

Question	Hypothesis	Sampling plan (e.g. power analysis)	Analysis Plan	Interpretation given to different outcomes
1.) Do negative pictures (compared to neutral pictures) evoke subjective arousal and physiological responding? (Manipulation check)	1a) Subjective arousal (arousal rating) is lower after actively viewing neutral pictures compared to actively viewing negative pictures.	<p>F tests - ANOVA: Repeated measures, within factors Analysis: A priori: Compute required sample size <u>Input:</u> Effect size $f = 1.59$ ($\eta_p^2 = 0.716$) (Scheffé et al., 2021) α err prob = 0.05 Power ($1 - \beta$ err prob) = 0.95 Number of groups = 1 Number of measurements = 2 Corr among rep measures = 0.5 Nonsphericity correction $\epsilon = 1$</p> <p><u>Output:</u> Noncentrality parameter $\lambda = 40.3380260$ Critical F = 10.1279645 Numerator df = 1.0 Denominator df = 3.0 Total sample size = 4 Actual power = 0.9789865</p>	<p>Repeated measures ANOVA with two linear contrasts, comparing the subjective arousal ratings of two blocks (active viewing – neutral and active viewing - negative).</p> <p>ANOVA is calculated using <code>aov_ez()</code> function of the <code>afex</code>-package, estimated marginal means are calculated using <code>emmeans()</code> function from the <code>emmeans</code>-package, pairwise contrasts are calculated using <code>pairs()</code>.</p> <p>Bayes factors are computed for the ANOVA and each contrast using the <code>BayesFactor</code>-package.</p>	<p>ANOVA yields $p < .05$ is interpreted as subjective arousal (arousal ratings) changing significantly with blocks. Values of arousal ratings are interpreted as equal between blocks if $p > .05$.</p> <p>Each contrast yielding $p < .05$ is interpreted as arousal ratings being different between those two blocks, magnitude and direction are inferred from the respective estimate. Values of arousal ratings are interpreted as equal between blocks if $p > .05$.</p> <p>The Bayes factor <i>BF</i>₁₀ is reported alongside every p-value to assess the strength of evidence.</p>
	1b) Physiological responding (EMG <i>corrugator</i> activity) is lower while actively viewing neutral pictures compared to actively viewing negative pictures.	<p>F tests - ANOVA: Repeated measures, within factors Analysis: A priori: Compute required sample size <u>Input:</u> Effect size $f = 0.5573293$ ($\eta_p^2 = 0.237$) (Pilot Study) α err prob = 0.05 Power ($1 - \beta$ err prob) = 0.95 Number of groups = 1 Number of measurements = 2</p>	<p>Repeated measures ANOVA with two linear contrasts, comparing the EMG <i>corrugator</i> activity of two blocks (active viewing – neutral and active viewing - negative).</p> <p>ANOVA is calculated using <code>aov_ez()</code> function of the <code>afex</code>-package, estimated marginal means are calculated using</p>	<p>ANOVA yields $p < .05$ is interpreted as physiological responding (EMG <i>corrugator</i> activity) changing significantly with blocks. Values of arousal ratings are interpreted as equal between blocks if $p > .05$.</p> <p>Each contrast yielding $p < .05$ is interpreted as EMG <i>corrugator</i> activity being different between those two blocks, magnitude and direction are</p>

		<p>Corr among rep measures = 0.5 Nonsphericity correction $\epsilon = 1$</p> <p><u>Output:</u> Noncentrality parameter $\lambda = 16.1520293$ Critical F = 4.7472253 Numerator df = 1.0 Denominator df = 12.0 Total sample size = 13 Actual power = 0.9573615</p>	<p>emmeans() function from the emmeans-package, pairwise contrasts are calculated using pairs().</p> <p>Bayes factors are computed for the ANOVA and each contrast using the BayesFactor-package.</p>	<p>inferred from the respective estimate. Values of EMG <i>corrugator</i> activity are interpreted as equal between blocks if $p > .05$.</p> <p>The Bayes factor <i>BF10</i> is reported alongside every p-value to assess the strength of evidence.</p>
	<p>1c) Physiological responding (EMG <i>levator</i> activity) is lower while actively viewing neutral pictures compared to actively viewing negative pictures.</p>	<p>F tests - ANOVA: Repeated measures, within factors Analysis: A priori: Compute required sample size <u>Input:</u> Effect size $f = 0.4396788$ ($\eta_p^2 = 0.162$) (Pilot Study) α err prob = 0.05 Power ($1 - \beta$ err prob) = 0.95 Number of groups = 1 Number of measurements = 2 Corr among rep measures = 0.5 Nonsphericity correction $\epsilon = 1$</p> <p><u>Output:</u> Noncentrality parameter $\lambda = 14.6921260$ Critical F = 4.4138734 Numerator df = 1.0 Denominator df = 18.0 Total sample size = 19 Actual power = 0.9517060</p>	<p>Repeated measures ANOVA with two linear contrasts, comparing the EMG <i>levator</i> activity of two blocks (active viewing – neutral and active viewing - negative).