

# **Social Robots and Emotion: Transcending the Boundary Between Humans and ICTs**

**Satomi Sugiyama**  
**Franklin College Switzerland**

**Jane Vincent**  
**London School of Economics and Political Science**  
**University of Surrey Digital World Research Centre**

**KEY WORDS:** social robot, emotion, ICTs, mobile phone, body

The notion of social robots often evokes the idea of ‘humanoid social robots’ which are “human-made autonomous entities that interact with humans in a humanlike way” (Zhao, 2006, p. 405). These humanoid social robots, and also zoomorphic social robots, are becoming a part of our everyday communicative interactions. They have been introduced to us as relational artefacts such as Tamagotchis, Furbies, and Aibos, asking the question of who we are becoming as we develop intimate and emotional relationships with machines (Picard 1997; Turkle, 2007, 2012). These relationships between humans and machines have been discussed not only in terms of intelligent machines, such as humanoid social robots incorporated into our social domains, but also in terms of the hybridization of the human body and machines (Haraway 1991; Fortunati, 2003a, 2003b; Katz, 2003; Fortunati, Katz, & Riccini, 2003). At the surface level, humanoid social robots and artificial intelligence might create an impression that the questions about the relationship between humans and technologies are still far removed from our everyday experiences and saved for the research laboratories and the world of science fiction. However, information and communication technologies (ICTs) have been slowly but steadily ‘approaching’ the human body, calling for a reconsideration of the notion of social robots.

Some international collaborative research on the topic has been conducted in Italy and the UK (e.g., Fortunati, Katz, & Riccini, 2003; Vincent & Fortunati, 2009), and in the U.S. (Katz, 2003) exploring the relationship between humans and machines, especially with regard to the body, intimacy and emotion. These research efforts have brought about work such as the *Machines That Become Us* perspective, which implies that “the technologies ‘become’ extensions and representative of the communicator,” “technologies become physically integrated with the user’s clothing and even body,” and technologies are “becoming to the wearer” (Katz, 2003, p. 1). Katz conceives of media technology to include telephone wires, computer networks and mobile phones, “second skin,” fashion, accessories, and decorations that we wear on our body (Katz, 2003, p.18). As McLuhan (1964/1994) stated, “all media are fragments of ourselves, extended into the public domain” (p. 266). Not only does the technology extend human body and sensory systems into the public domain, but it is also being *incorporated* into the human body and becoming part of a means of expressing identity and emotions (Katz, 2003). This need many people have for always on connectivity has engendered a close attachment to their ICT devices, emphasized by the mass adoption of mobile phones and tablet devices. Fortunati and Vincent (2009) argue this emotional attachment provokes electronic emotions - “emotions lived, re-lived or discovered through machines” (p. 13).

These past research efforts underline two essential points that allow us to reconsider the notion of social robots. First, as the distance between ICTs and the human body shrinks, ICTs are going through the process of *anthropomorphization*, which suggests the imitation and simulation of human beings both cognitively and affectively (Fortunati & Vincent, 2009, p. 2). Second, as ICTs are increasingly incorporated into the human body, humans are turning into “*homo technologicus*” (Longo, 2003), rendering the human body as a place where the natural and the artificial merge (Fortunati, 2003a, 2003b).<sup>1</sup> This line of research suggests that social robots do not only imply the humanized intelligent artefact but also refer to the *technologized* human body. Haraway (1991/2003) suggests that the blurring boundaries between humans and machines result in heightening our sense of connection to our tools, claiming that “we find ourselves to be cyborgs, hybrids, mosaics, chimeras” (p. 443). As ICTs blur the boundaries of the human body, we become more conscious and feel more connected to our body, which is “the first and most immediate technological tool” (Fortunati,

---

<sup>1</sup> In considering the *Machines That Become Us* perspective, Fortunati (2003a) argues that the human body “is represented as the emblem of naturalness” within a historically determined concept of naturalness, yet it is indeed “artifice to the maximum degree” (p. 72).

2003b, p. 62). Fortunati (2003a) points out that the recent technological advancement and its effects on the body make the body “retreat from the intermingling and confusion of the natural and artificial” (p. 74), but simultaneously, promote their reunification (p. 81). This unsettling phenomenon of blurring boundaries between ICTs and the body (Fortunati, 2003a; Sugiyama, 2010) highlights the binary tension between the natural and the artificial, as humans and technologies share agency (Låsen, 2010).

As discussed, past research suggests that the notion of social robots can be conceived of as a concept that implies ICTs turning into a human-like entity as well as humans turning into ICTs. Once one accepts that the commonly used ICTs such as mobile phones can be conceived of as social robots, and also, such ICTs are potentially turning humans into social robots, one realizes that it is time to give significant scientific efforts to examine the social impact of social robots including the ambivalent relationship between ICTs and the human body.

One of the approaches that we can take to examine the notion of social robots is to focus on emotion. As people “manage emotions” (Hochschild, 1983/2003) using ICTs, the miniature mobile technology becomes monstrous in presence (Sugiyama, 2009). The embodied ICTs evoke electronic emotions (Fortunati & Vincent, 2009, p. 13), and as the ICTs make our life convenient and complicated simultaneously (Aakhus, 2003) these electronic emotions need to be managed with great care. Aforementioned past research suggests the critical role of emotion in examining the technologized human body as well as the embodied ICTs. If ICTs serve as “creators and diffusers of emotion” as well as “repositories of electronic and mediated emotions” (Fortunati & Vincent, 2009, p. 15), how will technologized humans and *anthropomorphed* technologies create, diffuse, and store emotions? Longo (2003) states that “it is always the human-computer unity that thinks” (p. 27). Is it the humans who feel in response to the machines? Or is it the *human-machine unity that feels*? Almost a decade ago, Fortunati (2003) claimed that society has reached the point where “ICTs saturate the body and bodily senses” (p. 71), and this phenomenon is presumably even more pronounced in recent years as ICTs become ‘smarter.’ Then, we are prompted to ask questions about where we currently stand in terms of the relationship between humans and ICTs, and also, how people experience social robots, broadly defined, in everyday life.

In order to begin answering these questions, the mobile communication studies are pivotal because the mobile media can be considered as the ICTs that are closest to the human body and central to human emotional experiences at the moment. As a systematic step for synthesizing relevant work on mobile communication and emotions, and also, for starting to make a bridge between the work and the major research on humanoid social robots, a two-day workshop was convened in the summer of 2011 at Franklin College Switzerland supported by the Swiss National Science Foundation, Franklin College Switzerland, and the Green Leaves Fund. The workshop aimed to share our exploratory research and ideas to facilitate the future collaborative research. This inauguration volume of *intervalla: platform for intellectual exchange* presents a peer-reviewed selection of papers discussed during the workshop.

The first paper by Baron proffers questions that frame much of the debate explored in this volume and in particular the authenticity with regard to artificial intelligence (AI) and our use of ICTs. How accurate and authentic is the original item and how much does this matter to those who see or use it? The focus of her discussion is whether humans seek social robots that simulate human (or animal) emotion and how this might manifest. Baron shows that authenticity is not necessarily always demanded and might indeed be avoided in order to maintain anonymity. She takes us on a journey of exploration beginning with an evocative experience in Venice, through the arts, the presentation of the emotional self and the development of AI illustrated with many examples to explore her questions. Baron’s essay provides a link between the studies of human and humanoid

interaction that involve mobile phones, ICTs and especially designed social robots like the baby seal Paro.

We turn now to the remaining seven studies in this volume, the first three of which examine research that proffers a greater understanding of the developing human response to robots, as well as to the role of emotion and affect in this area of growing interaction. In their paper Halpern and Katz have shown through analysis using the social information processing model that humans' engagement and attitudes towards robots has been influenced by their earlier experiences online, and that, as a result, they tend to attribute robots with human-like characteristics. They argue that a stronger acceptance of robots has been led by the lack of formal cues available when interacting electronically in the socially charged electronic environments they explored. Furthermore there is an attribution and recognition of human like characteristics in these robots. This may have implications towards the greater social acceptability of robots in various human domains.

Whereas Halpern and Katz find emotion is an outcome of being in a socially dynamic electronic and digital environment, Höflich begins his analysis by showing how a person can start an emotional relationship with a technical, interactive artefact. Following Turkle (2007), Höflich explores whether people have perhaps always thought like a machine rather than developing ways to get machines to think like people. He takes us into the uncanny, when we wonder what is happening; a situation prompted by the relationship between man and social robot and one felt particularly acutely if the robot is made too humanlike. Drawing on Simmel (1995), Höflich further examines the role of the robot as a third person, or thing, one that is both constructive and deconstructive in relationship building, and how it plays an interventional role in the intersubjectivities of ego and alter in a relationship. The role of the robot as a machine with no emotion that is reacted to and interpreted as social is the focus of Höflich's discourse.

Finally in this section Linke's paper explores aspects of social relation through analysis of human technology and human-humanoid interaction. Her paper develops the mediatization approach to understanding the interaction between humans and social robots, as well as drawing on ritualization theory. She argues that useful insights for a conceptualization of the human-social robot relation can be achieved by exploring mediatized and ritualized relational practices. Linke asserts that in order to fully explore the possibilities for social interaction with social robots the topic should be considered in the context of a broad portfolio of information technologies and not just on specific ICTs, thereby enabling a greater understanding of the shaping of technologies and everyday lives.

The next two papers develop the idea of the social robot being a symbiotic relationship between device and user. Vincent's paper explores the emotional relationship between user and their phone – one that is engendered and developed by how and for what their mobile phone is used. This includes the relationships they enable and how the user's emotional identity is impacted by the electronic emotions created and lived via the mobile phone. She suggests that this intimate and constant interaction between user and device has changed the mobile phone into a personalized social robot when associated with its user. Contrasting the mobile phone with social robots that are especially constructed to interact with chosen emotions, Vincent argues that because the mobile phone has not been designed in this way it can be a much more personal and unique social robot device - one that only the user can relate with. Sugiyama also explores this increasingly close relationship between mobile phones and humans through the notion of the mobile device turning into a quasi-social robot. She questions the boundary between mobile device and humans in the context of her research about Japanese young people arguing that the mobile device has gone through a process of anthropomorphization to the extent that some even experience the device as part of their body. This transcending boundary between humans and the mobile communication device highlights the changing emotions that are also being experienced when the mobile phone is

being used. This is exemplified by the electronic emotions engendered as a consequence of interaction with this ICT machine itself.

The final two papers by Lásen and Barile explore the ICT environment in which social robots are being developed. Lásen's study of intimacy provides us with an understanding of the human behaviors involved in using mobile devices by exploring issues of affect and emotion such as they appear in the context of artificial intelligence and in contemporary use of ICTs. The social practices of humans and their interaction with technologies, emotion in couples' relationships, in the everyday leisure activities of life and in the working day, are all examined in this discourse. Lásen explores the affective turn in emotion research that particularly highlights the non-dualist approach now appropriate to examining emotion in relation to human interaction with artefacts. Changing social practices, such as loss of embarrassment, that lead to the public display of affect and emotion are also explored and in sum this paper provides a review of emotion that highlights the affective turn not only in emotion studies but in contemporary use of ICTs too. In Barile's paper we have a discourse on emotion, on the complexities of the new technological environment and a discussion of the dilemma of what is real. Positioning his discourse within the consuming culture of the past three decades, Barile develops his argument through his concept of 'ontobranding' and illustrates it with case studies. This reflects the transformation of a mass dimension in which the established human and machine interaction is moving towards a softer, emotional and immaterial distillation of everyday life. The discussion is not limited to the context of users of devices but extends to the metaphysical, to notions that places become media and emotion becomes content. The changing global dimensions of virtual and real of the late capitalism and aspects of the dynamic relationship between consumption and production provide a perspective of the complex technological world in which humans now interact with each other and with machines.

The volume concludes with an Afterword by Fortunati that links the journal papers through discussion of the transversal topic of the forms of social robots. Fortunati's exploration of the development of social robots from ancient automata to contemporary advanced robotic technologies examines the legacy of both the emotional and social relationships that humans have had with these machines. This paper shows just how influential automata and robots have been: since time immemorial and into the present; in the development of new technologies; in the advancement of the arts; in new scientific ideas; in innovations and in the changing social contract. Fortunati focuses her discussion on the changes in robotics particularly within the domestic sphere and the diverging paths of robotics that serve the material part of housework and immaterial part of reproduction work. These changes are explored through the new concept of 'ubiquitous social roboting,' which articulates the dematerialization process brought about by social robots. Fortunati asserts that the social meaning, and the impact on society of social robots is still unclear; the place they have in the domestic sphere is already significant and it would appear that social robots will increasingly be used in ways that people have yet to fully understand and accept.

As a whole, the volume explores the intricately changing boundary between humans and ICTs and the role emotions play in the dynamics. Furthermore, it explores the gap between the research on social robotics and that on ICTs with a special emphasis on mobile communication. As will be seen, these papers begin developing an understanding of the very notion of social robots that transcend the boundary between humans and ICTs, hoping to raise critical questions that require future investigations.

## RERERENCES

- Aakhus, M. (2003). Understanding information and communication technology and infrastructure in everyday life: Struggling with communication-at-a-distance. In J. E. Katz (Ed.), *Machines that become us: The social context of personal communication technology* (pp. 27-42). New Brunswick, NJ: Transaction.
- Fortunati, L. (2003a). The human body: Natural and artificial technology. In J. E. Katz (Ed.), *Machines that become us: The social context of personal communication technology* (pp. 71-87). New Brunswick, NJ: Transaction.
- Fortunati, L. (2003b). Real people, artificial bodies. In L. Fortunati, J. E. Katz, & R. Riccini (Eds.), *Mediating the human body: Technology, communication, and fashion* (pp. 61-71). Mahwah, NJ: Lawrence Erlbaum.
- Fortunati, L., Katz, J. E., & Riccini, R. (Eds.). (2003). *Mediating the human body: Technology, communication, and fashion*. Mahwah, NJ: Lawrence Erlbaum.
- Fortunati, L., & Vincent, J. (2009). Introduction. In J. Vincent, & L. Fortunati (Eds.), *Electronic emotion: The mediation of emotion via information and communication technologies* (pp. 1-31). Oxford: Peter Lang.
- Haraway, D. (2003). A cyborg manifesto: Science, technology, and socialist-feminism in the late twentieth century. In R. C. Scharff, & V. Dusek (Eds.), *Philosophy of technology: The technological condition: An anthology* (pp. 429-450). Malden, MA: Blackwell.
- Hochschild, A. R. (2003). *The managed heart: Commercialization of human feeling* (20<sup>th</sup> Anniversary edition with Afterword). Berkeley, CA: University of California Press.
- Katz, J. E. (Ed.). (2003). *Machines that become us: The social context of personal communication technology*. New Brunswick, NJ: Transaction.
- Låsen, A. (2010). Mobile culture and subjectivities: An example of the shared agency between people and technology. In L. Fortunati, J. Vincent, J. Gebhardt, A. Petrovic, & O. Vershinskaya (Eds.), *Interacting with broadband society* (pp. 109-123). Frankfurt: Peter Lang.
- Longo, G. O. (2003). Body and technology: Continuity or discontinuity. In L. Fortunati, J. E. Katz, & R. Riccini (Eds.), *Mediating the human body: Technology, communication, and fashion* (pp. 23-29). Mahwah, NJ: Lawrence Erlbaum.
- McLuhan, M. (1994). *Understanding media: The extensions of man*. Cambridge, MA: MIT Press.
- Picard, R. (1997). *Affective computing*. Cambridge, MA: MIT.
- Simmel, G. (1995). *Soziologie. Untersuchungen ueber die Formen der Vergesellschaftung* (2nd ed.). Frankfurt am Main: Suhrkamp.
- Sugiyama, S. (2010). Seeking equilibrium: A study of how college students experience their 'away from home' everyday life with a mobile phone. *Encyclopaideia: Journal of Phenomenology and Education* (Special issue: Between the subject's agency and the strength of things. A phenomenological approach to mobile communication in everyday life), 27(2), 133-154.
- Sugiyama, S. (2009). The decorated mobile phone and emotional attachment for Japanese youths. In J. Vincent, & L. Fortunati (Eds.), *Electronic emotion, the mediation of emotion via information and communication technologies* (pp. 85-103). Oxford: Peter Lang.
- Turkle, S. (2011). *Alone together: Why we expect more from technology and less from each other*. New York: Basic Books.
- Turkle, S. (2007). Authenticity in the age of digital companions. *Interaction Studies*, 8(3), 501-517.
- Zhao, S. (2006). Humanoid social robots as a medium of communication. *New Media and Society*, 8(3), 401-419.

# **Lessons from Venice: Authenticity, Emotions, and ICTs**

**Naomi S. Baron**  
**American University**

## **ABSTRACT**

Since the emergence of modern artificial intelligence research in the 1950s, scholars have striven to model the ways in which humans think, speak, move, and emote. A presumed measure of success is the degree to which computer-driven programs or mechanical constructs can reproduce (that is, simulate) behaviors of their human counterparts. With the development of robotic pets, comparable measures have been considered. The goal of simulation is based upon an assumption regarding the extent to which humans seek authenticity, more generally, in the representations they encounter. By “representation” we mean everything from an audio recording of a musical performance, to an architectural reproduction of an original edifice, to a sculpture depicting a person, to a robotic pet. This essay argues that authenticity in representation is not always a desired goal. As a result, as we think about the extent to which the robots of today (and tomorrow) are capable of expressing emotion and other behaviors that are judged to be life-like, it behooves us to consider the degree to which users of robots are actually seeking verisimilitude.

**KEY WORDS:** artificial intelligence, authenticity, emotion, ICTs, representation, simulation

## OPENING PRELUDE: SOUNDS AND SIGHTS OF VENICE

Chiesa di San Vidal stands in Venice, near the Accademia Bridge over the Grand Canal. Though no longer a functioning church, it is home to performances by a talented and vivacious chamber orchestra, *Interpreti Veneziani*, which specializes in playing music by Baroque composers. The group has recorded a number of CDs, making it possible to enjoy their music anywhere in the world. Yet however good the quality of the recordings, attending a live concert is a radically different aesthetic experience: The dynamics of the interaction between members of the group, their nuanced gestures, and the emotion on their faces render these performances “authentic” in a way that cannot be captured on an audio soundtrack.

The issue of authenticity also comes into play with a better-known Venice landmark: the Campanile di San Marco, the 98.6 meter bell tower that stands adjacent to the Basilica di San Marco. The original Campanile, completed by 1514, collapsed in 1902, but was faithfully rebuilt in 1912. Authentic? Not literally, but the very best that could be done, even incorporating pieces from the original structure. Far less faithful is the version of the Campanile that is part of the Venetian Hotel in Las Vegas, which opened in 1999. A bit like the buildings in the national pavilions at Walt Disney World, the Venetian Hotel complex (including the Campanile) is more intended to give the flavor of Venice than to offer verisimilitude. Judging from the commercial success of the hotel, it would appear that guests are not put off by the lack of authenticity.

What do issues of authenticity in Venetian music or architecture have to do with information and communication technologies (ICTs)? The answer is personal. A Spring 2011 visit to Venice inspired me to think about issues of authenticity in preparation for the Summer 2011 workshop on Social Robots and Emotions, hosted by Franklin College of Switzerland.

The central question of this essay is: How important is authenticity when we are using ICTs, particularly as social robots? We will argue that just as in the Venetian examples – as well as in a host of other auditory, linguistic, or visual contexts – strict authenticity is often less relevant than filling particular aesthetic or interactive functions.

## THE QUESTION OF AUTHENTICITY

To what extent does an artifact such as a musical recording, a building, a piece of art, or an artificial intelligence program constitute a “genuine” rendering of an original? This question contains two parts. The first concerns the extent to which the rendering is faithful. However, the second involves the degree to which the beholder (or the user) takes authenticity as a desirable goal.

Both parts of this question have long and complex histories. In the world of art, for example, the desire for authentic renderings has been dominant in some societies, and in some historical periods, but not in others. Or consider authenticity in lay use of digital media. In contemporary times, with the growth of blogs and citizen journalism, there are those whose writing seems to imply that representation of the “truth” (e.g., in news accounts or commentaries) can itself be relative (Manjoo, 2008), leading the comedian Stephen Colbert to introduce the notion of “truthiness,” meaning “the quality of preferring concepts or facts one wishes to be true, rather than concepts or facts known to be true” (American Dialect Society, 2006).

There is a vast literature on authenticity. Among the best-known studies are Walter Benjamin’s “The Work of Art in the Age of Mechanical Reproduction” (Benjamin, 1968) and Susan Sontag’s *On Photography* (1977) and *Regarding the Pain of Others* (2003). But there are hundreds of others, including philosophical discussions (e.g., Adorno, 1973), explorations of authenticity in the political arena (e.g., Murtola & Fleming, 2011), reflections on relevant moral issues (e.g., Trilling, 1972), books on authority and consumerism (e.g., Gilmore & Pine, 2007), and examinations of



cultural authenticity (e.g., Orvell, 1989), including in the tourist industry (e.g., Wang, 1999). This essay does not attempt to survey the field. Rather, it focuses on issues of authenticity in the domains of artificial intelligence and ICTs, leading to consideration of the role of authenticity in using social robots.

### **Authenticity and Artificial Intelligence**

Since 1956, when the term “artificial intelligence” was coined at a conference held at Dartmouth College, scientists and lay people alike have wrestled with the question of what it would mean for a software program (or a mechanical device operated by such a program) to have intellectual capacities equivalent to those of a human (e.g., McCorduck, 2004). A few years earlier, faced with the question of whether computers could think, Alan Turing (1950) had proposed a test: Could a machine engage in conversation with a human such that the dialogue was indistinguishable from conversation between humans? In 1990, Hugh Loebner established an annual competition in which contestants are invited to test their programs against a panel of judges.<sup>1</sup> Interestingly, there is also a prize for the human contestant best able to convince the judges of his or her humanness (Christian, 2011).

Looking more broadly at developments in the field of artificial intelligence, we have witnessed profound advances in what programs (and machines running those programs) can do. Natural language processing programs now broker millions (if not billions) of telephone inquiries a day. Google has prototyped a car that can drive itself (Markoff, 2010). And onscreen avatars are being engineered to express emotions (Ortiz et al., 2009; Paiva et al., 2007).

Traditionally, a fundamental question in AI has been whether the artifacts created are designed to emulate or simulate human behavior: Has the goal been to perform cognitive or motor operations in the same way that humans do (emulation) or, instead, to yield the same results as found in human action, regardless of the path followed to get there (simulation, which is a comparatively simpler task)? Our issue, however, is a different one: Are users of the fruits of AI actually looking for replicas of human behavior (however achieved)?

The theme of the workshop that generated papers in this volume is the expression of emotion by social robots – AI-driven machines that are explicitly designed to interact with people (in contrast, for example, to industrial robots). Therefore, our ultimate question here is whether human users are looking for their social robots to express emotion that closely simulates that of humans (or, in the case of robotic pets, animals).

### **Authenticity and ICTs**

Over the past twenty years, interest in these issues has expanded from the computer science-based discipline of AI to the growing field of new media studies, a syncretic conglomerate of research generated by sociologists, communication specialists, and linguists – to name but some of the contributing disciplines. The term ICTs is now widely used to refer to devices (typically computers and mobile phones, but potentially avatars on screens or robotic pets whose communicative powers may be non-verbal) that convey information or enable interaction between two or more entities. Conventionally, interlocutors using ICTs are humans (e.g., two friends exchanging text messages). However, as we have just implied from our examples, one or more of the entities might be a computer program (e.g., a natural language processing program) or a program-driven machine.

Underlying this essay are four interrelated questions:

- How does body-to-body (Fortunati, 2005) expression of emotion compare with that produced by mediated emotional expression (e.g., via musical recordings, robots, online avatars, or text messages)?

---

<sup>1</sup> See <http://www.loebner.net/Prizef/loebner-prize.html>

- How similar are issues concerning authenticity using ICTs to issues involving other realms of communication (e.g., face-to-face conversations) or visual representation (e.g., paintings, the Las Vegas Venetian Hotel)?
- How adaptive are we in dealing with representational limitations?
- To what extent does authenticity in ICTs matter?

We begin by looking at authenticity issues in the domains of communication and of visual representation. From there, we move to considering the implications of practices in these domains for understanding how to think about emotion and authenticity when using ICTs.

## AUTHENTICITY ISSUES

### Authenticity in Communication

Ask a beginning student of linguistics to define what a language is, and you will likely hear it is a system of communication. True, but we also know that people are not always straightforward about communicating with one another. We speak of someone maintaining a poker face or a stiff upper lip. What's more, people sometimes lie.

In the case of virtual communication via an ICT, authenticity can also be an issue. On Facebook, for example, American teenagers and young adults commonly “stage” their profiles with photographs or text that may not depict the individual you know from day-to-day encounters. In the words of one participant in a study I conducted on social networking, her Facebook page was “me on my best day” (Baron, 2008, see Chapter 5). Similarly, text messages sent via mobile phone may be missing in face-to-face authenticity, and not simply because they lack facial and vocal cues. In cross-cultural research I conducted on university students’ use of mobile phones, one Japanese student complained that “communication through *keitai* mail [the Japanese equivalent of texting] [can] trick people’s minds as if they were engaged in real communication” (Baron, 2011). For this student, “real” communication implied shared physical space and devotion of one’s full attention to the interlocutor.

Some studies of electronically-mediated communication (EMC) have concluded that written EMC cannot substitute for face-to-face interaction. Norman Nie, for example, has asserted that while “e-mail is a way to stay in touch, ... you can’t share a coffee or a beer with someone ... or give them a hug” (Nie & Erbring, 2000, p. 19). At the same time, though, virtual communication often becomes acceptable – that is, authenticity is not a necessary desideratum – when there is no face-to-face alternative. A relevant example is soldiers in distant lands Skyping their families back home.

In thinking about levels of authenticity in communication – and the extent to which users seek such authenticity – we need to keep in mind that the domestication process for any form of non-face-to-face communication tends to be gradual. Though the telegraph was first introduced in 1844, it would take several decades before the general public felt at ease sharing personal information with the telegraphers who needed to encode and decode messages (Marvin, 1988, p. 25). In the case of landline telephones, there was also a long lead time before arbiters of etiquette deemed it appropriate to engage in certain types of communication (such as issuing an invitation) on the telephone rather than in writing (Hall, 1914, pp. 53-54).

Because email, IM, and texting are still relatively new forms of communication, it may be too soon to determine what social conventions – including requirements for authenticity – we demand of them. Early arguments regarding the need for emoticons when sending email are a case in point (Baron, 2009). When email began to proliferate in the 1980s – first in academic research settings and then among the larger public – it was commonly argued that because the medium lacked the vocal and visual cues of face-to-face communication, email messages were highly prone to being

misunderstood. Therefore, it was assumed necessary to add emoticons to clarify meaning. However, as email (followed by other written forms of ECM such as IM, texting, blogs, and now Twitter) became increasingly domesticated, users began realizing that bare text could stand on its own.

In fact, there is a potpourri of evidence that too much authenticity in communication can be unwelcome. Movie theatres discovered that patrons were uninterested in having their olfactory senses stimulated by adding Smell-O-Vision to accompany the image onscreen.<sup>2</sup> Long before the development of ICTs, people often chose to write a letter rather than hold a face-to-face or telephone conversation, even if the interlocutors had the physical opportunity to communicate in one of these ways. Their reasons ran the gamut from wanting time to plan what they were going to say, to coping with shyness, to avoiding confrontation. While media platforms such as Skype make it possible to hear and even see one's interlocutor, users commonly choose to reduce the level of communication authenticity by ignoring one or more of these channels. I may be willing to have you hear my voice, but not see me (since I'm in my night clothes). Or I may opt to use only written communication, since I intentionally go by the initials of my first and middle names (e.g., J.K.) and don't want to reveal my gender through speaking.

### **Authenticity in Visual Representation**

When talking about authenticity in visual representation, the case of art naturally comes to mind. In thinking about art prior to the end of the nineteenth and early twentieth centuries (with the coming of such movements as impressionism, cubism, and surrealism), it's understandable to suppose that the artist's goal was accurate rendition of the subject being depicted. While such a goal might be unreachable if the subject were, say, a mythological figure or an angel, it was presumably attainable for historical personages, especially who were contemporaries of the artist.

But in fact literal rendition has not always been the artist's aim. Consider sculptures depicting Alexander the Great. What did Alexander actually look like? We don't know for sure from the statuary, since fifth and fourth century BC Greek (and later Hellenistic) art tended to idealize representations of important figures – in Alexander's case, depicting him in part as a god (Dunstan, 2011, p. 131). Or take Rembrandt's "The Company of Frans Banning Cocq and Willem van Ruytenburch," commonly known as "The Night Watch." Rembrandt had been commissioned to paint the members of a company of civic militia guards. However, upon seeing the finished production, the group refused to pay because many of their faces couldn't be seen clearly. Rembrandt was perfectly capable of rendering faces with photographic accuracy. But such was not his personal aim in doing the painting.

In fact, photography itself is an excellent case in point. With the development of photography by the mid-nineteenth century, the art world (at least in the west) puzzled over what the role of painting would now be, since a photograph could transparently render authentic images – or so it was thought. Yet as any contemporary photographer knows, a photograph is a malleable representation. In creating an image, the photographer can select from a range of apertures and shutter speeds, not to mention time of day and angle at which the subject is captured. In the production phase, images can be brightened or softened, colors changed, and real-life blemishes magically removed. Why do we retouch photographs? Largely for the same reason that college students stage Facebook pages to present themselves "on their best day." That is, we manipulate images to make them look the way we wish to appear to others, and the resulting images are not always "authentic."

Beyond the realm of art, we can think about accuracy of visual representation in the world of robots and computers more generally. Consider three examples.

---

<sup>2</sup> [http://www.wired.com/table\\_of\\_malcontents/2006/12/a\\_brief\\_history/](http://www.wired.com/table_of_malcontents/2006/12/a_brief_history/)

The first comes from Sherry Turkle, whose recent work examines attitudes regarding our relationship with real, animate objects as opposed to their mechanical representations. In November 2005, Turkle took her daughter Rebecca, then aged 14, to an exhibit on Charles Darwin at the American Museum of Natural History in New York. Two giant tortoises had been brought from the Galapagos Islands, where Darwin had done some of his groundbreaking research contributing to his work on evolution. Turkle writes:

One tortoise was hidden from view; the other rested in its cage, utterly still. Rebecca inspected the visible tortoise thoughtfully for a while and then said matter-of-factly, “They could have used a robot.” ... She said she thought it was a shame to bring a turtle all this way ... when it was just going to sit there in the museum, doing nothing. Rebecca was both concerned for the imprisoned turtle and unmoved by its authenticity. (Turkle, 2011, p. 3)

Would it have been preferable for the Museum to have used robotic replacements and saved the actual tortoises the long journey? There may be a generational divide in rendering judgment here. Museums (and exhibit curators) are dedicated to sharing with the public, wherever possible, genuine artifacts. By contrast, younger museum-goers have been raised on animatronics and computer games, where authenticity is typically less valued than the quality of an adventure.

The second example is Paro, a robotic baby harp seal.<sup>3</sup> Designed in Japan, Paro was first exhibited to the public in 2001 and became commercially available in 2004. Outfitted with sensors for touch, light, sound, temperature, and posture, it was created for therapeutic use in hospitals and extended-care facilities. According to the manufacturer, Paro can reduce patient stress and improve the socialization of patients with each other and with caregivers.

The idea of using pets therapeutically is hardly new. Cats and dogs have played this role for centuries (e.g., for people who live alone), and have been strategically introduced into nursing homes and centers for senior citizens. As for Paro, it’s hardly feasible to use a real-life baby harp seal in this way.

Does Paro perform as it’s designed to? Clinical evidence suggests it does (Wada et al., 2008). To these reports I add my own. In May 2005, I was fortunate to attend the Aichi Province (Japan) international Expo, at which Paro was on display. Petting Paro, and watching it respond by changing its body orientation and facial expression, I immediately bonded. In fact, my family had to pull me away so the next person in line could get a turn. Did I look for authenticity in Paro? Hardly. A real baby seal would not have been nearly as soft to the touch, or nearly as socially responsive.

The last example is computer avatars, specifically those created in Second Life. Designed by Linden Labs and opened to the public in 2003, Second Life can be thought of as a cross between a massive online role-playing game and an online digital world. The platform allows individuals to craft their own avatars, which can then interact with other avatars in virtual space. Users decide what appearance their avatars assume and then how those avatars move about. In many cases, users create essentially caricatures of their “real” selves (think of renditions of public figures appearing in political cartoons). Other times, users endow their avatars with wished-for characteristics (e.g., changed physical endowments, hair color, age, or gender). Some of those changes can even prove medically therapeutic. For example, people with motor disabilities now create avatars that can walk, dance, and even fly. There is evidence that fashioning such imagined selves can prove socially and psychologically beneficial (Laouris, 2009). Authentic? No. But that’s the whole point.

---

<sup>3</sup> See <http://www.parorobots.com>

## WHEN DOES AUTHENTICITY MATTER?

A central theme emerging from our discussion of authenticity in representation is that our perceived need for authenticity fluctuates. Variables may include technological possibility and historical attitudes, along with cultural practices and personal preference.

Consider the primitive graphics that were available on the Apple II (back in the late 1970s) and compare them with the stunning graphics on Apple's MacBook Pro "retina screen." The two technologies seem cons apart. Yet thirty-some years ago, excited Apple II users took enormous pleasure in playing games in which the characters were essentially drawn with Lego-like pixels. User demands have shifted with technological development. But it's important to remember that users can be happily content with quite inauthentic representation when that's what is available.

Availability is not the only variable shaping attitudes towards authenticity. Compare Leonardo da Vinci's "Last Supper," which is highly "realistic," with Salvador Dali's painting of the same name – which is not. Is da Vinci's work more "authentic"? Since neither artist was present at the (presumed) historical event, some degree of artistic license is to be expected regardless. But more to the point is that over 450 years separate the two paintings. Fifteenth and twentieth century artists (and audiences) had very different experiences and sensibilities. If one measure of artistic success is the impact a work has on a viewer, and verisimilitude may be less valued in the modern world than in the Renaissance, we cannot assume that representational authenticity is a universal goal.

Cultural and individual preferences can also play a role in shaping attitudes towards authenticity. Think about approaches to the kind of food we grow. The United States and Europe have adopted different stances regarding food they are willing to cultivate, sell, and eat. Where the US government has supported genetically-modified foods, much of Europe has refused to accept such "inauthentic" produce. Or go back to those Apple II graphics. While many enthusiasts took the crudeness of the images in their stride, others who were equally infatuated with computers complained that manufacturers had to do better.

### Humans versus Machines

Let us bring the discussion back now to the theme of this volume: social robots. As technological constructs such as robots and avatars are progressively successful at simulating at least some characteristics of human beings (or their pet counterparts), we need to ask how precise – how authentic – we want that simulation to be. Going hand in glove with that question is another: Are there traits that will continue to separate humans from machines, no matter how much authenticity we might desire?

Consider IBM's computer program named Watson, built to compete against human contestants on the American television quiz show "Jeopardy" (Baker, 2011). In the Spring of 2011, Watson took on the two top winners in Jeopardy's history. Watson won. Did we care that Watson "spoke" through a synthesized voice and was visually represented by an animated globe-like avatar? Did we care that Watson expressed no emotions? Or did we only care that Watson bested his human competitors? Judging from the press surrounding the event, the only thing that mattered was winning.

There has been growing discussion in recent years over whether the Turing Test will ever be passed by a computer (that is, passing for a human in conversation). In a review of Brian Christian's book *The Most Human Human* (2011) in which Christian chronicles his attempt to convince judges in the annual Loebner competition that he is indeed human, Adam Gopnik wrote:

how competitors fare in the Turing tests is more about the style of the response than about the substance. Human intelligence expressed in sentences doesn't have only attributes and

attainments; it has affect. Our stance, our emotional tone, is a surer sign that it's us back there than the ability to answer skill-testing questions. We interrupt, infer, guess, exclaim, ignore. And, at a deeper level, we express a "meta-attitude" about what we're saying and doing even as we say and do it. (Gopnik, 2011, p. 72)

Gopnik continued:

Empathy and sympathy, jokes and wordplay, are as necessary to intelligence as pure reason: [a] poker-playing program breaks down because it can't put itself in the mind of the guy across the table. (p. 72)

Christian understood the need to "humanize" his performance at the Loebner competition through just such linguistic subtleties as empathy and wordplay. Over time, computers may or may not be able to achieve these linguistic talents. What is equally unclear is whether we are even looking for such linguistic nuance from our machines.

### **Relinquishing Demands for Authenticity**

Thinking about the evolution of modern communication technologies over the past half-century, we can identify a growing list of circumstances in which we have been willing to relinquish a desire for authenticity in exchange for efficiency. Start with telephone calls to service providers such as doctors' offices or insurance companies. Despite an amount of personal grumbling, most of us have come to accept the phone trees and voice recognition systems that "answer" our calls in lieu of a live human being. Or think about purchasing airline tickets. Gone are the days (for most of us) when we casually call up an airline to book a ticket. Now, we dutifully go online, either to scope out the best price or to avoid the added fee for talking with a human agent.

In the realm of visual representation, we have made similar adjustments with regard to authenticity. For many official transactions, a scanned (or faxed) signature rather than an original is now deemed legally acceptable. In the book (and newspaper and magazine) world, online digital editions are rapidly gaining over printed versions of text. While the future of digital versus print publication remains uncertain, we are seeing traditional readers who cherish books making their peace with, even embracing, Kindles, Nooks, and iPads because of convenience and pricing advantages.

Now add in the social dimension: Paro is selling, as are other robotic pets. People are, in growing numbers, willing to lavish their affections on mechanical pets that they know aren't "real."

### **FINALE: RETURNING TO VENICE**

Some situations call for more authenticity than others. As a final example, we return to Venice, this time to the famous horses that adorn Basilica di San Marco.

During the Fourth Crusade, a set of four bronze horses – part of a Greco-Roman triumphal *quadriga* (a sculpture of a chariot drawn by four horses abreast) – was looted from the Hippodrome in Constantinople and taken to Venice in 1204. Originally housed in the Arsenale, the horses were moved to the outside of the Basilica about fifty years later, where they proudly stood over the central façade for the next 700 years. However, in the 1980s, to protect the originals from weather and pollution, the originals were moved inside and replaced with replicas. The originals are now part of a Basilica museum.

While the originals are exquisite, the replicas are excellent facsimiles. And we probably all agree that the replacement is both esthetically and practically satisfactory.

Just as with the horses of San Marco, we need to acknowledge that authenticity in communication isn't always a *sine qua non* for such communication to be successful. What is more, criteria for "success" are themselves not absolute. Before we rush to judgment over avatars whose emotions aren't "real" enough or the possibility – or impossibility – of sharing a beer (albeit virtually) via a mediated technology, we need to figure out what emotional authenticity we are actually seeking from our ICTs.

## REFERENCES

- Adorno, T. (1973). *The jargon of authenticity*. Evanston, IL: Northwestern University Press.
- American Dialect Society (2006). Truthiness voted 2005 word of the year. Retrieved from [http://www.american-dialect.org/truthiness\\_voted\\_2005\\_word\\_of\\_the\\_year](http://www.american-dialect.org/truthiness_voted_2005_word_of_the_year) (Last accessed on October 7, 2012)
- Baker, S. (2011). *Final jeopardy: Man versus machine and the quest to know everything*. Boston: Houghton Mifflin Harcourt.
- Baron, N. S. (2008). *Always on: Language in an online and mobile world*. New York: Oxford.
- Baron, N. S. (2009). The myth of impoverished signal: Dispelling the spoken language fallacy for emoticons in online communication. In J. Vincent & L. Fortunati (Eds.), *Electronic emotion: The mediation of emotion via information and communication technologies* (pp. 107-135). Oxford: Peter Lang.
- Baron, N. S. (2011). Concerns about mobile phones: A cross-national study. *First Monday*, 16(8). Retrieved from <http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/3335/3032> (Last accessed on October 7, 2012)
- Benjamin, W. (1968). *Illuminations*. H. Arendt (Ed.), H. Zohn (Trans.). New York: Harcourt, Brace & World.
- Christian, B. (2011). *The most human human: What talking with computers teaches us about what it means to be alive*. New York: Doubleday.
- Dunstan, W. (2011). *Ancient Rome*. Lanham, MD: Rowman & Littlefield.
- Fortunati, L. (2005). Is body-to-body communication still the prototype? *The Information Society*, 21, 53-61.
- Gilmore, J. H., & Pine II, B. J. (2007). *Authenticity: What consumers really want*. Boston: Harvard Business School Press.
- Gopnik, A. (2011, April 4). Get smart: How will we know when machines are more intelligent than we are? *New Yorker*, 70-74.
- Hall, F. H. (1914). *Good form for all occasions*. New York: Harper and Brothers.
- Laouris, Y. (2009). Web 3D challenges on the socialization and integration of people with activity limitations. *Proceedings of UAHCI '09: 5<sup>th</sup> international conference on universal access in human-computer interaction. Part III: Applications and services* (pp. 369-374). Berlin: Springer-Verlag.
- Manjoo, F. (2008). *True enough: Learning to live in a post-fact society*. Hoboken, NJ: Wiley.
- Markoff, J. (2010, October 9). Good cars drive themselves, in traffic. *New York Times*. Retrieved from <http://www.nytimes.com/2010/10/10/science/10google.html?pagewanted=all> (Last accessed on October 7, 2012)
- Marvin, C. (1988). *When old technologies were new*. New York: Oxford.
- McCorduck, P. (2004). *Machines who think* (2nd ed.). Natick, MA: AK Peters.
- Murtola, A. M., & Fleming, P. (2011). The business of truth: Authenticity, capitalism and the crisis of everyday life. *ephemera: Theory & Politics in Organization*, 11(1), 1-5.

- Nie, N., & Erbring, L. (2000). Internet and society: A preliminary report. Stanford Institute for the Quantitative Study of Society, February 17.
- Ortiz, A., Oyarzun, D., del Puy Carretero, M., Posada, J., Linaza, M. T., & Garay-Vitoria, N. (2009). Analyzing emotional interaction through avatars: A generic architecture. *eMinds*, 1(5). Retrieved from [http://www.researchgate.net/publication/220366688\\_Analysing\\_emotional\\_interaction](http://www.researchgate.net/publication/220366688_Analysing_emotional_interaction) (Last accessed on November 20, 2012)
- Orvell, M. (1989). *The real thing: Imitation and authenticity in American culture, 1880-1940*. Chapel Hill, NC: University of North Carolina Press.
- Paiva, A., Prada, R., & Picard, R. (Eds.). (2007). Affective computing and intelligent interaction. *Lecture notes in computer science 4738*. Berlin: Springer Verlag.
- Sontag, S. (1977). *On photography*. New York: Farrar, Straus and Giroux.
- Sontag, S. (2003). *Regarding the pain of others*. New York: Farrar, Straus and Giroux.
- Trilling, L. (1972). *Sincerity and authenticity*. Cambridge, MA: Harvard University Press.
- Turing, A. (1950). Computing machinery and intelligence, *Mind*, LIX(236), 433-460.
- Turkle, S. (2011). *Alone together: Why we expect more from technology and less from each other*. New York: Basic Books.
- Wada, K., Shibata, T., Musha, T., & Kimura, S. (2008 July/August). Robot therapy for elders affected by dementia. *IEEE Engineering in Medicine and Biology Magazine*, 53-60.
- Wang, N. (1999). Rethinking authenticity in tourism experience. *Annals of Tourism Research*, 26(2), 349-370.

## BIOGRAPHY

**Naomi S. Baron** is Professor of Linguistics and Executive Director of the Center for Teaching, Research, and Learning at American University in Washington, DC. A former Guggenheim Fellow and Swedish Fulbright Fellow, she is the author of seven books, including *Alphabet to Email: How Written English Evolved and Where It's Heading* (Routledge, 2000) and *Always On: Language in an Online and Mobile World* (Oxford, 2008). Her book *Always On* won the English-Speaking Union's Duke of Edinburgh English Language Book Award for 2008. Presently she is studying the relationship between reading in print versus reading onscreen.



# **Close But Not Stuck: Understanding Social Distance in Human-Robot Interaction Through a Computer Mediation Approach**

**Daniel Halpern**  
**Pontifical Catholic University of Chile**

**James E. Katz**  
**Boston University**

## **ABSTRACT**

We draw on the social information processing (SIP) model to argue that users' earlier experiences with online social environments tend to attribute human-like characteristics to robots. Specifically, when users engage in socially-charged electronic environments to interact and communicate electronically with others, they find ways to overcome the relative lack of cues to adapt to the medium; this includes in terms of reacting to emotional relationships (Walther, 1997). We hypothesize that individuals who have a high sense of online community, engage with avatars and have higher levels of competence communicating with information and communication technologies (ICT), are more likely to recognize humanlike cues in robots. This in turn leads them to accept robots as part of their social and physical environments. A "robotic" social distance scale was developed to measure willingness to accept robots, and the results based on this scale, from an empirical study of college students ( $N = 874$ ) are explored. The findings show that whereas avatar engagement and sense of online community have a strong effect on robots acceptance, recognition of human-like characteristics partially mediates the association between these concepts; this is even after accounting for predictors expected to affect attitudes toward robots such as religion, gender, age and robots' appearance. The article ends by exploring the implications of this research for greater social acceptability of robots in various human domains.

**KEY WORDS:** computer mediated communication (CMC), social robots, social information processing model (SIP), information and communication technology (ICT), avatar engagement, sense of online community

## INTRODUCTION

The idea of bringing robots into studies of social interaction has attracted scholars from diverse disciplines, especially since the 1990s when artificial intelligence developers “brought to life” embodied agents able to recognize one another, engage socially with humans and, through expressive abilities, influence people’s perceptions (Dautenhahn & Billard, 2002). Using the metaphor of a cybernetic organism called cyborg, and based on the idea that the development of hybrid beings had reached a level where it was no longer possible to tell where human beings ended and machines began, Haraway (1985) was one of the first scholars to theorize about social outcomes in this new human-technology relationship. Haraway argued that the biological side and the mechanical/electrical side of the entire society has become so inextricably entwined, that we cannot even distinguish between what makes something “real” and what makes something “human or alive,” which causes people to respond socially to these robotic inventions.

