



COMMENT

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Is data a toaster? Gender, sex, sexuality and robots

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ABSTRACT This article considers the development of robotics through the lens of Gender Studies, with a particular interest in exploring relationships of intimacy involving robots. The production of sex robots has prompted some ethicists to set up the Campaign Against Sex Robots, their position articulated in Kathleen Richardson's, 2015 paper, "The Asymmetrical 'Relationship': Parallels Between Prostitution and the Development of Sex Robots". It is notable that these sex robots are commonly referred to as sexbots or fembots, but there is seldom reference to a malebot, though makers suggest that they can or will be made. Others (notably the makers) see this technology as no different from a vibrator or dildo and suggest that it could be a way of dealing with aberrant and criminal sexual behaviours including paedophilia. Intimacy is more than sexual practice, of course, and the ability of humans to form emotional attachments to technology is well-documented. Consider, for example, Maja Mataric's description of the relationships formed by families with their Roomba vacuum cleaner in the *Robotics Primer* (2007). This led to problems for the makers for whom it was less expensive to replace a broken machine than to fix it, but who were faced with demands from families that their Roomba be repaired and returned to them. This article addresses this debate, exploring a range of contributions from ethicists, roboticists, gender theorists and others, and making specific reference to the television programs, the Scandinavian series, *Real Humans* (2012) and its English version, *Humans* (2015), as well as to Jordan Wolfson's recent artwork, *Female Figure* (2014). This article is published as part of a collection on gender studies.

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In the *Star Trek: The Next Generation* episode, ‘The Measure of a Man’ (1989) a Starfleet scientist, Commander Bruce Maddox has come aboard the starship Enterprise in order to conduct an experiment on the positronic brain of android crew member, Commander Data. When it is revealed that the experiment may wipe Data’s memory erasing the being he has become, the crew object to the experiment and Data refuses permission for the research. When Maddox insists on his right to conduct the research on the grounds that Data is a machine owned by Starfleet, a legal hearing is convened to determine whether Data has the right to self-determination. As sitting JAG officer Captain Phillipa Louvois brutally puts it, unless proved otherwise “Data is a toaster” and can be disassembled at will.

Louvois appoints Captain Picard to defend Data and First Officer, Commander Riker to act as prosecutor. Riker’s (grudging) demonstration of Data’s mechanical nature is based on a simple action; he turns him off:

Riker: The Commander is a physical representation of a dream—an idea, conceived of by the mind of a man. Its purpose: to serve human needs and interests. It’s a collection of neural nets and heuristic algorithms; its responses dictated by an elaborate software written by a man, its hardware built by a man. And now ... and now a man will shut it off.

Picard counters this graphic demonstration of Data’s mechanistic nature with an argument that addresses not only Data’s being but also the nature of humanity:

Picard: Now, the decision you reach here today will determine how we will regard this ... creation of our genius. It will reveal the kind of a people we are, what he is destined to be; it will reach far beyond this courtroom and this ... one android. It could significantly redefine the boundaries of personal liberty and freedom—expanding them for some ... savagely curtailing them for others. Are you prepared to condemn him and all who come after him, to servitude and slavery? Your Honor, Starfleet was founded to seek out new life; well, there it sits!—Waiting.

This kind of fictionalized debate about the status of the robot or android has been taking place in science fiction since the invention of the Creature by Victor Frankenstein gave birth to the genre. The robot has been used as a metaphor to question the treatment of many groups of people, from the displaced industrial working-class in *Frankenstein* (Shelley, 1982 [1818]) to the post-World War II fantasy of the submissive housewife in *The Stepford Wives* (1975). Today we are closer than ever before to having to address the question as a reality not a metaphor, as is dramatized in the Swedish television series *Real Humans* (2012), its British counterpart, *Humans* (2015-) and in a number of recent movies including *Robot and Frank* (2012) and *Ex Machina* (2015). As Picard notes, our answer to the question will determine not only the future of the android, but also our own future. This is a debate about the nature of humanity.

