Several studies have shown that watching one’s own body part improves tactile acuity and discrimination abilities for stimuli presented on that location (Blakemore et al., 2005). Kennett and colleagues (2009a) have shown that their participants could detect a tactile target delivered on their arms more effectively when they could directly see that part of the body, as compared to when its vision was prevented (‘Visual Enhancement of Touch’, VET). Moreover, Schaer et al.’s findings (2005) support the idea that the VET is linked to the observation of touch, rather than to the depiction of the body part per se.

Secondly, we took into account the issue of whether the effect of watching another person’s body on tactile information processing can be somehow related to an extension of body ownership towards the body part seen on the display, namely the relationship between the VET effect and body ownership. By means of the Rubber Hand Illusion procedure (RHI) (Botvinik et al., 1998), Longo et al. (2008) found a significant enhancement of acuity when the illusion was induced compared to a control condition where the illusion was not generated. The authors suggested that the VET effect depends on seeing ‘one’s own’ hand, rather than seeing ‘a whatever’ hand. So they stated that there is a functional relation between the bodily self and tactile perception. Interestingly, it should be noted here that Moseley et al. (2008) found a slow down of tactile information processing due to alterations of body ownership when a spatial discrimination task was used.

The aim of our research was to verify whether seeing another person’s hand being touched (on a pc screen) can affect the processing of tactile information presented on the participant’s body when the spatial discrimination of the stimuli is required. We also analyzed if an illusion of embodiment of the hand on the screen occurred and whether this had also an effect on the processing of tactile stimuli. Finally we investigated whether the position of the screen and the fact of viewing an object in place of a human hand on the pc screen could affect the tactile processing itself.

**Materials and Methods**

**Experimental Setup and Tasks** (Identical in the three experiments)

**Visual Stimulus**  
A finger touching/jumping without touching a hand or an object on the screen

**Vibratocisthile stimulus**  
Stimulus presented on hands and arms, press left/right mouse button

**Questionnaire**  
10 questions about the sense of ownership towards the hand on the screen  
Like/Dislike scale from ‘Totally disagree’ to ‘Totally agree’

**EXP-1**  
**Participants:** 15 healthy right-handed volunteers (13F), age = 22.3 ± 3.7 years; education = 15 ± 1.09 years of school. All participants performed all conditions. The order of presentation was randomly assigned.

**EXP-2**  
**Participants:** 14 healthy right-handed volunteers (9f), age = 24 ± 3.8 years; education = 16.9 ± 2.3 years of school. All participants performed all conditions. The order of presentation was randomly assigned.

**EXP-3**  
**Participants:** 32 healthy right-handed volunteers (22F), age = 24.6 ± 3.7 years; education = 16.2 ± 1.8 years of school. Half participants randomly assigned to Illusion Condition, the other half to the Non Illusion Condition. All participants performed the same spatial task.

**Conclusions**

- Participants responded faster to the tactile stimuli presented on their own arms when they could see on a pc screen the limb of a stranger being touched, as compared to a condition where they could see the same limb being approached but not touched;
- The effect that we found cannot be fully classifiable as a VET effect (i.e., a body-location specific enhancement of tactile processing caused by the vision of the location of the body where the stimuli are presented). In fact, the participants in our experiment responded faster to tactile stimuli when they could see a ‘picture’ of a hand being touched rather than when seeing their own body touched (just like in the classic VET paradigm; see Longo et al., 2008);
- The faster RTs for seeing an object instead of a hand may suggest that seeing a hand recruits higher attentional resources, leading to a slowing down of the RTs; the same can be supposed for the slower RTs in Hand Centre condition than both Hand Left condition and Hand Up Centre condition.

**Fig. 1** Faster RTs in Object Up Centre condition than in Object Down Left Condition and faster in Object Down Left Condition than in Hand Up Centre Condition (p=0.0337).

**Fig. 2** Faster RTs in Hand Left condition than in Hand Centre condition, independently from the side being touched (p = 0.0312).

**Fig. 3** Faster RTs in Object Left Down condition than in Hand Left Down condition (p=0.0450); Faster RTs in Hand Centre Up condition than in Hand Centre Down condition (p=0.0068).

**Fig. 4**

- Faster RTs in Touch Condition (finger touching the hand on the screen) than in no Touch Condition (finger just approaching) (p<0.001).
- Faster RTs for the tactile perception on the left side of the body than on the right (p<0.005).

**References**