These themes have continued to be explored over the past quarter century as technological progress allowed human experience with robots to move from the entirely imaginary, that is, the realm of fiction and film, to artifacts in prototypical and even realized forms. Fortunati and colleagues (2003) delineated numerous ways in which robots and simulacra have become part of human conceptions, i.e., the realm of contemplation, as well as something through which meaningful interactions have taken place. Further expansion of these themes, including at the level of the human body, have been discussed by Katz and colleagues (2003) who demonstrated in numerous social domains the growing importance of electronic representations in social interaction. Laboratory and other behavioral observations on Human Robot Interaction (HRI) areas confirm impressions of people’s inclination to invest “human-ness” in artificial entities. For instance, analyzing conversations in Sony’s robotic dog AIBO’s online discussion forums, Friedman, Kahn and Hagman (2003) found that 47% of the participants spoke about AIBO’s biological essences; 42% of the forums’ members spoke of AIBO as having intentional behavior; 38% of the commentators believed AIBO had feelings, and most incredibly 39% spoke of AIBO as being capable of being raised, developing, and maturing.

At the same time, personally relevant communication in today’s society is increasingly mediated by information technologies. These mediational settings include a host of texting and conversational interactions, some of which are operated by software programs that mimic human conversation. Consider a typical trip by commercial airlines: Passengers can go through nearly an entire travel experience without having any direct or face-to-face (FtF) conversation with others (Polkosky, 2008). (Flight attendants are among the last vestiges of human-provided personal service, but as many of their activities as possible are being replaced by technology.) First, passengers buy their tickets on an Internet webpage. Then, if a passenger finds it necessary to phone the airline to confirm the flight status or address other issues, they are handled via a synthetic voice and speech recognition program. For most questions, they are transferred to an automated speech system programmed to provide the needed information. A few hours before the flight, travelers receive a text message on their cellphone alerting them about flight status; upon airport arrival they can check in and obtain boarding passes at touch screen kiosks, again without any personal interaction. Even on the plane, they may hear about the safety features not from a person but from cartoon images shown on a small video display monitor. The first human interaction they may have is mid-flight when they are asked for their beverage choice by the flight attendant (Polkosky, 2008).

We argue in this paper that there is a strong relationship between the role that technology has in mediating interpersonal relationships and how individuals respond socially to robots. Based on the social information processing (SIP) model, we predict that in the same way that users have the capability to adapt to the medium when they communicate electronically with others, they will

find ways to overcome the relative shortage of cue systems and relate emotionally despite the lack of cues (Walther, 1997). “Technological savvy” individuals would assimilate these experiences and will be able to recognize more humanlike cues in robots. This in turn will lead them to accept robots as part of their social and physical environments. The paper is organized as follows: in the next section we discuss work that has already been carried out in this area, analyzing human-robots interactions from a Computer Mediated Communication (CMC) perspective. Then, drawing on previous research, we present factors found to affect subjects’ attitudes toward robots. Third we describe our research methodology and the results of our empirical study. Finally, we draw conclusions and implications from the analysis.

## **ANTHROPOMORPHISM AND HUMAN-LIKENESS**

For robots to engage in meaningful social interaction with people, it appears they need to be endowed with a degree of anthropomorphic or human-like qualities, whether in form or behavior (Duffy, 2003). To enhance anthropomorphic effects, “software agents” should have life-like characteristics and respond socially to stimuli, thus exploiting the social cues that humans naturally possess (Breazeal & Scassellat, 1999). The research literature on robotics has determined that the use of anthropomorphic “beings” leads human partners to treat humanoid social robots as real people (Brennan & Ohaeri, 1994). Nass and colleagues found that human-like robots invoke social-psychological processes, thus affecting one’s behavior as if another human were present instead of a robot. In a series of experiments, Nass demonstrated empirically how technology could elicit social responses from humans, concluding that human-like characteristics (e.g., facial expressions, voice, emotions) act as cues that lead individuals to assign these agents to the category of “human” and eliciting comparable social responses from them (Reeves & Nass, 1996). The argument made by Nass and then expanded by Katz (2003) and others (e.g., Turkle, 2005), is that certain types of technological objects arouse a sense of intersubjectivity in individuals, which prompts them to respond socially to such entities (Cerulo, 2009).

Research from different areas has supported the Social Responses to Technology paradigm, signifying a strong anthropomorphic tendency to attribute human-like qualities to autonomous robots (Dautenhahn & Billard, 2002). People respond more socially to robots if they are capable of eye contact (Cassell et al., 1999), gesture observation (Cowley & MacDorman, 1995), natural language interactions (Kanda et al., 2004) and able to demonstrate self-directed behavior (Schermerhorn, Scheutz, & Crowell, 2008). However, it is still unclear which types of variables and factors at the individual level affect the recognition of human likeness in robots. Research has noted that previous experiences with technology and robots may have an influence in the attitudes and behaviors toward them. Woods et al. (2007) found people with a technological background are more likely to assign their own personality traits to robots than participants with a non-technology background. Those in this latter category had difficulty seeing that robots had a clearly identifiable personality. This aspect of relating is relevant in HRI since subjects almost universally prefer computers, robots, and avatars with personalities or social characteristics similar to their own (Nass & Moon 2000). Revealingly, people also generally prefer other human beings whom they perceive as having characteristics similar to their own.

Similarly, Nomura et al. (2006) conducted several experiments where subjects interacted with Robovie, a social robot, concluding that previous experiences with robots reduce uncertainty and anxiety in their interaction, leading participants to behave much more positively toward them. Likewise, in a cross-cultural study Bartneck et al. (2005) concluded that Americans were less negative interacting with robots than Mexican participants, based on the belief that Americans are more accustomed to both technology and to talking casually to new people. These findings are also

consistent with research in CMC, which suggest that individuals with higher levels of competence with ICT tend to benefit more from relational uses of the technology (Campbell & Kwak, 2010; Hacker & Steiner, 2001).

## CMC AS A FRAMEWORK FOR HRI

Computer-mediated communication (CMC) has been historically framed as an impersonal phenomenon that deindividuates participants, encouraging uncivil discourse (flaming) and group-based stereotyping (Kiesler, Siegel, & McGuire, 1984; Short, Williams, & Christie, 1976; Spears & Lea, 1992). Several theoretical frameworks have been presented by scholars to justify this stance. The Social Presence Model states that the fewer channels a medium has, the lower will be the social presence afforded by the medium. Low-channel CMC make it more difficult to build relationships than via face-to-face communication since the communication is perceived as cold and impersonal rather than warm and sociable (Short et al., 1976). Under these conditions, communication partners tend not to see the other as someone who could be a friend. As Rice and Love (1987) summarized, “as bandwidth narrows, media allow less ‘social presence’; communication is likely to be described as less friendly, emotional, or personal and more serious, businesslike, or task oriented” (p. 88). Similarly, based on the Reduced Social Cues approach and Social Identity Model of Deindividuation Effects (SIDE), scholars argue that given the relative lack of social cues in CMC, individuals may find it easier to issue unpleasant decisions as they are divorced from the human consequences of their actions (Kiesler et al., 1984; Postmes, Spears, & Lea, 1998). “Deindividuation theory proposes that behavior becomes socially deregulated under conditions of anonymity and group immersion, as a result of reduced self-awareness” (Spears, Postmes, Lea, & Wolbert, 2002, p. 94). According to SIDE theory, under conditions in which participants’ individual identity is not salient, group norms and identity are triggered, and this in-group identity leads to stereotyping of out-group members.

However, despite the limitations presented in CMC and its description as impersonal, hostile, and task-oriented, research shows that users have found ways to increase the richness of CMC and achieve socially oriented communication through it. Evidence establishes that CMC is sometimes used for explicitly social purposes (McCormick & McCormick, 1992), and communication partners seem to overcome the lack of social cues by a variety of means, including their interpretation of natural language, questions and disclosures, or imbuing their messages with social meaning through the use of emoticons, augmenting the meaning of textual electronic messages (Walther & D’Addario, 2001). Walther (1992, 1994) suggests an explanation for these discrepancies through an alternative perspective: The social information processing (SIP) model, which basically posits that impression development process takes longer in CMC, but if there is sufficient time, the differences between CMC and FtF communication will diminish, since users have the capability to adapt to the medium and find ways to overcome the relative shortage of cue systems. In other words, although the model recognizes that the lack of nonverbal cues in CMC limits the scope of exchanges, it holds that through more messages and time, communicators “learn” how to bring relational effects in CMC to the same level as in comparable FtF relationships, being able to see and recognize the humanity of the partner in the other side of the computer.

## SENSE OF ONLINE COMMUNITY

The last decades have seen an unprecedented change in how people connect with their communities and form associations (Lin, 2001; Putnam, 1995; Wellman, Boase, & Chen, 2002). The concept of “sense of community,” commonly used by both political scientists and political communication scholars to characterize the relationship between individual and the social structure to which they

belong, has received an important amount of theoretical and empirical attention (Katz et al., 2004). This has especially been the case since the proliferation of new information and communication technologies, which according to researchers has provided technological changes for social relations and social structure (Katz & Rice, 2002), facilitating online relationships that supply the essentials of community such as support, sociability, information, social identities, and a sense of belonging (Wellman et al., 2002). Indeed, several studies have demonstrated the capacity of online communities to increase social ties and emotional support between users. Boase and Wellman (2006) concluded that the Internet has become one of the main channels to maintain physically distant relationships and to increase offline contacts because it can be used to arrange traditional meetings and strengthen relationships with people known offline. These positive impacts show how the Internet is supplementing rather than supplanting prior human communication (Katz & Rice, 2002; Wellman et al., 2003), demonstrating the potential as a tool for forming and maintaining weak tie networks (Ellison, Steinfield, & Lampe, 2007; Kavanaugh et al., 2005), extending social interactions and supporting community building (Williams, 2006).

Further, scholars have proposed new dimensions to the concept of “community,” which used to be limited to groups confined geographically, to social ties that concatenate forming networks able to provide sociability, aid, support, and social control (Hampton, 2003). This new perspective gave researchers a framework to study the virtual interaction between individuals who share interests and adhere to similar customs generated in the Internet, suggesting that in the same way that people participate in offline settings to get support from others, to turn to CMC for advice, sharing of personal problems or to alleviate loneliness (Preece, 1999; Williams, 2006). Even more, researchers have adopted the idea behind a sense of community -- defined as a “feeling that members have of belonging, that members matter to one another and to the group, and a shared faith that members’ needs will be met through their commitment to be together” (McMillan & Chavis, 1986, p. 9) -- to online environments, applying the term “sense of online community” (Katz & Aspden, 1997; Quan-Haase et al., 2002; Wellman et al., 2003). Importantly, these studies find that individuals who interact socially in virtual environments have been able to get similar social and emotional gratification in offline settings as well.

## **CULTURAL, DEMOGRAPHIC AND VIRTUAL DIFFERENCES IN ROBOTS PERCEPTION**

Research has identified demographic and cultural differences among users in their interaction with robots (Halpern & Katz, 2012). In the Judeo-Christian tradition for instance, in contrast to other religious and philosophical traditions such as Buddhism, a clear division is made between living and dead entities (Shaw-Garlock, 2009). The Judeo-Christian world enforces a strict division between creatures that have a soul and animals and objects that do not, which is not the case for religions such as Japan’s Shinto and India’s Jains or naturalistic philosophies, where all worldly things may be deemed as alive and having a soul (Shaw-Garlock, 2009). From this view, social robots for the Judeo-Christian world would remain non-human and people might perceive them as incapable of assuming a position of moral equivalence, which may influence their ability to recognize human-likeness qualities. Regarding gender differences, research has found that males tend to think of the robot as more human-like (Schermerhorn et al., 2008). In contrast, females not only see robots as more machine-like but also characterize robots as less socially desirable. Nomura and colleagues conducted different experiments yielding consistent results that female respondents had more pronounced negative attitudes than male respondents toward situations involving interaction with robots (Nomura et al., 2009). Finally, there is a growing body of research on how the use of virtual self-representations affects many factors both within virtual environments and outside of them

(Ratan & Hasler, 2010). Similar to Nass and his colleagues, research has found that many of the rules that subjects apply to human-human interaction, are carried over to human-agent interaction (Pertaub, Slater, & Barker, 2002). Thus research hypothesizes that despite technical differences between dealing with robotic and virtual domains, today many issues behind the construction of successful social agents cut across the boundaries of virtual agent species (Holz et al., 2009).

## **SOCIAL DISTANCE IN ROBOTS**

Researchers in robotics have started to explore how social robots are interacting with humans in diverse areas such as helpers for the elderly (Heerink, Kröse, Wielinga, & Evers, 2008), therapists for autistic children (Dautenhahn & Billard, 2002), home cleaners (Sung et al., 2007), receptionists in museums (Shiomi et al., 2006), and peer tutors in schools (Tanaka et al., 2006). On the other hand, human spatial behavior has been widely studied in social psychology, not only because of the role that proximity plays in personal interaction, but also because the proxy it plays in characterizing social distance or willingness that individuals show towards being associated with members of a designated group. Designed by Emory Bogardus (1967) to measure attitudes toward racial and ethnic groups, the Bogardus Social Distance Scale has remained one of the most commonly used methods of measuring prejudice (Wark & Galliher 2007). The present research assumes that similar rules apply for the interaction between people and robots. It would be natural to assume that individuals apply the same physical and social rules to robots who display levels of “social awareness” with human related roles. The “Robotic” Social Distance Scale we developed for this study modifies the Bogardus Social Distance Scale by adding statements related to willingness to be associated with robots.

## **RESEARCH STUDY**

While previous research has examined how people respond socially to robots’ appearance as well as the effects of human-likeness on attitudes toward robots, there has been little explanatory research on individual level factors that moderate this relationship, or how perceptions of human-likeness qualities in robots relate to other background aspects such as the use of communication and information technologies. Hence the present research explores the relationship between recognition of human-likeness qualities in robots, social uses of ICT and acceptance of robots based on the following research question:

For individuals, controlling for exposure to robot type, what is the relationship between activities that represent social uses of ICT and the willingness to accept robots as part of their social and physical environments?

Based on the idea that in the same way that users have the capability to adapt to a given electronic medium when they use it to communicate with others they will, when they communicate with robots, also find ways to overcome the paucity of cue systems and learn to relate emotionally despite the lack of cues (Walther, 1997). We also predict that individuals with a high sense of online community, high level of engagement with avatars, and high level of perceived competence communicating with ICT, would evince a greater level of recognition of more humanlike cues in robots. This, in turn, will lead to relatively higher acceptance of robots as part of their social and physical environments. This rationale could be summarized in the following hypotheses:

H1a: Respondents with a history of high level of engagement with avatars will perceive more human-likeness qualities in robots.

H1b: Respondents with a high sense of online community will perceive more human-likeness qualities in robots.

H1c: Respondents with a high sense of competence using ICT will perceive more human-likeness qualities in robots.

H2a: Respondents with high levels of engagement with avatars will be more willing to accept robots as part of their social and physical environments.

H2b: Respondents with a high sense of online community will be more willing to accept robots as part of their social and physical environments.

H2c: Respondents with a high level of perceived competence using ICT will be more willing to accept robots as part of their social and physical environments.

Additionally, since previous research has found that robots' capacity to engage in a meaningful social interaction depends on the recognition of human-like qualities, whether in form or behavior, and the literature in robotics has shown that the use of anthropomorphic "beings" makes human partners more likely to treat humanoid social robots as real people, we also expect that:

H3: Recognition of human-likeness qualities will be positively related to willing to accept robots as part of their social and physical environments.

H4: Recognition of human-likeness qualities will mediate the relationship among sense of online community, avatar engagement and perception of competence using ICT with willingness to accept robots as part of their social and physical environments.

## METHOD

### Design Overview

A between-subjects empirical study was designed to identify human response to robots' appearances and their perceptions of robots. Participants were 789 undergraduate students (470 females, 283 males, 36 unidentifiable) enrolled in six communication courses at a large northeastern university, and ranged in age from 18 to 30 ( $M = 20.1$ ,  $SD = 1.628$ ). They were randomly divided in three groups and each group was exposed to an image of a different type of robot: Romeo, a French humanoid robot designed by Aldebara to assist elderly and disabled people; the AIBO robotic dog designed by Sony, and an android with an extreme robotic appearance. The original formatted images were embedded in the questionnaire. Then participants completed an online questionnaire that measured their willingness to accept robots, the degree of human-like characteristics they perceived in them and self-reports of their competence with information and communication technologies, engagement with avatars, and sense of online community. Demographic data were also obtained to control for gender, religion and age to ensure the sample is statistically representative.

### Measurement

#### *Dependent Scales*

Human-likeness. This scale (Cronbach  $\alpha = .88$ ) was composed of eight items measuring recognition of human-like characteristics in the depicted robot. Questions such as "Most robots

have emotions of their own,” “Robots should have rights just like pets or people” or “I don’t think it is right to mistreat or abuse a robot” were included in an 8-point Likert scale, with anchors 1 = strongly disagree and 8 = strongly agree.

Robotic Social Distance. The Bogardus Social Distance Scale was modified by replacing seven of the original statements (and which yielded a Cronbach  $\alpha = .78$ ). Similar to the original scale, participants who wish to maintain robots at a specified social distance are assumed to not wish for any closer contact; the further the social distance we would maintain, reflects reduced willingness to be associated with robots. This scale was composed of questions such as “It is fine to let robots teach in schools,” “It is fine to have robots working in my neighborhood” or “It is fine to have robots living in houses with people.” The items were measured in an 8-point Likert scale, with anchors 1 = strongly disagree and 8 = strongly agree.

### *Independent Scales*

Perceived competence with information and communication technologies. Drawing from previous research (Campbell & Kwak, 2010), four questions were used to create a scale to measure the extent to which participants were competent with the use of technologies to communicate with others. Respondents were asked to state how much they agreed with each of the four statements: “I enjoy using my mobile phone to communicate with people,” “I feel technology in general is easy to operate,” “I am comfortable with the technical features of my mobile phone” and “It is easy for me to use my computer to communicate with others.” An 8-point Likert scale, ranging from strongly disagree to strongly agree was used (Cronbach  $\alpha = .76$ ).

Engagement with Avatars. A scale was adapted from Ratan and Hasler (2010) that utilizes self-presence and social presence factors to provide a measurement of how people connect to virtual self-representations on an emotional and identity level (Cronbach  $\alpha = .95$ ). It is composed of five statements such as “When upsetting events happen to my avatar playing a video game, I also feel angry” or “When disgusting events happen to my avatar playing a video game, I also feel disgusted.” Each item was rated on an 8-point Likert scale, with anchors 1 = strongly disagree and 8 = strongly agree.

Sense of Online Community. This scale was measured on an 8-point Likert scale adapted from Williams (2006) and Stravrositu and Sundar (2008) about sense of community in blogs ( $\alpha = .86$ ). The 14-item scale included questions about how participants felt about going online in general, such as: “I feel at home online,” “I receive support from others online,” and “I like to interact with others online.”

### *Control Variables*

Religion. Students were asked about their religion and we differentiated between Judeo-Christian religions (Catholics, Protestants, Jews, Muslims) and eastern religions (e.g., Hinduism, Jainism, Buddhism).

Use of Internet. Participants indicated how often they use the Internet via an 8-point scale ranging from 1 (do not use it at all) to 7 (almost all the day).

Second Life. A dichotomous variable for participation in Second Life was created to explore whether previous interaction with other users through avatars has had an effect on the dependent variables.

Age and Gender. All the regression models were controlled by age and gender.



## RESULTS

Congruent with previous studies, participants in the humanoid condition survey recognized more human qualities in robots. A one-way ANOVA with the human-likeness scale as the dependent variable showed a statistically significant difference in participants' perceptions of human qualities in robots ( $F(2, 744) = 13.53, p < .001$ ). Those who were exposed to humanoid robots recognized more human-likeness ( $M = 3.25, SD = 1.39$ ), than in the android ( $M = 2.93, SD = 1.43$ ) or the doggy robot conditions ( $M = 2.73, SD = 1.25$ ). However, no significant differences were found between the android and doggy robot conditions. To explore whether individuals with high sense of online community, those who engage more with avatars and feel more competent communicating with ICT recognize more human-like cues in robots, the variables were bifurcated at their means in order to divide participants in two groups for further analysis. Three separate factorial univariate ANOVA were conducted. Results show that participants with high sense of community ( $F(1, 723) = 13.53, p < .001$ ) and individuals who engage more with avatars ( $F(1, 731) = 48.5, p < .001$ ) both recognized significantly more human-likeness in robots. However, no significant effects were found for individuals who perceive higher levels of competence communicating with ICT.

To determine whether there is a relationship between the independent variables and recognition of human-likeness qualities in robots, after controlling for the factors identified as predictors by previous research, hierarchical multivariate ordinary least squares (OLS) regressions were run to account for potential rival explanations and to assess the precise contribution of each block of predictors. Table 1 confirms the impact of the stimulus on the level of human qualities recognized in robots even in a multivariate level: individuals who were exposed to the android ( $\beta = -.524, p < .001$ ) and dog robots ( $\beta = -.288, p < .05$ ) saw significantly less humanity in robots compared to those in the humanoid condition. On the other hand, the block of demographic variables was not significant; neither gender nor religion was associated to recognition of human qualities. Similarly, avatar engagement ( $\beta = .198, p < .001$ ) and sense of online community ( $\beta = .129, p < .01$ ) were both positively related to recognition of human likeness, confirming that individuals who engage with avatars (H1a) and those who have a high sense of online community (H1b) can see more human-likeness in robots. However, individuals who feel more competent using ICT did not show higher levels of recognition of humanlike cues in robots, unlike what was predicted in H1c.

**Table 1** OLS Regression Predicting Human-Likeness Qualities (N = 748)

	Human-Likeness (Block 1)	Human-Likeness (Block 2)	Human-Likeness (Block 3)
Doggy condition	-.524*** (.131)	-.529*** (.132)	-.454*** (.125)
Android condition	-.288* (.126)	-.291* (.127)	-.217* (.121)
R2 (%)	2.2	2.2	2.2
Judeo-Christian Religions (1= Yes)		-.163 (.120)	-.1 (.114)
Age		-.013 (.03)	-.01 (.028)
Gender (1 = Female)		-.06 (.108)	-.057 (.114)
R2 change (%)		.1	.1
Perceived competence ICT			-.067 (.051)
Avatar engagement			.198*** (.02)
Experience in Second Life (1= Yes)			.242 (.151)
Sense of Online Community			.129** (.047)
Internet Use			.16 (.33)
R2 change (%)			9.4
Constant	1.9	2.3	4.24
Adjusted R2 (%)	2.2	2.3	11.7

Notes: *b*=unstandardized regression coefficients with standard error in parentheses are presented.  $R^2$  change refers to the unique contribution of each block of variables controlling for the previous variables entered in the regression.

†  $p \leq .10$ , \*  $p \leq .05$ , \*\*  $p \leq .01$ , \*\*\*  $p \leq .001$ .

Concerning the impact that our independent variables have on willingness to accept robots as part of social and physical environments, Table 2 shows that engagement with avatars ( $\beta = .138$ ,  $p \leq .001$ ) as well as sense of online community ( $\beta = .152$ ,  $p \leq .001$ ) were both related positively, even after controlling for demographic and robots' appearance, supporting H2a and H2b respectively. However, perception of higher competence using ICT was not significantly related to willingness to accept robots as part of users' environments, unlike what was predicted by H2c. This means that those who engage more with avatars and have a high sense of community are more inclined to accept robots as part of their social and physical environments; however this is not necessarily the case for those who perceive higher competence using ICT.

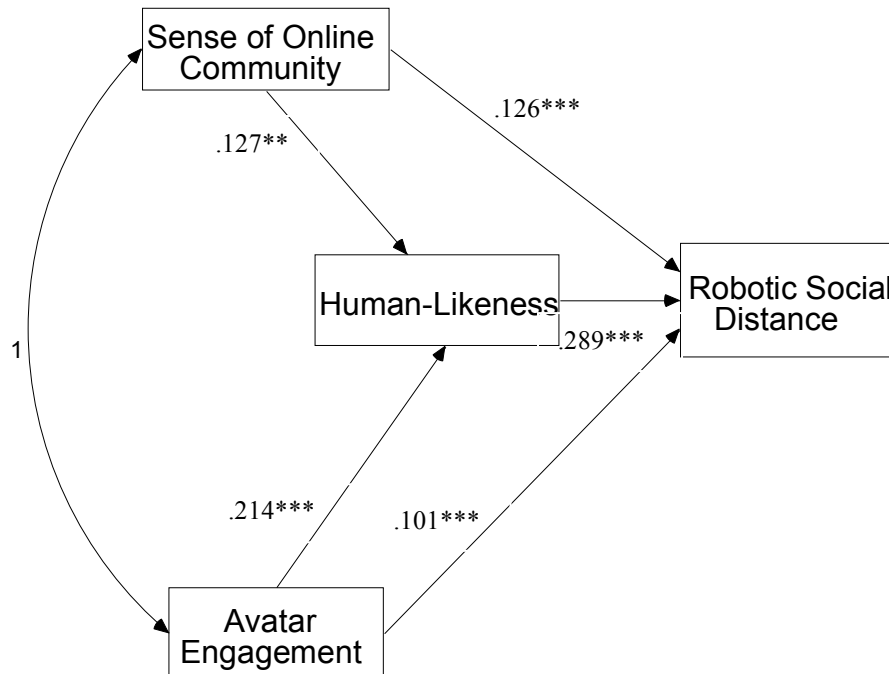
**Table 2** OLS Regression Predicting Robotic Social Distance ( $N = 748$ )

	Social Distance (Block 1)	Social Distance (Block 2)	Social Distance (Block 3)	Social Distance (Block 4)
Doggy condition	-.156 (.115)	-.182 (.112)	-.107 (.106)	.015 (.102)
Android condition	-.152 (.105)	-.119 (.108)	-.05 (.104)	.013 (.098)
$R^2$ (%)	.03	.03	.03	.03
Judeo-Christian Religions (1= Yes)		-.193* (.098)	-.138 (.089)	-.105 (.093)
Age		.014 (.027)	.014 (.024)	.016 (.022)
Gender (1 = Female)		-.563*** (.101)	-.49*** (.089)	-.512 (.084)
$R^2$ change (%)		5.5	5.5	5.5
Perceived competence ICT			-.026 (.044)	-.007 (.041)
Avatar engagement			.138*** (.024)	.82** (.023)
Experience in Second Life (1= Yes)			-.085 (.129)	-.152 (.122)
Sense of Online Community			.152*** (.04)	.117** (.038)
Internet Use			.452 (.28)	.404 (.269)
$R^2$ change (%)			8.3	8.3
Human-Likeness Qualities				.275*** (.031)
$R^2$ change (%)				8.8
Constant	1.914	4.84	4.24	4.24
Adjusted $R^2$ (%)	.03	5.5	13.8	22.6

Notes:  $b$ =unstandardized regression coefficients with standard error in parentheses are presented.  $R^2$  change refers to the unique contribution of each block of variables controlling for the previous variables entered in the regression.

†  $p \leq .10$ , \*  $p \leq .05$ , \*\*  $p \leq .01$ , \*\*\*  $p \leq .001$ .

As shown in Table 2, the total variance in robots acceptance explained by the regression model was 22.6%. Interestingly, the block of robots appearance was almost insignificant in the model, whereas the demographic block explained 5.5% of the variance, confirming the importance of gender and religion as predictors for robots acceptance. The block of technological variables on the other hand, could explain 8.3% of the variance, almost the same percentage (8.8%) as recognition of human-likeness. In terms of the role that recognition of human likeness plays in robots acceptance, the results revealed in the last block of Table 2 support H3, providing evidence for the concept that human-likeness is a strong predictor of willingness to accept robots as part of social and physical environments ( $\beta = .275$ ,  $p < .001$ ).



**Figure 1** SEM Model for the Influence of Avatar Engagement and Sense of Online Community on Robots

In testing H4, when recognition of human qualities was introduced in the model (as Table 2 shows), the unstandardized betas of both avatar engagement and sense of online community declined significantly. This finding suggests the mediation role of human qualities in attitudes toward robots as predicted by H4. To formally test this possibility we ran a SEM model. Using human-likeness as endogenous variables, and robots distance as the exogenous variables, we found avatar engagement and sense of online community as the only significant predictors. The covariance was the fixed parameter. Although results in figure 1 show that all the variables were significantly related, the proposed model had a poor but acceptable fit ( $\chi^2 = 8.1$  with  $p = .07$  and  $df = 1$ , RMSEA = .09, CFI = .91, NFI = .92, TLI = .91). Since the direct effects of both variables (sense of online community and avatar engagement) were still significant when recognition of human qualities was introduced into the model, a bootstrap procedure used to generate a 95% confidence interval (2000 samples) and tests were conducted to assess the indirect effect of the variables. Results show that the indirect effect of sense of online community ( $\beta = .021$ ) and avatar engagement ( $\beta = .015$ ) were both low but significant at  $p < .05$  level, supporting the idea that recognition of human like characteristics mediates the association between sense of online community, engagement with avatars and willingness to accept robots as part of social and physical environments.

## DISCUSSION

This work applied a CMC approach to study human-robots interaction, adding a new dimension of recognition of human-likeness qualities as a potential intermediary process between social uses of ICT and willingness to accept robots in our social and physical environments. This step was based on the prediction that in the same way that users have the capability to adapt to the medium when they communicate electronically with others, finding ways for instance to relate emotionally despite the lack of cues (as explained in the social information processing model), individuals with a high

sense of online community, and who engage with avatars and perceive higher levels of competence communicating with ICT, would be more inclined to perceive human-like cues in robots, which, in turn, will lead to acceptance of robots as part of their social and physical environments. Our results partially supported this communication based mediation model, with evidence of a positive relationship between two of the variables predicted (sense of online community and avatar engagement) and recognition of human-likeness and willing to accept robots as part of social and physical environments. Several aspects of these findings are worth discussing.

First, our study showed that exposure to humanoid designs increases recognition of human-likeness in robots but without affecting their attitudes toward them. In other words, participants exposed to the humanoid design could see more human-likeness in robots, but their willingness to accept robots as part of their environment was not affected by the appearance of the stimulus. We had hypothesized that following the same process of regular human interactions, in which recognizing other person's identity and discovering similarities are relevant to developing social relationships (Kanda, Hirano, Eaton, & Ishiguro, 2004), recognition of human-likeness in robots would lead individuals to accept them more. However, although in our model recognition of human-likeness was strongly related to robots acceptance, it could explain only an 8% of the variance, which means that more than 90% of the willingness to accept robots depends on other variables not necessarily related to human-likeness. In fact, gender and religion were both strong predictors for robot acceptance but not for recognition of human-likeness. This finding reinforces the idea that in our model there are factors more important than exposure to a visual stimulus of human-likeness. Rather these seem to be philosophical and cultural values held by respondents which affect their comfort and acceptance levels concerning robots in their routine social settings.

Regarding the relationship between the use of ICT to communicate with others and willingness to accept robots, it is noteworthy that whereas sense of online community and avatar engagement were positively related to recognition of human-likeness and "robotic" social distance, time spent using the Internet and previous experiences in Second Life, which shows whether participants had interacted previously with other users through avatars, were not significant predictors. One possible explanation might be related to the fact that the first two variables studied reflect how users interact with the technology, while the second set of variables reflects how much they use it. Research suggests that informational and social uses of the Internet encourage community involvement and foster civic participation (Norris, 2002; Shah, Cho, Eveland, & Kwak, 2005), arguing that it is not time spent using a particular medium that makes a difference but rather how individuals use it (Norris, 2002). Moreover, analyzing the same data that Putnam (2000) used to claim the negative effects of television on social capital, Shah, Mcleod and Yoon (2000) reported that informational uses of mass media are positively related to the production of social capital. Similarly, the analyses within subsamples also concluded that, among the youngest Americans, use of Internet for information exchange influences trust in people and civic participation. Consistent with this line of research, we found some variables contribute statistically to respondents recognizing human-likeness in robots; these were using the Internet to get support from other peers, share knowledge and meet others like them, and the feeling that the Internet made the respondent feel part of a larger community (all items represented in sense of online community). However, surprisingly, it was not necessarily the case that those who spent more time online also recognized greater human likeness in robots. Likewise, we found this positive relation only in those individuals who can engage emotionally with avatars, but not necessarily in those who only interact with them.

However, if individuals' capacity to recognize human-likeness is enhanced by the social use and engagement of ICT, as we discussed above, and our analysis considered more significant "qualitative" uses of ICT rather than quantitative (time spent), our study should have also found a positive relationship among individuals who perceive higher levels of competence communicating

through ICT with others. Nonetheless, the results did not show this positive relationship, neither in recognition of human-likeness nor in attitude towards robots. One plausible explanation could be related to respondents' greater exposure to technology and even perhaps robots in real life; this could make respondents more aware of the abilities represented by technology but also of their shortcomings (Halpern & Katz, 2012). Bartneck et al. (2005) reasoned along these lines to explain why Japanese participants with a high degree of competence and experience using technology were more concerned emotionally vis-à-vis interaction with robots than were less technologically savvy participants.

## LIMITATIONS

This study has limitations typical of undergraduate survey research, the most important of which is its lack of generalizability. By surveying only undergraduate students in a few classes at one university, the sample cannot be construed as being representative of either the entire university or of a larger population; hence, any generalizations must be limited. Students, for example, are traditionally more savvy with Internet and technology than other populations. Although we controlled for age, we had only relatively young people in the sample. We do not know if the results would be the same for senior citizens or a population that do not use Internet in general or social media in particular to develop human relationships. A more heterogeneous sample would be useful to better understand the model and to see the effects that different technological backgrounds may have on users. Another limitation was the exposure to the stimulus. Though we directed the respondent's attention to the figure with repeated questions, the power of the exposure would seem to be limited. This issue is discussed further when recommendations for future research are offered.

## CONCLUSION

This research was conceived as an exploratory study to apply a communication oriented framework to study human-robot interaction. Based on the assumption that lean communicative channels (in terms of social cues) may enrich interaction between respondents as relationships evolve over time (by allowing people to learn how to communicate socially despite the lack of cues), we assumed that individuals who communicate electronically would be more likely to recognize social cues in robots. On the other hand, since previous work has demonstrated that even minimal human-like cues in human-computer interaction affect user behavior, and recognizing other people's identity are relevant aspects in developing social relationships, we predicted a similar outcome in HRI. Although the results from our study indicate that avatar engagement and sense of online community have a strong effect on willingness to accept robots in local social and physical environments, and recognition of human like characteristics partially mediates the association between these concepts, the poor fit of the model and the small variance explained by the recognition of human-likeness, suggest that this approach may not adequately characterize the situation.

Finally, based on our results two main suggestions for future studies should be considered to validate the CMC model elaborated here. First, potential research might draw dependent variables from a broader set of reactions towards robots instead of the robotic social distance scale explored here. More general attitudes towards robots for instance, might be useful to explore whether recognition of human-likeness plays a more determinant role in the variance explained by the model. Second, we also recommend using livelier and more animated representations of robots as a stimulus. These might include videos showing how robots interact with humans, instead of mere exposure to a single image. This aspect may not only increase recognition of human-likeness in robots, but also actuate an attitude change toward them. It would also presumably elicit a more

accurate set of reactions on the respondents' part, yielding insight into potential acceptability for various social and interpersonal roles available for robots.

In sum, then, we have explored a range of predictors of the social reception of robots into everyday life. We have concluded that those with either experience with ICT representations of entities or pre-existing positive attitudes towards them (moderated through experience) will have more favorable attitudes towards robots in social roles. However, and rather surprisingly, recognition of human-like characteristics does not necessarily lead to a more favorable view of having robots involved in various social roles. This finding is provocative in that it problematizes several assumptions about the desirability of "human" or "android" qualities in robot design. Beyond the design implications are the communication ones. If human appearance is irrelevant to social acceptability, there is a much wider range of possible technological instantiations to make quotidian life more convenient. As well, it would mean that a broader range of automated services would be feasible in public settings such as hospitals and stores. Finally, it problematizes in interesting ways the nature of human social interaction and processes as they establish boundaries around in-groups and exclude out-groups. That said, these more philosophical extensions from the research lie outside the scope of the present article, though we anticipate addressing them elsewhere based on this and additional research.

## REFERENCES

- Bartneck, C., Nomura, T., Kanda, T., Suzuki, T., & Kato, K. (2005). Cultural differences in attitudes toward robots. *Proceedings of symposium on robot companions: Hard problems and open challenges in robot-human interaction (SSAISB 2005)*, 1-4.
- Bogardus, E. S. (1967). *A forty-year racial distance study*. Los Angeles, CA: University of Southern California Press.
- Boase, J., & Wellman, B. (2006). Personal relationships: On and off the Internet. In D. Perlman, & A. L. Vangelisti (Eds.), *Handbook of personal relations* (pp. 709-723). Oxford: Blackwell.
- Breazeal, C., & Scassellat, B. (1999). How to build robots that make friends and influence people. *Proceedings of IEEE/RSJ Int. Conf. Intelligent Robots and Systems*.
- Brennan, S. E., & Ohaeri, J. O. (1993). Effects of message style on user's attributions toward agents. *Proceedings of CHI '94: Companion*. Boston, MA.
- Campbell, S. W., & Kwak, N. (2010). Mobile communication and civic life. *Journal of Communication*, 60(3), 536-555.
- Cassell, J., McNeill, D., & McCullough, K. E. (1999). Speech-gesture mismatches: Evidence for one underlying representation of linguistic and nonlinguistic information. *Pragmatics and Cognition* 7(1), 1-33.
- Cerulo, K. A. (2009). Nonhumans in social interaction. *Annual Review of Sociology*, 35, 531-552.
- Cowley S. J., & MacDorman, K. F. (1995). Simulating conversations: The communion game. *AI & Society*, 9, 116-137.
- Dautenhahn, K., & Billard, A. (2002). Games children with autism can play with Robota, a humanoid robotic doll. In S. Keates et al. (Eds.), *Universal access and assistive technology* (pp. 179-190). London: Springer-Verlag London.
- Duffy, B. (2003). Anthropomorphism and the social robot. *Robotics and Autonomous Systems*, 42, 177-190.
- Ellison, N. B., Steinfield, C., & Lampe, C. (2007). The benefits of Facebook "friends:" Social capital and college students use of online social network sites. *Journal of Computer-Mediated Communication*, 12, 1143-1168.
- Fortunati, L., Katz, J. E., & Riccini, R. (Eds.). (2003). *Mediating the human body: Technology*,

- communication and fashion*. Mahwah, NJ: Erlbaum & Associates.
- Friedman, B., Kahn, P. H., & Hagman, J. (2003). Hardware companions? – What online AIBO discussion forums reveal about the human-robotic relationship. *Proceedings of CHI '03: SIGCHI conference on human factors in computing systems*.
- Hacker K., & Steiner, R. (2001). Hurdles of access and benefits of usage for Internet communication. *Communication Research Reports*, 18, 399-407.
- Halpern, D., & Katz, J. E. (2012). Unveiling robotophobia and cyber-dystopianism: The role of gender, technology and religion on attitudes towards robots. *Proceedings of HRI '12: 7th international conference on human-robot interaction*.
- Hampton, K. (2003). Grieving for a lost network: Collective action in a wired suburb. *The Information Society*, 19(5), 1-13.
- Haraway, D. J. (1985). A manifesto for cyborgs: Science, technology and socialist feminism in the 1980s. *Socialist Review*, 80(15), 65-107.
- Heerink, M., Kröse, B., Evers, V., & Wielinga, B. (2008). The influence of social presence on acceptance of a companion robot by older people. *Journal of Physical Agents*, 2, 33-40.
- Holz, T., Dragone, M., & O'Hare, G. (2009). Where robots and virtual agents meet. *International Journal of Social Robotics*, 1, 83-93.
- Kanda, T., Hirano, T., Eaton, D., & Ishiguro, H. (2004). Interactive robots as social partners and peer tutors for children: A field trial. *Human-Computer Interaction*, 19(1-2), 61-84.
- Katz, J. E. (Ed.). (2003). *Machines that become us: The social context of personal communication technology*. Piscataway, NJ: Transaction Publishers.
- Katz, J. E., & Rice, R. (2002). *Social consequences of Internet use: Access, involvement and interaction*. Cambridge, MA: MIT Press.
- Katz, J. E., & Aspden, P. (1997). A nation of strangers? Friendship patterns and community involvement of Internet users. *Communications of the ACM*, 40(12), 81-86.
- Katz, J. E., Rice, R. E., Acord, S., Dasgupta, K., & David, K. (2004). Personal mediated communication and the concept of community in theory and practice. In P. Kalbfleisch (Ed.), *Communication and community: Communication yearbook 28* (pp. 315-372). Mahwah, NJ: Lawrence Erlbaum.
- Kavanaugh, A., Reese, D., Carroll, J., & Rosson, M. (2005). Weak ties in networked communities. *Information Society*, 21, 119-131.
- Kiesler, S., Siegel, J., & McGuire, T. W. (1984). Social psychological aspects of computer-mediated communication. *American Psychologist*, 39, 1123-1134.
- Lin, N. (2001). *Social capital*. Cambridge, UK: Cambridge University Press.
- McCormick, N. B., & McCormick, J. W. (1992). Computer friends and foes: Content of undergraduates' electronic mail. *Computers in Human Behavior*, 8, 379-405.
- McMillan, D. W., & Chavis, D. M. (1986). Sense of community: A definition and theory. *Journal of Community Psychology*, 14(1), 6-23.
- Nass, C., & Moon, Y. (2000). Machines and mindlessness: Social responses to computers. *Journal of Social Issues*, 56, 81-103.
- Nomura, T., Suzuki, T., Kanda, T., & Kato, K. (2006). Altered attitudes of people toward robots: Investigation through the negative attitudes toward robots scale. *Proceedings of HRI '06: AAAI-06 workshop on human implications of human robot interaction*, Boston, MA, 29-35.
- Nomura, T., Kanda, T., Suzuki, T., Yamada, S., & Kato, K. (2009). Influences of concerns toward emotional interaction into social acceptability of robots. *Proceedings of HRI '09: 4th ACM/IEEE international conference on human robot interaction*, La Jolla, CA, 231-233.
- Norris, P. (2002). The bridging and bonding role of online communities. *Harvard International Journal of Press/Politics*, 7(3), 3-13.



- Pertaub, D. P., Slater, M., & Barker, C. (2002). An experiment on public speaking anxiety in response to three different types of virtual audience. *Presence: Teleoperators and virtual environments*, 11, 68-78.
- Polkosky, M. D. (2008). Machines as mediators: The challenge of technology for interpersonal communication theory and research. In E. Konijn, S. Utz, M. Tanis, & S. Barnes (Eds.), *Mediated interpersonal communication* (pp. 77-99). New York: Routledge.
- Postmes, T., Spears, R., & Lea, M. (1998). Breaching or building social boundaries? SIDE-effects of computer-mediated communication. *Communication Research* 25, 689-715.
- Preece, J. (1999). Empathic communities: Balancing emotional and factual communication. *Interacting with Computers*, 12(1), 63-77.
- Putnam, R. (1995). Tuning in, tuning out: The strange disappearance of social capital in America. *Political Science and Politics*, 12, 664-683.
- Putnam, R. D. (2000). *Bowling alone: The collapse and revival of American community*. New York: Simon and Schuster.
- Quan-Haase, A., & Wellman, B. (2004). How does the Internet affect social capital? In M. Huysman & V. Wulf (Eds.), *Social capital and information technology* (pp. 113-132). Cambridge, MA: MIT Press.
- Ratan, R., & Hasler, B. S. (2010). Exploring self-presence in collaborative virtual teams. *PsychNology Journal*, 8, 11-31.
- Reeves, B., & Nass, C. (1996). *The media equation*. Cambridge: Cambridge University Press.
- Rice, R. E., & Love, G. (1987). Electronic emotion: Socioemotional content in a computer-mediated network. *Communication Research*, 14, 85-108.
- Shah, D. V., McLeod, J. M., & Yoon, S. (2001). Communication, context, and community: An exploration of print, broadcast and Internet influences. *Communication Research* 28(4), 464-506.
- Shah, D. V., Cho, J., Eveland, W. P., & Kwak, N. (2005). Information and expression in a digital age: Modeling Internet effects on civic participation. *Communication Research*, 32, 531-565.
- Shaw-Garlock, G. (2009). Looking forward to sociable robots. *International Journal of Social Robotics*, 1, 249-260.
- Schermerhorn, P., Scheutz, M., & Crowell, C. R. (2008). Robot social presence and gender: Do females view robots differently than males? *Proceedings of HRI '08: 3rd ACM/IEEE international conference on human robot interaction*, Amsterdam, NL, 263-270.
- Shiomi, M., Kanda, T., Ishiguro, H., & Hagita, N. (2006). Interactive humanoid robots for a science museum. *Proceedings of HRI '06: 1st ACM/IEEE conference on human-robot interaction*, New York, NY, 305-312.
- Spears, R., & Lea, M. (1992). Social influence and the influence of the "social" in computer-mediated communication. In M. Lea (Ed.), *Contexts of computer-mediated communication* (pp. 30-65). London: Harvester-Wheatsheaf.
- Spears, R., Postmes, T., Lea, M., & Wolbert, A. (2002). When are net effects gross products? The power of influence and the influence of power in computer-mediated communication. *Journal of Social Issues*, 58(1), 91-108.
- Short, J., Williams, E., & Christie, B. (1976). *The social psychology of telecommunications*. Hoboken, NJ: John Wiley & Sons, Ltd.
- Stavrositu, C., & Sundar, S. S. (2008). *Psychological empowerment derived from blogging: Is it agency or is it community?* Paper presented at the annual meeting of the International Communication Association.
- Sung J-Y, et al. (2008). Housewives or technophiles?: Understanding domestic robot owners. *Proceedings of HRI '08: 3rd ACM/IEEE international conference on human robot interaction*, Amsterdam, NL, 129-136.

- Tanaka, F., Movellan, J. R., Fortenberry, B., & Aisaka, K. (2006). Daily HRI evaluation at a classroom environment: Reports from dance interaction experiments. *Proceedings of HRI '03: 1st ACM/IEEE international conference on human robot interaction*. Salt Lake City, Utah, ACM Press.
- Turkle, S. (2005). *The second self: Computers and the human spirit* (Twentieth Anniversary Edition). Cambridge, MA: MIT Press.
- Walther, J. B. (1992). Interpersonal effects in computer-mediated interaction: A relational perspective. *Communication Research*, 19, 52-90.
- Walther, J. B. (1994). Anticipated ongoing interaction versus channel effects on relational communication in computer-mediated interaction. *Human Communication Research*, 20, 473-501.
- Walther, J. B. (1997). Group and interpersonal effects in international computer-mediated collaboration. *Human Communication Research*, 23, 342-369.
- Walther, J. B., & D'Addario, K. P. (2001). The impacts of emoticons on message interpretation in computer-mediated communication. *Social Science Computer Review*, 19, 324-347.
- Wark, C., & Galliher, J. (2007). Emory Bogardus and the origins of the Social Distance Scale. *The American Sociologist*, 38(4), 383-395.
- Wellman, B., Boase, J., & Chen, W. (2002). The networked nature of community on and off the Internet. *IT and Society*, 1(1), 151-165.
- Wellman, B., Quan-Haase, A., Boase, J., Chen, W., Hampton, K., & Isla de Diaz, I. (2003). The social affordances of the Internet for networked individualism. *Journal of Computer-Mediated Communication*, 8(3). Retrieved from <http://jcmc.indiana.edu/vol8/issue3/wellman.html>
- Williams, D. (2006). On and off the 'net: Scales for social capital in an online era. *Journal of Computer-Mediated Communication*, 11(2). Retrieved from <http://jcmc.indiana.edu/vol11/issue2/williams.html>
- Woods, S., et al., (2007). Are robots like people?: Relationships between participant and robot personality traits in human-robot interaction studies. *Interaction Studies*, 8, 281-305.

