

6 Discussion

This chapter discusses a possible alignment of the semiotic characteristics of CVM with theoretical semiotic elements from Peirce's typology of signs (1992-98). This allows us to characterize human-computer interaction more precisely and deeply, illuminating subtle issues in cross-cultural HCI design research.

Signs have been defined by Peirce (1931-58) as:

“Something which stands to somebody for something in some respect or capacity. It addresses somebody, that is, creates in the mind of that person an equivalent sign, or perhaps a more developed sign. That sign which it creates I call the interpretant of the first sign. The sign stands for something, its object. It stands for that object, not in all respects, but in reference to a sort of idea, which I have sometimes called the ground of the representamen” (*ibid.*, p. 2.228).

Peirce defines a triadic model for a sign where: the representamen is the form which the sign takes (not necessarily material); the interpretant is not an interpreter but rather the sense that a human mind makes of the sign; and the object, to which the sign refers and thus provides *grounding* for it. Figure 46 shows the Peircean triad often referred to as Peirce's *semiotic triangle*.

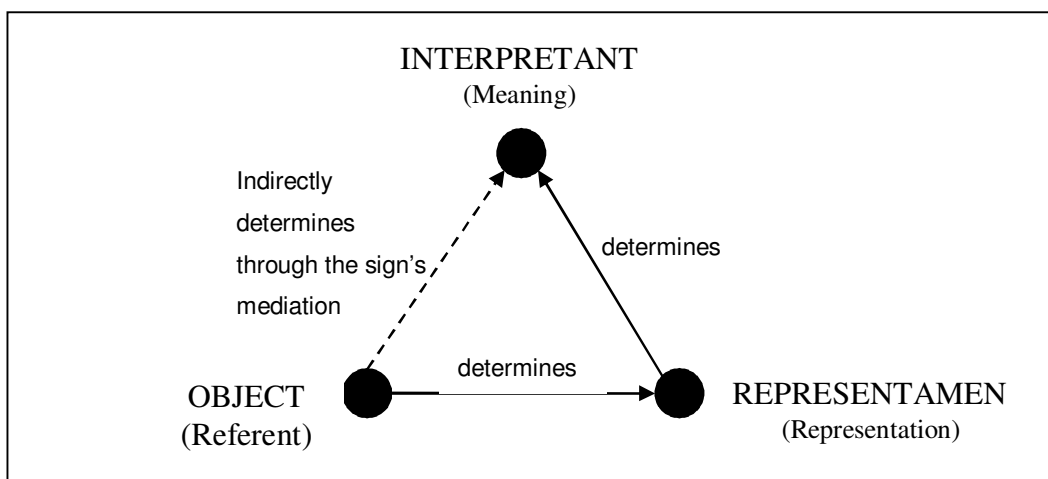



Figure 46: Peirce's semiotic triangle.

In the following definition, Peirce clarifies the determination relationship among the elements of the semiotic triangle:

“Sign is anything which is so determined by something else, called its Object, and so determines an effect upon a person, which effect I call its Interpretant, that the latter is thereby mediately determined by the former” (Peirce, 1998, p. 478).

For instance,  is a sign that represents 'warning' by virtue of a conventional contemporary Western culture interpretation (interpretant). It signifies some risk to a person. A sign exists whenever some interpreter takes a representation to mean something. Moreover, according to Peirce, the meaning of a representation (its interpretant), is also another sign. Then, each sign has another sign that corresponds to its meaning. The interaction between the representamen, the object and the interpretant is referred to by Peirce as 'semiosis' (Peirce, 1931-58, p. 5.484). Eco uses the term 'unlimited semiosis' to characterize this process as potentially infinite (Eco, 1984).

Peirce defined a fundamental typology of signs that can be manipulated to help communicators achieve their intent – symbols, indexes and icons. It is intrinsically related to Peirce's phenomenological categories of semiotic interest (firstness, secondness and thirdness), which are meant to provide the basis for explaining any phenomena of interest, *i.e.*, of all possible experiences to acquire knowledge (Santaella, 2000, p.7).

