social costs of positive emotion expression in performance situations. *Emotion, 14*(1), 180–186. <https://doi.org/10.1037/a0034442>

- Kalokerinos, E. K., Tamir, M., & Kuppens, P. (2017). Instrumental motives in negative emotion regulation in daily life: Frequency, consistency, and predictors. *Emotion, 17*(4), 648–657. <https://doi.org/10.1037/emo0000269>
- Kruschke, J. K. (2010). What to believe: Bayesian methods for data analysis. *Trends in Cognitive Sciences, 14*(7), 293–300. <https://doi.org/10.1016/j.tics.2010.05.001>
- Liu, D. Y., & Thompson, R. J. (2017). Selection and implementation of emotion regulation strategies in major depressive disorder: An integrative review. *Clinical Psychology Review, 57*, 183–194. <https://doi.org/10.1016/j.cpr.2017.07.004>
- Lougheed, J. P., & Hollenstein, T. (2012). A limited repertoire of emotion regulation strategies is associated with internalizing problems in adolescence: Adolescent emotion regulation patterns. *Social Development, 21*(4), 704–721. <https://doi.org/10.1111/j.1467-9507.2012.00663.x>
- Luong, G., & Charles, S. T. (2014). Age differences in affective and cardiovascular responses to a negative social interaction: The role of goals, appraisals, and emotion regulation. *Developmental Psychology, 50*(7), 1919–1930. <https://doi.org/10.1037/a0036621>
- Newman, D. B., & Nezlek, J. B. (2021). The influence of daily events on emotion regulation and well-being in daily life. *Personality and Social Psychology Bulletin, 0146167220980882*. <https://doi.org/10.1177/0146167220980882>
- Nolen-Hoeksema, S., Wisco, B. E., & Lyubomirsky, S. (2008). Rethinking rumination. *Perspectives on Psychological Science, 3*(5), 400–424. <https://doi.org/10.1111/j.1745-6924.2008.00088.x>

- Oberhauser, L., Neubauer, A. B., & Kessler, E.-M. (2017). Conflict avoidance in old age: The role of anticipated loneliness. *GeroPsych: The Journal of Gerontopsychology and Geriatric Psychiatry*, 30(2), 61–70. <https://doi.org/10.1024/1662-9647/a000168>
- R Core Team. (2020). *R: A Language and Environment for Statistical Computing*. R Foundation for Statistical Computing. <https://www.R-project.org/>
- Rauthmann, J. F., Gallardo-Pujol, D., Guillaume, E. M., Todd, E., Nave, C. S., Sherman, R. A., Ziegler, M., Jones, A. B., & Funder, D. C. (2014). The situational eight DIAMONDS: A taxonomy of major dimensions of situation characteristics. *Journal of Personality and Social Psychology*, 107(4), 677–718. <https://doi.org/10.1037/a0037250>
- Riediger, M., Schmiedek, F., Wagner, G. G., & Lindenberger, U. (2009). Seeking pleasure and seeking pain: Differences in prohedonic and contra-hedonic motivation from adolescence to old age. *Psychological Science*, 20(12), 1529–1535. <https://doi.org/10.1111/j.1467-9280.2009.02473.x>
- Scott, S. B., Sliwinski, M. J., & Blanchard Fields, F. (2013). Age differences in emotional responses to daily stress: The role of timing, severity, and global perceived stress. *Psychology and Aging*, 28(4). <https://doi.org/10.1037/a0034000>
- Sheppes, G., & Meiran, N. (2008). Divergent cognitive costs for online forms of reappraisal and distraction. *Emotion*. <https://doi.org/10.1037/a0013711>
- Sheppes, Gal, Scheibe, S., Suri, G., & Gross, J. J. (2011). Emotion-regulation choice. *Psychological Science*, 22(11), 1391–1396. <https://doi.org/10.1177/0956797611418350>
- Siemer, M., Mauss, I., & Gross, J. J. (2007). Same situation--Different emotions: How appraisals shape our emotions. *Emotion*, 7(3), 592–600. <https://doi.org/10.1037/1528-3542.7.3.592>