## BIOGRAPHY

**Daniel Halpern** is an assistant professor at the Pontifical Catholic University of Chile. He is the author of *El Pecado de el Rucio* (2008, Catalonia) and *Gestion de Crisis: Teoria y Practica de un modelo comunicacional* (2010, Ril). His research has been published in a variety of journals. In 2008 he received the Fulbright Scholarship to pursue his PhD at Rutgers University, where he is currently finishing his dissertation.

**James E. Katz**, Ph.D., is the inaugural Feld Family Professor of Emerging Media at Boston University, where he also directs the Division of Emerging Media Studies. He is on leave from his position at Rutgers University, where he holds the title of Board of Governors Professor of Communication. The Board of Governors Professorship is the highest honor that Rutgers University can bestow on a member of its faculty. While he was at Rutgers, Dr. Katz served two terms as chair and also directed the Center for Mobile Communication Studies, which he founded in 2004.

# **Relationships to Social Robots: Towards a Triadic Analysis of Media-oriented Behavior**

**Joachim R. Höflich**  
**University of Erfurt**

## **ABSTRACT**

People are living in relationships not only to other people but also to media, including things and robots. As the theory of media equation suggests, people treat media as if they were real persons. This theoretical perspective is also relevant to the case of human-robot interaction. A distinctive feature of such interaction is that the relation to social robots also depends on the human likeness as an anthropomorphic perspective underlines. But people seem to prefer a certain imperfection; otherwise they feel uncanny. This paper explores the idea of robots as media and people's relations to them. The paper argues that robots are seen not only in the context of a relationship with a medium but also as a medium that 'mediates.' This means that robots connect between the environment and other people, but can also divide them. The paper concludes with a proposed perspective that widens a dyadic model of human-robot-interaction towards a triadic analysis.

**KEY WORDS:** social robots, interpersonal communication, relationships to media, triadic relations

## INTRODUCTION: WHO IS THE MURDERER?

After living in a computer world, we are moving towards a world of robots. Such robots include those that are not only machines but also those that assist our life. Increasingly they are becoming a part of our social life – for the better or the worse. This necessitates a broader view on robots not only as ‘interaction partners’ but also as an integral part of our interpersonal networks. A short story will introduce the theme of this paper: Solaria – a future world, populated by human descendants. The few colonists on this world prefer to communicate exclusively via media. Holographic projections enable them to look at each other. Face-to-face conversations are not usual. Confronted with a real other being, the inhabitants of Solaria would feel very uncomfortable. Only robot servants get into direct contact with their human owners and masters. Solaria is a very innovative world and an Eldorado of robots concerning the research and industry of robot-technology.

However, a murder has been unexpectedly committed in this utopian world. This incident is not supposed to happen on Solaria. Firstly, as already mentioned, humans strictly avoid direct contact with each other. So it is quite improbable that a person could approach closely enough to strike someone dead. Secondly, robotic laws prevent robots with high-end artificial intelligence (positronic brains) from harming humans. The first law especially indicates that a robot may not injure a human being or, through inaction, allow a human being to come to harm (see Asimov, 1991, p. 44). Installed permanently in the positronic brain of every robot, there should be no way to bypass these rules. They must be obeyed strictly and with no exceptions. Then, how is it still possible to instrumentalize a robot to commit a murder? What about the implementation of two robots that are compatible to their programs, and also, could establish a situation where the Laws of Robotics would not work? This story is, of course, attributable to the science fiction author Isaac Asimov and one may recognize that the criminal case presented here outlines one of his popular novels from 1956, serialized in *Astonishing Science Fiction* and published under the title *The Naked Sun*.

With this introduction, I would like to point out that the relationship between humans and social robots is more complex than a dyadic one; rather, it is embedded in a triadic relationship where the robot is not only ‘a third’ (thing) but also ‘the third’ (social entity or communication partner). This characterizes robots as social robots as it is indicated by a definition presented by Fong, Nourbakhsh and Dautenhahn (2003): “Social robots are embodied agents that are part of a heterogeneous group: a society of robots or humans” (p. 144). My following comments are indeed well illustrated by the aforementioned futuristic story, because it shows that robots are socially linked between persons (in this case as a link between Ego and Alter with the intention to kill without being ‘aware’ of this). But this could also be in a socially positive sense, for instance, as a mediator between two persons or between a person and his or her environment. As a starting point, I will explore the idea that the human-robot relationship is based on a dyadic model of interaction, which underlines that people refer to robots not simply as a thing but in a social sense, that is, as if it is a real person. Two aspects will especially be regarded: one is how humans tend to have relationships to things in general and to media in particular, and the other is how this relationship (above all, with robots) seems to be dependent on the extent to which the robot looks like a human. Illustrating with some examples, I will extend this assumption by adding a perspective of the third person not only as a substitute for a dyadic analysis but even more as an additional view on ongoing interactions between humans and robots.

## RELATIONSHIPS BETWEEN HUMANS AND SOCIAL ROBOTS

Everyday life is increasingly becoming mediated. Today, mass media serve as a central reference providing orientation in life. The Internet and the variety of communication options through cyberspace accentuate this trend. This is not only because people are using the Internet for interpersonal communication but also because technological advancements are inducing media to become mobile. Lately, a new medium has arisen; that is, the robot. The robot can be considered as the real mobile medium because it is able to move autonomously, while in the case of mobile communication, it is the people who are mobile and the medium itself is not mobile. A robot can be defined in various ways depending on the theoretical point of view. The perspective of a robot as will be seen here is not the robot as a machine, a sensomotoric machine or an autonomous machine. Instead it will be looked at as a medium. A media perspective is a perspective on communication, and the medium is something that ‘mediates,’ connects, and relates to that. It is mediating between humans as well as between humans and their environment. Furthermore, this perspective posits that people have relations to media (see Höflich, 2003, p. 90), which are in a certain sense ‘talking back.’ From this point of view, robots can be understood as a special type of media, that is, “interactive media” (Krotz, 2007, p. 155). Zhao (2006) in particular locates the relationship to robots as a relationship with media. He contrasts a relationship with media to a communication via media, and also, to other computer-mediated interpersonal communication (CMC) devices. Robots enable individuals to communicate directly with them. On this matter, Zhao (2006) states: “Humanoid social robots differ from CMC technologies in that they are not a medium through which humans interact, but rather a medium with which humans interact. Acting as human surrogates, humanoid social robots extend the domain of human expression, discourse and communication into the computerized world” (p. 402). Thus, robots represent “a special medium of communication that affects the way we see ourselves and relate to others” (Zhao, p. 413).

Depending on the ways a medium is used (may it be more or less personal), the meaning of a medium will be constituted, and also, a distinctive relationship will be established or stabilized. Regardless of being material (hardware) or not (e.g., software agents), those interactive media seem to possess some sort of presumed ‘communicative intelligence’ or communicative skills. Whatever the consequences of such developments may be, it indicates a pluralization of social interaction forms (Scholtz, 2008). The more variety a media world offers, the more diverse the communicative practices in the context of media usage become. Scientists interested in this new research field (the human-robot interaction – HRI) would like “to understand and shape the interactions between one or more humans and one or more robots” (Goodrich & Schulz, 2007, p. 15).

## MEDIA SEEN AS SOCIAL ACTORS: THE MEDIA EQUATION

“Mediated life equals real life,” according to Reeves and Nass (1996, p. 7). People have relationships with media, although one might add that the relationships are in an ‘as if’ sense. As Reeves and Nass state, “People respond socially and naturally to media even though they believe it is not reasonable to do so, and even though they don’t think that these responses characterize themselves” (p. 7). In the context of mass communication, such an ‘as if’ relation is well known. There is a relationship to a person who indeed really exists but he or she is only ‘present’ via media as a media persona (e.g., a TV-soap character or an actor in a movie). Horton and Wohl (1956) termed such unidirectional relationships as para-social interactions. The media persona becomes a communicative reference point although s/he never runs the risk of getting into face-to-face contact in reality. This idea can be extended to explain the communication with a medium: the medium itself gets a

communicative reference based on imagination and secured by technological feedback (interactivity of the medium).

Interaction with media and with media-generated creatures can be felt as real. Computers, as well as computer-generated creatures and virtual personae, will be personified as illustrated by the early example of Kyoko Date, a Japanese virtual figure that even became a pop star. This indicates that emotional bindings are not only possible to humans, but also to non-human creatures, including pets and even spiritual phenomena (see also Cerulo, 2009). Robots are a special case: they are real, physically present (except for the case of software robots) and interactive. However, a social robot cannot act in a social way. Considering Max Weber's (1976) understanding of social action as reciprocal meaningful (*sinnhaftes*) behavior (p. 1), eventually, relationships to robots are not "interpersonal," but instead, quasi-interpersonal and quasi-social. The robot is a machine without empathy; but its reaction is interpreted as social. Therefore, Krotz (2007) suggests using the term "pseudosocial" to paraphrase the social component of the interaction with a robot (p. 161).

In order to explain this phenomenon, Reeves and Nass (1996) use the term "media equation," indicating that interactions with media (from television to the computer) are social affairs following the rules of face-to-face interaction. These do not basically differ from interactions in real life. They state, "It is possible to take a psychology research paper about how people respond to other people, replace the word 'human' with the word 'computer', and get the same results" (Reeves & Nass, 1996, p. 28), which is a somewhat exaggerated proposition. In a certain sense, I propose to replace the word "computer" with the word "social robot" because this better expresses the fact that a person is able to start an emotional relationship to a technical, interactive artifact. However, further empirical research will be helpful in order to explore the position and its related questions further. For instance, what are the rules of distance behavior? Do people have, in the sense of proxemics, the same social distances to robots as to other people? We are just at the beginning of this line of research development, but it shows that people even have emotional relationships to "strange" creatures such as the Tamagotchi, and they have a feeling of grief when the virtual creature dies. Nevertheless, it is an "as if" interaction with problematic consequences, as Sherry Turkle (2011) says: "It will begin with our seeing the new life as 'as if' life and then deciding that 'as if' may be life enough. Even now, as we contemplate 'creatures' with artificial feelings and intelligence, we come to reflect differently our own. The question here is not whether machines can be made to think like people but whether people have always thought like machines" (p. 54).

## ANTHROPOMORPHIC PERSPECTIVE

Although relationships to social robots cannot be more than quasi-interpersonal, interaction with a robot seems, in so far as we do not have further communication experiences, to occur in the frame of interpersonal communication, using the well known rules, the nonverbal cues and responding towards the well established pattern of physical attractiveness. Apparently, a reference frame for interpersonal communication in human-robot interaction is supposed to be reinforced if the robot counterpart is assembled in a human-like way: "By endowing robots with the capability of communicating with us at a level we can understand, a human level, and by building robots that have at least some appearances of humanlike features, we are rapidly moving towards an era when robots interact with us not only in a functional sense but also in a personal sense" (Levy, 2007, p. 12). At this stage, one should ask what peculiarities differentiate human-robot interaction from human-human interaction. Is there a point existing where the humanlike assembling of a social robot results in the inability to distinguish between the two forms of communication? Dealing with these questions, Masahiro Mori (1970) proposes the hypothesis of the "uncanny valley," assuming that there is no linear relationship between the variables human-likeness and familiarity. One can

assume that people prefer a humanlike appearance of a robotic creature to have a certain relationship. Indeed, increasing human-likeness of the robot causes the rise of a feeling of familiarity; namely, an emotional tendency referring to the artifact (the robot is supposed as real being). However, after a special amount of human-likeness, there exists a critical area, described by Mori as a valley. Now, people begin to feel very uneasy when confronted with such a robot. It is very interesting that the feeling of familiarity increases much more if the social robot moves. In turn, from a special amount of human-likeness, people start to feel much more eerie in the presence of a moving robot than in the case of a still robot. The following diagram illustrates the phenomenon:

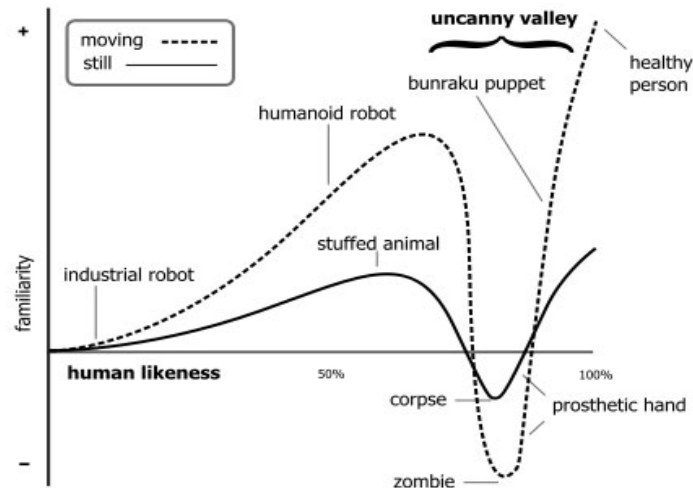


Figure 1. Uncanny valley (Mori, 1970; simplified version of the translated original figure).

The phenomenon of the uncanny indicates that the interaction is framed, meaning, in the words of Erving Goffman (1974), “What is going on here?” (p. 8). In this sense, “The uncanny has to do with the strangeness of framing and borders, an experience of liminal” (Royle, 2003, p. 3). A “psychology of the uncanny” is not really a new idea. As early as 1906, Ernst Jentsch, a German psychiatrist, mentioned such cognitive processes. Jentsch states that the uncanny originates if a person is confronted with an unfamiliar object or event. In a certain sense, one is not at home but separate from the home – in German, *nicht-heimlich*. Because of this, it becomes “*un-heimlich*” – eerie. In those situations, a person cannot fall back on accustomed orientation guidelines, leading to a feeling of uneasiness. Two types of doubt produce especially high discomfort: Doubts about the ensoulment of a creature (finally, it pretends to be alive through its appearance or/and movement) and doubts about the ensoulment of a non-alive machine (a feeling comparable with the appearance of a dead human). The author especially highlights that people feel highly embarrassed if they combine their visual perception of a human-like creature with the attribution of a soul or some sort of bodily functions. As an example, Jentsch describes life-size automatic machines doing complex activities simultaneously, such as blowing a trumpet, dancing, and so on. The more delicate and lifelike they are, the more a feeling of uneasiness they produce (Jentsch, 1906, p. 203). Jentsch’s body of ideas was taken up by Sigmund Freud (1970) in his essay about “The Uncanny.” In contrast to Jentsch, Freud chooses a psychoanalytic approach. He assumes that uneasiness is based on the result of a psychological suppression process. The uncanny is understood as “previously familiar, well-known. The prefix ‘un’ indicates the suppression” (Freud, p. 267).

A study conducted in summer 2012 at the University of Erfurt regarding the acceptance of social robots (based on 81 qualitative interviews; average age 26.4 years, 53% female) offers some

hints that there is something uncanny. The more complex (with elaborated functionality) and the more human-like the robot is, the less accepted it is. Partly the results of the study are similar to the results of a study by Halpern and Katz (2012), which found “only that recognition of human likeness in robots influence participants’ attitudes, which suggests that it is not the exposure to particular robots but rather the recognition of human attributes that affected subjects’ attitudes” (Halpern & Katz, 2012, p. 2). Empirical research has not yet succeeded in proving clear results for the uncanny valley, although it can be supposed that, in general, abnormalities also produce discomfort in a virtual context (see also MacDorman, Green, Ho, & Koch, 2009). As a conclusion, one has to consider that machines must not be too perfect because this could give rise to confusion and even fear (the uncanny valley), and such confusion and fear can especially be found in the early years of human-like machines or automata (see Kraemer, 2008, p. 27). Fortunately, robots have not yet reached such a perfect stage. Therefore, communication between a person and a medium is only successful when the human being is willing to adjust his/her behavior to the inadequacies of the medium (Krotz, 2007, p. 160). Here, by comparing the human-robot interaction with the human-animal interaction an analogy can be drawn. A sound example for this is the relationship between a person and his/her dog. Some dog owners are very proud of their stubborn pets, attributing them to some sort of intellectual personality. The German sociologist Hondrich (1997) explains this phenomenon by stating that humans recognize their own wish to live a self-determined life through observing the rebelliousness of their pets (p. 630). And it seems that this very lack of total obedience – because they do not ‘function’ as a machine – strengthens the emotional bonds.

### **TRIADIC RELATIONSHIPS AND HUMAN-ROBOT RELATIONSHIPS: THREE EXAMPLES**

People may have distinctive relationships with robots. They act as if they were real, which could be called a ‘robot equation’ that partly depends on a human likeness of the robot but with tolerances of imperfection. Human-robot relationships, however, do not only involve a relationship with a medium (the robot) but also a communication via the medium, where the medium is not only a third thing but a third entity despite its quasi-social nature. This could be illustrated with the following figure and the examples:

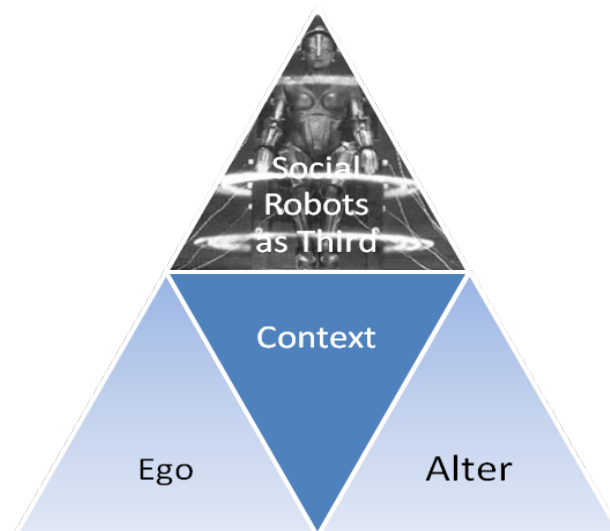


Figure 2: Ego-Alter-Robot triadic relation



### **An introductory example: Turing and the Third**

A triadic perspective on “intelligent machines” can be found already in the concept of the Turing test (or better, judgment) that analyzes the intelligence of a computer and a human being. He proposed a so-called imitation game that was basically described as follows:

The new form of the problem can be described in terms of a game which we call the ‘imitation game’. It is played with three people, a man (A), a woman (B), and an interrogator (C) who may be of either sex. The interrogator stays in a room apart from the other two. The object of the game for the interrogator is to determine which of the other two is the man and which is the woman. He knows them by labels, X and Y, and at the end of the game he says either ‘X is A and Y is B’ or ‘X is B and Y is A.’ (Turing, 1950, p. 433)

His question here was what would happen when a machine took the A part in this game. The interesting point is that Turing’s concern was not a simple estimation of the (person or machine) opposite, but instead, a comparison from an observer’s point of view, because he assumed that a comparative view is fundamental when a robot enters into the social field of acting individuals. The following three examples illustrate in which way robots serve as a third. In the first case, the robot is temporarily excluded from the dyad. Case two and three deal with the fact that a robot establishes a dyadic contact between two people or describe the situation of a robot being a team member of group communication.

### **Communication with robots and their social exclusion**

The first example is the Sony’s electronic pet AIBO (Artificial Intelligence robot, in the Japanese language, ‘partner’), which has already gained some research attention (see e.g., Krotz, 2007, p. 130ff.; Scholz, 2008). AIBO is an example of a social robot that came into private households as an entertainment robot and interactive medium. The electronic dog was accepted because it seemed so real that the human beings behaved as if it was an independent actor – a real pet (Krotz, 2007, p. 136), but actually, it is a special form of communication. As Krotz mentioned, the communication with AIBO results in the projection of AIBO interacting in a human way – it is like an autistic communication (Krotz, 2007, p. 137). What is interesting, however, is not the relationship structure between human and electronic dog but the way people talk about the “dog.”

Problematic situations generate communications to clarify why something does not work. This ideally brings solutions to approach the problem in a communicative way. Problems with AIBO arise if the human does not understand AIBO, and vice versa. As a study by Muhle (2008) shows, the communication with AIBO stops in such cases before it continues again. If all attempts at a solution do not work, it generates communication between the attendants. The problems are discussed interpersonally and the robot will be excluded from this. This seems to be a special character of the human-robot communication: The robot is an excluded third, as Muhle confirmed. In the sequences in which the humans try to interpret the statements of the robot, it is not seen as a present and available communication partner anymore (Muhle, 2008, p. 18). Here, human communication differs in a fundamental way. Furthermore, this emphasizes the hybrid status of the robot (Braun, 2000) that loses its “humanity” and is interpreted as the object itself. Such a human behavior where the status of a human subject is denied can only be seen in rare cases of temporary “de-personalization” for example, towards children, mentally disabled people or dementia patients. People may talk about them during their presence as if they were not present. This seems analogous

to the communication with animals (Bergmann, 1988) and refers to a special moment of the third person: the temporary exclusion and the reduction to a thing in an otherwise emotional relation.

### **Communication via robots – the case of KASPAR as a mediator**

The second example refers to helping robots, such as those that read the newspapers or make Internet connections, or robots that serve as mediators enabling communication. This includes the seal-robot Paro (developed by the Japanese researcher Takanori Shibata) that is used in homes for the elderly. Paro acts as a young seal that demands attention and care, and shows how the human does not only deal with the artificial creature, but also increases communication between the patients of the home and the nursing staff. Another example is the museum-robot Fritz (developed within the German research project “Learning Humanoid Robots”), which can communicate with several people at the same time (Weber, 2006). In the broadest sense, these are “assistive robots,” which help people in an interactive sense (Feil-Seifer & Matarić, 2005, p. 465). Another example of this type of robots is KASPAR, a “socially capable robotic platform,” which Robins, Dautenhahn and Dickerson (2009) discussed in their study *From Isolation to Communication*. It is a robot the size of a child that can make facial expressions, gestures and head movements, but with a controlled complexity. Indeed, it is the intention to de-personalize the face in order to achieve the possibility of creating projections. The robot KASPAR is controlled by a wireless remote control and is used in the therapy of autistic children in well-known environments.

Autistics, it is presumed, are missing the “Theory of Mind,” that means the ability to describe their own feelings as well as those of others. According to Dautenhahn (1999) there are problems especially in the “reading” of emotions within reciprocal eye and body contact. It is, as the author indicates, difficult for autistics to look other people in the face (see also Cole, 1999, p. 116). However, the behavior of KASPAR shows a special predictability, as well as a limited expression repertoire. The characteristic of KASPAR makes it easier for autistic children to establish contact to it in the presence of researchers and other children. Studies show that there is a certain generalization of the behavior towards KASPAR. “Not only do they show a level of direct, physical engagement with KASPAR, but they also appear to generalize this behavior at least to co-present others. Thus, children appear to use touching and gazing at KASPAR prior to touching and gazing to co-present others. Furthermore, children appear to show some awareness of co-present others’ perception of KASPAR, turning gaze at them following some potential relevant action on the part of KASPAR that they treated as having perceived” (Robins, Dautenhahn, & Dickerson, 2009). In this case, the robot is the third (‘person’), which connects rather than separates. Additionally, it evokes a notable behavior of the autistic children, which is also confirmed by the people who are well-known to them.

### **Group communication and robots – the group context**

The last example refers to robots in-group settings. As Goodrich and Schultz (2007) state, “HRI problems are not restricted to a single human and a single robot, though this is certainly one important type of interaction” (p. 22). Group communication that involves robots could be found in rescue operations (e.g., “search and rescue,” such as in the context of the World Trade Center disaster) or even in the military where it has a special relevance (Barnes & Jentsch, 2010). As already noted, Reeves and Nass (1996) have suggested that the feeling of “team” may also affect the interactions with media (pp. 158-159). Robots will become a part of human teams and thus bring new moments into the cooperation among the members of a team. Addressing such a group

communication, Thompson and Gillan (2010) state, “Researchers have effectively argued that emerging automated entities like robots and expert systems can serve as a new kind of team member – albeit technological – in situations where coordination, shared goals of team members, and interdependence among humans and technology exist” (p. 69). In such a group communication that involves humans and automated entities, according to the authors, it is important to consider social factors such as the extent to which those robots conform to the already existing rules as well as to a human appearance (one just has to think of the “uncanny valley”). Another important point of this example is that the robot will not only be a part of a triadic relation, but it is also located within a group structure. Although Georg Simmel stated that the third person brings the important change and the new quality, which is not essentially affected if a fourth person comes along, it is important to make a distinction between a robot as the third and a robot as a group member because of a distinctive collective orientation. In addition, as Singer (2009) mentions in his inspiring book *Wired for War*, humans develop strong emotional bonds with such “warrobots.” So-called improvised explosive devices (IEDs) are extremely dangerous things, and it is the duty of the EOD team (Explosive Ordnance Disposal) to “hunt” them as a military bomb squad. “Scooby-Doo” was the team’s PackBot in Iraq, and one day a critical event happened: Scooby Doo was “killed” – or rather blown up by an IED. Unfortunately, the specialists were not able to repair it (him?). The EOD who carried the box with the robot parts into the repair facility was terribly upset – he did not want a new machine, but he wanted Scooby-Doo back. Singer concluded as follows: “And yet while new technologies are breaking down the traditional soldierly bonds, entirely new bonds are being created in unmanned wars. People, including the most hardened soldiers, are projecting all sorts of thoughts, feelings, and emotions onto their new machines, creating a whole new side of the experience of war” (p. 338).

## THE THIRD PERSON IN THE CONTEXT OF INTERPERSONAL COMMUNICATION

If a third person – or even a robot – enters the stage of interpersonal communication something changes, be it enriching or restricting. Traditional communication models tend to take a dyadic perspective, a process where Ego and Alter, a sender and a receiver communicate in a reciprocal way. This model is not necessarily inappropriate but rather incomplete because communication involves not only a shared (although not always consensual) orientation towards a third object, as illustrated by the A-B-X model by Newcomb (1953), but also the (mere) existence – be it the physical presence or the anticipated existence – of a third person that influences the communication process. Although there has been certain development in understanding human communication process as discussed above, Becker (2006) points out that the understanding of human-machine interaction is still under development. Becker states, “It seems as though most concepts of man-machine interactions still start with the assumption of a simple transmitter-receiver model, according to which the message sent by the transmitter arrives at the receiver exactly as originally intended and is interpreted in accordance with the transmitter’s intention” (p. 43). However, human-machine interaction would benefit from taking a relational perspective. According to Becker, the question is not what a robot can perform or is able to do, but is about its skills as an agent in a social network; that is, in a field of social relations where a robot is an integral part. This introduces another relevant aspect; that is, the presence of others and the significance of third persons who present the frame of communication, and also, are framed on their own. And eventually, the meaning of the robot is not negotiated with the robot as social entity, but together with others in a process of continuous reciprocal indication.

One example of our research is underlining this assumption. An explanatory study, done in summer 2012 at the University of Erfurt, based on the method of introspection and a research diary, looked at the emotional relationships toward a baby simulator, known as RealCare Baby. One female student adopted this baby, called Lilly, for one week. During this week an emotional relationship between the ‘mother’ and the electronic child emerged. This was also influenced by the social environment, for instance the integration of the baby simulator into the already existing relationship with a boyfriend. The boyfriend not only accepted the social experiment but also showed some emotional involvement (for instance kissing the ‘baby’ on the forehead), ended up strengthening the relationship in a triadic sense.

The influence of a third person is well known not only in the case of the mother-father-child relationship where a baby may fundamentally change the already existing relationship, but also in the psychological field where the third is of special relevance such as the case of therapist or psychiatrist. From a sociological point of view, it was Georg Simmel who especially called attention to this social prototype. To understand the phenomenon of the third, some basic assumptions should be mentioned.

The third person is significant whenever knowledge is shared with another and is hidden from another. Simmel’s (1995) comment on secret addresses the point: If there is a secret triads emerge (p. 383ff; see also Nedelmann, 1985). In Simmel’s remarks, the third person is especially relevant in the context of the (quantitative) determination of a group (see further: Freud, 1976). With a third person, there is an additional person in a quantitative sense. Consequently, the relation to others is changed (Hessinger, 2010, p. 65). The constellation of the actors acquires a new quality that does not fundamentally change even if a fourth or fifth comes along. The third person makes change of alliances possible. Therefore, the third person has the characteristic to connect and to separate. Simmel (1995) further stated:

Where three elements A, B, and C build an alliance, besides the direct relation between, for example, A and B, an indirect one is gained, developing through the common relation of A and B in regard to C. This is a formal sociological enrichment. In addition to the connection by the straight and shortest line, every two elements are furthermore linked by a fractured one. Points where these elements do not have a direct contact are put in touch through the third element, which respectively turns a different side towards these elements but therewith nevertheless integrates them within the unity of its personality... The direct connection is not only strengthened through the indirect connection, but disrupted as well. There is no howsoever intimate relation, where one is not occasionally perceived as a perpetrator by the other two. This is also true for the case that only concerns the individual’s participation in certain sentiments, which only unfold their ‘being focused’ as well as their bashful delicateness within the focused gaze from eye to eye. Every sensitive conjointness of two is thus irritated by a bystander. (pp. 114-115)<sup>1 2</sup>

The third person is seen as a sociological prototype (Freund, 1976). Thereby, the meaning of a dyadic intersubjectivity is not excluded, but the figure of the third person is necessary to understand the moment of institutionalization. In this way, a kind of stability is established, so that the individual arbitrariness is socialized at the same time: Sociality as a dyadic-structured

---

<sup>1</sup> Simmel expiates the third person three times (Simmel, 1995, p. 125ff; see also Bedorf, 2003, p. 129ff): a) The impartial and mediator, b) the smiling third (*tertius gaudens*), and c) an advantage for himself, a winning and dominating third (*divide et impera*).

<sup>2</sup> This quotation was taken from the German text as translated and interpreted by the author.

phenomenon is unstable. Only through the addition of the third person does it obtain enough consistency (Lindemann, 2006, p. 140). A group of three does not require the presence of a single individual. The elements can be changed without the triad losing its functionality. According to Bedorf (2003), this is not possible in a dyad because the irreplaceability of both individuals is important for the dyad (p. 123). He says that the continuity of a relation is a central condition of the dyad; therefore, it needs both individuals to exist.

In this way, the analysis of specific interpersonal relations will be more complex. It shows that these are included in a communicative structure where the individual acts with the view to a counterpart, but also thinking about potential others. As Simmel said, a third person can both connect and separate. In the example of a love story, this could be a marriage broker who helps two people to be a couple. However, a third person can also separate or cause trouble in a relationship, so that the couple breaks up in the worst case (see also Lenz, 2010). Intangible beings, such as robots, can, as the examples illustrate, also be located in this context: the robot could be included and excluded, and also, include and exclude. In order to obtain a deeper understanding of the multiple facets of an ego-alter-robot interaction, further research is necessary. Nevertheless, the question at hand is also an analytic one: It depends on who the third person is in such a relational analysis from the view of the researcher. In this case, and based on a social acceptance of the robot as an interaction partner, a constellation of ego and alter is confronted with the robot as the third (person), the robot standing opposite to such a constellation. It is the question of how an existing social constellation considers the robot, how it will be involved in this relation, and which social status the robot acquires in this existing interpersonal structure. In the presence of the robot as third person, what is the behavior of Ego and Alter like? If we keep Simmel in mind, will the robot connect or separate them? Will it initiate relations between ego and alter or will it isolate them? And finally, is it possible that a robot can be a member of a social group or a team? Is the robot an intruder or a legitimate third? Otherwise, a (real) person could be seen as a third and be looked at whether or not a robot is included or excluded (think of the case of AIBO that was partially excluded). Such a comprehensive analysis of the ego-alter-robot interaction will eventually offer insights into the dimensions of robots as social agents.

## **PROSPECT: MEDIA ANALYSIS AND THE THIRD PERSON**

A scientific perspective offers a distinctive view of the world; it includes some aspects but also excludes others. A view of communication is often based on a dyadic perspective where ego and alter are in an interactive relationship, but such a perspective excludes social influences based on the existence of third persons. Since social robots are at the center of a sociological analysis (e.g. Böhle & Pfadenhauer, 2011), this becomes more obvious. The view of robots as interactive media and as a third entity refers to a complex view of media, which cannot only be a subject of discussion in dyadic contexts. There is not only an interaction with the medium but also an interaction via the medium where the medium is a third thing as well as a third social entity (or interaction partner). This does not mean to suspend a dyadic analysis, but to enrich it by adding a perspective of the third. In other words, it is an integrative perspective towards media behavior, including interaction with media such as social robots that are socially contextualized. It is possible to decline and analyze this in the context of every kind of media-oriented behavior, from television to mobile communications, and also, from communication through media to communication with media. All together, it refers to a way that does begin with but not end with dyadic communication models. Who the third person is will be an analytic question, and therefore, a question of the scientific point of view. But if the third person is included, the perspective of interaction and communication will be

expanded for social moments. The field of the human-robot interaction is one example, and also a test for the functionality of a triadic analysis.

## REFERENCES

- Asimov, I. (1991). *I, Robot*. New York: Bantam Books. (Original work published 1950)
- Asimov, I. (1982). *Die nackte Sonne* (6<sup>th</sup> ed.). Munich: Awa Verlag. (Original work published 1957)
- Barnes, M., & Jentsch, F. (Eds.). (2010). *Human-robot-interactions in future military operations*. Farnham: Ashgate.
- Becker, B. (2006). Social robots – emotional agents: Some remarks on naturalizing man-machine interaction. *International Review of Information Ethics*, 6, 37-45.
- Bedorf, T. (2003). *Dimensionen des Dritten. Sozialphilosophische Modelle zwischen Ethischem und Politischem*. Munich: Wilhelm Fink.
- Bergmann, J. B. (1988). Haustiere als kommunikative Ressourcen. In H-G. Soeffner (Ed.), *Kultur und Alltag*. Sonderband 6 der Zeitschrift, Soziale Welt (pp. 199-312).
- Blawat, K. (2010). „Ich weiß, es ist schwierig mit mir zu arbeiten.“ (Sueddeutsche.de, Wissen). Retrieved from <http://www.sueddeutsche.de/wissen/soziale-roboter-ich-weiss-es-ist-schwierig-mit-mir-zu-arbeiten-1.989482>
- Böhle, K., & Pfadenhauer, M. (2011). Parasoziale Beziehungen mit pseudointelligenten Softwareagenten und Robotern. *Technikfolgenabschätzung – Theorie und Praxis*, 20(1), 4-10.
- Braun, H. (2000). Soziologie des Hybriden. Über die Handlungsfähigkeit von technischen Agenten. Working Paper. Technische Universität Berlin.
- Cerulo, K. A. (2009). Nonhumans in social interaction. *Annual Review of Sociology*, 35, 531-552.
- Cole, J. (1999). *Über das Gesicht. Naturgeschichte des Gesichts und unnatürliche Geschichte derer, die es verloren haben*. Munich: Verlag Anja Kunstmann.
- Dautenhahn, K. (1999). Robots as social actors: Aurora and the case of autism. *Proceedings of CT '99: 3rd cognitive technology conference*, August, San Francisco.
- Dorman, K. F., Green, R., D., Ho, C. C., & Koch, C. T. (2009). Too real for comfort? Uncanny responses to computer generated faces. *Computers in Human Behavior*, 25, 695-710.
- Feil-Seifer, D., & Matarić, M. J. (2005). Defining socially assistive robotics. *Proceedings of the IEEE '05: 9th international conference on rehabilitation robotics*, June 28-July 1, Chicago, IL, USA, 465-468.
- Fong, T., Nourbakhsh, I., & Dautenhahn, K. (2003). A survey of socially interactive robots. *Robotics and Autonomous Systems*, 42, 143-166.
- Freud, S. (1970). Das Unheimliche. In S. Freud, *Psychologische Schriften* (pp. 241-274). Studienausgabe. Frankfurt am Main: Fischer. (Original work published 1919)
- Freund, J. (1976). Der Dritte in Simmels Soziologie. In H. Böhringer, & K. Gründer (Eds.), *Asthetik und Soziologie um die Jahrhundertwende: Georg Simmel* (pp. 90-104). Frankfurt am Main: Vittorio Klostermann.
- Goffman, E. (1974). *Frame analysis: An essay on the organization of experience*. New York: Harper & Row.
- Goodrich, M. A., & Schulze, A. C. (2007). Human-robot interaction: A survey. *Foundation and Trends in Human-Computer-Interaction*, 1(3), 203-275.
- Halpern, D., & Katz, J. E. (2012). Unveiling robotophobia and cyber-dystopianism: The role of gender, technology and religion on attitudes towards robots. *Proceedings of HRI '12: 7th international conference on human-robot interaction*, March 5-8, Boston, MA.
- Hegel, F. (2008). Gestalterisch konstruktiver Entwurf eines sozialen Roboters. Dissertation zur

- Erlangung des akademischen Grades Doktors der Ingenieurwissenschaften (Dr.-Ing).  
Maerz 2009. Tönning: Der Andere Verlag.
- Hessinger, P. (2010). Das Gegenüber des Selbst und der hinzukommende Dritte in der soziologischen Theorie. In E. Eßlinger, T. Schlechtriemen, & D. Schweitzer Doris (Eds.), *Die Figur des Dritten. Ein kulturwissenschaftliches Paradigma* (pp. 65-79). Frankfurt am Main: Suhrkamp.
- Höflich, J. R. (2003). *Mensch, Computer und Kommunikation. Theoretische Verortungen und empirische Befunde*. Frankfurt am Main: Peter Lang.
- Hondrich, K. O. (1997). Soziologie. Eine Kolumne. Soziale Beziehungen. *Merkur*, 51(7), 626-631.
- Horton, D., & Wohl, R. R. (1956). Mass communication and para-social interaction. *Psychiatry*, 19, 215-229.
- Jentsch, E. (1906). Zur Psychologie des Unheimlichen. *Psychiatrisch-Neurologische Wochenschrift*, 22(25 August), 195-198; 23(1 September), 203-205.
- Krämer, N. C. (2008). *Soziale Wirkungen virtueller Helfer. Gestaltung und Evaluation von Mensch-Computer-Interaktion*. Stuttgart: Kohlhammer.
- Krotz, F. (2007). *Mediatisierung: Fallstudien zum Wandel von Kommunikation*. Wiesbaden: VS-Verlag.
- Lenz, K. (2010). Dritte in Zweierbeziehungen. In T. Bedorf, J. Fischer, & G. Lindermann (Eds.), *Theorien des Dritten. Innovation in der Soziologie und Sozialpsychologie* (pp. 213-247). Munich: Wilhelm Fink.
- Levy, D. (2007). *Love and sex with robots*. New York: Harper/Perennial.
- Lindemann, G. (2006). Die dritte Person – das konstitutive Minimum der Sozialtheorie. In H-P. Krüger, & G. Lindemann (Eds.), *Philosophische Anthropologie im 21. Jahrhundert* (pp. 124-145). Berlin: Akademie Verlag.
- MacDorman, K. F., Green, R. D., Ho, C., & Koch, C. T. (2009). Too real for comfort? Uncanny responses to computer generated faces. *Computers in Human Behavior*, 25, 695-710.
- Mori, M. (1970). The uncanny valley. *Energy*, 7(49), 33-35. Retrieved from <http://www.movingimages.info/digitalmedia/wp-content/uploads/2010/06/MorUnc.pdf> (trans. MacDorman, K. F. & Minato, T.)
- Muhle, F. (2008). 'Versteh ich grad nicht' – Mensch-Maschine-Kommunikation als Problem. *Kommunikation@Gesellschaft*, 9(4), Retrieved from [http://www.soz.uni-frankfurt.de/K.G/B4\\_2008\\_Muhle.pdf](http://www.soz.uni-frankfurt.de/K.G/B4_2008_Muhle.pdf)
- Nedelmann, B. (1985). Geheimnis – Ein interaktionistisches Paradigma. *Vorgänge*, 78(6), 38-48.
- Newcomb, T. M. (1953). An approach to the study of communicative acts. *Psychological Review*, 60, 393-404.
- Reeves, B., & Nass, C. (1996). *The media equation: How people treat computers, television, and new media like real people*. Cambridge: Cambridge University Press.
- Robins, B., Dautenhahn, K., & Dickerson, P. (2009). From isolation to communication: A case study evaluation of robot assisted play for children with autistic with a minimally expressive humanoid robot. *Proceedings of ACH '09: 2nd international conference on advances in computer-human-interaction*, February 1-7, Cancun, Mexico.
- Royle, N. (2003). *The uncanny*. Manchester: Manchester University Press.
- Scholtz, C. (2008). Und täglich grüßt der Roboter. Analysen und Reflexionen des Alltags mit dem Roboterhund Aibo. In *Volkskunde in Rheinland Pfalz. Informationen der Gesellschaft für Volkskunde in Rheinland Pfalz e.V.*, 23, 139-154.
- Simmel, G. (1995). *Soziologie. Untersuchungen über die Formen der Vergesellschaftung* (2nd ed.). Frankfurt am Main: Suhrkamp.
- Singer, P. W. (2009). *Wired for war: The robotic revolution and conflict in the 21st century*. New York: Penguin.

- Thompson, L. F., & Gillan, D. J. (2010). Social factors in human-robot-interaction. In M. Barnes, & F. Jentsch (Eds.), *Human-robot-interactions in future military operations* (pp. 67-81). Farnham: Ashgate.
- Turkle, S. (2011). *Alone together: Why we expect more from technologies and less from each other*. New York: Basic Books.
- Turing, A. M. (1950). Computing machinery and intelligence. *Mind*, 5, 433-460.
- Weber, J. (2006). Der Roboter als Menschenfreund. *c't*, 2, 144-149.
- Weber, M. (1976). *Wirtschaft und Gesellschaft. Grundriss einer verstehenden Soziologie* (5th ed.). Tübingen: I.C.B. Mohr.
- Zhao, S. (2006). Humanoid social robots as a medium of communication. *New Media & Society*, 8(3), 401-419.

## BIOGRAPHY

**Joachim R. Höflich** studied economics, social science and communication sciences. He worked at the universities of Augsburg, Hohenheim, Bamberg and Munich. Since September 2002 he is Professor for Communication Science with a focus on media integration at the University of Erfurt. Research interests include media use and media effects; ‘new’ communication technologies and changes of mediation cultures; theory of mediated (interpersonal) communication. Latest publication: *Mobile Kommunikation im Kontext. Studien zur Nutzung des Mobiltelefons im öffentlichen Raum* (Mobile communication in context. Studies of mobile phone usage in the public sphere). Frankfurt/Main: Peter Lang.



# **Social Robotic Experience and Media Communication Practices: An Exploration on the Emotional and Ritualized Human-technology-relations**

**Christine Linke**  
**Independent Researcher**

## **ABSTRACT**

This article approaches the subject of social robots by focusing on the emotional relations people establish with media and information and communication technology (ICTs) in their everyday life. It examines human-technology-relation from a social studies point of view, seeking to raise questions that enable us to make a connection between the research on human relationships and the topic of human-technology relation, especially human-humanoid-relation. In order to explore the human-technology-relations, theoretical ideas of a mediatization of communication and of a ritual interaction order are applied. Ritual theory is particularly used to enable a focus on emotion as a significant dimension in analyzing social technologies. This explorative article refers to empirical findings regarding media communication practices in close relationships. It argues that following the developed approach regarding mediatized and ritualized relational practices, useful insights for a conceptualization of the human-social robot relation can be achieved. The article concludes with remarks regarding the challenge of an empirical approach to human-social robot-relations.

**KEY WORDS:** social robots, (mobile) media, information and communication technologies (ICTs), mediatization, interpersonal relationships, ritual interaction

## HUMANS, TECHNOLOGY AND SOCIAL INTERACTION PROCESSES<sup>1</sup>

As technologies and media have become an important and, for some people, even a natural part of everyday life, the questions about the relations humans develop with technology is a topic of increasing significance. Ideas and approaches from several academic disciplines are relevant to this discussion, and efforts to bring those together within an interdisciplinary framework offer a deeper understanding with regard to future developments. This article approaches the subject of emotion and social robots by focusing on the emotional relations that people establish with media and information and communication technology (ICTs) in their everyday life. Nowadays we face a situation where media and technology have become an integral part of the social processes. Furthermore, aspects of a hybridization of the human body and machines became a critical issue discussed in literature such as in Fortunati (2003), Katz (2003), Fortunati, Katz, and Riccini (2003), and Longo (2003). Following on from this earlier literature this paper aims to explore the conceptions of mental processes and the construction of relational action, as well as the production of (inter)subjective meaning and the creation of human-technology relations.

In order to develop this approach, some clarification of essential concepts is needed. Working in a highly diverse and interdisciplinary field and using the theoretical and empirical instruments of social studies, an important differentiation has to be made between human-humanoid interaction and human-machine interaction (Zhao, 2006). While human-machine interaction is referring to the people's usage of technology as instruments, human-humanoid interaction is describing how people interact with technology that is designed to interact with humans in a human like way. Following Zhao (2006), we can consider social robots as robotic technologies that can have a mechanical or digital form, and have been designed to be interactive and autonomous. Humanoid social robots have the pretense of facial expressions, voice or gaze directions to give the appearance of interacting with humans in a humanlike way, and their designers aim to imply emotional aspects within the interaction. Furthermore, there are social robots that are built in order to interact with humans following the norms of human-animal relationships: Robotic pets like Paro (Shibata, Yoshida, & Yamato 1997; Kidd, Taggart, & Turkle 2006) and AIBO (e.g. Melson, Kahn, Beck, & Friedman, 2009) have been researched for some time now and it was shown that people can engage in interaction with those social robots. If one is applying the broad definition of social robots as digital interactive forms, we can include sophisticated information and communication technologies (ICTs) in the analysis: People, for example, interact verbally with their cars or navigation devices and with their smart phones (e.g. the iPhone 4S function SIRI). This is one example of how everyday technology is transcending the borders and connections between humans and technology (Sugiyama & Vincent, 2013) and can be one relevant starting point of further investigation.