The *Star Trek* story introduces a number of the concerns addressed in this essay. First, it graphically introduces a scenario towards which we are now moving where species other than human are afforded their own right to live on their own terms. This potentially includes artificial beings though present-day robots are far from the sophisticated android represented by Commander Data. Second, it demonstrates the power of fictional narratives to enact contemporary social and cultural debates, and in particular their interrelation of emotion and reason in the production of embodied knowing. Thirdly, it reinforces the point that our struggle to incorporate new technologies into our lives is

fundamentally about the future of *human* nature and *human* society.

In this article, I confine the analysis to the study of human–robot relations and even more specifically to the development of social robots. The article was prompted by the founding of the Campaign Against Sex Robots instigated by anthropologist, Kathleen Richardson and informatics researcher, Erik Brilling and by recent concerns expressed about the development of Artificial Intelligence (AI) by scientists and engineers including Martin Rees (2003), Stephen Hawking, Elon Musk and Bill Gates (Sainato, 2015). Hawking, Musk and Gates are primarily concerned that we may create AI capable of developing an intelligence that we do not understand and that may decide that human beings are irrelevant or pathological. This is the scenario enacted in the movie *The Terminator* (1984) and its sequels where an AI command system, Skynet wages war on the human race. Skynet may have once seemed as far from contemporary reality as current robots are from Commander Data; however, the proposal that military drones be given autonomy to select and destroy targets shows how close that reality may be (Sharkey, 2011). The prospect of autonomous drones roaming our skies is probably a more pressing and immediate threat to human existence than social robots. And if those drones were to achieve the kind of intelligence feared by Hawking, Musk and Gates, Skynet may well become active.

The autonomous drone is the kind of threat that Wallach (2011) classifies among “specific discernible risks” that can be addressed through “innovation, regulation and soft governance” (187). Wallach also identifies two other kinds of risk, “far-reaching societal impacts arising from the various ways in which emerging technologies will be combined” (187) and existential risks which he explains with a quote from Nick Bostrom: “where an adverse outcome would either annihilate Earth-originating intelligent life or permanently and drastically curtail its potential” (187). Wallach notes that many emerging technologies combine these three kinds of risk in various ways. At this moment the emergence of social robots involves mostly existential and societal risks simply because the robots are not generally available; however, they soon may be, at least in industrialised countries. To put this into context I start with a brief account of what constitutes a social robot and of their current state of production.

Social robots

The term “social robot” is attributed to a report by Billard and Dautenhahn (1997) and is generally understood to mean a robot that is designed to interact with humans. Two years later Dautenhahn and Billard (1999) presented a definition that goes beyond human–robot interaction:

Social robots are embodied agents that are part of a heterogeneous group: a society of robots or humans. They are able to recognize each other and engage in social interactions, they possess histories (perceive and interpret the world in terms of their own experience), and they explicitly communicate with and learn from each other. (quoted Fong et al., 2003: 143)

This definition suggests a high degree of self-awareness and sociability which is echoed in the vision of MIT researcher, Cynthia Breazeal in her book *Designing Sociable Robots* (2002):

For me, a sociable robot is able to communicate and interact with us, understand and even relate to us, in a personal way. It should be able to understand us and itself in social terms. We, in turn, should be able to understand it in the same social terms—to be able to relate to it and to empathize with it. Such

a robot must be able to adapt and learn throughout its lifetime, incorporating shared experiences with other individuals into its understanding of self, of others, and of the relationships they share. In short, a sociable robot is socially intelligent in a humanlike way, and interacting with it is like interacting with another person. At the pinnacle of achievement, they could befriend us, as we could them. (1)

Fong et al. (2003) record a series of terms used to capture the nuances of robot-human interaction: four terms used by Breazeal, *socially evocative*, *social interface*, *socially receptive*, *sociable*, and their own suggestions, *socially situated*, *socially embedded*, *socially intelligent*. (145) My point here is not to quibble about terminology but rather to note the amount of slippage and indeterminacy in both the vision for robot development and our understanding of what constitutes social interaction and “the social”. For example, what an engineer terms a social interaction may not coincide with what a sociologist or cultural researcher understands by that term, with their differences proving either disruptive or informative and empowering depending on the communicative abilities and openness of the participants.

