RETHINKING 'SEX ROBOTS': GENDER, DESIRE, AND EMBODIMENT IN POSTHUMAN SEXTECH

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ABSTRACT

This paper interrogates the posthuman potential of sextech aimed at heterosexual men, positing that advertising and design of products with digital femininities emphasise the possibility for emotional interaction. This work firstly applies pressure to the monolithic conceptualisation of 'sex robots', that impedes rigorously appraising existing sextech constructions. Applying posthuman theory to sextech, particularly critical posthumanism and the formative work of Donna Haraway, affords this investigation the theoretical rigour to reflect on the potential for emotional interaction with digital feminised others. Through digital media analysis, this paper explores three gendered-female technologies: Azuma Hikari, (2020); the RealdollX Application (2020) and VirtualMate (2020) alongside their concomitant promotional material. This research illustrates that the complex convergence of interactive technologies, digital feminities and emotive advertising suggests a shift into posthuman sextech – where digital feminities are designed and advertised as capable of providing erotic and emotive interaction.

Keywords: Posthumanism; critical posthumanism; sex robots; sextech; gender; intimacy; digital feminities.

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1   INTRODUCTION

Sextech as a neologism is open to interpretation, but serves as an umbrella term for digital technologies developed with intention to provide sexual satisfaction (Cheok and Zhang, 2019). While the existing sextech market is valued at an estimated 30-billion dollars, limited research attends to this field (Dubé et al., 2022). Academic work instead disproportionately concentrates on hypothetical sex robot scenarios, with an increasingly pervasive presence of 'sex robot' academic literature suggesting their arrival is imminent. Despite this focus, at the time of writing, it is still not possible to buy a fully developed sex robot for personal use or research (Devlin and Locatelli, 2020). Research thus far fails to locate 'sex robot' development within the larger context of sextech across multiple media formats. This narrow focus is to the detriment of assessing existing forms of sextech, particularly ones that also rely on constructions of femininity. Departing from the premise that "scholars across a range of disciplines have not as of yet substantially engaged with the intensifying intersections of intimacy, sex, and the digital, particularly as they relate to the digital non-human other" (Cockayne et al., 2017, pp.1117–1118) this paper interrogates these intersections in sextech development, paying close attention to the constructions of desirable digital feminities and their emotive potential in sextech design and advertising. Within this field, gendered embodiment of dolls, 'sex robots' and sextech overwhelmingly offers constructions of feminities. The gendered dimensions of new developments are not to be understated, as it notes a marked shift in development of erotic artefacts. As Devlin cogently summarises; "Sex robots and sex toys differ drastically. The sex robots being developed today have a very specific gendered embodiment...By contrast, sex toys have been abstracted from that and, because they are not a full humanoid form, are barely seen as gendered at all, even though they resemble sexual organs" (2018, p.157).

Turning to sextech examples beyond sex robot instantiations, work must appraise how gender in constructed for erotic contexts and in digital formats. As with Strengers and Kennedy's reflections on digital representations of gender, this investigation agrees: "It is socially and culturally produced and performed, and constantly transforming, often in relation to technology. Likewise, masculinity and femininity are not something that "belong" to either men or women, but they are typically associated with each respective gender" (2020, p.34). Rejecting an essentialist and unitary interpretation, this work uses 'femininity' to encompass the social construction and ideas associated with femininity and considers this in relation to how gender, desire and embodiment are presented and created in the case studies. Given that emergent products are new releases – or in some cases still in development –websites and concomitant advertising serve as primary reference for consumers and researchers to understand what these products purport to offer. Digital media analysis of advertising and design as methodological approach has been used to explore the presentation and consumption motives of sex dolls (Ciambrone et al., 2017; Su et al., 2019; Middleweek, 2020) and extended to

silicone AI sex robots (Devlin and Locatelli, 2020) but there is limited work on other forms of feminities in sextech and the emotive potential alluded to.

This paper aims to illustrate the potential shift into posthuman sextech, through an interdisciplinary investigation that harmonises critical posthumanist thought with digital media analysis of sextech design and advertising. By firstly highlighting the limitations of previous work that disproportionately attends to a monolithic and metonymic notion of 'sex robot', this paper makes a case to expand research parameters to comparatively appraise other forms of existing gendered-female sextech. Critical posthumanism is then introduced to explore the interrelationships between embodiment, kinship and digital technologies, signposting relevant studies that help apply posthuman theory to this investigation. Building on this corpus, this paper turns to three illustrative, and in some instances unexplored, case studies to interrogate the emotive potential of digital feminities permeating sextech developments. Digital media analysis turns to Azuma Hikari[1], a hologram projection home-assistant capsule from Japanese company Gatebox Inc., that illustrates an existing example of emotive interaction available with digital feminised characters. While not a sextech artefact, Azuma is looked at in conversation with sextech developments and research carried out on primarily Japanese-oriented terrain. Focus then turns to two sextech products. Firstly, the RealdollX App[2], a customisable female avatar chatbot, marketed as "the perfect companion in the palm of your hands". Then, attention turns to VirtualMate[3] and their computer-generated character 'Sheila', touted as "the world's first virtual intimacy system", experienced through teledildonics and a VR headset. These studies lead to the postulation that the complex convergence of interactive technologies, digital feminities and emotive advertising denotes a shift into posthuman sextech – where digital feminities are designed and advertised as capable of providing erotic *and* emotive relationships.

