

Culture and Co-experience: Cultural Variation of User Experience in Social Interaction and Its Implications for Interaction Design

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Abstract. The notion of how multi-users experience technology as a group has opened important vistas in interaction design. Even though literature in cultural anthropology and cognitive psychology implies cultural influence on user experience in social interaction, a cross-cultural notion has, however, been overlooked in this area. This paper aims at exploring relationship between culture and a social aspect of user experience, in a catchier term, “co-experience,” drawing on the concept of “role-takings” by following the framework in symbolic interactionism. Based on literature review, we build the conceptual framework of how role-takings vary in different cultures and how the variations can shape different co-experience. In order to illustrate how this framework can be applied in a real design case, a novel interactive system called “Visual-talk table” is introduced. In so doing, we argue how the framework and the design experiment with this technology can serve as a tool to facilitate cultural aspect of social interaction in designing especially tangible and ubiquitous interaction.

Keywords: culture, co-experience, social interaction, interaction design.

1 Introduction

Over the last decade HCI community has played a leading role in propagating importance of user’s cultural background knowledge in interaction design. In previous conferences and publications of the HCI community, thematic areas such as “Internalization and localization,” “Cross-cultural user interface design,” and “Universal access in human-computer interaction,” have opened a key forum for this notion [12]. The studies on cultural interface design have varied from addressing linguistic and semiotic perspectives [6], creating new user experience [16], and comparing human cognitive styles [8][15].

Meanwhile, several approaches are engaged in establishing design knowledge about users’ social interaction within or in parallel to HCI, as the development of information communication technologies and consumer products support users as social actors in various ways [1][17]. Such fields, namely CSCW and Social Computing, criticize that existing interaction design frameworks have mostly been used in an individualistic way, by placing the individual into the center of thinking. This notion

shifted a focus of interaction design from relationship between a single user and a system to that among multi-users. With the regards to cultural variations in communication strategies and attribution styles, proven robust in recent studies from cultural anthropology, cognitive psychology, as well as communication study [8][11][20][22], this shift allows us to infer the way people shape social actions around technology and the meaning making process can depend on users' cultural backgrounds.

Very recently some studies address this issue by investigating influence of culture on technology use in intercultural collaborations. Diamant et al. [7] showed the interactive effect of culture and technology on member's attribution of performance by comparative experiments with Chinese and Americans. These studies, however, have their focus on user's technology evaluation and team performance and do not address the role of culture in shaping actions, emotions and meanings, which are notable factors in a current paradigm of interaction design [1][10][24]. To address the latter issue may lead us to new dimensions of putting users' socio-cultural aspects into designing interactive systems.

This paper aims at exploring what role users' cultural backgrounds play in organizing social actions and making meanings towards technology, which constitute user experience. We build the conceptual framework by reviewing literature in symbolic interactionism, user experience and cultural anthropology as a tool for further empirical exploration. Then we discuss implications of the framework by introducing an example of a design experiment with new technology.

2 User Experience in Social Interaction: “Co-experience”

This section delineates current notions of multi-users' social interaction in user experience research and interaction design with the perspective of their relation to culture. We especially introduce the concept of “co-experience,” as a key concept to explain what constitutes lines of actions and emotions in social situations, which formulates a conceptual framework in this study.

2.1 Co-experience

User experience has been one of the cornerstone concepts in HCI and design research over the last decade. The frameworks in user experience design have evolved as the advances in consumer products and available technologies bring new possibilities for product related experiences [1]. “Co-experience” was introduced by Battarbee [1] to address limitation in user experience literature that was missing social aspects in organization of user experience. In his book on “designing for social interaction,” Ludvigsen [17] advocates Battarbee's notion:

With a notion of experience design beyond the single user, Battarbee argues that it is limiting to see the user in the context of interactive technology as standing alone and be a passive consumer of whatever the designer has designed for them. Instead, users hack and rearrange their technology to fit with the activities at hand and especially in order to support social interaction and activities, and the construction of social spaces.

The central idea of co-experience is to explain how people become engaged in a social situation and, once engaged, how they interpret the situation and shape actions towards it [1]. To explain this initiation and reciprocation, she followed the framework of symbolic interactionism formulated by Blumer [3]. Symbolic interactionism is a theory of social interaction that sees meaning as something created by people interacting with others in the world. In the following, this theory is explained in more detail with the cultural perspective.

2.2 Role-Taking

According to Blumer, the framework of symbolic interactionism is based on three main principles:

1. people act upon and towards things according to the meanings they have for them.
2. these meanings arise from interaction with other people and then
3. these meanings are handled in and modified by people in an interpretive process [3].