These illustrations highlight what the technology developers consider important for the humans who interact with the technology. Being aware of the impact and relevance of the question as to how social robots can interact with humans effectively or be humanlike, this paper takes an approach distinct from that of human-technology relation as a whole. It seeks to raise questions that enable us to make a connection between the research on human relationships and the more recent topic of human-technology relation, and especially human-humanoid relation. While the field of computer science focuses on the development of robots and systems (e.g. Hudlicka et al., 2009), the analytic perspective that a sociological perspective can bring to the discussion merely concentrates on the relation between human and robots-related technology. This perspective does not only include the actual situational context of an interaction episode but also implies increasingly relevant

---

<sup>1</sup> The Author thanks the anonymous reviewer for her/his helpful and inspiring comments and suggestions.

aspects of actual relationships established between humans and humanoid technology. Herewith a research perspective, close to an interpretive social studies point of view, will be used to enable a broad focus on the social processes that occur when humans interact with different forms of technology. Therefore the term human-technology relation, and for more concrete cases, human-humanoid relation will be used in the present paper.

As one might expect, research on social robots has no particular bearing on ideas explored in science fiction. Indeed, the questions raised by studies in different academic fields are very much related to technological, economic and social phenomena that are actually occurring or are expected to occur in the near future. Nevertheless, being especially interested in the social aspects regarding the arrival of social robots in people's daily lives, as well as the impact of increasing robotic experiences, a consideration of some of the more sophisticated fiction might be useful as an inspiration and impetus for academic research. Accordingly I would like to reflect here on the work of the distinguished filmmaker and writer Stanley Kubrick. For years, his work has been influential and progressive asking fundamental questions about human existence and nature. The aspect of human-technology-relation is particularly relevant in his film *2001: A Space Odyssey* from 1968. This movie describes the human evolution in an experimental and nearly philosophical way and highlights the moment when prehistoric men come to be able to extend their actions by means of objects that are becoming instrumental. A famous scene in the film shows how a sapient uses a bone as a weapon for the first time and triumphs on this achievement. The film links this sequence to the future spaceman-Odysseus "Bowman" (in the imagined year 2001) and his interaction with the humanoid voice of the computer "HAL." As the story progresses, the question arises as to the extent to which the human and the computer differ regarding their emotion and cognition, and furthermore, whether we can actually address technology as pure instruments. With this film, Kubrick has articulated questions of the role that technology plays in a process of human evolution as well as the role it plays as an important driver of human society to a broad audience. Since *2001: A Space Odyssey*, Kubrick pursued his work on the topic of artificial intelligence as well as the question of how robots themselves might come close to human existence, especially by gaining the ability to feel emotions. He finally gave his project over to Steven Spielberg who, based on Kubrick's ideas, created the movie *A.I.* that was released in 2001. It is the story of the child robot "David" that is made to love his human adoptive mother "Monica." Realizing that he is not a human but rather in a sub-normal condition, he undergoes his very own Odyssey trying to become a real human child and hence winning the love of his mother back (see also Turkle, 2007).

Kubrick's cinematic discovery highlights one special aspect of the topic: emotion. This aspect will be an important facet of the following analysis. Beyond cognitive abilities, research in various disciplines generally agree (e.g. from the perspective of robot development and research: Hudlicka et al., 2009) that emotions are a key element of the research on artificial intelligence, robots and social technologies. The present paper develops a perspective using theoretical ideas drawn from interpretive sociology, psychology as well as media and communication studies taking several steps. Firstly, it reviews the state of research on mobile communication, relational presence and mediatized interaction. Secondly, it applies the ideas of a mediatization of human relationships to human-technology relations. It then introduces ritual theory as an approach to social technologies and emotion showing how empirical findings regarding media communication practices in close relationships are connected to those theoretical conceptualizations. Finally concluding remarks regarding the challenge of an empirical approach to ritual interaction practices in human-social robot-relations are discussed.

## **MOBILE COMMUNICATION, RELATIONAL PRESENCE AND MEDIATIZED INTERACTION**

Research on mobile communication has profoundly contributed to a new understanding of communication mediated by technology in the ways we communicate, think and feel about other humans, technology, and ourselves. ICTs have become a natural part of our everyday lives and a means of expressing identity and emotions (Katz, 2003). The advent of mobile communication technologies has brought new qualities of people connecting and feeling connected with each other. Licoppe (2004) described a notion of connected presence, as mobile communication technologies enabling an ongoing contact with others. At the same time Kenneth Gergen's concept of absent presence (2002) (see also Fortunati, 2001) highlights the sharing of people's attention between their present physical communication space and a virtual communication space elsewhere. Research on mobile communication has opened the door to sophisticated questions of changing individual human's interactions with each other, and, by extension, changing human interaction with technology and their relation to technology.

Social robots can be conceived of as a conceptualization transcending the borders and connections between humans and technology as Sugiyama and Vincent have developed in the introduction of this issue (Sugiyama & Vincent, 2013). Taking a look at the state of research, one can start to work on this topic using diverse approaches. Mobile media has especially been the focus of many inspiring studies on everyday communication changes in the last few years. Recent development, not only on the technological and economic side, brings further changes to media communication practices. The distinctions between mobile and computer-mediated, and also between mobile and what has been traditionally labeled as "mass communication," have become blurred. Those developments after all promote sustainable empirical research, and allow us to develop theoretical concepts that cover communication/social practices with technologies more deeply.

Today we are facing enormous processes of change in relation to digitalization and world-wide diffusion of media and ICTs. Furthermore we can speak of a new dimension of connection because we do not isolate technologies any more, but rather, consider them as a part of an integrative communication network. According to Krotz (2007), there are three kinds of communication processes that can be schematically differentiated: mediatized interpersonal communication, interactive communication (between human and intelligent technology), and production and reception of standardized, generally addressed communication (p. 17). The concept of mediatization of communication processes is particularly pertinent here (Krotz, 2009; Lundby, 2009). This process of mediatization can be conceptualized as a background of changing media including the level of relationships and identities. Mediatization has to be focused in relation to other meta-processes like individualization, mobilization or globalization. A perspective on mediatization demands aspects of societal change to be included in an analysis of human interaction with media and technology so as to understand those relations entirely. Mediatization considers human-social robot interaction as interactive communication and even focuses on the expansion of interaction opportunities. The question that accompanies this assumption is what kind of transformation combines with the increase of mediatization in comparison to basic forms of direct communication. This concept can be helpful not only to understand forms of human-social robot relation but also to bridge the sociological and communications research that has been accumulated in the emerging field of human-humanoid interaction.

## THE MEDIATIZATION OF HUMAN RELATIONSHIPS AND HUMAN-TECHNOLOGY RELATIONS

As we observe a shrinking distance between ICTs and the human body, how machines imitate and simulate human beings cognitively and affectively (Fortunati & Vincent, 2009) needs to be discussed. An essential step to examine the affective side of human-technology interaction is to consider a perspective on social relationships assuming that the principles people practice with other humans are connected to the interaction practices with technology and machines. Reeves and Nass's (1998) media equation thesis that gained much attention in the late 1990s takes this perspective, postulating that people treat technology like they treat other humans. The approach here is different in that human interaction is conceptualized as much more complex (Duck & McMahan, 2009). Human interactions, especially relational practices, are processes of meaning construction and of creating symbolic (inter)subjectivity.

It has been argued that there is an important connection between the evolution of ICTs and the practices of social relations. We live in an age with enormous processes of change and interconnection of technology and human interaction. Considering face-to-face-communication as a prototype of all human social interaction (Berger & Luckmann, 2004), a particular focus should be directed toward social practices, and therefore, toward human relationships. Human communication is regarded as symbolic action and, referring to the seminal work of George Herbert Mead (1967), is the basis of ongoing processes of role taking and construction of identity via seeing oneself through the eyes of significant others. The development and maintenance of relationships is connected with interpersonal communication. With mediated interpersonal communication, there is the necessity to negotiate media and technology rules and arrangements (Höflich, 1996, 2003; Schlote & Linke, 2010). The question raised here is whether these rules, bargained in interpersonal communication between humans, also apply to anticipated situations when people interact with technology and social robots. In answering the question, it is important to differentiate between general norms of communicative action and idiosyncratic rules. While general norms and rules are established in a cultural context and apply to every member of a society, idiosyncratic rules are negotiated in specific interaction and communication situations as well as in the specific context of a relationship. This means, furthermore, that those rules might only apply to a concrete communication partner in a specific situational context. Those kinds of rules are much more flexible because they develop according to the evolution of a relational bonding. They are relation specific negotiation. From here we can ask if one can apply this thought to an idea of idiosyncratic rules established in a human-social robot relation and have a research agenda to answer this question. For example, to what extent do people establish specific rules and habits in their interaction with social technologies, such as their smart phone or a robotic pet? What subjective meaning has the ongoing interaction that follows these specific rules or course of action? How do they respond to the (more or less) autonomous interaction modes that social technologies and social robots follow and to what extent do they accept them to be specific for their own personal interaction with the technology?

Close relationships between humans can be described as exclusive and engaging connections between people (Lenz, 2006). They can be characterized in regard to specific dynamics and developmental stages (Duck, 1990) and also in connection to media communication patterns (Höflich & Linke, 2011). Thinking of relationships as communicative and mental processes, the communication between humans is integrated into their daily routines and grind, and is part of complex negotiation processes that are part of creating a shared everyday life. In doing so, people establish a mutual reference system regarding their everyday and long-term communicative action. The question arising from here is how these categories and concepts can be applied to human-technology interaction, and furthermore, if those ideas can be fruitful to explain new practices. This

question is actually not new at all, as we do know that people's life worlds are steeped in media and technology. This process has been conceptualized with the idea of a domestication of ICTs in people's everyday lives (Silverstone & Haddon, 1996), and research in this tradition has shown how media technologies are appropriated in the course of shaping everyday practices.

Another important theoretical assumption is that the mental and communicative processes in close relationships are significant for the interpersonal construction of identity and reality (Berger & Kellner, 1964). Human relationships are thus constantly changing and evolving through communication, and are connected to the social order of interaction by an updating process of communicative structure (Goffman, 1989). Berger and Kellner (1965) emphasized the impact of everyday conversation between partners in their classical work on the construction of identity in marriage. They argue that the mutual buildup of a couple's identity constitutes the state of *nomos*. *Nomos* can be understood as an arrangement in which the individual feels safe and at home in the world. Duck and Pittman (1994) have enhanced these ideas and shown that partners do mentally create their relationship based on their inter-subjective constructions of meaning. Relational interaction depends on the representation the persons have of the relationship and is oriented beyond single situations. Therefore, relationships have to be understood regarding the dyad, and the important focus is the relational level rather than the individual level (Duck, 1990). This implies that a theoretical as well as empirical research attention has to focus not only on the individual but also the mental construction of the relationship by each of them. Furthermore, beyond this individual level, the processes of inter-subjective construction that are related to the communication between the partners need to be considered. Technology, more precisely, media and communication technology, is becoming a more and more natural part of people's everyday life and communication. They might also be a part of processes of relational construction. Promoting this idea further, we need to elaborate how technologies are conceptualized as social robots, and have to ask the question of what this development means for human's relational practices and construction of identities.

As communication is a part of the processes of construction, or to put it in another way, the processes of mental creation, we not only need to pay attention to the relevance of media and ICTs for these processes but also ask if these practices are becoming essential for the ways people interact with social technologies because media and ICTs are fundamental for human relations and society. It has been demonstrated that mobile media communication practices can be analyzed as an element of the state of *nomos* and is connected to the ideas of Berger and Kellner (1964). This conceptualization enables one to think of mobile communication as ritual action that grants the potential of social cohesion and to foster relationships to the mobile phone (Ling, 2008). The following section builds on this point, and furthermore, asks if these principles can be useful not only to explain new ways of social coherence but also to understand new forms of social relations between humans and technology.

## **RITUAL THEORY AS AN APPROACH TO SOCIAL TECHNOLOGIES AND EMOTION**

In order to explore the topic, ideas of social constructivism and the ritual interaction order serve as an important theoretical base. Following the idea of creating mental representations of relationships (Duck & Pittman, 1994) and the mutual buildup of relationship identity (Berger & Kellner, 1965), we have to consider the impact that an ordinary conversation has on people's everyday life. Relational partner's constructions of meaning are a part of their mental creation of the relationship. Those conversations are also enacted and mediated, and therefore, this theoretical idea has to be further explored to see whether there are changing moments of the "old" social practices. Rituals play an important role in relationships as forms of face-to-face communication (e.g. Bruess &

Pearson, 2002) as well as in forms of mediated communication (adaptation for mobile communication: Ling, 2008). According to Albert Bergesen (1999), we can differentiate among three levels of human rituals: the macro-level connecting to the Durkheimian ceremonies, the meso-level of interaction as described by Goffman (1989), and the micro-level of language codes that is inherently a part of the higher levels. The three levels of rituals are interconnected and people do enable another relation by taking part in rituals through their daily routines and even through their lives. This bonding at the different levels over time is called ritual interaction chains (Collins, 2004). Ritual theory inherently includes the idea that social principles become meaningful beyond human interaction, especially as symbols of the social ritual order are created to stand for its social implications and are recognized by the individual.

This principle can be applied to social robots and complex ICTs. Emotion is described as a basic ingredient of a ritual, which can be thought of as a “mechanism of mutually focused emotion and attention producing a momentarily shared reality, which thereby generates solidarity and symbols of group membership” (Collins, 2004, p. 7). Those mechanisms might be working beyond the age-old situation between co-present humans, not only in mediated settings but also in relations beyond human interpersonal settings. A ritual theory approach enables an integrative understanding of the diverse findings, questions and also problems regarding the research object of media communication practices. Following this approach, my argument here is that, we can further gain useful insight by adapting the conceptualization of ritual action to the human-social robot interaction. For example we can ask what subjective meaning and emotional bonding are created by people engaging in ritualistic interactions with their SIRI function of their iPhones or analyze people’s build-up of specific and maybe idiosyncratic ritualistic interactions with their car navigation system in their everyday life. Regarding robotic pets, past research (e.g. Kidd, Taggart, & Turkle, 2006; Melson, Kahn, Beck, & Friedman, 2009) suggests that human-robotic pet relations potentially involve affective and socializing functions especially when robotic pets are interaction partners in human groups. Miklósi and Gácsi (2012) even argue that conceptual emphasis of research and design of social robots should be on the interspecific interaction between humans and social robots as social companions.

Rituals can be understood as social processes that include symbolic, performative, active and emotional moments. As already mentioned, they can be systematically differentiated by means of three levels. A connection across the three levels forms an ongoing repetition and enhancement of the ritual actions, and develops ritual interaction chains where a ritual order is grounded in everyday life (Bergesen, 1999; Collins, 2004). From this idea, we can formulate research questions highlighting the connection of people’s media communication practices and their social experiences with technology, especially with (humanoid) robots. A hypothesis that can be formulated from here is that there is a complex interrelation among human media communication, robotic experience and ritual interaction practices.

Findings of empirical studies regarding close relationships and dynamic media ensembles have illustrated mental anticipation practices in close relationships that follow the mental mapping of time, space as well as the mobility and physical presence of relational partners with regard to their communicative media use in everyday life. Additionally there is an active negotiation of these aspects as part of communicative repertoires (Linke, 2010, 2011). These ritualized practices can be interpreted as an intensification of the mental representation of relational bonding and a connection between the identity construction processes and the mediatization processes of communicative action. The findings reveal that the mental creation of intimate relationships is transformed by the everyday media communication and interaction with technology. ICTs might increase social attachment between relational partners and strengthen relationships beyond actual communication. Relational practices are changing and evolving through our usage of technology. Technology is

increasingly becoming a part of our human relations. This development has to be closely analyzed regarding our relation to technology itself, and such an analysis can be very useful especially in regard to an understanding of human-social robot interaction. Hereby what is critical is not only the process of shaping everyday life communication practices with ICTs and social robots (a perspective according to domestication theory), but even more importantly, what this means for people as social human being in a ritual order. A ritual theory perspective integrates the analyses of different scales of social processes, and is therefore providing a fruitful framework to study human-social technology interaction and relation.

The communicative repertoires in close human relationships include sophisticated media communication practices, which have been established according to the everyday life requirements of the related persons. Empirical research reveals that partners in close relationships have different possibilities of contacting each other during the course of the day, even if they are in different places and engaged in different situations (Linke, 2010, 2011). These constellations create more actual contacts between the partners. Furthermore, it also became clear that there is an increasing mental representation leading to this potential of initiating communication. Hereby a ritual dimension of the mental representation and the potentially on-going communicative action is displayed. People performatively and meaningfully enact ritual elements on a linguistic level (at a micro-level of codes) and include them into interaction rituals (at a meso-level) as well as in ceremonial rituals (at a macro-level) as an embedding of mediatized communicative contact in partners' everyday life. Ritual action can be differentiated from habitualized action, as the mediatized contacts have a subjective meaning for the relational partners and include an emotional component. This emotional ingredient is again the important aspect that is connected to social robot-human interaction. Hence, the ideas of ritual theory would appear to be useful especially with focus on emotional impact.

Still, it is important to regard a perspective of multiple dialectics (Höflich & Linke, 2011), which considers the potential as well as the risks of media, which have been applied to achieve an analysis of robotic technology, and are sensitive to transformations of relational communication on different levels. In addition, it is essential to mention the possibility of social rituals failing. In the case of ritual practices between people with the usage of technology or rituals that humans establish in relation with social technology, there are possibilities of rituals failing, which results in them being empty in meaning and turning out as anti-rituals. Empty rituals can be understood as the rituals that were formerly working because they were once connected and functionally regarded as the relational construction of (inter)personal meaning, but gradually have become subjectively meaningless, unimportant or even annoying. An example could be a ritualized good-evening interaction, which was once experienced with emotional well-being by the person(s) but has lost relevance to (at least) one relational partner. Anti-rituals are social phenomena that perfectly fit with the above definition but do not serve social purposes because of rather negative interaction outcomes. An example might be events of flaming and discrimination that can manifest in a ritual way. This aspect can be noted as the dark side of the ritual interaction order and should be considered when applying the ideas of ritual theory for the analysis of human-social robot relation. This dimension might even be useful to gather a broad conception including light and dark shades, as well as benefits and problems regarding the social and societal impact of social robot experiences.

## **CHALLENGE OF AN EMPIRICAL APPROACH TO RITUAL INTERACTION PRACTICES IN HUMAN-SOCIAL ROBOT RELATIONS**

The concept of absent present introduced by Kenneth Gergen (2002) has shown that mobile communication enables people to maintain virtually continuous contact and can be connected to the previously introduced findings and ideas. The on-going communication with relational partners as



well as the potential to contact them is making relationships immanently present. Developing this aspect further, one can ask if those practices work not only in relation to other humans including the relationally close ones but also in relation to technology and social robots considering what Turkle (2007) suggests about the relational artifacts. Exploring the ritual dimension of this mental representation practice, it is beneficial to consider Ling's (2008) thesis on how the ritualization of perpetual (mobile) media communication strengthens processes of social cohesion. Hereby, from my point of view, another central question arises that has to be addressed and discussed in the near future: How can we empirically approach these complex social phenomena regarding human-social robots relations? If we are interested in a deep understanding of technology and especially social robotic experiences in people's life, we have to develop integrative empirical research. The existing research on media and communication technologies in personal relationships is leading to some important consequences for empirical research regarding social robots, particularly the connection between humans and ICTs. The focus of an analysis should not be only on artificially isolated usage of technology. It is essential to cover the complex interplay between mental processes, as the sum of emotional and cognitive processes, and communication practices as a whole. Rather than focusing only on selected ICTs it is preferable to consider a broader ensemble of media and technologies. In this way it might be possible to achieve greater openness in the analysis of how this more complex relationship between everyday communication practices and technologies is shaping and shaped by people's everyday lives in the first place.

The concept of mediatization, and furthermore, ritual interaction theory have been applied here as fruitful approaches to enable research on human-social robot relations. This approach offers a broad understanding of interaction processes and the possibilities to focus on the relational rather than the individual level. Drawing on the concept and theory further empirical work would be beneficial, particularly ethnographic research designs focusing on innovative groups of people such as children and young people (Turtle, 2007). Such an approach facilitates a process of obtaining an insight into their thoughts on ICTs and their usage patterns as well as on their routinized and ritualized practices including ICTs and social robot technologies. At the same time, we should consider that research must not reproduce phenomena of social inequalities regarding the access, participation and competencies with ICTs, and furthermore, with social robotic technologies. This further supposes that theoretical and empirical approaches that are sensitive to culture and socio-structure have to be developed.

## REFERENCES

- Berger, P. L., & Kellner, H. (1964). Marriage and the construction of reality. An exercise in the microsociology of knowledge. *Diogenes*, 45, 1-24.
- Berger, P. L., & Luckmann, T. (2004). *The social construction of reality: A treatise in the sociology of knowledge*. Garden City: Doubleday.
- Bergesen, A. (1999). The ritual order. *Humboldt Journal of Social Relations*, 25, 157-197.
- Bruess, C., & Pearson, J. C. (2002). The function of mundane ritualizing in adult friendship and marriage. *Communication Research Reports*, 19(4), 314-326.
- Collins, R. (2004). *Interaction ritual chains*. Princeton: Princeton University Press.
- Duck, S. (1990). Relationships as unfinished business: Out of the frying pan and into the 1990s. *Journal of Social and Personal Relationships*, 7, 5-28.
- Duck, S., & Pittman, G. (1994). Social and personal relationships. In M. L. Knapp, & G. R. Miller (Eds.), *Handbook of interpersonal communication* (pp. 676-695). Thousand Oaks, CA: Sage.
- Duck, S., & McMahan, D. T. (2009). *The basics of communication: A relational perspective*. Los Angeles: Sage.

- Fortunati, L. (2001). The mobile phone: An identity on the move. *Personal and Ubiquitous Computing*, 5, 85-98.
- Fortunati, L. (2003). The human body: Natural and artificial technology. In J. E. Katz (Ed.), *Machines that become us: The social context of personal communication technology* (pp. 71-87). New Brunswick, NJ: Transaction.
- Fortunati, L., Katz, J. E., & Riccini, R. (Eds.). (2003). *Mediating the human body: Technology, communication, and fashion*. Mahwah, NJ: Lawrence Erlbaum.
- Fortunati, L., & Vincent, J. (2009). Introduction. In J. Vincent, & L. Fortunati (Eds.), *Electronic emotion: The mediation of emotion via information and communication technologies* (pp. 1-31). Oxford: Peter Lang.
- Gergen, K. (2002). Cell phone technology and the realm of absent presence. In J. E. Katz, & M. Aakhus (Eds.), *Perpetual contact* (pp. 227-241). New York: Cambridge University Press.
- Goffman, E. (1989). *Interaction ritual: Essays on face-to-face behavior*. New York: Pantheon Books.
- Hudlicka, E., Payr, S., Ventura, R., Becker-Asano, C., Fischer, K., Leite, I., Paiva, A., & von Scheve, C. (2009). Social interaction with robots and agents: Where do we stand, Where do we go? *Proceedings of ACII '09: Affective computing and intelligent interaction*, Los Alamitos, 698-703. Retrieved from <http://gaips.inesc-id.pt/gaips/component/gaips/publications/showPublicationPdf?pid=18&format=raw>
- Höflich, J. R. (1996). Technisch vermittelte interpersonale Kommunikation. Grundlagen, organisatorische Medienverwendung, Konstitution „elektronischer Gemeinschaften.“ Opladen: Westdeutscher Verlag.
- Höflich, J. R. (2003). Part of two frames: Mobile communication and the situational arrangement of communicative behavior. In K. Nyiri, (Ed.), *Mobile democracy: Essays on society, self and politics* (pp. 33-51). Vienna: Passagen Verlag.
- Höflich, J. R., & Linke, C. (2011). Mobile communication in intimate relationships: Relationship development and the multiple dialectics of couples' media usage and communication. In R. Ling, & S. W. Campbell (Eds.), *Mobile communication: Bringing us together or tearing us apart? (The mobile communication research series, vol. II)* (pp. 107-126). Piscataway, NJ: Transaction.
- Katz, J. E. (Ed.). (2003). *Machines that become us: The social context of personal communication technology*. New Brunswick, NJ: Transaction.
- Kidd, C. D., Taggart, W., & Turkle, S. (2006). A sociable robot to encourage social interaction among elderly. *Proceedings of the IEEE international conference on robotics and automation*, Orlando, FL, 3972-3976.
- Krotz, F. (2007). *Mediatisierung: Fallstudien zum Wandel von Kommunikation*. Wiesbaden: VS Verlag.
- Krotz, F. (2009). Mediatization: A concept with which to grasp media and societal change. In K. Lundby (Ed.), *Mediatization: Concept, changes, consequences* (pp. 21-40). New York: Peter Lang.
- Kubrick, S. (Director, & Producer). (1968). *2001: A Space Odyssey* [Motion picture], United States, & United Kingdom: Metro-Goldwyn-Mayer.
- Lenz, K. (2006). *Soziologie der Zweierbeziehung. Eine Einführung*. Wiesbaden: VS Verlag.
- Licoppe, C. (2004). Connected presence: The emergence of a new repertoire for managing social relationships in a changing communications technoscape. *Environment and Planning D: Society and Space*, 22, 135-156.
- Ling, R. (2005). *Flexible coordination in the Nomos: Stress, emotional maintenance and coordination via the mobile telephone in intact families*. Retrieved from [http://www.richardling.com/papers/2005\\_life\\_in\\_the\\_nomos.pdf](http://www.richardling.com/papers/2005_life_in_the_nomos.pdf) (Last accessed on April 13, 2013)
- Ling, R. (2008). *New tech, new ties: How mobile communication is reshaping social cohesion*. Cambridge, MA: MIT Press.

- Linke, C. (2011). Being a couple in a media world: The mediatization of everyday communication in couple relationships. *Communications*, 36(1), 91-111.
- Linke, C. (2010). *Medien im Alltag von Paaren. Eine Studie der Mediatisierung der Kommunikation in Paarbeziehungen*. Wiesbaden: VS Verlag.
- Longo, G. O. (2003). Body and technology: Continuity or discontinuity. In L. Fortunati, J. E. Katz, & R. Riccini (Eds.), *Mediating the human body: Technology, communication, and fashion* (pp. 23-29). Mahwah, NJ: Lawrence Erlbaum.
- Lundby, K. (Ed.). (2009). *Mediatization: Concept, changes, consequences*. New York: Peter Lang.
- Mead, G. H. (1967). *Mind, self, and society: From the standpoint of a social behaviorist*. Chicago: University of Chicago Press.
- Melson, G. F., Kahn Jr., P. H., Beck, A., & Friedman, B. (2009). Robotic pets in human lives: Implications for the human-animal bond and for human relationships with personified technologies. *Journal of Social Issues*, 65, 545-567. doi: 10.1111/j.1540-4560.2009.01613.x
- Miklósi, Ád., & Gácsi, M. (2012). On the utilization of social animals as a model for social robotics. *Frontiers in Psychology*, 3, 75. doi: 10.3389/fpsyg.2012.00075
- Reeves, B., & Nass, C. (1998). *The media equation: How people treat computers, television, and new media like real people and places*. Stanford, CA: CSLI.
- Schlote, I., & Linke, C. (2010). Interaction and individual patterns of mobile communication in public places. In J. R. Höfllich, G. F. Kircher, C. Linke, & I. Schlote (Eds.), *Mobile media and the change of everyday life* (pp. 97-128). Berlin: Peter Lang.
- Shibata, T., Yoshida, M., & Yamato, J. (1997). Artificial emotional creature for human-machine interaction. *IEEE Int. Conf. Syst. Man Cybern.* 3, 2269-2274.
- Silverstone, R., & Haddon, L. (1996). Design and the domestication of information and communication technologies: Technical change and everyday life. In R. Mansell, & R. Silverstone (Eds.), *Communication design: The politics of information and communication technology* (pp. 44-74). Oxford: Oxford University Press.
- Spielberg, S. (Director, & Producer). (2001). *A.I. Artificial Intelligence* [Motion picture], United States: Amblin Entertainment, The Kennedy/Marshall Company, & Stanley Kubrick Productions.
- Sugiyama, S. (2009). The decorated mobile phone and emotional attachment for Japanese youths. In J. Vincent, & L. Fortunati (Eds.), *Electronic emotion: The mediation of emotion via information and communication technologies* (pp. 85-103). Oxford: Peter Lang.
- Sugiyama, S., & Vincent, J. (2013). Social robots and emotion: Transcending the boundary between humans and ICTs. *intervalla: platform for intellectual exchange*, 1, 1-6.
- Turkle, S. (2007). Authenticity in the age of digital companions. *Interaction Studies*, 8(3), 501-517.
- Zhao, S. (2006). Humanoid social robots as a medium of communication. *New Media and Society*, 8(3), 401-419.

## BIOGRAPHY

**Christine Linke**, Dr. phil., is a communications and media scholar based in Berlin, Germany. She has received a doctoral degree from the University of Erfurt, Germany. Her research focuses on media and technology in everyday life and in social relationships. She is working on theoretical questions regarding the ritual interaction and the delimitation of communication processes. Furthermore she has been involved in empirical projects on gender and media at the Free University of Berlin. During her position as a Visiting Professor (2011-2012) at the Berlin University of Arts, she taught and researched in the area of Sociology of Communication.

# Is the Mobile Phone a Personalized Social Robot?

Jane Vincent

London School of Economics and Political Science

University of Surrey Digital World Research Centre

## ABSTRACT

This paper explores how some people use their mobile phone to manage their emotions and presentation of self to such an extent that they develop a strong bond with it, turning to it first in times of emotional need. It examines how some social robots, designed by experts to provide bespoke emotional support, can address only particular emotional problems. This is further examined by contrasting the electronic emotions managed via the mobile phone with the uses for three social robots: Amazing Ally, KASPAR and Paro. Unlike these robots, that are effective only when responding to certain pre-programmed emotions, the mobile phone appears to be a constant companion dealing with every eventuality. Imbued with the user's feelings and emotions that surround the continuous and always on presence of the device, the user constantly turns to it for solace, to share joyous moments, recall special memories and more. The resulting close emotional and physical association with a device that is filled with the personal biography of its user is that the mobile phone becomes like a personal social robot; a co-construction of functional machine and intimate emotional experiences known only to the user.

**KEY WORDS:** personal social robot, emotion, mobile phone, electronic emotions

## INTRODUCTION

There is a lot more that we haven't even begun to understand well enough in ourselves to know how to implement [...] will we ever know how to build a robot like us? (Picard, 2011)

This paper explores the particular qualities of our emotional relationship with mobile phones and how it compares and contrasts with the parallel development of social (and sociable) robots. Detailed discussion of the methods for creating artificial emotions and building robots is not for this paper rather it is about how humans are making their own personalized social robots by appropriating and manipulating a particular machine in their day to day life to manage their emotions and their self. Social robot is a term that has many definitions with seemingly limitless boundaries from lift sensors responding to a presence to autonomous humanoid machines that perform complex domestic or industrial functions. Picard's (1997) seminal research on affective computing and her continuing discourse on emotions and robots has highlighted the complexities of understanding and interpreting human actions both in ourselves and in translating these into the design of robotic machines. What happens, however, if the everyday and constant interaction with a computational machine – a mobile phone – enables the user to feel, share, manage and interpret their emotions through using the device? These electronic emotions (Vincent & Fortunati, 2009) remain within the human user but are only created, lived or relived when interacting with the mobile phone. This volte face when human feelings initiate the robotic turn is central to my discussion in this paper; it is not about a machine that has been designed (with emotions) to be a social robot but instead is about a machine that appears to have all the properties of a social robot only when combined with its human user.

As Picard notes in the introductory quote above despite our endeavors, we still do not really know or understand ourselves nor have we found a way or a technology to make a robot that might independently feel emotions. Although this technological and emotional impasse has thus far prevented humans creating a robot that is one hundred per cent human, social robots have been made that interact with particular facial or physical actions and express programmed emotions; the work of Breazeal (2003) at MIT and Ishiguro (Guizzo 2010) at Osaka University being leading examples. Social robots have also been explored in countless novels and films, often in the guise of an awkwardly jointed metal machine with some form of human transmogrification. The inclusion of emotion in the design of a robot is often heralded as a possible threat to humans for fear that it will create an out of control monster rather than a sympathetic companion (see for example *I, Robot* by Isaac Asimov). Research on affective computing and sociable robots such as by Picard (1997), Norman (2004), Shaw-Garlock (2009) and Turkle (2011) provides a mass of mostly positive ideas about future social and emotional robots, much of which is about putting the emotion into the robot and creating the affective turn in these otherwise mechanistic devices.

Having set out my position in this introduction, in the next section of this paper, I outline the theoretical framework for the discussion. I then continue by firstly examining what I consider to be exceptional about a mobile phone, how it might enable this extraordinary role as a kind of social robot for the self and why I believe it is these aspects of the device that set it apart from other information communication technologies (including robotic devices). I illustrate my discussion with examples from my own prior research on mobile phone use (Vincent, 2009; 2011) and from a review of three examples of social robots by way of contrast with the mobile phone: these are machines with human or animal likenesses that are designed to provide emotional support and draw out feelings to enable their human users to express themselves. Contrasting the mobile phone with these social robots I explore how it is being used in similar ways but as a device of self exploration

and interaction which, because it has been created or ‘set up’ by the user, is in many ways a reflection of the personal desires and needs of their self.

## THE MOBILE PHONE

The mobile phone is a machine originally designed for voice communication on the move that has been shaped by users and designers to become a highly complex device conveying all types of mediated communications and more. It has a continuous omnipresence, the effect of which has led to it becoming much more than simply a communications device for keeping in contact with others. Press a button and the phone becomes a link to turn off or turn on relationships with whomever we choose, much as a remote control can be used to flick between or choose a television channel that suits our mood and our interests at that moment. Floating between content and communications at the press of a button, or the touch of a screen on the mobile phone one can flit between the virtual world of games to the real world of voice and data contact; all are mediated via the mobile phone device and then layered and intertwined with the electronic emotions that it elicits.

A ‘must have’ for many people and with nearly five billion mobile phone subscriptions worldwide there are now more mobile phones with Internet connectivity than there are personal computers. This provides opportunities for a scale and richness of personal digital mediation never previously encountered. In the UK and Europe, which is the location of my own more than ten years of research on mobile phone users (Vincent, 2009, 2011), this small electronic computational device is an integral, and completely domesticated, part of daily life. Nowadays it is so commonplace that a person is more likely to have to explain why they do not have a mobile phone rather than why they do have one.

New smart phone technologies have extended the basic voice and text messaging capabilities to include camera, video and audio recording and playback, email, access to the WWW, location based services, multiple applications such as banking and gaming, television, radio and broadcast interactive communications. Each mobile phone is usually owned and used by one person (the user) and to a greater extent all the information and data stored on the device has been initiated and programmed by the user. All the contact details arise from the user’s personal relationships; the ring tones and keypad tones are personally selected: Apps, games, photographs and the decisions to allow location data transfer and so on.

Thus almost every function on the device is set up and can be controlled by the user and is the outcome of the interaction between the user and the mobile phone. The result of the activity between user and mobile phone is a highly sophisticated and complex device that can be used to quickly map and respond to the user’s personal memories and actions in a completely unique way (Vincent, 2011). Pick up someone’s mobile phone and try to use it – the first challenge might be the keypad is locked with a personal password and then much of the data stored on it is meaningless unless it is already mutually known. This is articulated by a respondent, June, talking about her own mobile phone:

It’s entirely personal to me. Um, and I think text, particularly, can be quite personal as well, because it’s messages and it can be quite personal to you. And I wouldn’t like, pick up my husband’s mobile phone and look at his texts and I wouldn’t expect him to look at mine either. So I feel quite, it is kind of like your possession: you’re quite possessive of it, almost. And I, I couldn’t see it as a shared device. No. It’s just so specific to you personally. (Vincent, 2011, p. 95)

Through constant use, personalization of features, functions and content, the mobile phone has become a personal compendium for the life of the user and one that reflects intimate aspects of their self, not shared with any other person or device apart from their own mobile phone (Vincent, 2011).

Spending time absorbed in one's own thoughts oblivious to others is not a new phenomenon but with a mobile phone constantly clutched in many peoples' hands this thinking time is often accompanied by fondling or fiddling with a mobile phone (Vincent, 2003; Lásen, 2005). This can also be a way of dealing with the awkwardness of the moment or with boredom as was found in our study of children's use of mobile phones (Haddon & Vincent, 2007). Thinking about loved ones, about events past and present, the place where they occurred, the smells, sounds and touch of the experiences, many of which have been in some way recorded or transacted over the mobile phone, is somehow made sharper or more focused by the attachment to the device on which it was recorded (Vincent, 2010b; Cumiskey, 2010, 2011). Having established a strong bond with the mobile phone let us also recognize that this bond is transferrable via the SIM card and phone memory on upgrade to a new phone, so, with a few exceptions, it is not about a particular device itself but more about what it contains.

The mobile phone as a compendium can be adapted and is tolerated if it does not quite do what is wanted as it has many other facets that more than compensate for its shortcomings. This constant attachment to the mobile phone means that it is used to perform multiple roles in the emotional life of its user. It is perhaps this diversity and personalization that stands it apart from tailored social robot products targeted at specific users and designed to give enjoyment, comfort, and emotional support in particular circumstances.

## CONTEXTUALIZING EMOTION AND MACHINES

The material being explored in this paper is framed by the sociology of emotions and in particular the interactionist dramaturgical approach of Goffman (1959); Hochschild's (2003) exploration of feeling rules that govern the management of emotion, and Vincent and Fortunati's (2009) concept of the electronic emotions experienced by users when they interact with machines. Goffman asserted in his dramaturgy theory that the interaction between people, and the presentation of their self, is played out as if they are acting on a stage; their actions can be considered to be either front stage – those which are on public display, or back stage, those which one keeps private for the self or for a chosen few. It is these private back stage behaviors that I am exploring in this paper and in particular those which could be described as a form of interaction with the self. Private behaviors are not necessarily kept to the self as they may be known to others such as behaviors shared with family, friends or those familiar to a person. Nowadays we play out our private moments via our phones on a public stage leading us to question whether private behaviors still exist, or at least that they have been eroded (Fortunati, 2005). There is a distinction here between doing something in a public place and making the behavior known to the public as Höflich explored in his observational studies of mobile phone users (Höflich, 2005, 2009). Using a mobile phone to explore private, back stage moments, in a public place does not necessarily diminish the privacy of that event. However, in addition to those moments observed and/or overheard to be private I assert that there are even more intimate types of private behaviors and interactions that occur before perhaps even the person involved is aware and as they develop their own feelings and responses to situations. Following Mead (1934/1967) Hochschild (2003) discusses this notion referring to the 'inner self' and the point at which the 'I' becomes the 'me': when thoughts and ideas are articulated beyond the mind and

shared. These thoughts are shared sometimes with others but also, as I will go on to discuss, just with the mobile phone (Vincent, 2011).

During our lifetime we develop ways of dealing with our emotions in everyday life depending on the social norms and morays for the circumstances in which they occur, for example feeling sad at a funeral, happy at a wedding and so on. Hochschild talks about this in terms of two kinds of feeling rules: surface acting when our emotional response to a situation is one that is appropriate but that might be seen by others to be false, and deep acting when we behave as society and social etiquette has determined and is a learned response that occurs often without a moment's thought. Just occasionally we find ourselves in conflict with our emotions such as when we do not feel happy at a wedding or a celebration party. In these circumstances we have to manage the situation with surface acting. These feelings rules highlight the emotion management that is continually exercised in people's day to day lives and today this is now greatly underpinned by the use of, and to some extent the dependence on, mobile phones. We see an incident or experience a situation that elicits strong feelings and that emotionally we want to share; instead of turning to the person next to us, we pick up the phone and talk to a chosen person often our spouse or loved one. Rimé (2009) reports observing the response to a traffic accident when people were calling friends and family to report what they were seeing rather than talking to each other. Many moments are seen through the lens of a camera phone, or with the phone held up to snap a record of the occasion such as when a celebrity is seen or a child is performing in a school production.

The electronic emotions (Vincent & Fortunati, 2009) elicited via the mobile phone are not different from those we feel in everyday lives. What is different, however, is how they are prompted such as via some contact (touch or thought) of the mobile phone, where and when they might occur. The flashing up of a name out of context with that moment as you scroll through a list of contacts or flick through photos looking for a particular item can force recollection of a lot of memories that may have been forgotten or are not appropriate at that time. One respondent from my study of mobile phone users aged over forty (Vincent 2010a, 2010b) had to use surface acting to manage an unexpected emotional response to seeing the details of his mother on the mobile shortly after she had died; with his grief still raw he broke down when he caught a glimpse of his mother's name. He had not deleted her details but did so for fear of a similar incident occurring in a business meeting. Another respondent from the same study, James, talked affectionately about his sons and how the mobile phone he used with his son to take pictures would be handed on to him as a toy when James upgraded to a new phone. He liked the idea that the phone, which he had used to share precious moments with his sons, would continue to be used by them. The spontaneity of this emotional recall is an outcome of the interaction with the self that is enabled via the mobile phone and the electronic emotions they prompt, meaning that on occasions conflicting and contrasting feelings elicited by interaction with the phone have to be faced and dealt with.

## **SOCIAL ROBOT DEVICES**

In order to illustrate the differences between the personalized mobile phones and social robots I turn now to three examples of social robots that are used for particular social interactions: Animatronic dolls such as Amazing Ally; KASPAR<sup>1</sup> a character doll designed for interaction with autistic children; and Paro a baby seal used to provide comfort for older people.

---

<sup>1</sup> KASPAR is the acronym for Kinesics and Synchronisation in Personal Assistant Robotics



### Playing with animatronic toys – Amazing Ally™

Robot toys have been made for over a century but in the latter part of the twentieth century electronic animatronic dolls became popular; many were soft toys with robotic functions but one example of a lifelike doll is ‘Amazing Ally’ made by Playmates. At 60cm high Ally looks like a small child with a softly textured plastic ‘skin’ and a face that emulates human movements in the cheeks and lips. Ally speaks pre-programmed words and sentences with facial movements but the body arms and legs are more like a conventional toy doll requiring the child to move the joints which are not visible externally. Ally can be programmed with information such as the date of its owner’s birthday, their name, and other days in the year such as Christmas and Easter holidays. On those days the doll proffers an unprompted personalized greeting when switched on, e.g. Happy Birthday Mary.<sup>2</sup> Ally can be dressed and undressed like a conventional doll and a series of different programs (plugged into the body of the doll) are user controlled through a band on the doll’s wrist provide a range of ‘conversations.’

Ally's age is timeless, she's the same age as you are. And of course she likes to do the same things you do. She's spunky and has an adorable, fun loving personality. Her voice is full of energy and excitement. Her wit is sharp and she'll keep you on your toes. She will be your best friend that will play and interact with you in exciting new ways. (Manufacturer’s Description)<sup>3</sup>

Davis (2000), exploring the world of animated dolls in his article for WIRED, suggested that they have limited appeal and their attraction starts to pall after a while. Children’s toys might well be expected to have a limited lifetime of use as the children grow up and into new toys, although the reasons for interest in these dolls beginning to wane are unclear. Nevertheless they represent an early interface with robot technology, one that is perhaps substituted by more advanced electronic toys and even the mobile phone as the child becomes older. Robots are indeed being made to act and look like humans such as the ‘daughter’ and ‘wife’ of Professor Hiroshi Ishiguro of Osaka University but although looking like a human might enable people responding to it to feel more at ease, the robot machine is still a very long way from having human feelings and emotions.

### Developing social interaction - KASPAR

KASPAR<sup>4</sup> is a rag doll like robot, much less sophisticated in appearance than Amazing Ally, with animatronic limbs and joints, responsive eyes but no speech; it is only available in experimental form. Developed by an academic project to help autistic children interact emotionally the KASPAR team describes their aims for this social robot:

Our goal was not to create scientifically plausible emotional and other expressions (compare FEELIX<sup>5</sup>, Kismet<sup>6</sup>) but to create a robot with - from a user-centred perspective - appealing and interactionally salient features. (Dautenhahn et al., 2009 para 3.5)

The development of emotion in robots, as explored by the seminal works of Picard in particular, is a significant factor in the positioning of a social robot device. A topic too vast to cover in this short paper, it nevertheless highlights the huge research investment that continues in

<sup>2</sup> <http://www.youtube.com/watch?v=Nj3NsQ9FzEk> Accessed June 2012

<sup>3</sup> <http://www.amazon.co.uk/Vivid-Imaginations-PM98101-Amazing-Ally/dp/B00004YR1N> Accessed 9 May 2012

<sup>4</sup> <http://www.kaspar.herts.ac.uk/kaspar/introducing-kaspar.htm>

<sup>5</sup> <http://www.feelix-growing.org/>

<sup>6</sup> <http://www.ai.mit.edu/projects/humanoid-robotics-group/kismet/kismet.html>

developing artificial intelligence, and the simulation of human emotion. Robots like KASPAR are designed to complement particular activities such as those involved in caring for children with autism (therapists or the child's parents) and often to inject some fun and pleasure in the processes of learning. Both Amazing Ally and KASPAR have as their design focus the human desire to respond to faces and as Dautenhahn et al. (2009) explain "Faces help humans to communicate, regulate interaction, display (or betray) our emotions, elicit protective instincts, attract others and give clues about our health or age" (para 2.2.2). There are touching examples recorded and available on Youtube<sup>7</sup> of the interaction between research subjects and KASPAR with the suggestion that it has been a turning point for 'unlocking' a response in an autistic child. The objectives for KASPAR are clear and targeted and unlike Amazing Ally it is not a toy but a learning aid. The emotional response from those who use it, however, is the point of similarity as indeed it is with the social robot Paro.

### **Dealing with Dementia: Paro**

Unlike Amazing Ally and KASPAR Paro is an animal – a seal - covered in a fur fabric and small enough to pick up and hold under your arm or cradle. Similarly to KASPAR Paro is designed to stimulate interaction between patients and the caregivers and to improve socialization between them and others.

A baby harp seal spends most of the day sleeping. However, Paro has a diurnal rhythm of morning, daytime, and night. For example, Paro is active during the daytime, but gets sleepy at night. Paro has five kinds of sensors: tactile, light, audition, temperature, and posture sensors, with which it can perceive people and its environment. With the light sensor, Paro can recognize light and dark. He feels being stroked and beaten by tactile sensor, or being held by the posture sensor. Paro can also recognize the direction of voice and words such as its name, greetings, and praise with its audio sensor. (Paro, Paro Photo Gallery section, para.2)

Small research studies have shown that Paro is helpful for relaxing and comforting dementia patients in particular and a long term study is in progress in Denmark to determine its value in care homes for dementia sufferers. Paro is also available commercially, albeit at a high cost, but nevertheless its success to date in capturing the attention of researchers and users alike shows that some benefits have already been accrued for this robotic pet.