</p> <p>ANOVA is calculated using aov_ez() function of the afex-package, estimated maginal means are calculated using emmeans() function from the emmeans-package, pairwise contrasts are calculated using pairs().</p> <p>Bayes factors are computed for the ANOVA and each contrast using the BayesFactor-package.</p>	<p>ANOVA yields $p < .05$ is interpreted as physiological responding (EMG <i>levator</i> activity) changing significantly with blocks. Values of arousal ratings are interpreted as equal between blocks if $p > .05$.</p> <p>Each contrast yielding $p < .05$ is interpreted as EMG <i>levator</i> activity being different between those two blocks, magnitude and direction are inferred from the respective estimate. Values of EMG <i>levator</i> activity are interpreted as equal between blocks if $p > .05$.</p> <p>The Bayes factor <i>BF10</i> is reported alongside every p-value to assess the strength of evidence.</p>

2.) Do ER strategies reduce emotional arousal? (Manipulation check)	2a) Subjective arousal (arousal rating) is lower after using an emotion regulation strategy (distraction, distancing, suppression) compared to active viewing.	<p>F tests - ANOVA: Repeated measures, within factors Analysis: A priori: Compute required sample size <u>Input:</u> Effect size $f = 0.50$ ($\eta_p^2 = 0.20$) (Scheffé et al., 2021) α err prob = 0.05 Power ($1 - \beta$ err prob) = 0.95 Number of groups = 1 Number of measurements = 4 Corr among rep measures = 0.5 Nonsphericity correction $\epsilon = 1$</p> <p><u>Output:</u> Noncentrality parameter $\lambda = 20.0$ Critical F = 2.9603513 Numerator df = 3.0 Denominator df = 27.0 Total sample size = 10 Actual power = 0.95210128</p>	<p>Repeated measures ANOVA with four linear contrasts, comparing the subjective arousal ratings of four blocks (active viewing, distraction, distancing, suppression).</p> <p>ANOVA is calculated using <code>aov_ez()</code> function of the <code>afex</code>-package, estimated marginal means are calculated using <code>emmeans()</code> function from the <code>emmeans</code>-package, pairwise contrasts are calculated using <code>pairs()</code>.</p> <p>Bayes factors are computed for the ANOVA and each contrast using the <code>BayesFactor</code>-package.</p>	<p>ANOVA yields $p < .05$ is interpreted as arousal ratings changing significantly with blocks. Values of arousal ratings are interpreted as equal between blocks if $p > .05$.</p> <p>Each contrast yielding $p < .05$ is interpreted as arousal ratings being different between those two blocks, magnitude and direction are inferred from the respective estimate. Values of arousal ratings are interpreted as equal between blocks if $p > .05$.</p> <p>The Bayes factor <i>BF</i>₁₀ is reported alongside every p-value to assess the strength of evidence.</p>
3.) Do ER strategies reduce physiological responding? (Manipulation check)	3a) Physiological responding (EMG <i>corrugator</i> activity) is lower after using an emotion regulation strategy (distraction, distancing, suppression) compared to active viewing.	<p>F tests - ANOVA: Repeated measures, within factors Analysis: A priori: Compute required sample size <u>Input:</u> Effect size $f = 0.1605$ (Zaehring et al., 2020) α err prob = 0.05 Power ($1 - \beta$ err prob) = 0.95 Number of groups = 1 Number of measurements = 4 Corr among rep measures = 0.5 Nonsphericity correction $\epsilon = 1$</p>	<p>Repeated measures ANOVA with four linear contrasts, comparing the <i>corrugator</i> muscle activity of four blocks (active viewing, distraction, distancing, suppression).</p> <p>ANOVA is calculated using <code>aov_ez()</code> function of the <code>afex</code>-package, estimated marginal means are calculated using <code>emmeans()</code> function from the <code>emmeans</code>-package, pairwise</p>	<p>ANOVA yields $p < .05$ is interpreted as <i>corrugator</i> muscle activity changing significantly with blocks. Values of <i>corrugator</i> muscle activity are interpreted as equal between blocks if $p > .05$.</p> <p>Each contrast yielding $p < .05$ is interpreted as <i>corrugator</i> muscle activity being different between those two blocks, magnitude and direction are inferred from the respective estimate. Values of <i>corrugator</i> muscle activity</p>

		<u>Output:</u> Noncentrality parameter $\lambda = 17.5169700$ Critical F = 2.6404222 Numerator df = 3.0 Denominator df = 252 Total sample size = 85 Actual power = 0.9509128	contrasts are calculated using pairs(). Bayes factors are computed for the ANOVA and each contrast using the BayesFactor-package.	are interpreted as equal between blocks if $p > .05$. The Bayes factor <i>BF10</i> is reported alongside every p -value to assess the strength of evidence.
