Interoception and interpersonal expectations in emotion recognition under uncertainty

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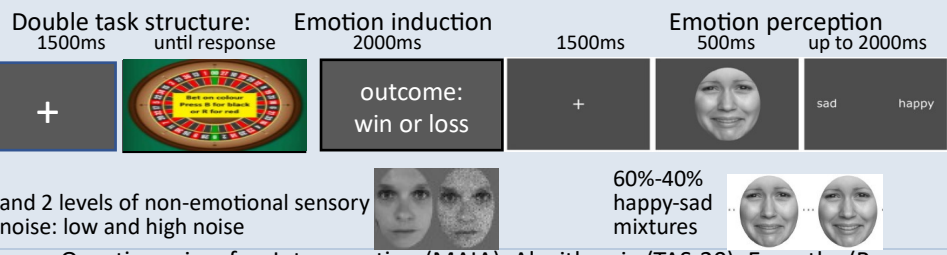
Study 1 and 2

Theoretical background

· Emotion perception is based on various internal bodily and interpersonal cues with different sources and levels of uncertainty

· Emotion egocentricity bias (EEB): Judgement of other's emotions is influenced by one's own emotional state (Trilla, Wiagand & Dziobek, 2020)

Research questions

· Is EEB influenced by probabilistic associations between self's and other's emotional state?

· Is EBB more pronounced under conditions of increased perceptual (visual) uncertainty?

Methods

• Study 1 is an online study and study 2 is the lab version with additional physiological measurements and questionnaires

• Participants: 46 (study 1), 27(study 2)

• **Emotion induction task**: a roulette game with gains and losses linked to a prize, however, wins and losses are controlled in every trial

• **Emotion perception task**: After the emotion induction in every trial, participants have to make emotional judgements (as accurate and fast as possible), in a 2AFC task, on images of people with mixed facial expressions, comprising a mixture of happy and sad expressions

• Blocks: Neutral expectations(50-50 congruent-incongreunt trials), Expected congruency (70-30 congruent-incongruent trials), Expected incongruency (30-70 congreunt-incongreunt trials)

Double task structure:

| 1500ms | until response | Emotion induction 2000ms | 1500ms | Emotion perception 500ms | up to 2000ms |

+ | roulette | outcome: win or loss | + | (face) | sad   happy

and 2 levels of non-emotional sensory noise: low and high noise

60%-40% happy-sad mixtures

• Questionnaires for: Interoception (MAIA), Alexithymia (TAS-20), Empathy (Baron-Cohen Empathy Quotient)

• Physiology measurements: Electrocardiagram, Skin conductance

Results
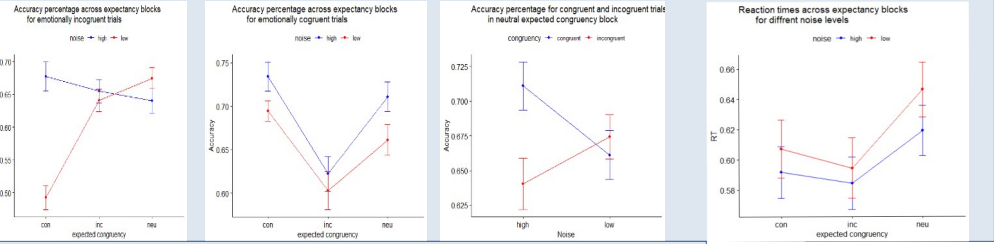
Results presented are from online Study (we observe almost full replication in the lab stud

• ANOVA for accuracy (congruency(2) x expected_congruency(3) x noise(2

• Main effect noise: $F_{(1,42)}=19.081$, $p<0.001$

• Main effect congruency: $F_{(1,42)}=6.871$, $p<0.01$

• Main effect expected congruency: $F_{(2,84)}=6.242$, $p<0.01$

• Interaction congruency x exp_congruency: $F_{(2,84)}=30.617$, $p<0.001$

• Interaction noise x exp_congruency: $F_{(2,82)}=15.705$, $p<0.001$

• Interaction coingruency x noise x exp_congruency: $F_{(2,84)}=12.917$, $p<0.001$

ANOVA for reaction times (congruency(2) x expected_congruency(3) x noise(2))
• Main effect noise: $F_{(1,42)}=4.081$, $p<0.5$
• Main effect exp_congruency: $F_{(2,84)}=1.094$, $p<0.001$

Conclusions and future steps

• Implicit expectations of interpersonal emotion contingencies affect emotion perception increasing wrong judgments and decreasing reaction times

• Visual noise also enhances projection of self-emotion decreasing accuracy but only in the block of neutral expectations

• The behavioural data will be analyzed using hierarchical bayesian modeling (HGF) to examine how participant learn interpersonal emotion contingencies by taking into account different sources of uncertainty, and how this processing is affect by bodily sensations and arousal

Study 3 and 4

Theoretical background

· Emotion processing of self and others is linked to interoception and alexithymia

· Anxiety is related to problematic processing of uncertainty but also to aberrant perception of bodily signals

· Various anxiety disorders have been linked to distinct emotion perception of others and difficulties in empathizing and social interactions

Research questions

· How interoception and alexythimia predict anxiety and intolerance of uncertainty?

· How intolerance of uncertainty, anxiety and interoception affect empathic abilities and emotion perception under conditions of uncertainty?

Methods

• Participants: study 3:120, study 4:60

• 5 questionnaires: Interoception (MAIA), Alexithymia (TAS-20), Intolerance of uncertainty scale, Anxiety (STAI), Empathy (Interpersonal Reactivity Index)

• Study 3 uses the above questionnaires (except IRI) to perform data analysis using Structural Equation Modelling

• Study 4 uses the 5 questionnaires and an emotion recognition task

• Emotion recognition task:

Participants have to categorize the emotion they see in faces with ambiguous expressions comprising mixtures of happy, angry, and fearful faces. In 3 different blocks they have to decide among the emotion pairs: happy-fearful, happy-angry, angry-fearful

· Diffusion drift model analysis will be used to analyse the behavioural data to examine how the sampling and decision making processes are linked to individual differences

Study 3 results
Structural equation model

Indirect pathways with $p<0.05$
• d1*e1
• d1*e1*i1
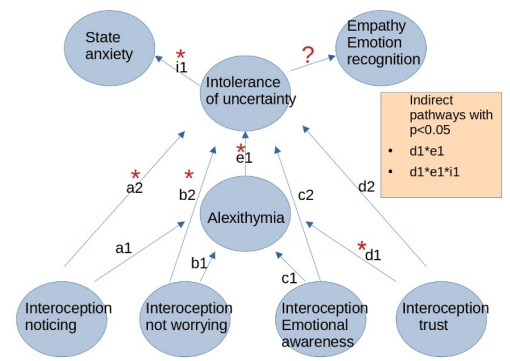
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