Empathy manifestations in interspecies Game Design experiences

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ABSTRACT

In the present work forms of empathy manifestations in interspecies (game) design experiences are observed. In order to do this, general aspects of empathy and its intersections with design and games are discussed. Then, some game design approaches are observed in the context of Animal-Computer Interaction. Finally, four interspecies (game) design experiences are briefly discussed and possible ways of empathy manifestations are pointed out. The research shows that cognitive and emotional empathetic responses such as perspective-taking, relationship-building and reflective thinking are able to be perceived during the game design activity as well as by observing the animal-technology interaction.

KEYWORDS

Game Design;
Empathy;
Animal-Computer Interaction;
Interspecies.

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1. INTRODUCTION

Related to the communicative, collaborative and creative processes that unfold in the relations between designers and users, empathy can be observed as the effort to connect with people on a fundamental level: to observe or to comprehend the world in the same way that others do, to understand it from another's experiences and feel it through their emotions (Brown 2009). It is worth to emphasize that the movement towards empathy is not about putting a designer in the role of another, but to be able to connect with others from their experiences and perspectives, supported by a dialogical process.

Empathy is a phenomenon associated with different aspects, such as: competence; ability; intellectual virtue; behavioral response. Batson (2009, 4-8), for example, points out eight distinct conceptions resulting from research on empathy: (i) know a person's internal states, including his or her thoughts and feelings; (ii) adopt the posture or match the neural responses of an observed other; (iii) come to feel as another person feels; (iv) intuit or project oneself into another's situation; (v) imagine how another is thinking and feeling; (vi) imagine how one would think and feel in the other's place; (vii) feel distress at witnessing another person's suffering; and (viii) feel for another person who is suffering.

As Hess and Fila (2016, 4) synthesize, empathy "includes both affective experiences and cognitive processes that may be primed automatically or within the subconscious, and that may operate in isolation or concurrently, but which tend to have a cyclical relationship." In this process, affective experiences comprise empathic distress and empathic concern, while cognitive processes include perspectives that can be oriented to self or to others.

Among the positive characteristics associated with the development of empathy are the interest in another, the apprehension of different perspectives and experiences, the expansion of communication and the tendency to make ethical decisions. Such benefits go beyond improving attitudes and motivating affective behaviors toward humans. Empathetic people demonstrate, for example, stronger feelings of moral obligation to help animals, plants and nature (Berenguer 2007).

Animal-Computer Interaction's (ACI) efforts propose the application of design principles that place the animal at the center of an iterative development process as a legitimate user and contributor of design (Mancini 2013). This involves recognizing that non-human animals have the ability to feel, perceive, experience subjectivity, however without looking at them from an essentially anthropocentric perspective. This implies looking at them without associating

their way of thinking or feeling with ours, or comparing if they are aware of the natural world in the same way that we are.

The use of digital technologies to promote experiences of engagement between people and the natural world (Webber et al. 2017), especially from the perspective of play, have benefited from these qualities. In this sense, the emergence of the ACI discipline (Mancini 2011) seems to put us in a new perspective of expansion of the fields of Interaction Design and Games. But would it be possible to stimulate human empathy through interspecies playful design? If so, how this characteristic is manifested in the relationships between human and non-human animals in a (game) design context?

Seeking to answer those questions, the game design activity is seen here as a way to build new forms of interaction and interspecies communication. And, the playful aspect is an element capable of enhancing empathy in these relationships. Therefore, the present work discusses the manifestation of interspecies empathy in the context of (game) design from an Experience-Centered Design approach.

The discussion presented here is the result of a bibliographical review using the Google academic database in August 2018. A search for the terms "animal computer-interaction", "game design" and "empathy" returned 10 papers, where: one of these was dedicated specifically to the subject (Webber et al. 2017); two referred to empathy as a cross-cutting theme (Westerlaken and Gualeni 2016; Pons and Jaen 2017); and the others either mentioned the term empathy or cited previous studies. From the analysis of these works and the state of art about empathy, some general considerations about empathy in the context of design and games are traced; after that, the Animal-Computer Interaction discipline and its insertion in game design context is introduced; and finally, some insights related to the manifestation of empathy in the context of interspecies (game) design experience is presented.

2. INTERSECTIONS OF EMPATHY, DESIGN AND GAMES

The empathetic relationship between designers and users has been explored in the context of Human-Computer Interaction and Interaction Design for some time. Suri (2001), for example, has already pointed out empathy as a necessary factor in Ergonomics to deal with future challenges and opportunities. Mattelmäki and Battarbee (2002) explored it in the context of designing personal experiences with interactive technologies. Wright and McCarthy (2008) explored the dialogic characteristic of empathy in user experience design.