In relation to the current production of social robots the International Federation of Robotics web site (2016) notes: “In 2014, about 4.7 million service robots for personal and domestic use were sold, 28% more than in 2013. The value of sales increased to US\$2.2 billion”. For the period 2015–2018 they predict sales of domestic (primarily floor and window cleaning, lawn mowing) robots to number about 25.9 million units; sales of toy and hobby robots of about 6 million units; about 3 million units for educational and research purposes. They also note that sales of robots for elderly and handicap assistance will be about 124,000 and that: “This market is expected to increase substantially within the next 20 years”. Of the humanoid robots that are the focus of most fictional explorations of human-robot relationships they note:

... there have been no significant sales of humanoids as human companions to perform typical everyday tasks in production, office or home environments. Quite a few Japanese companies (HONDA, Kawada, Toyota and some others) and also American, Korean and European companies are in the process of developing these general-purpose robot assistants beyond the toy and leisure stage. First shipments of these humanoid robots started in 2004 to international laboratories and universities as high-end robotics research and development platforms.

The development of social robots for domestic use is led by engineers such as Breazeal (2002, 2003a, b), whose social robot JIBO is now available for pre-order (now expected to be released in October 2016). JIBO is not a humanoid robot but interacts with humans verbally and with the kind of movement exhibited by the *Star Wars* robot R2D2. That movement, Breazeal explains, creates an engagement that facilitates the formation of an emotional relationship between robot and owner.

The development of explicitly humanoid robots or androids is led by researchers at sites such as Hiroshi Ishiguro’s Intelligent Robotics Laboratory in Japan and Hanson Robotics in the United States. Ishiguro (2006) writes explicitly about his development of androids to explore the human-robot relationship and ultimately the nature of the human. A report on the Ishiguro and Hanson laboratories for CNBC by Harriet Taylor (16 March 2016) entitled, “Could you fall in love with this robot?” begins: “Humanlike robots may seem creepy, but some roboticists are betting they are the key to unlocking a future in which humans and superintelligent computers coexist, work alongside each other

and even develop relationships”. Taylor’s final point is intriguing and takes us toward one of the ideas proposed by Wallach, *techno sapiens*—the prosthetically-enhanced human who can directly interface with machines and so begins to change fundamentally as a result. This is yet another potential possibility and problem that might be explored, however this article focuses on the development of robots for domestic use. Accordingly, I want to start with the most basic robot with which some of us already share our homes—Roomba.

Roomba

One of the greatest surprises for the manufacturers of Roomba vacuum cleaners was that many owners made an emotional connection with their machines (Forlizzi and DiSalvo, 2006). Robotician Maja Mataric (2007: 286) reports: “Roomba users already refuse to have their Roombas replaced when they need repair, insisting on getting the same one back. What happens when the robot is much more interesting, intelligent, and engaging than the Roomba”. Furthermore, some owners name their machines; talk to them; apologize for getting in their way; take them on holidays; introduce them to others; and give them time off work (Forlizzi and DiSalvo, 2006). Just as people forge emotional relationships with fictional characters, they do the same with machines, and the machines do not need to be bipedal human-like androids in order for this to happen.

One explanation for this response is that humans extend the empathy that is a source of social cohesion (Rifkin, 2009; Segal, 2011) to non-humans. Segal explains this social empathy as a combination of individual empathy (feeling into someone else’s experience), contextual understanding and social responsibility, which enables people to understand others “by perceiving or experiencing their life situations and as a result gain insight into structural inequalities and disparities” (266–267). People commonly extend this empathy to animals and to other things, living and non-living—from trees to teddy bears—where it operates as a model for socially responsible interaction. There are negative responses to this kind of engagement. For example, Sparrow (2002) writes about the dangers of robot pets, particularly their use as companions for the elderly, if this is simply a way to avoid social responsibility and if it is based on delusions about the “reality” of the pet. However, I would argue with Rifkin and Segal that our empathetic responses to the non-human are more often a form of learning and exploration and rarely result in the kind of self-delusion he fears.

