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Sex (Ro)bots: Theoretical Challenges in the study of Human-Machine Communication

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ABSTRACT

Research concerning sex (ro)bots is very new and has been recently undertaken from various scholarships such as gender studies, post-humanist studies as well as social robotics. This review article examines the research focus of studying sex (ro)bots from a Human-Machine Communication (HMC) perspective, explores two possible theoretical directions and argues in support of and proposes the most appropriate for qualitative HMC researchers. The relational and post-humanist agential philosophy of Bruno Latour is compared and contrasted with the post-structuralist, hermeneutical philosophy of imagination of Cornelius Castoriadis. This article underlines how each of these theories may impact a study within the discipline of HMC, which focuses on the meaning-making processes between humans and machines (Guzman, 2018). By focusing on the epistemological and ontological underpinnings of the two thinkers and providing distinct possible research directions for each theory, the article agrees with the renewed call for qualitative researchers to ground their research to robust theoretical frameworks (Collins & Stockton, 2018). It is argued that Castoriadis's social imaginary is an appropriate theoretical tool to critically investigate sex (ro)bots as it is compatible with HMC's research interests and key concepts in critical AI studies. The purpose of this review article is to encourage the identification of appropriate methodological tools to address sex (ro)bot qualitative research within HMC and the exploration of unanticipated old and new theoretical frameworks.

Keywords: human-machine communication, HMC, ANT, sociotechnical imaginary, sex robots

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INTRODUCTION

Research concerning sexual and intimate relationships with robots and chatbots is new and has been undertaken from various scholarships such as social robotics (Dubé & Anctil, 2020; Koumpis & Gees, 2020), sexuality studies (McArthur & Twist, 2017; Smith & Twist, 2020) post-humanist studies (Ray, 2016; Levy, 2017), ethics (Hancock, 2020) and gender studies (Richardson, 2015; Kubes, 2019). This review article shifts the focus towards the newly formed field of scholarship established as Human-Machine Communication (HMC) (Guzman, 2018) and specifically a qualitative enquiry within HMC for the study of sex (ro)bots. The purpose of this article is to help new researchers who wish to study sex (ro)bots from the interdisciplinary field of HMC to expand their knowledge on what are some of the available theoretical tools they can apply. Thus, this article reviews two possible theoretical directions for researchers to follow when studying sex (ro)bots qualitatively and relates the main theoretical tools provided by the two approaches with HMC's main research interests.

Specifically, the relational (Schinkel, 2017) and post-humanist (Kipnis, 2017) agential philosophy of Bruno Latour is compared and contrasted with the post-structuralist (Michel, 2015), hermeneutical (Adams, 2011) philosophy of imagination by Cornelius Castoriadis. By elaborating on the epistemological and ontological underpinnings of the two thinkers and providing distinct possible research directions for each theory, the article agrees with the renewed call for qualitative researchers to ground their research to robust theoretical frameworks (Collins & Stockton, 2018). The article argues that the Castoriadian philosophy and subsequently the *social imaginary* are not only methodologically appropriate tools to critically investigate sex (ro)bots but also useful in posing questions that go beyond the ontological, moral and ethical dilemmas of sex (ro)bots commonly discussed in current literature.

Questions about the ontology of sex robots in conjunction with the human ontological boundaries as well as the ethical and moral dilemmas involved in the usage of robots as sexual partners and companions have been centerstage in related research, as it often happens when researching robot adoption across facets of everyday life (Guzman, 2020). Nonetheless, there have been additional areas of interest such as the rise of digisexuality through these technologies (McArthur & Twist, 2017), the sexual care and dignity of the disabled and elderly (Koumpis & Gees, 2020) and the perpetuation of oppressive gender stereotypes enacted in sex robot narratives (Ue, 2020). These arising areas of interest are adjacent with HMC's research agenda (Guzman, 2018) that involves the study of everyday experiences with machines, implications of the relationships with machines on the self and society, the types of relationships humans form with machines and what it means culturally to communicate and form relationships with machines. To identify the most appropriate philosophical approach through which to explore sex (ro)bots within the HMC qualitative enquiry, this article examines two different approaches which are plausible and yield different research foci. Drawing on key concepts of the two theoretical approaches such as Actor-Network Theory (ANT) (Latour and Woolgar, 1986;

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Latour, 1987) and the sociotechnical imaginary (Jasanoff & Kim, 2009) this paper contributes to the effort to equip qualitative researchers with comprehensive methodological toolkits to conduct their research (Collins & Stockton, 2018).