These researches are focused essentially on the human perspective

and can be seen as responses to the challenges of a new demand of Design, such as the understanding of significant actions and emotional aspects related to users' experiences since the late 1990s (Mattelmäki et al. 2014). This has revealed a need for finding new ways to deal with the uncertainties arising from the insertion of these immaterial issues. In this context, the notion of Empathic Design (Leonard and Rayport 1997) emerged as an additional approach to ergonomic practices and marketing research. The Empathic Design method was seen as a tool for developing the designer's ability to connect with people and involves: observation; data collection; reflection and analysis; brainstorming for solutions; and prototype development of possible solutions.

This perspective of Empathic Design turned to the User-Centered Design notion, especially with the participatory design movement, from the year 2003, when the change from product design to interaction with systems and services was perceived (Mattelmäki et al. 2014). It is possible to say that this was the moment in which the notion of Design Thinking started gain emergency (Brown and Wyatt 2010). An approach that has among its principles the experimentation, collaboration, co-creation, focus on the human, holistic bias (Brown 2009; Stickdorn and Schneider 2010).

When we talk about codesign or participatory design we are also referring to empathy because its practice reveals the subjects' individuality. The construction of empathy is established by an aesthetic relationship formed by learning the qualities and values of another. This dialogic, immersive process can take time until the designer became able to recognize behaviors and strategies that people use to cope with the complexity of the world. The perception of these behaviors is subsequently translated into design trends in order to generate systems or services that can impact the lives of individuals. In this context, the designer appears as a kind of cultural intermediary.

The state of the art regarding video games and empathy is still recent (Belman and Flanagan 2010; Greiteyeyer 2013; Darvasi 2016). The most recent work seems to be that wrote by Matthew Farber and Karen Schrier (2017). Among the results of this study, it can be highlighted the characteristics of games in promoting immersive experiences are a way of stimulating behaviors and actions related to empathy (Mahood and Hanus 2017). Another striking factor for empathy through videogames is what Janet Murray (2003) calls agency, that is the feeling that the actions and choices made by the player during the gameplay result in significant changes in the game world. Making meaningful choices helps the player to

control his or her gaming experience and usually promtes a sense of free will. Despite this, "it may also lessen empathy because the player is not removed enough from the choices." (Farber and Schrier 2017, 14)

Farber and Schrier also point out perspective-taking and identity characteristics, which refers to the act of taking the point of view of another, making possible to better understand the other, even if we do not have the same view or agree with it. Hofman (2000) considers the perspective-taking the most advanced form of empathy, because it enables us to become affectively empathetic towards another even though they are not present. Perspective-taking in the context of games helps to form a sense of identity and, as argued by Darvasi (2016), the player becomes more easily empathic if he or she is able to see the character on the screen. This can happen in a gameplay experience by enabling a third-person perspective, or by allowing changing between first and third-person perspectives.

In addition to this connection with player-controlled characters, it is also possible to create links to non-playable characters, which are controlled by the game programming. The independent relationship with non-playable characters is developed over time and may result in empathic emotions similar to those established with actors or characters from a book. The last-mentioned aspects are connection, communication and reflection resulted from real people interactions. These can help to support several aspects that are relevant to the practice of empathy, such as perspective-taking, role-playing, reflection, agency, identify formation and relationship building (Belman and Flanagan 2010; Schrier 2015; Hess and Fila 2016).

As discussed previously, an empathetic connection suggests a predisposition for it to occur. At the same time, it demands presence, there is also absence, since there is a need to connect with the other to empathize. This implies a possible detachment of individuality and can take place in both affective and cognitive way. This connection with another can occur through both observation and dialogic relationship. This last one, in fact, seems to be more intense since it is consolidated from the experience of interaction with the other.

In this context, design and game activities can be seen as possible ways for the development of empathic forms. Both are activities that presuppose or stimulate the engagement of their actors and provide an immersive dive into new experiences and contexts. These qualities, which are usually seen from a human point of

view, are presented here as potential indexes for a perceptual and cognitive expansion into a broader field of relationships, which is assumed in this work as interspecies empathy phenomenon.

