Supplemental Material

Self-Reflection and Personal Physicalization Construction

Index

This supplemental material, provides details of:

(i) the study documents including:
   - recruitment poster p.2
   - email prompt for the diary study p.2
   - pre and post study interview guidelines p.3

(ii) the workshop components including:
   - summary of the workshop presentation p.4
   - all datasets used p.4-6
   - pictures of the workshop process p.7
   - resulting artefacts p.8

(iii) the construction kit p.9

(iii) additional pictures of participants’ physicalisations alongside the description from the paper. p.10-18
Hi <Participant>,

Your answers to the questions below will help us document and understand your process.

- Are you experiencing any challenges?
- Did you make any decisions to adjust your visualization design?
- Did you adjust your process?
- Did you add any materials to your visualization beyond what was provided in your kit?
- Have you identified any interesting patterns in your visualization?
- Please describe when and how you are creating your visualization?
- Please tell us about any other thoughts you have about your representation, logging or process.
- Please take some pictures of the current state of your visualization and attach them in your response!

IMPORTANT:
Whenever you are making any adjustments or add to your visualization please take a quick picture!

Thank you so much and happy visualizing!
TOPIC OF INTEREST

- Are you already logging data about your life? How?
- What aspects of your life would you be interested in exploring during this study?
- What about this aspect particularly interests you?
- What is your main motivation for logging and visualizing this data?
- Do you have any specific questions you are interested in exploring?

VISUALIZATION PLAN

- What data attributes about <aspect> would you like to log?
- Did you decide on the materials you would like to use? How?
- How do you want to represent this data using these materials?
- Do you envision any challenges or problems during the process?
- Do you think the process will fit with your daily routines?
- When were you thinking of doing the logging?
- Do you think you might discuss the representation with other people? Who? In which context?
- How long would you like to try it?
- Do you think it will be challenging for you to stick with the process? How?

MAPPING

- Please explain the visualization you made.

DISCOVERIES AND REFLECTIONS

- Did you make any discoveries or learn anything from creating your visualization?
- Was anything you found surprising?

INTEGRATION

- Where did you place the visualization? Why?
- Did the logging fit with your routines?
- What kind of habit did you create around it?
- Was it difficult to remember to update the visualization regularly?
- Did the reminder emails to take photos change anything about your process?

COMMUNICATION

- Did you talk about the representation with other people?
- Are you planning to show it to anyone in the future?

PHYSICALIZATION

- What are your thoughts on using physical materials to log your data?
- Do you think the physical logging has any particular advantages for you?
- Do you think it has any disadvantages?
- Do you feel like the materials gave you enough freedom to create your representation in the way you wanted to? What were you missing?
- Why did you choose material x for your representation?
- In retrospect do you think this worked for you?
- (If materials were added: why did you add x to your visualization?)

GENERAL THOUGHTS

- Did you experience any difficulties in logging or visualizing your data?
- Are you satisfied with your visualization?
- Did it meet your initial motivations?
- Are you planning on keeping it?
- Do you want to add any other thoughts about your project or the process?
CONSTRUCTING VISUALIZATIONS

Look Up Sheet

MOTIVATIONS
Constructing your own visualization can help you to create awareness, address a problem, express yourself, tell stories, reminisce, motivate or reward yourself, improve a behaviour, be curious... and many more.

TOPICS
Possible topics you could log include social activities, workouts, dreams, household chores, sleep, headaches, mood, compliments, acts of kindness, things you bought, expenses, complaints, drinks, saying “I love you”, trying new things, reading, work hours, eating, worries, procrastination, coffees or anything else you are interested in exploring.

DATA TYPES
There are different types of data you can collect. Your visualization does not have to incorporate all these types. Decide on what best suits your own purpose. Here are some examples of possible data types:

<table>
<thead>
<tr>
<th>Date</th>
<th>How many people</th>
<th>Costs ($)</th>
<th>Where</th>
<th>New enjoyable</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/03/2016</td>
<td>5</td>
<td>45</td>
<td>Bar</td>
<td>**</td>
</tr>
</tbody>
</table>

MATERIALS & VISUAL PROPERTIES
To create your visualization, you can map data to the visual properties of the provided materials or materials you decide to incorporate all these types. Decide on what data attributes do you want to map to which visual properties?