BRUNO LATOUR AND ANT

Established mainly by Bruno Latour, Actor-Network Theory (ANT) has been described mainly as an approach, a toolkit or a sensibility to sociotechnical analysis, rather than a distinct theory (Law, 2004). ANT originates from Science and Technology Studies (STS) and proposes a new kind of social theory and sociology of knowledge. As put by Lutz & Tamo (2018, p.145) ANT considers the agency of objects, concepts and ideas as well as the relationality of technology and the social. ANT's main premise is that we live in a world composed of assemblages or actor-networks of actors that are human and non-human (Latour, 2005). Actor-networks are open, transient and unique networks of associations or influences (Latour, 2005), while the word actor is only a semiotic definition (Latour, 1996) rather than implying any kind of human action or motivation (Latour, 1996). ANT has been widely interpreted and moulded to fit into different topics of research enquiry as it has also been misunderstood as a framework to study social networks (Latour, 1996). In reality, ANT's relation to networks is ontological as it seeks to rebuild social theory out of networks (Latour, 1996). Furthermore, Latour (1996) explains ANT's ontology as irreductionist and relationist – as almost providing a breathing space from social theorists to allow for an element to fully unravel through its alliances (Harman, 2009) in the network, without accounting for "tyrannical" notions such as hierarchy or micro/macro distinctions (Latour, 1996).

Latour's network-y ontology brings forward a different social theory wherein actors lack a priori order relationships, can be literally (almost) anything and exercise agency (Latour, 1996). Latour's new materialism is demonstrated in the attribution of nonhuman agency, which has been the most controversial aspect of his scholarship. To bridge the two seemingly incompatible concepts of agency with nonhuman actors, it's useful to note that ANT examines how actors (both human and nonhuman) mediate agency (Kipnis, 2015), by re-introducing agency as decoupled by intentionality, subjectivity and autonomy (Sayes, 2013). It stems from the above, that ANT essentially suggests the assemblage of networks of actors of various ontologies, variable times and spaces (Sayes, 2013). For example, the work of Akrich (1997) seeks to explore the role of technological artefacts in ANTs and specifically how innovators "inscribe" visions of the world into the technical contents of their new object. Thus, even though ANT is considered an object-oriented philosophy (Harman, 2009), we must not forget that ANT encourages us to consider humans, material objects but also social or cultural factors as actors influencing the social world (Elder-Vass, 2014) and the knowledge-making of it.

Latour believes that the binary between subjects and objects is an invention of modernity (Nimmo, 2011). He is a notorious anti-dualist thinker who seeks to dismantle the persistent

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binaries such as subject/object that have been structuring the social scientific discourse (Nimmo, 2011). He argues (Latour, 1993) that the dualist thinking of the divides between science and politics, and between society and nature, were laboured that way in modern knowledge-making. He furthermore considers this a "work of purification" to disentangle the social from the natural in an attempt to avoid "cross-contamination" (Latour, 1993) in the social sciences. Besides attacking the dualist binaries of modern knowledge practices, the Latourian approach introduces the term "black box" (Latour, 1987) to describe practices, machines or organisations whose inner workings become increasingly opaque as they succeed (Latour, 1999). Expanding the black box theory, Latour urges to open the black boxes during knowledge-making to trace how processes unfold in big, black-boxed concepts such as society or class instead of assuming that they carry predetermined "truth" (Kipnis, 2015).

Latour questions the constructions through which social science knowledge-making happens and goes as far as to repudiate structure and agency while calling for the dismantling of the social in favour of distributions, connections (Elder-Vass, 2014) and heterogeneity (Latour, 1996). This approach to knowledge practices is radical and has been described as the theory of *translation* (Callon,1984). Essentially, rejecting the positivist paradigm, ANT's epistemology could be described as relativist (Law, 1991) and reflexive (Latour, 1996), while maintaining the excitement for empiricism as in a post-positivist exercise (Whittle, 2008). Indeed, ANT views reality as emerging out there (Cordella & Shaikh, 2006, p.17), nonetheless it is socially constructed by the humans and nonhumans of the actor-networks. Through ANT's approach, scientific beliefs, theories, knowledge and facts are considered to be constructed by stable actor-networks assembled by external objects, routines, scientists, texts and much more (Detel, 2015). The next section focuses on how and why ANT is a plausible approach in the study of sex (ro)bots from an HMC perspective.

