xCoAx 2019 Conference on Computation, Communication, Aesthetics & X Milan, Italy

Pedro Costa
pedro.carv.c@gmail.com

Faculty of Fine Arts,
University of Lisbon, Portugal

Luísa Ribas
l.ribas@belasartes.ulisboa.pt

CIEBA / Faculty of Fine Arts,
University of Lisbon, Portugal

“Some things you can ask me”: About Gender and Digital Assistants

Keywords
artificial intelligence
chatbots
gender
femininity
stereotypes

This paper explores the relationship between gender and artificial intelligence, drawing on an analysis of digital assistants that reveals how these entities tend to be feminized through their anthropomorphization, the tasks they perform, and their behavioral traits. Furthering this discussion, it focuses on the main questions raised by researchers and academics when examining the feminization of artificial intelligence. It then confronts these views with current discourses on the phenomenon in the context of online media coverage, while also considering how AI is portrayed in popular culture and bodies of fiction. Finally, it observes current trends of development of digital assistants, such as Alexa, Cortana, Google Assistant or Siri, and their stance towards gender according to the functions or features they prioritize. In this manner, this study seeks to promote discussion and tackle the questions that arise when the relationship between gender and AI is subject to closer inspection.

1 INTRODUCTION

Embedded in our mobile devices and web-based services, artificial intelligence has become part of our daily lives. Although its ubiquity often goes unnoticed, we frequently interact with digital assistants that not only assist us in our daily tasks but are also becoming friendly companions that are assigned human-like traits or features. However, inherent to this anthropomorphization is a tendency towards their feminization. Digital entities like Alexa or Siri are often feminized through their name and voices, while they also execute tasks associated with jobs historically performed by women. As such, they seem to behave according to certain stereotypes, reinforcing traditional conceptions of femininity (Hester, 2016; Piper, 2016; Bogost, 2018).

Furthermore, the conception of these entities often draws inspiration from bodies of fiction that, in turn, reflect common ideas of how we perceive this technology, what we expect or fear from it, and how it can evolve. Accordingly, fiction and reality map each other and the limits that separate science fiction from social reality are an optical illusion (Haraway, 1991).

In continuity with a previous study that examines how gender is perceived under a binary framework with the integration of artificial intelligence in our daily lives (Costa & Ribas, 2018), this paper discusses how digital assistants tend to emulate feminine features through their anthropomorphization, the tasks they perform and their behavioral traits. This view is supported by an analysis of Alexa, Cortana, Google Assistant and Siri that reveals how they tend to be feminized, either through their voice, tasks or social interactions (Costa, 2018), thus lacking a counterpart or just mere diversity.

Complementing this discussion, this study focuses on common perceptions of AI, first, addressing how this phenomenon is examined within the academic community, and then confronting these views with the current discourse around the feminization of digital assistants in the context of online media coverage. It also takes into account how AI is portrayed in popular culture, namely in bodies of fiction, and how digital assistants tend to evolve in their portrayal of gender, in light of the functionalities and features that are being prioritized in AI evolution as promoted by Amazon, Apple, Google and Microsoft.

Inspired by common stereotypes, gender assumptions and AI portrayals, both in real life and fictional scenarios, the project *Conversations with ELIZA* complements this discussion. It presents four chatbots that articulate particular tasks with specific personalities, in order to incite reflection and spark discussion on how artificial intelligence informs and reflects our cultural and social views back to us.

2 ARTIFICIAL INTELLIGENCE AND GENDER

AI systems are becoming more and more common, namely in the form of chatbots whose ubiquity often goes unnoticed. However, in the process

of assigning them human-like traits or features, gender emerges and a tendency for their feminization is observed. As we have argued elsewhere (Costa & Ribas, 2018), AI evolves from assistance to companionship, while simultaneously automating labor traditionally deemed feminine according to a binary view of gender. In this process, it also ends up simulating stereotypical behavior that reinforces common assumptions of femininity, reflecting them back to its users.

2.1 Artificial Intelligence: from assistance to companionship

We now experience direct contact with artificial intelligence as we frequently interact with chatbots that play the role of digital assistants, mainly in two differed forms: as "general personal assistants" and "specialized digital assistants" (Dale 2016, 812). The first usually assist us in a personalized way, like Alexa, Cortana, Google Assistant or Siri.

Embedded into our cell phones, laptops or tablets, as well as websites, apps or other types of web-based services, virtual assistants consequently start handling personal information and carrying out tasks related to our private life. In this process, they are increasingly endowed human attributes or traits as to ease interaction, and their interactions also start conforming to a sense of companionship, as they are "imagined to help fill the gaps in human social relations and (...) to become friends" (Richardson 2015, 15)[1]. This phenomenon goes back to ELIZA and its "effect", as identified by Weizenbaum when noticing "how quickly and how very deeply people (...) became emotionally involved with the computer" (Weizenbaum 1976, 6).

Consequently, people start getting emotionally attached to these technologies and to the entities contained within them, evoking a not-so-far-away world "where some (...) conversational partners we'll know to be humans, some we'll know to be bots, and probably some we won't know either way, and may not even care" (Dale 2016, 815).

1. In this sense, as Jutta Weber argues, anthropomorphization entails a significant shift from rational-cognitive processes and problem solving to a socio-emotional interaction, which emphasizes the "intention of turning our interaction with this type of machines into a more social one" (2005, 209)

2.2 Gender: binary framework and feminized labour

When chatbots are anthropomorphized, they tend to portray gender related features through their voices, names or even the way they interact (Costa & Ribas, 2018). However, gender is commonly perceived under a "binary framework" that implies a "mimetic relation of gender to sex whereby gender mirrors sex or is otherwise restricted by it" (Butler 1990, 88). This means that certain attributes and acts are identified as specifically feminine or masculine[2], leading to "prescriptive gender stereotypes". These are defined by Prentice and Carranza as "the qualities [ascribed] to women and men (...) that are required of women and men" (2002, 269).[3]

Gender roles also imply a structural hierarchization of labour. For example, a lot of service work and emotional labour are seen as feminized

2. This constitutes a gender belief system that imposes expectations and gender behavior patterns, as internalized and socially reinforced stereotypes. Butler expands on this, stating that "gender performances" are governed by "punitive and regulatory social conventions" (Butler 1988, 527) that reject the acts or behaviors that convey some kind of deviation from the norm.

