

Effect of Visual Stimuli on Emotional Transition

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This project was presented in the Cognitive Neuroscience Course.

Background

- Study on Mental Health in our campus, it's alarming
- We thought of proposing an ideal website design as an interface for students to reach out people
- Images for web pages - positive and empathetic outlook
- Wanted to see if images do impact the overall experience

Objective

- We want to explore if there is any temporal persistence of emotion when transition in stimuli occurs

Hypothesis

- Null Hypothesis: There is no carried effect in emotion, when type of stimuli changes

Stimuli

- Static Images

- **Sad (B1)**: crying, depressed
- **Happy (B2)**: enjoying, smiling
- **Nature (B3)**: birds, mountains, river
- **Kind acts (B4)**: helping
- **Neutral** : jogging, walking

- Presentation of Stimuli

- 4 blocks
- 1st - Sad(Fixed)
- Sad(B1) | (B2/ B3/ B4) - Randomised block shuffling
- Each block's sequence: b1 b2 n1 b3 b4

SAD block
2 sad images

HAPPY block
4 happy images +
1 neutral image

KIND block
4 images of kind acts
+ 1 neutral image

NATURE block
4 images of nature +
1 neutral image

Experiment Design

- Single blind
- Randomised Sampling: 10 participants (6F, 4M)
- To counterbalance the order effect: Pure randomisation in 3 blocks
- Independent Variable: Visual Stimuli
- Dependent Variable: Emotion depicted

Procedure

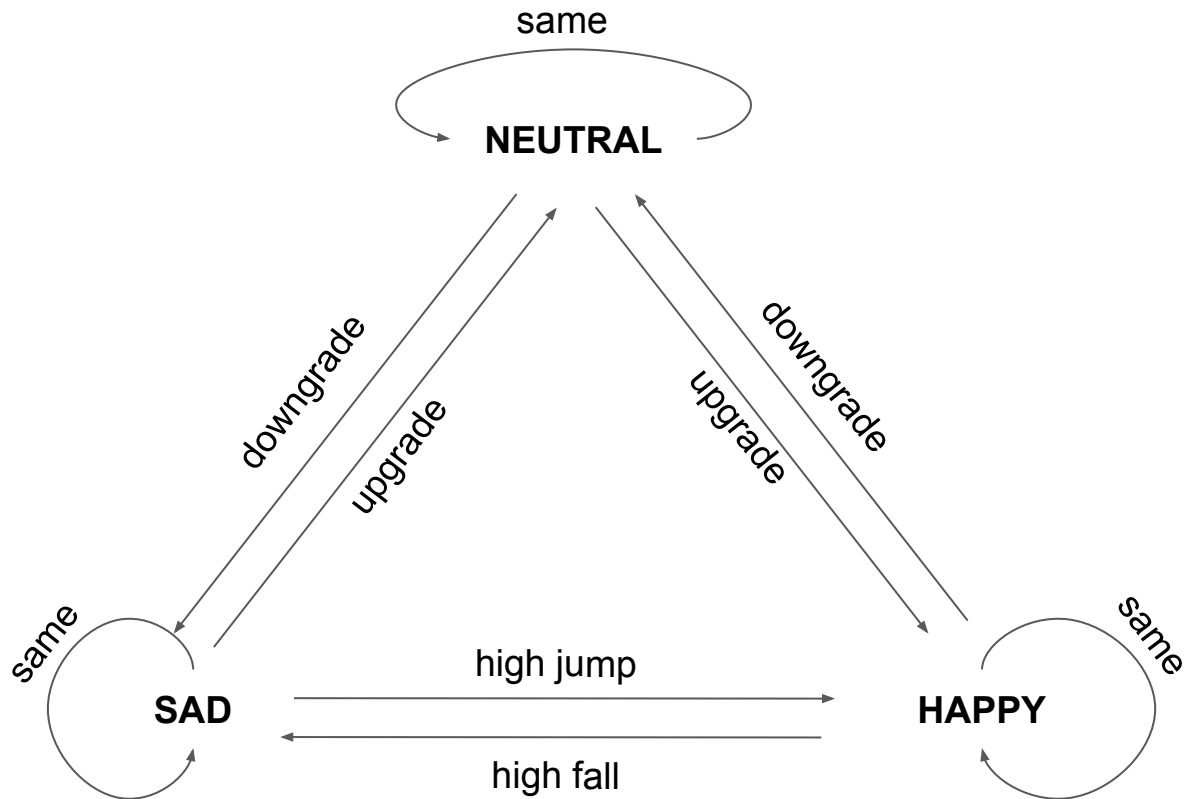
- Participants demographics
 - Subject ID
 - Age: Avg 23 yrs
 - Gender: Male, Female, Others, Prefer not to say
- Screening task
 - Emotion Reactivity Scale (ERS) Survey: 21 questions
- Main experiment(Designed using OpenSesame)
 - Instructions
 - Sequence of Stimuli: [Fixation dot(2s) -> Image(6s) -> Response] - 17 times

ERS Survey

- 21-item self-report measure of emotional reactivity
- Measures three aspects (subscales) of emotion reactivity:
 - Sensitivity -10Q
 - Intensity - 7Q
 - Persistence - 4Q
- Each item is rated on a scale of 0-4
 - “not at all like me” to “completely like me”

