IP Presentation

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COVERT SHIFT OF ATTENTION MODULATES PUPIL DIAMETER IN EMOTION PERCEPTION

1. **Covert Shift of Attention:** This refers to the involuntary or unconscious redirection of attention. In the context of emotion perception, it suggests that without conscious awareness, individuals might focus their attention on specific aspects of emotional stimuli.
2. **Modulates Pupil Diameter:** "Modulates" means it changes or influences, while "pupil diameter" refers to the size of the pupil in the eye. The **pupil dilates (gets larger) or constricts (gets smaller) in response to various factors, including changes in light and cognitive processes**. In this case, the study suggests that the covert shift of attention affects the size of the pupil.
3. **Emotion Perception:** This refers to the process of recognizing and interpreting emotions in others, through facial expressions. Emotion perception involves both conscious and unconscious processes.

PURPOSE OF STUDY

“To investigate the influence of facial expressions being presented at varying eccentricities(covertly) on pupillary response(pupil diameter)”

STEP BY STEP WORKING ON THIS EXPERIMENT

Task I

Finalizing the logistics of experiment

Task II

Designing the experiment on psychopy

Task III

Performing the experiment on participants (Trial-Run)

Task IV

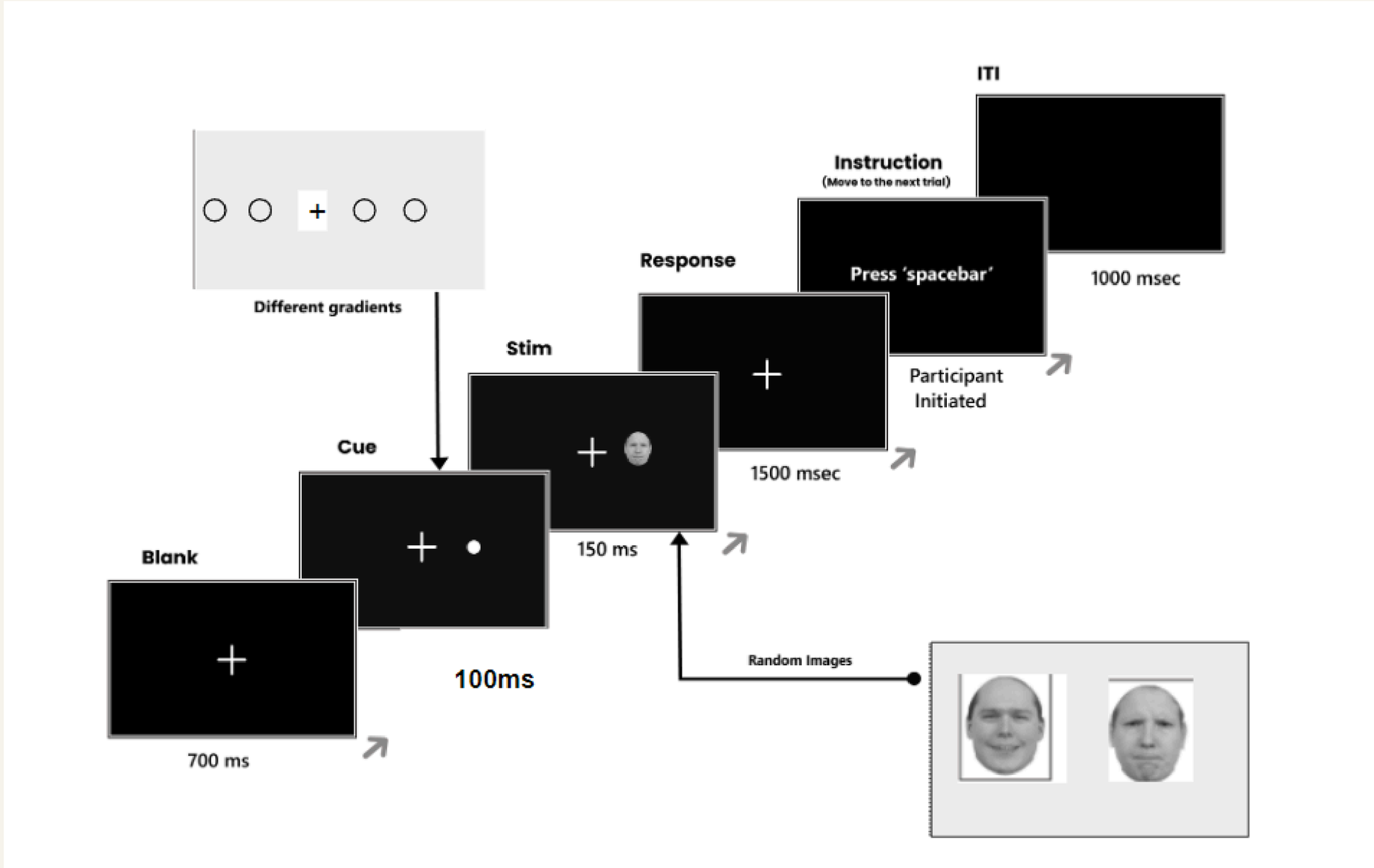
Based on User-response & analysis of results, performed changes in experiment

