Is the Mobile Phone a Personalized Social Robot?

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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[1] a character doll designed for interaction with autistic children; and Paro a baby seal used to provide comfort for older people.

[1] 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.[2] 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)[3]

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[4] 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[5], Kismet[6]) 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

[2] http://www.youtube.com/watch?v=NJ3NsQ9FzEk Accessed June 2012
[3] http://www.amazon.co.uk/Vivid-Imaginations-PM98101-Amazing-Ally/dp/B00004YR1N Accessed 9 May 2012
[4] http://www.kaspar.herts.ac.uk/kaspar/introducing-kaspar.htm
[5] http://www.feelix-growing.org/
[6] 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[7] 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

[7] 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.

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BIOGRAPHY

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