	3b) Physiological responding (EMG <i>levator</i> activity) is lower after using an emotion regulation strategy (distraction, distancing, suppression) compared to active viewing.	F tests - ANOVA: Repeated measures, within factors Analysis: A priori: Compute required sample size <u>Input:</u> Effect size $f = 0.1605$ (Zaehringer et al., 2020) α err prob = 0.05 Power ($1 - \beta$ err prob) = 0.95 Number of groups = 1 Number of measurements = 4 Corr among rep measures = 0.5 Nonsphericity correction $\epsilon = 1$ <u>Output:</u> Noncentrality parameter $\lambda = 17.5169700$ Critical F = 2.6404222 Numerator df = 3.0 Denominator df = 252 Total sample size = 85 Actual power = 0.9509128	Repeated measures ANOVA with four linear contrasts, comparing the <i>levator</i> muscle activity of four blocks (active viewing, distraction, distancing, suppression). ANOVA is calculated using aov_ez() function of the afex-package, estimated marginal means are calculated using emmeans() function from the emmeans-package, pairwise contrasts are calculated using pairs(). Bayes factors are computed for the ANOVA and each contrast using the BayesFactor-package.	ANOVA yields $p < .05$ is interpreted as <i>levator</i> muscle activity changing significantly with blocks. Values of <i>levator</i> muscle activity are interpreted as equal between blocks if $p > .05$. Each contrast yielding $p < .05$ is interpreted as <i>levator</i> muscle activity being different between those two blocks, magnitude and direction are inferred from the respective estimate. Values of <i>levator</i> muscle activity are interpreted as equal between blocks if $p > .05$. The Bayes factor <i>BF10</i> is reported alongside every p -value to assess the strength of evidence.
4.) Do ER strategies require cognitive effort? (Manipulation check)	4a) Subjective effort (effort rating) is greater after using an emotion regulation strategy (distraction,	F tests - ANOVA: Repeated measures, within factors Analysis: A priori: Compute required sample size <u>Input:</u>	Repeated measures ANOVA with four linear contrasts, comparing the subjective effort ratings of four blocks (active	ANOVA yields $p < .05$ is interpreted as effort ratings changing significantly with blocks. Values of effort ratings are interpreted as equal between blocks if $p > .05$.

	distancing, suppression) compared to active viewing.	<p>Effect size $f = 0.2041241$ ($\eta_p^2 = 0.04$) (Scheffé et al., 2021) α err prob = 0.05 Power ($1-\beta$ err prob) = 0.95 Number of groups = 1 Number of measurements = 4 Corr among rep measures = 0.5 Nonsphericity correction $\epsilon = 1$</p> <p><u>Output:</u> Noncentrality parameter $\lambda = 17.6666588$ Critical F = 2.6625685 Numerator df = 3.0 Denominator df = 156.0 Total sample size = 53 Actual power = 0.95206921</p>	<p>viewing, distraction, distancing, suppression).</p> <p>ANOVA is calculated using <code>aov_ez()</code> function of the <code>afex</code>-package, estimated marginal means are calculated using <code>emmeans()</code> function from the <code>emmeans</code>-package, pairwise contrasts are calculated using <code>pairs()</code>.</p> <p>Bayes factors are computed for the ANOVA and each contrast using the <code>BayesFactor</code>-package.</p>	<p>Each contrast yielding $p < .05$ is interpreted as effort ratings being different between those two blocks, magnitude and direction are inferred from the respective estimate. Values of effort ratings are interpreted as equal between blocks if $p > .05$.</p> <p>The Bayes factor <i>BF10</i> is reported alongside every p-value to assess the strength of evidence.</p>
	4b) Majority of participants reuse the strategy that was least effortful for them.	-	Subjects are asked about the reasons for their choice in the follow-up survey. These answers are classified into categories and counted.	The percentage choice of strategies is described descriptively.