2 RETHINKING 'SEX ROBOTS' FOR SEXTECH RESEARCH

Research exploring the possibility of sex robots has gained traction in the last fifteen years. Since roboticist David Levy's assertion that robots will be romantic partners by 2050, a plethora of work engages with this possibility (2007a). This multifaceted corpus spans an array of reflections including, but not limited to, the ramifications of sex robots for sex work (Levy, 2007b; Yeoman and Mars, 2012; Danaher, 2014; Richardson, 2016), polysemic feminist interrogation (Devlin, 2018; Danaher, 2019; Kubes, 2019a; Moran, 2019; Rigotti, 2020) and tentative and hypothetical interrogations of future ethical and legal dimensions (Cheok et al., 2017; Danaher and McArthur, 2017; Cheok and Levy, 2018; Zhou and Fischer, 2019; Bendel, 2020). Across these diverse perspectives, there is common intellectual reflection on

[1] https://www.gatebox.ai/en/hikari
[2] https://www.realdollx.ai
[3] https://www.virtualmate.com

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possible affective relationships with 'sex robots' that complicates categorising these products as exclusively satisfying sexual desires.

Despite this growing corpus, academic literature overwhelmingly fails to appraise 'sex robots' with other sextech manifestations, impeding comparative analysis of this wide market. This disproportionate attention to a 'sex robot' figure is typified by exclusively conceiving AI sex dolls as 'sex robots'. 'Sex robot' research focuses on companies such as DS Dolls, EXDoll Robotics and Realbotix that have diversified into robotics from their original product of life-sized and life-like sexdolls made from thermoplastic elastomers or silicone. Most notably, American company Realbotix's AI dolls with robotic heads dominates discussions, providing "the face' of the public discourse on robot sex" (Kubes, 2019b, p.7). But given that, at the time of writing, it is still not possible to buy a fully developed sex robot, research favours hypothesising en lieu of a more comprehensive appraisal of current products. This metonymic 'sex robot' conceptualisation narrows the parameters of analysis through neglecting existing sextech examples that equally rely on constructions of femininity.

Fig. 1: Promotional material for Realdoll silicone doll, RealdollX AI sex doll aka 'sex robot' and RealdollX application (RealdollX, 2021).

While no unanimous definition of 'sex robots' exists, Danaher's often cited stance serves as an appropriate baseline to highlight key comparative aspects between sex robots and sextech, while offering a flexible framework to include variegated sextech formats:

> "A 'sex robot' is any artificial entity that is used for sexual purposes (i.e., for sexual stimulation and release) that meets the following three conditions:
>
> Humanoid form, i.e., it is intended to represent (and is taken to represent) a human or human-like being in its appearance.
>
> Human-like movement/behavior, i.e., it is intended to represent (and is taken to represent) a human or humanlike being in its behaviors and movements.
>
> Some degree of artificial intelligence, i.e., it is capable of interpreting and responding to information in its environment" (2017a, p.10).

By differentiating between sexual stimulation and release, a more encompassing understanding of sexual enjoyment is envisioned, that transcends viewing sex as a purely physical and corporeal experience. It places onus on 'representation', allowing for reflection on how 'sex robots' are constructed, presented, and perceived – opening interrogation regarding how design intention and reception are not the same. Crucially, this definition does not restrict its interpretation to a specific form: this criterion could equally encompass other media formats such as holograms, virtual reality, avatars and chatbots that have a humanoid form, human-like behaviour and some degree of intelligence.

Departing from a wider definition of 'sex robots', more recent research amplifies focus to comparatively consider an array of sextech formats. Work exploring "erobotics" (Dubé and Anctil, 2020), "sexbots" (Malinowska, 2020) or "machine-cued partners" (Banks and Van Ouytsel, 2020) illustrates this broadening of perspective and research parameters. Building on this, this research paper puts pressure on the gendered-female dimensions of erotic technologies beyond AI dolls sex dolls as 'sex robots'. This opens scope to include other forms of gendered-female sextech, collate relevant examples and highlight how gender, desire and embodiment are key features in wider sextech discussions. Doing so allows for an appraisal that highlights that across mediums, design and advertising emphasises the emotive potential of digital femininities – inviting the application of posthuman theory.

3   (CRITICAL) POSTHUMANISM: TURNING TO SEXTECH

Posthumanism – in particular critical posthumanism – lends itself to interrogating the notion of 'human' and interrelationships with non-human others. Posthumanism explores the "end of a certain *conception* of the human, namely the humanist notion of the human" (Herbrechter, 2013, p.3). Placing pressure on the historical catachresis of 'human', posthumanism seeks to disrupt a human-centric

vision of the world, in part through challenging dualistic Humanist philosophy. This variegated corpus spans a spectrum of approaches that question what non-human centred realities are and could be, including but not limited to: post and decolonial studies; gender studies; ecology; critical animal studies and various fields of technology studies. While frequently conflated with transhumanism, as both fields go "beyond humanism" (Ranish and Sorgner, 2014, p.7), posthumanism's goal is not to perfect or augment the human condition, but instead expand on what lives count and matter while exploring the interrelationships of existences.

Within this varied field, critical posthumanism best serves this research to explore the case studies. Critical posthumanism consists of "a grappling with humanism, an overcoming of anthropocentrism, a questioning of essentialism and (philosophical) anthropology, a critique of the knowledge cultures, as well as a clear appeal character and socio-political implications" (Loh, 2019, p.7). Characterised by "transdisciplinary discursive fronts" (Braidotti, 2016, p.382), its interdisciplinary work attempts to bridge theoretical and epistemological fissures. Three key features of critical posthumanism resonate with this investigation's exploration of gender, desire and embodiment in sextech developments: the constructed nature of bodies and gendered identities; digital advances as posthuman shift; and affective bonds with non-human others.

