

Modeling Learners Beyond the Mean

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Experimenteller Vergleich von Likert Skala und visueller Analogskala im Ecological Momentary Assessment von Affekt bei Studierenden

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Within-person Perspektive
Blume et al., 2022; Blume & Schmiedek, 2024

Ideographie vs. & Nomotheetik
Molenaar & Valsiner, 2009

Please indicate to what extent you feel the following mood states and physical sensations at this moment:

Sad

Not at all Extremely

Tap on the line to start!

Kontrolle von Trait-Varianz
Hamaker et al., 2007

Assessment von Dynamiken
Haslbeck & Ryan, 2022

Methodologie: Meistens unbegründet/intuitiv
Haselbeck et al., 2023

*Typischer Ansatz:
7-stufige Likert oder visuelle
Analogskala,
lineares gemischtes Modell*
Haselbeck et al., 2023

Please indicate to what extent you feel the following mood states and physical sensations at this moment:

Sad

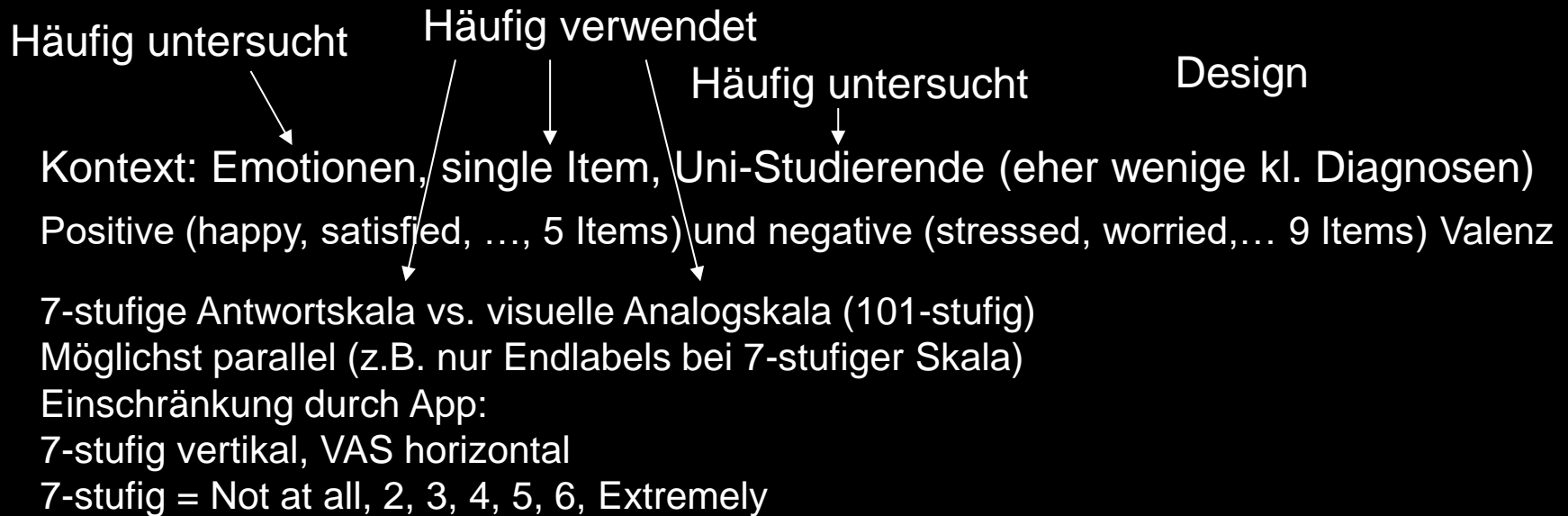
Not at all Extremely

Tap on the line to start!

*Frühere Studien über
Antwortformate: Hauptsächlich
querschnittlich, höhere
Reliabilität mit > 4
Antwortstufen (siehe Simms et al., 2019;
Fritz et al., 2024)
Übertragbarkeit?*

*Forschungsfrage:
Wie wirkt sich die Antwortskala
aus? Auf...*

- ... 1) Univariate Statistiken/Verteilungen
- 2) Multivariate Statistiken/Verteilungen
- 3) Zusammenhänge mit externen Kovariaten
- 4) Subjektive Bewertung



Between-person (Vermeidung von Übertragungseffekten/Manipulationsreaktanz):
Zwei Wochen, 3x täglich, entweder immer 7-stufig oder immer VAS

Please indicate to what extent you feel the following mood states and physical sensations at this moment:

Sad

☐ Not at all

☐ 2

☐ 3

☐ 4

☐ 5

☐ 6

☐ Extremely

Please indicate to what extent you feel the following mood states and physical sensations at this moment:

Sad

Not at all Extremely

Tap on the line to start!

