

Anna Fischer¹, Alexander Ecker² & Annekathrin Schacht¹

[1] Affective Neuroscience and Psychophysiology Laboratory, Institute of Psychology, Georg August University of Göttingen, Germany; Leibniz ScienceCampus "Primate Cognition", Göttingen, Germany

[2] Institute of Computer Science and Campus Institute Data Science, University of Göttingen, Germany; Max Planck Institute for Dynamics and Self-Organization, Göttingen, Germany; Leibniz ScienceCampus "Primate Cognition", Göttingen, Germany

Introduction

- How we regulate our emotions is essential for our well-being and social relationships [e.g., 1]. Emotion regulation (ER) is a highly complex, adaptive, and dynamic process and thus difficult to assess under restricted conditions.
 - Lack of studies investigating the ER processes in real life situations
- Moreover, it has been suggested that not the use of specific 'adaptive' ER strategies (e.g., reappraisal) but greater ER flexibility is related to increased adaptation to the environment and better mental health. Thus, well-being requires flexibly adapting emotion regulation strategies to fit with differing situational demands [2, 3].

Research questions

- How are health and well-being reflected in emotion regulation choice according to situational and emotional factors?
- How is emotion regulation flexibility related to health and well-being?

Materials and methods

Participants

- 100 subjects: 18-35 years, native German speakers, no history of psychiatric diseases

Lab Session

- Demographic data
- Questionnaires (well-being scores): physical and mental health (SF-36), social and global self-satisfaction (BSZ-S), drug consumption score (use of alcohol, tobacco, medication, other drugs)
- Installing the App

Experience sampling (smartphone app)

- RealLife Exp custom made package
- Running for 2 - 4 weeks
- 5 times per day (8am - 10pm) with at least 3h between beeps

Study design (app-questions)

Since the last beep, did you experience an emotional situation? yes/no



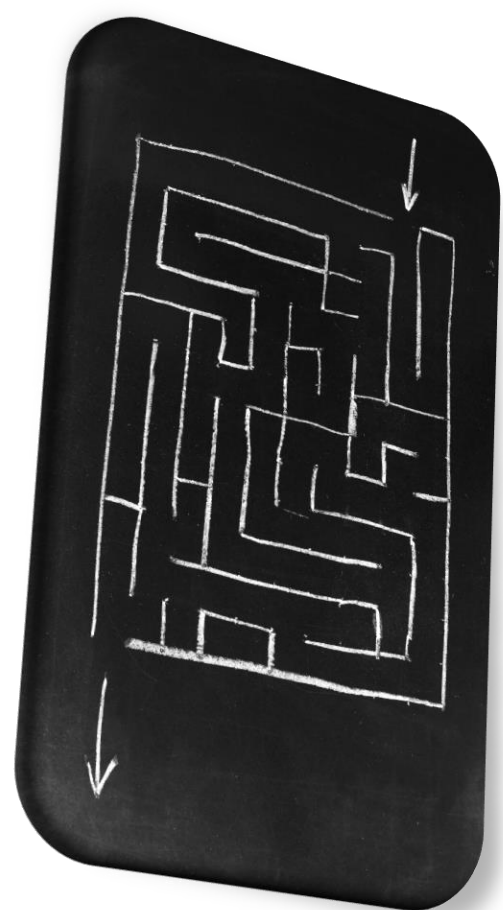
- VALENCE situation:** 1-very negative, 2-negative, 3-rather negative, 4-neutral, 5-rather positive, 6-positive, 7-very positive, 0-don't know/doesn't apply
- CONTEXT location:** school/university/work – hobby/sports – home – other: _____
- CONTEXT social:** friends/partner/family – colleagues – boss – strangers – patients/clients – nobody/alone – other: _____
- EXPECTED REOCCURRENCE:** 1-very unlikely, 2-unlikely, 3-rather unlikely, 4-neither/neutral, 5-rather likely, 6-likely, 7-very likely, 0- don't know/doesn't apply
- CONTROL:** 1-completely uncontrollable, 2-uncontrollable, 3-rather uncontrollable/somewhat controllable, 4- neither/neutral, 5-rather controllable, 6-controllable, 7-completely controllable, 0-don't know/doesn't apply
- EMOTION LABEL: label : _____
- INTENSITY:** 1-very weak, 2-weak, 3-rather weak, 4-neutral, 5-rather strong, 6-strong, 7-very strong, 0-don't know/doesn't apply
- VALENCE emotion:** 1-very negative, 2-negative, 3-rather negative, 4-neutral, 5-rather positive, 6-positive, 7-very positive, 0-don't know/doesn't apply
- DIFFICULTY:** 1-very easy, 2-easy, 3-rather easy, 4-neither, 5-rather difficult, 6-difficult, 7-very difficult, 0-don't know/doesn't apply
- SUCCESS:** 1-very unsuccessful, 2-unsuccessful, 3-rather unsuccessful, 4-neither/neutral, 5-rather successful, 6- successful, 7-very successful, 0-don't know/doesn't apply
- GOAL:** pro-hedonic, contra-hedonic, pro-social (other-focused), impression management (self-focused), performance, epistemic (world-oriented), epistemic (self-oriented), eudaemonic, other: _____; I have pursued several goals: yes/no
- STRATEGY:** problem solving, catastrophizing, distraction/behaviour, rumination, reappraisal, suppression, distraction/impulsive behaviour, acceptance, self- or other-blame, seeking social support, putting into perspective, no regulation, other : _____; I have used several strategies: yes/no