5.) Which variables can predict individual subjective values of ER strategies?	5a) Subjective effort (effort ratings) negatively predict subjective values of ER strategies.	<p>t tests - Linear multiple regression: Fixed model, single regression coefficient Analysis: A priori: Compute required sample size <u>Input:</u> Tail(s) = One Effect size $f^2 = 0.34$ (Since there are no findings in this respect yet,</p>	Multilevel model of SVs with level-1-predictors subjective effort, subjective arousal, subjective utility, <i>corrugator</i> , and <i>levator</i> muscle activity using subject specific intercepts and allowing random slopes for ER strategies.	<p>Fixed effects yield $p < .05$ are interpreted as subjective values are related to subjective effort. Subjective values are interpreted as not being related to subjective effort if $p > .05$.</p> <p>The Bayes factor <i>BF10</i> is reported alongside every p-value to assess the strength of evidence.</p>

5b) Subjective arousal (arousal ratings) negatively predict subjective values of ER strategies.	<p>we have inferred from the effect size in the closest-similar model: Westbrook et al., 2013)</p> <p>α err prob = 0.05</p> <p>Power (1-β err prob) = 0.95</p> <p>Number of predictors = 4</p> <p><u>Output:</u></p> <p>Noncentrality parameter $\delta = 3.4$</p> <p>Critical t = 1.6991270</p> <p>Df = 29</p> <p>Total sample size = 34</p> <p>Actual power = 0.9529571</p>	<p>The null model and the random slopes model are calculated using lmer() of the lmerTest-package.</p> <p>Bayes factors are computed for the MLM using the BayesFactor-package.</p>	<p>Fixed effects yield $p < .05$ are interpreted as subjective values are related to subjective arousal. Subjective values are interpreted as not being related to subjective arousal if $p > .05$.</p> <p>The Bayes factor <i>BF10</i> is reported alongside every p-value to assess the strength of evidence.</p>
5c) Subjective utility (utility ratings) positively predict subjective values of ER strategies.			<p>Fixed effects yield $p < .05$ are interpreted as subjective values are related to subjective utility. Subjective values are interpreted as not being related to subjective utility if $p > .05$.</p> <p>The Bayes factor <i>BF10</i> is reported alongside every p-value to assess the strength of evidence.</p>
5d) Physiological responding (EMG <i>corrugator</i> activity) negatively predict subjective values of ER strategies.			<p>Fixed effects yield $p < .05$ are interpreted as subjective values are related to <i>corrugator</i> activity. Subjective values are interpreted as not being related to <i>corrugator</i> activity if $p > .05$.</p> <p>The Bayes factor <i>BF10</i> is reported alongside every p-value to assess the strength of evidence.</p>
5e) Physiological responding (EMG <i>levator</i> activity) negatively predict subjective values of ER strategies.			<p>Fixed effects yield $p < .05$ are interpreted as subjective values are related to <i>levator</i> activity. Subjective values are interpreted as not being related to <i>levator</i> activity if $p > .05$.</p>

				The Bayes factor <i>BF10</i> is reported alongside every <i>p</i> -value to assess the strength of evidence.
