

## **Advice from a Caterpillar: an Application for Cultural Computing about the Self**

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**Abstract.** We are exploring an application for a novel direction in human-computer interaction named ‘cultural computing’, which aims to provide a new medium for cultural translation. The main objective of this project is to create an interactive experience that encourages people to reflect on their self-concept. In Western culture the self-concept is generally based on conscious perception of the self. The story ‘Alice’s Adventures in Wonderland’ survived for over centuries, and therefore seems to be a promising narrative to address this issue. The user in the role of Alice will go through the interactive experience and meets a Caterpillar, who questions the participant’s whereabouts of his/her self-concept. To determine the effect of this experience, we discuss a method that measures changes in a person’s implicit self-concept for we predict that the experience will have an unconscious effect towards individual metamorphosis. The ‘implicit association test’ (IAT) seems to be a promising measure.

**Keywords:** cultural computing, interactive experience, self-concept

### **1 Introduction**

Recently, developments in the field of Human Computer Interaction (HCI) have opened up a new direction for the application of computer technology. After the introduction of personal computing, cooperative computing and social computing, a new paradigm for HCI named cultural computing has emerged [9]. Cultural computing is based on what is called Kansei Mediated Interaction [8]. Kansei Mediation is a form of multimedia communication that carries non-verbal, emotional and even unconscious information. In the first application of cultural computing, Tosa [10] and Tosa et al. defined cultural computing as cultural translation that uses scientific methods to represent essential aspects of a culture [11]. These scientific methods, such as artificial intelligence and mixed realities can give a person the sense of entering and participating in a different world. They developed an installation named the ‘ZENetic Computer’, which incorporates certain elements of the Japanese Zen culture such as *sansui* paintings, poetry and kimonos. Through an interactive dialog with the system, users can experience the birth of self-awareness brought about through the unification of one’s everyday self and one’s unconscious self.

The Zen teachings and symbols that are used in the ‘ZENetic Computer’ are very typical for the Japanese culture and are not likely to be understood by most people

from the West. The question is how to create a comparable experience in the West that is based on symbols that can reach people from the West. Rauterberg [9] tried to answer this question in the project named ALICE by proposing cultural computing based on the story of 'Alice's Adventures in Wonderland' [1]. In the role of Alice, the user goes through an interactive narrative and encounters six stages that are based on selected parts of the original plot. In this paper, we address the stage 'Advice from a Caterpillar', which centers on the user's self-concept.

## 2 The Self

Throughout history, there have been wide varieties of theories about the self, coming from the fields of philosophy, psychology, and religion. This includes assertions that there is no self; that the idea is a logical, psychological, or grammatical fiction; that the sense of self is properly understood and defined in terms of brain processes; that it is merely a constructed sociological locus, or the centre of personal and public narratives, or that it belongs in an ineffable category on its own [3].

Kitayama et al. pointed out that there is a significant difference in the construction of the self when comparing European/American culture and the Japanese culture [7]. Western middle-class cultures are generally organized according to meanings and practices that promote the independence and autonomy of a self that is separate from other similar selves and from social context. This resulted in a prevalent self-esteem among western people with a tendency to self-enhancement. In contrast, many Asian cultures do not highlight the explicit separation of each individual, promoting the fundamental connectedness among individuals in a social group. The result of this on the construction of the self according to Kitayama et al. is that they are more likely to engage in self-criticism instead of self-enhancement.

By addressing the Western individual self-concept, Alice's self is challenged in 'Advice from a Caterpillar'. After she entered the rabbit hole to follow the White Rabbit, she experienced a lot of transformations both physically and mentally. This brought her in an initial state of confusion, which is emphasized in her conversation with the Caterpillar: 'Who are YOU?' This challenging attitude of the Caterpillar makes Alice uncertain about herself, becoming vulnerable and open for persuasion. Such a situation gives the possibility for a confrontation with and stimulates awareness of the self-concept. The character symbolized as a caterpillar is well chosen. One of the most important characteristic of caterpillars and butterflies is their unique life cycle. One of nature's most mysterious metamorphoses<sup>1</sup> occurs when a caterpillar changes from a slow-moving, fat and ugly creature to a colorfully winged, beautiful butterfly. This metamorphosis happens to a lot of insects, but not as dramatically as it does to a butterfly [6]. In this respect the 'caterpillar' character can unconsciously pursue the message to a human user not to be afraid of a fundamental metamorphosis in his or her self concept. This symbolic meaning can counterbalances the challenges intended by the conscious dialog.