- Soto, C. J., Napolitano, C. M., & Roberts, B. W. (2020). Taking skills seriously: Toward an integrative model and agenda for social, emotional, and behavioral skills. *Current Directions in Psychological Science*, 0963721420978613.
<https://doi.org/10.1177/0963721420978613>
- Stan Development Team. (2016). Rstan: the R interface to Stan. Retrieved from <http://mc-stan.org/>
- Troy, A. S., Shallcross, A. J., & Mauss, I. B. (2013). A person-by-situation approach to emotion regulation: Cognitive reappraisal can either help or hurt, depending on the context. *Psychological Science*, 24(12), 2505–2514. <https://doi.org/10.1177/0956797613496434>
- Urry, H. L., & Gross, J. J. (2010). Emotion regulation in older age. *Current Directions in Psychological Science*, 19(6), 352–357. <https://doi.org/10.1177/0963721410388395>
- Valentiner, D. P., Holahan, C. J., & Moos, R. H. (1994). Social support, appraisals of event controllability, and coping: An integrative model. *Journal of Personality and Social Psychology*, 66(6), 1094–1102. <https://doi.org/10.1037/0022-3514.66.6.1094>
- Wenzel, M., Rowland, Z., Weber, H., & Kubiak, T. (2020). A round peg in a square hole: Strategy-situation fit of intra- and interpersonal emotion regulation strategies and controllability. *Cognition and Emotion*, 34(5), 1003–1009.
<https://doi.org/10.1080/02699931.2019.1697209>
- Westphal, M., Seivert, N. H., & Bonanno, G. A. (2010). Expressive flexibility. *Emotion*, 10(1), 92–100. <https://doi.org/10.1037/a0018420>
- Williams, D. R., Martin, S. R., Liu, S., & Rast, P. (2021). Bayesian multivariate mixed-effects location scale modeling of longitudinal relations among affective traits, states, and physical activity. *European Journal of Psychological Assessment*.

Willroth, E. C., Flett, J. A. M., & Mauss, I. B. (2019). Depressive symptoms and deficits in stress-reactive negative, positive, and within-emotion-category differentiation: A daily diary study. *Journal of Personality*, *0*(0), 1–11. <https://doi.org/10.1111/jopy.12475>

Appendix

CONTROLLING FOR MEAN

Table A1

Age and Depression predicting Location-based ER flexibility

	Age				Depression			
	Est	SE	95%CrI	Pd	Est	SE	95%CrI	Pd
Behavioral Activation	0.00	0.01	-0.02;0.01	58.63%	0.07	0.01	0.05;0.08	100%
Situation Selection (Avoid)	-0.05	0.01	-0.06; -0.03	100%	0.07	0.01	0.05; 0.08	100%
Reminiscing	0.04	0.01	0.03;0.06	100%	0.04	0.01	0.03;0.06	100 %
Acceptance	-0.16	0.01	-0.18;-0.14	100. %	0.03	0.01	0.02;0.05	100 %
Savoring	0.01	0.01	-0.01;0.03	86.26%	0.02	0.01	0.01;0.04	99.91%
Rumination	-0.09	0.01	-0.10;-0.07	100%	0.13	0.01	0.11;0.14	100 %
Capitalization	0.03	0.01	0.01;0.05	100%	0.05	0.01	0.03;0.06	100 %
Sharing Negative	/	/	/	/	/	/	/	/
Distraction	-0.06	0.01	-0.08;-0.05	100 %	0.08	0.01	0.07;0.10	100%
Pos. Reappraisal	/	/	/	/	/	/	/	/
Minimizing	/	/	/	/	/	/	/	/
Co-Reappraisal	-0.02	0.01	-0.04;-0.00	99.28%	0.04	0.01	0.03;0.06	100%
Suppression	0.01	0.01	-0.00; 0.03	94.24%	0.05	0.01	0.03; 0.06	100%
Masking	-0.07	0.01	-0.08; -0.05	100%	0.07	0.01	0.06; 0.09	100%

Note. Negative values indicate higher flexibility. 95%CI = 95% Credibility Interval, PD = Probability of Direction. Probability of

Direction can be transformed to a p-value $ptwo-sided=2*(1-pd)$, with 97.5% corresponding to a p-value of .05 in a two-tailed test.

Models without estimates reported reflect models for which adding context variables was not contributing to model fit.