## **DISCUSSION**

In these three examples of social robots one can see that they are successful products designed in response to particular social interactions and social needs. The problem, for example, of how to help an autistic child interact emotionally is specifically addressed with a robotic solution designed for that purpose. The mobile phone is the antithesis of this approach. The technology for the present day mobile phone was designed to accommodate a requirement for a device that could be taken anywhere in the world and used to communicate voice and data that could be paid for in one home location by the user (Vincent, 1992; GSM, 2012). In providing an always on and flexible computational device such as this the user has been empowered to organize their daily life wherever they might be. Mothers are no longer restricted to stay at home while their child is at school so as to be accessible via the house fixed telephone in the event of an emergency, but are free to meet

---

<sup>7</sup> <http://www.youtube.com/watch?v=D6gTHPoO9VI>

friends, take a job, go to the gym and so on knowing that at the press of a button they can be contacted by their child's school or carer (Vincent, 2003; Turkle, 2011). Whilst for some the mobile phone has had a negative effect of creating a digital leash in which one can appear to have less freedom, for others it is liberating.

Looking at these examples from my prior research and that of others, we can see some of the ways people have appropriated their mobile phones and further how they have managed the electronic emotions they associate with them. In contrast to this are the three different social robot devices that have been developed for particular target audiences who use them to play, develop social interaction and to combat some of the effects of dementia. I would assert, however, that although these social robots might be considered successful within their target niche their applications are limited to the bounds of their design and the emotions with which they are pre-programmed. On the other hand the mobile phone can be adapted and made personal by its user. It can also be successful for developing social interaction, as a toy, and as an aid to combating loneliness, managing feelings and more. Although I am not suggesting that patients with special needs arising from dementia and autism might benefit in the same way from using a mobile phone as from a specially designed social robot, I do assert that the interaction between the mobile phone and its user can be equally therapeutic, and more, it is personalized to its particular user's needs in ways that only the user knows. This is because the social robot facets of the mobile phone have been developed in the interaction between the mobile phone and the self of the user making the relationship between user and device completely unique.

This interaction between human and machine that I am exploring here is not about artificial intelligence, rather it is about developing a social robot that allows the user to explore their own emotions as the mood takes them. I suggest that this is why the mobile phone has become a social robot - one that has been created entirely at the hand of the user. There have been no pre-planned emotional analyses to ensure the device reacts in a particular way like KASPAR turning away when hit to show that hitting is not a good emotional expression, or Paro responding to particular words or crying when it is not paid any attention. The mobile phone is an inanimate, benign object, but personalized in every facet of its interface and simply and easily accessed at the press of button or touch of a screen.

## CONCLUSION

In this paper I have explored the ways that peoples' emotions are stimulated and mediated over their mobile phones and how they use feeling rules to manage these electronic emotions that are created or lived via their mobile phones. In contrast with other social robot devices that also attend to the emotional needs of their users, I have suggested that the continual presence on or close to the body and the always on properties of the mobile phone device have lead to it becoming used as if it is a remote control for one's life, flicking through the content and communications it conveys to suit our mood, a constant reassurance and an always available point of interaction, a bridge from virtual to real life and from private moments to shared experiences. The emphasis of this paper is on the ways the mobile phone allows the user to explore their emotions and how the combined effect of the mobile phone machine and the human interaction with it leads to the personalization of the device. There is no suggestion that this is about the creation of a new artificial intelligence, rather it is about showing how the closeness of the mobile phone and its user are leading to the development of a personalized robot that allows the user to explore their emotions as the mood takes them.

This suggests, as indeed I do in the title of this article, that the mobile phone device is a personalized robot but I should like to conclude with the suggestion that, as the compendium of our

emotions, feelings and activities, perhaps the device alone is not the social robot. Instead the mobile phone is putting the robotic turn into the human user and thus it is the combination of user *and* mobile phone that is the social robot. The almost symbiotic use of mobile phones - being emotionally and metaphorically tied to a mobile - is not necessarily always by choice as the mobile phone has become an essential tool for others to demand one's always on constant availability. This can lead to an emotional paradox where the mobile phone becomes too precious or too important to lose as it is so vital for keeping contact and maintaining day to day life (Vincent & Harper, 2003). With our emotions always on alert and frequently triggered when least expected the outcome of having this close relationship with the device might not appear to be completely positive for all. Indeed, in managing and mediating our electronic emotions via this machine we have allowed the 'I' in ourselves, our inner self, to become absorbed and articulated into the 'me' that others see only via an electronic device. As I explained in my introduction there are many definitions for social robots, and in this paper I do proffer yet another. However, my examination of what a social robot might actually be has perhaps opened a new perspective on the interaction between a machine - the mobile phone - and its human user. The blurring of the boundaries between the expression of our feelings and our emotional self have become in some way shaped or considered differently as a result of interactions and emotions mediated via our mobile phones.

The significance is that it is our own emotions that are imbued in the mobile phone, our electronic emotions that are created, re-lived and lived through our own experiences loaded onto the machine. Robotic devices such as the animatronic Ally, the responsive KASPAR and caressed Paro are designed with specific emotion responses in mind; perhaps if a relationship is built up with the device some emotions can be 'imagined' into the robot but it will forever respond according to its emotion program, and perhaps only be used on occasions when play or therapy times are allocated. The mobile phone is constantly at hand, often constantly *in* the hand, and filled with the personal biography of its user. This is why I believe that the interaction of the mobile phone and its user has co-constructed a new personalized social robot; a machine imbued with our unique electronic emotions that we turn to in moments of loneliness, happiness, crisis, boredom and daily life experience for comfort, solace, assistance and guidance.

## REFERENCES

- Breazeal, C. (2003). Emotion and sociable humanoid robots. *International Journal of Human-Computer Studies*, 29, 119-155.
- Cumiskey, K. M. (2010). "Simply leaving my house would even be scarier": How mobile phones affect women's perception of safety and experiences of public places. *Media Asia*, 37(4), 205-214.
- Cumiskey, K. M. (2011). Mobile symbiosis: A precursor to public risk-taking behavior? In R. Ling, & S. W. Campbell (Eds.), *Mobile communication: Bringing us together or tearing us apart? (The mobile communication research series, vol. II)* (pp. 17-36). New Brunswick, NJ: Transaction Publishers.
- Dautenhahn, K., Nehaniv, C. L., Walters, N. L., Robins, B., Kose-Bagci, H., Mirza, N. A., & Blow, M., (2009). KASPAR – a minimally expressive humanoid robot for human-robot interaction research. *Applied Bionics and Biomechanics Human Robots*, 6(3-4), 369-397.
- Davis, E. (2000). *Congratulations: It's a Bot!* Wired, 8.09. Retrieved from [http://www.wired.com/wired/archive/8.09/robobaby\\_pr.html](http://www.wired.com/wired/archive/8.09/robobaby_pr.html)
- Fortunati, L. (2005). Mobile telephone and the presentation of self. In R. Ling, & P. Pederson (Eds.), *Mobile communications: Renegotiation of the social sphere* (pp. 203-218). London: Springer.
- Goffman, E. (1959). *The presentation of self in everyday life* (1969 Edition). Middlesex: Penguin Books.

- GSM Association. (2012). *Experience a world where everything intelligently connects: The connected world*. Retrieved from [www.gsma.com/connected-life/](http://www.gsma.com/connected-life/) (Last accessed in June 2012)
- Guizzo, E. (2010). The man who made a copy of himself. *Spectrum IEEE*, 47(4), 44-56.
- Haddon, L., & Vincent, J. (2007). Children's broadening use of mobile phones. In G. Goggin, & L. Hjorth (Eds.), *Mobile technologies from telecommunications to media* (pp. 37-49). New York: Routledge.
- Hochschild, A. (2003). *The managed heart: Commercialization the human feeling* (20<sup>th</sup> Anniversary edition with Afterword). Berkley, CA: University of California.
- Höflich, J. (2005). A certain sense of place mobile communications and local orientation. In K. Nyiri (Ed.), *A sense of place: The global and the local in mobile communication* (pp. 159-168). Vienna: Passagen Verlag.
- Höflich, J. (2009). Mobile phone calls and emotional stress. In J. Vincent, & L. Fortunati (Eds.), *Electronic emotion: The mediation of emotion via information and communication technologies* (pp. 63-83). Oxford: Peter Lang.
- Låsen, A. (2005). The social shaping of fixed and mobile networks: A historical comparison. In P. Gossett (Ed.), *Understanding mobile phone users and usage* (pp. 1-43). Newbury: Vodafone Group.
- Mead, G. H. (1967). *Mind self and society*. Chicago: Chicago University Press. (Original work published 1934)
- Norman, D. (2004). *Emotional design*. New York: Basic Books.
- Paro photo gallery. Retrieved from <http://www.parorobots.com/photogallery.asp> (Last accessed on April 21, 2013)
- Picard, R. (1997). *Affective computing*. Cambridge, MA: MIT.
- Picard, R. (2011). *Robots, autism and god*. Presentation at Rice Veritas Forum at Rice University, April 2011. Retrieved from <http://www.youtube.com/watch?v=xsFH2YUsTls&feature=relmfu> (Last accessed in June 2012)
- Rimé, B. (2009). Emotion elicits the social sharing of emotion. *Emotion Review*, 1(1), 60-85.
- Shaw-Garlock, G. (2009). Looking forward to sociable robots. *International Journal of Social Robots*, 1, 249-260.
- Turkle, S. (2011). *Alone together: Why we expect more from technology and less from each other*. New York: Basic Books.
- Vincent, J. (1992). Let the customer lead! *Proceedings of the DMRV 5th Nordic seminar on digital mobile communications*, Helsinki, December 1-3.
- Vincent, J. (2003). Emotion and mobile phones. In K. Nyiri (Ed.), *Mobile democracy: Essays on society, self and politics* (pp. 215-230). Vienna: Passagen Verlag.
- Vincent, J. (2009). Affiliations, emotion and the mobile phone. In A. Esposito, & R. Vich (Eds.), *Cross modal analysis of speech, gestures, gaze and facial expression: Lecture notes in Computer Science 5641* (pp. 28-41). Berlin: Springer.
- Vincent, J. (2010a). *Body to body interaction in broadband society*. Paper presented at the 'You will shape the digital society with your knowledge – Make it happen' conference on communications, University of Applied Science Wildau. Retrieved from [http://www.th-wildau.de/fileadmin/dokumente/marketing/dokumente/Conference-on-Communications\\_Volume\\_Version05\\_ISBN978-3-936527-23-0.pdf](http://www.th-wildau.de/fileadmin/dokumente/marketing/dokumente/Conference-on-Communications_Volume_Version05_ISBN978-3-936527-23-0.pdf) (Last accessed on June 2012)
- Vincent, J. (2010b). Emotion and the mobile phone. In H. Greif, L. Hjorth, A. Lasen, & C. Lobet-Maris (Eds.), *Cultures of participation: Media practices, politics and literacy* (pp. 95-110). Berlin: Peter Lang.
- Vincent, J. (2011). *Emotion in the social practices of mobile phones*. Thesis submitted for the degree of

Doctor of Philosophy, University of Surrey. Available at [www.ethos.bl.uk](http://www.ethos.bl.uk) (Last accessed on April 14, 2013)

Vincent, J., & Fortunati, L. (Eds.). (2009). *Electronic emotion: The mediation of emotion via information and communication technologies*. Oxford: Peter Lang.

Vincent, J., & Harper, R. (2003). Social shaping of UMTS – Preparing the 3G customer, Report 26 UMTS Forum. Retrieved from <http://www.dwrc.surrey.ac.uk/pdf/SocialShaping.pdf> (Last accessed on April 21, 2013)

## BIOGRAPHY

**Jane Vincent** PhD FRSA, is Senior Research Fellow at the LSE Department of Media and Communications and Visiting Fellow with the Digital World Research Centre University of Surrey. Prior to joining DWRC in 2002 Jane worked in the international mobile communications industry for 21 years on the development and marketing of digital mobile services, strategy and business transformation. Jane researches the social practices of information and communication technology users and her studies for industry and international academic organizations on the social shaping of technology, children's and older peoples' use of mobile phones, and migrants use of ICTs have been widely published. She was a member of ESF COST Action 298 Participation in the Broadband Society; and is an invited expert on COST Action FP1104 researching experiences of writing and reading on paper and on screen. Jane is joint editor of Participation in Broadband Society series Peter Lang Berlin and, with L Fortunati, editor of *Electronic emotion: The mediation of emotion via information and communication technologies* (2009), Peter Lang Oxford, and with L Fortunati, R Pertierria *Migration, diaspora and information technology in global societies* (2012), Routledge NY.

# Melding with the Self, Melding with Relational Partners, and Turning into a *Quasi-social Robot*: A Japanese Case Study of People's Experiences of Emotion and Mobile Devices

Satomi Sugiyama  
Franklin College Switzerland

## ABSTRACT

Past research suggests that the mobile device can be experienced as a relational artefact, and also, as a technology for cyborgization, questioning the boundary between the mobile device and humans. This paper examines the question in the context of Japanese young people. More specifically, the present study seeks to identify various patterns of the way people make sense of their mobile device in Japan, suggesting some possible future research questions where the notion of social robots, mobile device, and emotions intersect. Based on the results of focus group interviews conducted in 2010, the paper explicates how humans start blurring the distinction between their relational partners and the mobile device that affords the sense of perpetual contact. This is indicative of how a mobile device has gone through the process of *anthropomorphization*, turning into a *quasi-social robot*. Furthermore, the paper discusses how some experience their own mobile device as a part of their body. This suggests how a mobile device is perceptually incorporated into the body, turning humans into *quasi-social robots*. Connecting the results to the notion of electronic emotions, the paper conceptualizes the idea of *quasi-social robot* as a metaphor that conveys the extent to which humans are now equipped with advanced technologies, making us more powerful but also simultaneously more vulnerable. It concludes that the heightened complexity in the relational dynamics, and the emotions that are triggered and exchanged deserve further investigation to see how their emotional experiences are changing. Such future research promises to foster our understanding of the transcending boundary between humans and the mobile communication device, informing the question of social robots and emotion.

**KEY WORDS:** mobile device, social robot, quasi-social robot, emotion, body, Japan

## INTRODUCTION

Literature on the relationship between the mobile device and people is relatively scarce compared to the literature on how the relationships between people were facilitated or hindered by the mobile device. The essential difference between the two paradigms is that the former treats the mobile device as more than a functional communication tool. Examining the relationship between the mobile device and people draws our attention to the physical and symbolic distance between the mobile technology and the human.

Although limited, the question of the distance between mobile technology and the human was explored during the past decade. A part of such an effort is the *Machines That Become Us* perspective proposed by Katz (2003). In this perspective, Katz delineates how machines such as mobile devices *become* us in three senses: *become* extensions of us, *become* integrated with our clothing and body, and *becoming*/fitting to us. The research findings such as the mobile phone as an extension of the hand and a body part in the case of Finnish teens (Oksman & Rautiainen, 2003a, 2003b) inform the *Machines That Become Us* perspective by offering some empirical evidence as to the way one can experience the mobile as an extension of the body.

As is seen in the *Machines That Become Us* perspective, an aesthetic aspect of the mobile technology has been noted in exploring the relationship between the mobile device and the user. The aesthetic aspect of the mobile device has been associated with the shrinking distance between the mobile device and the human body (Fortunati, 2003; Fortunati, Katz, & Riccini, 2003). This rather philosophical question has been explored at the level of empirical studies by examining the importance of the mobile design and its overall appearance with quantitative and qualitative data (e.g., Katz & Sugiyama, 2006; Ling & Yttri, 2002; Ling, 2003; Sugiyama, 2009, 2010a). These studies highlighted how the aesthetic aspect of the mobile device is closely tied to one's self-expression, thereby not only expressing the self, but one also defines and redefines one's self via the aestheticized mobile device displayed in public (Sugiyama, 2010a).

Aforementioned studies by Sugiyama (2009, 2010a) specifically focused on the case of Japanese youth. Based on a series of focus group interviews of college students conducted in 2005-2006, Sugiyama argued how the mobile phone is not a mere telephone in transit but an aestheticized object whose aesthetic appeal to the user is continuously evaluated against the changing norms of mobile phone appearance in a given place and time. This aspect was explicated by applying the concept of fashion. Simultaneously, the study uncovered how these college students in Japan develop emotional attachment to the externally and internally decorated mobile phone because the mobile phone is a locus of relational negotiations (Sugiyama, 2009). The college students reported that it is hard to be separated from their mobile phone, rendering the machine that physically is miniature to be monstrous in presence (Sugiyama, 2009).

It is within this context that the question of social robots and emotion, as it relates to the mobile technology, arises. Zhao (2006) defines humanoid social robots as "human-made autonomous entities that interact with humans in a human like way" (p. 405). In making distinctions among human-humanoid interactions, computer-mediated communication, human-computer interaction, and "post-human" cyborgization, Zhao explains that, in computer-mediated communication, a technology serves as a medium of human interactions rather than as a counterpart of interactions. Since the mobile device is not an autonomous entity and often serves as a medium of human interactions, the mobile communication resembles computer-mediated communication at the most apparent level.

However, as the mobile device comes closer to the human body constantly extending the natural human capacities, this seeming resemblance requires a critical examination. For example, aforementioned past research seems to suggest that the mobile device can be experienced as a



relational artefact, and also, as a technology for cyborgization, questioning the boundary between the mobile device and humans. That is, positing the mobile device as a mere medium of human interactions is not sufficient to account for such human experiences with the mobile. As people engage in emotional exchanges that are expressed both on the surface of the mobile as well as in the SMS and voice calls, how does the boundary between the mobile and humans change? Are humans with electronic emotions, which are “emotions lived, re-lived or discovered through machines” (Fortunati & Vincent, 2009, p. 13), turning into social robots through the process of cyborgization? Are mobile devices turning into social robots by being heavily involved in the human experiences of electronic emotion? Or perhaps, if not social robots, can we identify some traits that both humans and mobile devices are turning into *quasi-social robots*? In order to explore these questions, this paper analyzes the relationship between people and their own mobile device, building upon the previous study conducted in Japan during 2005-2006. More specifically, the present study seeks to identify various patterns of the way people make sense of their mobile device in Japan, suggesting some possible future research questions where the notion of social robots, mobile device, and emotions intersect.

## METHOD

In order to examine the proposed question, focus group interviews were conducted in Japan during the summer of 2010. The method of focus group interviews was selected because of its strength in creating the dynamics that is similar to one of everyday social discourse (Lindlof, 1995). Four sessions of focus group interviews were conducted. In order to keep each focus group demographically homogenous following the recommendation by Lindlof, each group was composed of participants with similar backgrounds in terms of their age and professions. In a collectivistic culture such as Japan, age and social status play a significant role in group dynamics and sharing ideas. Therefore, the demographically homogenous group composition was regarded particularly important so as to facilitate frank and lively group discussions minimizing the concern for violating the cultural norm of “occupying a proper place” (Lebra, 1976).

More specifically, one group was composed of young professionals, between the age of 35 and 40, who work at the major corporations in Tokyo (FGI 1), two groups were composed of undergraduate students from a private university in Tokyo (FGI 2 and 3), and one group was composed of graduate students in the Master’s program at a public university outside of Nagoya area (FGI 4). In total, 17 people participated in the focus group interviews. In addition to the focus groups, two junior high school students and one business entrepreneur were interviewed as a supplemental data source. However, this portion of data is not reported in the present paper.

It should be noted that all focus group participants were below the age of 40, and except for 1 participant in FGI 1, all were unmarried. These demographic characteristics make the data particularly interesting for examining how single young adults were experiencing their mobile device and interpersonal relationships. At the same time, it must be acknowledged that the experienced relationship with the mobile device might be quite different for those who are older and at a different life stages. Therefore, this study should be treated as such.

Each interview session lasted about one hour, taking a semi-structured approach. The interview schedule was adopted from the previous study conducted in 2006 (Sugiyama, 2006). The interview began with some questions regarding when they started using a mobile phone as well as how often and in what ways they use it. It then moved on to some questions about the style and the decoration of their mobile and what the mobile means to them. All focus group interviews were audio-recorded and transcribed.

Once the transcriptions were completed, the data was analyzed using the grounded theory approach (Strauss & Corbin, 1998). In this process, the past literature and experience were used to sensitize the analytical perspective of the researcher, while minimizing the possibility of forced interpretations (Strauss & Corbin). Throughout the analysis, the researcher sought to discern phenomena, which is “repeated patterns of happenings, events, or actions/interactions that represent what people do or say, along or together, in response to the problems and situations in which they find themselves” (Strauss & Corbin, p. 130). In the present study, the researcher sought to discern some repeated patterns of the meanings participants attach to their mobile device, as well as their emotional experiences involving their mobile, in order to understand the perceived distance between people and their mobile device.

## MELDING WITH THE SELF

Past research identified how people develop emotional attachment to the content stored in the mobile device (e.g., Vincent, 2003), as well as to the device itself (e.g., Sugiyama, 2009; Vincent, 2009). This theme was quite notable in the present study as well. However, it should be noted that there was a range of responses in terms of how closely they keep their mobile device with them, suggesting that the attachment people feel to their mobile device varies.

A notable number of the focus group interview participants suggested how they are attached to their mobile device and how they maintain a close relationship with the device. For example, the focus group 1 participants agreed that they always carry their mobiles including the time when they sleep. All participants of the focus group 3 also reported that they keep their mobile device right by them when they sleep, and carry it even to the toilet. The following quote captures this proximity between the user and the mobile device:

Moderator: How often do you use (your mobile)?

F<sup>1</sup>: All the time.

M: *Hadami banasazu*.

F: If I accidentally leave it at home, I feel anxious.

Moderator: So you always keep it very close to you?

M: I always keep it in my pocket.

F: Always (with me) other than the time when I take a bath.

*Hadami banasazu* is a common Japanese expression. *Hadami* literally means “skin and body” and *banasazu* means “don’t let it go.” This expression is often used when one carries something precious all the time, or keeps it in a very close possession. A male participant of focus group 2 also suggested the preciousness of the mobile device, commenting “It is a tool for killing time, but it’s also like an *omamori*.” *Omamori* is a cultural artifact that is often purchased at a Shinto shrine or a temple in wishing good luck for a variety of causes (e.g., health, business, study, marriage, etc.). Although he emphasized the utilitarian aspect of the mobile device such as a tool for contact and information access, he also described that the mobile is like an *omamori* for him. Just like he feels calm and safe if he hangs an *omamori* nearby, he feels calm and safe if he is with his mobile.

This trend is not new but it is noteworthy that a similar trend is still observable even after the ever-developing mobile technology has become so ubiquitous in our everyday life. Furthermore,

---

<sup>1</sup> F indicates female participant and M indicates male participant in the focus group. When more than one female and male participants appear in the given quote, numbering system such as F1 and F2 was used to indicate the range of ideas expressed by different participants.

what is interesting is how their mobile device accompanies mundane movements from one place to another even though they do not exert much effort of remembering to carry it. For example, when the moderator asked if they carry their own mobile device to go to a different room within their house, the focus group 1 participants all said no at first. Then, the following conversation took place:

F: Come to think of it, I might do that.

M: I might put it on my pocket and go downstairs.

F: I might keep it nearby, like in the living room.

This conversation suggests that they do not necessarily pay attention to whether they carry their mobile device, but instead, their movement from one location to another with their mobile devices, despite the proximity between the two locations, seem to *just happen*. In fact, a female participant from focus group 2 reported that she sometimes takes her mobile device “without realizing it.” This sense of “come to think of it” implies how closely the mobile device has been incorporated not only into everyday life but also into their minute location movements.

As this sense of “always with” is a default for these participants, they appear to lose balance when their mobile device is not with them. For example, the following conversation took place during the focus group 1 session:

F1: When I accidentally leave my mobile at home, I go back home to get it.

F2: Really?

M: Yeah, I get extremely anxious. If I left my mobile at home, I will be extremely anxious at work, so I might go back home in the middle of the day.

Moderator: You might go home to get it?

M: Yeah.

F2: Somehow, all day long, somehow, feel blue (if I left my mobile at home).

M: Depressing.

F2: Not sure if feeling blue is a right word, but...

M: I think that I have to go home early on that day.

(All agree)

Then, they all laughed saying that they usually do not receive any *meiru* (*keitai* email)<sup>2</sup> or phone calls on such an occasion, but admit that they cannot help worrying about their mobile. It is particularly noteworthy that they explain how their emotional states fluctuate depending on the presence of the mobile device. The following example from focus group 3 also indicates how the state of “always with” their mobile device is a default for them:

F: I am at a loss when I don't have it. If I accidentally left my mobile at home, I feel uneasy all day long. I can't focus, worrying if some important *meiru* is waiting for me. The mobile gets too much of my attention.

Moderator: Like, “I don't have my mobile!” all day long?

F: Always, start looking for it like, “where is it?” And then, realize once again that I left it at home.

It is notable that she said that the mobile gets too much of her attention when it is *not* right there with her. In the same way that they do not pay much attention to the presence of, say, a right hand,

<sup>2</sup> For explanations for *meiru* (*keitai* email) and SMS, please see Matsuda (2005), p. 35.

they do not make a special note on the presence of their mobile if it is with them. “Always with” is indeed a norm for these participants. For them, the mobile device presence is so paramount that it has developed into a natural part of their own presence, and by extension, a natural part of their own body.

This metaphor of the mobile as an extension or a part of the human body appears to be even more clearly and directly pronounced for some people in Japan these days. It is hard not to notice the way many people in public places are walking around with their mobile device in hand, looking as if their device is extending their hand.<sup>3</sup> Indeed, some of the focus group interview participants reported that they often find themselves walking around with their mobile device in hand. For example, a female participant from focus group 2 stated, “I am often holding my mobile in my hand. Always.” She showed me how she always preciously holds her two mobiles in her right hand. Others said they sometimes walk with their mobile in their hand after using it in the train, or when they are waiting for someone to contact. The following conversation from focus group 3 serves as an additional example:

Moderator: Do you walk around with your mobile in your hand?

All F: Ah, yeah!

Moderator: Is it for a particular time, or you just find yourself walking around with your mobile in your hand?

F1: I just find myself walking with my mobile in my hand.

F2: When I am expecting a contact.

[...]

Moderator: Do you carry it in your hand?

F3: Yeah, I carry it in my hand. Perhaps, that’s my most typical way of carrying my mobile.

When she made this comment, others expressed a little surprise in a teasing manner. She explained that it is because her mobile decorations tend to get caught with other items in her bag when she takes her mobile out. However, this account sounded like her excuse to accommodate her peers’ teasing comment.

On the other hand, a sizable number of participants reported that they do not feel particularly attached to their mobile device. A male college student from focus group 2 said that he does not bother carrying his mobile when he goes to a nearby convenience store. He reported that he keeps his mobile at the entrance hall once he returns home where he lives with his family, indicating that he keeps a distance from the mobile when he is at home.

A female college student from focus group 3 made the following comment after other participants reported how they carry their mobile device everywhere:

I think that I am not that attached to my mobile. Without it ... it will be inconvenient if I don't have it when I have a plan to meet someone, but if I don't have a plan, I tend to be ok without it. I just think, what I'm going to do from now (laugh). I feel it's ok without it.

Another female college student from a different focus group (FGI 2) made a similar comment:

---

<sup>3</sup> Based on informal yet informed observations in Tokyo in summer 2012, the trend of walking around with their mobile in hand seems to be still quite prevalent. With the increasing dissemination of smart phones, however, how they look with their mobile in hand in public places seems to be changing. Since the smart phones that are currently available tend to fit in the hand, walking around with their mobile device in hand does not seem to create a visible impression of extending their hand like the way the “Galapagos *keitai*” do.

I sometimes accidentally leave my mobile at home. At first, I think, oh no, what I'm going to do, and particularly when I have a plan to meet with my friend in the evening, I feel like "what I'm going to do!" but then, on the day I don't have any particular plan, I just go home wondering if there is any *meiru* while I was away. So I don't get anxious at all.

In addition to the two examples above, none of the focus group 4 participants (male graduate students) said that they use their mobile all the time. The actual number of the *meiru* they exchanged does not necessarily seem to be less than other FGI participants. For example, one of the participants reported that they exchange 5-10 messages per day. What is noticeable is that they all emphasized how much they use the computer. One of the participants said that he uses his mobile device to forward messages from his computer. This significant presence of a computer might be a reason why they did not express the sense of "always together" with their mobile in the way that many participants from other focus groups expressed. These participants also live in a more suburban area where they live very close to their university. This living environment might also contribute to the different sentiment that they expressed compared to those living in an urban environment.

As is shown, the overall data indicated that the participants' experiences of feeling attached to their mobile device range on the continuum of attachment between high and low, and this range of attachment does not necessarily come from the frequency of *meiru* exchanges and phone calls. When all focus group 1 participants agreed that they "always" use their mobile for *meiru*, the moderator asked about how many *meiru* they exchange per day:

F1: Depends on the day. When I have an appointment like this, I exchange 10-20 *meiru* per day, but when I don't have an appointment, sometimes, it's like one or two *meiru*.

F2: I never reach 20.

F1: Perhaps 20 is an exaggeration, maybe.

F2: About 10.

F1: Maybe about 10. Then, I might not be using my mobile that much.

This suggests that the mobile device has quite a significant presence in their everyday life regardless of the frequency of exchanging *meiru* for these participants. The number of *meiru* that they exchange is not so different from the number of *meiru* that the aforementioned focus group 4 participants reported. It is noteworthy that the focus group 1 participants felt like they are always using the mobile device, while the focus group 4 participants felt that they are much more detached from the device. This distinction shows that there is a different degree of mobile device presence that one feels, and the degree of the presence does not necessarily correspond to the frequency of the interpersonal contact one has with the device. There seem to be different factors that can explain the varied levels of perceived attachment.

In discussing the frequency of mobile device use, a female participant from focus group 2 stated, "Well...whenever I have free moment....looking at it (her mobile device)." What she is "looking at" is websites such as some blog pages and pages on the Japanese social networking site called *Mixi*. When asked to elaborate what she means by the "free moment," she said, "*Chotto shita toki*," which can be roughly translated into "little random moments." This captures the sense of how the mobile is always right by her, whenever she is, whatever she is doing. This also shows the significant presence it has in her everyday life. This physical proximity that one feels for his/her own device might be a potential factor that leads to a higher degree of emotional attachment, leading to the melding between the mobile device and the self. In discussing the case of mobile use in Japan, Fujimoto (2005) states that "as gadgetlike media with audiovisual dimensions become more

prominent, one outcome is that our experiences with and relationships to objects become more intimate” (p. 91). The present data offer a support for this point.

## MELDING WITH RELATIONAL PARTNERS

There was a range of responses in terms of the experienced nature of the relationship between the participants and their mobile device. An essential concept that captures the nature of the relationship appears to be the control and the uneasiness that emerges when the relationship becomes out of control.

A number of focus group participants reported an uneasy relationship with their mobile device. This trend was particularly noticeable among the focus group 3 participants. They discussed how they sometimes receive late night calls, and this can be quite troublesome. Particularly among female students, they seem to call each other when they are worrying about something, or when they cannot sleep.

F1: Yeah, phone call right before midnight!

Others: Yeah, right before midnight!

F2: I was going to sleep, but I somehow answered...

Moderator: You can't help answering?

All: No, (I) can't help.

This shows a difficult relationship that these participants have with their mobile device because the mobile gets them involved in their friend's personal troubles when they are in a rather peaceful state. Such troubles that the mobile device brings in to their life appears to be translated into an uneasy relationship that they experience with their device itself.

Not only does the mobile bring their friend's personal problems into their life at an inconvenient moment, it also brings some complications to their own relationships at random moments.

Moderator: Is the mobile important to you?

F1: Yes, in its own way. (laugh)

F2: I wish it's gone.

F1: Yeah, I wish it's gone too.

Moderator: You wish it's gone?

M: I might have thought in the way too, maybe once. (laugh)

Moderator: Only once?

M: It might be better once it disappears (from my life). I feel it's controlling me.

All: Yeah, controlling me.

F3: There are some moments that I feel like breaking my mobile.

F2: Yeah, often!

F3: When everything is annoying.

M: I see.

F3: So, I turn it off, because I cannot break it. So, I turn it off, and leave it somewhere.

F2: Yeah, that happens.

M: If I turn it off...

F1: Then, nothing comes in.

Moderator: Have you felt in the way?

M: Once in a while.

- F1: I have done it. [...] I was like, sorry for a while....
- Moderator: When does it happen?
- F1: When I am extremely busy, and receive so many *meiru* from the mailing lists...when everyone is busy, like right before an event...
- F2: Also for relationships....
- Others: Relationships!
- F2: When relationships are complicated, it's like "too much trouble!"
- F3: Yeah, too much trouble!
- F2: It's like "because there is a mobile!" and like "you should say face to face!"
- F3: Like "you should say directly to me!"
- Moderator: Something like that happens?
- F2: Yeah, we can't see the other person, so *kei wo tsukau*. Also, misunderstandings happen when replies get delayed, and the other person also worries....ahhh troublesome! Things like the timing of replies and so on...
- F1: I know what you mean, the timing of replies...
- Moderator: So in that kind of cases involving complicated relationships, you turn off your phone?
- F2: Yeah.
- Moderator: 2 to 3 days?
- All: No, can't turn off my phone for 2 to 3 days!
- F3: Maybe only that night.
- [...]
- Moderator: You can ignore your phone without turning off your phone? But you'd rather turn it off?
- (brief silence)
- F2: Because it flashes... (laugh)
- All: It gets my attention. I can't help checking if a *meiru* comes in.

This lengthy discussion from the focus group 3 suggests the frustration that the participants experience toward their mobile is because it tends to bring relational complications, or at least, it seems to magnify such relational complications. Since the mobile device offers a potential for the perpetual contact (Katz & Aakhus, 2002) and "possible communication" (Campbell, 2008, p. 160), and the participants are quite aware that timing of the contact conveys relational meanings, they feel that they cannot postpone dealing with the relational complications. They are somewhat trapped in inescapable relational complications, leading them to feel a strong urge to cut themselves off from all potential perpetual contact. They wish to control the device so that they can avoid complicated social relationships and their felt social saturation. The only way to control it, according to them, is to turn it off for just a while. Even if the mobile is on silent mode, they appear to feel that they cannot help checking for *meiru*. If they notice that a *meiru* came in, they just cannot avoid paying attention to it. Many Japanese mobile devices flash these days in order to signal incoming contacts, which seems to make it even harder to ignore it.

Turning off their mobile device appears to be the only way to control the device, and consequently, the only way to make it "disappear" from their life. As the conversation above suggests, turning off their mobile is an extremely difficult thing to do because the mobile device serves as the social blood vein for them (Sugiyama, 2009). However, they experience the intense frustrations toward their mobile device to the extent that they feel like breaking it. Therefore, they have to oscillate between the anxiety of being cut off from their perpetual contact and the strong desire for controlling the device so that they can regain a balanced relationship with their mobile.

This can be analyzed through the theoretical lens of the relational dialectics that considers social life as “a process of contradictory discourses” of the centripetal (discourses of unity) and the centrifugal (discourses of dispersion) (Baxter, 2004, p. 182). Just like the way people often experience the competing discourses of centripetal and centrifugal forces with their relational partners, these participants experience such a dialectical tension of connection and autonomy with their mobile device itself.

The focus group 3 participants further commented on their frustrating relationship with their mobile:

Moderator: What is mobile for you?

F1: It is troublesome, but something I need.

[...]

F1: It's troublesome. It makes my life complicated.

M: Indeed.

(Others agree)

F1: Like “you didn't reply to my *meiru*!”

Others: Yeah!

F1: Or I am not receiving a reply....making me excited and worry, but without it, I feel anxious. I feel completely separated from the world.

F2: Yeah, yeah.

F1: So I feel anxious, but it often makes me worry.

Moderator: Makes you worry?

F3: But perhaps, it is a necessity after all. I feel anxious without it.

M: Yeah, anxious.

This conversation captures the sentiment of seeking to manage the aforementioned dialectical tension with two highly intertwining relationships: with relational partners and with their mobile device itself that can become out of control. Since personal relationships and the mobile devices that make perpetual contact possible are hard to be separated, the dialectical tensions that need to be negotiated heighten the sense that the mobile device is a complicated and troublesome object in which their relational partners and the mobile device meld together, suggesting that the mobile device can be experienced as an animated humanized object. Once the mobile device is entrusted with numerous relational meanings in their mind, such relational meanings start facilitating the personification of the machine, creating the sense that the device itself is a relational partner that poses numerous challenges on their life.

## CONCLUSION: FROM MELDING TO *QUASI-SOCIAL ROBOTS*

In observing the patterns of how people explain their everyday experience involving their mobile device, it appears that the level of emotional attachment that one feels towards their mobile device has something to do with the degree of the relational dialectics between the connection and autonomy that they experience. More specifically, those who feel attached to their mobile device seem to experience the need for connection and need for autonomy in a more pronounced way, both in terms of their relationship with others via their mobile device as well as in terms of their relationship with their mobile device itself. That is, one with a higher level of attachment to one's own device needs to continuously negotiate the dialectical tension between seeking for connection and seeking for autonomy, and the movement across the continuum of a relational dialectics tension is greater. This is a process of seeking equilibrium (Sugiyama, 2010b) although a state of equilibrium



is not to be attained since relational dialectics is “ongoing centripetal-centrifugal flux” without a balanced central point (Baxter, p. 186). This intense movement across the continuum triggers the stronger sentiment of uneasiness.

Then, why do some of the people experience more intense relational dialectics than others? In introducing Durkheim, Cladis (2001) points out Durkheim’s concern on “multiplicity of ways of organizing and categorizing the world” in diverse societies (p. xxiv). As Durkheim writes, “the categories of human thought are never fixed in a definite form. They are made, unmade, and remade incessantly; they vary according to time and place” (p. 16). The way people make sense of the world is constantly in flux, and as our society become more fragmented at the micro level (Meyrowitz, 2003), our everyday interactions and media experiences at a small group level start to play a critical role in the meaning-making process. Durkheim states, “society needs not only a degree of moral conformity but a minimum of logical conformity as well” (p. 19). Then, we are in constant search, or perhaps, in constant participation of constructing the moral and logical conformity in numerous small groups to which we belong. With the use of a mobile device that allows us to be in perpetual contact (Katz & Aakhus, 2002) within close-knit group members (e.g., Ling, 2008; Sugiyama, 2011) people can feel the stronger need for staying abreast of this meaning-making process. The meanings they create are essential for developing and maintaining their social relationships, and also, constructing their selves. This might be a reason why some of the focus group participants feel that they cannot ignore the phone calls around midnight. If one of their friends needs to talk late at night, they should be available for him/her as a close friend. After all, s/he is relationally close enough to feel comfortable making such a late night phone call. They know that ignoring the call would not be perceived favorably within the agreed-upon framework of meanings among their close-knit group members.

In discussing Durkheim, Ling (2008) points out Durkheim’s sentiment that “there was a plasticity regarding the concrete forms used in the ritual” (p. 49). What is important, according to Ling, is not about each steps of rituals, but rather, about the group’s awareness of the ritual itself and how mutually understood interaction rituals help develop a sense of unity and cohesion (Ling, p. 49-50). In applying Durkheim to the context of mobile communication, Ling draws our attention to the role of totem in rituals. He points out that the totem is “an object or icon into which the energy of the collective ritual is symbolically invested” (Ling, p. 50) which serves as a symbolic reservoir of shared experiences; but constant contact via mobile communication nullifies the periodic need for co-presence to rejuvenate its symbolic power, obviating the totem in the group. In this way, mobile-mediated interactions become pivotal in creating solidarity and cohesion rather than solely relying on co-present interactions like before. Because mobile-mediated interactions make the internal group bond stronger (Ling, p. 18), conforming to the internally proper rituals is essential for staying in-group. This can give a paramount pressure to be always close to their mobile for those who belongs to a group where “always in contact” is an expected interactive ritual, leading to a more intense level of emotional attachment to the mobile.

The process of developing an emotional attachment to their mobile device can also be analyzed in light of the discussion of social robots. The present analysis offers additional support for the idea about how humans start blurring the distinction between their relational partners and the mobile device that affords the sense of perpetual contact. As Fujimoto (2005) states, the mobile device is more than a tool for young people in Japan, and “it is something that they are highly motivated to animate” (p. 87). And this trend was more pronounced among those who suggested a higher level of emotional attachment to their mobile device and a higher level of proximity to their device. This is indicative of how a mobile device has gone through the process of *anthropomorphization*, turning into a *quasi-social robot*.

Katz (2003) states, “human perception can lead to the feeling that machines have a value, ‘mind,’ and separate evolution unto themselves” (p. 314). The mobile device is *anthropomorphed* into an almost autonomous entity in the mind of some people. This autonomy at the perceptual level might be a factor that triggers the felt need of control of the device. In discussing the idea of media equation, which is the idea of “media equal real life” (Reeves & Nass, p. 5), Reeves and Nass (1996) state that what *seems* real is more influential than what *is* real. Then, this perceived *anthropomorphization* could play a significant role in their mobile experiences.

Turkle (2012) states that attachment to the technological artefact follows from what they evoke in users, and not from the belief that those objects have intelligence and emotions (p. 20). We feel attached not because we think that they are communicating with us but because it triggers numerous emotions. As Turkle reports, children built “a thou” with sociable robots such as Kismet and Cog from caring, disappointment, and anger, among others (p. 92). Reflecting upon this present Japanese case study, we can see a parallel here: it is not that these people are feeling that their mobile is actually their relational partner. Because of the emotion that it triggers, such as anxiousness, anger, and comfort, they feel as if their mobile is alive, or in Turkle’s term, “alive enough” (2011, p. 35), although its appearance and originally intended function are quite different from such sociable robots as Furbie and Aibo. It is not about actually confusing their relational partners and their mobile device, nor confusing their mobile device with one of those sociable robots. Indeed, the boundary blurring for this ubiquitous technology is so subtle and very hard to recognize in everyday use.

The paper also discussed how some experience their own mobile device as a part of their body. This suggests how a mobile device is perceptually incorporated into the body, turning humans into *quasi-social robots*. Because of the physical closeness and emotional immediacy people feel toward their mobile device, the mobile device is perceived as a part of themselves. The enhanced ability to interact, and also, to feel the presence of important others, technologizes us at a more advanced level than the pre-mobile phone era. The prevalence of smart phones is presumably making our body into a hybrid with even more advanced technologies.

Fortunati (2003) argues that the human body “is represented as the emblem of naturalness” within a historically determined concept of naturalness, yet it is indeed “artifice to the maximum degree” (p. 72). Then, how shall we reconsider the technologized human body in relation to the concept of naturalness? When we use a term such as *quasi-social robot*, many of us might have certain negative reactions thinking that we are losing our naturalness. Do we need to resent it if some of us are turning into *quasi-social robot* as a result of their mobile device melding with us? If we experience electronic emotions with the mobile device melded with us, is it an *unnatural* human experience? The strength of the electronic emotions that some of the people reported seems to suggest that their experienced emotions are no less natural.

If emotion is one of the criteria to distinguish humans from social robots, then, a *quasi-social robot* in this case should not be heavily associated with the autonomous entity with artificial intelligence but without emotions. It is rather a metaphor that conveys the extent to which humans are now equipped with advanced technologies, making us more powerful but also simultaneously more vulnerable. The heightened complexity in the relational dynamics, and the emotions that are triggered and exchanged deserve further investigation to see how their emotional experiences are changing. Detailed examination of the process in which people manage emotions triggered and mediated via their mobile device in the given relational and technological dynamics will foster our understanding of the transcending boundary between humans and the mobile communication device, informing the question of social robots and emotion.

## REFERENCES

- Baxter, L. A. (2004). A tale of two voices: Relational dialectics theory. *Journal of Family Communication*, 4(3&4), 181-192.
- Campbell, S. W. (2008). Mobile technology and the body: Apparatus, fashion, and function. In J. E. Katz (Ed.), *Handbook of mobile communication studies* (pp. 153-164). Cambridge, MA: MIT.
- Cladis, M. S. (2001). Introduction. In E. Durkheim (2001). *The elementary forms of religious life* (C. Cosman trans.), (pp. vii-xxxv). Oxford: Oxford University Press. (Original work published 1912)
- Durkheim, E. (2001). *The elementary forms of religious life*. (C. Cosman trans.). Oxford: Oxford University Press. (Original work published 1912)
- Fortunati, L. (2003). The human body: Natural and artificial technology. In J. E. Katz (Ed.), *Machines that become us: The social context of personal communication technology* (pp. 71-87). New Brunswick, NJ: Transaction.
- Fortunati, L., Katz, J. E., & Riccini, R. (2003). *Mediating the human body: Technology, communication, and fashion*. Mahwah, NJ: Lawrence Erlbaum.
- Fortunati, L., & Vincent, J. (2009). Introduction. In J. Vincent, & L. Fortunati (Eds.), *Electronic emotion: The mediation of emotion via information and communication technologies* (pp. 1-31). Oxford: Peter Lang.
- Fujimoto, K. (2005). The third stage paradigm: Territory machines from the girls' pager revolution to mobile aesthetics. In M. Ito, D. Okabe, & M. Matsuda (Eds.), *Personal, portable, pedestrian: Mobile phones in Japanese life* (pp. 77-101). Cambridge, MA: MIT.
- Katz, J. E., & Aakhus, M. (2002). *Perpetual contact: Mobile communication, private talk, public performance*. Cambridge: Cambridge University Press.
- Katz, J. E. (2003). *Machines that become us: The social context of personal communication technology*. New Brunswick, NJ: Transaction.
- Katz, J. E., & Sugiyama, S. (2006). Mobile phones as fashion statements: Evidence from student surveys in the US and Japan. *New Media and Society*, 8(2), 367-383.
- Lebra, T. S. (1976). *Japanese patterns of behavior*. Honolulu, HI: University Press of Hawaii.
- Lindlof, T. R. (1995). *Qualitative communication research methods*. Thousand Oaks, CA: Sage.
- Ling, R. (2003). Fashion and vulgarity in the adoption of the mobile telephone among teens in Norway. In L. Fortunati, J. E. Katz, & R. Riccini (Eds.), *Mediating the human body: Technology, communication, and fashion* (pp. 93-102). Mahwah, NJ: Lawrence Erlbaum.
- Ling, R. (2008). *New tech, new ties: How mobile communication is reshaping social cohesion*. Cambridge, MA: MIT.
- Ling, R., & Yttri, B. (2002). Hyper-coordination via mobile phones in Norway. In J. E. Katz, & M. Aakhus (Eds.), *Perpetual contact: Mobile communication, private talk, public performance* (pp. 139-169). Cambridge: Cambridge University Press.
- Matsuda, M. (2005). Discourses of *keitai* in Japan. In M. Ito, D. Okabe, & M. Matsuda (Eds.), *Personal, portable, pedestrian: Mobile phones in Japanese life* (pp. 19-39). Cambridge, MA: MIT.
- Meyrowitz, J. (2003). Global nomads in the digital veldt. In K. Nyiri (Ed.), *Mobile democracy: Essays on society, self and politics* (pp. 91-102). Vienna: Passagen Verlag.
- Oksman, V., & Rautiainen, P. (2003a). "Perhaps it is a body part": How the mobile phone became an organic part of the everyday lives of Finnish children and teenagers. In J. E. Katz (Ed.), *Machines that become us: The social context of personal communication technology* (pp. 201-217). New Brunswick, NJ: Transaction.
- Oksman, V., & Rautiainen, P. (2003b). Extension of the hand: Children's and teenagers' relationship

- with the mobile phone in Finland. In L. Fortunati, J. E. Katz, & R. Riccini (Eds.), *Mediating the human body: Technology, communication, and fashion* (pp. 103-111). Mahwah, NJ: Lawrence Erlbaum.
- Reeves, B., & Nass, C. (1996). *The Media equation: How people treat computers, television, and new media like real people and places*. New York: Cambridge University Press.
- Strauss, A., & Corbin, J. (1998). *Basics of qualitative research: Grounded theory procedures and techniques*. Newbury Park, CA: Sage.
- Sugiyama, S. (2006). Fashioning the self: Symbolic meanings of the mobile phone for youths in Japan. (Doctoral Dissertation, Rutgers, The State University of New Jersey, 2006). AAT3240282.
- Sugiyama, S. (2009). The decorated mobile phone and emotional attachment for Japanese youths. In J. Vincent, & L. Fortunati (Eds.), *Electronic emotion: The mediation of emotion via information and communication technologies* (pp. 85-103). Oxford: Peter Lang.
- Sugiyama, S. (2010a). Fashion and the mobile phone: A study of symbolic meanings of mobile phone for college-age young people across cultures. J. R. Hoflich, G. F. Kircher, C. Linke, & I. Schlote (Eds.), *Mobile media and the change of everyday life* (pp.171-190). Berlin: Peter Lang.
- Sugiyama, S. (2010b). Seeking equilibrium: A study of how college students with diverse cultural backgrounds experience mobile communication in everyday life. *Encyclopaideia: Journal of Phenomenology and Education*, 27(2), 133-154.
- Sugiyama, S. (2011). Interpersonal communication beyond geographical constraints: A case of college students who maintain geographically dispersed relationships. In R. Ling, & S. W. Campbell (Eds.), *Mobile communication: Bringing us together or tearing us apart? (The mobile communication research series, vol. II)* (pp. 271-292). New Brunswick, NJ: Transaction.
- Turkle, S. (2011). *Alone together: Why we expect more from technology and less from each other*. New York: Basic Books.
- Vincent, J. (2003). Emotion and mobile phones. In K. Nyiri (Ed.), *Mobile democracy: Essays on society, self and politics* (pp. 215-224). Vienna: Passagen Verlag.
- Vincent, J. (2009). Emotion, my mobile, my identity. In J. Vincent, & L. Fortunati (Eds.), *Electronic emotion: The mediation of emotion via information and communication technologies* (pp. 187-206). Oxford: Peter Lang.
- Zhao, S. (2006). Humanoid social robots as a medium of communication. *New Media and Society*, 8(3), 401-419.

