

# SUM Preliminary study

## Experimental protocol

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### 1 Context

The main objective of this preliminary experiment will be to *desgin an experimental protocol* which targets the validation of the following scientific hypothesis:

- Knowing the mood expressed by a musical performance allows us to know which mood is felt by a listener (may be the same mood).
- Knowing the motions of the hand holding the bio sensor could allow us to compensate and/or complement the estimation of affective states.

Priority is given to try the organization of the experiment rather to the obtention of data (aka. try to do many things, but in limited time).

### 2 Setup

#### Equipment check-list:

- A chair which needs to be able to be easily removed (wheels?). A table.
- Sound system capable of providing sufficient sound quality for it to "disappear". Small but good.
- Hand-held USB sensor (BVP, GSR, 3 axis acceleration) + towels (wipe hands)
- Laptop + USB cable (long)
- Audio files for 3 expressions of moods (happy, sad and aggressive) and one 'neutral'.
- Software for recording data and for playing music (mp3).
- Questionnaires, pen, watch.

**Setup:**

Simple room, no visual distractions. Light a bit dimmed (making the room less visually apparent).

In a 'cosy' corner, the sound system is setup. The chair is in the center, A table is nearby to fill in questionnaires. Experimenters are hidden behind a room separator, controlling the music and recording of data from a laptop.

### 3 Tasks

When arriving, subjects are asked to:

1. Wash their hands
2. Listen to instructions (presentation of the questionnaire, presentation of the tasks)
3. Sit on the chair, grab the sensor in left hand (following instructions).
4. *Listening task 1*: Just sit and listen to the 4 musical performances, trying to relax and not physically move; after each music, quickly answer to the questionnaire.
5. Stand up (still with the device in the hand).
6. *Listening task 2*; Move / dance to the music; after each music, quickly answer to the questionnaire.

For the two listening tasks, the instructions are given orally in ways similar to these sentences;

**Listening task 1:**

“Stand still while listening to the music. Let the music influence your mood.”

**Listening task 2:**

“Move as the music makes you feel; dance, conduct, play imaginary instruments, etc. (nobody is watching you and we are not recording video).”

For both listening tasks, the order of the musics mood is identical for a participant, and always starting with the neutral. The order of the moods is randomized between participants ( e.g. Neutral, Sad, Happy, Aggressive, or N,H,S,A, or N,S,A,H, etc.).

### 4 Timing

Two versions may be tried:

**For a total of 15 minutes per subject:**

- ~2 minutes initiating experiment, give instructions, adjustment to the room, etc.
- 8 times ; *1 minute listening to a music* + 15 second break between moods for task 1 or 45 seconds break between moods for task 2.
- + ~1 minute extra.

**For a total of 23 minutes per subject:**

- ~2 minutes initiating experiment, give instructions, adjustment to the room, etc.
- 8 times ; *2 minute listening to a music* + 15 second break between moods for task 1 or 45 seconds break between moods for task 2.
- + ~1 minute extra.

## 5 Cohort

People of the same cultural background in terms of music taste, generation (age), social segment. In terms of movement, we propose that the generation is not too old, perhaps 20-26.

In practice, students present on campus will be invited to come for a short experiment.

## 6 Data

The device measures conductivity of the skin between two fingers, variations of blood volume pressure on a finger, and acceleration on 3 axis (of the hand). It provides us with the following data;

**AN0** - Acceleration X axis (approx. 0V-4V and approx 2V at rest)

**AN1** - Acceleration Y axis (approx. 0V-4V and approx 2V at rest)

**AN2** - Acceleration Z axis (approx. 0V-4V and approx 2V at rest)

**AN3** - BVP (1,2-4V approx)

**AN4** - GSR (0V-5V approx. 0-2 MOhm non linear)

All values are normalized (range above) when recorded.

## 7 Synthesis

Example of points to be discussed thanks to the experience gained in doing the experiment:

- Was the setup sufficient? What did we miss?
- Did the subjects understood their tasks?
- How difficult is it to manage the randomization of the order of the musics?
- Which timing is preferable? (e.g. from subjects point of view)
- Was the subjects profile adapted?
- Did we encounter problem for recording data?

And in general, any comment on how the experiment went and on the problems to avoid in the future are welcome.