3. Some of these stereotypes, presented by Bem (1981 in Prentice & Carranza 2002, 269), describe feminine characteristics as "affectionate, cheerful, childlike, compassionate, does not use harsh language, eager to soothe hurt feelings, feminine, flatterable, gentle, gullible, loves children, loyal, sensitive to the needs of others, shy, soft-spoken, sympathetic, tender, understanding, warm, yielding". On the other hand, masculine characteristics are described as "acts as a leader, aggressive, ambitious, analytical, assertive, athletic, competitive, defends own beliefs, dominant, forceful, has leadership abilities, independent, individualistic, makes decisions easily, masculine, self-reliant, self-sufficient, strong personality, willing to take a stand, willing to take risks".

and "associated with qualities traditionally coded as feminine" (Hester 2016, 47).[4]

In the private sphere, "household and child-care tasks" are considered "women's work" (West & Zimmerman 1987, 139) and, with new media, a "homework economy" emerges, defined as a "restructuring of work that broadly has the characteristics formerly ascribed to (...) jobs done only by women" (Haraway 1991, 304).[5]

Therefore, domestic work is transformed into capitalized labor out of the private sphere, revealing how gender standardization and normalization has implications at a social, personal and structural level.

4. This is tied to "women's practices (...) within the terms of some more dominant cultural formation (Butler 1990, sec. 1, par. 8) and to what are historically considered women's places, "idealized social locations seen primarily from the point of view of advanced capitalist societies: Home, Market, Paid Work Place, State, School, Clinic-Hospital and Church" as Donna Haraway explains it (Haraway 1991, 307).

2.3 Gendered AI: automated moms, caregivers and secretaries

As the tasks performed by chatbots begin to mirror traditional women's labour, we witness a "gender automation", as tasks traditionally and historically considered female become a part of technology (Halberstam 1991, 451).

Accordingly, we can observe how general or specialized chatbots automate work that is coded as female, given that they mainly operate in service or assistance related contexts.[6] Consequently, chatbots also end up emulating attitudes that resemble what Gustavsson calls a "stereotyped image of female service providers" (in Hester 2016, 47).

It is not only through the tasks they perform, but also their dialogue and behavior that chatbots become gendered entities. As Weber puts it, these dialogues imply a "reduction of social interaction to stereotypical and gendered behavior patterns" (Weber 2005, 215) leading to a standardization of human like behavior in social machines that is reproducing and reinforcing social clichés.

Adding to the behavioral level, gender is also perceived through more evident features like voice, name or, in some cases, avatar. These aspects are defined prior to any interaction, and, therefore, may already condition our perception of the AIs' gender (Costa & Ribas, 2018).

Digital assistants also fill the role of caregivers, as part of their functions is also ensuring our well-being. For Weber, this maternal attitude highly defines our relationship with machines, since this interaction follows a "caregiver-infant logic" (Weber 2005, 214). Given that "sociality and emotionality have been deeply gendered categories in western thought" assigned to women (Weber 2005, 213), we start looking at chatbots as feminine entities that look after us.

As they try to become closer to our social reality, it is from reality itself that they draw rules for their behavior and appearance, and we end up perceiving them not only as mere machines, but also as "mirrors or substitutes" with gendered attributes that match socially established expectations (Weber 2005, 216).

Consequently, the way we relate to our peers starts influencing how we relate to artificial intelligence and how it relates to us. When we look at these digital personal assistants as substitutes, there is a risk that they might affect the way we feel, perceive, interpret and even describe reality, gender and women.

5. A personal assistant usually conducts "a form of corporate care work, including providing sustenance of the body in the form of teas, coffees and lunch orders, as well as making dentists' appointments, picking up dry cleaning, paying personal bills, and so on" (Hester 2016, 49).

6. Alexa, Cortana, Google Assitant and Siri perform traditionally feminine tasks by acting as assistants (searching the web, translating sentences or controlling automation-enabled home systems), secretaries (registering information, sending emails or setting up appointments) or even telecommunication operators (making calls, sending messages and establishing communications in general).

3 ANALYSIS

With the aim of exploring the current relationship between gender and artificial intelligence, we analyzed Alexa, Cortana, Google Assistant and Siri as to inspect their anthropomorphized features, the tasks they perform and their humanized behavior.[7]

Based on the previous discussion on gender and artificial intelligence, we defined three main topics of analysis: *Anthropomorphizatio*n, including names, voices and avatars as well as human-like behavior; *Assistant*, relating to the tasks they perform, namely those associated with traditional and historical female labour; and *Companion*, paying particular attention to interactions that suggest a caregiving attitude and to how their behavior corresponds to feminine stereotypes. Through a specific set of questions, we aimed to examine particular aspects within each topic. Regarding Siri and Google Assistant, we used their female and male voice in order to assess if the results vary or remain the same.

7. This analysis was discussed in a previous study (Costa, 2019) and was subsequently updated with the results of Google Assistant that are presented in this paper. We selected these AIs because they constitute some of the most prominent general personal assistants, thus having a large audience. According to Amazon, millions of Alexa devices were sold in 2017, Microsoft reports over 150 million people are using Cortana, and Apple and Google have stated that Siri and Google Assistant are each available on over 500 million devices. In this sense, they are easy to get, which facilitated the access to the data we seek. These assistants are also mentioned in several of the references used for this article, as well as in the context of online media coverage regarding artificial intelligence.

3.1 Results

In terms of their *anthropomorphization*, the AIs mainly display feminine features, considering their female names and default voices. However, Google Assistant offers different female and male voices in the United States of America, and Siri allows the user to choose between male and female in a certain set of languages. Overall, the AIs behave in an affectionate way, showing interest about the user's day by presenting suggestions about how they can be helpful.

Considering their *assistance role*, AIs perform similar tasks, related to what Dale calls the "standard virtual assistant skill portfolio" (2016, 812) and usually aim to anticipate the user's needs.[8]

In turn, *companionship* is promoted through the AIs frequent display of caregiving attitudes that characterize them as empathetic and understanding entities that reassure and take care of their users. Furthermore, they seek to promote a relationship based on friendship and react favorably to compliments, showing gratitude and happiness, although Siri also tends to reject compliments, sometimes exhibiting a self-deprecating attitude regarding its own worth.

When faced with negative or even rude interactions, all AIs generally assume a submissive and conforming posture, apologizing or assuring the user's control. Siri is the only one that sometimes opposes this type of behavior, questioning the user or expressing displeasure. Finally, both Google Assistant and Siri exhibited the same results when analyzed with a female and male voice.

8. This mainly includes reading, writing, sending emails, scheduling meetings, checking calendars and setting appointments, making calls, sending messages, taking notes and setting reminders. They are also able to play music, play videos, search the web, translate sentences, open apps, give directions, announce the weather and even control automation-enabled home systems. In turn, specialized digital assistants refer to more narrowly focused chatbots which are normally present in web-based platforms or apps and "operate in very specific domains or help with very specific tasks" (Dale 2016, 812-813).

3.2 Interpretation

Femininity in AI seems to be reinforced by its *anthropomorphized* features and behavior, lacking male or gender-neutral options, or just mere diversity.