## BIOGRAPHY

**Satomi Sugiyama** is associate professor of Communication and Media Studies at Franklin College Switzerland. She has been conducting research on the way young people perceive and use mobile communication technologies in various cultural contexts, particularly in Japan. She completed her Ph.D. in Communication at Rutgers University in 2006. She was awarded MacArthur and National Endowment for the Humanities pre-doctoral fellowships at Colgate University. She has organized an international exploratory workshop on social robots and emotion upon receiving a grant from the Swiss National Science Foundation in 2011, and is currently examining the boundary between humans and mobile technologies.

# **Digital Inscriptions and Loss of Embarrassment: Some Thoughts about the Technological Mediations of Affectivity**

**Amparo Lasén**  
**Universidad Complutense de Madrid**

## **ABSTRACT**

One of the consequences of the widespread use and ubiquity of digital technologies is how a growing number and kind of exchanges and information are inscribed in and by these devices, as texts, images and sounds, contributing to the materialization of emotions and feelings. These affective inscriptions increase our reflexivity and the sharing of emotions, the attachment between people and devices, as well as the mediated attachment and attunement to other people. These inscriptions that increase the ability to read and keep track of affects and relationships contribute to the shaping of our affective cultures, as well as to contemporary modes of subjection. Contemporary transformations of the threshold of embarrassment regarding the disclosure of personal information and personal images online are an example of this digital contribution to our affective culture.

**KEY WORDS:** digital inscriptions, affective turn, affective paradox, embarrassment

## INTRODUCTION

If we agree with cultural analyst Evan Eisenberg (2005) that writing turned poetry into a thing and that music became a thing thanks to recording technologies, we could ask ourselves whether information and communication technologies (ICTs) are transforming emotions into things due to the inscriptive power of digital devices and their growing mediation of affective relationships and interactions. Thus, mediated affects would become things inscribed in our phones, tablets, computers and screens, that we can manage, count, weigh, compare, read, share, interpret and distance ourselves from. This “we” reading and listening to these affective inscriptions afforded by digital devices covers diverse agents with different and sometimes conflicting agendas: people involved in different interpersonal relationships; designers and engineers thinking in terms of “affective bandwidth” or emotional usability; commercial agents leading marketing strategies; or public authorities engaged in the somehow “schizoid” task of trying to gather information about their citizens, as well as trying to control and limit who makes these affective inscriptions and how they are made.

In this paper I discuss digital mediations of affectivity highlighting the implications of the inscriptive power of these technologies. The shared agency between people and technologies, the participation of these devices and applications in everyday interactions and relationships, and the ways in which current forms of remediation (Bolter & Grusin, 1999) configure affective experiences, constitute both an arena to study contemporary dynamics of continuities and shifts in our affective culture and emotional styles, as well as a privileged stage to deploy the study of emotions and test its different versions and concepts.

After a section on the growing interest about affects and emotions in different social realms, from social sciences to computing, design and management, the prevalence of dualisms in the different versions of studying and conceiving emotions is discussed, as well as the paradoxes derived from these assumptions. Then, I consider the notion of digital inscriptions and explore the transformations of embarrassment revealed by many contemporary digital practices, which help us to nuance and problematize the notion of ‘affective bandwidth’ and the views on affectivity underlying such concept.

This paper is grounded on empirical research on mobile media carried out for the last decade, though it is not going to be discussed here. Mobile phones are at the center of this research, in convergence with other devices and applications. This empirical background relates firstly to the implications of digital photography for contemporary embodiment processes and the redefinition of intimacy, regarding self-portraits, their exchange in the Net or through mobile applications, as well as their growing presence online, from social network and sharing sites, to online dating sites or Instant Messaging exchanges<sup>1</sup> (Lasén & Gómez, 2009; Lasén, 2012). Secondly, research about mobile phones and couples relationships<sup>2</sup> focusing on communication, personalization and conflicts (Lasén, 2011; Lasén & Casado, forthcoming) provides material and examples for this discussion. Thirdly, previous research about mobile phones and emotions, part of a European cross-national

---

<sup>1</sup> Research Project “Estrategias creativas de los jóvenes y redes culturales para el desarrollo” in collaboration with the UNED (Spain) and UAM (México) funded by Fundación Telefónica; and the GRESO project “Digital self-portraits and contemporary masculinities” in collaboration with Antonio García (UCM).

<sup>2</sup> “Nuevas tecnologías de la comunicación y rearticulación de las relaciones de género: emergencia, expresión y gestión de los conflictos en la pareja” Research Project funded by the Spanish Ministry of Science and Innovation, carried out with my colleagues of the University Complutense of Madrid, Elena Casado, Rubén Blanco and Antonio García (2009-2011). ‘La contribución de los usos del teléfono móvil a la configuración y transformación de redes, vínculos y subjetividades’ by the Complutense Research Group Cibernomasaguas (2007-2008); Proyecto Complutense 2006 “La mediación de subjetividades e identidades sociales a través de la telefonía móvil,” with my colleagues from the University Complutense of Madrid, Angel Gordo and Lucila Finkel.

study about mobile phone users and uses, helped to ground a reflection about what an affective mobile phone could be (Lasén, 2004, 2005, pp. 121-187).<sup>3</sup>

## AFFECTIVE TURN

Since the mid-eighties of the last century, an increasing interest in emotions and affectivity has entered social sciences and social practices. This affective turn (Clough & Halley, 2007) is related to social changes in Western societies in the way of considering emotions, subjectivity and their relationship to rationality. It comes after several decades of theoretical critique and questioning of the traditional rationalist view of emotions. This conception considers emotions, at best as some luxury belonging to art and idleness and, at worst, as an obstacle to clear judgment. Therefore emotions had been relegated to private space and intimacy. As Norbert Elias (1982) points out, discipline and the self-constraint of emotions and urges became necessary in societies with growing complexity and social differentiation. In these rationalistic societies, ‘emotional’ is not only an adjective simply denoting that something or someone is related to emotion, but also it becomes a pejorative adjective. Those characterized as emotional – women, children, primitives – were thought to lack the fundamental ability to think and decide rationally, and were placed in the lower levels of the social and even human hierarchies.<sup>4</sup>

The social changes in Western societies that have modified this picture have been analyzed under the label of the crisis of modernity, postmodernity, reflexive modernity or post-industrial societies. In contemporary society, the expression of one’s subjectivity becomes almost a claimed right (Mansfield, 2000, p. 2). For more than thirty years now, social scientists have analyzed these changes in the social considerations of emotions and feelings, either to denounce the tyranny of intimacy and the vanishing of public space (Sennett, 1977) or to criticize the excess of rationalism, acknowledging that emotions are not only individual and psychological features but fundamental aspects of social life (Maffesoli, 1993). The tension between a civilization process marked by the restraint, shield and control of emotions and bodies, and the necessary emotional attunement for social life would be one of the features of modernity and its paradoxes.

Besides the different diagnosis and evaluations, what has been manifested in the realm of social sciences these last decades is the importance of seizing the role of emotions in the constitution of social experience, in order to understand what is at stake for people in everyday life (Lutz & White, 1986, p. 431). Emotions are necessary to understand social experiences, as they are part of these experiences and are also shaped by them. Therefore emotions are subject to cultural, collective and historical variations. Feelings are socialized (Hochschild, 1979), which entails learning how to feel, display and interpret emotions in different affective cultures. Emotional labor and management characterize a big part of the way people experience affectivity, and both are increasingly mediated by ICTs.

This attention to emotions arises as part of the effort to counteract the disembodied character of classic social theory, strongly supported and initiated by feminist theorists and women studies, and therefore goes with the centrality of subjectivity and embodiment in socio-cultural

<sup>3</sup> Certain sections of this paper have been published in Lasén, 2010a.

<sup>4</sup> The opening paragraph of the preface of *Affective Computing* by MIT researcher Rosalind Picard (1997) clearly summarizes the dominant Western conception of emotions, expressed with her personal unease:

I never expected to write a book addressing emotions. My education has been dominated by science and engineering, and based on axioms, laws, equations, rational thinking, and a pride that shuns the ‘touchy-feely.’ Being a woman in a field containing mostly men has provided extra incentive to cast off the stereotype of ‘emotional female’ in favor of the logical behavior of a scholar. For most of my life my thinking of emotions could have been summarized as: “Emotions are fine for art, entertainment and certain social interactions, but keep them out of science and computing” (p. X).

studies. This turn happened as well in culture and media studies with some authors' claim to shift the centrality from meaning to affect (Grossberg, 1992) acknowledging that culture and also media cannot be totally accounted for just as "signifying practices." Besides, meanings and affects are narrowly linked, as meanings are constructed in a constant movement of attunement, which makes them emerge and is made possible by the sharing and emergence of emotions.

Computing and technological design and usability are also part of this turn, with the emergence and development of affective computing, emotional usability and emotional design. Affective computing refers to giving computers the ability to recognize, express and have emotions in order to improve human-computer interaction (Picard, 1997, 2003), as people tend to interact socially and emotionally with computers (Reeves & Nass, 1996). Applications of affective computing are found in different shapes (wearables, autonomous agents, robots, software) and in different areas, such as entertainment, learning systems, simulations, surveillance and security applications.<sup>5</sup> Design and usability research have developed emotional awareness as well, taking into account pleasure, enjoyment and fun (Norman, 2003). This is a new way of understanding design that adds to the traditional engineering and scientific skills, the support of psychology, sociology and arts. The aim of both affective computing and emotional design is to make ICTs uses and experiences an emotionally richer interaction, multi-media and multi-sensuous, which would improve communication and task performance. They wish to contribute to people's awareness of their emotional style, and, in the case of affective computing, to make computer devices a kind of emotional intelligence tools. A contemporary example of this are the multiple mobile applications for couples developed and marketed recently (Feel Me, Avocado, Duet, Cupple, Between, Tokii, etc.), which work as a kind of a two-persons social network aiming to increase the couple continuous connectivity and their affective attunement, facilitating the sharing of personal messages and nonverbal affective cues (as the "thumbkiss," a vibration of the phone when both partners place their thumbs on the phone screen at the same time); as well as they allow an increased mutual surveillance and permanent localization.

This affective turn seems to be another example of the interaction between forms of academic and scientific knowledge and other social discourses and practices. Nowadays there is an interest in emotions by the public at large, manifested for instance in media and media studies, marketing, advertising, politics and political communication, or in the notion of emotional intelligence (Gardner, 1973; Goleman, 1997) being embraced by educators and businessmen alike. This growing concern about affectivity is also related to the renegotiation of the boundaries between private and public, leisure and work, and personal and professional. Emotions belonging to privacy, leisure and personal realms are now explicitly mobilized in public and working activities, and considered to be ways of augmenting productivity and efficacy. A phenomenon well seized in the term "playbour" used for instance to describe free labor, fan labor and peer production, as in the digital games industry (Kücklich, 2005). In these uses and practices emotions are targeted to increase productivity, to bring more efficacy and efficiency to working tasks, and to make time use more productive.

This is also found in the way people use technological devices for interpersonal and affective communication and relationships. For instance, in our research about couples and mobile phones, housewives describe their use of the mobile for family matters and exchanges using the same terms "efficacy," "efficiency," "time spare," which their husbands use to portray the advantages of the mobile phone use for work. Another example can be found in online dating sites advertising, which puts forward the advantage of their services in terms of productivity, efficacy and time sparing. These considerations are found as well in the accounts of users to describe their motivations and

---

<sup>5</sup> See for instance affective computing projects at the MIT, <http://affect.media.mit.edu/>.



practices in their online search for sexual or loving partners. Regarding the renegotiation of boundaries between work and leisure, or professional and personal relationships, it is noticeable the mutual borrowing of social practices and Internet applications, such as social network sites where the same design architecture serves both. Another example can be found in “speed dating” gatherings, a direct application of economic rationality to the realm of matchmaking and dating. Shortly after their first apparition in the late 90’s in the US and the UK, business speed dating was organized as well, as a way of providing contacts for professionals working in the same branch. Moreover, similar mechanisms are proposed to improve learning activities (Maidment & Crisp, 2007), revealing the growing fluidity between those different realms in contemporary societies, the articulation between affectivity, group dynamics, efficacy and learning.

The practices and spaces where emotions are expected are no longer considered secondary, revealing the growing importance of leisure activities and popular culture, not only economically but also in terms of personal self-fulfillment. Changes in the capitalist system and the modes of working organization in enterprises reveal an increasing concern with the emergence and mobilization of desires, hopes, beliefs, expressions of feeling, changes of sensibility, forms of intuitive intelligence and new communicative resources (Thrift, 2006). Affect becomes an economic factor necessary to the governing of productivity, not only because affectivity is increasingly commoditized and mobilized in the workplace, as affective labor and emotional labor theories state (Hochschild, 1983; and authors such as Hardt and Negri, Lazzarato, Virno, see Hardt, 1999), but also because economic value is measured affectively.

Therefore, affective computing software and applications would help to augment people efficacy and productivity, as well as to increase surveillance by gathering knowledge and data about emotional styles and people’s affects. Biometrics-based surveillance systems are just one of these examples. Questions about privacy, surveillance and the disclosure of personal information, are not often addressed by affective computing research, which only recently has started to consider the ethical implications of its applications. However ethical issues are addressed by proposing a contract between users and designers, as if they were the only actors involved (Reynolds & Picard, 2004). Although an effort is being made in this field, mostly in the work of Carson Reynolds, surveillance, harmful and unethical uses of affective computing, are mainly thought of as the consequences of misuse, accidents or some unruly individual behavior (Reynolds & Picard, 2005). The consideration of whether it is right to contribute to affective labor and the mobilization and surveillance of emotions for increasing work efficacy, productivity or consumption, is absent of such writings on ethics. This absence is maybe related to the lack of socio-cultural considerations in their way of approaching emotions.

Affective computing adopts a naturalistic version of emotions, which recognizes their link with cognition but tend to ignore social issues and social sciences literature concerning emotions and their cultural variations (Despret, 2004). Emotions are considered to be natural, universal, reactive, situated and measured biologically in the body and its organs. This choice is understandable because the simplified and systematic conceptualization of emotions and emotional expression makes easier the formulation of models susceptible to be implemented in software, robots and other computational devices. However this could be an obstacle to the main objective of affective computing: the achievement of the emotional interaction between users and devices. This ignorance of the socio-cultural aspects of emotions is doubled with a lack of consideration of the dark side of emotions. Affective computing authors tend to identify emotion with positive emotions and forget that all affects are not affects of joy. ICTs uses and practices entail many examples of these bad encounters that trigger passions of sadness, borrowing Spinoza’s terms: harm, flaming, trolling and bullying. Anger, anguish, anxiety, embarrassment, guilt, and sadness are emotions as well, which are as well present, shaped and elicited in digital practices and, as Spinoza points out, these affects

diminish people's abilities to act and achieve.

Following the scientific and biological categorization of emotions, these researchers do not seem to acknowledge the ambivalence and mixed feelings involved in any emotional experience, and that affective technologies or emotionally richer human-computer interactions would not eliminate the frustration and paradoxes inherent in social bonds and human communication. For instance, mobile phones, as in the previous example of mobile apps for couples, can increase the possibility of making good encounters, of being connected to those who bring us joy and relieve our sadness and stress. But being a device of social connectivity, they often make explicit and visible the lack of contact, when no call or message is received. They also create the occasion for bad encounters (unwanted calls, excessive requests, disturbing interruptions), often with these same loved ones, and reveal unrequited communication expectations, as it can happen within the couple, which can elicit disappointment and conflicts.

## VERSIONS OF EMOTIONS AND DUALISMS

The study of emotions mobilizes interdisciplinary approaches, from psychology, biology, neurosciences, sociology, anthropology, and philosophy, acknowledging the interplay between psychobiological and socio-cultural determinants that do justice to the complex, multi-component phenomenon called emotion (e.g. Damasio, 1994). When studying emotions we come across a plurality of terms: affect, emotion, passion, sentiment, feeling, and multiple definitions and conceptions. There are different versions of what emotions are and entail, corresponding to a plurality of notions, controversies, knowledge and disciplines (Despret, 2004).

These versions reproduce diverse dualisms regarding the way of conceiving emotions such as: reason/emotion, body/mind, universal-natural/socio-cultural, internal/external, active/passive-reactive. Thus, the traditional Western approach defines emotions as opposed to reason. They are considered to be passive reactions to external causes, which elicit them. Situated in the body, they are therefore revealed and measurable in biological processes. Emotions and their bodily manifestations are considered to be universal, common to all human beings regardless of socio-cultural and historical variations. This version has helped to develop many techniques and modalities used to detect physiological signals of affects, such as facial expression recognition, speech prosody recognition, and pressure sensors. Following the influential work of Charles Darwin (1872), the tenants of this version consider emotions as universal and adaptive: a biological navigation software developed through evolution to be used by individuals or groups. Cross-cultural research on emotion such as the 'neurocultural' research program led by Paul Ekman (Ekman, Friesen, & Ellsworth, 1992) draws on Darwinian insights, which studies facial expressions of emotions. This is one of the main conceptual backgrounds of affective computing as well.

The neurologist Antonio Damasio presents another current influential version of emotions, which, while criticizing the classic divide between emotion and reason and demonstrating the crucial role of emotions in rational decision-making processes, translates the body-mind duality in his differentiation of feelings (private mental representations) and emotions (public and bodily automatic responses) (Damasio, 1999). To this list of dualities concerning emotions, we could add another found in recent versions under the label 'affect theory', which oppose emotion and affect, (Deleuze & Guattari, 1987; Massumi, 2002, p. 28) influenced, as Damasio's work, by Spinoza. Emotions are considered to be individual, experienced as personal, a subjective content, fixed by social convention and language, endowed with meaning and function, subject to socialization practices and strategies of emotional labor and management, of intentional control and performance,

whereas affect would be pre-individual, non intentional, unqualified and unrecognizable.<sup>6</sup> This duality accounts for the non-social and non-conscious aspects of affectivity, without renewing the old conception of considering emotions universal, natural, and authentic, but sharing somehow some aspects with that approach, regarding the non-conscious and bodily character of affects. As the bodily ‘innate’ movements involving facial muscles, viscera, the respiratory system, skin, blood flow changes and vocalizations, which are triggered by uncontrolled factors, are considered to be the sign of affects, affectivity would be a form of ‘visceral perception’ preceding perception, accounting for the autonomy of affect regarding consciousness and language (Massumi, 2002, p. 25; a similar account can be found in Damasio’s work with different terms, emotion for the visceral reaction prior to perception, and feeling for the conscious perception).

This naturalistic approach is doubled with the belief that emotions are a sign of the authentic self and state of mind. This idea of the authenticity of affects that are neither socialized nor under the individual control can also be found in affect theory. Considering emotions as reactive, outside people’s conscious control, grounds for its authenticity and force. Individuals would be betrayed by their body reactions, from gestures to blood pressure, which would reveal their true state. This view does not account for all the forms of emotional management and control that have become habits and non-conscious, as well as the ways of expressing and displaying emotions, which are socially shaped and learnt.

This view coexists with the belief that passions can drive yourself away from your sense, that you are not yourself when too moved, as you are not able to see and reason clearly. Both beliefs produce what can be called the affective paradox. We would be outside ourselves when we are more authentic. As if socialization and individualization were a fake cover over our true self. But affects and emotions are source and effect of attachments: to other people, ideas, and things. Therefore affective authenticity would be linked to attachments, subjections, and dependencies, putting at risk as well the common view of the true and authentic self as an autonomous one. This ambiguity is stressed by contemporary conceptions of emotions as they are popularized by advertising, corporate management strategy or commercial media, with that double rhetoric about the importance of being passionate, spontaneous and involved, but also of being in control of what happens, of one’s life, relationships, activities and feelings. In these brief accounts of contemporary subjectivities that are the self-presentation profiles of online dating sites, this double character of being passionate and spontaneous, but in total control as well, is found very often. This paradox about self-control and authenticity also points to the ambiguous status of intentional behavior, as the link between emotions and authenticity would entail that we are more authentic, closer to our true self when not acting intentionally.

The study of emotions is narrowly linked to the analysis and study of subjectivities, which are also burdened by a similar dualism, or by the attempts to overcome it by proposing a monist solution, a synthesis or harmonization of the opposed terms. Translating to the research about emotions what Elizabeth Grosz proposes for the study of subjectivities (Grosz, 1994), we could see that the problem with dualism is not that it differentiates and particularizes entities and concepts, but that these are placed in a particular relationship of opposition, hierarchy or exclusion that is supposed to always exist, for all cases and situations. Following Grosz, instead of replacing dualism by monism, and therefore losing the particularities and differences of the terms forming the duality, a more productive approach would be to consider the articulations and disarticulations, resonances and dissonances between those different terms in each particular situation. This is, how the body

---

<sup>6</sup> This view fails to take into account that subjectivities and subjective matters, are not only related to the individual subject and social conventions, as complex dynamics, resistances and a multiplicity of actors, as the objects and technologies that form our material and media environment, are involved in the always dynamic subjectivation processes.

and the mind, the internal and the external, the collective and the individual, the biological and the cultural, as well as the different mediations and material conditions of our environment, are mobilized in the emergence, shaping, expression, display, performance, experience and understanding of emotions. This is to say, how the different approaches, the different versions of emotions, with their particular forms of knowledge, methodologies and research instruments, contribute to their shaping as well.

Then, we could recognize that the duality between affect and emotion quoted above can be considered differently as well, looking at how in everyday situations these individual and pre-individual aspects are both present, part of the same affective experiences, for instance by observing media practices where affectivity emerges and is mobilized. Søren Mørk Petersen's research about the sharing of personal pictures on the Web offers a good example of how in Flickr users' practices both forms coexist. The affectivity involved, as well as the emotions shared and the quality and intensity of the sharing experience, mobilized by the display in the pictures of the banality of everyday life, go beyond the function and meaning of the pictures shared, and relate to collective and common experiences. The subjective aspects of such practices are not necessarily conscious, individual and intentional, as it is revealed by the difficulties of the amateur photographers to explain why they take and share those pictures (Petersen, 2009). In our research about mobile phone uses and practices, both dimensions of affectivity are found as well, sometimes entangled in the same situation: the emergence of unforeseen and unintentional emotional experiences, as well as the collective conventional shaping of affects, strategies of control, face-work monitoring, accountability and modes of subjection (Lasén, 2011; Qiu, 2007; Green, 2001).

## **DIGITAL INSCRIPTIONS AND EMBARRASSMENT**

The growing presence and uses of ICTs mediate people's relationships with their environment, the others and themselves, producing multimedia digital inscriptions of places, bodies and emotions, as well as contributing to the shaping of localities, affectivity and selves. These technological practices put into play a complex articulation between mobility and attachment: an increasing mobility, not only spatial, but also mobility of thoughts, ideas and feelings, whereas people's uses and social practices around these media reveal how they contribute to develop different kind of attachments, to the devices, to the applications, to other people, and to particular online and offline places. Digital technologies contribute to the materialization of affects through their inscription as text, images and sounds in our mobile phones and Internet applications such as emails, social networks sites, blogs and micro-blogs, instant messaging, forums or sharing sites. They take part in the emergence, shaping, display, management, control, expression and experience of positive and negative emotions, as well as in the social learning process of affective experiences and communication. These uses and practices are redefining the realm of intimacy (Perterra, 2005; Prøitz, 2005; Hjorth, 2008, 2011; Tomita, 2006; Crawford, 2008; Arminen & Weilenmann, 2009). Moreover, we have an affective relationship with our devices and applications, and are emotionally attached to them (Lasén, 2004, 2010; Vincent, 2005). This is partly due to the intrinsic emotional character of human interactions, and also because ICTs that are present in most of the settings of everyday life have become technologies of intimacy (Haraway, 1991; Fortunati, 2002) and technologies of the self (Foucault, 1988), which mediate our attachment to others.

Social bonds and relationships, as well as emotions, are mobile and fluid. They need to be followed, traced and localized. The possibility of keeping track of these movements, of stabilizing the affective flux of interpersonal contacts, depends to a great extent on the materiality of objects, bodies and devices. ICTs and their ability to keep the trace of communications, messages, social networks and activities are an example of this inscriptive power (Ferraris, 2005). They are not only

mediators of verbal, written, aural and visual communications but artefacts that make and keep multimedia inscriptions. They afford the inscription and visibility of users' social networks, of their significant ones' presence, and of their affective bonds materialized in the images, sounds and texts sent, received and stored. These devices can even provide insight into the degree of cohesion of relationships by keeping the trace of their intensity and the reciprocity between the partners. This can be measured through the register of calls and SMS, as some people do when they compare the frequency and amount of calls and SMS from and to their partners (Lasén, 2011).

Emotions are an example of the shared agency between individuals and other entities. Being acted upon, put into motion, and affected, can be considered ways of sharing our personal agency. Nowadays technology uses and practices entail forms of shared agency between people and devices, where both entities are affected and mobilized by the other, where uses are the result of negotiations and clashes between technical affordances, commercial conditions and people's intentions, aims, habits and obligations, and where non-intentional as well as non-conscious aspects are involved. This shared agency is a dynamic and learning process where all these aspects (affordances, conditions, norms, intentions, habits, experiences, emergences) are subject to change and mobilized too. People's relations with their digital devices are an example of a material and bodily tie that mediate other interactions. They facilitate some exchanges, activities and modes of control. They contribute to the eliciting, expression, communication and management of affects and emotions.

ICTs are taking part in the shaping of contemporary individuals and their interpersonal bonds. The shaping of the self also entails different modes of emotional attunement and attachment, modes of subjecting the self. In this case, the term 'subject' entails a double meaning. The first is subject as being subject to something or someone, under the power, control or dependence of another person, group or institution. The second is subject as constraint to a particular identity, self-conscience and self-knowledge (Foucault, 1982). Both meanings suggest a form of power that subjugates and shapes us as subjects. There are two modes of attachment regarding these technological practices: first, the relations between people and the devices, and secondly, the interpersonal relationships mediated by digital technologies. Therefore the dependence and attachment to the devices are both narrowly linked to the dependence and attachment to other people and to our obligations to them.

## AFFECTIVE BANDWIDTH

The notion of 'affective bandwidth' refers to the amount of affective information relayed through a particular device or application (Picard, 1997, p. 57). It is currently used in affective computing, software and videogame design. The affective bandwidth of a channel refers to how much affective information the channel lets through. Information is conceived as "discrete units or states internal to an individual that can be transmitted in a loss-free manner from people to computational systems and back" (Boehner, DePaula, Dourish, & Sengers, 2007, p. 275). But this is a particular kind of information that concerns not only the kind of feeling or emotion but also the shades, the emotional tonality of the exchange and the mood of the participants. Affective computing researchers adopt a version of emotions, which is not opposed to cognition but a part of it. In this case, the duality between emotion and cognition is solved by reducing emotions to cognition standards, failing to account for the particularities of emotions and their socio-cultural implications.

According to affective computing researchers, this bandwidth increases when more senses are involved and also when moving from asynchronic to synchronic communication. Affective information would be shaped by immediacy and delay. Email and SMS would have the lower affective bandwidth, followed by IM, then phone conversation, then video conference, as the maximum would be found in face-to-face encounters. This sequence resembles the communication

stages of people meeting in online dating sites: first emails and chat, then webcam and phone, and finally the face-to-face date. However the affective intensity experienced in digitally mediated communication does not necessarily follow that path. For instance our research about couples reveal that the forms of written communication, as texts and *WhatsApps*, are more frequent and intense during the first stages of the relationship, when falling in love, as they are the favorite form for romantic exchanges, for describing and communicating feelings and moods. “Colder,” asynchronous, written media do not always facilitate colder emotional experiences. From cybersex to the anger or love bursts caused when writing or reading particular messages, many are the everyday examples of intense emotional experiences afforded by this media. In cybersex, talk and written chats “function as sex” (Attwood, 2009). They can be forms of sexual intercourse. Regarding the senses and the body, one should not forget that in spite of the distance, the delay, and the lack of clues about the physical presence of the other, bodies are there, involved and affected. The participants affect and are affected, feel in their bodies and their senses, the effects of the affective experiences they are living.

This affective intensity is increased by the digital inscriptions of these exchanges, which contribute to materialize our emotions in texts, images and sounds that we can store, revisit, share, comment or compare. All these activities afforded by digital inscriptions can elicit further emotions as well, revealing different affective tones, as when reading several times through the day the loving words of our partner, increasing as well our attachment, our subjection, to these devices and platforms where these inscriptions are kept and displayed.

The assessment of the affective bandwidth has to consider not only the affordances and constrains of the particular media but also the asymmetry of the sender and the recipient. The choice of a so called colder channel in order to minimize the affective implication of the sender, as part of the face-work when communicating some bad news or when the message risks to harm or upset the receiver, can have the effect of making the receiving experience a much more emotional one. As the recipient’s anger, frustration or sadness will be increased by the sender’s media choice, for instance, when a partner chooses to communicate the end of a love relationship by SMS or when an employer uses this same channel to let his workers know that they are made redundant.<sup>7</sup> Once again one has to take in consideration the concrete situation of the exchange, the kind of relationship between the participants, the current norms setting their expectations, in order to assess the affective implications of a particular technological mediation.

It is usually assumed that technology-mediated communication always has less affective bandwidth than person-to-person communication.<sup>8</sup> This comparison between face-to-face and technology-mediated communication does not take into consideration the specific affective affordances of ICTs. For instance asynchronous forms of communication, from love letters to e-mails and texts, provide a way of displaying the emotion of the sender and of eliciting emotional responses in the receiver, which is different from the face-to-face communication, without being necessarily less intense. In many occasions the absence of the face-work and self-control required by synchronous and co-present forms of communication facilitates the emergence of affective occasions, as in the examples quoted above about romantic SMS. In these cases a particular form of emotion, embarrassment, is lowered, making easier the emergence of other kind of affects and affective information, as people dare to say and to show what would remain silenced and hidden in face-to-face encounters.

<sup>7</sup> In May 2003 British insurance company Accident Group fired 2400 workers, many of them received the announcement by an SMS sent by the human resources department to their company mobile phones, not during working hours, avoiding then a first collective reaction in the office, retrieved July 9, 2012 from <http://news.bbc.co.uk/2/hi/business/2949578.stm>

<sup>8</sup> Of course it does not mean that face-to-face encounters are always affective experiences, as we all have experienced how impersonal and formal these exchanges can be, in administrative contexts for instance.

Contemporary digital practices and uses reveal a shift concerning what is considered to be embarrassing and how to deal with embarrassment, as in the self-disclosure and sharing of intimate personal information, feelings and body images (Lasén & Gómez, 2009; Lasén, 2012). This distribution of intimate images and narratives found in blogs, social network sites, social sharing sites, webs for personal contacts, and other online exchanges between friends, acquaintances or strangers, marks a current change about intimacy and what is considered to be embarrassing. These changes are related to the contents of what is shared, the people and audiences who share it, and the situations and “spaces” where the self-disclosure takes place. Distance, delay and anonymity, as in the display and exchange of naked pictures of faceless bodies, afford forms of empowering exhibitionism (Koskela, 2004) and self-deprecation humor.

We can find examples of this loss of embarrassment in the growing number of amateur porn websites, sexting practices or initiatives as the web [vagasoftheworld.tumblr.com](http://vagasoftheworld.tumblr.com); in the numerous video clips posted in social network or sharing sites showing people drunk, vomiting or realizing other physiological activities considered unsuitable for the public viewing, as well as in the online written accounts of personal problems related to health, love and sex life, and other aspects of intimacy. In many cases these accounts are shared with strangers in online spaces, sometimes in forums that were not created with the intention to host these intimate outbursts, as the very popular Spanish site [forocoches.com](http://forocoches.com), a website composed of multiple forums, addressed mostly to men, where threads are frequently found where men share their unfortunate love experiences and break-ups, in a way that is not common in traditional male exchanges, where affectivity and recognition of one’s failures and mistakes are considered inappropriate. Of course all these examples, practices and platforms are very different, involving different participants and rules; but all of them reveal a loss of embarrassment. In these digitally mediated situation sharing matters concerning bodies, feelings, sexuality, fears and weakness, often with completely strangers, is correct, fits with the other participants’ expectations.

The sharing of these practices in reciprocal exchanges with collectives whose expectations you meet (“If you do it alone you are mad, but if you do it with others...”) helps to explain the changes in the threshold for embarrassment. As this is a particular self-feeling, where one is the object and the subject, elicited by the failure to fit with other people’s expectations. Embarrassment is the affective cost of not following the scripts of normative experience, which therefore changes as these scripts move on. It is experienced during undesired intimate situations, when we are visible and not ready to be visible (Erikson, 1950, p. 223). Therefore the lower threshold for embarrassment found in digitally mediated interactions could be the sign of an increased readiness to be visible. These changes raise conflicting views about what is considered to be suitable, as in the example of public campaigns in different countries warning against self-disclosure, addressed to young people, especially women, in order to counter these trends and to put embarrassment back in the picture, using fear and highlighting potential risks and threads.<sup>9</sup>

Distant and asynchronous modes of communication help to avoid some of the risks and embarrassing consequences of emotionally charged exchanges, so that the apparent lower affective bandwidth appears to be an advantage for the display, expression and performance of more intense emotions. This shows the complexity of evaluating the affective bandwidth. Forms of communication considered “colder” than face to face, with a lower affective bandwidth, are sometimes more suitable to make oneself visible, thanks to distance and delay. Face-to-face

---

<sup>9</sup> Often these campaigns shame young women who upload pictures or send MMS but not those who misuse these pictures in a kind of re-mediation of old practices of “slut shaming”, e.g. the Madrid Region Children’s Ombudsman Office campaigning “En la Web tu imagen es de todos”, <http://www.defensordelmenor.org/>; the US Campaign “Think before you post” by the National Center for Missing & Exploited Children and the Ad Council.

encounters are shaped by the face-work and the self-control of the participants. Technologically mediated encounters also have their forms of face-work and self-control, but very often they allow for rich affective exchanges and for more affective information to be exchanged, as it was already acknowledged by the MUD users interviewed by Sherry Turkle more than fifteen years ago (Turkle, 1995).

Fiction portrays this feature for mobile phones as a way of overcoming the expectations and norms developed in face-to-face encounters. That is, technological mediation re-mediate face-to-face interactions (gender, etiquette, appearance, language, class, etc.), allowing sometimes for different configuration. A good example is the short story of the Belgian writer Laurent de Graeve (2001), *Grégoire et le téléphone portable*. Grégoire is an upper class young man who has an extremely ritualized and formal communication with his father, a wealthy and busy chief director. They only meet once every three months for a lunch in the same expensive restaurant, the meeting always being arranged by the father's secretary. One day Grégoire's father is given a mobile phone and, for the first time in years, has the possibility of making and receiving calls without the mediation of secretaries and other employees. He phones his son and they have a more personal and intimate conversation than those face-to-face meetings over lunch. On this occasion Grégoire overcomes the constraints of his habits and education, as well as the fear of his father's authority and reveals to him that he is in love with another man. This is an example of how the participation of ICTs in our interactions changes their semiotic situation, as their mediations and the delay they facilitate cancel the "I am looking at you looking at me" immediacy. Forms of remediated immediacy emerge reconfiguring an intimacy that can be public, asynchronous and at distance. In the example of this short story the mediation of the mobile phone replace or weaken the usual mediations in the communication between father and son, making possible to overcome habits and non-written rules. The secret is revealed without eliciting embarrassment and the mobile conversation gives occasion to a much more affective and intimate exchange between both men.

The transformation of social norms concerning the visibility and sharing of personal and intimate matters in digitally mediated situations also mobilizes the affective paradox described above. On the one hand a great amount of personal and intimate visibility is driven by the aim of being and presenting oneself as more spontaneous and authentic, to our loved ones or to our online microaudiences, as well as by the empowering pleasures of breaking with the usual embarrassment rules. On the other hand the features of these digital mediations, such as the distance, the delay, the different ways of shaping and editing our digital inscriptions, afford a greater control and management of the affective information and experiences, this affective management being one of the main reasons as well for the shifts on the non written rules of what is suitable, as they allow for a particular face-work in these sensitive situations.

## CONCLUSION

The inscriptive power of ICTs, their ubiquitous presence and their ability to create affective occasions and to mediate emotional exchanges turn their practices and uses into privileged stages to put into practice a non-dualist approach to the study of emotions, accounting for the articulations, resonances and dissonances of their different aspects. Thus, the assessment of the affective bandwidth of a particular device or application has to take into account the diverse and complex situations of its uses and practices, as well as the particularities of affective information and the particularity of emotions. It is necessary to take into account the kind of affective experiences that emerged, in some cases unwillingly created by the sender's intention of saving his or her face. These experiences and situations exceed the intention and awareness of people involved in the exchanges, which raises questions about the ethical consequences of implementing devices and applications that



are able to disclose, reveal and perform emotions. Hence, affective information could be considered as a kind of 'active information,' borrowing Bohm's term (Clough et al., 2007), understood as a form of physical activity, which shapes energy and matter, which is not reduced to meaning and byte. As intensities, passions, encounters and experiences digitally inscribed, present complex power dynamics involving individuals, collectives, institutions and commercial interests. Therefore, the complexity of the affective implications of mobile media uses and practices demands a revision of the categories used to assess and develop their affective role.

The transformation of embarrassment reveals dynamics of subjectivation and de-subjectivation: how ICTs are contributing to the making of contemporary subjectivities and subjections, as well as to the oblivion and loss of former modes and attachments, that is, how they are taking part in the transformation of our affective culture. The notion of affective culture provides a schema of experience and action, used by individuals to build their behavior and to make sense according to their personal history, their style and their evaluation of the situation. The biological background is socially and culturally translated in ways that can be similar but also very different from one social group to another and also from one time to another, as Elias describes for instance, how people in the Middle Ages did not know the invisible walls of affective reactions that separate our bodies. They did not experience the shame and embarrassment associated with the body and its physical functions that we know (Elias, 1982), or we used to know.

The affective turn of these last decades could be the sign of a shift in the civilizing process, as affects and bodies matters are not relegated to the private realms but configure different modes of public intimacies, in parallel to what has been happening in the sphere of commercial media, reality television or politic communication. Self-control and discipline remain under the form of mediated and re-mediated ways of emotional management. Digital practices reveal the complex current emotional work, as they are part of our sentimental education and socialization of feelings. At the same time many of these practices display the will to experience and share affective intensity controlling the risks (something that according to Elias has been provided by mimetic leisure practices from theatre, to cinema and sports). The remediation of the affective paradoxes and ambiguities gives rise to forms of disquiet surrounding these practices, which are part as well of the emotional attunement required for social life, for the sense of belonging, and for recognition, involving diverse modes of attachment and subjection: to the significant others, to our micro-audiences, to the written and non-written rules of what is appropriate.

## REFERENCES

- Arminen, I., & Weilenmann, A. (2009). Mobile presence and intimacy - Reshaping social actions in mobile contextual configuration. *Journal of Pragmatics*, 41(10), 1905-1923.
- Attwood, F. (2009). 'deepthroatfucker' and 'Discerning Adonis'. Men and cybersex. *International Journal of Cultural Studies*, 12(3), 279-294.
- Boehner, K., DePaula, R., Dourish, P., & Sengers, P. (2007). How emotion is made and measured. *International Journal of Human-Computer Studies*, 65, 275-291.
- Clough, P., & Halley, J. (2007). *The affective turn: Theorizing the social*. Durham: Duke UP.
- Clough, P. et al. (2007). Notes towards a theory of affect-itself. *ephemera*, 7(1), 60-77. Retrieved from [www.ephemeraweb.org/journal/7-1/7-1cloughetal.pdf](http://www.ephemeraweb.org/journal/7-1/7-1cloughetal.pdf) (Last accessed on July 9, 2012)
- Crawford, K. (2008). These foolish things: On intimacy and insignificance in mobile media. In G. Goggin, & L. Hjorth (Eds.), *Mobile technologies: From telecommunications to media* (pp. 252-265). London: Routledge.
- Damasio, A. (1994). *Descartes' error: Emotion, reason and the human brain*. New York: Grosset/Putnam.

- Damasio, A. (1999). *The feeling of what happens: Body and emotion in the making of consciousness*. New York: Harcourt Brace.
- Darwin, C. (1872). *The expression of the emotions in man and animals*. New York: Philosophical Library.
- Deleuze, G., & Guattari, F. (1987). *A thousand plateaus: Capitalism and schizophrenia*. (B. Massumi Trans. and Foreword). Minneapolis, MN: University of Minnesota Press.
- Despret, V. (2004). *Emotional makeup: Ethnopsychology and selfhood*. New York: Other Press.
- Eisenberg, E. (2005). *The recording angel: Music, records and culture from Aristotle to Zappa*. New Haven, CT: Yale University Press.
- Ekman, P., Friesen, W., & Ellsworth, P. (1992). *Emotion in the human face*. New York: Pergamon.
- Elias, N. (1982). *The civilizing process*. Oxford: Blackwell.
- Erikson, E. (1950). *Childhood and society*. New York: Norton.
- Ferraris, M. (2005). *Dove sei? Ontologia del telefonino*. Milano: Bompiani.
- Fortunati, L. (2002). The mobile phone: Towards new categories and social relations. *Information, Communication & Society*, 5(4), 513-528.
- Foucault, M. (1988). Technologies of the self. In L. H. Martin et al. (Eds.), *Technologies of the self: A seminar with Michel Foucault* (pp. 16-49). London: Tavistock.
- Foucault, M. (1982). The subject and the power. Afterword. In L. D. Hubert, & P. Rabinow (Eds.), *Beyond structuralism and hermeneutics* (pp. 208-216). Chicago: The University of Chicago Press.
- Gardner, H. (1973). *Frames of the mind*. NY: Basic Books.
- Goleman, D. (1997). *Emotional intelligence*. New York: Bantam.
- Green, N. (2001). Who's watching whom? Monitoring and accountability in mobile relations. In B. Brown, N. Green, & R. Harper (Eds.), *Wireless world: Social and interactional aspects of the mobile age* (pp. 32-45). London: Springer Verlag.
- Grossberg, L. (1992). *We gotta get out of this place: Popular conservatism and postmodern culture*. New York: Routledge.
- Grosz, E. (1994). *Volatile bodies: Towards a corporeal feminism*. Bloomington: Indiana University Press.
- Haraway, D. (1991). A cyborg manifesto: Science, technology, and socialist-feminism in the late twentieth century. In *Simians, cyborgs and women: The reinvention of nature* (pp. 149-181). New York: Routledge.
- Hardt, M. (1999). Affective labor. *Boundary 2*, 26(2), 89-100.
- Hjorth, L. (2008). *Mobile media in the asia-pacific*. London/ New York: Routledge.
- Hjorth, L. (2011). Mobile specters of intimacy: A case study of women and mobile intimacy. In R. Ling, & S. W. Campbell (Eds.), *Mobile communication: Bringing us together or tearing us apart? (The mobile communication research series, vol. II)* (pp. 37-60). Edison, NJ: Transaction books.
- Hochschild, A. R. (1979). Emotion work, feeling rules and social structure. *The American Journal of Sociology*, 85, 551-575.
- Koskela, H. (2004). Webcams, TV shows and mobile phones: Empowering exhibitionism. *Surveillance and Society*, 2(2/3), 199-215. Retrieved from [http://www.surveillance-and-society.org/articles2\(2\)/webcams.pdf](http://www.surveillance-and-society.org/articles2(2)/webcams.pdf) (Last accessed on July 6, 2012)
- Kücklich, J. (2005). Precarious playbour: Modders and the digital games industry. *Fibreculture*, 5. Retrieved from <http://journal.fibreculture.org/issue5/kucklich.html> (Last accessed on July 9, 2012)
- Lasén, A. (2004). Affective technologies: Emotions and mobile phones. *Receiver*, 11, 1-8.
- Lasén, A. (2005). *Understanding mobile phone users and usage*. Newbury: Vodafone Group R&D.
- Lasén, A. (2010). Mobile media and affectivity: Some thoughts about the notion of affective bandwidth. In J. R. Höflich, G. F. Kircher, C. Linke, & I. Schlote (Eds.), *Mobile media and the change of everyday life* (pp. 131-153). Berlin: Peter Lang.