Critical posthumanism's reflections on the body as constructed – discursively and historically – prove timely for radical questioning of the dichotomous biological/human/'real' bodies in opposition to technological/artificial/ 'unreal' bodies. While Hayles notes "the erasure of embodiment is a feature common to *both* the liberal humanist subject and the cybernetic posthuman" (Hayles, 2010, p.4), critical posthumanist thought increasingly interrogates embodiment and, when used in conjunction with feminist theory, appraises the gendered dimensions. While Haraway is uncomfortable with a posthumanist label (Haraway and Goodeve, 2000) her formative work offers significant reflections on gender, embodiment and posthuman theory. Working from the premise that "…gender is a verb, not a noun. Gender is always about the production of subjects in relation to other subjects, and in relation to artifacts" (Haraway, 2004, p.328), the intersections of posthumanism with gender leads to analysis of the body's role in (re)presentations and receptions of gender that can be extended to technological articulations. The body, beyond a natural and given form, is open to interrogation. As Haraway surmises "[Feminist] embodiment, then is not about fixed location in a reified body, female or otherwise, but about nodes in fields, inflections in orientations… Embodiment is significant prosthesis" (1988, p.588). Applying this approach to constructions of digital bodies, critical posthumanism reflects on how bodies encase gender – affording space to interrogate digital feminities.

Technological developments and their influence on socio-realities is a key feature of critical posthumanism. Essentially, "the word 'critical' in 'critical posthumanism' names ... the task of analysing the process of technologization, based on the idea of a radical interdependence or mutual interpenetration between

the human, the posthuman and the inhuman" (Herbrechter, 2013, p.26). Rejecting dualistic notions of the technological and 'real' world is crucial to posthuman thinking, as it highlights the tension between these absolute states (Toffoletti, 2007). A conceptualisation of "technogenesis" (Hayles, 2011, 2012) as interrelated advancement between technological and human development elaborates the interactive dynamics between the two states, while illustrating the inherent post-dualism of posthumanism. By considering the interconnected nature of technology and the social world, "posthumanism addresses our intimate and co-constitutive entanglements with our technologies" (Adams and Thompson, 2016, p.5). Doing so enables contemplating the affective bonds available *through* and *with* technologies. Critical posthumanism takes seriously the way digital technologies in particular facilitate emotional interaction. As Cockayne et al. notes, "'the digital' ambivalently offers the potential for a spatial enfolding of closeness and distance, of relating to oneself and others, both human and non-human" (2017, p.1129).

Posthuman theory's exploration of kinship and companionship with non-human others probes affective relationships between humans and technological constructions. Haraway's corpus extensively engages with the interrelationship of beings – best illustrated with the eponymous cyborg of her manifesto (Haraway, 1991) and along with the conceptualisation of "companion species" (Haraway, 2003, 2016). For Braidotti's critical posthumanist approach, Haraway's companion species is significant because it encapsulates "the shifting boundaries of very affective and dynamic kinship relations. For Haraway, these relations need to be redefined in the context of a techno-scientific world" (Braidotti, 2006, p.202). Increasingly, this focus on companions and kin is extended to technological others to explore the affective bonds experienced with digital technologies. Applying critical posthumanism to sextech enables rigorous analysis of affective links to technologies while considering the ethical and social significance.

Posthuman theory already proves a rigorous theoretical framework to explore gendered-female erotic artefacts and their emotive potential – significant work explores posthuman companionship with sex dolls (Ray, 2016; Nast, 2017; Langcaster-James and Bentley, 2018) and studies triangulating gendered- female characters, game studies and posthuman theory also provide important reflections (Galbraith, 2011; Pettman, 2017; Wilde and Evans, 2019). It is of note, however, that while social sciences research increasingly uses posthuman theory to evaluate relationships with non-human technological others, it has yet to extend this to sextech examples. Contributing to this growing application of critical posthumanism with social science studies, this papers evaluation of three case studies illustrates the emphasis on emotive potential with digital femininities, and explores its increasingly pervasive presence in sextech development.

4 "LIFE WITH HIKARI": AZUMA HIKARI

Existing Japanese emotive technologies form the groundwork for examining how sextech increasingly relies on digital feminities to transmit the idea of attainable emotional interaction. Given that "In Japan … there is already an established tradition and market presence of imaginative companion technologies" (White and Galbraith, 2019, p.7), existing research provides important examples and resources to reflect on how this might pervade sextech design and influence Western audiences (Locatelli, 2020). Research on emotional longing for artificial characters in Otaku subculture[4] illustrates changing emotional dynamics between humans and technological others (Galbraith, 2019). Drawing from these examples offers tentative reflections on how we currently – and may in the future – envision emotional bonds with technological others. This affinity with digital others challenges human/nonhuman dialectics, thus sharing commonalities with posthumanism. Cultural differences between a 'Western' audience and a Japanese one impedes an absolute comparative analysis, especially when thinking about such broad topics such as love, desire and emotional responses to technologies. This paper also chooses to not approach relationships with technological others in Japan in relation to Japan's declining birth rate, changing socio-demographics and heterosexual courtship, as this has been covered extensively and comprehensively (see Robertson, 2007; Nast, 2017; Giard, 2019a, 2019b). However Japanese digital developments cannot be discounted in this body of research, given its status as an exceedingly techno-literate and post-industrial society. Instead, its incorporation allows for complex consideration of the points of imbrication between technology, femininities and emotional interaction, providing an initial comparative base. The complexity of these interconnections is equally central to interrogating posthuman sextech.