Task V

Final Version of experiment is Formulated

Experiment Designing & Methodology

STUDY DESIGN



Method:

Participants were chosen and they were instructed to wear eye trackers. Their pupils were adjusted to fitting of camera of eye-tracker. Their eyes were calibrated with the help of cursor to ensure that pupil of the eyes were properly aligned wit eye-tracker.

A fixation point was presented for 700ms at the center. Participant was instructed to put gaze at the center. A cue in shape of small white circle was then presented at center for 100ms.

Facial expression(angry/happy) was presented at eccentricities(6 degree,12 degree) at both possible directions (Left, Right) of center for 150ms. Then, participant is given 1500ms to register his/her response. After each trial, participant has to press any key to start the next trial.

Method:

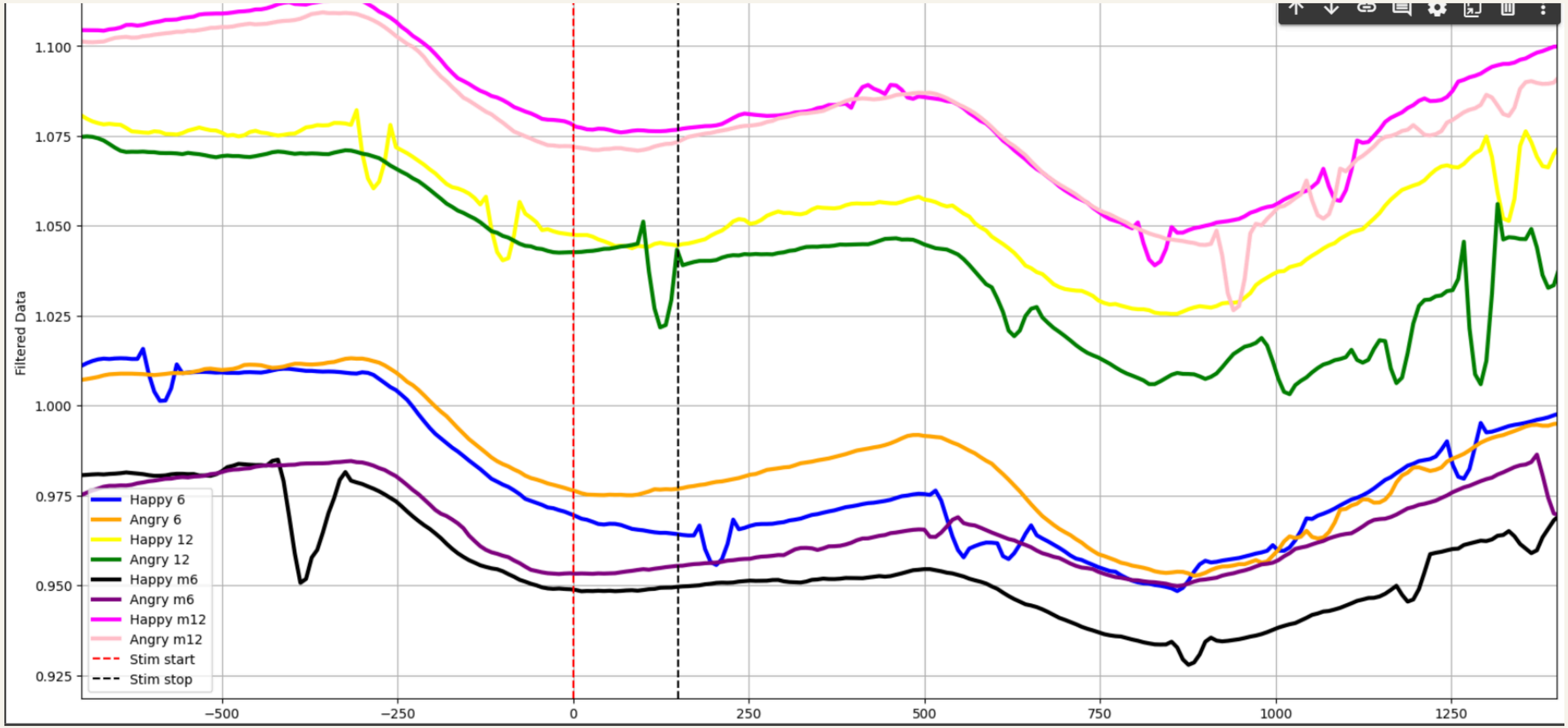
=> 3 Blocks of trials, each block consisting of 120 trials were performed (total=360 trials). These 3 trials were E1,E2 and Baseline.

- **E1 included trials in which user has to respond to right key on keypad when happy expression was presented else left key for any other expression.**

- **E2 included trials in which user has to respond to right key on keypad for angry expression was presented else left key for any other expression.**

- **One block was especially designed for Baseline experiment. Baseline block consisted of trials in which user has to respond to right key if they found red colored dot on forehead of facial expression else press left key if they found it on Chin of face.**

Mean Pupillary Response(eye-diameter vs time)



ANALYSIS OF CURVE

=> The curve represents mean pupil diameter vs time for 4 participants. Since, Number of participants are very less so we can not conclude anything firmly but I have tried to analyze this result and tried to generalize it.