Planned analyses

General points

- binomial mixed model for each strategy (or multinomial model) with maximal random structure (intercept, slopes, and correlation between random slopes and random intercepts)
- nested structure: event (reported emotional situation) in day in subject
- to be considered: amount of available data points (duration, response rate, reported situations), number of levels of the response variable (amount of variation, chosen in 10-90% of all cases, "other" options), number of predictors (collinearity), number of included interactions (model comparisons)

ER choice: strategy ~ situation, emotion, well-being



Basic model predictors:

- situation:** valence, context (location/social), expected reoccurrence, control
- emotion:** intensity, valence, goal
- well-being:** physical & mental health, global & social satisfaction, drug consumption score

Basic model interactions:

- valence * (intensity + control + expected reoccurrence)
- intensity * expected reoccurrence

ER strategy

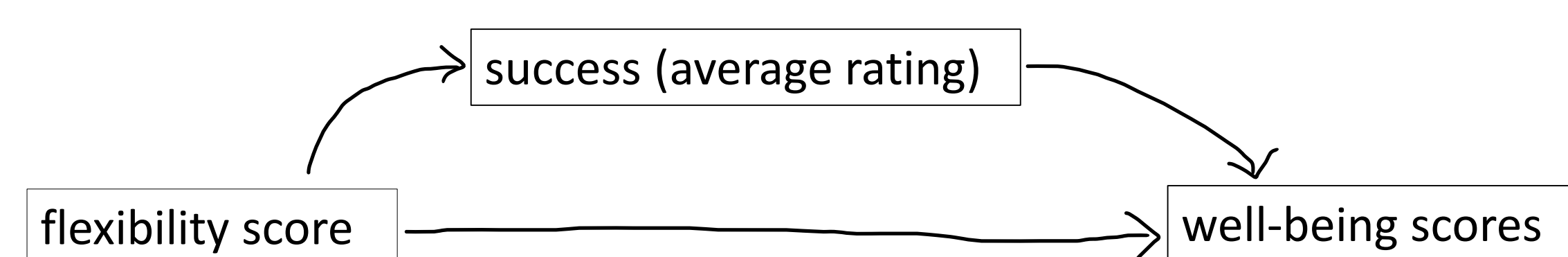
problem solving, catastrophizing, distraction/behaviour, rumination, reappraisal, suppression, distraction/impulsive behaviour, acceptance, self- or other-blame, seeking social support, putting into perspective, no regulation

Model comparison & selection

test interaction terms with model comparison approach

ER flexibility

Aim: path analysis to investigate 2nd research question



How to calculate a flexibility score?