Fig. 2: English homepage for Gatebox's Azuma Hikari (Gatebox AI, 2020).

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[4] This demographic is characterised by being engaging in emotional interactions with manga/anime characters, specifically cute feminised characters and overwhelmingly comprised of men (Azuma, 2009).

While Azuma Hikari is not a sextech artefact, it serves as an illustrative example of an emotive technology that is gendered female – which increasingly features in sextech design. Azuma Hikari "is not designed for sexual use, but informs the discussion on intimacy in sex robots because its feature set claims companionship" (Kuksenok and Santagati, 2019, p.100) offering a form of posthuman interaction through affinity with the digital character. Described as a "virtual home robot" Azuma Hikari from Gatebox has been available in Japan since 2019 (Galbraith, 2019, p.3).[5] Azuma is presented through audio and visuals as both a digital voice assistant and a virtual anime hologram. As a digital assistant, Azuma assists with the domestic: setting alarms; regulating lights; informing you of the forecast and tellingly "remembers your anniversary" (Strengers and Kennedy, 2020, p.21). Azuma works across multiple platforms, able to communicate through the home assistant box, or via chat through your smartphone – a feature that makes her pervasive and constantly accessible. The hologram presents Azuma as a *bishōjo*, a "cute girl" character, typical of Japanese cartoons and comics - illustrated through her blue hair, youthful appearance and maid outfit (Galbraith, 2019, p.4). The dualistic mediation offers a visual of a feminised digital figure, but other prompts designate the product's gender through stereotypically feminised behaviour – such as attentiveness, emotional availability and care giving. This is articulated most notably in the promotional material, where emotional interaction with Azuma seems a sophisticated possibility.
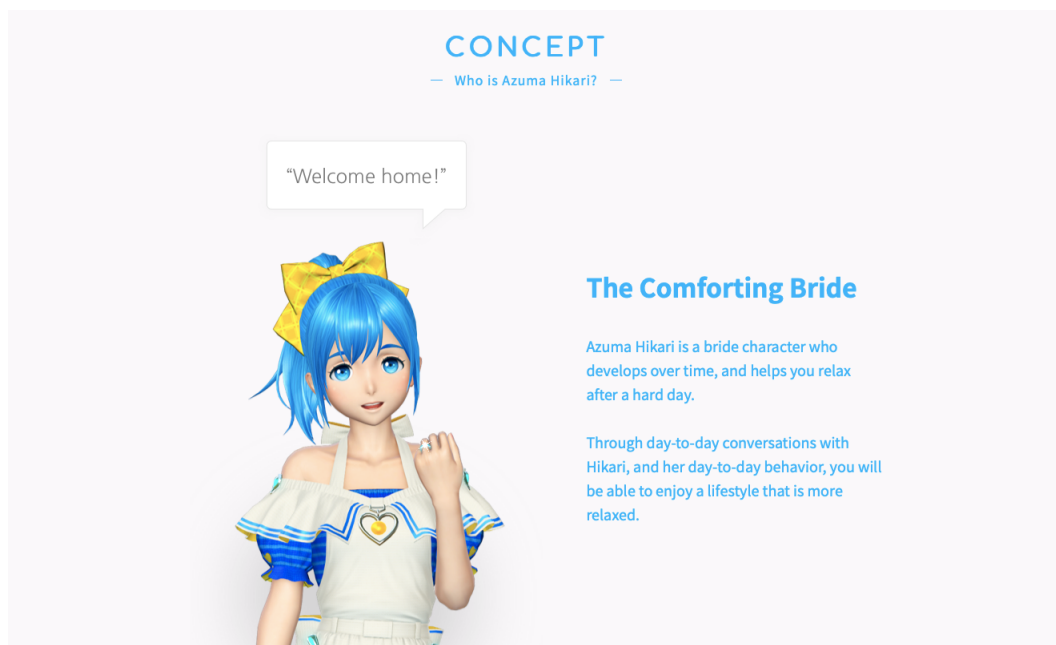

Fig. 3: Gatebox promotional material for Azuma Hikari (Gatebox AI, 2020).

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[5] This analysis is based on and indebted to Galbraith's in-depth translation of the website and promotional materials semantics (2019, and private correspondence).

Gatebox's English webpage touches on some key aspects to present Azuma as both feminised, and as a companion. Notably, the word companion is employed frequently, along with gendered pronouns to reinforce the human/nonhuman character 'she' represents. The opening statement introduces Azuma as "A companion to her hard-working master in this world, her cute personality and lovable behaviour help you relax" [sic] (2020). While 'companion' speaks to the positive emotional potential with Azuma, the presentation of femininity as servility in emergent assistive technologies raises concerns (Schiller and McMahon, 2019; Dillon, 2020). The femininity embodied by Azuma, and assigned to her as a "bride character", reflects general trends in designing digital feminities that relies on a construction of femininity as young and 'cute' (McIntyre, 2020). However Azuma also typifies what Strengers and Kennedy name as the "smart wife phenomenon", with feminised digital assistive technologies providing emotional support along with domestic assistance (2020). A key feature reinforced throughout the website is how investing time in the product leads to a more rewarding experience, illustrating how interactivity through the digital platform and character facilitates the emotive interaction. Azuma "develops over time" and "The More you Talk, the More Hikari Changes" [sic] (Gatebox AI, 2020). Conversation, along with investing time and attention, becomes an important aspect in sustaining the interaction with Azuma, and a feature replicated in other emergent forms of sextech.