The following interpretation of Peirce's view by Santaella (2000) gives us the notion of what these phenomenological categories are:


“Firstness is allied to the ideas of chance, indeterminacy, freshness, originality, spontaneity, quality, immediacy, monad... Secondness is associated to the ideas of brute-force, action-reaction, conflict, here and now, effort and endurance, dyad... Thirdness is linked to the ideas of generality, continuity, growth, advocacy, mediation, triad.” (Santaella, 2000, p.8).²¹

The interpretation of de Souza (2005a), in turn, precisely gives meaning to the explanatory power of this classification:

“Firstness is the category of undifferentiated qualitative experience. It encompasses all the phenomena that we are aware of experiencing but do not discriminate from, or associate with, anything else. We can align this category to sensations, perceptions (...). Secondness is the category of strict associations between two phenomena. Our capacity to relate one thing to another requires that we perceive an invariant or commonality between them (...). Thirdness is the

²¹ Original text in Portuguese: “O primeiro está aliado às ideias de acaso, indeterminação, frescor, originalidade, espontaneidade, qualidade, presentidade, imediatividade, mônada... O segundo às ideias de força-bruta, ação-reação, conflito, aqui e agora, esforço e resistência, díada... O terceiro está ligado às ideias de generalidade, continuidade, crescimento, representação, mediação, tríada...” (Santaella, 2000, p. 8).

category of mediated relations (...), it allows formulate principles for relating things, for naming classes of things, and so on” (de Souza, 2005a, p. 46-47).

Peirce’s sign classification into icons, indexes and symbols is about how representations evoke their referents, not their meaning, in other words, for instance, how this image  evokes ‘some risk’.

Iconic signs represent their objects “mainly by its similarity” (Peirce, 1931-58, p.2.276). A sign is an icon “insofar as it is like that thing and used as a sign of it” (*ibid.*, p. 2.247). Indeed, icons have qualities which 'resemble' those of the objects they represent, and they “excite analogous sensations in the mind” (*ibid.*, p. 2.299). Unlike indexical representations, the icon has no dynamic connection with the object it represents.


So, an iconic representation evokes the firstness of its referent by sensorial perceptions. Again with our example, let us imagine how to represent the referent ‘some risk’ by an iconic representation. Such is the case of a sound, for example, to represent risks associated with it for disaster preparedness.  evokes the same perception as we have in contexts where we encountered a physical object like the one shown in Figure 47.



Figure 47: A physical outdoor posted near a dangerous place (Photo by photoeverywhere.co.uk: <http://www.photoeverywhere.co.uk>).

An index is a sign which demonstrates a genuine relation between the 'sign' and the object which does not depend purely on “the interpreting mind”

(*ibid.*, p.2.298). The object is “necessarily existent” (*ibid.*, 2.310). The index is connected to its object “as a matter of fact” (*ibid.*, 4.447). There is “a real connection” (*ibid.*, 5.75). An indexical sign is like “a fragment torn away from the object” (*ibid.*, 2.231). Unlike an icon (the object of which may be fictional) an index stands “unequivocally for this or that existing thing” (*ibid.*, 4.531)


So, indexical representations evoke the secondness of their referent. In this case, an indexical representation to the referent ‘some risk’ is used in the website of President Costa e Silva Bridge, commonly known as the Rio-Niteroi Bridge, <http://www.ponte.com.br/>. Figure 48 shows how they alert the users to the traffic conditions to Niteroi city (in a given moment) by an indexical representation . Actually, it is an index to more detailed information (see Figure 49).



Figure 48: Indexical representation in Rio-Niteroi Bridge website
(<http://www.ponte.com.br/>).

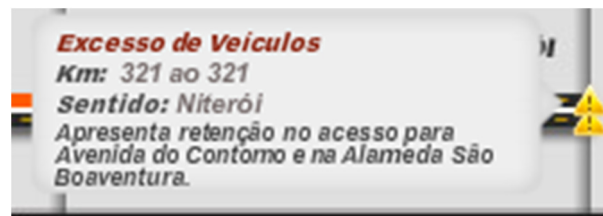


Figure 49: Detailed information about traffic in Rio-Niteroi Bridge website.

