Holos: an environment for studying the evolution of sensory dimensions of individual product space based on holistic methods, using digit-tracking

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Context

16 cards with different drawings, based on 7 criteria:

1. *Background color* (orange vs. yellow)
2. *Shape color* (blue vs. green)
3. *Contour* (dotted vs. continuous line)
4. *Shape* (circle vs. square)
5. *Size* (big vs. small)
6. *Position* (top vs. bottom)
7. *Background pattern* (shaded vs. plain)

Cadoret et al. (2011)
Napping® task to collect data

Stimuli separation according to:

- *Shape* on the first dimension (circles on the left and squares on the right)
- *Size on the second dimension* (small shapes at the top and big shapes at the bottom)
This task highlights the cards diversity
This diversity is only based on the final configuration

What about the judges’ cognitive processes? How did they get this final configuration?

Solution: Highlight a judge’s perception process through his process of doing the task

The method must be adapted to the task (sorting, Napping®, etc.)
Hierarchical sorting task to highlight the cognitive process during a sorting task

(Cadoret et al., 2011)
Digit-tracking to highlight the cognitive process during a Napping® task

Digit-tracking

Process of tracking the motion of a digit when subjects perform an holistic method (by analogy with eye-tracking)

« Number » or « Finger »

Process of following something or someone
Digit-tracking to highlight the cognitive process during a Napping® task

For each judge, stimuli’s movements are recorded all through the Napping® task.

Therefore it is possible to know, for a judge and at every moment of the experience, the configuration of stimuli.
Digit-tracking to highlight the cognitive process during a Napping® task

For each judge and at every moment, stimuli’s coordinates are stored on the Holos server. Data can be downloaded from the server [http://napping.agrocampus-ouest.fr/](http://napping.agrocampus-ouest.fr/). These data can be shared with other users or not, depending on the experimenter’s choice.
**Digit-tracking** to highlight the cognitive process during a Napping® task

**A judge’s data**

<table>
<thead>
<tr>
<th>Stimulus 1</th>
<th>Stimulus S</th>
</tr>
</thead>
<tbody>
<tr>
<td>( X_0, Y_0 )</td>
<td>( X_0, Y_0 )</td>
</tr>
<tr>
<td>( X_1, Y_1 )</td>
<td>( X_1, Y_1 )</td>
</tr>
<tr>
<td>( X_i, Y_i )</td>
<td>( X_i, Y_i )</td>
</tr>
</tbody>
</table>

**Panel’s data**

<table>
<thead>
<tr>
<th>Stimulus 1</th>
<th>Stimulus S</th>
</tr>
</thead>
<tbody>
<tr>
<td>( )</td>
<td>( )</td>
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<td>( )</td>
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<td>( )</td>
<td>( )</td>
</tr>
</tbody>
</table>

Coordonnées au temps 0
Coordonnées au temps 1
Coordonnées au temps i
Coordonnées au temps I
**Digit-tracking** to highlight the cognitive process during a Napping® task

Judge 2 and Judge 5 chose the **same final configuration**: a configuration according to the shape color.
Digit-tracking to highlight the cognitive process during a Napping® task

Representation of the trajectory used by Judge 1 = cognitive process

Individual trajectory of S1

Coordinates au temps 0

Coordinates au temps 1

Coordinates au temps i

Coordinates au temps I
Digit-tracking to highlight the cognitive process during a Napping® task

Judge 2 and Judge 5 chose the same final configuration: a configuration according to the shape color.

But trajectories highlight the fact that:
• Judge 2 only saw the shape color
• Judge 5 saw the background color first and then decided to use the color shape

Although the final configuration is the same, the cognitive process is different!
Digit-tracking to highlight the cognitive process during a Napping® task
Digit-tracking to highlight the cognitive process during a Napping® task

- Judges may have identical final configurations but obtained with a different cognitive process (sensory dimensions evolve throughout the experiment)

- **Digit-tracking** allows to understand how sensory dimensions evolve over time

- By using **Holos**, it is possible to collect Napping® data with a tablet computer: the same experiment can be realized in different places (at home, abroad, etc.)