<table>
<thead>
<tr>
<th>Compliment</th>
<th>How much I believed it (1-5)</th>
<th>Setting of use</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Motivating myself to say more nice things to people. Noticing what people appreciate about me.</td>
<td></td>
</tr>
</tbody>
</table>

Example

<table>
<thead>
<tr>
<th>Date</th>
<th>From/To</th>
<th>Given/Received</th>
<th>About (Accomplishments, Intelligence, Skills, Character, Looks)</th>
<th>How much I believed it (1-5)</th>
<th>Wording of the Compliment</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-Mar</td>
<td>Friend</td>
<td>Received</td>
<td>Character</td>
<td>5</td>
<td>“Thank you for being such a good friend.”</td>
</tr>
<tr>
<td>17-Mar</td>
<td>Stranger</td>
<td>Given</td>
<td>Looks</td>
<td>5</td>
<td>“Those are awesome shoes”</td>
</tr>
<tr>
<td>17-Mar</td>
<td>Partner</td>
<td>Received</td>
<td>Looks</td>
<td>3</td>
<td>“You look great today”</td>
</tr>
<tr>
<td>19-Mar</td>
<td>Friend</td>
<td>Received</td>
<td>Character</td>
<td>5</td>
<td>“You are always there for me when I need you.”</td>
</tr>
<tr>
<td>19-Mar</td>
<td>Friend</td>
<td>Given</td>
<td>Character</td>
<td>5</td>
<td>“I think you are very brave.”</td>
</tr>
<tr>
<td>22-Mar</td>
<td>Colleague</td>
<td>Given</td>
<td>Skills</td>
<td>5</td>
<td>“You always give such thoughtful feedback.”</td>
</tr>
<tr>
<td>23-Mar</td>
<td>Friend</td>
<td>Received</td>
<td>Looks</td>
<td>2</td>
<td>“Your hair looks good today!”</td>
</tr>
<tr>
<td>24-Mar</td>
<td>Colleague</td>
<td>Received</td>
<td>Accomplishment</td>
<td>4</td>
<td>“That was a great presentation.”</td>
</tr>
<tr>
<td>27-Mar</td>
<td>Partner</td>
<td>Received</td>
<td>Intelligence</td>
<td>4</td>
<td>“You are so smart!”</td>
</tr>
</tbody>
</table>

Step by step

YOUR TOPIC
The chosen topic is engaging?
What topic or aspect of your life are you interested in exploring? Understanding, enhancing?
Why are you interested in this topic?
What is the visualization for (e.g. to discuss it friends, reflect, create something decorative ...)?

DATA ATTRIBUTES
Which questions about your chosen topic interests you?
What aspects do you want to get an overview of or compare?
What data would you need to collect to represent this topic?
How will you collect this data? Is it feasible?
Decide on categories, numbers, dates, etc. you will log!

MAPPING
Which materials will you use?
What data attributes do you want to map to which visual properties?
How many colour/size choices do the materials provide? Or do they require loneliness the data?
Do you want to change your representation or is it permanent?
Draw sketches and try out the materials by different manuscript before deciding on one!

LOG & VISUALIZE
How can you integrate the logging into your daily routines?
When and you extend the data (e.g. after the event, at the end of the day, right after you get up...)? Whenever you add data, take a moment to reflect.
Make adjustments when it is necessary.
### EXPENSES

**Data Attributes**
- Date
- Amount
- Category
- Necessity

**For?**
Reflecting on my spending and trying to be more mindful about my expenses.

**Setting of use**
To use in personal office space.

**Example**

<table>
<thead>
<tr>
<th>Date</th>
<th>Amount in $</th>
<th>Category</th>
<th>How Necessary</th>
</tr>
</thead>
<tbody>
<tr>
<td>01-Mar</td>
<td>1000.00</td>
<td>rent</td>
<td>very</td>
</tr>
<tr>
<td>02-Mar</td>
<td>189.20</td>
<td>groceries</td>
<td>very</td>
</tr>
<tr>
<td>02-Mar</td>
<td>53.56</td>
<td>going out</td>
<td>kind of</td>
</tr>
<tr>
<td>03-Mar</td>
<td>78.56</td>
<td>clothes</td>
<td>not at all</td>
</tr>
<tr>
<td>04-Mar</td>
<td>23.67</td>
<td>going out</td>
<td>kind of</td>
</tr>
<tr>
<td>05-Mar</td>
<td>35.99</td>
<td>other</td>
<td>not at all</td>
</tr>
<tr>
<td>07-Mar</td>
<td>56.18</td>
<td>groceries</td>
<td>very</td>
</tr>
<tr>
<td>09-Mar</td>
<td>37.20</td>
<td>going out</td>
<td>very</td>
</tr>
<tr>
<td>12-Mar</td>
<td>67.89</td>
<td>going out</td>
<td>kind of</td>
</tr>
</tbody>
</table>