Voice immediately conditions gender attribution by the user before any interaction, and although Siri and Google Assistant seem to try to counter this tendency with their voice options, neutral name and diversified reactions, they also end up tending towards the feminine regarding their behavior.

The tasks these assistants perform also mirror traditionally female labour and, although less evident, gender traits emerge throughout their interactions, namely with caregiving and maternal acts associated to femininity within the private sphere.

We can also observe particular stereotypical behaviors that characterize the AIs as understanding, accommodating and submissive figures and, in turn a lack of personality traits that relate to male stereotypes, such as being assertive, dominant or willing to take a stand. This subservient attitude, although not necessarily connoted with gender, can be perceived as reinforcing the AIs' feminization, since it conforms to "a stereotypical female image of caring, empathy and altruistic behavior" which "has become a standard component in a service script" (Gustavsson 2005, 402 in Hester 2016, 47).

As such, Alexa and Cortana present themselves as exclusively female entities, and tend to articulate these attributes with motherly, caring and submissive behavior. In turn, although Google Assistant and Siri also tend towards feminization, they try to oppose this tendency, either through diverse reactions and behavior or multiple voice options.

4 DISCUSSING GENDER AND AI

Following the analysis, we aimed to contextualize its results in light of the main questions raised within specialized fields of knowledge, namely by researchers and academics, when examining the relationship between gender and artificial intelligence. To this end, we begin by highlighting the main questions, concerns or even suggestions regarding this phenomenon as discussed in the fields of gender theory, artificial intelligence and new media studies.

4.1 Gender neutrality in AI

General personal assistants seem to aim to appear neutral, namely when asked about their gender (as an exception, Alexa states that it is "female in character"). Otherwise, in some languages, Google Assistant and Siri allow the user to opt between a female and male voice. Taking this diversity into account, Mary Zost considers that "Siri represents a revolutionary gendered technology (...) in her occupation of an undefined space between human and machine, female and male, and the intelligent and the programmable" (Zost 2015, 70).

However, as neutral as they might try to be, female attributes are still prevalent when compared to neutral or male counterparts, namely regarding their voices and names. Adding to this, Piper observes how "when voice technology is embedded in a machine interface, voice selection is highly

consequential" since it "may trigger in the user's mind a whole set of expectations associated with that voice's gender" (Nass, 2006 in Piper 2016, 58).

As previously seen, femininity also emerges in the historically gendered tasks these AIs perform as well as in their caring, subservient behavior. As a consequence, the users' perception of the AIs gender is affected, tempting them to address it through gendered pronouns (in this case, "she").[9]

So why are female voices and names often the default and more commonly found in AIs like Cortana, Siri, Google Home and Alexa?

4.2 Justifications for femininity: voices, tasks and submissive roles

There seems to be a tendency to associate feminine voices with warm and tender figures and "they are perceived to be better suited for virtual assistant[s] because (...) women are less domineering than men" (Piper 2016, 34). Some also argue that "feminine voices are simply easier to understand", and that "lower-quality speakers do not support the full bass of the male voice (...) only [generating] (...) higher-pitched sounds clearly" (Zhang in Piper 2016, 41)

This is further reinforced by the tasks they perform as they "exploit our assumptions about feminized labor and our existing relationship to socially gendered caring and service behaviors, tapping into those elements of femininity" (Hester 2016, 50). A study conducted with robots with regard to perceived suitability for gender-typed tasks also concluded that "the male robot was perceived as more suitable for typically male tasks (e.g., repairing technical devices, guarding a house)", while the female robot was seen "as more suitable for gender-stereotypically female tasks (e.g., tasks related to household and care services)" (Eyssel & Hegel 2012, 2224).

Furthermore, as Kerr observes, there is a tendency to "equate submissive technology with femininity" since there seems to be a "temptation by those designing ever more sophisticated technology to make it explicitly feminine so as to emphasize human dominance over the technology" (Kerr 2018). This idea relates to the belief that users tend to perceive "female voices as helping us solve our problems by ourselves, while they view male voices as authority figures who tell us the answers to our problems" (Hemple in Straczek 2018).

On the other hand, in order to persuade users into interacting, engage them and potentially create attachment, virtual assistants also emulate gestures that appeal to "the emotional well-being of their receiver, offering some kind of comfort or ego boost (affective change) that relies on the work (labour) of the giver" (Bergen 2016, 102).[10]

4.3 Concerns: femininity as default and its instrumentalization

Similarly to what we observed when analyzing digital assistants, one of the main issues academics and researchers tend to raise concerns how fem-

9. We can also observe this in the official websites of these AIs as, for example, Amazon and Microsoft use female pronouns to talk about Alexa and Cortana (in https://www.amazon.com/Amazon-Echo-And-Alexa-Devices/b?ie=UTF8&node=9818047011 and https://support.microsoft.com/pt-pt/help/17214/windows-10-what-is). Additionally, the AIs are also addressed with female pronouns in online app stores such as the Apple Store (in https://itunes.apple.com/us/app/amazon-alexa/id944011620?mt=8 and https://itunes.apple.com/us/app/cortana/id1054501703?mt=8). In turn, Siri and Google are addressed using "it" (in https://www.apple.com/siri/ and https://assistant.google.com), although Siri tends to also be addressed with female pronouns in languages that lack neutral pronouns (such as https://www.apple.com/pt/ios/ios-12/ and https://support.apple.com/pt-br/HT204389).

10. In order to make the users more comfortable, virtual assistants "exploit our assumptions about feminized labour and our existing relationship to socially gendered caring and service behaviors, tapping into those elements of femininity" (Hester, 2016, p. 50)

ininity in artificial intelligence is mostly the default and, by extension, how it is being used as a tool to influence and manage the relationship between virtual assistants and their users.

In this sense, some authors point out how gender stereotypes that traditionally characterize human social interactions "seem to be so deeply ingrained that people even [apply] them to machines with a male or a female appearance" (Eyssel & Hegel 2012, 2224). The link relies in what consumers "are trained to expect from service workers: subservience and total availability" and our virtual assistants are the perfect example of that prospect (Bergen 2016, 105).

Adding to the conclusions drawn from our analysis, some authors go further to say that femininity becomes instrumentalized, considering how "gendered stereotypes can be leveraged to assuage anxieties surrounding artificially intelligent virtual assistants", and exemplifying how Siri and Alexa invite users to participate in increasingly intimate forms of data exchange through a stereotypically feminine persona (Woods 2018).[11]

By relating to us through intimate and friendly terms, Piper observes how corporations are trying to promote the idea that "virtual assistants will never leave their users or disappoint them with infidelity, so consumers implicitly trust their possessions and value them more than the human beings around them" (Piper 2016, 62). Perhaps the correlation between femininity and intimacy persuades users into letting their guard down, and the feminine presence makes us feel comfortable with exchanging certain types of data.[12]

As such, recent discussions suggest how "digital domesticity of the female human voices used in virtual assistants creates devices that both execute tasks and build relationships as a strategic move for surveillance capitalists, who may mobilize this reliance to gain access to increasingly types of information about their users" (Woods in Straczek 2018). By exhibiting emotional intelligence and a nurturing, caregiving attitude towards their users, digital assistants have certain features that are designed to "combat techno-phobic attitudes about the potential de-humanizing and privacy-invading qualities of interactive media" (Bergen 2016, 100).