What people see as a proper way of acting in any situation depends on how they position themselves and others into it. In particular, what interactionists call “role-taking” plays a crucial role: identities and roles are key resources when people construe lines of actions for any situation [18].

What is interesting in the concept of “role-taking” is that how people perceive their roles and shape actions towards perceived roles can be different in different societies. For example, Blumer’s view of symbolic interactionism whose origin is in Chicago of the 1930s, a city of restlessness with high immigration and social disorder, understands acting as a labile process, reducing role-taking almost to situational improvisation [3][1]. However, once these meanings are learned, they remain relatively stable, and even in restless environments, people strive for stability and respectability of conduct [9]. In more stable and tradition respecting societies, structural role-identities such as age, social status, or gender can play a more crucial role in shaping actions in a social situation. This linking between role-taking and culture provides a robust basis to deduce what role culture will play in creation of co-experience.

2.3 The Role of Interactive Technology in Co-experience

Interactive technology plays also an important role in organization of co-experience, as well as the role-taking process. Above all, it is evident that interactive technology opens a social situation in the first place by working as a communication means or drawing people’s attention: for example interactive installation in children’s science museum can engage group of children or a new hand-held device with innovative touch screen interface can draw surroundings’ attention. Moreover, it also participates in shaping properties and lines of actions in the process of social interaction. For instance, when sending a photo by MMS (mobile multimedia service) and IM (instant message), lines of actions and emotions created are different despite the same purpose. Through these social interactions, people come to make meanings to technology. All this meaning making process finally organizes co-experience, which implies that how given technology intervenes in role-takings, whether support or interrupt them, can result in different co-experiences.

3 Co-experience in Cultural Terms

Based on previous discussion of what constitute co-experience, this section has a sharper look at what aspects of culture affect role-takings and how this affect can shape different co-experience. Then we formulate a framework of relationship between co-experience and culture.

3.1 Cultural Differences in Communication Styles

What is considered appropriate is different in different cultures. This different value attribution results in different role-takings and different communication strategies. Ting-Toomey [22] formulated the framework on cultural differences in communication styles by adapting a politeness theory in which a central notion is human desire to maintain their “face.” Cultural variations in terms of the facework and communication styles are distinguishable particularly in the dimension of *high-context* culture versus *low-context* culture, the well-known framework formulated by Edward T. Hall [11].

In the field of cognitive psychology, Ross and Nisbett [21] and Choi et al. [5] found robust evidence that a person’s cultural background affects the way he or she interpret others and situations. According to them, people of *low-context* culture, such as that of the United States, value personal initiative and independence in group work. In contrast, people of *high-context* culture, such as that of China or South Korea, value group solidarity and tend to rely on member’s nonverbal behaviors when collaboratively solving a problem. Based on these studies, cultural differences in communication styles can be presented as Table 1.

Table 1. Comparison of communication styles in *high-context* versus *low-context* culture

Elements	<i>High-context</i> culture (e.g. East Asia)	<i>Low-context</i> culture (e.g. U.S.A., Western Europe)
Identity	Emphasis on “We” identity	Emphasis on “I” Identity
Supra-Strategy	‘Face-giving’, supporting others’ needs for appreciation	‘Face-restore’, protecting own freedom and space
Style	Obliging, avoiding, affective-oriented style	Controlling, confrontational, solution-oriented style
Nonverbal acts	Contextualistic (role-oriented) acts, indirect emotional expressions	Individualistic acts, direct emotional expressions
Value when solving a problem	Group solidarity	Personal initiative and independence

3.2 Cultural Differences in Role-taking and Co-experience

The preceding discussions on co-experience, role-takings and cultural differences enable us to formulate the conceptual model of relationship between culture and co-experience as Figure 1.

