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# The Bodily Aspect in Computer-Supported Creativity

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**Abstract**

In opposition to being the fundamental condition for our existence, the human body has long been marginalized in the field of Human-Computer Interaction. It is now gaining consideration through the idea of embodiment. I want to support the embodied argument by pointing out the role of the body in creativity. A general framework and a criticism of interaction with today's Personal Computers delivers guidelines and starting points for a more conscious design of systems that seek to support creativity.

**Keywords**

Body, embodied interaction, creativity, Computer-Supported Creativity

**Introduction**

The topic for my thesis was born out of a personal frustration with having to work at the computer in always the same, reduced bodily manner. In particular, I feel that it compromises my ability to be creative -- to think and act freshly, freely and flexibly. Computers have come to embrace an enormous range of today's activities, and have brought with it a disembodiment on the actors' side. If the body is experienced at all, it is only negatively so. This stands in a harsh contrast to its

marvelous abilities and primal importance in all aspects of our lives.

The questions that guide my research are thus, what do we lose by neglecting our bodies in the interaction with computer technology, and what could we gain by designing systems with greater respect to this human condition. Specifically, I am interested in the effects on creativity, as opposed to mere productivity. My work so far has resulted in [1], on which I wish to build my design efforts.

### The marginalization of the body

The question for the role of the body in human accomplishment is as old as the mind-body-problem, ranging back to Plato. Today, the Western culture still holds on to a strong dualism, reinforced by Descartes' *Meditations*: The mind is regarded as the dominant part which uses the body as a sensory-motor complex.

This view can also be found in the influential HCI textbooks by Card, Moran & Newell [2] and Norman [3], exemplified by the *Model Human Processor* [2, p.26] (see Figure 1). Following this cognitivist view, everything essential happens in the mind. Formulated to an extreme, the role of HCI is to raise effectiveness of information intake and to ease output of the deferred actions.

### Responses in HCI

Naturally, this view has not remained uncriticized. More recent examples of opposing views are the works of Svanaes [4] and Dourish [5]: By building on the works of phenomenologist philosophers like Heidegger and Merleau-Ponty, they reconfirm the relevance of the human body in our interaction with the world. They also

pick up the term *embodiment*, which refers to the idea that cognition arises from bodily interaction with the world. This idea can be found underlying alternative views in a wide range of sciences, e.g., in cognitive science, philosophy, education, neuroscience, or medicine [1, pp.21-26].

A powerful overview of aspects of our bodily existence and their relation to interaction design can also be found in a very recent paper by Klemmer et al. [6]. They synthesize five themes from their research: thinking through doing, performance, visibility, risk, and thickness of practice.

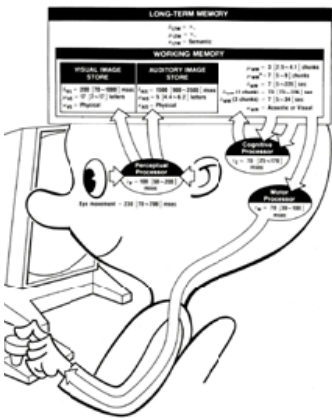
The most fruitful applications in the field of HCI that demonstrate these ideas are Tangible User Interfaces [7]. They define a class of interfaces around the idea of giving the richness of the physical world back to the human computer users.

Still, the connection between the body and creativity has hardly received explicit attention, neither in the field of HCI, nor in creativity research.

### The bodily aspect in creativity

In the domain of design, the importance of bodily experience and exploration for creative work is not new. Creative recipes like sketching, prototyping, chaotic desks, warm-up games for brainstorming, etc., demonstrate this.

But how exactly does this relation between body and creativity look like? Is it a general relation, or just a casual connection? To get a more systematic understanding, I proposed a framework that



**Figure 1:** The Model Human Processor

summarizes indications found in an extensive literature research [1, ch.2] (see Table 1).

|                     | <b>bodily aspect</b>      | <b>dimensions</b>                | <b>creativity aspects</b>   |
|---------------------|---------------------------|----------------------------------|---|
| <b>foundational</b> | health                    |                                  | endurance, time to invest, energy, brain processing power           |
|                     | fitness                   |                                  |   |
|                     | experience                | richness, directness, activeness | understanding of/feel for the world, tacit knowledge, individuality |
| <b>cultivative</b>  | awareness & attentiveness |                                  | sensitivity, openness, flexibility, emotionality                    |
|                     | control of motion         |                                  | concentration, focus, calmness, subconscious                        |
|                     | control of senses         |                                  |   |
|                     | bodily skills             | diversity, subtlety              | eased utilization of the world, expressivity                        |
| <b>situative</b>    | environment-on-body       | atmosphere, impression, change   | concentration, inspiration, chance                                  |
|                     | body-on-environment       | malleability                     | expressivity, externalizability                                     |
|                     | movement                  | freedom, intensity, rhythm       | trigger, concentration, flow, subconscious                          |
|                     | stature                   | in context, change               | flexibility, diversity of perspectives                              |
|                     | nutrition                 | system-sustaining, drug          | concentration, energy, subconscious                                 |

**Table 1:** A framework relating aspects of the body to those of creativity.

As it is not possible to improve creativity directly, but only through creating supportive conditions, I tried to relate “aspects” of the body to aspects that are considered to be positively affecting creativity. The

framework is divided into three levels on which this relation takes place: The foundational level covers the basic bodily conditions for being creative, the cultivative level describes aspects that need life-long cultivation in order to flourish, and the situational level highlights those aspects that are dominant in the very situation of creative work.

Even though these relations are of a more general kind, I see potential in applying them to the design of interactive systems.

### **The creative body at the Personal Computer**

In returning to my original motivation, I applied the proposed framework to a criticism of the currently prevalent mode of interaction with computers, namely Personal Computers. This analysis resulted in a number of critical findings (detailed in [1, pp.35-37]):

#### *On the foundational level*

- Impairment of health and fitness
- Shallow experience
- Indirect and abstract experience
- Virtual experience
- Little opportunity for individualization

#### *On the cultivative level*

- Only negative awareness of the body
- No use of bodily skills
- Suppression of emotions
- Lack of refined control
- Reduced grounding in the real

### *On the situative level*

- Absorbing presence
- Immobility
- Narrowed expressive freedom
- Weakened grip on reality
- Appearance not as a tool, but as an own world
- Permanent expectation
- Cumbersome sketching
- Missing physical presence of what one is working on (weak externalization)
- Sterility and perfection
- Noisy and stressful
- Confined dimensions

### **Design Proposal**

Following this theoretical analysis I am now beginning to design systems that try to overcome some of the mentioned criticisms and regard the bodily impact on creativity. A first experiment was the Touchboard [1, p.50], a multi-touch interactive easel. It allows for a much larger freedom of movement, an improved utilization of manual skills, the use of tools such as a paint-brush, and real-world collaboration.

Currently, I am experimenting with the idea of an explicitly calm and natural, yet interactive desk, that tries to work against the absorbing presence inherent in screen-based interactions. Another current experiment is an immersive musical interface for a composer that targets the sustainment of the status of flow.

### **Expectations for the conference**

For the graduate symposium, I primarily hope to meet people with a similar interest and engagement, with whom I can share experiences and discuss our ideas. I wish to gain confidence and motivation through discussing and relating our works to each other.

I am looking forward to interact with experienced researchers in order to receive thorough criticism and practical guidance and orientation. I would also like to get a feel for the research community and the common beliefs and goals. Lastly, I also hope to be able to introduce new ideas to them.

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