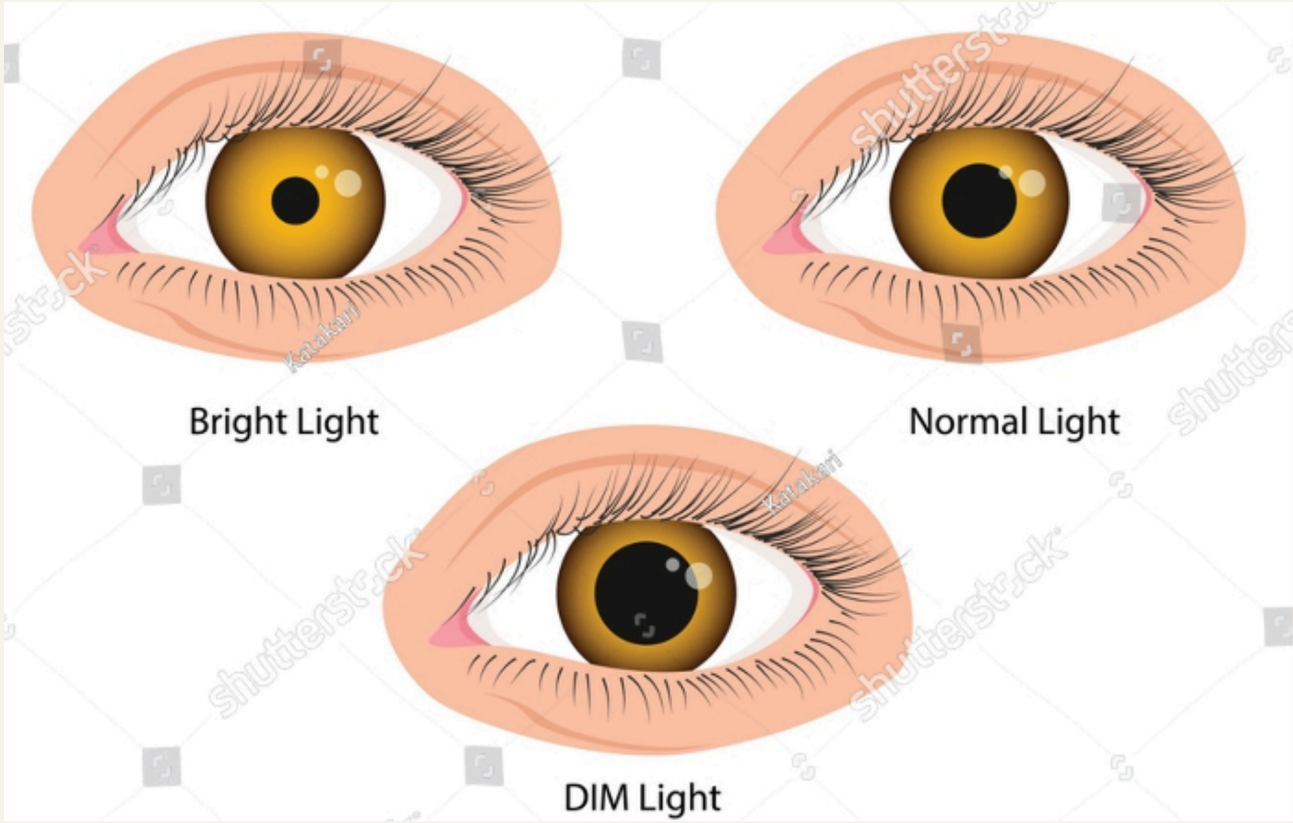
analysis:

Pupillary Diameter at facial expressions with 12 degrees eccentricity > Pupillary Diameter at facial expressions with 6 degrees eccentricity

Concept of PLR

Pupillary light reflex

The pupillary light reflex is an autonomic reflex that constricts the pupil in response to light, thereby adjusting the amount of light that reaches the retina.



Experimental Changes performed

Change 1: Initially, we decided to perform experiment for 3 eccentricities but later changed to 2 eccentricities