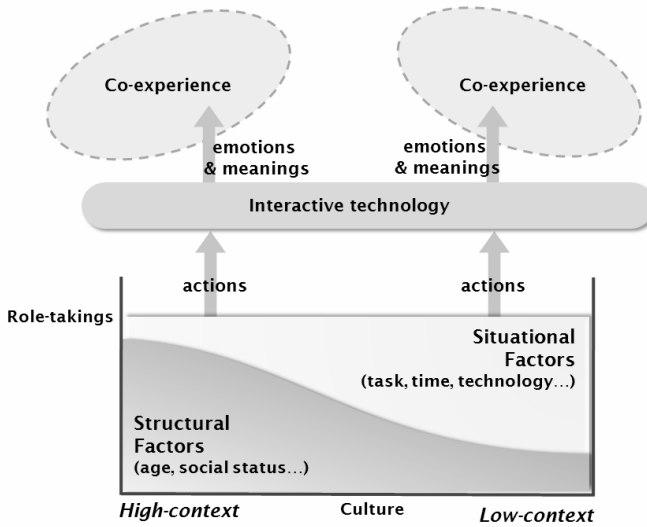


Fig. 1. The process of organization of co-experience in different cultures: When people perceive their roles in a group, structural factors (age, social status or gender) and situational factors (task, time or technology) affect in role-takings. In this process, structural factors become more salient in *high-context* culture, while situational factors become more influencing in *low-context* culture. Then people shape their actions according to the perceived roles, and interact with technology as well as other members. Emotions and meanings to the situation and technology arise and transform in this interaction. This process constitutes user experience in social interaction, i.e. co-experience.

Based on this framework, we can give a sociological interpretation for how cultural identities play out in certain situations as follows:

- In *high-context* cultures such as China and Korea one has to act not only in terms of situational identities, but also on structural identities by for example giving priority to more senior and higher status people. Technology should also follow the direction coming from social organization: if it intrudes with social order, it can insult seniors.
- On the other hand, urban California is an example of a *low-context* culture in which people play down issues like honorifics and status, encouraging people to go with the flow. Interactive technologies can be built for maximal efficiency without recourse to how it functions in social organization.
- Similarly, some of the claims of Hofstede's [13] study can lead to technology-related hypotheses. For example, in countries with *high power distance*, action is organized through status hierarchy, while in countries with *high uncertainty avoidance* scores, it is up to the highest status people to voice complaints about ambiguity and take lead in reducing it.
- Furthermore, with social change, these patterns change. According to Inglehart [14], as societies get wealthier, over the course of a few generations, they drift from traditionalist through materialist to post-materialist values. In his study, Scandinavia is the world leader in terms of post-materialistic values, while Korea is more materialistic. However in a study of social change in Korea, Na and Cha [19] have shown

that young metropolitan Koreans are far more post-materialistic than their order and rural countrymen, who lean towards materialistic and traditional values.

4 Towards Design Experiments

The next step is to feed the conceptual framework with empirical data. In order to validate the framework and yield design implications, we take the approach of design experiment, following the notion of *exemplary design research* [2]. As a design intervention to explore the research question, i.e. *how people in different cultures organize co-experience with interactive technology, intervened by role-taking process*, we designed a new technology called “Visual-Talk Table.” In this section, we depict how the framework of culture and co-experience led to design of “Visual-Talk Table” and how this technology can serve as a tool for testing the framework and hypotheses.

4.1 Visualize the Degree of Participation. “Visual-Talk Table”

In the context of team work, the development of group dynamics and the degree of participant’s involvement cannot be isolated from cultural context [23]. The development of group dynamics in group discussion is a good example of how role-taking functions in social situation. We came up with the idea that intervening group dynamics in group discussion situations can be a design experiment setting for observing influence of role-takings on co-experience. The design idea was how people will react to technology when the technology visualizes each member’s participation pattern. How will their role-takings shape actions responding to this visualization?

“Visual-Talk table” was designed to explore these questions, visualizing each member’s verbal participation by lights on the tabletop (Figure 2). Typically the combination of a table and chairs can invite a group of people and create social interaction in nature, for example, tea time, a brainstorming meeting or a group game.

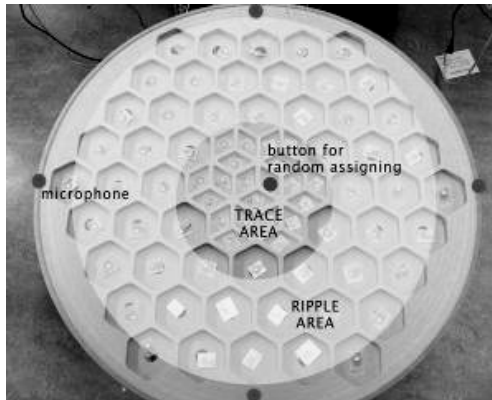


Fig. 2. Design of “Visual-Talk table”: For displaying patterns on the table, we designed a honeycomb pattern which consists of 75 hexagons containing microprocessor units with dual LEDs in each because a honeycomb pattern is capable of displaying various kinds of patterns on it and associated with patterns of tablecloths. Four directional microphones are embedded on the edges of four different sectors so that they can sense a voice from each participant.