### PLACES I VISITED

**Data Attributes**
- Date
- Place
- Category
- Enjoyment

**For?**
Storytelling and Reminiscing. Creating a souvenir of a trip.

**Setting of use**
To tell my friends about a recent trip over dinner and as a decorative piece in my living room.

**Example**

<table>
<thead>
<tr>
<th>Date</th>
<th>Place</th>
<th>Category</th>
<th>Enjoyment</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-Mar</td>
<td>MoMa</td>
<td>museum</td>
<td>5</td>
</tr>
<tr>
<td>15-Mar</td>
<td>Rockefeller Center</td>
<td>landmark</td>
<td>5</td>
</tr>
<tr>
<td>15-Mar</td>
<td>Ming</td>
<td>restaurant</td>
<td>3</td>
</tr>
<tr>
<td>16-Mar</td>
<td>Fat Cat</td>
<td>bar</td>
<td>5</td>
</tr>
<tr>
<td>17-Mar</td>
<td>Roebling Tearoom</td>
<td>restaurant</td>
<td>4</td>
</tr>
<tr>
<td>18-Mar</td>
<td>Central Park</td>
<td>outdoor</td>
<td>5</td>
</tr>
<tr>
<td>18-Mar</td>
<td>Punk Pub</td>
<td>bar</td>
<td>2</td>
</tr>
<tr>
<td>19-Mar</td>
<td>Brooklyn Passenger Ferry</td>
<td>outdoor</td>
<td>4</td>
</tr>
<tr>
<td>19-Mar</td>
<td>Pizza Pizza</td>
<td>restaurant</td>
<td>3</td>
</tr>
</tbody>
</table>
### HEADACHES

**Data Attributes**
- Date
- Time
- Duration
- Pain Level
- Type
- Stress Level

**For?**
Identifying whether my headaches are stress related

**Setting of use**
To show to my doctor during my next visit.

**Example**

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Duration (in h)</th>
<th>Pain Level</th>
<th>Type (Throbbing, Piercing, Pressing, Other)</th>
<th>Stress Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-Mar</td>
<td>2:40 PM</td>
<td>2:30</td>
<td>3</td>
<td>Piercing</td>
<td>4</td>
</tr>
<tr>
<td>18-Mar</td>
<td>7:45 PM</td>
<td>2</td>
<td>4</td>
<td>Pressing</td>
<td>5</td>
</tr>
<tr>
<td>20-Mar</td>
<td>8:25 PM</td>
<td>1</td>
<td>2</td>
<td>Pressing</td>
<td>3</td>
</tr>
<tr>
<td>23-Mar</td>
<td>11:00 AM</td>
<td>3</td>
<td>5</td>
<td>Piercing</td>
<td>4</td>
</tr>
<tr>
<td>24-Mar</td>
<td>9:00 PM</td>
<td>2:30</td>
<td>3</td>
<td>Throbbing</td>
<td>2</td>
</tr>
<tr>
<td>25-Mar</td>
<td>8:30 PM</td>
<td>2</td>
<td>2</td>
<td>Pressing</td>
<td>3</td>
</tr>
<tr>
<td>27-Mar</td>
<td>6:00 PM</td>
<td>3</td>
<td>4</td>
<td>Pressing</td>
<td>5</td>
</tr>
<tr>
<td>28-Mar</td>
<td>9:30 AM</td>
<td>2:30</td>
<td>2</td>
<td>Piercing</td>
<td>3</td>
</tr>
<tr>
<td>29-Mar</td>
<td>8:45 PM</td>
<td>1:30</td>
<td>3</td>
<td>Pressing</td>
<td>4</td>
</tr>
</tbody>
</table>