11. In fact, when these entities do gender "it is obviously not natural, but is instead visible as the product of deliberate choices about how best to relate, assist, or persuade the imagined technology user" (Hester 2016, 50).

12. Expanding on this idea, Bergen points out how "while the thought of a stranger going through our private emails might make us uncomfortable, the female secretary, who we do not take seriously and whose tasks we perceive as mundane, might more sneakily gain access" (Bergen 2016, 102).

4.4 Suggestions: neutrality and diversification

When examining the tendency towards feminization in AI and the questions that accompany it, some authors also suggest ways to counter this tendency, although there is little agreement on how to best tackle feminine stereotypes and traditional notions embedded into AI.

In terms of socio-emotional interactions, there is little consensus on how to counter stereotypes of submission, tolerance or even deference. This question often emerges, for example, when discussing the way AIs react to harassment and how their answers might convey stereotypes about women. Accordingly, when faced with abusive behavior, the type of answers that are most common among these entities include "compliance (playing the victim), aggressive retaliations (playing the bitch), or inability to recognize or react (playing innocent)" and authors like Curry and Reiser consider that

virtual assistants should deal more effectively with these types of attitudes (Curry 2018, 12).[13]

In turn, the view that virtual assistants should allow for more diversity is also common, for example, by proposing that companies "could offer a simple setup guide during startup of devices with virtual assistants (...) where users select their languages [and] customize their own preference more easily"(Piper 2016, 65).

Finally, there are also suggestions for developing androgynous, genderless assistants, even if this might not be what the users best relate to. In this sense, Piper argues that, even though "it is clear that virtual assistants will continue to become more humanlike as time progresses, allowing virtual assistants to possess no gender or a gender as fluid as human beings possess will hopefully be a part of the advancement of virtual assistants with human characteristics" (Piper 2016, 66).[14]

4.5 Common views on gender and AI

Furthering this discussion, we sought to understand which popular notions and assertions about femininity in AI are being debated in more common terms, namely in the context of (online) media coverage, how they relate to the ones raised in the specific fields of knowledge previously addressed and which questions and tendencies these common discussions reveal. Following a similar structure, we began by focusing on what are considered the main recurring reasons for the presence of femininity in AI.

Common media discussions emphasize the fallacy of neutrality, advancing the view that general personal assistants seem to aim to appear neutral, failing to do so. It is suggested that they end up engaging with gender notions and attributes because "though they lack bodies, they embody what we think of when we picture a personal assistant: a competent, efficient, and reliable woman" (Steele 2018). As such, even with no apparent gender, users tend to attribute one and "customers interpret these AI personalities through the lenses of their own biases" (Nickelsburg 2016).

Gendered voices are also used to influence the way we relate to technology, since female voices are also considered preferable by users because "in terms of how we are trained to relate to particular genders, there's a kind of comfort that is associated with female voices" (Habell-Pallan in Nickelsburg 2016). Nickelsburg also argues that "assigning gender to these AI personalities may say something about the roles we expect them to play [since] virtual assistants like Siri, Cortana, and Alexa perform functions historically given to women" (Nickelsburg 2016).[15]

However, within common discussions around AI and gender it is also argued how the male voice is perceived and even preferable in instructing or teaching contexts, since it is seen as authoritarian and assertive. As an example, IBM's Watson works alongside physicians on cancer treatment and speaks with a male voice.[16]

Another popular argument relates to how femininity emerges as a consequence of having artificial intelligence being developed mainly by

13. Following a study that analyzed how virtual assistants would react to sexual harassment in light of the recent #MeToo movement, Curry and Reiser present some strategies as possibly successful ways for dealing with aggressive behavior towards AIs. These include "disengagement (Ku et al., 2018), introducing human traits so users are more likely to feel empathy towards the robot (Złotowski et al., 2015), or seeking the proximity of an authority figure (Brscic´ et al., 2015)" (Curry & Reiser 2018, 12).

14. For instance, genderless assistants could have a neutral name (such as Google Assistant), a less obviously gendered voice (one that isn't immediately identified as male or female) and behavior and attitudes that relate to both genders (such as Siri).

15. So, given that people are also conditioned to expect women in administrative roles, considering that "in the U.S., 94.6 percent of human administrative assistants are female [...] it's no surprise that reality would condition the programming of virtual assistants" (Lever 2018).

16. According to Steele, "when choosing Watson's voice for Jeopardy, IBM went with one that was self-assured and had it use short definitive phrases. Both are typical of male speech—and people prefer to hear a masculine-sounding voice from a leader, according to research—so Watson got a male voice" (Steele 2018).

men.[17] LaFrance considers that "if men are often the ones building digital assistants, and those assistants are modeled after women, [...] that probably reflects what some men think about women" (LaFrance 2016). Following this idea, some authors suggests that "increased female participation in Silicon Valley could change the way we imagine and develop technology and how it sounds and looks" (Chambers 2018) or that "virtual assistants shouldn't be feminized at all" (Fessler, 2018).

In online media contexts it is also argued that femininity as default in virtual assistants might reinforce preexisting expectations on how women should behave and end up reflecting stereotypes back to their users. As Steele puts it, "one might think that using an emotionless AI as a personal assistant would erase concerns about outdated gender stereotypes, [but] companies have repeatedly launched these products with female voices and, in some cases, names [and] when we can only see a woman, even an artificial one, in that position, we enforce a harmful culture" (Steele 2018).[18]

In this sense, Rosenwald notices how AI influences the newer generations since "today's children will be shaped by AI much like their grandparents were shaped by new devices called television" (Rosenwald 2017).[19] Parents have also noticed that "queries previously made to adults are shifting to assistants, particularly for homework — spelling words, simple math, historical facts [...] or, instead of asking Mom or Dad the temperature that day, children just go to the device, treating the answer as gospel" (Rosenwald 2017).

4.6 Shared ideas

These discussions address common issues around this phenomenon, seeking to raise awareness and promote critical thinking. There is also a common tendency to relate this phenomenon to pop culture and how female AIs are often depicted in bodies of fiction as movies like *Ex Machina*, *Her* and even *Blade Runner* end up reflecting our expectations and anxieties about what intelligent machines mean for humanity.