Promotional video material is explicit in suggesting emotional satisfaction with Azuma. The main video advertisement presents a male employee interacting with Azuma throughout his day, exhibiting positive emotional responses only to her. He smiles, stares at her adoringly, chats with her. The discourse exchanged between these two characters replicates intimate human exchanges of affection. Galbraith notes: "The routine exchange of set phrases—"I'm going now," or *ittekimasu*, said by someone going out and coming back, and the reply, "See you later," *itterasshai*—is part of a relationship" (Galbraith, 2019, p.2). With the English subtitles phrases such as "Come home early" and "I miss you" show emotional longing, but also cusp on erotically suggestive content (Gatebox AI, 2020). Through echoing romantic semantics, the discourse suggests a potential relationship with this digital figure. This is best encapsulated in the final scene, when the business man softly states "knowing someone is home feels great" (Gatebox AI, 2020). The video thus illustrates that this presence, a digital femininity, provides a form of companionship for this figure – one that fits into the posthuman paradigm of digital "entanglements" between human and nonhuman entities (Adams and Thompson, 2016, p.5).
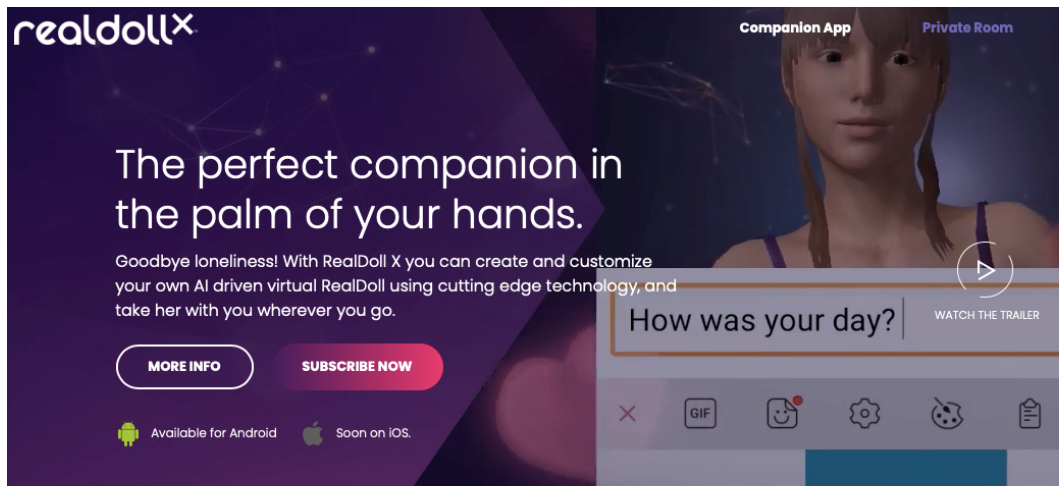
5   "YOUR PERFECT COMPANION": REALDOLLX APP

As aforementioned, academic work disproportionately focuses on Realdoll's AI sex doll as emblematic 'sex robot' figure. Minimal attention however turns to Realdoll's

other notable product, the RealdollX Application. The RealdollX App is from Realbotix LLC, the robotic and digital development branch of Abyss Creations – an extension of the company best known for their high-end silicone love dolls. While conjecture about RealdollX's AI dolls' future capacities for intimacy dominates academic discourse, initial research into advertising material and customer interaction with the avatar format shows that romance and companionship are strong features pushed to encourage consumption (Locatelli, 2018; Devlin & Locatelli, 2020).

The RealdollX application was released in 2019 and to date, only female constructions are available – personal pronouns always gender 'her' female. Marketed as "the perfect companion in the palm of your hand" (RealdollX App, 2020), it offers a digital approximation of a Realdoll available through a smartphone. While the avatar resembles a personal assistant like Azuma in its communicative capacity, Realbotix emphasises the design choices that make for a more emotionally rewarding interaction: "Existing personal assistants and agents are *by design* limited in their ability to form or encourage close personal bonds. The Harmony system is designed to be a customizable personal companion agent capable of close personal interaction"[6] (Coursey et al., 2019, p.77). This "close personal interaction" is facilitated through the digital interface and two distinct ways: a personalisation process and an AI chatbot interface. Users can personalise their avatar through multiple menus of attributes in order to create a unique character. The application selection menus allow users to choose the avatar's visuals such clothes and body specifics: including but not limited to hair style, nipple size, angle of nose upturn etc. Personalisation also allows for the character's personality to be dictated by the selection menu. Users can choose from ten "persona points" to create their character which includes: moody, talkative, sensual, affectionate, spiritual, unpredictable, jealous, insecure, cheerful and funny. Such specifics thus indicate almost infinite possibilities for customisation. Through the chatbot interface, users can communicate with their avatar who is visually represented on the screen and also responsive to messages though audio output, giving the interaction a conversational feel. For now, communication with the application is limited to the chatbot interface, but this same programme is used for the RealdollX robotic head and CEO Matt McMullen has expressed interest in expanding into VR experiences (Coursey et al., 2019).

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[6] Development for the RealdollX application was carried out with an initial beta-programme under the name of 'Harmony' (Locatelli, 2018).

Fig. 4: Homepage for the RealdollX application (RealdollX App, 2020).