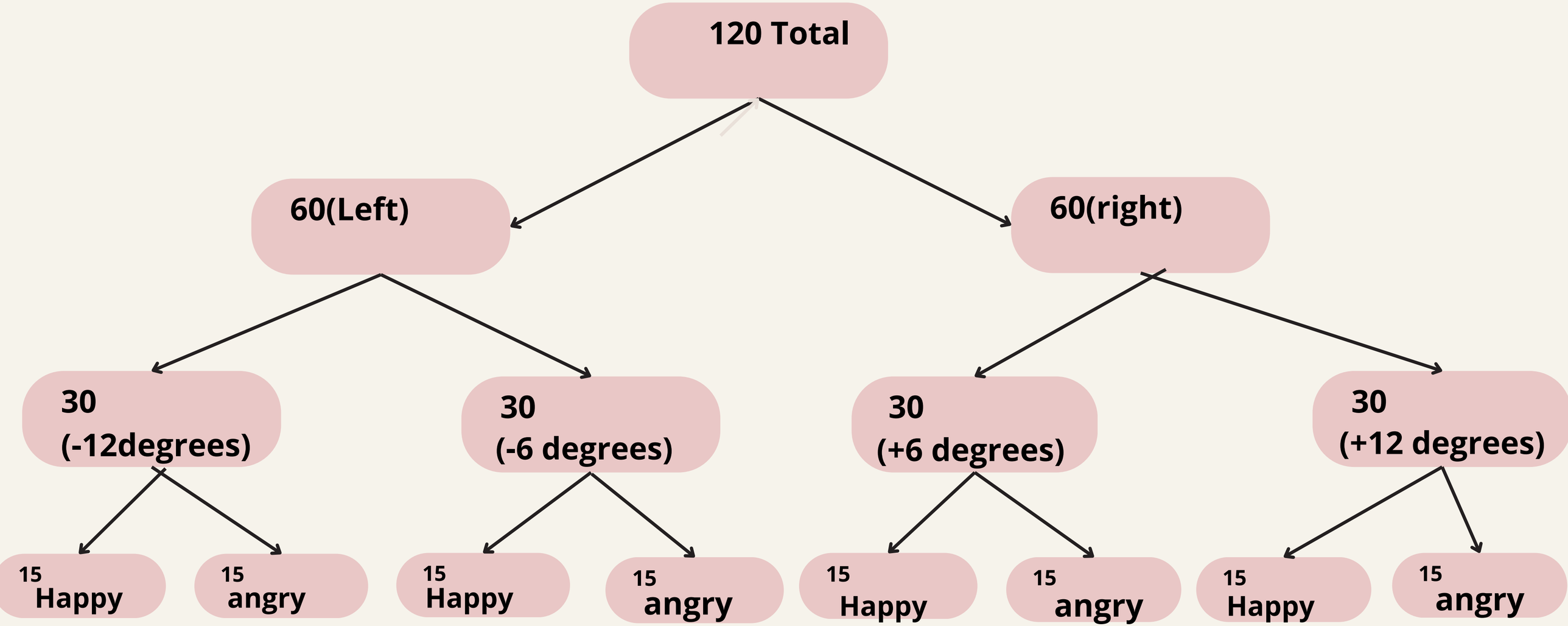
Using 3 eccentricities increases number of trials so much, as as a result the number of trials went very high in each block and hence it was not possible to conduct such 3 big blocks of trials, hence we reduced it to 2 eccentricities only (6,12 degrees)

Change 2: We removed neutral facial expression

WHY????

For a total 120 trials in each block, from the division in previous slide, we can see that we are getting only 15 trials for each eccentricity and each facial expression if we included only Happy, Anger but if we include Neutral also, then we are getting Just 10 TRIALS PER FACIAL EXPRESSION AT EACH ECCENTRICITY which is very less, the curve for just 10 trials will not be Smooth and we will get Noisy data curve , hence we won't be able to analyze properly

DISTRIBUTION OF TRIALS IN A BLOCK



We are getting 15 trials at each eccentricity for each facial expression

MY KEY LEARNINGS THIS SEMESTER

Although, It is visible that the OUTCOME of this whole process seems not to be much prominent, but the Majority of time of this semester was Spent by me in learning -

1) Reading the Research Papers & Understanding the Concepts & Technical terms.

2)Understanding the Logistics of the experiment.

3) Standardizing the experiment & performing trial run on participants then incorporating changes based on output.

4) How data recording is performed on participants-> How to handle Eye-tracker, Performing Calibration, Instructing participants, Understanding the codes,Extracting the data, Identifying Noisy data, plotting the curves & Analyzing them.

FUTURE PROSPECTIVES

Based on enormous amount of learnings and experiences gained by me through this semester, I got to learn a lot in Supervision of Dr. Sonia Ma'am and Sangramjit bhaiya. I would like to utilize the precious learnings & experiences gained by working on more projects(BTP) in upcoming Semester under the supervision of ma'am, if I would be given a chance !!!

THANK YOU SO MUCH