On the table, light areas are divided into two; one is the ripple area displaying participants' ongoing talking and another is the trace area collecting the amount of each participant's speaking and remaining traces of their verbal social interaction. The main functions of the table are as follows:

Visualizing the amount of speech and its flow. When a microphone senses the voice from an assigned sector, LEDs mounted on the tabletop are turned on from the side of a person currently speaking. As speaking continues, the light ripples with yellow color spread. They go off when speaking stopped. When a person speaks long enough for ripples to reach the trace area in the middle of the table, one of blue LEDs in the person's sector is turned on. The light ripples and traces enable members to recognize who talked the most and the least as well as interaction flows by the shape of traces.

Visualizing intersections and random turn-taking. When ripples from different sides are intersected, lights show higher intensity so that it can represent intensive interaction or even interference between two persons. When nobody speaks, participants can press the button which can randomly point out one person in order to instigate speech. When the button is pressed, lights of one sector are randomly turned on, meaning a person in the sector should speak.

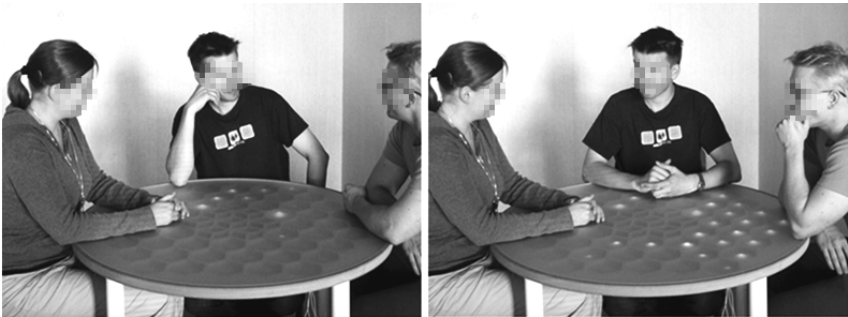


Fig. 3. “Visual-Talk table” in use denoting members' talking by lights

4.2 Experiment Design

In order to explore the relationship among role-takings, culture and co-experience, we can put this new design in the real world and observe how people use, interpret and appropriate given technology. Building case-specific hypotheses can provide us with more focused indicators for observation and analysis.

Experimental hypotheses. The way Visual-talk table visualizes group members' participation and verbal social interaction is not necessarily compatible with their role identities. Social position gives power to the highest-status person; the table denotes who talks most. It can infringe with the demands of social position. In high-context culture like China or South Korea people can be more sensitive to these infringements than in low-context culture like U.S.A. or the Netherlands; high-status people can get

annoyed if their role is challenged by technology and low-status people will get embarrassed because they feel high-status people lose their face.

In addition, who defines the line of actions related to technology, for example, drawing attentions from ongoing discussion to the technology and deciding what to do with it, can show variations according to cultures. In *high-context* culture, high-status people may get these turns more while these are distributed more evenly in *low-context* culture. Judgments concerning the table's behaviors can be also more voiced by higher status people in *high-context* culture, while this process will be more equal in *low-context* culture.

Experiment procedure. The design experiment with Visual-talk table should be carried out in a real context where group activities are organized, such as a meeting room or a coffee room in the office for two weeks. When people gather around the table, a video camera set in the room starts to record. After the events, people are interviewed in order to identify participants in mixed status groups.

Analysis will be first qualitative. From what people do around the table, we will identify instances in which it enters talk as a topic of its own and how this happens, and how people attribute changes in interaction and experience to the table. This analysis will be summarized with simple quantitative measures following quasi-experimental logic [4]. These measures will be also probed in interviews.

5 Discussion and Further Work

In this paper, we first built the conceptual framework to explain how cultural variations in role-taking can entail variations in “co-experience.” Then we introduced an example of a design case to illustrate how the conceptual framework can move towards empirical study. Because this paper is from ongoing study of the design experiment with “Visual-talk table,” comparative observations and result analysis should be the next step.

Despite promising observation data for further work, the paper brings important implications for interaction design in two aspects: “cultural aspect of co-experience” as a sensitizing concept for new design and an evaluation tool for cultural fitness. More specifically users' role-taking of experiencing interactive system can provide a new dimension in interaction design. In this study, we designed a novel interactive technology called “Visual-talk table,” inspired by the concept of role-taking. Observation on ways people create experience with this technology, which designers might not even expect, will produce more implications for both the framework and the design. A new design can be an interactive system better supporting role-takings in certain cultural domains. A system can also be designed to manipulate role-takings in order to create new user experience.

Moreover, the experiment design of Visual-talk table implies how the conceptual framework can be specified into indicators to evaluate cultural adaptability of interactive systems. Especially since few studies on cultural aspects in tangible and ubiquitous interaction are found, this approach can make convincing contributions in such areas.

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