N(Likert) = 63,

N(VAS) = 56

M(age) = 22 (SD = 4)

Modellierungen:

Bayesianische Mehrebenenmodelle in brms

Verteilungen: Deskriptive Statistiken pro Person berechnet und deren Verteilungen Modelliert.

z.B. Within-person means: zero-inflated beta

Fixed effects: Antwortformat (contrast coding, baseline = Likert), Valenz (effects coding) + Interaktion

Random effects: Intercept über Personen, Random slopes über Items

Distributional models: Fixed effects auf alle Verteilungsparameter (Zero-Anteil, beide beta-Parameter)

Please indicate to what extent you feel the following mood states and physical sensations at this moment:

Sad

☐ Not at all

☐ 2

☐ 3

☐ 4

☐ 5

☐ 6

☐ Extremely

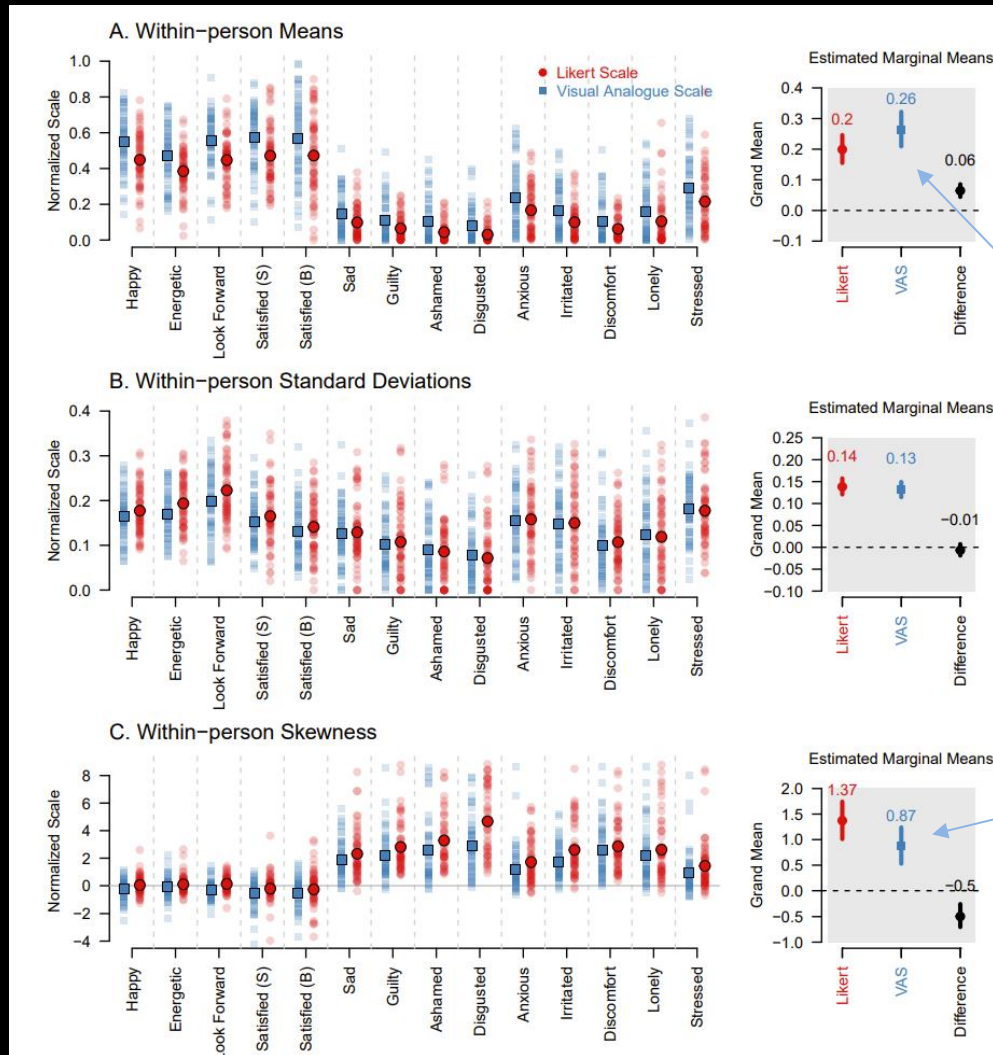
Please indicate to what extent you feel the following mood states and physical sensations at this moment:

Sad

Not at all Extremely

Tap on the line to start!

Ergebnisse: Deskriptive Verteilungsparameter



7-stufig

Please indicate to what extent you feel the following mood states and physical sensations at this moment.