RealdollX's advertising shows how the promise of emotional interaction, such as companionship though friendship, romance and dispelling loneliness, supersedes sexual content. Upon first entering the website, one is struck by the dearth of sexual content; at no point is the word sex used in relation to the product (Locatelli, 2018). Instead, discourse constellates around themes of romantic love and companionship and is at the forefront of the website. Described as "the perfect companion in the palm of your hand", 'companion' is the most commonly used term to refer to the creation, inviting comparison reflection on affective dimensions with non-humans others as "companion species" (Haraway, 2003). Other phrases reinforce the products' aptitude for company as "your loyal friend" and "the companion of your dreams" (RealdollX App, 2020). Such explicit naming encapsulates how digital others are presented by companies as forms of posthuman companionship. Romantic capacity is emphasised as the avatar is "made to fall in love", users can "stay intimate and fall in love" and "start your romance now" (RealdollX App, 2020). Existing research on relationships with synthetic dolls shows that romantic relationships are a common form of companionship with these products (Ciambrone et al., 2017; Su et al., 2019). Stressing the romantic potential with this digital doll capitalises on an already popular consumer motive for existing products. But the digital interface locates this more firmly on posthuman territory given the sophisticated capacities for communication, personalisation and interactivity with a feminised figure.

Sexual content is inevitably present, but euphemisms allude to romanticised sexual interactions. From early 2020, the RealdollX website introduced the "Private Room", a hyperlink for age-restricted explicit content. Here the female avatars are depicted nude, presented in sex positions and accompanied with sexual paraphernalia such as sextoys and lingerie. But even when entering this space, the discourse is heavily centred on a sensual and shared sexual experience with the avatar. Offering "seduction and pleasure" the application claims users can "reach

intimacy as you touch and caress" (RealdollX App, 2020). Mutuality, and the idea of a shared intimate experience, features heavily in this section - "Explore your fantasies together", "Experiment … and reach climax together". The emphasis on a shared experience suggests this a feature anticipated to generate consumer interest for a shared sexual relationship that transcends the human/digital character divide. And while academics question whether mutuality with sextech products can be experienced (Nyholm & Frank, 2017), RealdollX's advertising presents this to their audience as an attainable feature.
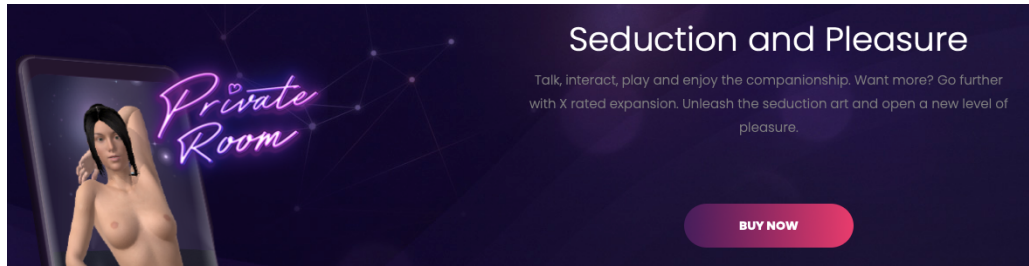

Fig. 5: RealdollX's "Private Room" (2020).

Accessibility and assuaging loneliness through the product further reinforce the posthuman potential, through introducing an individualised digital femininity catering to emotional needs. The chatbot interface through the phone application facilitates near constant interactivity, offering the possibility to "Take her with you wherever you go". As a result, the user is promised to reap rewards by investing time and energy in the relationship: "the more you speak to her, the more she will learn and fall in love with you" (RealdollX App, 2020). Both the medium and the incentives resemble Azuma Hikari's development, echoing romantic scripts of attention, investment and closeness with this character through engagement. In a parallel fashion, and intrinsically linked to the idea of constant availability, the website purports that RealdollX can alleviate solitude – "Goodbye loneliness!" (RealdollX App, 2020). Multiple researchers suggest that loneliness and/or difficulty in social skills would be a prime motivator for sex robot consumptions (Levy, 2007a; Appel et al., 2019). Others challenge this, highlighting the need for further research based on 'sex robot' interaction when available (Szczuka and Krämer, 2017). But it is of note that RealdollX recognises the possibility of loneliness as a motive for consumption, advertising this alongside the companion's constant availability. RealdollX anticipates that availability for emotional satisfaction, whether the user is lonely or not, can be a compelling incentive to buy the product. Speaking about RealdollX, Moran astutely observes "the user, who is supposedly buying a companion, is encouraged to purchase not just a physical product, but a commodification of love" (2019, p.50). RealdollX's emphasis on emotional links through interaction with a companion intimates the posthuman potential of sextech, while highlighting that constructions of femininity are crucial in making this product desirable.