3. PLAYFUL DESIGN IN THE CONTEXT OF ANIMAL-COMPUTER INTERACTION

Research involving interaction between animals and technology is not recent (Mancini 2017). However, the perception that their design approaches were not focused on animal-centered design gained evidence in 2011, when Clara Mancini published the Manifesto on Animal-Computer Interaction (Mancini 2011). In this paper the author describes scientific objectives, methodological approaches, ethical principles and outlines a scientific agenda for the systematic development of ACI as a discipline. Its purpose is to understand the interaction between animals, technologies and contextual elements of the environment in which they live.

Despite the increasingly number of studies, the design experiments in the context of ACI are still at an early stage and its approaches are mostly based on the knowledge of Human-Computer Interaction discipline and traditional practices of User-Centered Design. Research in this context has tested different technologies (Hirskyj-Douglas et al. 2018), adopted different methodologies (French et al. 2017) and involved different species. An idea of these experiments can be seen in the research by Hirskyj-Douglas and his colleagues (2018). After an extensive literature review of the field, the authors identified and classified the technologies adopted in ACI from their forms of use: tangible and physical; haptic and wearable; olfactory; screen-based; and tracking. These technologies used sound interfaces, biotelemetry collars, GPS, thermal cameras, touch screens, among others, and aimed at the control, communication, well-being, monitoring and playful of animals such as pigs, dogs, elephants and horses.

It is known that play is an activity shared by animals (Fava 2018). Because play is intrinsically motivated and performed for the pleasure of the activity in itself (Huizinga 2007), it represents a characteristic of animal welfare (Oliveira et al. 2010), since it only occurs at times when they are not subject to stress situations. In the context of social play, animals develop play signals to know whether they are in a play activity or not (Burghardt 2005). These signals may perform different functions during play and can be of several types, such as postures, odors, facial expressions, vocalizations. Recognizing those signs may be paramount for defining if an activity is play and to engage with playing experiences in an interspecies' context. In this sense, a design perspective, through prototyping, experimenting and co-creating in playful interaction

contexts, may lead us to a better understanding of play itself and of what is involved in the complex interspecies playful interactions.

The exploration of playful interactions is one of the main objectives of ACI studies. These studies explore, for example, playful interactions mediated by technology as a potential way to improve the quality of life of animals (Alfrink et al. 2013; Geurtsen et al. 2015; French et al. 2018) as well as interspecies interaction design as a form of sensitization for the relationship between humans and non-humans animals (Cheok et al. 2011; Westerlaken and Gualeni 2014; Baskin and Zamansky 2015).

In the following section will be discussed four ACI (game) design experiences: a study with visitors of a zoo conducted by Sarah Webber and her colleagues (2017); an experimental game design activity with children by Patricia Pons and Javier Jaen (2017); an exploratory game design research with two orangutans conducted by Hannah Wirman (2014); and an exploratory (game) design exercise involving an ant colony led by Michelle Westerlaken and Stefano Gualeni (2016). It will be seen, from the point of view of designers and users, how empathy forms and characteristics can possible manifests during the interspecies game design activity.

4. EMPATHY-RELATED CHARACTERISTICS IN INTERSPECIES GAME DESIGN

In a study conducted at the Melbourne Zoo, Australia, Sarah Webber and her colleagues (2017) designed and analyzed an interactive installation for six orangutans to understand the forms of empathy experienced by humans by observing animals interacting with technology (Fig. 1). The team developed four interactive applications for the animals and identified three specific strategies to evoke empathic responses from visitors: (1) enable visitors to observe animals' natural behaviors in close proximity; (2) make visible to visitors the orangutans' cognitive capabilities; and (3) allow visitors to observe differences between individual animals' behaviors and preferences. For four weeks the researchers conducted semi-structured interviews with 25 visitors to discuss aspects of the interaction, such as what they had learned from the experience, how their perception of animals was affected, and what were their impressions about the facility. The authors perceived that distinct forms of empathy are manifested.

In the cognitive aspect, empathy was revealed in the reflection on the animals' intention to interact: "they're not being rewarded for interacting with the technology. So, in that way it's a good thing because it's more free exploration, not sort of training to use it". Interviewees observed different forms of interaction and pointed

out reflections on desire of the animals in the interaction: "what's really interesting is that they're using the back of their hands to play with the patterns and she's obviously intrigued"; "they seem to enjoy it". Learning aspects and forms of intelligence were also observed, which changed the visitors' perspective towards the animals: "They can do a lot more than I thought, especially I didn't think they could do things with technology". The perception of rapid learning in the interaction with the system also indicated a reflexive engagement with the animals and a particular interest in their intrinsic state: "the challenge of the program is trying to work out a variety of things, they'll always have to be reviewing this, because I would say, with most animals, if they can solve certain problems they will be able to get to a level and once they get there they'll get bored". Perceptions of similarities between orangutans and humans were also considered. This, in fact, is an element that plays an important role for empathy since people are more inclined to empathize to animals by recognizing in them human characteristics (Butterfield et al. 2012).