- Lasén, A. (2011). 'Mobiles are not that personal': The unexpected consequences of the accountability, accessibility and transparency afforded by mobile telephony. In R. Ling, & S. W. Campbell (Eds.), *Mobile communication: Bringing us together or tearing us apart? (The mobile communication research series, vol. II)* (pp. 83-105). Edison, NJ: Transaction books.
- Lasén, A. (2012). Autofotos: subjetividades y medios sociales, In N. García Canclini et al. (Eds.), *Jóvenes, culturas urbanas y redes digitales* (pp. 253-269). Madrid: Ariel-Fundación Telefónica.
- Lasén, A., & Casado, E. (2012). Mobile telephony and the remediation of couple intimacy. *Feminist Media Studies*, 12(4). Retrieved from <http://www.tandfonline.com/doi/full/10.1080/14680777.2012.741871>
- Lasén, A., & Gómez, E. (2009). Digital photography and picture sharing: Redefining the public/private divide. *Knowledge, Technology and Policy*, 22(3), 205-215.
- Lutz, C., & White, G. M. (1986). The anthropology of emotions. *Annual Review of Anthropology*, 15, 405-436.
- Maffesoli, M. (1993). *The shadow of Dionysus: A contribution to the sociology of the orgy state*. New York: University of New York Press.
- Maidment, J., & Crisp, B. (2007). Not just for romance: Applications of 'speed dating' in social work education. *Groupwork: An Interdisciplinary Journal for Working with Groups*, 17(2), 13-27.
- Massumi, B. (2002). *Parables for the virtual: Movement, affect, sensation*. Durham: Duke University Press.
- Norman, D. A. (2003). *Emotional design: Why we love (or hate) everyday things*. New York: Basic Books.
- Pertierra, R. (2005). Mobile phones, identity and discursive intimacy. *Human Technology*, 1(1), 23-44.
- Petersen, S. M. (2009). Common banality: The affective character of photo sharing, everyday life and produsage cultures. PhD thesis, department of innovative communication at the IT University of Copenhagen, Denmark.
- Picard, R. W. (1997). *Affective computing*. Cambridge: The MIT Press.
- Picard, R. W. (2003). Affective computing: Challenges. *International Journal of Human Computer Studies*, 59(1-2), 55-64.
- Prøitz, L. (2005). Intimacy fiction intimate discourses in mobile telephone communication amongst Norwegian youth. In K. Nyiri (Ed.), *A sense of place: The global and the local in mobile Communication* (pp. 191-200). Vienna: Passagen Verlag.
- Qiu, J. L. (2007). The wireless leash: Mobile messaging service as a means of control. *International Journal of Communication*, 1, 74-91.
- Reeves, B., & Nass, C. (1996). *The media equation: How people treat computers, television and new media like real people and places*. New York: Cambridge University Press/CSLI Publications.
- Reynolds, C., & Picard, R. W. (2004). Affective sensors, privacy, and ethical contracts. *Proceedings of CHI '04: Conference on human factors and computing systems*. Vienna: ACM Press.
- Reynolds, C., & Picard, R. W. (2005). Evaluation of affective computing systems from dimensional metaethical position. *1st augmented cognition conference, in conjunction with the 11th international conference on human-computer interaction*, July 22-27, Las Vegas, NV.
- Sennett, R. (1977). *The fall of the public man*. New York: Alfred A. Knopf.
- Thrift, N. J. (2006). Re-inventing invention: New tendencies in capitalist commodification. *Economy and Society*, 35, 279-306.
- Tomita, H. (2006). Keitai and the intimate stranger. In M. Ito, D. Okabe, & M. Matsuda (Eds.), *Personal, portable, pedestrian: Mobile phones in Japanese life* (pp. 183-201). Cambridge, MA: MIT.
- Turkle, S. (1995). *Life on the screen: Identity in the age of the Internet*. New York: Simon & Schuster.
- Vincent, J. (2005). Emotional attachment and mobile phones: An extraordinary relationship. In L. Hamill, & A. Lasén (Eds.), *Mobile world: Past, present and future* (pp. 11-28). London: Springer.

**BIOGRAPHY**

**Amparo Lasén**, holds a Ph.D. from the University Paris V-La Sorbonne. She is Professor of Sociology at the University Complutense de Madrid. Her research focuses on the social implications of the usages, practices and presence of ICT especially in relationship with affectivity and the configuration of contemporary subjectivities. Prior to her current position, she was the Vodafone Surrey Scholar at the DWRC of Surrey University, where she conducted cross-cultural research on mobile phone uses and practices. She has been academic visitor at the Department of Sociology of the LSE and researcher of the CEAQ (Centre d'Études de l'Actuel et du Quotidien) Paris V-La Sorbonne. A list of her publications is available at <http://ucm.academia.edu/AmparoLasén>

# From the Posthuman Consumer to the *Ontobranding* Dimension: Geolocalization, Augmented Reality and Emotional Ontology as a Radical Redefinition of What Is Real

Nello Barile  
IULM University of Milan

## ABSTRACT

This paper seeks to underline how *ontobranding* (Barile, 2009a, 2009b) is the final stage of an evolution from an old ideal of interaction between human and machines to a new kind of interaction where the machines become softer and immaterial, emotions become contents, and places become media. In this endeavor, this paper first offers an overview of how branding and consumer culture evolved. It then highlights the close link between technologies and emotions by introducing how the main metaphor (from monster, robot, to cyborg) has shifted with the development of society. With the metaphors and societal/technological transformation in mind, the next section explicates the notion of *ontobranding*. Finally, the paper provides some case analyses applying the *ontobranding* perspective, suggesting that the analyses of contemporary technological innovations require a new perspective that is able to understand and unify the dynamic interaction between what were once separated as the ontological distinction between reality and virtuality.

**KEY WORDS:** emotional ontology, selfbranding, digital dualism, geolocalization, augmented reality, Supranet, posthuman consumer, ingress (Google)

## INTRODUCTION

The process of progressive integration between the three circuits of technology, consumption and communication (Kline, Dyer-Witheford, & de Peute, 2003) has brought us today to rediscover the hidden value and the strategic importance of the Real, the place, and the concrete human experience. Although the branding used to be a marketing tool to empower the visibility and the activity of companies, it has become more diffused in the social scene from the second half of the nineties. In other words, it has been adopted by users/consumers that wanted to reconstruct their identities and communicate them in a larger scale. The development of the web 2.0 empowered this idea and extended the possibility of existential branding to a larger amount of people. At the same time, there is the possibility of even greater progress in the development of technologies that tell us, in the future, real objects and places will be smarter and permanently connected with the immaterial world. At this moment the logic of branding could be the common language spoken by companies, people and artificial entities although it will be much different from the simple way of communication based on traditional advertising. It will be a new way to reshape the surface of reality through a complex system of experiences, emotions and relations (Barile, 2012).

The aim of this paper is to reflect on the *ontobranding* (Barile, 2009a, 2009b) dimension as the point of intersection between two processes of transformation: the process in which the brand logic and the consuming culture develop from an anterior, mass dimension to a micronized distillation in the everyday life, and the process in which the technological system evolves from a hard and utilitarian conception to a softer ideal based on the emotional value of new devices. The topic of an emotional status of technologies is not just referable to the digital development but it also involves the uses of oldest media (Fortunati, 2009). The same happens if we want to discover the origin of the so called “emotional capitalism” (Illouz, 1997), which is not just a technological production but it has more to do with development of a scientific industrial organization and the dynamic relationship between production and consumption.

The evolution of this new form of capital works as a circular process of modification where the reification of human emotions through consumption and digital innovation (as in the dynamic of social networking) corresponds to the specular process of emotional transformation of technologies (as in the radical case of Turkle’s emotional robots). The reification of emotion and its transformation in a resource of the late capitalism is just a way to implement a new dimension where the virtual and the real, the map and the territory become a unique communicative entity. In other words, *ontobranding* (Barile, 2009a, 2009b) indicates the process of a progressive and radical integration of knowledge, emotions, publicity and the being through the new technological environment. In this paper I will try to underline how *ontobranding* is the final stage of an evolution from an old ideal of interaction between human and machines to a new kind of interaction where the machines become softer and immaterial, emotions become contents, and places become media. In this endeavor, this paper first offers an overview of how branding and consumer culture evolved. It then highlights the close link between technologies and emotions by introducing how the main metaphor (from monster, robot, to cyborg) has shifted with the development of society. With the metaphors and societal/technological transformation in mind, the next section explicates the notion of *ontobranding*. Finally, the paper provides some case analyses applying the *ontobranding* perspective. The methodology of case studies is a fruitful approach because it allows me to explore the lines of conjunctions across heterogeneous objects such as applications, commercial devices and academic experiments, with the aim to define a meaningful scenario where new technological trends are developing.

## EVOLUTION OF BRANDING AND CONSUMING CULTURE

In my previous work (Barile, 2009a, 2009b), I analyzed the development of our contemporary consuming society as a mix of technological, organizational and communicational innovations that modified the “spontaneous” practices of everyday life from the second half of the XIX century to the present. Those four main stages of development are: a) Welcoming, b) Diffusion, c) Profusion, and d) Dilution. The first stage is very old and concerns the birth of the consuming system. The main metaphor of this time is the Universal Exhibition, a huge container of the main industrial innovations. This can be considered the real generative point of the contemporary cultural industry under the “media archeology” perspective (Abruzzese, 1993). “Welcoming” means that the everyday life prepares itself to host the new goods made for a new lifestyle and installs several frames in the body of the urban space where people can confront their local experience with something made somewhere else, in far laboratories with new tools of production.

The second stage, the “Diffusion” is governed by the metaphor of the machine and the factory, especially the Fordism that transforms the Protestant value of “thrift” (Rifkin, 1994; Ewen, 1998) in a new moral legitimization of opulence. Since the mechanical idealization of society had a strong impact on the communication research, the experts of the communication research have studied even a post-mechanical medium such as the TV as a mass production system.

The third stage, the age of “Profusion” (from the second half of the seventies to the end of eighties), is dominated by the TV imagery but is also characterized by the metaphor of the home computer as the new protagonist of everyday life. From the 1982, when it was nominated as the protagonist of the year on the cover of the Times, to the 1984 when the famous Apple’s advertising campaign represents a dystopian world where the electronic image of a common Big Brother, speaking to his crowd, is broken from a hammer hurled from an amazing blond athlete.<sup>1</sup> According to J. M. Floch (2000), the semiotic opposition between the world of meanings representing Apple and the world of meanings representing IBM (the soft and multi-chromatic shapes against the gray and straight ones) is the implicit narration of the opposition between the two different logos (p. 41).

	<b>IBM</b>	<b>APPLE</b>
<b>Structure</b>	<ul style="list-style-type: none"> <li>- Complex configuration</li> <li>- Repetition (abab)</li> <li>- Disjoined lines</li> </ul>	<ul style="list-style-type: none"> <li>- Simple configuration</li> <li>- Non-repetition (abba)</li> <li>- Joined lines</li> </ul>
<b>Colour</b>	<ul style="list-style-type: none"> <li>- Monochromatic</li> <li>- Cold</li> </ul>	<ul style="list-style-type: none"> <li>- Polychromatic</li> <li>- Warm</li> </ul>
<b>Forms</b>	<ul style="list-style-type: none"> <li>- Substance (Bold)</li> <li>- Straight</li> </ul>	<ul style="list-style-type: none"> <li>- Outline</li> <li>- Curved</li> </ul>

(J. M. Floch, 2000, p. 41)

In both cases of a rationalistic vision of the digital innovation or of a more human one, the age of Profusion communicates technology adopting the semiotic ideal of a powerful branding, while consumer is called to be part of a certain world of meanings, empowering his own identity through the brand ID.

<sup>1</sup> <https://www.youtube.com/watch?v=HhsWzJo2sN4>

The fourth stage that we can call as the “Dilution” lasts from the nineties until today. The main aspects of this stage are represented in the Wim Wender’s *Until the End of the World* (1991), where the uses of video phones and other devices give us a hilarious sense of anachronism that is prevalent today. This more advanced stage is influenced by new kinds of metaphors (e.g., the virtual reality, the melting pot, the hybrid, the posthuman). A main technology that characterizes the dilution stage is the mobile phone. For the first time the ideal of a dynamic, permanent and customized connection between people becomes true and this process is the real forerunner of the social network phenomena. As J. Katz (1999) underlined, possessing a mobile phone was no longer a mere strategy to accumulate the social power in that period. Since this moment mobile phones has become an aesthetic expression and also a proper fashion trend (Katz & Sugiyama, 2006, p. 65), and the future of this technology is guaranteed by its increasing integration with computers in the negotiation of new uses with the future early adopters.

## WHEN TECHNOLOGIES MEET THE WORLD OF EMOTIONS

Nowadays, we are living a new scenario where technology is not just a sector of the productive system, but consumption’s main precondition and the first cognitive environment in which consumers experience the brand power. In particular the digital technologies today are far from the utopian/dystopian visions of a future saved/destroyed by the techno-science. In other words they follow a more pragmatic conception where digital life comes down from the screen and becomes a consistent aspect of the real life. The social networking is a clear example of how a new technology – so called Web 2.0 – is not only a digital infrastructure, but rather a whole of links and nodes in which the relationships between members are the real content and the real system of interaction.

By the end of the nineties and the crisis of the new economy, rhetoric shifted on a more pragmatic level. The domestication and appropriation of recent digital devices (from mobile phones to laptops) opens today a new horizon, which is quite far from the discourse about virtuality, and remote global connections were very common during the Nineties. New technologies have a very influential role in the transformation of the contemporary market and also in the process of emancipation of the new post-modern consumer. It does not mean they are an independent variable of the process but they have a very relevant role in the transition from an old paradigm to a new one. Even the most inspiring theory of the period – Pierre Levy’s reflection on the “collective intelligence” (1997) that influenced several researchers in communication or in management – is more properly represented by the evanescent process of smart mobs (Rheingold, 2002) and in the management innovation such as in Nonaka and Takeuchi’s (1995) transformation of the tacit knowledge to the explicit one. If Rheingold’s Smart Mobs is a sort of collective and dynamic form of knowledge sharing, Nonaka underlines how the innovation in organizations comes from a background of emotions and experiences that must be valorized in the organizational processes. In a certain way the same process of “Dilution” that Levy presented theoretically, is analyzed by Nonaka on the side of the organizational process and by Rheingold on the side of the consuming practices. Both are the forerunners of the contemporary crowdsourcing strategies, based on the externalization of creative processes from the organization to the users. This transformation of being in business is only one side of the coin and it underlines the deep human qualities that are turned into external goods. However, in a more classical way, the development of the industrial society has underlined much more the other side of the coin: the human being mechanized by technologies.

Many things that have changed since the development of the industrial society were communicated through the icon of the robot as a new way to narrate the technological impact on the humanity. The word “robot” is a word that comes from the ancient Latin “robor” to indicate the activity of workers. The idea of robot in the ancient culture is related to a slave, a servant or an entity



that can solve some problems of a community. This is exemplified with the invention of the Golem, the monster that has the task to save the Jewish community from several threats that the community was subjected to in the pre-modernity. With the development of the industrial society, this figure is even more related to the world of work and production. And exactly in this moment, we can see the straight convergence between the disvalue of an increasing automatization of the productive processes and the suggestive hypothesis of an artificial creature becoming alive. This convergence is found in the Fordistic representation of the Fritz Lang's *Metropolis* (1927): human workers getting out from the factory as a homogenous group of robots and the beautiful icon of the artificial life coming alive in the body of a female android. The development of the industrial society from a productive approach to the hegemony of consumption, pulls the figure of the robot from the backstage of the post-Fordistic production to the stage of everyday consumption. Since the fifties it more commonly diffused the idea of a robot as a *Mechanical Bride* (1951), the title of the famous McLuhan's book dedicated to the folklore of the American consumerist culture, or in other words, the robot as the quintessential icon of the modernity.

Although the icon of the robot raised the question of a technological impact on society, more recently it has been replaced by the softer ideal of the cyborg. In the evolution from the robot to the cyborg, we find not only the progressive integration of technology and the human body but also the even more relevant centrality of experiences and emotions. This is why, more than the famous Wachowsky's movie *Matrix* (1998), I consider another nineties movie as the main narration of this new convergence among virtuality, emotions and experiences: K. Bigelow's *Strange Days* (1995).

Several disciplines have focused on the ways in which the emotional worlds, as an essential part of the human being, became an external resource for organizations, media and people. In the evolution of the "emotional capitalism" (Illouz, 2007), the icon of the robot expresses a fundamental role in the representation of this huge imagery and social change. It indicates a double perspective where humans are turning into machines and, at the same time, machines are getting some human soft skills and feelings. This dynamic of emotional circulation between humans and machines is settled in the cultural sphere and takes us to the crucial point of a specular enforcement. That is, the more we uses communicative tools that turn our emotions in a resource for the social exchange, the more technologies and automs absorb the wet substance of emotions, from the fetishisms of common products to the new zoomorphic and anthropomorphic toys (Turkle, 2011). Furthermore, those technologies are developing themselves with a new competence in expressing much more complex emotions than the mere simulations of the human emotions. Today the social networking is the limit where this process shows its real power. We used to believe that robots were overwhelmed by a new technological evolution based on the immaterial and the virtualization. The old ideal of a robot as a slave and a surrogate of the human activity was obscured first by the development of the so-called cyber-culture, and more recently, by the diffusion of the new participative culture. Moreover, this culture began to cancel the old ideal of the avatar as the projection of the real human identities.

Today the social networks are working on a sort of reconjunction between the copy and the original, and also, between our personal identity and its virtual projection (Lovink, 2010). Authenticity is the keyword of the contemporary market of identities, from the new technologies to the general commercial goods. In this sense as well, the new frontiers of robotics are necessarily following this general trend. They will represent a softer innovation based on personalization and emotions, as the fantastic short movie *I'm Here* directed in the 2010 by Spike Jones tries to describe with its low-tech and thus more human like robots. But the reification of emotions is not just a rhetorical strategy to communicate the impact of the innovation in a softer way. It also defines a new playground where the conception of being must be extended in two directions: the first one is

the way the mediated circulation of emotions redefines new social identities in what we can call “selfbranding” and the second is the way the solipsistic being must be opened to the external environment or, in other words, the way emotions become the general content that re-defines the identity of places.

## TOWARDS THE ONTOBRANDING PERSPECTIVE

If we consider the integration between new media and the newest brand strategies, we can describe a transformation from a traditional form of branding to the recent and more complex one. This transformation moves through the following stages: branding, selfbranding, biobranding, metabranding, and finally, *ontobranding*. If the traditional branding was just a tool in the hands of companies to build their own image and positioning in the collective mind, as in the cognitive approach to positioning (Ries & Trout 1981), today the selfbranding approach demonstrates how the marketing thought is a state of mind that produces an existential positioning (as in the formula: “be your own brand”).

More ambiguous is the idea of biobranding, indicating two main phenomena: the marketing and communication of the biotechnologies (Simon & Kotler, 2003) and the colonization of consumer’s everyday life made by global brands (Codeluppi, 2009). If the first one is just dedicated to understand the corporation’s strategies of rebranding natural matters and also the DNA codes of specific commodities, the second one considers a more general sense of “bio,” closer to the ancient Greek etymology, or to the more recent reflection on the biolife as the point of application of power.

Metabranding is the extension of the branding structure on the external context such as the “competitive identity” systems (Anholt, 2007) for nations, cities and regions. A metabrand has the capability to reconfigure the diversity of contents and references in a solid unity. Something similar to what L. Manovich (2008) means when he considers the computer as something that is not just “a tool, though it can act like many tools. It is the first metamedium, and as such it has degrees of freedom for representation and expression never before encountered and as yet barely investigated” (Manovich, 2008, p. 79). This process is completed by the increasing diffusion of the software across every minimal aspects of our everyday life so that it is becoming not just a tool but the way we operate on the entire surface of reality. Manovich (2008) states:

I think there are good reasons for supporting this perspective. I think of software as a layer that permeates all areas of contemporary societies. Therefore, if we want to understand contemporary techniques of control, communication, representation, simulation, analysis, decision making, memory, vision, writing, and interaction, our analysis can't be complete until we consider this software layer. (Manovich, p. 7)

This penetration of the logic of software in every minimal dimension of everyday life, or better this complete redefinition of our reality in the terms of a digital application, means that the boundaries between the artificial, the biological and the psychological are blurred away. But more than a process of “hybridization” as Manovich continues to consider, I would regard this transformation as a de-contextualization and re-contextualization of objects and meanings under the semiotic identity of the brand. In this way we can assimilate metabrands and metamediums as open design processes that are able to modify dynamically their tools and contents.

*Ontobranding* is the last and more general category that works as a superior limit of this process of brand extension. The neologism puts together ontology and branding. Ontology is a philosophical concept, which is also used in psychology and sociology. It originally means a general

theory of being as the total reality where our local experience is situated. This totality contains the being of inanimate objects, organisms, and the specific kind of life that is able to give a sense to the world. This idea introduces us to the famous M. Heidegger's "ontological difference" and it can be used to explain the contemporary modification of the relationship between things, organisms and thoughts. The agent of this blurring of boundaries between the diverse kinds of located beings is the technology, or better the specific kind of media that integrates map and territory, thoughts and things, emotions and commercial goods, virtual and real. As we have seen with few examples on locative media and augmented reality, once that the surfaces of the web and of the planet are overwhelmed, the territory becomes a communicative subject. This advanced form of metabranding goes from the smart cities to the local communities, and it can be also applied to monuments, holiday destinations, and so on. Even if we are still not completely in a world of intelligent things, the age of "Dilution" shows us how communication and branding are flexible enough to cover new parts of reality, giving them the opportunity to communicate their existential positioning in the world wide market of identities.

*Ontobranding* is based on 4 main characteristics:

- 1) The overturning of the avatar
- 2) Smartphones or similar devices working as reality search engines or local scanners
- 3) The possibility to track and re-write the surface of reality with conscious or unconscious contents
- 4) Products or services profiling and seeking their users

The first point can be illustrated with the English multiplayer game, *Uncle Roy All Around You*<sup>2</sup> (but also in the J. Cameron's movie): the avatar is not just the projection of a real identity in a virtual world, but is the real agent in a realistic action scene, driven by an online player. Regarding the second point, we can see how the locative media can be used as a reality "search engine," as in the banal GPS application, or better as a scanner that reads the services offered by a shop, a building, a station, and so on. This is shown in some recent research on the design of Hybrid Ecologies (Pata & Fuksas, 2009). The third point is probably the most important because it addresses the connection between the selfbranding and the ontospace. Pata (2010) compared this new way of shaping the social environment with her resources on the ontospace, underlining how the digital narratives can be embodied in the surface of places creating a new emotional geography. In her exploration of this topic, Pata refers to my own, aforementioned, studies (Barile, 2009b) to highlight her contrasting views on this point, or better, to extend this concept to the dimension of embedded storytelling.<sup>3</sup>

She states, "ontobrand is story prototypes, which emerge if a person continuously takes closely related perspectives in an ontospace. They serve as attractors for the storyteller himself and for the other storytellers, constraining and guiding their enactment in this ecosystem" (Pata, 2010, para. 20). This example of a hybrid ecology shows the trajectory of the story mapped in the ontospace, moving across different attractor areas. As Pata underlines as an output of her research, "it became evident that individual storytellers would act largely as autonomous agents, aligning their narratives according to story prototypes that they perceive. Swarming actions took place around perceived stories as attractor areas in ontospace. Many storytellers were autonomously contributing

<sup>2</sup> [http://www.blasttheory.co.uk/bt/mov/mov\\_uncle\\_roy.html](http://www.blasttheory.co.uk/bt/mov/mov_uncle_roy.html)

<sup>3</sup> For example, Pata states, "(a)s another approach, Nello Barile (2009) has used the term ontobrand to describe the process by which personal places would arise in narrated mediation process in hybrid ecosystem. He assumes that if the traditional branding was just a tool in the hands of companies to build their own image and positioning in the collective mind, the self-branding approach demonstrates how the marketing thought is a state of mind that produces an existential positioning" (2010, para.19).

to the emerging shared stories” (para. 24-25).

Related to the fourth point, we can find another turn about in the users/consumer perspective. Products, services or advertising are not static and passive; that is, they are not waiting to be seen on a billboard or chosen on a bookcase. Instead, they can profile the user walking in the area and communicate him/her their quality or other users’ impressions and experiences. We can use them to write or draw explicit messages or tags on a material object, or also to modify the semantic structure of advertising, billboards, logos, and so on, just as in the case of the augmented graffiti, analyzed in several experiments (Ferrari, Tuytelaars, & Van Gool, 2001) and implemented in some Android and iPhone applications such as *ArStreets*. The same idea can also involve proximity marketing strategies, where a product or a shop entrance can be tagged with our judgments, recorded and shared with our friends through a social network. Using the new neuro-scientific methodologies such as bio-feedback and eye-tracking, it is also possible to deposit on products, services and places the spectrum of conscious and unconscious feelings that accompany the consumer experience. In this way, the inanimate matter of goods can absorb and accumulate the wet substance of the living emotions through a digital system, and then communicate it to the world wide web as a proper art installation.

## CASE STUDIES

This significant evolution can be summarized in the application of the digital technologies across a new paradigm in the following four main dimensions:

- The end of the opposition between virtual and real
- Social interaction and a radical proximity of technologies and everyday life (smart objects and the Internet of things)
- The global circulation of emotions and the new strategic resource of a sentimental economy
- The laborious work of technologies in the body of the geographic space with the geotagging technologies and the hybrid ecologies

In order to elaborate and illustrate these dimensions, several cases are analyzed in the following section.

Some of the recent new media applications are trying to overturn the classic relation between virtual and real. In the aforementioned case of the English multiplayer game called *Uncle Roy All Around You*, we find a strong integration between the street and the online players, but the most important innovation is that the street player (not allowed to interact with the other real players) is a kind of physical avatar of the persons that are following the game from home in front of a screen.

Mixed reality mobile games, like online games before them, are often conceived of in terms of entertainment and, more recently, in terms of art. [...] The game’s production clearly relies on a division of labour consisting of discrete ensembles of activities carried out by particular staff at particular sites, which articulate distinct processes of work that combine to produce a product, namely Uncle Roy: “the game that pitches online players around the world alongside players on the streets of a real city.”(Crabtree, 2004, p.1)

Another example is Nike<sup>+</sup>: for the first time this famous sportswear brand does not invest its own energies in the promotion of a specific product (a well-made and better pair of sneakers) but seek to reframe a spontaneous human activity as jogging in a new brand experience mediated by technology.

Jogging is not the same old thing and becomes a more exciting performance with the help of Nike<sup>+</sup>. As the advertising suggests, the challenge between the people, that until now is only virtual because the result has to be uploaded on the web after the ride, could become totally integrated if we substitute the iPod with an iPhone and create a geolocating software that shows, controls and compares the player's performances on different tracks.

With these few examples we can obtain many important contributions to understand how marketing and digital life are getting closer. The old ideal of a post-human dimension, which dominated the nineties as it was a sort of cultural and "epistemic fracture" (Foucault, 1966), can survive today only as a sub-dimension of the contemporary market space. With the beginning of the new millennium, the ideal of post-human shifted from philosophy, art theory and cyber-culture to the domain of marketing. In a study on Sony's advertising campaign for the launch of a new memory stick, Venkatesh, Karababa, and Ger (2002) adopted the expression "post-human consumer" to indicate new relationships between technological brands and new consumers.<sup>4</sup>

The research examines a famous Sony ad of a new generation of memory stick that, in the fictional world of communication, shows an image of a memory stick inserted directly in our brain. This is demonstrative of the point of intersection between organic and inorganic, our mind and the computer memory. Venkatesh et al. point out that the analysis of the Sony ad highlights some implications of "new ways of constructing the consumer, or more precisely the posthuman consumer" (p. 453). The powerful image of this advertising reinforces the identity of Sony as a technologic brand and socializes the post-human dimension in the common field of consumption.

Addressing a similar point of posthuman consumer, but more oriented to the marketing studies, a team of American and Australian researchers defined the U-Space as a relativistic trading space, quite far from the three dimensional common reality we used to know. With their contribution we have to abandon completely the picture of the cyborg as an extraordinary figure, mentally and somatically empowered by technologies. In fact the digitalization of our societies changes the protagonists of the market in the senses of a "U-Space." "U" stands for ubiquitous, universal, unique and unison and it is composed of four main fields: the hyper-real, the post-human, the matrix and the node (Watson, Pitt, Berthon, & Zinkhan, 2002).

According to Watson et al. (2002), the hyper-real includes "guided tours to Mount Everest supported by oxygen tanks and a team of experienced, satellite radio-connected Sherpas; entertainment (e.g., a movie, theatre, concert)" (p. 335), and the post-human is about "information storage and processing enhancement [...], the sphere of transformation and marketing currently deals with issues such as marketing body change (e.g., breast enlargement, rhinoplasty)" (p.335). The matrix "consists of the universal, acontextual processes designed to automatically perform processes on behalf of the individual or collective" (p. 336) as in the example of the semantic Web; while the node is the "automated consumption or usage [...] Smart cards and chips containing personal electronic information will automate personal consumption of service staples" (p. 336). U-space is not a static classification of contemporary markets but a dynamic process in which a single activity can shift from a dimension to another. In this way the big innovation is guaranteed not just by the singular ideas of hyper-real (empowered reality), hybridization (post human), virtuality (the matrix), or demassification (the node) but also more by the dynamic cooperation between them. The lowest common denominator between those dimensions is the category of experience that blurs the boundaries between digital and real, global and local. The hegemony of experiential values has simultaneously changed the languages of media in the sense of an "emotional ontology" (Illouz, 2007, p. 36), and also the main contemporary marketing strategies (Schmitt, 1999).

---

<sup>4</sup> See Venkatesh, Karababa, and Ger, (2002) for the Sony's advertising image ([http://www.crito.uci.edu/noah/paper/Posthuman8\\_v2.pdf](http://www.crito.uci.edu/noah/paper/Posthuman8_v2.pdf))

In a recent application, the technology of blue tooth is used to implement on one of the oldest and most famous socio-psychological concept: the “familiar stranger” (Milgram, 1977). This study on routine in the metropolitan life underlines how people “without a name” are supposed to be numbers. S. Milgram defined this social type as “someone who is observed repeatedly for a certain time period and without interaction” (p. 51-53). Instead, under the modern paradigm in which the phenomena are analyzed, the “familiar stranger” shows how urban life is a complex system with specific emergent properties. From the chaotic random encounters comes out a process governed by “strong temporal, spatial and intentional patterns” (Lawrence & Payne, 2005, p. 1) referred to in a recent research study as co-location. There is abundant research about this subject, some of which using the statistical analysis of interactions (Mikias, Gollu, Chan, Saroiu, Gummadi, & de Laura, 2007), but the most interesting question is the way in which a theoretical problem becomes a technical tool. Jabberwocky is a new software available for Bluetooth enabled mobile phones capable of running MIDP 2.0 applications. The application operates even if the other Bluetooth mobile phone is not running the Jabberwocky application and after a while each application accumulates a log of unique entries of persons that have been previously encountered, creating a sort of dynamic borderless community. If the Bluetooth devices create a connection between groups of subjects walking through a certain area, other softwares connect a virtual/global space or community with a material one.

*AroundMe* is one of the iPhone’s first applications that opened to the market of geolocalized services. The software was invented by an Italian developer, Marco Pifferi, working for Tweakersoft, a company that created several applications for Apple’s iPhone. The strength of this software is the simplicity in the classification of the research categories and which is very quick and does not require any textual input from the user. Another example is the software commercialized by Nokia for the geolocation tagging.<sup>5</sup> In the original application, when you take a photo in a certain place, the software records the coordinate of your place via GPS, associating them to the file of the picture. The research is underway for other softwares that follow the opposite process: if you point your smart phone on a urban surface it works as a scanner that gets information about that object (a building, a shop, a monument etc.) such as origin, identity, and history, and eventually all the services offered by it.

The general trends I discuss here are already described in the new paradigm that is going to overwhelm the old Internet in the direction of Supranet. This vision comes from the Gartner researchers (Magrassi, Panarella, Deighton, & Johnson, 2001) and focuses on the way in which the new digital life is not so far from the physical one compared to the past. The ubiquity of future computers, the RFID, the wireless connection and other strategic innovation will completely transform our approach to reality. If Lévy (1997) considered intelligence and communication as a human kind’s resources, today we can catch the potential of a progressive diffusion of intelligence in what few decades ago was called the “system of objects” (Baudrillard, 1968) that surrounds our physical environment.

One of the newest paradigms working on those presumptions is the Supranet paradigm, anticipated by D. Gelernter (1992) and developed by the Gartner research team. The main aspects of this paradigm are:

- Many physical objects (e.g., products) will be coded and, therefore, will become uniquely identifiable;
- Intelligent devices will be embedded in physical objects of all sorts, such as cars, consumer goods, surgical nanomachines traveling the human body, appliances, clothing, jewelry and livestock;

---

<sup>5</sup> <http://www.dailymobile.net/2008/03/03/symbian-application-nokia-location-tagger-updated-to-10-beta2/>

- Intelligent devices will increasingly be networked via the (mostly) wireless Internet;
- As a consequence, all physical objects, animals and human beings carrying intelligent devices will also be networked, in addition to being identifiable (Magrassi, Panarella, Deighton, & Johnson, 2001, pp. 2-3).

As many other paradigms, Supranet describes a mix of hypothesis, conjectures and facts. Some predictions are already set up by the contemporary technology as in the case of geotagging information shared via social networks exemplified by Nokia location tagger. One of the most impressive ideas is the way new technologies will have a capacity to code approximately every square meter of the earth's surface, which will be linked to an IP address (Magrassi et al., 2001, p. 3). This suggests that there will be a complete isomorphism between the net and the planet so that every movement in one dimension implies an immediate modification in the other. Every element of our urban and natural environment could be able to interact and dialogue with this integrated system and other system connected with it. In this way the idea of a traditional branding strategy will be overcome by a diffused kind of branding demonstrating the initial stages of transformation toward the *ontobranding*. With Wikipedia we already discover that a simple tool to manage knowledge has created a sort of "ontological democracy." In Wikipedia epic gestures of historic celebrities cohabit with modern pop-star's adventures, common people activities, academic curricula, touristic routes, commercial products, brand identities and so on. Since there is an overlapping of knowledge, reality and promotion strategies in several points, I am not just talking about the way in which devices can "mobilize the brand" (Nysveen, Pedersen, Thorbjørnsen, & Berthon, 2005).

Instead the problem is more the way in which branding becomes a flexible and spread technology. The future smart phone will not be just a device, but it will be a scanner that offers the opportunity to rewrite the reality in a reversible modality, giving sense to a chaotic and meaningless urban experience. The same can happen as well in a natural landscape so that it is easy to imagine walking through an Italian mountain footpath and be surprised by the appearance of an edelweiss flower. Contemporary smartphones are able to catch that magic moment and immediately the photo cam with an integrated GPS will associate the latitude and longitude of its geographic position to the file that we can instantly upload onto our favorite network. If we are interested in botany, we can even send information about that object and create a specific profile, an interest group, a fan club etc. In this way, that specific edelweiss is institutionalized as a collective reality and becomes a reference point for a larger community. And when someone passes nearby without knowing that it is there, the geolocalization system for smartphone can alert him/her about its presence and being. So, finally, after a process of content and experience sharing through the social networks, the edelweiss becomes a product, or better, a brand of itself. The combination of Supranet, narrative ecologies and the Internet of things gives us the traits of a new scenario where branding means more than a mere commercial tool, and it confronts itself with the domains of knowledge and ontology.

## CONCLUSION

With my reflection on the new forms of interaction between reality and virtuality, my aim in this paper was to introduce and discuss a trend that started at least six to eight years ago and that continues today, showing even more interesting lines of development. I do not pretend to have made a clear prediction of a future trend by introducing my concept of *ontobranding*, but this paper sought to elaborate how a scenario peopled by several applications, programs or experiments became meaningful considering the strong coherence in the development of several phenomena I

have been analyzing since 2009.<sup>6</sup> As the reader will appreciate, I decided to adopt the case studies as a methodology to explore the category of *ontobranding* because it is much more useful aid to discovering hidden trajectories behind the external surface of a techno-communicative object. This is why I continue to take the same approach as I develop my conclusion to this work.

When we apply the three circuits of technology, consumption and communication, it is possible to understand how the “interactive game experience” (Kline, Dyer-Witheford, & de Peute, 2003, pp. 53-54) in the product of a complex interaction across other sub-dimensions such as programmers, consoles, users for the technological circuit, marketers, commodities and consumers for the consumption circuit, designers, gamers and player for the cultural circuits. From my point of view, the interaction between the three circuits is not just limited to the perception of the game experience. This dynamic interaction works like an engine that will modify deeply our conception of reality, determining a new radical overlapping between what is normally considered real (business, love, everyday life etc.) and what is normally considered virtual (game, entertainment, connectivity etc.).

Many international newspapers, blogs and websites have discusses the recent project called *Ingress*: a new game designed by Google, although the definition of game in this case is probably too narrow. *Ingress*<sup>7</sup> is a dynamic narration that works as a social network and uses the intersection between augmented reality and geolocalization to generate a parallel universe of experiences that is not really parallel but it is completely overlapped with the “authentic” reality.

This new application is quite interesting because, in a certain way, it is the complete implementation of the main topic I presented in this paper as sub-dimensions of the *ontobranding* process. First of all what has been called as the “storytelling imperialism” (Salmon, 2007): an expression of how the contemporary narration of products needs an even stronger emotional style of representation and promotion. The trailer produced to launch the game is quite similar to a movie so that the viewer cannot understand if it is just a spy story, a videogame, a music video or an artistic project. After this, the second main character is the challenge of the users. The multiple-player-modality recreates a sort of hidden community following a real goal behind the masquerades of the common life. This community (opposed in two factions: the rebels and the integrated) looks similar to some antagonist groups as described in some recent movies such as *The Fight Club* and *Matrix*. The hybrid modality of interaction takes something from other projects I discussed before, like the *Uncle Roy*’s “overturning” of the avatar, but here there are no distinctions between the online and the offline players, because everyone is permanently and ubiquitously online. The initial narration is based on the idea that there are “some places on earth able to attract not only people but also events” as the promo says on their website. This is the precondition to implement a kind of digital geomancy where the new communicative power of the places is not completely unrelated from the networks of human interactions and their inner circulation of the emotional capitalism. So, even though, in the real world, places have no sort of power, unless we would say it in a symbolic way, the intersected tools of augmented reality and geolocalization give to the located places the possibility to produce and communicate special events related to the screenplay of the game. Today the grade of implementation and diffusion of this application is still limited (just for early adopters), but in the further future this game will probably turns in to a killer application - notwithstanding the recent Google+ flop – ready to host a new and more sophisticated model of brand and product placement. With the diffusion of a new pair of sunglasses, also projected by Google to conquer and overturn the market of smart phones, this application will be able to express 100% of its potential.

---

<sup>6</sup> The first version of this paper was discussed in a session of the conference “Mobile communication and social policies” organized by Prof. James Katz at Rutgers University in 2009.

<sup>7</sup> See <http://www.ingress.com>



Pushing a higher number of players to interact and build the global narration of the game may recreate a new social environment where the strategy of sociability, economy and power are totally rewriteable. This concept demonstrates how technology is running faster than science and society. Contemporary innovation can not just be analyzed with the categories of a modern rationality - still living today in the form of the “digital dualism” (Jurgenson 2011)<sup>8</sup> - but it requires a new perspective that is able to understand and unify the dynamic interaction between what were once separated as the ontological distinction between reality and virtuality.

## REFERENCES

- Abruzzese, A. (1993). *Lo splendore della Tv*. Genova: Costa & Nolan.
- Anholt, S. (2007). *Competitive identity: The new brand management for nations, cities and regions*. New York, Palgrave MacMillan
- Barile, N. (2009a). *Brand new world. Il consumo delle marche come forma di rappresentazione del mondo*. Milano: Lupetti.
- Barile, N. (2009b, October). *From post-human consumer to the ontobranding dimension: Mobile phones and other ubiquitous devices as a new way in which reality can promote itself*. Paper presented at mobile communication and social policy conference, New Brunswick, NJ.
- Barile, N. (2012). The age of personal web TVs: A cultural analysis of the convergence between web 2.0, branding and everyday life. In A. Abruzzese, N. Barile, J. Gebhardt, J. Vincent, & L. Fortunati (Eds.), *The new television ecosystem* (pp. 41-60). Berlin: Peter Lang.
- Baudrillard, J. (1996). *The system of objects*. London and New York: Verso Books.
- Breton, P. (1995). *L'utopie de la communication: le mythe du « village planétaire »*. Paris: La Découverte.
- Codeluppi, V. (2009). *Biocapitalismo*. Torino: Bollati Boringhieri.
- Crabtree, A. (2004). Understanding the social life of Uncle Roy: Field report. Retrieved from <http://www.cs.nott.ac.uk/~axc/work/URAY.pdf>
- Ewen, S. (1988). *All consuming images: The politics of style in contemporary culture*. New York: Basic Books.
- Ferrari, V., Tuytelaars, T., & Van Gool, L. J. (2001). Markerless augmented reality with a real-time affine region tracker. In D. C. Young (Ed.), *Proceedings of ISAR '01: IEEE and ACM international symposium on augmented reality*, 87-96. doi : 10.1109/ISAR.2001.970518
- Floch, J. M. (2000). *Visual identities*. London and New York: Continuum.
- Fortunati, L. (2009). Old and new media, old emotion. In J. Vincent, & L. Fortunati (Eds.), *Electronic emotion: The mediation of emotion via information and communication technologies* (pp. 35-62). Oxford: Peter Lang.
- Foucault, M. (1966). *Les Mots et les Choses. Archéologie des sciences humaines*. Paris: Gallimard, NRF.
- Gelernter, D. (1992). *Mirror worlds: Or the day software puts the universe in a shoebox... How it will happen and what it will mean*. Oxford: Oxford University Press.
- Heidegger, M. (1978). *Being and time*. London: Blackwell.
- Illouz, E. (2007). *Cold intimacies: The making of emotional capitalism*. Cambridge: Polity Press.
- Jurgenson, N. (2011). Digital dualism and the fallacy of web objectivity. Retrieved from

---

<sup>8</sup> Jurgenson (2011) states, “Digital dualism is a fallacy, and it seems to be pervasive: from academics like Sherry Turkle operating with the assumption of a digital “[second self](#)” to mainstream conceptualizations like the [The Social Network](#) film arguing that Facebook users are trading “real life” connections for a something digital. While many more examples can be listed (and many have been on this blog by myself and others), what [research](#) as well as those who actually use social media tell us is that social media has everything to do with the physical world and our offline lives are increasingly influenced by social media, even when logged off. We need to shed the digital dualist bias because our Facebook pages are indeed “real life” and our offline existence is increasingly “virtual” (Jurgenson, para. 4).

- <http://thesocietypages.org/cyborgology/2011/09/13/digital-dualism-and-the-fallacy-of-web-objectivity/> (Last accessed on September 13, 2011)
- Katz, J. E. (1999). *Connections: Social and cultural studies of the telephone in American life*. New Brunswick, NJ: Transaction.
- Katz, J. E., & Sugiyama, S. (2006). Mobile phones as fashion statements: Evidence from student surveys in the US and Japan. *New Media & Society*, 8(2), 321-337.
- Kline, S., Dyer-Witheford, N., & de Peuter, G. (2003). *Digital play: The interaction of technology, culture, and marketing* (2<sup>nd</sup> ed.). Montreal: McGill-Queen's University Press.
- Lawrence, J., Payne, T., & De Roure, D. (2005, February). *Communities of collocation*. Presented at UK UbiNet Workshop, Bath, UK.
- Levy, P. (1997). *Collective intelligence: Mankind's emerging world in cyberspace*. New York: Plenum.
- Lovink, G. (2010). Mybrain.net: The colonization of the real-time and other trends in web 2.0. *Eurozine*. Retrieved from <http://www.eurozine.com/articles/2010-03-18-lovink-en.html>
- Magrassi, P., Panarella, A., Deighton, N., & Johnson, G. (2001, September). Computers to acquire control of the physical world. *Gartner Research Report T-14-0301*.
- Manovich, L. (2008). *Software takes command*. Released under CC license.
- McLuhan, M. H. (1951). *The mechanical bride: Folklore of industrial man*. NY: Vanguard Press.
- Meyorowitz, J. (1986). *No sense of place: The impact of electronic media on social behavior*. Oxford: Oxford University Press.
- Miklas, A. G., Gollu, K. K., Chan, K. K. W., Saroiu, S., Gummadi, K. P., & de Lara, E. (2007). *Exploiting social interactions in mobile systems*. In J. Krumm, G. D. Abowd, A. Seneviratne, & T. Strang (Eds.), *Proceedings of UbiComp '07: 9th international conference on ubiquitous computing*, 409-428. Berlin, Heidelberg: Springer.
- Milgram, S. (1977). The familiar stranger: An aspect of urban anonymity. In S. Milgram (Ed.), *The individual in a social world* (pp. 51-53). Reading, MA: Addison-Wesley.
- Nonaka, I., & Takeuchi, H. (1995). *The knowledge-creating company: How Japanese companies create the dynamics of innovation*. New York: Oxford University Press.
- Nysveen, H., Pedersen, P. E., Thorbjørnsen, H., & Berthon, P. (2005). Mobilizing the brand: The effects of mobile services on brand relationships and main channel use. *Journal of Services Research*, 7(3), 257-276.
- Pata, K., & Fuksas, A. (2009). The ecology of embodied narratives in the age of locative media and social networks: A design experiment. *Cognitive Philology*, 2. Retrieved from <http://ojs.uniroma1.it/index.php/cogphil/index>.
- Pata, K. (2010, January 12). *Ontobrand as prototypical stories attract stigmergic narrative mediation and swarming*. Retrieved from <http://tihane.wordpress.com/2010/01/12/ontobrand-as-prototypical-stories-attract-stigmergic-narrative-mediation-and-swarming/>
- Rheingold, H. (2002). *Smart mobs: The next social revolution*. Cambridge, MA: Perseus Publishing.
- Ries, A., & Trout, J. (1981). *Positioning: The battle for your mind*. New York: Warner Books - McGraw-Hill.
- Rifkin, J. (1995). *The end of work: The decline of the global labor force and the dawn of the post-market era*. New York, NY: Tarcher/Putnam.
- Salmon, C. (2007). *Storytelling. La machine à fabriquer des histoires et à formater les esprits*. Paris: La Découverte.
- Schmitt, B. H. (1999). *Experiential marketing: How to get customers to sense, feel, think, act, relate to your company and brands*. New York, NY: The Free Press.
- Simon, F., & Kotler, P. (2003). *Building global biobrand: Taking biotechnology to market*. New York: Free Press/Simon & Shuster.
- Turkle, S. (2011). *Alone together: Why we expect more from technology and less from each other*. New York, NY:

Basic Books.