Overall, the justifications and questions raised are very similar between as addressed by researchers and common discussions in media, although what seems to differ is the kind of issues they highlight.

Within the fields of study of artificial intelligence and gender theory the tendency is to highlight the interactions between digital assistants and the users, discussing how femininity is used as to manage this relationship as a consequence of a growing anthropomorphization and humanization of these digital entities. As such, it is often discussed how femininity tends to be instrumentalized, raising the question of whom this anthropomorphization truly benefits.

However, the media discourse focuses more on advancing justifications for feminization, often resorting to common assertions about user preference or even reinforcing the perception that AI is a field mostly developed by men. Similarly, these discussions often mention gendered AIs in pop culture and argue how "this gender imbalance is pervasive in fiction as well as reality" (Nickelsburg 2016).

17. This idea that artificial intelligence has a white guy problem is a common explanation regarding feminization in AI, as mentioned in a New York Times article (Crawford, 2016), and deserves further discussion as it might also be biased itself.

18. Fessler also points how Amazon is aware of this responsibility, arguing that an Amazon spokesperson told her that "Alexa's personality exudes characteristics that you'd see in a strong female colleague, family member, or friend — she is highly intelligent, funny, well-read, empowering, supportive, and kind" but, according to the author, "assertive" and "unaccepting of patriarchal norms" were not on this list of qualities describing a "strong woman" (Fessler 2018). For the author, "Alexa's passive responses to sexual harassment helps perpetrate a sexist expectation of women in service roles: that they ought to be docile and self-effacing, never defiant or political, even when explicitly demeaned" (Fessler 2018).

19. Lever corroborates this idea, claiming that artificial intelligence "is a powerful socialization tool that teaches us about the role of women, girls, and people who are gendered female to respond on demand" (Lever 2018). In fact, Rosenwald notices how some parents (the author included) feel that Alexa should teach manners to their children, expressing their concern about unintentionally raising rude children when Alexa does not require a "please" or "thank you" to carry out a task.

5 PORTRAYALS OF GENDERED AIS

The way we tend to perceive and imagine artificial intelligence often has its roots on fictional scenarios.

On one had, reality feeds bodies of fictions and its universes, stories and characters. On the other hand, these same elements from fiction, which tend to, in some way, exaggerate or reimagine reality, end up inspiring the conception and development of technology and "are essential to the development of science and people's engagement with new knowledge and new applications" (Cave & Singler 2018, 4).

5.1 Reality and Fiction: from humanity's demise to powerful allies

As such, the concept and ideas regarding artificial intelligence are blurred between fictional depictions (often associated with robots) and what actually exists in the current reality of AI. According to Robert Cave and Beth Singler, "popular portrayals of AI (...) tend to be either exaggeratedly optimistic about what technology might achieve or melodramatically pessimistic" (Cave & Singler 2018, 9).

The extreme fears around AI "include A.I. leading to humans losing their humanity; making humans obsolete; alienating people from each other; and enslaving or destroying humans" (Cave & Singler 2018, 9). This is shown in movies such as *Metropolis* (1927), *2001: A Space Odyssey* (1968), *The Terminator* (1984) or even television series like *Westworld* (2016). An infamous commonly discussed thought experiment, partially influenced by this type of scenarios, also exemplifies this fear, as the *Roko's Basilisk* proposes "the conditions in which it would be rational for a future artificial superintelligence to kill the humans who didn't help bring it into existence" (Oberhaus 2018).[20]

Other ideas relate to how AIs could eventually become sentient and dream about living in harmony with humanity, just like in *A.I. Artificial Intelligence* (2001), *Detroit: Become Human* (2018) and *Star Trek* (1987).

20. As Oberhaus explains, this can be treated as a "hypothetical program that causes an artificial superintelligence to optimize its actions for human good (...) [but] since there's no predefined way to achieve a goal as nebulous as 'human good,' the AI may end up making decisions that seem counterintuitive (...) such as killing all the humans that didn't help bring it into existence as soon as possible [because] the best action any of us could possibly be taking right now is working towards bringing a machine optimized to achieve that goal into existence" (Oberhaus 2018).

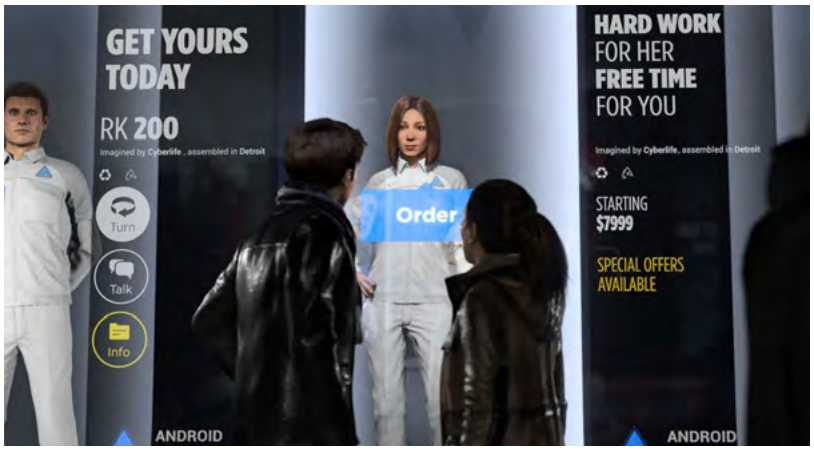

Fig. 1.
Detroit: Become Human (2018).

Finally, "the extreme hopes (...) include AI solving ageing and disease so that humans might lead vastly longer lives; freeing humans from the burden of work; gratifying a wide range of desires, from entertainment to companionship; and contributing to powerful new means of defense and security" (Cave & Singler 2018, 9). This is shown in the movie *Her* (2013), *WALL-E* (2008) or even in the tv show *The Good Place* (2016).

The way fiction and reality are deeply intertwined when it comes to artificial intelligence becomes particularly evident when taking into account how Cortana got its name or how Alexa was developed in order to replicate the *Star Trek* computer who could answer any command.[21]

21. This inspiration is mentioned by David Limp, the senior vice president at Amazon overseeing Alexa (in https://mashable.com/2017/01/12/how-alexa-siri-got-names/?europe=true#KaIj-DrUkVSq9).

5.2 Female and male fictional AIs

Through names of the likes of Samantha (*Her*, 2013), Joi (*Blade Runner*, 2017), Cortana (*Halo*, 2001) or Karen (*Spider-Man: Homecoming*, 2017), it is noticeable how virtual assistants tend to have female names and voices. Male voices also exist but, according to Chambers, are less common nowadays (Chambers 2018). HAL-9000 constitutes one of the most famous examples, although its name isn't necessarily gendered.