### DREAMS

**Data Attributes**
- Date
- Emotion
- Intensity
- Location
- Themes

**For?**
Increasing awareness of my dreams and chance of lucid dreaming.

**Setting of use**
To place on my nightstand and use every day after waking up.

**Example**

<table>
<thead>
<tr>
<th>Date</th>
<th>Emotion (joy, fear, anger, stress, sadness, neutral)</th>
<th>Intensity (1-5)</th>
<th>Location</th>
<th>Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-Mar</td>
<td>fear</td>
<td>2</td>
<td>Forest</td>
<td>Relationships</td>
</tr>
<tr>
<td>16-Mar</td>
<td>joy</td>
<td>3</td>
<td>My House</td>
<td>Friendship</td>
</tr>
<tr>
<td>18-Mar</td>
<td>fear</td>
<td>5</td>
<td>Top of a building</td>
<td>Loss of Control</td>
</tr>
<tr>
<td>20-Mar</td>
<td>anger</td>
<td>2</td>
<td>Store</td>
<td>Loss of Control</td>
</tr>
<tr>
<td>21-Mar</td>
<td>neutral</td>
<td>0</td>
<td>A House</td>
<td>Relationships</td>
</tr>
<tr>
<td>22-Mar</td>
<td>stress</td>
<td>5</td>
<td>Workplace</td>
<td>Failure</td>
</tr>
<tr>
<td>24-Mar</td>
<td>stress</td>
<td>3</td>
<td>Workplace</td>
<td>Failure</td>
</tr>
<tr>
<td>26-Mar</td>
<td>joy</td>
<td>4</td>
<td>A House</td>
<td>Family</td>
</tr>
<tr>
<td>27-Mar</td>
<td>fear</td>
<td>5</td>
<td>A Hospital</td>
<td>Courage</td>
</tr>
</tbody>
</table>
INTRODUCTORY GROUP WORKSHOP

Group Exercise

These pictures illustrate the group exercise activity during the workshop. Participants physicalized data in groups of 2-3 by revealing the datasets line by line. This simulates the ongoing physicalization process later implemented by participants at home.

A new data point is integrated after revealing a new line of the dataset.

All participants around the workshop table.
Workshop Physicalizations

These physicalizations were created by participants during the group activity of the workshop.

- Physicalisation showing Headaches
- Physicalisation showing Dreams
- Physicalisation showing Expenses
- Physicalisation of Compliments as a Necklace
After the workshop, the participants received this construction kit. The kit contained beads (8 colours, 3 sizes), plasticine (8 colours), pins (8 colours), tape (10 colours), thread (2 colours), labels, measuring tape, and a foam core board. Alongside the kit participants were handed a summary of the presentation (see page 4) to take home.

- Beads in 8 colours and 3 sizes: (~80-100 small, 50-60 medium, 20-30 large beads per colour)
- Approximately 200 pins in 8 different colours.
- Rolls of tape in 10 different colours.
- Two packs of plasticine in 8 different colours.
- Measuring tape, labels in two sizes, thread in two colours.
Participant 1

Workouts

P1 wanted to create a “sport autobiography” of his workouts that adequately “portrays” this central part of his identity. He also aimed to use the physicalization to develop a workout routine that contributes to his well-being while facilitating his ambitious fitness goals. He used colours to represent his physical activities (e.g. running, swimming, biking; see on the right side). Intensities of workouts are marked with tape around the board and durations are shown using beads next to the tape and in the centre of the board. The physicalization is laid out as a stylized “race track” with start and finish flags. Through this visual analogy, P1 aimed to emphasize his “story”. He found that the manual construction brought out “the human experience” of the topic and fostered “deep thinking”. The process paired with his knowledge on athletic training let P1 develop a workout routine that allowed his body to recover.
P2 is experiencing severe hip pain and wanted to create a physicalization to see how his pain progresses. His physicalization shows the intensity of the pain in the number of medium sized beads, the "walkability" in their colour and his pain killer intake in the small beads for each day grouped on a piece of plasticine (see above). After 5 days P2 noticed that his pain is "very complex" and thus decided to add "difficulty of changing position" as an additional attribute (shown in the colour of a large bead) to more fully describe his experience. He stated that while he did not use his physicalization directly in communication with a medical specialist it helped him to become more aware of the intricacies of his condition.
Participant 3

Mood

P3 wanted to understand how being active affects her mood and to create a decorative artefact that positively affects her mood: “you can actually look at it and be in a good mood if it looks nice”. P3 created a small bead ornament each day that she used to decorate branches in her kitchen. She logged her data in 4-hour intervals, each represented by one bead with its size showing P3’s mood and colour showing whether she was active, social or home. P3 took the physicalization materials with her while on-the-go which allowed her to log her mood throughout the day. Constructing her physicalization continuously helped P3 gain an awareness of her mood which in turn positively affected her reflections in the evening when hanging her day’s ornament into the branches: “Instead of going to bed thinking ok it’s been a bad day, nothing extraordinary, you can see ‘Ok, I’ve put a lot of big beads on, so it must have been a good day.’. Contrary to P3’s expectation her activities did not have “any influence on the mood”.