Another explanation for our attachment to Roomba may come from the study of material culture, which has shown that human beings have more than a purely functional relationship with the things they encounter. Things may also embody memory; enable interrelationships; actualize important events or earlier civilizations. The encounter engages the human senses as well as the intellect, enabling embodied learning and cognition that generates knowledge: “There is a corporate communication between the body and things, the person and the world, which points to the perceptual construction of truth as the involuntary disclosure of meaning through the senses” (Seremetakis, 1994: 6). These encounters are often analysed by reference to the notion of *affect*, which has become a key term for cultural, social and philosophical studies of human-object relations including human engagements with technology. As Wilson (2010) notes, a groundbreaking study for scientific research in the late twentieth century was Antonio Damasio’s book, *Descartes’ Error* (1994), which argued that cognitive ability is intertwined with emotion not separate from it. His research fundamentally challenged the Cartesian notion of the mind as separate from and in control of the body and provided scientists with validation of the notion of

embodied being or embodied subjectivity that was also prominent in humanities and social research in the latter part of the twentieth century.

Wilson notes that AI researchers have incorporated this understanding into their design practice, so that it has become a key element in the design of social robots, where it facilitates not only the engagement with humans but also the ability to think and act: “programming affective states into artificial agents makes them more resilient, better able to respond in real time, and more engaged with the vicissitudes of human use.” (loc. 46) And she goes on to note: “At the end of the twentieth century, the pioneering computational question was no longer Can machines *think*? But Can they *feel*?” (loc.46) Wilson cites the work of Kathleen Woodward whose research demonstrates “that relations between humans and machines are richly configured bonds of kinship and intimacy rather than transactions between a sentient subject and an inert tool.” (loc.63) Woodward (2009) presents a compelling study of the interrelationship of thinking and feeling, including a chapter that specifically addresses relationships with non-human cyborgs. These studies address not only the future of our relationship with the non-human but also confirm the fundamental role of emotional engagement in our thinking and being.

How much more profound is this engagement likely to be when the technology looks more like us; when it moves like us and engages us in conversation? How might it involve sex, gender, sexuality and love? And how might human gendering, sexuality and love be transformed by our relationships with our silicon others? In the final section of the paper I address some of the issues raised by the prospect of our engagement with humanoid social robots.

Humanoid social robots

Some of the most recent criticism of engagement with humanoid robots has come from the Campaign Against Sex Robots founded by Richardson and Brilling, and this addresses a specific concern—that robots produced specifically as sex partners will exacerbate existing sexual abuses and inequities affecting primarily women and children (Richardson, 2015). Their campaign was prompted at least in part by David Levy’s book *Love and Sex with Robots* (2007), which argues provocatively for the development of sexbots and predicts human-robot marriage by 2050. On their web site Richardson and Brilling present a list of objections to the development of sex robots:

- We believe the development of sex robots further sexually objectifies women and children.¹
- The vision for sex robots is underscored by reference to prostitute-john exchange which relies on recognizing only the needs and wants of the buyers of sex, the sellers of sex are not attributed subjectivity and reduced to a thing (just like the robot).
- The development of sex robots and the ideas to support their production show the immense horrors still present in the world of prostitution which is built on the “perceived” inferiority of women and children and therefore justifies their use as sex objects.
- We propose that the development of sex robots will further reduce human empathy that can only be developed by an experience of mutual relationship.
- We challenge the view that the development of adult and child sex robots will have a positive benefit to society, but instead further reinforce power relations of inequality and violence.
- We take issue with those arguments that propose that sex robots could help reduce sexual exploitation and violence towards prostituted persons, pointing to all the evidence that shows how technology and the sex trade coexist and reinforce

each other creating more demand for human bodies (*Campaign Against Sex Robots* web site (2016)).

It may be easy to dismiss these concerns if they are considered from the viewpoint of immediate, discernible risk identified by Wallach simply because the humanoid robots available now are not accessible to most householders. However, from the viewpoint of what Wallach calls societal risks the Campaign raises some important issues, which accord with some of the concerns expressed by Sparrow (2002).