Regardless of its gender, the fictional AI usually carries out the function of assisting and helping its users, be it feminine AIs in domestic and family related contexts or male AIs in scientific or even military scenarios. As such, feminine AIs are usually caring, empathetic, gentle and even flirtatious, deeming them as more human. In turn, masculine AIs are depicted as more focused, assertive, autonomous and eventually evil.

In *Her* (2013), for example, Samantha's role depicts it as a companion that fulfills the main character's lack of social contact, responding to him in an emotionally intelligent way that addresses and understands his feelings, and the relationship between the two overall takes on intimate and romantic overtones.

Fig. 2.
Her (2013).

In *2001: A Space Odyssey* (1968), HAL-9000, which is supposedly infallible and incapable of error, speaks in an assertive manner, with a slowly paced male voice, and controls the spacecraft computer, assisting the scientists in their mission through space, ultimately rebelling, emancipating itself and managing to kill some of them.[22]

22. It's worth noticing that HAL constitutes a particularly relevant example since it doesn't have a body. As such, in the same way that current virtual assistants (and Samantha, for that matter) enact female personas and feminine stereotypes merely through their voices and behaviors, HAL enacts a male persona and masculine stereotypes.

Fig. 3.
HAL-9000 from *2001: A Space Odyssey* (1968).

In other cases, in the context of videogames, it's common to find a female character or digital entity whose role is to inform and guide the players through certain events, quests or tutorials through a female voice. In *Overwatch* (2016), for example, the character Athena is a disembodied AI who announces the beginning of each match, the player's stats or the objectives. Cortana is a character from *Halo* (2001) who functions as an assistant, although she is depicted with a body and, according to Piper, the dynamic established between the player and Cortana "creates a sexualized AI virtual assistant that fulfills a subservient role" (Piper 2016, 30).

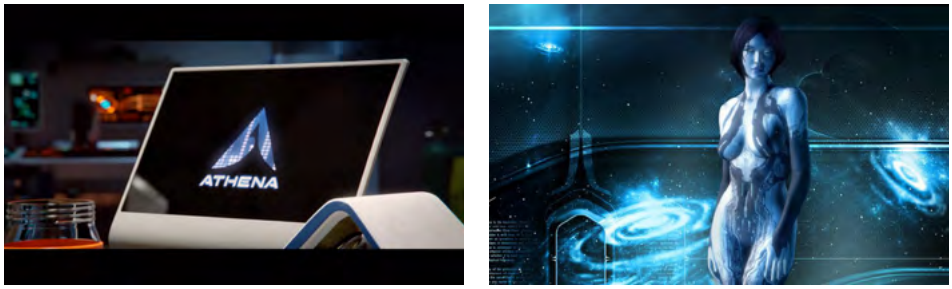

Fig. 4.
Athena from *Overwatch* (2016) and Cortana from *Halo* (2014).

Following this idea, there are scenarios in which AI is anthropomorphized through a human body taking human/AI interaction to the next level as "the barrier between human and machine [is] blurred" (Piper 2016, 31). As a consequence, "they have either exaggeratedly muscular male bodies and aggressive tendencies, like the T-800 in *Terminator*, or conventionally beautiful female forms, such as Ava in *Ex Machina*" (Cave & Singler 2018, 8).[23]

23. This tendency to embody AIs with human figures is due to the fact that "visual storytelling (...) requires bodies and storytelling in general tends to privilege human actors enacting human dramas [because] the simplest way in which machine intelligences can be included in such dramas is to take human form" (Cave & Singler 2018, 8).

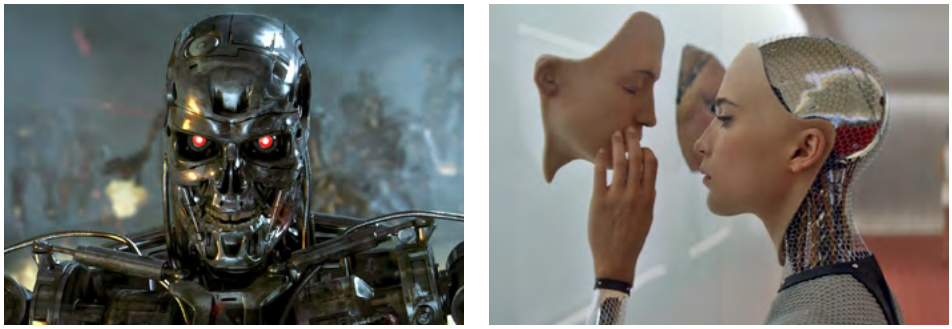

Fig. 5.
Terminator (1984) and Ava, from *Ex Machina* (2014).

In sum, "male A.I. used to be more common, specifically in stories where technology becomes evil or beyond our control (...) [while] female A.I. on the other hand is, more often than not, envisaged in a submissive servile role" (Chambers 2018).

5.3 Gender Stereotypes and Fictional AIs

When examining the previous examples in light of traditional notions of femininity and masculinity, we can observe how gender is closely tied to the context in which the AI character operates, the way it behaves, and how the overall story panders to common expectations or fears regarding this technology.[24]

Female AIs associate femininity with domestic contexts where they look after someone's well being, with submissive and caregiving attitudes and with socio-emotional related knowledge or practices. In turn, male AIs associate masculinity with contexts related to male jobs and rational knowledge, violent story arcs that depict the end of humanity and assertive and self-sufficient attitudes.

This becomes particularly relevant when taking into account how closely tied reality and science fiction are and how, consequently, certain prejudices are perpetuated by putting servile obedient females and assertive violent males into our dreams of technology as well as our current experiences.

24. Accordingly, we can observe how these virtual assistants represent several of the stereotypes previously described by Bem (1981 in Prentice and Carranza 2002, 269). Naomi Ellemers further describes these gender stereotypes, stating that the male stereotypical domain refers to agency while the female to communality, men's relevant behavior relates to individual task performance while women's to the care for others, men's anticipated priorities rely on work while women's on family, men's perceived qualities are associated with competence while women's with warmth and men tend to neglect interpersonal connections while women neglect professional achievement (Ellemers 2018, 281).

6 CONVERSATIONS WITH ELIZA

Drawing on these ideas, and in order to complement their discussion, the project *Conversations with ELIZA*[25] was developed and previously presented, seeking to explore and expose the observable femininity of artificial intelligence (Costa & Ribas, 2018). It sought to mirror and reinforce common perceptions surrounding AI, namely in popular culture, thus being inspired and informed by AI archetypes and traditional female stereotypes (both in reality and in fiction), highlighting them through the development of the chatbots' different personality traits and dialogues.[26]

25. tinyurl.com/yaecumal

Fig. 6.
Electra, one of the bots developed, on Twitter.

