

Designing EmoHCI: emotions and presence in HCI

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Abstract

Today emotions are more accepted as an important ingredient of human life. Several studies show that emotions play a vital role in almost everything we do, for example in cognitive functions, such as rational decision making and learning, as well as in perception. In the design of HCI, both software and hardware, it is important to realise what kind of emotion the design should evoke at the same time as being able to evoke that emotion in the user, whether it is a business administrative system, an application aimed at rehabilitation, or a computer game. The EU funded EMMA project (Engaging Media for Mental health Applications) explored the relation between a feeling of presence and emotion. During the project we developed a bio-cultural theory of presence (Riva et al. 2004) which we suggest has the potential to be used as a base in order to discuss the relation between computer-mediated presence and emotion and its impact on designing EmoHCI.

During the project we developed a virtual environment called the Exploratorium (Olsson and Waterworth 2004) that consists of three different zones (Paradiso, Purgatory and Inferno) arranged vertically and aimed at evoking three different types of mood (calm, neutral, and anxiety/fear). Our tests have shown that it was possible to induce the different moods by the use of the virtual environment. The results also showed that different kinds of mood evoke different degrees of presence in the environment. Paradise, which evoked a calm mood, created a low degree of presence, while Inferno, which evoked anxiety, induced a high degree of presence. The obvious interpretation is that different kinds of emotions induce different degrees of presence in a computer-mediated environment

When considering presence it is also important to consider its opposite, absence (Waterworth and Waterworth 2001), although this has often been ignored in the literature on mediated presence. It is as important to study the impact emotion has on absence as it is to study its impact on presence, and how the two are related. Our three-layer model of presence (figure 1) can provide a starting point for predicting whether a design with emotional effects will bring about a certain degree of presence or absence. The three layers are proto-presence, at the sensori-motor level, core presence, at the perceptual level, and extended presence, at the conceptual level.

According to this model, the overall presence level depends on how well integrated the cognitive system is to focus on the environment around the individual. Emotion can affect this in several different ways, for example by creating an arousing effect that orientates the individual to attend to the environment (stimulating presence) from the bottom up. On the other hand, emotion induced at higher levels may increase attention to the environment or reduce it, depending on whether the content is associated with the current environment (presence) or opposed to it (absence).

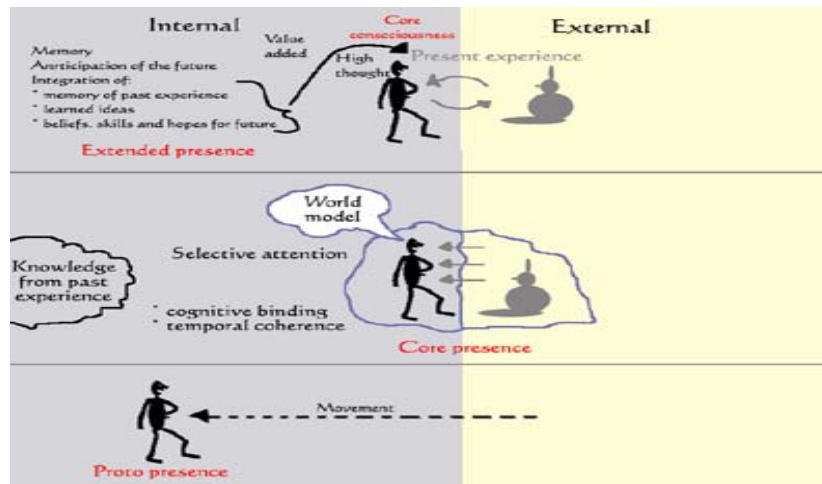


Figure 1 A 3-layer model of Presence (Riva, Waterworth and Waterworth. 2004)

In the test with the Exploratorium (Olsson and Waterworth, 2004) we found that Paradiso, which is experienced as a pleasant and calm environment, produced a low degree of presence and a high degree of absence, in which participants reported day dreaming or other cognitive activity not related to the environment. In Inferno, on the other hand, which users experienced as both unpleasant and exciting, a high degree of presence and a low degree of absence were induced.

In HCI design we believe that emotions play a very important role, closely related to the sense of presence in a mediated environment. As a designer one should be aware of the emotional impact your design will have on its user and try to evoke the most suitable emotion for the purpose of the design. It is useful to consider the different levels of the psyche at which emotion may be induced. At the lowest layer, emotional responses may include a sensory orientation towards or away from the environment, a very transitory effect - but one which may result in the recruitment of other layers to increase either presence or absence. At the highest layer, the content displayed in an environment will reinforce or inhibit attention to the environment or to other (non-present) conceptualisations. But unless the middle layer, of perception, is aligned to one or both of the other layers, the sense of presence induced will be limited, and the emotional impact may be diffused.

We are currently developing more detailed guidelines for design taking into account the relationship between emotions, of different types, presence and absence, and based in an enhanced version of our three-layer model. Demos of the Exploratorium will be available at the workshop.

References

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