6.) Is the effort required for an ER strategy the best predictor for subjective values of ER strategies?	6a) Subjective values decline with increasing effort, even after controlling for task performance (subjective arousal ratings), utility (subjective utility ratings), and physiological responding (EMG <i>corrugator</i> and <i>levator</i> activity).	<p>t tests - Linear multiple regression: Fixed model, single regression coefficient</p> <p>Analysis: A priori: Compute required sample size</p> <p><u>Input:</u></p> <p>Tail(s) = One</p> <p>Effect size $f^2 = 0.34$ (Since there are no findings in this respect yet, we have inferred from the effect size in the closest-similar model: Westbrook et al., 2013)</p> <p>α err prob = 0.05</p> <p>Power (1-β err prob) = 0.95</p> <p>Number of predictors = 4</p> <p><u>Output:</u></p> <p>Noncentrality parameter $\delta = 3.4$</p> <p>Critical t = 1.6991270</p> <p>Df = 29</p> <p>Total sample size = 34</p> <p>Actual power = 0.9529571</p>		<p>Fixed effects yield $p < .05$ are interpreted as subjective values changing significantly with ER strategy. Subjective values are interpreted as equal between ER strategies if $p > .05$.</p> <p>The Bayes factor <i>BF10</i> is reported alongside every <i>p</i>-value to assess the strength of evidence.</p>
7.) Are subjective values related to flexible emotion regulation?	7a) The higher the subjective value, the more likely the respective strategy is chosen.	<p>1) χ^2 tests – Goodness-of-fit tests_ Contingency tables</p> <p>Analysis: A priori: Compute required sample size</p> <p><u>Input:</u></p> <p>Effect size $\omega = 0.5$ (Based on our theoretical considerations, we assume a large effect)</p> <p>α err prob = 0.05</p>	<p>1) Chi-squared test with the variables “predicted choice” (= highest SV of each participant) and “choice” (Strategy 1, 2, or 3)</p> <p>2) Ordinal regression with dependent variable “Choice” (Strategy 1, 2, or 3) and independent variables “SV</p>	<p>1) χ^2 yields $p < .05$ is interpreted as predicted choice (highest SV of each participant) and actual choice show significant consistency. Predicted choice and actual choice are interpreted as independent if $p > .05$.</p>

		<p>Power (1-β err prob) = 0.95 Df = 1 <u>Output:</u> Noncentrality parameter λ = 19.8 Critical χ^2 = 11.0704977 Total sample size = 52 Actual power = 0.9500756</p> <p>2) z tests –Logistic regression Analysis: A priori: Compute required sample size <u>Input:</u> Tails: One Pr(Y=1 X=1) H1 = 0.80 (Based on our theoretical considerations, that a higher SVs should lead almost certainly to the choice of the respective strategy) Pr(Y=1 X=1) H0 = 0.333 (Based on theoretical considerations: if all SVs are equal, choice is on chance level) α err prob = 0.05 Power (1-β err prob) = 0.95 R² other X = 0 X distribution: normal X param μ = 0 X param σ = 1 <u>Output:</u> Critical z = 1.6448536 Total sample size = 25 Actual power = 0.9528726</p>	<p>strategy 1”, “SV strategy 2” and “SV strategy 3”.</p>	<p>The Bayes factor <i>BF10</i> is reported alongside every <i>p</i>-value to assess the strength of evidence.</p> <p>2) Ordinal logistic regression yields <i>p</i> < .05 is interpreted as the respective subjective value has a significant influence on the OR of the choice of a strategy. Respective SV is interpreted as not related to choice if <i>p</i> > .05.</p> <p>The Bayes factor <i>BF10</i> is reported alongside every <i>p</i>-value to assess the strength of evidence.</p>
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	<p>7b) Subjective values are lower and decline stronger when ER flexibility is lower.</p>	<p>t tests – Linear multiple regression: Fixed model, single regression coefficient Analysis: A priori: compute required sample size <u>Input:</u> Tail(s) = One Effect size $f^2 = 0.15$ (as there is no evidence in the literature, we assume a medium sized effect) α err prob = 0.05 Power (1-β err prob) = 0.95 Number of predictors = 2 <u>Output:</u> Noncentrality parameter $\delta = 3.316662$ Critical t = 1.69665997 Df = 71 Total sample size = 74 Actual power = 0.95101851</p>	<p>SVs will be ordered by magnitude. Values will be fitted in a GLM to estimate the individual intercept and slope.</p> <p>A linear regression will be computed with intercept and slope as predictors and FlexER score as criterion.</p>	<p>β yield $p < .05$ are interpreted as significant association between predictor (intercept, slope) and ER flexibility. The direction of effect is interpreted according to sign (negative or positive). p – values $> .05$ are interpreted as no association between predictor and ER flexibility.</p> <p>The Bayes factor <i>BF10</i> is reported alongside every p-value to assess the strength of evidence.</p>
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Exploratory: Are individual subjective values of ER strategies related to personality traits?			<p>Multilevel model of SVs with level-1-predictors subjective effort, subjective arousal, <i>corrugator</i>, and <i>levator</i> muscle activity and level-2-predictors NFC and self-control using subject specific intercepts and allowing random slopes for ER strategies.</p> <p>The null model and the random slopes model are calculated using lmer() of the lmerTest-package.</p> <p>Bayes factors are computed for the MLM using the BayesFactor-package.</p>	<p>Fixed effects yield $p < .05$ are interpreted as subjective values are related to NFC and self-control. Subjective values are interpreted as not being related to subjective effort if $p > .05$.</p> <p>The Bayes factor <i>BF10</i> is reported alongside every p-value to assess the strength of evidence.</p>
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