Fig. 1
Interactive projections powered by a
Microsoft Kinect in use by an orangutan.

Responses related to the experimentation of emotional empathy have also been striking: "I'm a bit in love with them anyway. So, anything that is provided that can help them and improve them and make their lives interesting, I think is fascinating". This is a positive indicator to reinforce perceptions about the benefits of using technology in contributing to positive attitudes towards animals and their potential for improving their quality of life. The results of this project demonstrate that interspecies empathy can be evoked through interaction design from an observatory point of view. The act of observing animals while they interact with technology can be a way of triggering perspective-taking and identity that may establish reflective thinking and different forms of connection with animals.

Patricia Pons and Javier Jaen (2017), on the other hand, carried out a research that allows us to observe these manifestations in the context of the design activity. The authors conducted an experiment where children aged from 5 to 13 years old, patients from a hospital in Spain, assumed the role of game designers to create interspecies games between humans and animals. The children worked individually with the researchers in order to create scenarios for two games, each one for a different animal. The research method involved a pre-questionnaire (to understand the child's knowledge and feelings about the animal before designing the game), a semi-structured interview conducted during the procedure (so that the researcher could understand the game and guide the design process) and a post-questionnaire (to, among other objectives, encourage the child to reflect on his or her design, and thinking about how the animal would enjoy or perceive the game).

Despite the fact that the animals were the focus of the project, their absence in the design activity limited and conditioned the results to the children's previous knowledge of both species and the use of technology. The results showed that many of the solutions centered on the human aspect without considering the implications of the game for the animal. On the other hand, the experience was significant to generate interest and positively impact their opinions about the animals. At the end of the process, they showed interest in knowing more about animals, especially the wild ones. They also considered the game as a tool to increase the animals' skills such as speed, dexterity, and development of smell. These perceptions highlight several aspects of design and games: the importance of involving animals as part of the design process (as argued by Mancini 2011); the potential that games have for learning; the potential quality to empathy sensitization, such as perspective-taking, reflection and relationship-building to name a few.

In another project, Hannah Wirman (2014) conducted an exploratory game design activity with two orangutans at a rescue and rehabilitation center in Indonesia. The researcher introduced computer technologies – particularly touch screen interfaces – and experimented with different games in which the orangutans could perform a set of simple interactions such as moving objects, making items disappear by touching, drawing, selecting and watching videos. Among the objectives of the study were the improvement of the quality of life of orangutans in captivity and the discussion about how games can be used as a way of facilitating interspecies interaction.

Although physical similarities between orangutans and humans suggested a human-like interaction experience – fact that could be observed, for example, in the participants responses of the study conducted by Sarah Webber and her colleagues (2017) –, Wirman's experience revealed limitations of such a pre-conception in at least four aspects: input mechanisms – games were not designed to respond to the interaction used by animals, such as the palm of the hands, wrist, licks, legs, feet and applied force; viewing angle – the orangutans may interact too close (Fig. 2) or too far from the screen, upside down, and the interaction was generally dispersed; software/hardware – the screens were licked, touched and often destroyed; and continuum of play practices – the animals interaction with technology was always competing with other forms of play, and in general, could not be determined when one game started and another ended.

Fig. 2
Orangutan Bento observing orangutan-proof touch screen 'too close' with his keeper.

These are perceptions that are mostly seen in the context of participatory design. This activity demands the adoption of a posture based on dialogism, iteration and open mind to deal with different types of experience. The design and game activities are commonly frustrated, and the researcher or the game designer needs to be prepared to deal with this quality of the process as Wirman says: "Sometimes, I assume, I have been trying to teach them to be what they cannot be. This has occasionally led to feelings of great incompetency, which I am little by little learning to let go and allow control from my side to theirs". The researcher adds: "If I had taken the route to really teach (read: condition) the apes to 'correctly' use and play the games I made, this would have been a step away from my very understanding of play itself" (Wirman 2014, 113). The immersive experience of the researcher was able to promote an empathic experience, which resulted respecting the singularities of the animal hence the observation of new facts about its forms of behavior, interaction and fun.