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<sup>1</sup> the Greek word 'metamorphosis' means 'change in form'

### 3 The Installation

Using an interactive installation, our goal is to make the participant question her/his own self-concept. Although this might sound very ambitious at first, it is what happens to Alice in the chapter ‘Advice from a Caterpillar’. Our design strategy is thus to design the installation in such a way that the participant’s experience is as consistent as possible with Alice’s experience in the original story. Caused by the preliminary stages in the ALICE installation, the user will feel small and therefore confused about what happened (criteria 1). We also expect s(he) wants to know what all this means (criteria 2). Criteria (1) and (2) correspond with Fogg’s guidelines for timing persuasion [2]. Hence, it creates an opportune moment to question whether people are, and what they think they are. On entering the stage, the user will meet a Caterpillar, who has its back turned towards the user. He is humming softly and smoking a water pipe. When the user comes closer and enters the personal space of the Caterpillar, he suddenly wakes up, turns and bends towards the user. This should be a spontaneous movement to yield a surprise reaction. “Who are YOU?” the Caterpillar asks next. This should initiate a dialog in which the Caterpillar is agent. During the dialog, the Caterpillar maintains eye contact with the user and supports its utterances with subtle body expressions. The question “You? Who are YOU?” is repeated whenever the participant speaks with the words “I”, “my”, “me” or “mine” until (s)he replies with a sentence like “I don’t know”. This will initiate a monologue of the Caterpillar about the transience of the self and he will transform into a beautiful butterfly. After that, he disappears and sends the user away.

### 4 Experience Assessment

To measure the effect of the installation with respect to its goal, we need to test whether users experience any changes in self-concept when coming out of the installation. This will be a major challenge, for we suspect the installation will mainly have an unconscious effect on people. Moreover, the self is a very personal issue and therefore difficult to enquire. Even in the context of psychotherapy, psychologists have problems finding out how a client really thinks about her/himself. Greenwald et al. [4] made a distinction between conscious (explicit) and unconscious (implicit) cognition and the way they influence human response mechanisms. They developed the Implicit Association Test (IAT) to focus only on the implicit (unconscious) part of cognition. The test measures differential association of two target concepts with an attribute. The two concepts appear in a two-choice task (e.g., flower vs. insect names), and the attribute in a second task (e.g., pleasant vs. unpleasant words for an evaluation attribute). When instructions oblige highly associated categories (e.g., flower + pleasant) to share a response key, performance is faster than when less associated categories (e.g., insect + pleasant) share a key. This performance difference implicitly measures differential association of the two concepts with the attribute. Greenwald and Farnham [5] developed an IAT to measure self-concept. This is a useful starting point for the experience assessment. By choosing concepts that relate to the self and attributes such as sure vs. unsure, it would be possible to measure how sure and

confident people are about their self-concept. A decrease of confidence when comparing test results before and after the interactive experience could be a measurable success criterion for our installation.

## 5 Conclusion

We have introduced and discussed an application for the new field in HCI named cultural computing, based on one particular part in the narrative 'Alice in Wonderland' by Lewis Carroll. It addresses the individual self-concept of Westerners through an interactive experience of Alice's encounter with a Caterpillar. The proposed installation aims to offer an experience that is as consistent as possible with the original story. The next step for our project will be the technical implementation. Finally, an Implicit Association Test will be conducted on people from different age groups in order to measure and compare the unconscious effects of the installation.

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