The works of Latour have had an extreme influence in the study of sociotechnical change and especially in the case of AI technology such as robots, bots and voice assistants. Nonhuman agency, ANT's most controversial feature, is accepted into the ontology and epistemology of (ro)bots in HMC and even negotiated in various degrees (Neff & Nagy, 2016) since AI companions are designed to have agency (Guzman, 2018). As Latour (1996) encourages the interrogation of facts manufactured by the natural and social sciences and the artefacts designed by engineers, a range of questions arises to approach robots designed for sex and love purposes. For example, one could explore the relational agency of those robots during sexting and romantic role-play, relating to consent and robot ethics. Another question could be about how the specific technology of sex and role-play is inscribed by the developers and how it deviates from inscription during usage (Akrich, 1992). Similarly, to how Lutz & Tamo (2018) have approached health robots in HMC, a study on sex robots could benefit from ANT to map out the intimacy assemblages of AI companions comprising of actor-networks of the intimate/sex companions' developers, end-users, the sex/romantic role-playing algorithms and pornography laws. In the actor-network of sex/love with (ro)bots, translation (Callon, 1984) would involve negotiation between different actants beyond the (ro)bot, the end-users and the manufacturers of (ro)bots,

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such as disabled clubs and groups, women's advocacy groups or even the Campaign Against Sex Robots (Danaher et al, 2017). The latter could also be described as an *Obligatory Passage Point (OPP)* in translation (Callon,1986) whereby its ramifications could shine a light on the responsibility of the industry when designing such technologies.

CASTORIADIS AND THE SOCIO-TECHNICAL IMAGINARY

Described as "a paradigm-in-the-making," (Adams et al., 2015), a heterogenous field of enquiry that assists in "reinterpreting socio-political worlds" (Adams, 2019.p. 32), the social imaginary mirrors the interdisciplinarity of HMC. Castoriadis's philosophical approach combines psychoanalysis, anthropology and political philosophy to map out a theory that bridges the chasm between the individual and the social, through the utilisation of the concept of imagination in a twofold manner (Kli, 2018). On an individual level, there is the *radical imagination* representing the *psyche*, while on a collective level, there is the *social imaginary* of instituted significations, that corresponds to a collective creation of meaning in the sociohistorical (Kli, 2018, p.128; Castoriadis, 1987). Castoriadis's main ontological stance views the human being as a subjectivity with the ability to constitute its essential quality, its "essence" through *auto-poiesis* or self-constitution (Castoriadis, 2001). Furthermore, the subject is shaped in the socio-historical context through the instituted significations of the social imaginary that are both interdependent and in alterity with the subject (Kli, 2018). The *auto-poiesis* of the subject through radical imagination uncovers the Castoriadian ontology of creation, whereby the psyche is determined by the multiplicity of *magma* (Castoriadis, 1987) and socialisation (Kli, 2018; Castoriadis, 1987). Inextricably bounded, radical imagination and social imaginary give rise to the concept of the *autonomous society* – a social condition wherein the inherited social significances have come into question and critique to allow a shift from the instituted to the instituting (Castoriadis, 1983). Overall, Castoriadis's analysis is particularly preoccupied with the creation of meaning in an individual and collective level, as he considers the need of psyche for symbolic meaning to be drawing on the *social imaginary*, which is considered the everlasting source of the collective creation of meaning (Kli, 2018). Indeed, his approach is considered analysis of both meaning and interpretation, of culture and the symbolic (Adams, 2005), situating his work within the hermeneutical tradition.