For Peirce, a symbolic representation is “a sign which refers to the object that it denotes by virtue of a law, usually an association of general ideas, which operates to cause the symbol to be interpreted as referring to that object” (*ibid.*, 2.249). The representation evokes the thirdness of its referent not by any phenomenon, situation or sensorial, temporal or spatial circumstance, but by the forces of social and historical conventions. Figure 50 shows some industrial signs to represent 'danger', which are extensively used and known by Western culture.



Figure 50: Symbolic representation to 'danger' (image by dreamstime.com:
<http://www.dreamstime.com>).

By adopting each metaphor, designers are invited to follow a specific combination of metacommunication features and cultural variables to achieve effects on interactive discourse (see Table 8 – Chapter 4, Section 4.2 for details). However, results from the Case Study reported in Chapter 5 regarding difficulties in understanding differences among CVM and their practical effects in design, led us to think about the challenges in the semiotic engineering itself and opened the following research questions regarding how to protocol cultural components in the interface:

- Which kinds of signs (icons, index, symbols) are appropriate to characterize each metaphor?
- What are the potential consequences of using CVM on the users' levels of perception and knowledge about cultural diversity?

The two questions are related since CVM generate a causal relation among them. The CVM want to help designers in stimulating users to engage in different levels of intercultural contact (if it is desirable), which may increase their perception about cultural diversity in the particular domain where the system is placed. So, the intercultural contact potentially causes a level of perception of cultural diversity.

In order to address the research questions presented above, from now on we analyze the different ways of promoting intercultural contact with cultural diversity by using CVM (and their respective effects) in the light of Peirce's typology of signs. We aim then at discussing whether the different intercultural contact promoted with CVM as well as their consequences to the users' perception about cultural diversity take place in accordance with Peirce's categories.

To begin, the *domestic traveler* metaphor stays out of question, since it does not intend to promote intercultural contact. The intended design effect is, thus, that of **cultural unawareness**, i.e., the condition of being uninformed or unaware (unconsciousness resulting from lack of knowledge or attention).

The definition of *observer at a distance* metaphor says that “the cultural markers of another culture are communicated as ‘information’ (not as an experience the user can ‘feel’). It is achieved by a narrative about the foreign culture to provide factual information about what is different from one’s own culture. So, design intent is to give the seed for cultural semiosis, but not the experience of cultural diversity itself. In Peirce’s semiotic terms, the idea of this metaphor is to present an index for the presence of other culture, so the user will be contact with other culture in a secondness way.

We are not saying that the whole interface is created with indexical signs, but that the general idea is that a design with this metaphor usually evokes the secondness of the referents of cultural diversity. For instance, using the example of websites of international recipes (see Chapter 4) the Austrian flag link act as sign of the presence of a foreign culture and as an invitation to ‘learn more’ (see Figure 51).



Figure 51: Screenshot of www.globalgourmet.com, section 'Destination: Austria' (last accessed in December 2010).

The *Guided tour metaphor*, in turn, usually evokes the thirdness, since designer's deputy mediates intercultural contact by giving meaning to foreign referents. The definition says that the cultural markers from another culture are 'illustrated' to the user (aspects of cultural issues are exemplified and explained in the user's language). It is achieved by an interpreted view and commentary on the foreign culture which mediates the user's approximation and contact with cultural diversity. The idea of this metaphor is to guide the user's interpretation by thirdness signs, thus reaching the maximum mediation.