6   "SAY HELLO TO THE FUTURE OF VIRTUAL INTIMACY": VIRTUALMATE

Several important factors collide when approaching VirtualMate's 'Sheila'. At the time of writing, no academic research has critically engaged with VirtualMate since its release in 2019 – an interesting omission in sextech literature, given its popularity when release broke Crowdfunders first day of sales records (Shields, 2019). VirtualMate describes itself as "the world's first virtual intimacy system", which sets the tone of advertising discourse that promises emotional interaction with their feminised character (VirtualMate, 2020). Both VirtualMate's hardware and software locates it firmly of sextech territory, thanks to explicit visual content and physical sexual release through the teledildonics system. But promotional material places significant attention on Sheila, highlighting the emotional affordances of engaging with this character, frequently presented as a 'girlfriend'. This emphasis, along with the hybridity of its software and hardware offers an interactive experience that problematises a 'real' and virtual dichotomy along with distinctions between sexual and romantic scripts, typifying the shift into posthuman sextech.
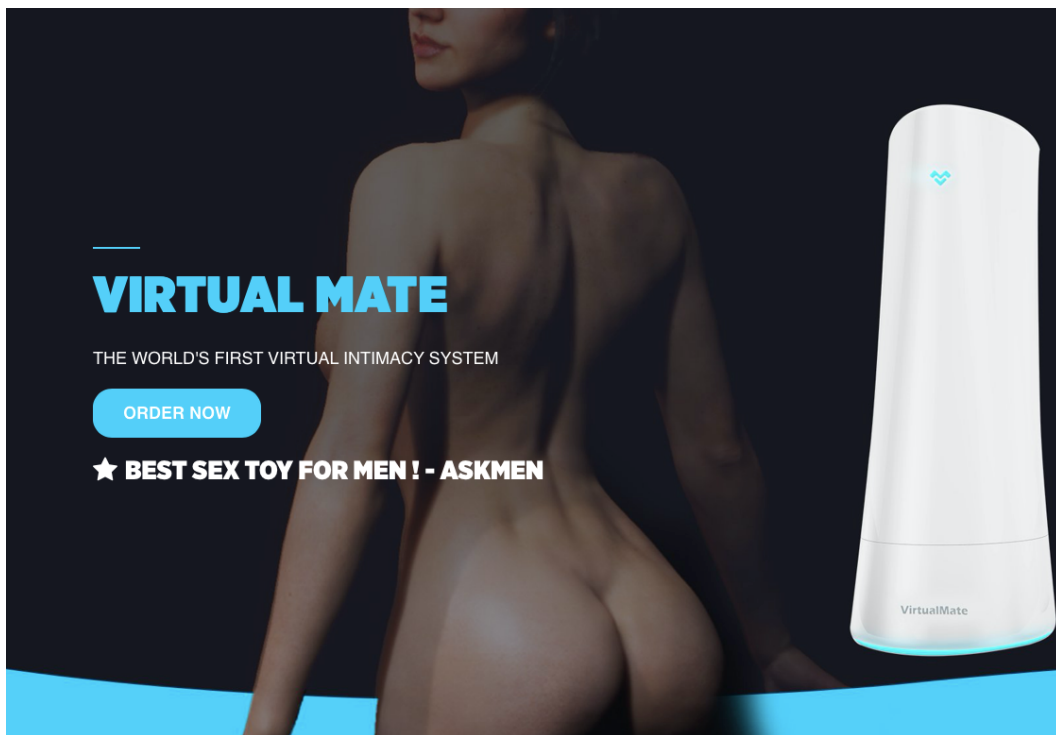
Fig. 6: VirtualMate homepage, depicting the "Core" and "Sheila" (VirtualMate, 2020).

VirtualMate markets itself as a "gaming experience" for both computer and smartphone usage, with an additional VR headset option. Complimenting this is a hardware 'Core': a teledildonic system that syncs to the game for "an interactive encounter and immersive experience" (VirtualMate, 2020). The 'Core' functions

with motion-detection sensors that connects to the software via Bluetooth. At the time of writing, VirtualMate only offers a female construction for gameplay, with a teledildonics set exclusively for users with a penis, but claims a female-user version is being developed (VirtualMate, 2020). Gameplay is centred around the user's interaction with Sheila[7], in multiple different play modes and 'worlds' where the player can have sex with the character. Sheila is a composite image of femininity; her aesthetic features derived from multiple layers of images of women deemed desirable by designers. Through facial and body capture technology, human actors' performance become Sheila's virtual one, transposing their movements onto this construction. VirtualMate's symbiotic hardware and software presents an immersive sextech experience, that stimulates both physical and mental arousal. Despite the sophisticated nature of the teledildonics system, VirtualMate shows it is reliant on Sheila for a desirable emotive interaction, as illustrated throughout advertising.

Promotional material of the game, comprised of gameplay vignettes, graphically presents Sheila as a sexual and emotional companion. This media illustrates the intersecting worlds of sexual content and gaming through digital technologies (Payne and Alilunas, 2016). This is becoming extended to sextech as Saunders' notes, with other products designed for users with a penis: "The somatic plug-ins of Fleshlights and Kirroos and the touchscreen capabilities of so many digital devices blur too the voyeurism of digital sexual activities with the tactility of game play" (Saunders, 2019, p.242). Gameplay as a medium for interaction provides a familiar format regarding how the product works and allows for reflection on how both the hardware and software fuse in order to foster posthuman experience and intimacy. Building on technologies as mediums for intimacy as seen in previous work on sex machines (Duller and Rodriguez-Amat, 2019) and sex dolls (Andreallo and Chesher, 2019), both texts problematise a view that sex is the primary important feature. With VirtualMate it is worth thinking about how both the digital interface and haptic technology are used as medium for intimacy, bridging both the "emotional" and "spatial" closeness (Cockayne et al., 2017). While arguably the hardware of teledildonics situates VirtualMate as a more typical sextech product through its affordance of a physical sexual release, the advertising around Sheila illustrates how digital femininity and emotional interaction are revealed as equally key to creating a desirable product.