Table A2

Age and Depression predicting Activity -based Flexibility

	Age				Depression			
	Est	SE	95%CrI	P _d	Est	SE	95%CrI	P _d
Behavioral Activation	0.00	0.01	-0.01;0.02	63.57%	0.07	0.01	0.05;0.08	100%
Situation Selection (Avoid)	/	/	/	/	/	/	/	/
Reminiscing	0.04	0.01	0.03; 0.06	100%	0.04	0.01	0.03; 0.06	100%
Acceptance	/	/	/	/	/	/	/	/
Savoring	0.01	0.01	-0.01;0.02	81.12%	0.02	0.01	0.00; 0.04	99.53%
Rumination	/	/	/	/	/	/	/	/
Capitalization	0.03	0.01	0.01; 0.04	99.98%	0.05	0.01	0.04;0.07	100%
Sharing Negative	-0.07	0.01	-0.09;-0.06	100%	0.04	0.01	0.03; 0.06	100%
Distraction	/	/	/	/	/	/	/	/
Pos. Reappraisal	-0.01	0.01	-0.02;0.01	81.67%	0.04	0.01	0.03; 0.06	100%
Minimizing	0.01	0.01	-0.01;0.02	73.45%	0.04	0.01	0.03; 0.06	100%
Co-Reappraisal	-0.02	0.01	-0.04;-0.01	99.83%	0.04	0.01	0.03; 0.06	100%
Suppression	0.01	0.01	-0.01; 0.02	82.49%	0.04	0.01	0.03; 0.06	100%
Masking	-0.07	0.01	-0.08; -0.05	100%	0.07	0.01	0.06; 0.09	100%

Note: Negative values indicate higher flexibility. 95%CI = 95% Credibility Interval, PD = Probability of Direction. Probability of

Direction can be transformed to a p-value $ptwo-sided=2*(1-pd)$, with 97.5% corresponding to a p-value of .05 in a two-tailed test.

Models without estimates reported reflect models for which adding context variables was not contributing to model fit.

Table A3

Age and Depression predicting Social Context based ER Flexibility

	Age				Depression			
	Est	SE	95%CrI	P _d	Est	SE	95%CrI	P _d
Behavioral Activation	-0.01	0.01	-0.02; 0.01	69.65%	0.06	0.01	0.05; 0.08	100%
Situation Selection (Avoid)	/	/	/	/	/	/	/	/
Reminiscing	/	/	/	/	/	/	/	/
Acceptance	/	/	/	/	/	/	/	/
Savoring	0.01	0.01	-0.01; 0.03	88.17%	0.02	0.01	0.00; 0.03	98.71%
Rumination	/	/	/	/	/	/	/	/
Capitalization	0.02	0.01	0.01; 0.04	99.77%	0.05	0.01	0.04; 0.07	100%
Sharing Negative	-0.08	0.01	-0.10; -0.07	100%	0.04	0.01	0.03; 0.06	100%
Distraction	-0.06	0.01	-0.07; -0.04	100%	0.08	0.01	0.07; 0.10	100%
Pos. Reappraisal	/	/	/	/	/	/	/	/
Minimizing	/	/	/	/	/	/	/	/
Co-Reappraisal	-0.04	0.01	-0.05; -0.02	100%	0.04	0.01	0.03; 0.06	100%
Suppression	0.01	0.01	-0.01; 0.02	77.32%	0.04	0.01	0.03; 0.06	100%
Masking	-0.07	0.01	-0.08; 0.05	100%	0.08	0.01	0.06; 0.09	100%

Note: Negative values indicate higher flexibility. 95%CI = 95% Credibility Interval, PD = Probability of Direction. Probability of

Direction can be transformed to a p-value $ptwo-sided=2*(1-pd)$, with 97.5% corresponding to a p-value of .05 in a two-tailed test.

Models without estimates reported reflect models for which adding context variables was not contributing to model fit.

Table A4

Age and Depression predicting Appraisal-based ER Flexibility

	Age				Depression			
	Est	SE	95%CrI	P _d	Est	SE	95%CrI	P _d
Behavioral Activation	-0.01	0.01	-0.02; 0.01	86.73%	0.06	0.01	0.04; 0.07	100%
Situation Selection (Avoid)	-0.05	0.01	-0.07; -0.04	100%	0.07	0.01	0.05; 0.09	100%
Reminiscing	0.05	0.01	0.03; 0.06	100%	0.04	0.01	0.02; 0.06	100%
Acceptance	-0.16	0.01	-0.18; -0.15	100%	0.03	0.01	0.01; 0.04	99.98%
Savoring	-0.00	0.01	-0.02; 0.02	52.62%	0.02	0.01	0.00; 0.03	97.72%
Rumination	-0.10	0.01	-0.12; -0.08	100%	0.12	0.01	0.10; 0.13	100%
Capitalization	0.04	0.01	0.02; 0.05	100%	0.05	0.01	0.03; 0.06	100%
Sharing Negative	-0.07	0.01	-0.09; -0.05	100%	0.04	0.01	0.03; 0.06	100%
Distraction	-0.06	0.01	-0.08; -0.05	100%	0.08	0.01	0.07; 0.10	100%
Pos. Reappraisal	-0.01	0.01	-0.02; 0.01	83.23%	0.04	0.01	0.02; 0.05	100%
Minimizing	0.00	0.01	-0.02; 0.02	58.72%	0.04	0.01	0.03; 0.06	100%
Co-Reappraisal	-0.02	0.01	-0.03; -0.00	98.68%	0.04	0.01	0.03; 0.06	100%
Suppression	0.01	0.01	-0.00; 0.03	95.13%	0.04	0.01	0.03; 0.06	100%
Masking	-0.07	0.01	-0.09; -0.05	100%	0.08	0.01	0.06; 0.09	100%