The campaign focuses on the sexual deployment of humanoid robots made to mimic human women and children. Richardson and Brilling reject the notion that sex robots will provide an outlet for pedophiles and other sexual abusers, arguing that the production of replicant children and adults for the purpose of violent, non-consensual (or coerced) domination will simply entrench the sexism and misogyny that enables or generates the degradation of human children and adults. As Richardson (2015) noted, if that argument was valid, then the massive online expansion of the pornography industry should have led to a decrease in sexual violence and exploitation, but evidence shows the contrary (291). Indeed, it may simply mean that human women and children become even more valuable commodities to abusers and commerce in them more valuable to their procurers, who might accordingly become even more ruthless in their methods of acquisition and control. Furthermore, Richardson and Brilling question the basis of this claim: will someone who is a sexual sadist be satisfied by physically assaulting a machine even if that machine is programmed to show pain or fear? After all, a sexual sadist is doubtless lacking the empathy that enables engagement with the non-human. And if the robot is programmed to show fear and pain, is not the construction of such simulations part of a technology of gender that is based on power, control and violence? So these robots are part of a gender regime that enables, even tacitly approves, the abuse of the weakest and most vulnerable in our society. The recent BBC series, *Humans* articulated this concern when one of its sentient robots, employed in a brothel, finally reacted against the violence of a particular user and killed him. This is a turning point in the narrative and suggests that this enabling of sexual violence via android partners is already perceived as a danger.

The Campaign also rejects the notion that sex robots will take work from consensual prostitutes, by noting again that the spread of internet porn has not decreased male use of prostitutes but increased it; Richardson quotes an increase between 1990 and 2000 from 5.5% to 8.8% of men who admit to paying for sex (291). And, as noted above, human prostitutes may even be valued more highly than robots, so a rejection of their campaign on the grounds that it disadvantages sex workers is not valid.

Even if we exclude the limit cases—the sexual sadists and abusers—the Campaign can be seen as raising a major concern: that we are creating a technology for purposes based on unjust and abusive modes of human interaction that will perpetuate those practices. It is worth diverting briefly to consider the research background of these arguments, which was the study of robot laboratories in Japan and the United States.

Robot labs

Anthropologist Robertson (2010) undertook an ethnographic study of Japanese robot laboratories, which have led the global interest in the development of humanoid service robots. The major reasons for the huge expansion of robotics in Japan identified by Robertson include: the need for elder carers for a rapidly ageing population; provision of household help so that Japanese women will have more children; a disinclination to

admit foreign workers into the country. At the same time, Robertson notes that social roles for women in Japan are so restricted and conservative that women are avoiding marriage resulting in a low national birth rate. She notes, for example, the implicit sexism in the dismissive response of one leading roboticist's response to her suggestion that women in a subservient service role (lift operators) could be replaced by robots: "With a bemused look, he dismissed my 'Western (*obei*) idea', noting that flesh-and-blood women supplied an authentic aura of human service so crucial to ensuring customer satisfaction" (Robertson, 2010: 7).

Robertson's analysis of the Japanese robotics laboratories identified a consistent failure or refusal by engineers to examine assumptions about sex and gender: "their naïve and unreflexive assumptions about humans" differences informed how they imagined both the bodies and the social performances of their creations" (5). The robots they produce are gendered in conventional and conservative ways: "female" robots are slender, have their mechanical hardware concealed and have high pitched, childlike voices, while "male" robots are bigger, chunkier, and show their mechanics (19–21). This is explained not in terms of technical necessity but simply (and unreflexively) as what people want or expect. The solutions to the social problems of low marriage and birth rates might be found, Robertson suggests, by addressing the conservative gendering of Japanese society that makes heterosexual marriage so unattractive to Japanese women, rather than by developing a robot industry.

In analysing the gendering of these robots Robertson returns to de Lauretis' (1987) concept of the "technology of gender" which theorized the ways that gender is a technology for the formation of human subjectivity. Robertson applies this to David Levy's justification of robot companionship: "I believe that among the principal reasons will be the *certainty* that one's robot friend will behave in ways that one finds empathetic, always being loyal and having a combination of social, emotional and intellectual skills that far exceeds the characteristics likely to be found in a human friend" (106). If we use beings constructed in our own image and relate to them in a purely narcissistic way so that they simply reflect our assumptions back to us, what consequences can this have for our ability to interact with beings that we cannot pre-program? Can we possibly develop emotionally and socially in such circumstances? In terms of gender and sexuality, how can we learn anything about those who are different from ourselves, across the wide variations of sex and gender, if our most intimate partners are likely to be constructed in terms of conservative stereotypes, are made to order, and can be discarded at will?

