1. Dataset Description

Data with respect to a total of volunteers (Two groups: 22 Control and 22 Stress group / Three groups: 11 Control, 11 Eustress, and 11 Distress groups) were stored in MATLAB (Mathworks, Natick, USA) structure array format. Each volunteer's data comprised concentration changes of oxygenated/reduced hemoglobin ΔHbO/HbR (cntHb), trigger (mrk), and fNIRS channel information (dat and mnt). Each MATLAB structure array includes several fields, as listed in Table 1. The fNIRS dataset can be conveniently processed through the BBCI toolbox (https://github.com/bbci/bbci_public) implemented by the Berlin Brain–Computer Interface group.

Table 1. Functional near-infrared spectroscopy dataset description.

Structure	Field	Description
dat	.fs .snr	Sampling rage (Hz) Signal-to-noise ratio
mrk	.event .time .y	Class labels' descriptions Event occurrence times [1] Class labels in vector form
mnt	.clab	Channel labels
ch1 ~ ch15		Concentration changes of oxygenated hemoglobin (ΔHbO)
ch16~ ch30		Concentration changes of reduced oxygenated hemoglobin (HbR)

[1] A trigger is marked where each task period starts

2. Experimental tasks

Figure 1 shows the experimental block design. These experiments designed two separate sessions comprising 20 trials with respect to each task. Smile or non-smile (S1) was presented (one at a time) on the display monitor for 0.5 s with an anticipatory period (AP) of 2 s. At the end of the AP, positive or negative images (S2) were presented in a semi-random order in the center of computer monitor for 2 s and participants should find a positive or negative target, depending on the conditions of each session. Each session is as follows. (a) positive stimulus-positive target, (b) negative stimulus negative target. If participants find the target image, they should press the right key; otherwise, they should press the left key. It is important to note that participants should press the button as quickly as possible for reaction time analysis. Each session was counterbalanced across participants. In order to enhance participants' motivation for efficient task-performance, feedback results (i.e., correct, incorrect, or time out) was presented automatically after each stimulus. Then, an inter-trial break period was showed with a cross fixation for 35 s.

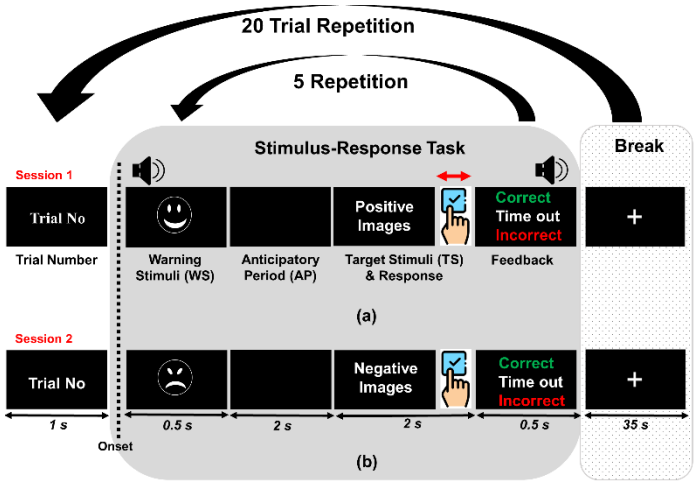

Figure 1. Experiment block design. There is a total of 20 trials for each of the conditions (a) Negative focus: smile (stimulus) and positive image (target) and (b) Positive focus: un-smile (stimulus) and

negative image (target). In each block, experimental task is presented for 25 s followed by 35 s rest. Note that triggers were transmitted and marked in the data file from the start of the task periods to the end (e.g., Session 1: ***1~11***; Session 2: ***2~22***) during one trial for each session. The inter-trial interval (i.e., the time interval between adjacent triggers) was 60 s on average.

3. Data recording

The fNIRS data were recorded by a two-wavelength(780-850nm) continuous-time multi-channel fNIRS system (NIRSIT Lite, OBELAB, Seoul, Korea) consisting of 15 light channels. Each channel was placed on prefrontal cortex (PFC) around forehead, where **Figure 2** depicts the placement of the fNIRS optodes. Five sources were placed on positions red circles, whereas seven detectors were placed on blue circles. Emitter-detector distance was 25 mm for contiguous optodes and were attached to the forehead. The center of the middle probe set row was placed approximately at FPz, according to the 10-20 international system.

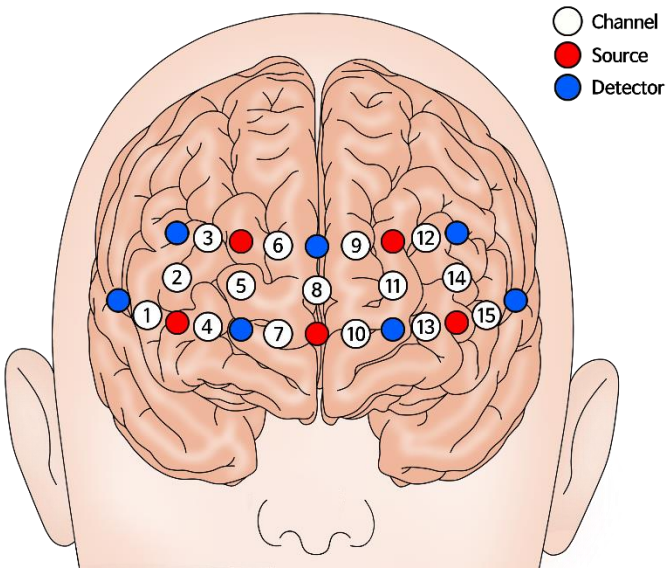

Figure 2. The topographical distribution of the fNIRS recording channels