		0 Not at all like me	1 A little like me	2 Somewhat like me	3 A lot like me	4 Completely like me
1	When something happens that upsets me, it's all I can think about it for a long time.	0	1	2	3	4
2	My feelings get hurt easily.	0	1	2	3	4
3	When I experience emotions, I feel them very strongly/intensely.	0	1	2	3	4
4	When I'm emotionally upset, my whole body gets physically upset as well.	0	1	2	3	4
5	I tend to get very emotional very easily.	0	1	2	3	4
6	I experience emotions very strongly.	0	1	2	3	4
7	I often feel extremely anxious.	0	1	2	3	4
8	When I feel emotional, it's hard for me to imagine feeling any other way.	0	1	2	3	4
9	Even the littlest things make me emotional.	0	1	2	3	4
10	If I have a disagreement with someone, it takes a long time for me to get over it.	0	1	2	3	4
11	When I am angry/upset, it takes me much longer than most people to calm down.	0	1	2	3	4
12	I get angry at people very easily.	0	1	2	3	4
13	I am often bothered by things that other people don't react to.	0	1	2	3	4
14	I am easily agitated.	0	1	2	3	4
15	My emotions go from neutral to extreme in an instant.	0	1	2	3	4
16	When something bad happens, my mood changes very quickly. People tell me I have a very short fuse.	0	1	2	3	4
17	People tell me that my emotions are often too intense for the situation.	0	1	2	3	4
18	I am a very sensitive person.	0	1	2	3	4
19	My moods are very strong and powerful.	0	1	2	3	4
20	I often get so upset it's hard for me to think straight.	0	1	2	3	4
21	Other people tell me I'm overreacting.	0	1	2	3	4

Transitions in Emotions



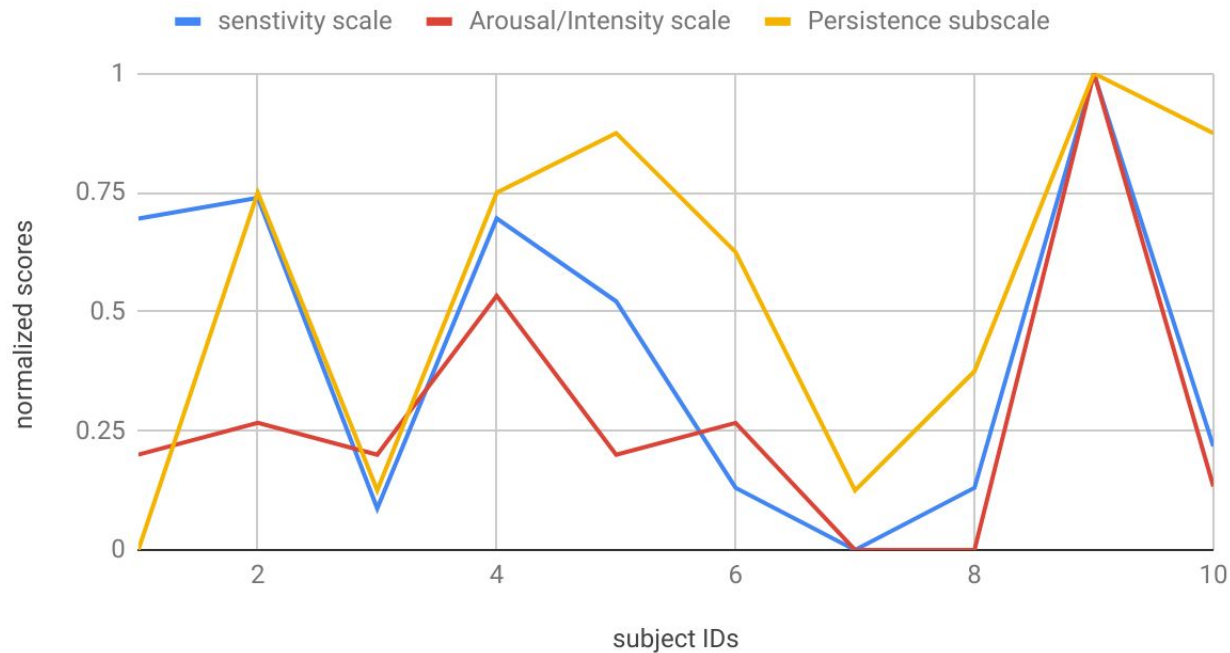
Measures

- ERS responses - 21Q:
 - Subscale trend among subjects
- Responses from participants:
 - Happy
 - Neutral
 - Sad
- Screen recording tuned with facial expression recording(with consent)

Emotional Reactivity Scale

- **Most Dominant:**
Persistence
- **Moderately Dominant:**
Sensitivity
- **Least Dominant:**
Arousal/ Intensity

Screening Task



Response Analysis

- Maximum upgrades: Sad to Happy
- Persistence of emotion: Depicted by “**Same**” column
- Same: response didn’t change on stimuli transition

	High Fall	Downgrade	Same	Upgrade	High Jump
Sad to Happy(4)				3	1
Sad to Kind(1)			1		
Sad to Nature(5)			2	2	1
Happy to Kind(4)	1		1	2	
Happy to Nature(3)			2	1	
Kind to Happy(4)		1	3		
Kind to Nature(2)		1		1	
Nature to Happy(2)			2		
Nature to Kind(5)			4	1	
Column Total	1	2	15	10	2

Analysis - CHI Square

- Categorical Data
- To find relation between:
 - Change in stimuli type
 - Emotional response
- Degrees of freedom
 - $8*4 = 32$
- CHI Square value: 32.4
- Probability(p) value: 0.446
- Alpha = 0.5
- CHI Square(crit) = 31.33
- $p < 0.5$ Null hypothesis gets rejected
 - Stating there is a carried effect in emotion, when type of stimuli changes

Future Scope

- Can be performed on a larger sample size
- Facial expressions can be analyzed
- Mental state changes can be measured using EEG
- Short videos can be used instead of images as stimuli
- Eye tracking can be used

Reference to ERS

https://projects.iq.harvard.edu/files/nocklab/files/nock_2008_emotion_reactivity_scale_behther_0.pdf