Note. Negative values indicate higher flexibility. 95%CI = 95% Credibility Interval, PD = Probability of Direction. Probability of

Direction can be transformed to a p-value $ptwo-sided=2*(1-pd)$, with 97.5% corresponding to a p-value of .05 in a two-tailed test.

Models without estimates reported reflect models for which adding context variables was not contributing to model fit.

CONTROLLING FOR STRESS

Table B1

Age and Depression predicting Location-based ER Flexibility

	Age				Depression			
	Est	SE	95%CrI	Pd	Est	SE	95%CrI	Pd
Behavioral Activation	0.00	0.01	-0.02;0.01	58.63%	0.07	0.01	0.05;0.08	100%
Situation Selection (Avoid)	-0.04	0.01	-0.06; -0.03	100%	0.07	0.01	0.05; 0.09	100%
Reminiscing	0.05	0.01	0.03;0.06	100%	0.04	0.01	0.02;0.05	100 %
Acceptance	-0.16	0.01	-0.18;-0.14	100. %	0.03	0.01	0.02;0.05	100 %
Savoring	-0.00	0.01	-0.02;0.02	54.25%	0.02	0.01	0.01;0.04	99.78%
Rumination	-0.10	0.01	-0.11;-0.08	100%	0.13	0.01	0.11;0.15	100 %
Capitalization	0.03	0.01	0.01;0.05	99.99%	0.05	0.01	0.03;0.07	100 %
Sharing Negative	/	/	/	/	/	/	/	/
Distraction	-0.06	0.01	-0.08;-0.04	100 %	0.09	0.01	0.08;0.11	100%
Pos. Reappraisal	/	/	/	/	/	/	/	/
Minimizing	/	/	/	/	/	/	/	/
Co-Reappraisal	-0.02	0.01	-0.04;-0.00	99.28%	0.05	0.01	0.03;0.06	100%
Suppression	0.01	0.01	-0.00; 0.03	94.09%	0.04	0.01	0.03; 0.06	100%
Masking	-0.07	0.01	-0.09; -0.05	100%	0.08	0.01	0.06; 0.10	100%

Note. Negative values indicate higher flexibility. 95%CI = 95% Credibility Interval, PD = Probability of Direction. Probability of

Direction can be transformed to a p-value $ptwo-sided=2*(1-pd)$, with 97.5% corresponding to a p-value of .05 in a two-tailed test.

Models without estimates reported reflect models for which adding context variables was not contributing to model fit.

Table B2

Age and Depression predicting Activity -based ER Flexibility

	Age				Depression			
	Est	SE	95%CrI	P _d	Est	SE	95%CrI	P _d
Behavioral Activation	0.00	0.01	-0.01;0.02	62.80%	0.06	0.01	0.05;0.08	100%
Situation Selection (Avoid)	/	/	/	/	/	/	/	/
Reminiscing	0.05	0.01	0.03; 0.07	100%	0.04	0.01	0.02; 0.05	100%
Acceptance	/	/	/	/	/	/	/	/
Savoring	-0.00	0.01	-0.02;0.01	69.10%	0.02	0.01	0.00; 0.04	98.79%
Rumination	/	/	/	/	/	/	/	/
Capitalization	0.03	0.01	0.01; 0.04	99.98%	0.05	0.01	0.04;0.07	100%
Sharing Negative	-0.07	0.01	-0.09;-0.06	100%	0.04	0.01	0.03; 0.06	100%
Distraction	/	/	/	/	/	/	/	/
Pos. Reappraisal	-0.01	0.01	-0.03;0.00	95.28%	0.04	0.01	0.03; 0.06	100%
Minimizing	0.00	0.01	-0.01;0.02	72.75%	0.05	0.01	0.03; 0.07	100%
Co-Reappraisal	-0.03	0.01	-0.04;-0.01	99.91%	0.04	0.01	0.03; 0.06	100%
Suppression	0.01	0.01	-0.01; 0.02	83.22%	0.04	0.01	0.02; 0.06	100%
Masking	-0.07	0.01	-0.09; -0.06	100%	0.08	0.01	0.06; 0.10	100%

Note: Negative values indicate higher flexibility. 95%CI = 95% Credibility Interval, PD = Probability of Direction. Probability of

Direction can be transformed to a p-value $ptwo-sided=2*(1-pd)$, with 97.5% corresponding to a p-value of .05 in a two-tailed test.