P3 made this small kit to physicalize on-the-go.
Participant 4

**Nutrition**

P4 wanted to explore how her 4-year-old daughter’s (P4c) nutrition affects the child’s bowel movements. The project was motivated by P4’s worry that her daughter’s diet might lead to constipation. The physical approach allowed P4 and her daughter to engage in the process together. Their shared physicalization shows an overview of food servings (each shown with one bead coloured according to the type of food) across 27 days (marked with tape; see on the right side). The plasticine sculptures created by P4c mark days when she had bowel movements. This activity “motonated” P4c to go to the bathroom more frequently, thus mitigating the previous problem of constipation. The physicalization reduced P4’s worries of having to eliminate specific food from P4c’s diet. P4 describes their collaborative construction as a “bonding experience” and as a way for P4c to become “more body aware”.

**Legend**

- **GLUTEN**
- **DAIRY**
- **SUGAR**
- **VEG**
- **LIQUID**
- **STARCH**
- **PROTEIN**
**STUDY RESULTS**

**Participant 5**  
**Distractions during Writing**

P5 created wearable physicalizations of distractions during her thesis writing. She anticipated that wearing them would motivate her to be focused. She made one bracelet/necklace for each work day with one stitch representing 3 min of work and beads showing times of distraction (see on the right side). Work sessions are separated with purple beads. The colour of other beads shows whether tasks for each working session were accomplished. Because “the process has not been as motivational as expected” P5 started using the physicalization “in an explorative way”. This approach helped her develop more productive work strategies. The process further encouraged her to become “more compassionate” with her own ways of working.

**Overview of necklaces/bracelets on a board with additional information about times of work sessions, marked with tape.**

**Translating logs into a pattern for creating the necklace/bracelet.**

**Digital log, created during writing**
Participant 6

Activities and Enjoyment

P6 wanted to understand “where [her] time goes”. She logged 6 different activities (e.g. meditation, work, etc.) shown as different coloured beads, each representing one hour, with their size showing enjoyment (see on the right side). Aesthetic appeal was a central goal in P6’s design and is reflected in the circular layout of strings that each represent one day. P6 sometimes experienced the manual construction process as “tedious”. However, the invested effort made P6 feel “attached” to her physicalization.
Participant 7

Meditation

P7 wanted to create his physicalization to monitor and improve the “consistency” of his meditation practice and understand which forms of guidance improve his experienced “quality” of meditations. He represented the duration of each meditation in the horizontal position of pins on a board in his meditation space (see on the right side). The aggregated duration of all meditations per day is marked with a thread connecting consecutive days. Hand-rolled plasticine balls attached to the pins represent P7’s experienced quality of each meditation (size) and the type of guidance (colour). The sensual aspect of the plasticine fit well with P7’s mindfulness practice and allowed him to apply a “continuous” scale for meditation quality. He describes the visualization as a way to “keep [him] honest”, a reward for his consistency, and as prop to have an “open dialogue” with friends about meditation.
Participant 8
Places Visited

P8 designed her physical-ization as a memento of her time in the city she just moved to. She marked visited places with pins on two maps (city overview and detail of downtown; see on the right side). Pin colours represent types of places (e.g., restaurant or bar) and beads on the pins show how much she enjoyed each place (colour) and how long she stayed there (size). P8 took time reflect back on her day during construction and decide “if I like the place and I want to keep that memory in my life”. P8, who describes herself as “very neutral”, found it difficult to rate her enjoyment. For her, the process was “helpful” in becoming more decisive. It further motivated her “to go out more” but also to “throw away my great expectation to do many things per day but I will at least do something new. One thing per day”.

STUDY RESULTS
Participant 9
DIY Care Products

P9 creates her own recipes for care products and wanted to use her physicalization to keep track of her recipes. She mapped different colours of beads to ingredients and sizes to their ratios in each recipe (see). P9 used the beads to experiment and plan out the recipe and "actually play with them a bit more [...]", sort of like Lego and just build [the recipe]. P9 used the finished "bead recipe" for making the product and to "label" its container. The physical construction has since replaced her previous approach of planning recipes on paper.