Technologies of gender

Robertson applies Rossini's (2003) description of biomedical engineers to roboticists, claiming that they are "*imagineers*, not just of bodies, but of cultural configurations and social arrangements as well" (28). She adds: "But the act of imagining per se does not necessarily yield fresh or progressive results" (28). Both Robertson and Richardson (co-founder of the Campaign Against Sex Robots) based their analyses of human-robot relationships on ethnographic studies of robot laboratories, Robertson in Japan and Richardson in the United States. Robertson, Richardson and Brilling all consider the social implications of introducing a technology based on conservative gender and sexual politics and practices. For Richardson and Brilling robots that are made in the image of patriarchal imaginings of masculinity and femininity; that can be abused in any way by their owners; that can be made in the image of children for sexual purposes; that invite engagement by acting as

much like human beings as possible; that live and interact with human beings and so become part of their everyday lives, inviting emotional interaction; that are totally subjugated to the desires of their owners—indeed who have *owners*—are likely to further entrench gender and sexual injustice and inequality, not because of the actions of a few violent people but because of the environment of gender inequality and of sexual violence they potentially create.

Increasingly we incorporate digital technology into our lives, through internet use, games, media, industrial robots, household and carer services. Many of these services already operate as a technology of gender through the metaphors by which they operate, the ways in which they constitute user relations, the situations they represent. However, it may also be that we are learning new ways of interacting through the use of this technology, including new ways of being gender and sexually diverse; that it enables new and more diverse sexualities to be recognized and acknowledged, and opens up debates and enables community formations that were not possible in the past. As Brahnham et al. (2011) contend:

Gender norms, inscribed in the tools we use, define who we are as human beings. This is true, no less, for HCI; interface design defines who we are as human beings. Beneath the screen-based metaphors that cloak the interface are unspoken gendered subtexts that have the power to bind or liberate. (402)

Given the ever-increasing numbers of robots and other digital technologies in our lives, the challenge is to find ways of deploying these technologies that are ethical, egalitarian and equitable—and not the means of propping up sexist and misogynistic gender regimes. Ultimately this affects us all, not just the potential users of sex robots.

This challenge requires a transdisciplinary approach, with engineers and designers in dialogue with anthropologists, cultural researchers, sociologists, economists, health workers and others to produce an informed analysis of technology, its assumptions and ethics, including its gendering of robots and of human-robot relationships. A range of perspectives from different disciplines on human-robot interactions have recently been published: *Connection Science* (2006), 18(4) Special Issue on Android Science; *Studies in Ethics, Law and Technology* (2008), 2(1) Special Issue on Robotics; *Interaction Studies* (2010), 11(2) Special Issue on Robot Nannies; *Interacting with Computers* (2011), 23(5) Special Issue on Feminism and HCI: New Perspectives; *Feminist Theory* (2011), 12(2) Special Issue on Nonhuman Feminisms; *Ethics and Information Technology* (2013), 15(2) Special Issue on Armed Military Robots; *Journal of Evolution and Technology* (2014), 24(3) Special Issue on Nonhuman Personhood.

Studying robots is a way of studying ourselves and what it is to be human: the production of robots and the attempt to make them more lifelike could be the source and site of transformational studies of genders, sexualities and the processes of gendering. It will almost inevitably change who we are as human beings as we learn new ways of understanding and being in the world; our challenge is to make this a positive, ethical experience that changes us and our world in positive ways.

Returning to the *Star Trek* story with which I started: one factor cited by Picard as proof of Data's sentience was his complex emotional and sexual relationship with ship's security officer, Natasha Yar. The boundaries breached by their relationship were not android, but *human*; their relationship was a way of exploring and expanding the possibilities of not only android but also human being. Our interactions with robots may be leading us

in a similar direction but this is not a relationship that should be left to military research and market exploitation; it involves us all. As for Commander Data and the humans among whom he lives, it could result in either enlightenment or enslavement; we must take up this challenge.

Notes

1 Note that manufacturers have acknowledged that male sex robots can be made, but they are not the primary market interest.

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Additional information

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