Models without estimates reported reflect models for which adding context variables was not contributing to model fit.

Table B3

Age and Depression predicting Social Context-based ER Flexibility

	Age				Depression			
	Est	SE	95%CrI	P _d	Est	SE	95%CrI	P _d
Behavioral Activation	-0.01	0.01	-0.02; 0.01	68.73%	0.06	0.01	0.05; 0.08	100%
Situation Selection (Avoid)	/	/	/	/	/	/	/	/
Reminiscing	/	/	/	/	/	/	/	/
Acceptance	/	/	/	/	/	/	/	/
Savoring	-0.00	0.01	-0.02; 0.02	88.18%	0.02	0.01	0.00; 0.03	98.77%
Rumination	/	/	/	/	/	/	/	/
Capitalization	0.02	0.01	0.01; 0.04	99.85%	0.05	0.01	0.04; 0.07	100%
Sharing Negative	-0.09	0.01	-0.10; -0.07	100%	0.05	0.01	0.03; 0.06	100%
Distraction	-0.06	0.01	-0.07; -0.04	100%	0.09	0.01	0.07; 0.10	100%
Pos. Reappraisal	/	/	/	/	/	/	/	/
Minimizing	/	/	/	/	/	/	/	/
Co-Reappraisal	-0.04	0.01	-0.05; -0.02	100%	0.04	0.01	0.03; 0.06	100%
Suppression	0.01	0.01	-0.01; 0.02	76.82%	0.04	0.01	0.03; 0.06	100%
Masking	-0.07	0.01	-0.09; 0.05	100%	0.08	0.01	0.06; 0.10	100%

Note: Negative values indicate higher flexibility. 95%CI = 95% Credibility Interval, PD = Probability of Direction. Probability of

Direction can be transformed to a p-value $ptwo-sided=2*(1-pd)$, with 97.5% corresponding to a p-value of .05 in a two-tailed test.

Models without estimates reported reflect models for which adding context variables was not contributing to model fit.

Table B4

Age and Depression predicting Appraisal-based ER Flexibility

	Age				Depression			
	Est	SE	95%CrI	P _d	Est	SE	95%CrI	P _d
Behavioral Activation	-0.01	0.01	-0.02; 0.01	86.48%	0.06	0.01	0.04; 0.07	100%
Situation Selection (Avoid)	-0.05	0.01	-0.06; -0.03	100%	0.07	0.01	0.05; 0.09	100%
Reminiscing	0.05	0.01	0.03; 0.07	100%	0.03	0.01	0.02; 0.05	100%
Acceptance	-0.16	0.01	-0.18; -0.15	100%	0.03	0.01	0.02; 0.05	100%
Savoring	-0.01	0.01	-0.02; 0.01	52.64%	0.02	0.01	0.00; 0.03	97.67%
Rumination	-0.11	0.01	-0.12; -0.09	100%	0.13	0.01	0.11; 0.14	100%
Capitalization	0.04	0.01	0.02; 0.05	100%	0.05	0.01	0.03; 0.06	100%
Sharing Negative	-0.07	0.01	-0.09; -0.05	100%	0.04	0.01	0.03; 0.06	100%
Distraction	-0.06	0.01	-0.08; -0.04	100%	0.09	0.01	0.07; 0.10	100%
Pos. Reappraisal	-0.01	0.01	-0.03; 0.00	83.11%	0.04	0.01	0.02; 0.05	100%
Minimizing	0.00	0.01	-0.02; 0.02	59.19%	0.04	0.01	0.03; 0.06	100%
Co-Reappraisal	-0.02	0.01	-0.03; -0.00	98.80%	0.04	0.01	0.03; 0.06	100%
Suppression	0.01	0.01	-0.00; 0.03	95.11%	0.04	0.01	0.03; 0.06	100%
Masking	-0.07	0.01	-0.09; -0.06	100%	0.08	0.01	0.06; 0.09	100%

Note. Negative values indicate higher flexibility. 95%CI = 95% Credibility Interval, PD = Probability of Direction. Probability of

Direction can be transformed to a p-value $ptwo-sided=2*(1-pd)$, with 97.5% corresponding to a p-value of .05 in a two-tailed test.

Models without estimates reported reflect models for which adding context variables was not contributing to model fit.