Sad

Not at all

2

3

4

5

6

Extremely

VAS

Please indicate to what extent you feel the following mood states and physical sensations at this moment.

Sad

Not at all

Extremely

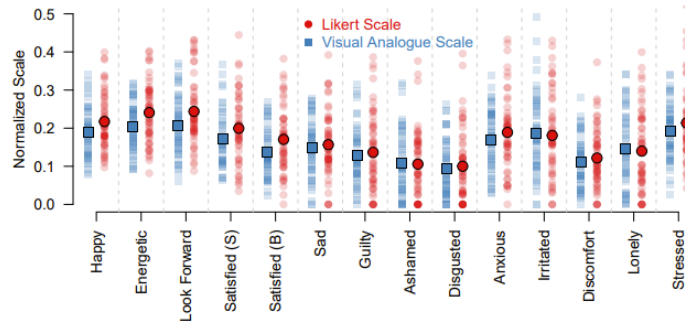
Tap on the line to start!

Höhere Mittelwerte

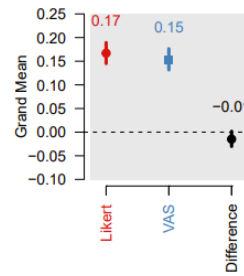
Geringere Schiefe

Ergebnisse: Within-Person Dynamiken

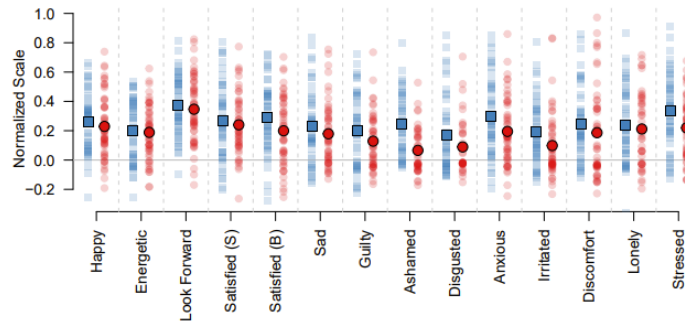
A. Within-person RMSSD



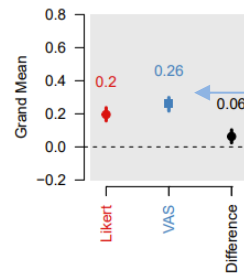
Estimated Marginal Means



B. Within-person Autocorrelation



Estimated Marginal Means



Höhere Autokorrelation

7-stufig

Please indicate to what extent you feel the following mood states and physical sensations at this moment.

Sad

Not at all

2

3

4

5

6

Extremely

VAS

Please indicate to what extent you feel the following mood states and physical sensations at this moment.

Sad

Not at all

Extremely

Tap on the line to start!

Ergebnisse: Multivariate Verteilungen

7-stufig

Please indicate to what extent you feel the following mood states and physical sensations at this moment.

Sad

Not at all

2

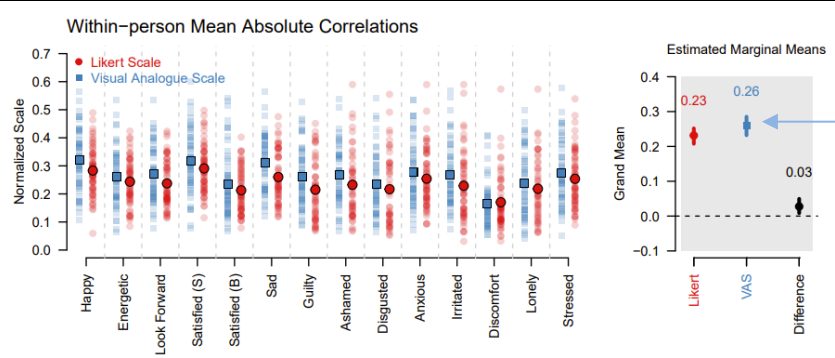
3

4

5

6

Extremely



Etwas höhere within-Person Itemkorrelationen

VAS

Please indicate to what extent you feel the following mood states and physical sensations at this moment.