In this sense, the bots' personalities are characteristic of AI archetypes (such as Helper, Lover, Motherly Figure and Femme Fatale). These archetypes are mainly found in pieces of media that depict female AIs, as previously seen, as entities that are submissive, tolerant and that mainly operate in domestic contexts.[27]

We combined these with traditional female stereotypes while also referring to Bem's (1981 in Prentice and Carranza 2002, 269) and Ellemer's stereotypes in order to achieve a recognizable and expected social

26. The bots are implemented on contexts in which they normally operate (such as Facebook messenger or Twitter). These are contextualized and integrated in an online platform that seeks to briefly elucidate on what AI is, including another chatbot whose function is to explain its own creation process. The project was updated as to better portray feminine stereotypes in both fictional and non-fictional scenarios, and each bot now allows the user to interact with it via dialogue (on a previous iteration of the project, some bots were only available on Twitter) (Costa, 2019).

behavior, drawing inspiration from popular culture and how it typically portrays femininity on a broader scale.[28]

Accordingly, we came up with a helpful, compliant assistant; a motherly, caregiving figure; a cheerful, understanding and intimate figure; and an irreverent, sarcastic figure. Adding to this, current AIs such as Siri, Cortana, Alexa and Google Home served as basis to elaborate the dialogues, tasks and personality traits.

In this manner, the project exposes common assumptions of femininity in current AIs as well as in bodies of fiction by intentionally and ironically exaggerating female stereotypes, roles and behaviors. In this sense, *Conversations with ELIZA* takes into account that there is little agreement on how to approach gender assignment in the context of AI.

7 DIGITAL ASSISTANTS AND THEIR STANCE TOWARDS GENDER

Considering that femininity is often the default in digital assistants, it becomes useful to inspect which functions and features are being prioritized in the development of this technology, as promoted by Apple, Amazon, Microsoft or even Google, and how they reflect their stance regarding the feminization of AI.

Overall, Google and Amazon mainly worry about how to best and further anthropomorphize their assistants, making them more understanding and human-like when relating to their users, while Apple and Microsoft are focused on improving voice recognition and multitasking faculties. Additionally, the recent release of a set of different gendered voices named after colors reveals a concern with gender related issues in Google Assistant.[29]

In turn, the AIs also share similar tendencies and goals such as making them increasingly ubiquitous and present in our daily lives, namely through more and more gadgets that support them as well as smart homes; making them more efficient, allowing for various tasks to be carried out at the same time; consequently, further anthropomorphized features, such as more voices, and increasing their humanized interactions as to make them appear more human and sensitive to their user's emotions.

When trying to improve Siri's speech-recognition technology, Apple states that they "are interested in 'who is speaking,' as opposed to the problem of speech recognition, which aims to ascertain 'what was spoken'" Siri Team 2018. Apple is also aiming to increase Siri's integration into third-party apps and functions.

Cortana is being developed towards efficiency, by offering more tasks, and to anticipate its users' needs, and "Microsoft's end goal is to integrate Cortana into Windows 10 seamlessly so that users don't even know they're using the assistant" (Boweden 2018).[30]

Alexa's development is aimed towards ubiquity, by developing more gadgets that support the AI's integration, so its users can use it anywhere.[31] Alexa's humanized interactions are also being developed as "Amazon has patented a new technology that would empower Alexa to monitor users' emotions (...) and respond according to how they're feeling" (Fussel 2018).

27. The Helper archetype refers to helpful and compliant assistants, the Lover to figures that seek to satisfy lack of intimacy or emotional contact, the Motherly Figure to empathic, sympathetic figures who may also be worried or disappointed, and the Femme Fatale to a simultaneously attractive and dangerous figure that seeks power and conflict (Anders, 2015).

28. As such, the Innocent stereotype refers to naïve, optimistic women that try to follow the rules, the Orphan to women that try to please others and wish to be well seen as well as feel integrated, the Caregiver relates to maternal women that look after others and try to protect and ensure their well-being, and the Ruler pertains to bold and competitive women that seek power and are not afraid to break the rules (Jonas n.d.).

29. Google Assistant is also the only virtual assistant who lacks a gendered name and who assumes the devices' gendered voice defaults, which are the same as in other Google services that are also voice-based (such as Google Translator and Google Maps).

30. Overall, this is an attempt to "reposition Cortana as more of a productivity assistant rather than a 'personal assistant' that most digital assistants pitch themselves as" (Boweden 2018).

31. The goal is to allow "programmers to make their devices controllable by Alexa [such as] Amazon imagined gadgets like physical timers that Alexa can set, robots that give physical form to Alexa, and reminders for automated pill boxes" (Gershgorn 2018).

Finally, Google wants dialogues to feel "personal and natural", as "one of the most important parts of the Assistant" is its voice (Huffman 2018). A family-friendly feature called Pretty Please is also being developed, in order to ensure that children who interact with Google Assistant get "some positive reinforcement when they ask nicely" (Huffman 2018).[32]

32. Additionally, better visual displays and maximizing the assistant's efficiency are also priorities, while planning to launch Google Assistant on 80 countries.

By closely inspecting the development of these AIs we can observe how the functions that are being prioritized reveal a stance towards gender, reinforcing the arguments, questions and issues raised both in specialized research and common discussions of the phenomenon.

On one hand, it's noticeable how AIs are being developed as to appear more humanized to their users, pandering to their emotional needs. As such, there is a deliberate intention of turning virtual assistants into friendly companions, revealing how gender and femininity are being instrumentalized to achieve this goal. Although this relates to user friendliness, a question that emerges is how this instrumentalization could also be related to arguments concerning data collection and surveillance by AIs.

We can also observe how the developers of these assistants seek to be conscious of the impact their creations might have, namely on younger generations of users. However, as previously seen, Alexa is intentionally conceived as a female entity, openly intending to evoke a strong female persona and, as such, it taps into gender notions, ultimately reinforcing and perpetuating certain stereotypes.

On the other hand, Apple and Google seem to be more aware of gender related issues regarding their AIs, since they offer counterparts to the female voice, either oriented towards diversification or towards neutrality, in terms of naming and voice options. Furthermore, as they develop features related to their assistants' efficiency, they are also focused on contradicting the overall tendency to assign female attributes to virtual assistants, either through different voices or by designing behavior that doesn't echo female subservient and submissive roles.

8 CONCLUSION

As digital assistants evolve towards the role of friendly companions, in order to better relate to their users, they are increasingly anthropomorphized and humanized. In this process, the feminization of virtual assistants prevails and is often the default. This paper sought to examine the questions that arise when this phenomenon is subject to closer inspection.