- van Kranenburg, R. (2008). *The Internet of things: A critique of ambient technology and the all seeing network of RFID*. Amsterdam: Network Notebooks.
- Venkatesh, A., Karababa, E., & Ger, G. (2002). The emergence of the posthuman consumer and the fusion of the virtual and the real. In S. Broniarczyk, & K. Nakamoto (Eds.), *Advances in consumer research* (pp. 446-452). Valdosta, GA: Association for Consumer Research.
- Watson, R., Pitt, L., Berthon, P., & Zinkhan, G. (2002). *U-commerce: Expanding the universe of marketing*. *Journal of the Academy of Marketing Science*, 30(4), 329-343.

## BIOGRAPHY

**Nello Barile** teaches Media studies and Sociology of cultural processes at IULM University of Milan where also coordinated for 6 years a Master programme in Creativity Management. He holds a PhD in communication sciences, resources management, and formative processes at University of Rome “La Sapienza.” He has published numerous books in Italy such as *Sistema moda. Oggetti strategie e simboli dall’iperlusso alla società low cost* (Milano 2011) and *Brand new world. Il consumo delle marche come forma di rappresentazione del mondo* (Milano 2009). He also published articles and short essays in France, Brazil, and USA, such as “A knot to untie. A social History of tie between fetishism, communication and power” in C. Giorcelli & P. Rabinowitz (Eds.), *Habits of being* (vol. 2). Minneapolis, MN: University of Minnesota Press 2012. He is also the editor of *The New Television Ecosystem* (Peter Lang 2012) with A. Abruzzese, J. Gebhardt, J. Vincent and L. Fortunati.

## **Afterword: Robot Conceptualizations Between Continuity and Innovation**

**Leopoldina Fortunati**  
**University of Udine**

### **ABSTRACT**

The aim of this afterword is to discuss a topic that links all the papers presented in this special issue. This transversal topic is the forms of social robots. Firstly, social robots form is discussed in light of the forms of robotics we have inherited from the past. This includes the models of society that each of them embodied, as well as the social logic of the emotions connected to them. Secondly, social robots form is analyzed in light of the arrival in a new area for robotics, that of robots in the domestic sphere. Here, the system of filters created by the mass appropriation of information and communication technologies in the last two decades, has set the premise for a change of the social contract that has made social robot penetration possible. Whilst exploring the models and the meanings of social robots in the domestic sphere it emerges that robotics is following two different paths: one addressing the material part of housework (more traditional robotics) and the other addressing the immaterial part of reproduction work (more innovative robotics). Finally, the paper analyzes the dematerialization process of social robotics that is still taking place, a practice that is defined herein as “ubiquitous social roboting.”

**KEY WORDS:** social robots, social robots form, ubiquitous social roboting, social contract change, robotics and immaterial labor

## INTRODUCTION

The aim of this afterword is to propose another point for discussion that did not emerge clearly from individual papers but is evident when reviewing the combination of all the papers. This point is the forms that social robots take and how this can be further explored by building on the various contexts examined by the authors in this special edition. In order to explore this point I look firstly at the forms of social robots and how they manifest in various media and research. Secondly I examine models and meanings of social robots in the domestic sphere in which the competing and complementary roles of social robots are discussed. Finally I conclude with the notion of ubiquitous social roboting in which I propose a new way of looking at this topic that addresses the dematerialization process of our everyday lives.

## FORMS OF SOCIAL ROBOTS

One crucial point of the current research on robotics is how to define the form we give to the robots we build. In this endeavor we can take two paths: one is to rely on the past and choose from the representations that have characterized the history of technology from antiquity, and another is to explore new paths. Obviously the representations we have inherited from the past convey safety because they are familiar forms that signal continuity, but at this point, a new, innovative effort is needed. Nowadays contemporary societies present a sophisticated technological system in which each technology resonates and is enhanced by the others. This has led to new opportunities for robot forms. A new approach is suggested here that tries to take advantage of the innovations that have shaped the territories of the immaterial labor in the reproductive sphere and that proposes a new way to conceptualize the forms of robotic life. Looking back the past, four main representations can be identified:

- the robot as zoomorphic representation;
- the robot as android or gynoid (Carpenter et al., 2009) that is a perfect machine in its attempt to imitate the human being where a series of historical experiences such as the automata, the wax replica, the creation of the double (Rank, 1925) converge;
- the robot as machine with a very different profile from human beings, in which the identity of the robot must be clearly something very different. This model is inspired by human characteristics but it can also expand them. Consider, for example, the robot whose limbs can turn 360 degrees or whose neck can be extended according to the needs;
- the robot as a particular object, such as in the case of the automatic musical instruments built by Erone (Trabucco, 2010).

These representations suggest the prevailing rhetorical strategies for the form of robots: displacement in the first case, similarity in the second case, dissimilarity in the third and fourth case. These representations have been present in our imagination from ancient times. In antiquity the robot was mostly created as a zoomorphic and android representation. In particular, the most ancient automaton whose memory has been handed down is the dove of Archytas, whereby the story of robots has begun with the zoomorphic representation. This representation can be explained by reasons that become evident when we look at the history of robot construction. If we turn to the Middle Ages, for example, we discover that only animals could become automata. This limitation to the animals was of teleological origin, because the power to create an object in the image and likeness of a human being demanded that an individual able to do so would be similar to God. For this reason, according to Allegri (1991), Christian culture set a negative relationship with artifice and artificiality from the beginning. Although religion has lost its normative strength on shaping the

public opinion about robots, the importance of religion as a factor that is capable of influencing the social attitude towards social robots is remarkable, as Halpern and Katz show in this same issue.

However, even though such limitation does not exist, animated objects were also built mainly in the form of animals in the East. The chronicles of the time reported that in the Celestial Empire the French goldsmith Guillaume Boucher erected for the Great Khan a tree of silver, which distributed drinks and at whose base there were four lions. A Ming official described many automata: heavenly tigers and devils dancing on a terrace, coiled dragons that exhaled perfumes, and boats in the shape of dragons that opened and closed the jaws. The spread of these Chinese forms intensified both in Asia and in Europe the mid-200 (Baltrusaitis, 1982, pp. 187-188).

The idea of a human being created with magic or artificial tools in competition with the divine act of creation, is a very old one. Of particular importance in the Judaic-cabalistic tradition is the myth of Golem, a kind of human-robot. Golem's creation followed the various phases of the divine creation that were first to model a simulacrum, then to animate it with the magic of the word, and to end with the rebellion and disobedience of the creature. But although all the phases of the divine creation were respected, the human creature was not able to reflect humans' image: it was appearing just as a slave and moreover inclined to evil (Chevalier & Gheerbrant, 1987, pp. 523-524). Furthermore, Golem was mute because humans had not been able to give it the spoken word: it was a kind of shape without soul. This artificial creature, oscillating between matter (its root) and antimatter (its ideal) (Dal Lago, 1991, p. 237), also had the ability to grow very rapidly, becoming gigantic and overwhelming. Its strength could provoke terrible catastrophes, because Golem was only capable of bad actions.

Hence, the fear that the robot could rebel and attack humans comes from the most ancient myths and the most archaic figures of humankind's imagination. This fear continues to be present in contemporary imagination. But fear was not the only emotion involved in this story; wonder was also involved. Aristotle, for example, liked the automata (called *Thaumata*) for their capacity to surprise intellectually and to stimulate theoretical questions. Another emotion involved was the envy on the part of males both of the creative power of the divine and of the feminine power to give life. Faced with this ability they do not possess, men have often pursued the dream to create a human being with the scientific knowledge at their disposal. The golem, the automaton, the android and the robot, represent not only a challenge to God, but also men's secret desire for motherhood, their hidden dream of being able to steal the power of women to have children.

In the western world the founding fathers of the automatons were mainly Egyptians, Assyrian-Babylonians and Greeks but all over the world many populations worked in this field: Chinese (the first Su Song's clock tower which was an automaton), Japanese (who built mechanical servants with automatisms called *karakuri*) and Iraqi (Al-Jazari), not to mention the Maya and Inca. In Greece, after Aristotle, the technology of machines and especially of automata developed quickly in the Hellenist, and especially Alexandrian, environment thanks to pneumatics, which was the science studying the property of fluids in movement through steam and compressed air. Automata, in fact, were not only mere objects of entertainment but, as explained by Ferrari (1984, pp. 225 onwards and following), they were also "ostensible equipments," that is general instruments of application and demonstration of mechanical principles, and particularly pneumatic.

It is well known that the Alexandrian anatomist, Erasistrato, was the first to build a wonderful automaton. After him, argues Vegetti (1991), the human being and the machine continued to be thought of in a circular relationship, in which the automaton is required to reproduce the human being and in which, in turn, the human being is conceived in the image and likeness of the automaton. But the figure which probably anticipates the automaton even more is Talos, a being made of bronze, half human being and half automaton, whose task was to protect Crete. By virtue of its metallic nature, it could jump into the fire to become hot and then to pursue the enemies forcing them to a deadly embrace. Talos was kept alive by a single vein that crossed its

body from the neck to the ankle, where it was closed by a nail or by a membrane, to prevent spillage of its vital liquid. This living statue was created by Hephaestus for Zeus, who presented it to Europa. It was a gigantic automaton that was invulnerable, except in the point of the ankle, where the only vein containing the blood was visible. Talos, as Apollonius of Rhodes tells, was defeated by Medea, the sorceress who bewitched and enchanted.

In the Renaissance the idea of the automaton regained momentum and it situated automata in a pleasant place: the garden of lilies. The complex machinery of the Medici garden became the foundation of the experimental science along with the Cartesian theory that sought the mechanical laws that govern living organisms (Parlato, 1991). In this period of time there is a growing awareness that the construction of automata requires not only the contribution of science but also of art. Placed as a hybridization between nature and art, the automaton, which belongs to the 'heterogeneous' class of wonders and 'effects ad extra,' can also be a fountain, where the flow of water in the containers that collect or pour it (e.g. the skins, and the bucket of the Samaritan woman, the cup of the farmer with the dragon) obeys a rhythm adjusted on the regular intervals of a gesture metric (Rinaldi, 1979, p. 156, p. 169).

Moreover, the polemics on the alleged, demonic aspect of automata was continuing and was attributed to the magic halo that surrounded them and that derived from the delay with which the public understood the truth of the artefact or even from the impossibility on the part of the public to understand this. This point has to deal with the old issue of 'authenticity' concerning the robot, which Naomi Baron (in this issue) analyzes. Baron's article focuses on the problem of the infringement conveyed by automata as their aims were to surprise but also to trick the public. The issue of authenticity crosses the long story of robots especially in their representation as androids or gynoids. The social contract in fact is based on a high degree of authenticity of the individuals and their social identity. It is true that humans do not always pursue authenticity and grant themselves various degrees of freedom in playing with inauthenticity, but at a certain point one has to come back to authenticity. The foundations of any society are built upon authenticity, a basis on which humans will to some extent derogate, albeit only tactically rather than strategically. Hence the theme of authenticity brings further elements inside the question of the possible role that social robots can play in contemporary societies.

Between the sixteenth and eighteenth centuries, curiosity and passion for automata have lead to a more sophisticated construction of robots. They developed within a scenario of medicine that was completely changing - in particular anatomy. Although up to the sixteenth century the interest of anatomists was directed to study the human body from a static point of view, in the seventeenth century they began to give priority to the study of the human body. Harvey applied dynamics, the science of motion of the bodies, to the problem of blood circulation, founding with his studies and experiments the modern physiology. Descartes conceived the human body as a machine whose functions could be understood through mechanical models not dissimilar to the workings of machines that were based upon levers and pulleys (Fye, 2003). The idea of the living being as a machine acquired considerable importance with the development of experimental technology, and also the construction of artificial limbs (Zanca, 1991, p.33). The French surgeon Paré (1509-1590), driven by the need to provide prostheses to maimed soldiers, developed complicated mechanisms for arms and hands. Programs that explored the decomposition of the body-machine were continued by many researchers in the second half of the 17th century such as in Padova where Girolamo Fabrici d'Acquapendente released two major tables depicting the prosthetic being during this time.

At the end of the eighteenth century great importance was assumed by Von Kempelen's studies on the human voice: the iatromechanical approach influenced the construction of dismountable models to show the structure and function of sense organs. But, as Zanca (1991) recalls, those who brought the idea of the human-machine to the extreme were De La Mettrie and

Jacquet-Droz, who, in particular, developed three androids (the Scribe, the Designer and the Musician) representing the best results obtained with traditional mechanics.

The first true automaton to enter the fairy-tale tradition, argues Landucci (1991, p. 176), is Pinocchio, one of the early contributions to a long series of the automata that spread much in the boundless world of the cinema. The android and gynoid have visual characteristics and structural features that might be more disturbing symbolically when the infringement of anthropomorphic appearance reaches very high levels. In fact, there is not only the problem of counterfeiting and of the very essence of the object in question, but also the issue of the “uncanny valley” (Freud, 1919). Androids can be perturbing since the animation of a thing that should be inanimate involves the very essence of the movement, which appears in this case an illogical or unexpected mobility. Given that movement is synonymous with life, the appearance of life in the movement suggests in fact greater concern than stillness whilst looking alive. However, as we will see the disturbance aroused by androids might depend also on other reasons.

With the advent of a large-scale industry, we have gone from automaton to the robot. Different from automata, robots do not aim to refine the imitation of their inspiring entities. They are only finalized to replace the material capacity for work of humans and in their last version of social robots, also the immaterial capacity of care. This shift represents in reality a leap (Baudrillard, 1990, pp. 64-66). We passed from the mechanical and theatrical counterfeit of the human being, where the technique served to build the analogy and the effect of simulacrum, to a technical principle that is able to produce the equivalent of a human being, considered as worker. While the automaton had to astonish and entertain the public in attempting to be more natural than the human being, a perfect double, the robot (which also in the etymology of the word coming from the Czech word “robota” meaning “hard work”) does not pursue the similarity to human beings, but only the will to demonstrate its mechanical effectiveness in comparison with human capacity for work. The only law it challenges is that of value.

The model of society that is embodied in the robot is quite different from the model that was embodied in the automaton. The magnitude of the challenge is more limited now: there is no longer the challenge to God and to women. The dream is set aside and this time the starting point is considering the human being only as worker. It is the secrets of the capacity to work that are observed, stolen and reproduced in a machine: the robot. The motivation behind the third type of robots is the reduction of fatigue and danger in the labor world producing commodities or services (also regarding wars) or the improvement of precision of the work itself (like in surgery robotics). These motivations may vary according to the specific sector of human life which becomes robotized and in which the works and the professions to be substituted are defined. Here the logics of dissimilarity may work better because the imitation and the simulation of human beings are limited to only one aspect: the capacity to work.

The robot becomes the basis for the development of the automation process in the factories. It replaces workers in repetitive or dangerous tasks, but it is also used to transform workers in a superfluous population inside the labor market. Hence, robots are both beneficial and harmful especially when they are put in competition with workers. If there is a large offer of cheap labor, the use of robotics stops. When this offer diminishes, at least in perspective, or the human labor becomes too expensive, robots are possibly introduced.

## **THE ARRIVAL OF ROBOTS IN NEW SPHERES OF HUMAN LIFE AND THE CHANGE OF THE SOCIAL CONTRACT**

All the models analyzed so far have demonstrated the history of robotics and have prepared and nourished people’s imagination over the course of time. Along with the myths and the chronicles telling us about the marvelous creations of automata, these models have continued with science



fiction and cinema. Like all the models that have lasted for centuries, they have developed a strong inertia in shaping our conceptualization. However the new wave of robots are emerging in a completely different scenario. With the new millennium robotics from the industrial sector has moved to colonize several other dimensions of public life such as hospitals, armies and so on. But the most radical change in robotics has been the starting of their penetration in the domestic sphere where the material and immaterial reproduction of workers is carried out. The robots have moved on to become “social” robots and as such they aim to substitute at least some parts of human caring such as company, affect, communication, and entertainment.

This shift however has been possible because the electronic culture in the domestic sphere had developed an efficient system of filters among individuals inside the communication process as well as between the self and the reality (authenticity). From telephone wires to computer or mobile screen, different filters have created a huge backstage of the communication process.

A cone of shadow has encompassed the human body making it invisible in its real life and individuals have begun to suffer an increasingly fluid identity. Some portraits or even videos may accompany a profile in one or other of the current social networks, but in the majority of mediated communication the body still remains concealed. It is for this reason that emotions are submitted to a remarkable under-expression or compression (Fortunati, forthcoming). The existence of these filters had brought a profound transformation of the social contract and it developed in this way over the course of time. The change in the social contract happened not so much at a legal or regulatory level but at the level of its practical expression and application. In particular, this strategic change had impacted areas such as responsibility (Bier, Sherblom, & Gallo, 1996), trust (Uslaner, 2004), and control (Kraut et al., 1998), making these important aspects of the social contract increasingly indirect and thus difficult to perform and assess.

If one compares mediated and immediate communication, it emerges that in co-present communication the physical and emotional presence of the human body regulates social relationships in a manner that the individual identity is made quite clear and evident (Vincent & Fortunati, 2009). Both interlocutors can control one another and the context of the social engagement, because of their reciprocal trust, is based upon a rich display of signs. On the contrary, in mediated communication electronic dispositifs (Agamben, 2009), with their specific filters, make the reciprocal control only partially possible, and in turn, the under-developed sense of social responsibility, which derives from the limitation of social control in the absence of the body, shakes the foundations of the social trust and thus of the social contract. In their own social exchanges people have increasingly become less visible and more diffident. Of course, recent developments have introduced more multimodal communication, in which image, sound, and text collaborate together in the codification and de-codification of the message. This type of communication removes some previous limitations and gives more visibility to the human body (Kress, 2010). However, people do not always react negatively towards the filters, because in the meantime people have also learnt to take advantage of these filters and experience different modalities of communication, which have, on the whole, enriched their communication possibilities. An example of this is the difficulty for Telecoms and operators to commercialize the video-telephone. After many decades of using simple fixed telephones which completely filtered the vision of the body of the two interlocutors, people do not now appreciate the possibility of having a telephone augmented by images (especially the face) of both interlocutors (Lewis, 1984).

In the last two decades the volume of the various forms of mediated communication has increased and the volume of communications in presence has decreased in the social sphere. For dealing with these transformations, the foundations of the social contract were tempered and humans learned to coexist and to make society in a more labile way. These steps are the basis for the arrival of social robots. In fact, these same issues of social responsibility, trust, and control are also fundamental to social robots (Bicuspid, Croissant, & Restivo, 2006). Consider, for example,

“battlefield robots,” the autonomous mobile systems with the capability of shooting to kill. The aim of the research on “battlefield robots” was to reduce casualties, especially of the military personnel who must operate in high-risk settings. However “battlefield robots” research poses a serious problem of responsibility. The decision to shoot, injure, or kill another human being is made by the software algorithms, which are embedded within them. But does it mean that the responsibility to make a choice between life and death is given to a machine? In reality, it might belong to those who built the algorithms. If the diffusion and appropriation of ICTs have entailed a radical change in the social contract, the arrival of the robots in new spheres of the social life will require further changes of it.

## **EXPLORING MODELS AND MEANINGS OF SOCIAL ROBOTS IN THE DOMESTIC SPHERE**

Entering into the domestic sphere and the everyday life, the form of robots has in turn become an open problem. In the environment of commodities production, the automatization process has always been weak in dealing with the creative, aesthetic, sensorial, emotional aspects of the several tasks involved in it. In the reproduction sphere, the sphere of family, housework, care work, and affections, this weakness has been shown to be even more dramatic. This sphere in fact has traditionally included the most precious part of human life, which is concerned with the production and reproduction of humans (Fortunati, 1981). Here the penetration of robots had to take two different paths; firstly a path robotizing the material part of housework, such as the robot cleaning the house, cooking, or ironing (fourth model), and secondly another path leading to the robotization of the immaterial part of housework such as communication, emotion and so on. The fundamental worker in the domestic sphere has always been women, although all the family members were involved to different degrees in the reproduction process of individuals. The main characteristic of this work is the fact that it is unpaid and not regulated. Interestingly, the more women’s involvement in the external labor market has increased (but not the commitment of the state in providing adequate social services), the more women’s presence in the house has remained without assistance or, in the wealthier households women were assisted in regard to some tasks by immigrant women (Fortunati, Pertierra, & Vincent, 2011).

Right now a variable part of housework and care work is carried out by migrants and especially by migrant women. The socio-economic model involved in the domestic sphere is that when women cannot guarantee their personal, unwaged housework at home, the family has paid for somebody else to replace their work. This model tends to substitute unpaid and personal care with paid and abstract care, but it still replaces human work with human work. However, the model poses two challenges: firstly, the current economic crisis does not enable a sufficient amount of family income, and secondly, availability of the migrant labor is limited. The social robots are aimed to be an implicit answer to this situation, offering partial, yet perhaps economical solutions, to some of the problems connected to the reproduction, especially that of weak social subjects such as children, ill or disabled persons and elderly. However, what has to be stressed is that the solution “social robots” start from the assumption that the current model of society will not be questioned by citizens. This vision is inert and simplistic as social scientists know that the engine of social change is the multitude’s subjectivity, social conflict and political initiative. This problem does, however, need to be set aside for the moment in order to remain focused on the discourse on robots’ forms.

In the first instance, the social robots targeted at everyday life tasks have kept the old models. This applies especially to robots with zoomorphic or machine-like representations that have begun to spread in the domestic sphere. It suffices here to think of Tamagotchi, AIBO and Paro, for the immaterial part of reproductive labor (Hutson et al., 2011) and of Roomba (Forlizzi, 2007) for the material part of housework. Interestingly Forlizzi’s study shows how the arrival of Roomba

stimulated families to clean more often, to renegotiate the division of labor inside the family (men, for example, were cleaning more than before). As Hutson et al. (2011) argue, and as we will see below, much of the current research “literature about social robots for elderly focuses on devices that can provide assistance or support to people with physical or mental health problems” (p. 579). Broekens et al. (2009) also report that a recent review of the studies focused on social robots for the wellbeing of the elderly found that a) most studies were carried out in Japan; b) they investigated Paro and AIBO; c) they were conducted with elderly people in nursing homes. Hutson et al. tried to verify in the UK if social robots could help to improve wellbeing in the elderly, possibly by reducing their loneliness. They found that participants in their research were mostly unsatisfied with the social robots and that participants expected that animal-type robots behaved like real animals. This study, like Shibata’s research (2004), also found that the participants more easily accepted unfamiliar animal-type robots than familiar animal-types because people were less able to compare them unfavorably with the actual animals (Hutson et. al., 2011).

Hutson et al.’s and Shibata’s studies raise a well known question among scholars. Even if the religious anathemas have lost their strength, there are psychological reasons that continue to block the personal and collective acceptance of social robots when they are too similar to human beings or animals. This question is that of the “uncanny valley” sketched by Freud (1919), finalized by Mori (1970) and masterfully discussed by Höflich in this issue. Social robots cannot be too similar to human beings because in this case a reaction of discomfort develops. If a certain degree of similarity is achieved by social robots, that is, if their appearance seems to authenticate their humanity, users feel cheated when they discover that an entity that looks human is not. A too high degree of similarity with humans by social robots provokes in the users an effect of “uncanny valley” when they discover that social robots are not humans. This could be because too much similarity violates the mental representation we have of the machine.

Remaining on the social robots with zoomorphic representation, let me focus for a while on Paro that is the most studied social robot so far. Paro is modeled after a baby harp seal. It is covered with soft artificial fur to make people feel comfortable, as if they are touching a real animal. Paro has five kinds of sensors: tactile, light, audible, temperature, and posture sensors, with which it can perceive people and its environment. With the light sensor, Paro can recognize light and dark. He feels being stroked and beaten by tactile sensor, or being held by the posture sensor. Paro can also recognize the direction of voice and words such as its name, greetings, and praise with its audio sensor. Although a real baby harp seal spends most of the day sleeping, Paro is active during the daytime, but gets sleepy at night like a human. Inoue, Wada and Ito (2008) argue how this robot has been designed for two market niches: those who cannot take care of real animals and those who live in places where pets are forbidden. Since research seems to show that Animal Assisted Therapy has positive psychological, physiological and social effects on patients, Paro is used by occupational therapists in place of true pets. Inoue, Wada and Ito did a qualitative research with 20 occupational therapists: the results describe Paro’s merits (e.g., “it is so pretty,” “touch sense is very good”) and demerits (e.g. “Paro’s body is so firm,” Paro’s weight is too heavy,” “Paro’s outer shape gets dirty with time”) as perceived by the patients.

Wada, Shibata, Saito and Tanie (2004) studied the long-term effects of Paro presence in a group of elderly. Paro was made available in a health service facility for three months and in a day service center for five weeks. The applied methodology was quite complex (face scale, geriatric depression scale, comments of nursing staff). Results show an improvement of the elderly’s moods and depression and a stability of their interest towards Paro. On the other hand, Gerderblom, Bemelmans, Spierts, Jonker and de Witte (2010) stress an important concept: the availability of a technical system as such is insufficient in itself for an efficient inclusion of social robots inside a healthcare institution. They reported about Paro’s application in three care institutions for psycho-geriatric patients in the Netherlands, arguing that interventions need to be defined describing goal,

target group, environment and how care staff should be used to pursue effective application. Shibata, Kawaguchi and Wada (2009) present an interesting investigation on people living with Paro at home. They report, for example, that in 1999 in Japan 3000 units of AIBO were sold and 2000 in US and that sales stopped in 2006. At the moment we do not know how many people bought Paro. However, some partial data is available. Of the questionnaires sent with Paro to its owners in Japan, 85 came back. Among the 85 respondents, 22 males (25.8%) and 61 females (71.7%). Main results are that female owners seemed to accept Paro more naturally than males; that the majority of owners liked animals and had kept pets before but could keep pets no longer; that both males and females liked to touch and hug Paro, but females also liked the tactile sensation of Paro. Both were equally satisfied with Paro, but maybe for different reasons (Shibata et al., 2009).

A new field of research called human-robot-interaction aims to investigate and understand the interactions which develop between humans and robots. When approaching the field from a communication science perspective, it is fundamental to ask in which sense they are social as Höflisch argues. Given that “they are not a medium through which humans interact, but rather a medium with which humans interact” (Zhao, 2006, p. 402), generally social robots do not provide more options to get into contact with other people. They appear instead as a surrogate, a para-social interaction (Horton & Wohl, 1956). Nevertheless, an emotional bond can be created in the relationship with social robots in the same way we express our emotional investment in objects (Zhao, 2006). Hence, more than a communicative tool, they seem to be more affective tools.

They are affective technological artefacts rather than social (cf. Linke, Lásen and Barile in this same issue). They represent in fact limited communication skills. The sentiment of wonder that was so strong in antiquity has now given space to an articulated range of positive emotions such as interest, joy, relaxation, company, amusement, satisfaction, curiosity, enthusiasm, and surprise (Vincent & Fortunati, 2009). The relationship with technologies has in fact become more personal, close and familiar, but the fear of losing control over technology did not disappear. Meanwhile this fear is at the basis of the laws of robots, but also of the diffidence of Europeans towards social robots (Taipale, Sarrica, de Luca, & Fortunati, forthcoming).

A further important aspect of social robots, connected not so much with their forms but rather with their meaning is their relationship with toys and the sense of playfulness that toys embody. In the sixties the dolls have begun to become increasingly sophisticated, being able to say some words, as Vincent argues in this issue. In the eighties robots became common toys for boys being products developed out of cartoons about robots. These cultural products for infancy have reintroduced into the robots the sense of playfulness that they had lost with industrialization. The tradition of the toys has converged on social robots, probably because now these are now addressed to the domestic sphere and in particular to two segments of the market (children and elderly). Of what are pets and toys metaphors in the communication process? They embody the passion for playing and the narcissistic preference for a unidirectional communication. Furthermore, pets and toys have both a strong transactional power that brings with it a nostalgia for our childhood.

What then, is the difference between Paro and a teddy bear or an advanced dolly? Shibata, Kawaguchi and Wada reported that Paro’s owners were especially women and that they considered important that they “can touch and hug” Paro as well as his “tactile texture.” So it seems that haptic communication is involved, which is the most basic and primary form of communication. When we were born, we experienced tactile communication at unidirectional levels as we undergo the caresses of our mother. When we grow older haptic communication generally becomes bi-directional. It becomes an exchange but we are still able to invest haptic communication on objects, which thus become transactional objects. Paro is a more sophisticated teddy bear. Paro and Tamagotchi represent a surrogate of affectivity and they operate in the intertwining of a human baby and a pet.

All these historical models entail – as we saw – different meanings and emotion. We saw, for example, that the zoomorphic representation was pursued in the past because of the teleological

anathema against building an automaton too similar to the human being. Although in many countries this anathema remains, now the choice to produce zoomorphic robots is based on other motivations; for example, to create a product responding to cocoon culture among children and adolescents so spread in some Asian societies such as Japan and China. Understanding and discussing these motivations is an open question. One motivation could be, and this is the case of Tamagotchi, to build a robotized pet to teach children caring behavior by simultaneously reducing the amount of work that true pets entail. Probably the real meaning of this sociable robot is that it is easier to ask children to care for this robotic pet instead of providing robotic care. Another motivation, and this is the case of AIBO, Paro and so on, is to allow elderly and ill persons to develop a caring behavior and to develop an emotional relationship with them, without having the burdens that mothering and fathering in general require. Another motivation is to have fun and entertain, something similar to our heritage from antiquity where the automata had also the function to be ostensible.

In this new context of robotization of both material and immaterial reproductive labor in the domestic sphere, the competition takes place between social robots and women in their capacity of caregivers and immigrant who, in many families, substitute the capacity of native women to care children, ill persons and elderly. The socio-economic model involved now is that of substitution of housework by social robots, even in its immaterial part. The premise is that social robots should cost less than migrant women although the performance might be lower in quality. This model should respond not only to the progressive unavailability of migrant women but also to the unsustainable model that would see the employment of a caregiver for each elderly.

In this section we also saw the problems connected with the penetration of the first wave of social robots in the domestic sphere. Firstly, some studies stress that social robots are addressed to specific niches of users. Secondly, other studies confirm that too much similarity to pets has to be discarded and thirdly it turned out that a new field of studies called human-robot-interaction has started. This new field of studies is identifying the communicative, emotional and entertainment model capable to describe the functioning of the interaction between humans and social robots.

## UBIQUITOUS SOCIAL ROBOTING AND FINAL REMARKS

We saw in the previous section that social robots arriving in the domestic sphere have so far kept the traditional forms. These material forms will continue to exist because people prefer physical robots as transactional objects (Mataric et al., 2007). Mataric and her colleagues in fact report that the participants in their research have found that physical robots are more “watchful” and “enjoyable” than virtual ones. However the socio-technical system working in contemporary societies has opened new possibilities of conceptualization. The Robot Companions for Citizens (RCC) Manifesto (2012),<sup>1</sup> for example, reports two very interesting new conceptualizations: the first is “Robot suit,” that is a wearable robot that provides support to people when moving and doing everyday life activities. The second is “Microrobots,” that is “a class of intracorporeal robots for medical intervention, medical diagnosis or organ repair, substitution and functional regeneration, completely deployed inside the body” (The Robot Companions for Citizens Manifesto, p. 21). At the same time Timo Kaerlein (2012) argues that there is already some kind of robotic presence inside the new media such as the mobile phone. He analyzes, for example, a “cellphone-type tele-operated android” called Elfoid, which has been designed and produced to provide a substitute “for a dialog partner through evoking a feeling of presence” (Kaerlein, 2012, p. 1). Avatars such as SIRI in the iPhone or S-Voice in the Samsung Galaxy that work in the current mobile communication

<sup>1</sup> <http://www.robotcompanions.eu>

This website contains many useful information on this project led by Paolo Dario.

system as social agents also serve as examples. The help on the part of these avatars is still very limited and people have fun in getting them confused at the moment. However, they are merely the first step of a long journey that is occurring in the mobile environment. These presences, if developed further, can transform themselves in new modes.

A new, innovative model for social robots is possible: it is what I call, along the lines of the definition given by Mark Weiser of “ubiquitous computing,” the invisible and ubiquitous roboting, which is the robot that exists without its own hardware. Within this process, robotic functions are separated from their electronic shells and social robots “weave themselves into the fabric of everyday life until they are indistinguishable” (Weiser, 1991, p. 94). In this case many people will use robots without being aware of it. This unaware use will avoid the elaboration of a specific attitude towards robots. The use of robots in this case is sucked inside the use of other media such as the mobile phone or the computer/Internet. As a consequence, the new technologies will become robotized in the sense that the presence of robots inside them will increase the automatization of communication and information processes, or, to put it another way, that social robots will be the new media.

The hidden and ubiquitous robot implies that robots must renounce their hardware. They will fertilize and strengthen the old and the new media with their software. It is the robot, whether it is an avatar or a social believable agent, that will work, in a saprophyte way, inside the already available technologies such as the mobile phone. This perspective is illuminated by two important papers: that of Sugiyama on mobile phones as quasi-social robots and that of Vincent on mobile phones as personalized social robots, both in this issue. In particular, these two papers highlight the notion of social robots as the combination of users and mobile phone. This hidden presence of robots has advantages and disadvantages. It can work well for all the areas of communication and immaterial labor, but it does not fit with users’ needs when they have to do things or need a material, concrete help. Nevertheless, there is room for developing the invisible and ubiquitous robot, as this development accompanies and mirrors the disappearance of the human body from the communicative scenario.

To conclude, if we look at social robots from the perspective of the model of society they embody, their social meaning is not yet clear. Societal efforts seem to go in the direction of creating phantoms, simulacra, simulation, anti-authenticity, counterfeit, “as if” situations and processes, as Turkle stresses in her book *Alone Together: Why We Expect More from Technology and Less from Each Other* (2011). Do we think that an “as if” life is a social life enough and is this the way in which we like to organize the society of the future? Furthermore, the availability of an innovation such as that of social robots is not sufficient in itself to justify their production. It is necessary to quantify their costs in the short and the long run for the society in economic and social terms. This would also include the care staff required in order to pursue the effective application of a robot system, as Gelderblom, Bemelmans, Spierts, Jonker and de Witte underline (2010). It is also essential to articulate their goals, the target groups, and the environment.

Our societies need first of all to see themselves as organisms under change and then they need to establish limits and boundaries between automatized behaviors and free and creative behaviors. People need to make sense of social robots, to be aware of what it means to be working in glocal societies, to assess the environmental and social role of innovations, to include robotics in the production, protection and enhancement of territories, including houses, according to advanced ethical and aesthetical perspectives. However, at the same time, they do not have to be in need of social robots if this reduces the scope of the realization of human beings and if this impoverishes the search for meaning and fulfillment of human life.

Being at the beginning of a new phase, there are numerous future research questions that call for our attention. Why robots? What is a robot as technological artefact? What do robots represent to people? What is the relationship between people and robots? Who will be their owners? Why

should people buy (or not) them and what might be the social consequences? What might life and society with robots become like? What are the social needs or desires to which social robots answer? What are the economical, social, psychological and political motivations or are they technologically pushed? Do we really think that social robots will be able to answer profound and authentic emotional needs of human beings? And if so, in what way? Are there any alternative solutions to replace this growing presence of social robots, or perhaps, even a better solution? Answering these questions would be a good starting point for moving toward the next phase of our research efforts.

## REFERENCES

- Agamben, G. (2009). *What is an apparatus? And other essays*. (D. Kishik & S. Pedatella, Trans.). Stanford: Stanford University Press.
- Allegri, L. (1991). Dal filosofo al folle: la marionetta nel Medioevo. In U. Artioli, & F. Bartoli (Eds.), *Il mito dell'automa* (pp. 21-25). Firenze: Artificio.
- Baltrusaitis, J. (1982). *Il Medioevo fantastico*. Milano: Mondadori.
- Barile, N. (2013). From the posthuman consumer to the ontobranding dimension: Geolocalization, augmented reality and emotional ontology as a radical redefinition of what is real. *intervalla: platform for intellectual exchange*, 1, 101-115.
- Baron, N. S. (2013). Lessons from Venice: Authenticity, emotions, and ICTs. *intervalla: platform for intellectual exchange*, 1, 7-16.
- Bauchspies, W. K., Croissant, J., & Restivo, S. P. (2006). *Science, technology, and society: A sociological approach*. Malden, MA: Blackwell.
- Baudrillard, J. (1990). *Lo scambio simbolico e la morte*. Milano: Feltrinelli.
- Bier, M. C., Sherblom, S. A., & Gallo, M. A. (1996). Ethical issues in a study of Internet use: Uncertainty, responsibility, and the spirit of research relationships. *Ethics & Behavior*, 6(2), 141-151.
- Broekens, J., Heerink, M., & Rosendal, H. (2009). Assistive social robots in elderly care: A review. *Gerontechnology*, 8, 94-103.
- Carpenter, J., Davis, J. M., Erwin-Stewart, N., Lee, T. R., & Bransford, J. D. (2009). Gender representation and humanoid robots designed for domestic use. *International Journal of Social Robots*, 1(3), 261-265.
- Chevalier, J., & Gheerbrant, A. (1987). *Dizionario dei Simboli* (vol. 2). Milano: Rizzoli.
- Dal Lago, B. (1991). *Il sogno della ragione. Unicorni, ippogrifi, basilischi, mostri e sirene*. Milano: Mondadori.
- Ferrari, G. A. (1984). Meccanica 'allargata.' In G. Giannantoni, & M. Vegetti (Eds.), *La scienza ellenistica* (pp. 225-296). Napoli: Bibliopolis.
- Forlizzi, J. (2007). How robotic products become social products: An ethnographic study of robotic products in the home. *Proceedings of HRI '07: The ACM/IEEE international conference on human-robot interaction*. doi:10.1145/1228716.1228734  
Retrieved from <http://dl.acm.org/citation.cfm?id=1228734>
- Fortunati, L. (1981). *L'arcano della riproduzione: Casalinghe, prostitute, operaie e capitale*. Venezia: Marsilio.  
[Fortunati, L. (1995). *The Arcane of reproduction: Housework, prostitution, labour and capital*, New York: Autonomedia.].
- Fortunati, L. (2003). The human body: Natural and artificial technology. In J. E. Katz (Ed.), *Machines that become us* (pp. 71-87). New Brunswick, New Jersey: Transaction.
- Fortunati, L. (forthcoming). *Human body, communication and the new media*.
- Fortunati, L., Pertierra, R., & Vincent, J. (Eds.). (2011). *Migration, diaspora and information technology in global societies*. New York: Routledge.
- Freud, S. (1919). *The "uncanny."* Retrieved from <http://web.mit.edu/allanmc/www/freud1.pdf>
- Fye, B. W. (2003). René Descartes. *Clinical Cardiology*, 26, 49-51.

- Gerderblom, G. J., Bemelmans, R., Spierts, N., Jonker, P., & de Witte, L. (2010). Development of PARO interventions for dementia patients in Dutch psycho-geriatric care, *ICSR, LNAI 6414*, 253-258.
- Halpern, D., & Katz, J. E. (2013). Close but not stuck: Understanding social distance in human-robot interaction through a computer mediation approach. *intervalla: platform for intellectual exchange*, 1, 17-34.
- Höflich, J. R. (2013). Relationships to social robots: Toward a triadic analysis of media-oriented behavior. *intervalla: platform for intellectual exchange*, 1, 35-48.
- Horton, D., & Wohl, R. R. (1956). Mass communication and para-social interaction: Observations on intimacy at a distance. *Psychiatry*, 19, 215-229.
- Hutson, S., Lim, S. L., Bentley, P. J., Bianchi-Berthouze, N., & Bowling, A. (2011). Investigating the suitability of social robots for the wellbeing of the elderly. In S. D'Mello et al. (Eds.), *Proceedings of ACII '11: International conference of the HUMAINE association on affective computing and intelligent interaction. Part I, LNCS 6974*, 578-587. Retrieved from <http://soolinglim.files.wordpress.com/2010/07/social-robots-for-the-elderly.pdf>
- Inoue, K., Wada, K., & Ito, Y. (2008). Effective application of Paro: Seal type robots for disabled people in according to ideas of occupational therapists. In K. Miesenberger et al. (Eds.), *ICCHP 2008, LNCS 5105*, 1321-1324.
- Kaerlein, T. (2012). Presence in a pocket: Phantasms of immediacy in Japanese mobile telepresence robotics, communication+1: vol.1, article 6. Retrieved from <http://scholarworks.umass.edu/cpo/vol1/iss1/6> (Last accessed on October 3, 2013)
- Kraut, R., Patterson, M., Lundmark, V., Kiesler, S., Mukophadhyay, T., & Scherlis, W. (1998). Internet paradox: A social technology that reduces social involvement and psychological well-being? *American Psychologist*, 53(9), 1017-1031.
- Kress, G. (2010). *Multimodality: A social semiotic approach to contemporary communication*. New York: Routledge.
- Landucci, S. (1991). *I filosofi e i selvaggi: 1580-1780*. Bari: Laterza.
- Lanza, D. (1989). Aristotele, la miglior tragedia, gli automata. In D. Lanza, & O. Longo (Eds.), *Il Meraviglioso e il Verosimile* (pp. 101-111). Firenze: Olschki.
- Lasén, A. (2013). Digital inscriptions and loss of embarrassment: Some thoughts about the technological mediations of affectivity. *intervalla: platform for intellectual exchange*, 1, 85-100.
- Lewis, P. M. (1984). *Media for people in cities: A study of community media in the urban context*. Paris: UNESCO.
- Linke, C. (2013). Social robotic experience and media communication practices: An exploration on the emotional and ritualized human-technology-relations. *intervalla: platform for intellectual exchange*, 1, 49-59.
- Mataric, M. J., Eriksson, J., Feil-Seifer, D. J., & Winstein, C. J. (2007). Socially assistive robotics for post-stroke rehabilitation. *Journal of NeuroEngineering and Rehabilitation*, 4(5). doi:10.1186/1743-0003-4-5
- Mori, M. (1970). Bukimi no tani [The Uncanny Valley], *Energy*, 7(49), 33-35.
- Nussbaum, M. (2001). *Upheavals of thought: The intelligence of emotions*. Cambridge: Cambridge University Press.
- Parlato, E. (1991). Il Volto dell'Utopia: modi e significato dell'automa rinascimentale. In U. Artioli, & F. Bartoli (Eds.), *Il mito dell'automa* (pp. 26-30). Firenze: Artificio.
- Rank, O. (1989). *The double: A psychoanalytic study* (H. Tucker, Jr, Trans). London: Carnac. (Original work published 1925)
- Rinaldi, A. (1979). La ricerca della 'terza' natura: artificialia e naturalia nel giardino toscano del '500. In M. Fagiolo (Ed.), *Natura e artificio* (pp. 154-175). Roma: Officina Edizioni.
- The Robot Companions for Citizens Manifesto (2012). Retrieved from



- [http://www.robotcompanions.eu/drupal-robocom-files/page-files/RCC\\_MANIFESTO.pdf](http://www.robotcompanions.eu/drupal-robocom-files/page-files/RCC_MANIFESTO.pdf)
- Shibata, T. (2004). An overview of human interactive robots for psychological enrichment. *Proceedings of IEEE 92*, 1749-1758.
- Shibata, T., Kawaguchi, Y., & Wada, K. (2009). *Investigation on people living with Paro at home: Effects of sex differences and owners' animal preference*. Paper presented at the 18<sup>th</sup> IEEE international symposium on robot and human interactive communication, September 27-October 2, Toyama, Japan.
- Smith, A. (2008). *Teoria dei Sentimenti Morali* (S. di Pietro Trans.). Milano: RCS libri. (Original work published 1759)
- Sugiyama, S. (2013). Melding with the self, melding with relational partners, and turning into a *quasi-social robot*: A Japanese case study of people's experiences of emotion and mobile devices. *intervalla: platform for intellectual exchange*, 1, 71-84.
- Taipale, S., Sarrica, M., de Luca, F., & Fortunati, L. (forthcoming). *How European citizens face up to robots*.
- Trabucco, O. (2010). «L'opere stupende dell'arti più ingegnose». La recezione degli Πνευματικά di Erone Alessandrino nella cultura italiana del Cinquecento. Firenze: Olschki.
- Trebbi, F. (1991). Dedalo, la statua e l'automa. In U. Artioli, & F. Bartoli (Eds.), *Il mito dell'automa* (pp. 13-20). Firenze: Artificio.
- Turkle, S. (2011). *Alone together: Why we expect more from technology and less from each other*. New York: Basic Books.
- Uslaner, E. M. (2004). Trust, civic engagement, and the Internet. *Political Communication*, 21(2), 223-242.
- Vegetti, M. (1991). L'automa meraviglioso. In U. Artioli, & F. Bartoli (Eds.), *Il mito dell'automa* (pp. 9-12). Firenze: Artificio.
- Vincent, J. (2013). Is the mobile phone a personalized social robot? *intervalla: platform for intellectual exchange*, 1, 60-70.
- Vincent, J., & Fortunati, L. (Eds.). (2009). *Electronic emotion: The mediation of emotion via information and communication technologies*. Oxford: Peter Lang.
- Wada, K., Shibata, T., Saito, T., & Tanie, K. (2004). Psychological and social effects in long-term experiment of robot assisted activity to elderly people at a health service facility for the aged. *Proceedings of '04 IEEE/RSJ international conference in intelligent robots and systems*, September 28-October 2, Sendai, Japan.
- Weiser, M. (1991). The computer for the 21<sup>st</sup> century. *Scientific American*, 265(3), 94-104.
- Zanca, A. (1991). Il mondo degli automi tra manierismo e secolo dei lumi. In U. Artioli, & F. Bartoli (Eds.), *Il mito dell'automa* (pp. 31-39). Firenze: Artificio.
- Zhao, S. (2006). Humanoid social robots as a medium of communication. *New Media and Society*, 8(3), 401-419.

## BIOGRAPHY

**Professor Leopoldina Fortunati** is the director of the PhD Programme in Multimedia Communication at the University of Udine, where she teaches Sociology of Communication and Culture. She has conducted several studies in the field of gender studies, cultural processes and communication and information technologies. Her works have been published in eleven languages: Bulgarian, Chinese, English, French, German, Italian, Japanese, Korean, Russian, Slovenian, and Spanish. E-mail: fortunati.deluca@tin.it