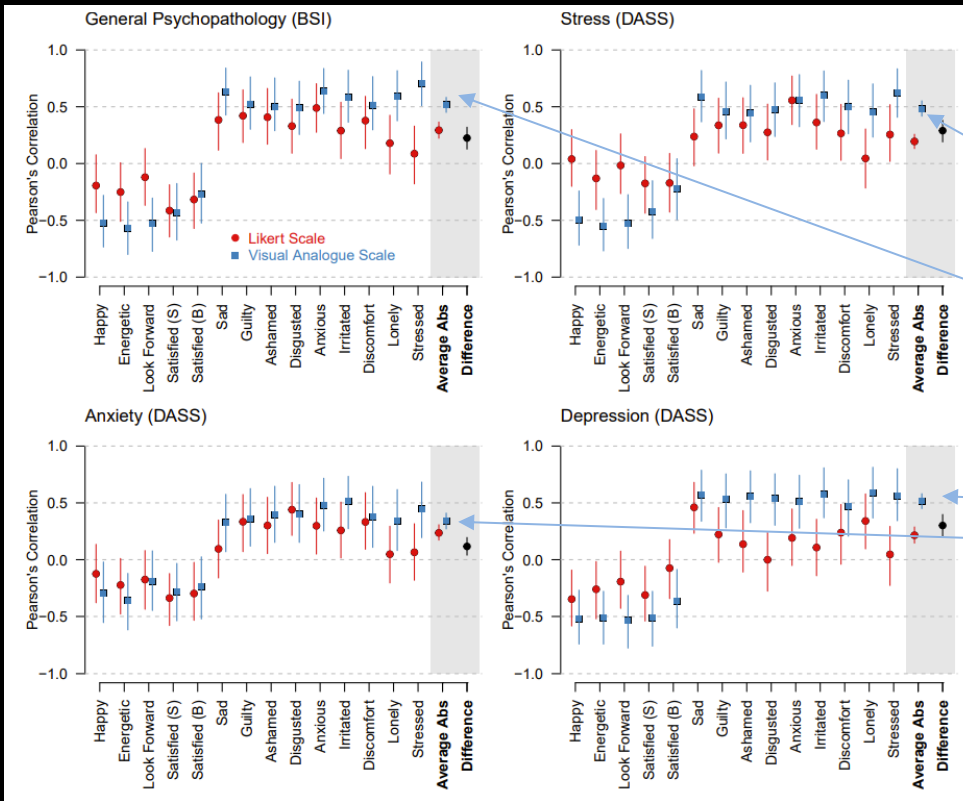
Sad

Not at all

Extremely

Tap on the line to start!

Ergebnisse: Korrelationen mit externen Kriterien (Skalen klinischer Symptome)



7-stufig

Please indicate to what extent you feel the following mood states and physical sensations at this moment:

Sad

Not at all

2

3

4

5

6

Extremely

Brutal höhere
Korrelationen

VAS

Please indicate to what extent you feel the following mood states and physical sensations at this moment:

Sad

Not at all

Extremely

Tap on the line to start!

Ergebnisse: Weitere Ergebnisse

Subjektive Einschätzung recht ähnlich; deskriptiv VAS
etwas anstrengender und unklarer

Wenig Multimodalität auf beiden Skalen (vgl. Haslbeck et al., 2023)

Missing data & Bearbeitungszeit ähnlich

Kein *Initial Elevation Bias* (Shrout et al., 2017)

7-stufig

Please indicate to what extent you feel the following mood states and physical sensations at this moment.

Sad

1 Not at all

2

3

4

5

6

7 Extremely

VAS

Please indicate to what extent you feel the following mood states and physical sensations at this moment.

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Extremely

Tap on the line to start!

Ergebnisse: Schlussfolgerung

Unsere VAS greift mehr systematische Variation im niedrigen Bereich ab.

(Höhere Mittelwerte, weniger Schiefe, höhere Korrelationen mit externen Kriterien) – vorläufige Empfehlung in *ähnlichen Studienkontexten*.

Einschränkung:

- Konstrukte, bei denen sich wichtige Varianz nah an den Skalenlimits (Min./Max.) abspielt (z.B. klinische Symptome bei nicht-klinischen Populationen)
- 7-stufige Skala: Zweite Kategorie «2», was wäre bei «1» oder (*echtem* Likert-)Label «gering»/»sehr gering»?
- Wir brauchen (Replikationen &) faktorielle Studien, die viele Faktoren (Anzahl Stufen, Position & Inhalte der Labels, horizontal vs. vertikal, Startpunkt auf VAS) gleichzeitig randomisieren, (Baribault et al., 2018), potentiell within-Person
 - Sowie kognitive Surveys und formale Modelle (Antwortprozess ergründen & modellieren)
 - Multi-Item Skalen

7-stufig

Please indicate to what extent you feel the following mood states and physical sensations at this moment:

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2

3

4

5

6

7 Extremely

VAS

Please indicate to what extent you feel the following mood states and physical sensations at this moment:

Sad

Not at all

Extremely

Tap on the line to start!

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