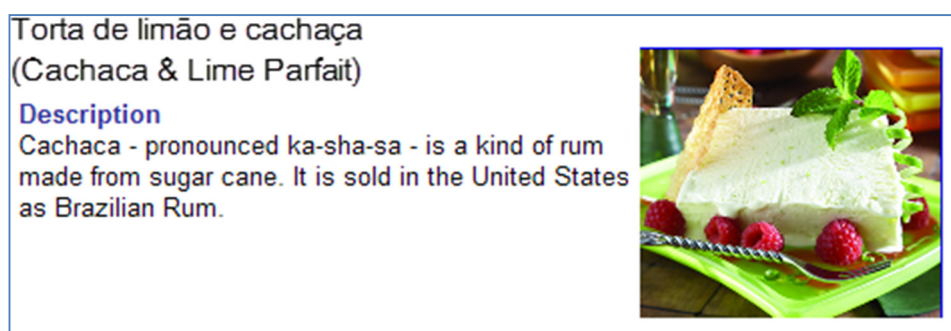


Figure 52: The www.culinary.net website (last accessed in December 2010).

The Culinary.net website is a good example of how metalinguistic signs may mediate the differences of typical Brazilian food with American culture (see Figure 52). With the guided tour visitor metaphor, thus, the designers' deputy mediates the intercultural contact by illustrating the foreign culture in comparison to user's culture.

In both cases (in the *observer at a distance* and *guided tour visitor* metaphors) the intended effect is that of **cultural awareness**. But the effects on cultural diversity perception are different, since the strict associations evoked by secondness representation in *observer at a distance* metaphor are not mediated by the designer's deputy.

Peirce's theory of perception shed some light to explain the differentiation among different levels of **cultural awareness** on users' perception with these two metaphors. According to Santaella (1993), this theory is triadic, since three logical elements are involved in every perception: (1) the percipuum, (2) the percept, and (3) the judgment of perception.

"The percept is the object of perception, something that is out there, mute, foreign, that which knocks at the door of our senses. The percipuum corresponds to the way the percept is translated by our sensory organs. This translation is immediately interpreted in a judgment of perception." (*ibid.*, p. 24)

The awareness of cultural diversity actually requires a number of levels of knowledge. In Peirce's vision, as interpreted by Santaella (1993) "transformation of the percept, that which is outside, into the percipuum, that which is inside, will evidently and logically take place in accordance with three categories: firstness, secondness and thirdness" (1993, p.74). These categories denominate three different states of knowledge and processes of integration of the percept. Santaella continues: "Peirce says these moments are infinitesimal, from which it results that consciousness is a continuum" (*ibid.*, p. 303-4).

The idea of the *foreign with* and *without translator* metaphors is to represent cultural diversity by evoking the firstness of their referents, since according to their definitions the cultural markers of another culture can be directly 'experienced' by the user. With firstness signs there is no mediation, but we also see secondness elements with the *foreign with translator* metaphor, since the interface in the users' language acts as a reference to their native culture when making relations to the foreign cultures. In both cases, the design intent provokes a **cultural experience**, since it represents the nearest point of contact with a foreign culture where the designer may try to offer to the user.

As a whole, in Peirces' semiotic terms, design represents cultural diversity by signs to users. If we consider that the correspondence between CVM and the Peirce's categories is plausible, with CVM designers may work thinking about different levels of knowledge in terms of firstness, secondness, and thirdness. So, designers may consider that users' semioses may walk through the continuum of cultural approximation by reflecting how intercultural contact may stem from rationality to sensorial experiences with different levels of cultural perceptions. Figure 53 shows the possible gradual effects on cultural diversity perception of different cultural mediation rhetoric regarding each metaphor.