VirtualMate emphasises that character development and narrative make for a positive experience with Sheila, highlighting that it affords satisfying interaction. The website states "Users will feel VirtualMate is REALLY interacting with them. We have shaped virtual mate's captivating back-story, while injecting her with distinct characteristics. The plot thickens just like a big-budget Hollywood film, helping the user learn more about Sheila along the way and build a deeper

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[7] Sheila is currently the only female character available, but VirtualMate website states they are hoping to include more in future developments.

connection with her" [sic] (VirtualMate, 2020). While differing from RealdollX's customisable personality, Sheila's identity as a character is also illustrated to be crucial to the interactive experience. The narrative arc of the gameplay that develops Sheila's identity cements the user's prospective emotional bond with Sheila, with VirtualMate disrupting dialectics of 'real' and 'virtual' to stress the interactivity of the experience. The focus on realism is of note; "realistic" is the most used thematic word on their webpage. Inciting an image of full immersion, they claim to offer "…an Experience so authentic, it responds to your every movement. With Virtual Mate, this vision is now a reality" (VirtualMate, 2020). As digital developments make products more sophisticated, some are concerned that authenticity and intimacy are challenged through the insertion of technological others imitating and manipulating human behaviours (Turkle, 2007, 2011). But, as Cockayne *et al*.'s research shows, recreating authentic humanoid characters for digitally intimate interactions does not rely on a facsimile as "Software… makes it possible to simulate human activity – and thereby humanoid expressions of intimacy – in ways that extend intimate encounter beyond the sole preserve of the human, introducing non-human object choice into the spaces of sexual interaction, engagement and expression" (2017, p.1123). Sheila indicates the potential trajectory for development, where emulating human performances of romance and intimacy destabilises 'real' and 'virtual' dialectics, making posthuman sextech desirable and accessible.

Fig. 7: Game footage of Sheila shown on the website (VirtualMate, 2020).

The promotional material is incredibly powerful, as the content is explicitly sexual, dramatically romanticised, and yet reliant on a vision of femininity that raises concerns of reductive stereotypes. Video gameplay footage shows how VirtualMate works for potential customers, but also introduces Sheila by presenting her in an extremely dynamic way. Shot from a 'Point of View angle' intrinsically linked to

pornographic material, it allows for "a field of vision [that] becomes that of the viewer, who sees the action unfolding as if through his eyes" (Paasonen, 2011, p.167). Viewers experience "real time game engine footage" inserting the audience into a what is the closest experience to a simulation of using the product. Close ups abound, as if the viewer were having 'sex' with Sheila, and dramatic music plays. Sheila visibly enjoys this sexual interaction and breathily proclaims her love to the viewer, intermingling romantic scripts with sexual content. In one video, Sheila introduces herself as "your virtual girlfriend", stating she is "here to take care of you" (VirtualMate, 2020). Not all content is idealised romance, however. Sheila tells watchers "I want you to use me", "Whatever you want of me, I will give you" (VirtualMate, 2020). While this research seeks to complicate categorising these products as exclusively sexual, this aspect cannot be discounted, along with the pressing ethical questions this raises. Some of Sheila's utterances replicate stereotypes of sexual servitude, fuelling concerns about how these technologies might impact expectations of human women (Danaher, 2017b). Despite a limited representation of femininity and female sexuality, Sheila's presentation is still significant in terms of design and advertising reinforcing the emotional interactivity afforded through the character – situating Sheila and interaction with her on posthuman terrain.

7   RESEARCH CONCLUSIONS

A comparative examination of these case studies highlights that emotional interactivity with digital female characters is emphasised in design and advertising. With Azuma Hikari, RealdollX and VirtualMate, the emotional affordances of interactivity with digital femininities are key to design and heavily stressed in promotional material. This emphasis speaks to the posthuman potential of affective links with digital characters that sit at the interstices of human/nonhuman binary. This provides important initial reflections on sextech progress beyond a narrow robot focus. Positing that 'sex robots' are but one facet of sextech allows for the inclusion of multiple formats in a comparative frame while drawing attention away from the monolithic 'AI-doll-as-sex-robot-figure' so rife in academic circles. Doing so illustrates how across media formats, gendered-female characters are designed to appear emotionally responsive to create desirable and engaging products. Speaking about AI girlfriends, Devlin and Belton state:

> "They are not, primarily, *sex* fantasies, but *love* fantasies, which are intimately tied up with the realities of the capitalist system. It is possible to pay for sex—the realities of sex work, and the emerging development of sex robots, point to this. It is not, however, currently possible to buy something that will love you and desire you" (2020, p.371).

While buying such a product may not be possible, the case studies' advertising and design choices certainly heavily allude to emotional and romantic interaction. Despite affinity with digital others challenging human/nonhuman dialectics, thus

sharing commonalities with posthumanism, this is not a neutral enterprise. As Braidotti warns "the advocates of advanced capitalism seem to be faster in grasping the creative potential of the posthuman than some of the well-meaning and progressive neo-humanist opponents of this system" (2013, p.45). A critical posthumanist stance thus allows for serious interrogation of companionship with technological others, without losing sight of concerning aspects of its manifestation in sextech. While this work attends primarily to the gendered dimensions, other tentative studies in this field probe the racial elements of design that favours whiteness and fetishes constructions of femininity that represent non-white characters (Puig, 2017; Johnson, 2019; Moran, 2019). Although beyond the scope of this paper, sextech research needs to expand to attend to these factors. This work agrees that "notions of intimacy and companionship … must overtake narrower discussions of sexuality, robots, and 'sex robots'" (Scheutz and Arnold, 2017, p.460), as all the while this market grows exponentially and symbiotically with digital developments in a myriad of formats. This investigation provides an initial attempt, heeding calls for urgent and nuanced research in this ever-expanding field (Döring and Poeschl, 2018). This market is poised to create intimate and sexual interaction with digital feminities, envisioning forms of posthuman sextech – with or without the arrival of 'sex robots'.

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