Castoriadis's effervescent radical politics of autonomy and the centrality of imagination in his philosophy, lead him to a damning critique of Modern epistemology. Sharing similar viewpoints with many of his peers belonging to the poststructuralist and postmodernist thought, Castoriadis focuses on critiquing the exhaustive and ordering tendencies of rational knowledge in its attempts for a self-grounding reason (Breckman, 1998). First, he believes that autonomy can only be achieved through the critique of inherited thought and second, that inherited thought obscures the imagination (Mouzakitis, 2010; Breckman, 1998). His goal to exceed inherited thought (Castoriadis, 1984) is shown in his search of a new point of view for thought- a critical examination between science and ontology (Breckman, 1998) to uncover what the history of

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science has to say about what simply is, how it is organised and what is its content (Castoriadis, 1984). Specifically, Castoriadis invites us to rethink ontologically the knowledge-making practices which have been prescribed by Modernism. As explained further above, for Castoriadis, sense-making comes from the imaginary significations, therefore he adapts a schema whereby the development of knowledge, science and logic is mediated by the socio-historical context (Mouzakitis, 2010).

The Castoriadian social construction of knowledge is also manifested in the conception of science as a non-cumulative process that retains the particularities of its creation and cannot be reduced to scientific manifestations (Mouzakitis, 2010). As with other critics of Modernism, Castoriadis holds a specific imaginary of Modernism – to use his terminology – which is reflected in his critique of the western conceptions of knowledge as responsible for privileging scientism and instrumentalist logic in both knowledge-making and society at large (Breckman, 1998). Modern logic, which Castoriadis calls "ensemblistic-identitary" (Castoriadis, 1997a) is asserted through the scientific ideology that comes to be Modernity's self-understanding (Breckman, 1998). Overall, Castoriadis is critical of Modernity's both ontological and epistemological conceptions as they unravel in the Modern scientific rationality imaginary coupled with the "central imaginary signification of capitalism" (Castoriadis, 1997b).

As demonstrated above, Castoriadis's social theory is not inherently a social theory of technology as ANT can be. As a result, additional frameworks stemming from his scholarship should be added to aid this approach. Before that, it's essential to note that one locates Castoriadis's break from Marxism, among other reasons, because the latter fails to critique technology and wholly adopts technological determinism (Kli, 2018; Breckman, 1998). Instead, Castoriadis argues for a strong relationality between technology and society as he views the former as one of the imaginary significations of society (Castoriadis, 1984). As Bogiatzis (2013) aptly analyses, Castoriadis strongly opposes technological determinism and rejects neutralist approaches to technology. However, Castoriadis does not avoid essentialism all together, when he claims that we can only discuss modern technology in terms of capitalist technology (Castoriadis, 1984). By locating technology within the capitalist imaginary, Castoriadis makes a case against the capitalist "pseudo-rational" mastery of the world, which he describes as "meaningless and impossible" (Karagiannis & Wagner, 2012). In this light, it's crucial to investigate what are the implications of the "blackboxing" of technology as mere capitalist (Bogiatzis, 2013, p.5).

Castoriadis's philosophy inspired Jasanoff and Kim (2015) to construct the concept of the sociotechnical imaginary as an approach to study technological advancement within society. As Castoriadis (1987, in Jasanoff & Kim, 2009) explains, "imagination helps produce systems of meaning that enable collective interpretations of social reality" whereby the sociotechnical imaginary is deemed a useful framework to interrogate the underlying assumptions of the current social order (Sovacool & Hess, 2017). As defined by Jasanoff & Kim, (2009) sociotechnical imaginaries are "collectively imagined forms of social life and social order" that can be traced in

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nation-specific technological and/or design projects. We find the sociotechnical imaginary participating vividly in scholarship concerned with advanced sociotechnical change that expands beyond its limits from a nation-bound approach to include sociotechnical imaginaries of the smart city, AI or digital touch (Natale & Ballatore, 2017; Sadowski & Bendor, 2018; Jewitt et al., 2020). Usually, sociotechnical imaginaries are instrumental and futuristic (Sovacool & Hess, 2017), portraying desirable futures, enveloping either dystopian or utopian narratives which mainly focus on materiality, meaning and morality (Jasanoff &Kim, 2015) to describe the material outcomes of the technologies, the meaning-making behind them and their wider moral implications (Sovacool &Hess, 2017).