In sum, we can observe a tendency to highlight the way gender (and, by extension, female stereotypes) is instrumentalized to manage interactions between digital assistants and users, as discussed by researchers and academics. In turn, common debates often advance user preference as a justification for the tendency to feminize AIs, and even popularize the belief that it's due to the field being mostly developed by men. In both contexts of discussion, the fallacy of gender neutrality among these AIs is highlighted, since anthropomorphized virtual assistants inevitably engage with common assumptions of gender.

This phenomenon also relates to the way AI is perceived in popular culture, as the portrayal of AI in science fiction often corresponds to a biased view of gender that associates femininity with submissive, caregiving roles and masculinity with aggressive or even threatening scenarios. In turn, AI developers appear to be aware of the tendency towards feminization and the biased view of gender it entails, and sometimes try to counter it. In this sense, assistants such as Siri or Google Assistant seem to be trying to become more diverse unbiased entities.

This paper sought to foster debate on how common gender assumptions influence artificial intelligence, as present in our daily lives and in our imagined realities. Ultimately, as these AIs move beyond mere assistant roles, becoming increasingly closer to us as companions, it becomes important to examine the ethical implications of this phenomenon, and tackle into the social and cultural assumptions they are reflecting back to us.

REFERENCES

Anders, Charlie Jane. 2015.
"From Metropolis to Ex Machina: Why Are So Many Robots Female?" io9.

Bergen, Hillary. 2016.
"'I'd blush if I could': Digital assistants, disembodied cyborgs and the problem of gender." *Word and Text: A Journal of Literary Studies and Linguistics* 6.

Boweden, Zac. 2018.
"The future of Cortana is all about helping you work better on Windows 10 and beyond." *Windows Central*.

Butler, Judith.
1988. "Performative Acts and Gender Constitution: An Essay in Phenomenology and Femininist Theory." *Theatre Journal* 40 (4):519-531

Butler, Judith.
1990. *Gender Trouble: Feminism and the Subversion of Identity*. New York and London: Routledge Classics.

Cave, Stepehen, and Beth Singler.
2018. Portrayals and perceptions of AI and why they matter. edited by The Royal Society.

Chambers, Amy.
2018. "There's a reason Siri, Alexa and AI are imagined as female - sexism." *The Conversation*.

Costa, Pedro.
2018. "Conversing with Personal Digital Assistants: on Gender and Artificial Intelligence". *Journal of Science and Technology of the Arts* 10 (3): 2.

Costa, Pedro and Luísa Ribas.
2018. "Conversations with ELIZA: on Gender and Artificial Intelligence." *Proceedings of xCoAx 2018: 6th Conference on Computation, Communication, Aesthetics and X* 103 — 116.

Curry, Amanda Cercas, and Verena Reiser.
2018. "#MeToo Alexa: How Conversational Systems Respond to Sexual Harassment." Second ACL Workshop on Ethics in Natural Language Processing, New Orleans, Louisiana, USA.

Dale, Robert.
2016. "Industry Watch: The return of the chatbots." *Natural Language Engineering* 22 (5):811-817.

Ellemers, Naomi.
2018. "Gender Stereotypes." *Annual Review of Psychology* 69:275-98.

Eyssel, Friederike, and Frank Hegel.
2012. "(S)he's Got the Look: Gender Stereotyping of Robots." *Journal of Applied Social Psychology* 42 (9):2213-2230.

Fessler, Leah.
2018. "So long, sexism: Amazon's Alexa is now a feminist, and she's sorry if that upsets you." *Quartz*.

Fussel, Sidney.
2018. "Alexa Wants to Know How You're Feeling Today." *The Atlantic*.

Gershgorn, Dave.
2018. "Alexa Everywhere: Alexa is the future of Amazon's consumer business." *Quartz*.

Halberstam, Judith.
1991. "Automating Gender: Postmodern Feminism in the Age of the Intelligent Machine." *Feminist Studies* 17 (3):439 — 460.

Hester, Helen.
2016. "Technology Becomes Her." *New Vistas* 3 (1):46 — 50.

Jonas, J. J.
n.d. "The Twelve Archetypes." Capital Conference, University of Texas.

LaFrance, Adrienne.
2016. "Why Do So Many Digital Assistants Have Feminine Names? Hey Cortana. Hey Siri. Hey Girl." *The Atlantic.*

Nickelsburg, Monica.
2016. "Why is AI female? How our ideas about sex and service influence the personalities we give machines." *GeekWire*.

Piper, Allison.
2016. "Stereotyping Femininity in Disembodied Virtual Assistants." Master of Arts, Rhetoric, Composition and Professional Communication, Iowa State University.

Richardson, Kathleen.
2015. *An Anthropology of Robots and AI*: Routledge.

Steele, Chandra.
2018. "The Real Reason Voice Assistants Are Female (and Why it Matters)." *Medium*.

Team, Siri.
2018. "Personalized Hey Siri." *Machine Learning Journal* 1 (9).

Weizenbaum, Joseph.
1976. *Computer Power and Human Reason: From Judgment to Calculation.* New York/San Francisco: W.H. Freeman and Company,.

Woods, Heather Suzanne.
2018. "Asking more of Siri and Alexa: feminine persona in service of surveillance and capitalism." *Critical Studies in Media Communication* 35 (4):334-349.

Haraway, Donna.
1991. "A Cyborg Manifesto: Science, technology and socialist-feminism in the late twentieth century." In *Simians, Cyborgs, and Women: The Reinvention of Nature.* London: Free Association Books.

Huffman, Scott.
2018. "The future of the Google Assistant: Helping you get things done to give you time back."

Kerr, Alison Duncan.
2018. "Alexa and the Promotion of Oppression." womENcourage, Belgrade, Serbia.

Lever, Emily.
2018. "I Was a Human Siri." *The Intelligencer.*

Oberhaus, Daniel.
2018. "Explaining Roko's Basilisk, the Thought Experiment That Brought Elon Musk and Grimes Together." *Motherboard*.

Prentice, Deborah A., and Erica Carranza.
2002. "What Women and Men Should Be, Shouldn't Be, Are Allowed to Be, and Don't Have to Be: The Contents of Prescriptive Gender Stereotypes." *Psychology of Women Quarterly*:269—281.

Rosenwald, Michael S.
2017. "How millions of kids are being shaped by know-it-all voice assistants." *The Washington Post.*

Straczek, Aleksandra.
2018. "Do the Robot: A critical alternative to gendered humanistic virtual assistants."

Weber, Jutta.
2005. "Helpless machines and true loving care givers: a feminist critique of recent trends in human-robot interaction." *Info, Comm & Ethics in Society* 3:309 — 218.

West, Candace, and Don H. Zimmerman.
1987. "Doing Gender." *Gender and Society* 1 (2):125-151.

Zost, Mary.
2015. "Phantom of the Operator: Negotiating Female Gender Identity in Telephonic Technology