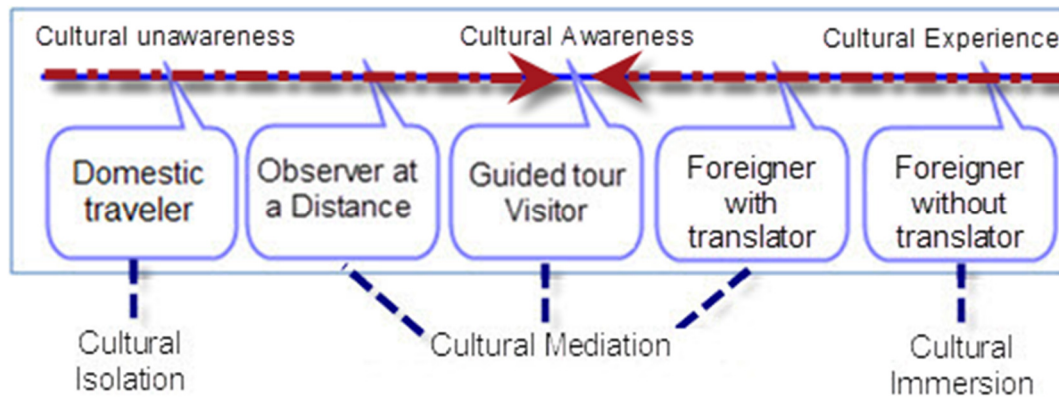


Figure 53: Continuum of cultural approximation with different levels of cultural perception.

Figure 54 (also presented in Chapter 4, p. 63) shows how the metaphors are distributed in relation to cultural approximation (horizontal axis) and support provided by the metacommunicative discourse (vertical axis). Additionally, though, we included the effects on users' perception. It clearly demonstrates the causal relation between the semiotic engineering with icons, indexes and symbols and the potential consequences of them to the users' levels of perception and knowledge about cultural diversity.

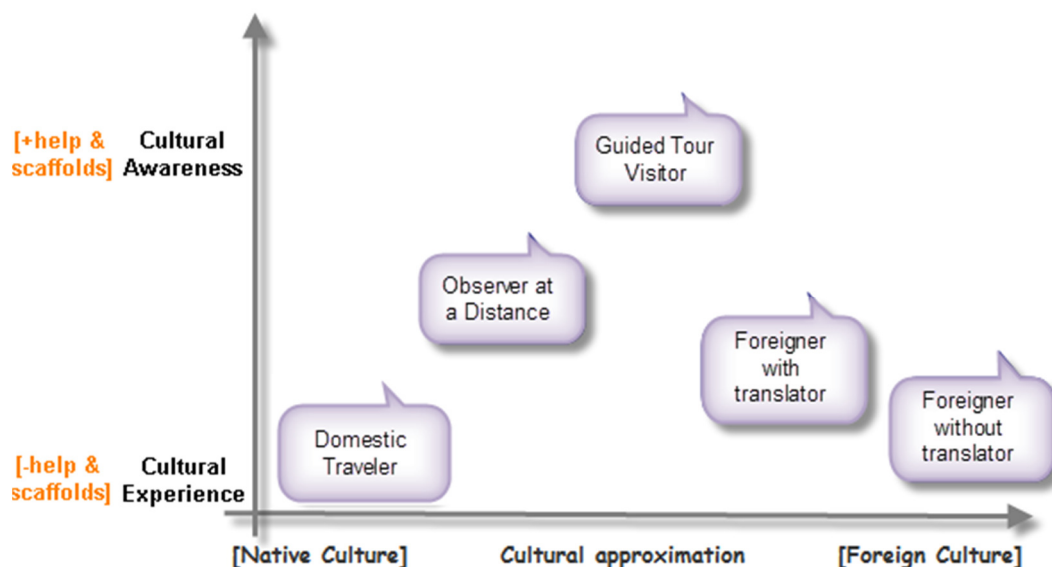


Figure 54: Metaphors' signification and effects while expressing design intent.

The value of this view is that semiotic engineering of cross-cultural systems, i.e., the elaboration of metacommunication, may be viewed as a matter of promoting cultural unawareness, awareness or experience. So far, we only have

the metacommunication itself, but from now on we have a metacommunication in a cultural context.

Furthermore, the current Semiotic Engineering ontology considers three classes of signs in the designer's deputy's interaction discourse: static, dynamic, metalinguistic (de Souza & Leitão, 2009). With this view we are opening a theoretical way of thinking in classes of cultural signs in terms of the promotion of cultural unawareness, awareness or experience.

Next chapter presents the contributions of this thesis to HCI research, to Semiotic Engineering, and opportunities to future work.