Unexpected events are a characteristic of the fundamentally exploratory design process (Brown 2009) and the designer needs to be sensitive to perceive possible trends from these episodes. This can be observed in a project developed by Michelle Westerlaken and Stefano Gualeni (2016). Westerlaken acquired a colony of ants and kept it in her work environment for a period of three months. During this time, she made daily observations, studies and small interventions in the colony's arrangement to see how the ants would react. One day the ants found a small gap between the plates of their enclosure and traced an escape route. From this event, the project took a course that was made possible by the empathic relationship that Westerlaken established with the ants.

Inspired by the ants' behavior the researchers sought to expand moral consent to animals and critically rethink our relationships with them. Seeking this they promoted a provocative and speculative activity where students of interaction design and games from a Swedish University should design scape room game prototypes so that the ants could potentially play (Fig. 3). The activity was relevant to promote empathic-related skills as reflective thinking, perspective-taking, identity, agency and communication.
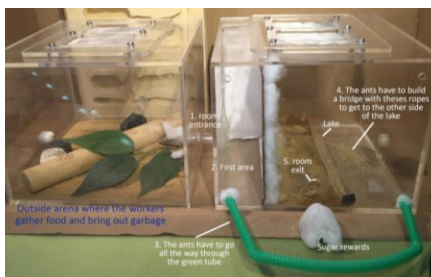

Fig. 3
One of the designed prototypes that propose an escape room in which the ants enter into a small room on the left of the box. The ants then have to crawl through the green tube to enter a bigger area.
The ants can escape the room after crossing a small lake by building a bridge using small ropes.

After the activity the students answered a questionnaire commenting on the implications of designing interaction scenarios for ants: "it should not be dangerous. We should respect these small animals."; "we created a design [in which] the ants can be trapped forever without food. We almost went ahead and presumed they're smart enough to figure [this] out. I feel guilty about this". It also could be noticed that, like the experience of observation with the orangutans (Webber et al. 2017), the workshop changed the way they observe the ants: "it was very interesting to design for something that you have absolutely no clue about. I feel more close to the ants (feels like that). And I can identify more since I know more about them.";

"I think we view them as much smarter animals now."; "We almost humanize them by saying things are 'fun' and all. I don't know how much of this is true, but it does make me wonder". These critical reports show that, through involvement with another promoted by a game design activity, it is possible to raise issues related to the human condition, such as communication links, relationship-building, cognitive expansion and systemic vision.

Finally, the researchers conducted a playtest experience with the prototypes. For five weeks, they watched the ants interact with each of them – they managed to escape from three of them. The experience was transmitted online with the aim of generating conversations and reflections on the ideas prompted by the project. This situation stimulated several online discussions and elicited varying degrees of sensitivity about how people perceived the experience and how the ants interacted with the prototypes. While some were engaged in the project, others discussed ethical aspects of the experiment.

In general, the research revealed that the practice of design with an interspecies way of thinking allowed "through unexpected situations, to stimulate new thoughts, alternative points of view and forms of involvement not previously experienced." And the ants "acting, escaping, responding, and appropriating artifacts unexpectedly" actively influenced the way in which these transformations took place and the way the project evolved.

5. FINAL CONSIDERATIONS

In this work it was investigated how empathy could possibly emerge from interspecies game design activities. It was possible to observe four distinct experiences where empathy-related characteristics were manifested from the observation of animal-technology interactions as well as from a designer perspective during interspecies interactions. Discussions have shown that design and games have specific qualities and general characteristics capable of enhancing the development of empathy that go beyond the human perspective. The empathic relationship with the animal can occur both indirectly, through observation and directly, through an immersive experience in a dialogical and collaborative interaction with animals.

The development of empathetic abilities, such as immersive experiences, perspective-taking, reflective thinking and relationship-building may turn us more open to the perception of new forms of consciousness in the animal world and to access new phenomenological worlds. This means perceiving animals from their biological individuality. Perspective that will possibly bring

positive influences also to the expansion of human consciousness as it makes it possible for new forms of relationships to emerge.

In an ecological perspective for ACI it is necessary to keep in mind that the animal is connected to its own space and the human insertion in this context will show some limitations of traditional User-Centered Design approach. It is not possible, for example, to present the game's instructions to the animal or to question the animal about its impressions regarding the interaction design as we can do when conducting participatory design sections and interviews with humans.

This complex and uncertain scenario, which presents a diversity of unexpected phenomena, is, in fact, the space of design. It is in this environment that the designer acts to restructure theories, strategies of action, and forms of knowledge. Context that is relevant for the exploration of playful design possibilities as well as the expansion of the Game Design field. In this sense, the conception of Design, which was already migrating from product design to the design of immaterial solutions, may also involves the challenges of experimenting with an ecological vision aimed to understand non-human qualities.

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