Basic model IVs:

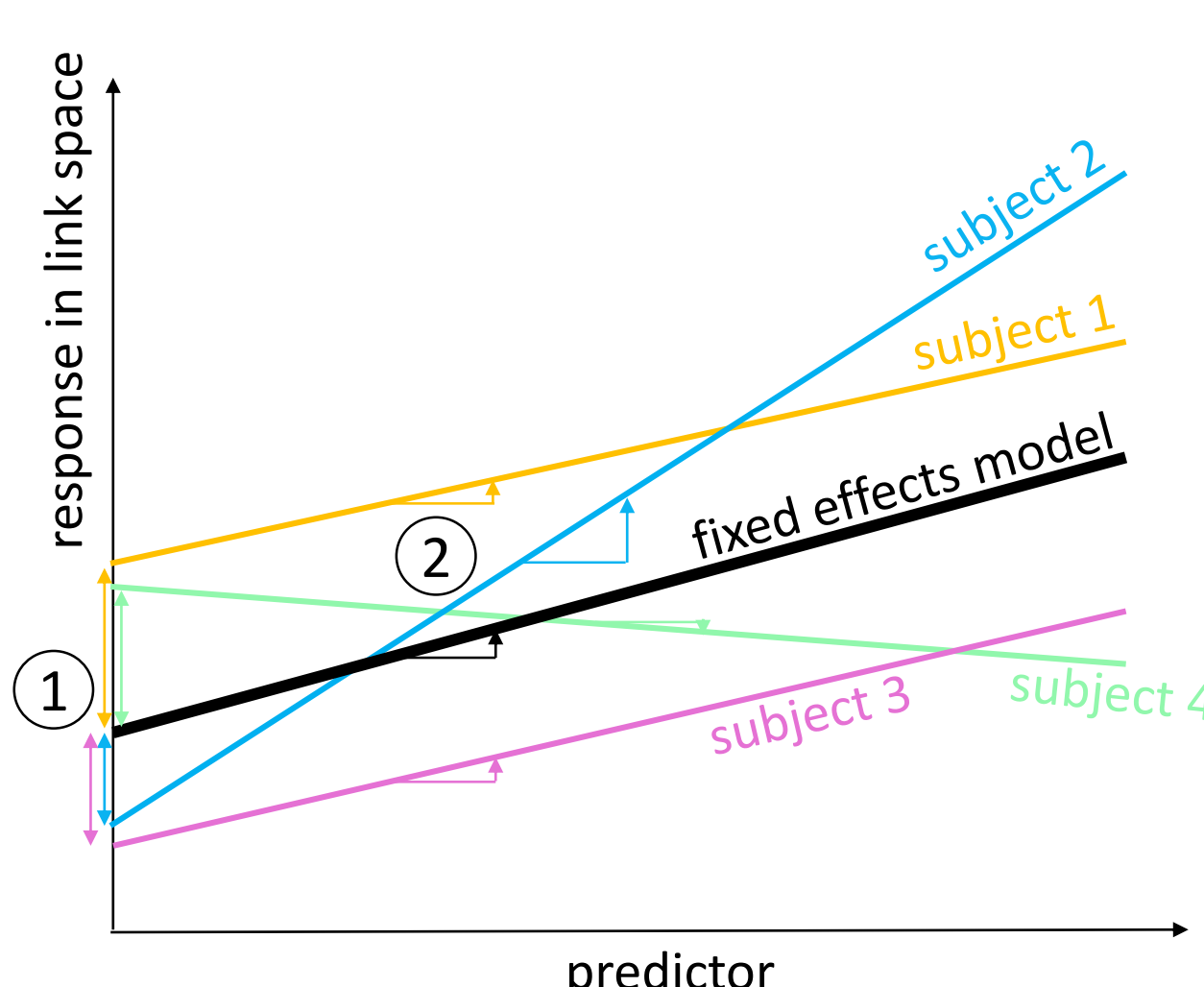
- situation:** valence, context (location/social), expected reoccurrence, control
- emotion:** intensity, valence, goal

Basic model interactions:

- valence * (intensity + control + expected reoccurrence)
- intensity * expected reoccurrence

Model comparison & selection (as for ER choice)

Flexibility is reflected in the difference between individual-specific and mean estimates: BLUPs



- intercept BLUPs:** estimated difference between individual-specific estimate (random intercepts) and mean estimate (fixed effect intercept) as absolute values
- slope BLUPs:** estimated difference between individual-specific estimate (random slope) and mean estimate (fixed effect slope)

flexibility score: averaging the slope and intercept BLUPs (absolute values) over each predictor and strategy for each participant

References:

- [1] Heij & Cheavens (2014), *Emotion*, 14(5), 878-891.
 [2] Kashdan (2010), *Clin Psychol Rev*, 30(7), 865-878.
 [3] Aldao et al. (2015), *Cogn Ther Res*, 39, 263-278.