Both Castoriadis's broad philosophical interests and the sociotechnical imaginary as a theoretical tool have various applications to the study of sex (ro)bots. For example, one could explore what are the sociotechnical imaginaries of sex and love developed by the users of a specific (ro)bot or whether the adoption of sex (ro)bots impacts the way intimacy and sex are re-imagined for specific groups of users. In this context, sex with (ro)bots could entail granting rights to robots, which can be re-imagined through a Castoriadian approach. Castoriadis's *autopoiesis* could also be used to examine how sex (ro)bot users and/or digisexuals constitute their signification and negotiate their identity in society. Sociotechnical imaginaries involve both dystopian and utopian scenarios, through which one could sketch out the dystopian narratives circulated about sex (ro)bots or even whether the media speculations about the advent of sex (ro)bots indicate dystopian or utopian imaginaries. Furthermore, the controversiality of sex (ro)bots, native to AI technologies (Natale & Ballatore, 2017) could be further explored by following the *radical imagination* in exploring how sex (ro)bots might help re-imagine pornography through their avatars and AR functions.

SOCIOTECHNICAL IMAGINARIES IN THE QUALITATIVE STUDY OF SEX (RO)BOTS

Following interdisciplinary practices that favour cross-pollination between the relative fields of HMC (Guzman, 2018) such as cultural studies, STS and critical theory, this article suggests that Castoriadis's approach and the *sociotechnical imaginaries* is most suitable to explore sex (ro)bots from an HMC angle. In the intersection of the aforementioned scholarships, we find the shared rejection of technology's neutrality and a focus on the structural powers and meanings of machines (Guzman, 2018). Despite the various calls to apply ANT in a new "laboratory" studies context for companion chatbot research (Hepp, 2020; Waldherr, 2019), the article proposes that the Castoriadian approach is more appropriate to conduct critical because it allows researchers to highlight the meaning and the power relations behind sex (ro)bots. In the next section, argumentation for adopting the Castoriadian framework to qualitative enquiry of sex (ro)bots within HMC is presented.

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First, as many critiques have rightfully noted, Latour's repudiation of structure and agency (Elder-Vass, 2014) leaves little room for critical (Sovacool & Hess, 2017) and political research, as it seeks to dismantle the social and the causal effects of social structure forces (Elder-Vass, 2014). Second, Latour's general disinterest in power struggles (Sovacool & Hess, 2017) and astonishing lack of discussion of capital and power (Kipnis, 2015) could be very problematic in dealing with essential concepts in critical AI studies such as algorithmic governance, design thinking, platformisation and digital labour, to name a few. Third, as Lupton (2014, p.610) has underlined, apps and by extension (ro)bots are not mere tools but also sociocultural artefacts situated "within pre-established circuits of discourse and meaning." As a result, researchers would benefit from the imaginary approach that aims to uncover hidden ideology in language or the interpretation of sex and love with (ro)bots. Fourth**,** Latour's contribution to the study of agential nonhuman things in social theory is undeniable, however, this concept is almost equally preserved in the triptych of meaning-materiality-morality in the imaginaries, without undervaluing the involvement of human structural powers. To clarify, Latour's fallacy is not the ascription of agency to things but the ascription of anthropomorphic agency to things (Kipnis, 2015), which highlights the most incongruent Latourian aspect of the research aim. Fifth**,** what Förster (2019) points us at, is how ANT contributes to the opacity of advanced technologies through the increased agential potency of machines. As a result, Djeffal (2019, p.277) advises not to forget to interrogate how technologies are "interwoven and used with human agency", instead of focusing on the nonhuman agency as manifested in characteristics such as automation.

CONCLUSION

In conclusion, in this article two possible theoretical directions for the study of sex (ro)bots within the qualitative enquiry and the HMC scholarship were reviewed. Latour's *Actor-Network Theory (ANT)* and Castoriadis's *sociotechnical imaginary* examined to present a theoretical reflection that may help new HMC researchers pose critical questions about sex (ro)bots. The article argued that the Castoriadian philosophy of the *imaginary* is the most suitable to conduct qualitative HMC research on sex robots because its methodology is fitting to critical AI studies concepts and aligns with the current research agenda of HMC. By analyzing the methodological underpinnings of both Latour's and Castoriadis's theoretical frameworks and highlighting their potential implications for qualitative HMC researchers, the article responds to the call for qualitative researchers to employ robust theoretical frameworks (Collins & Stockton, 2018) and have a deep understanding of the different methodological toolkits available.

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