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Lying cheating robots – robots and infidelity

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Abstract. Love has been described as unpredictable, immeasurable and non-purchasable and as such, poses challenges for anyone in a relationship to both stay in love, and to not fall in love with someone else. Scientists are still discovering whether or not love follows any specific recipe. Outlooks, personality, sense of humor and talent may not perfectly guarantee an individual falls in love with another, and more importantly is able to sustain that relationship. This article portrays a futuristic scenario in which truly intelligent and emotional robots already exist. Here, the bi-directional love discussed in Lovotics is not simulated through engineering, but genuine on behalf of both the machine and the human. This is a theoretical piece that draws on psychological theories of love, sex, attraction, associated emotions and behavior. The method involves reviewing previous literature on human-robot bi-directional love, and combines it with current discussions and theories of the realistic future potential of love relationships between humans and robots with full artificial intelligence and emotional capabilities. The result of the investigation is a multifaceted projection of the complexity humans will experience in love relationships with robots. The fact that due to the incalculable nature of love, affection and sexual attraction, the utilization of robots to fulfill human's basic desire to be loved will not have such straight forward outcomes as often predicted.

Keywords: Love, Sex, Emotions, Infidelity, Human-Robot, Artificial Intelligence, Psychology.

1 Introduction

The year is 2050, and existing in this world are robots that not only possess true (artificial) intelligence, thus, the ability to fully autonomously problem-solve, think and survive on their own but also harbor their own emotions. These robots, humanoids or otherwise, have the capacity to empathize, care for and reciprocate emotions, on top of the propensity to develop unprecedented, unabashed love and fulfilling sexual relationships. It is no longer uncommon for humans and robots to get married, and there are most likely possibilities for human-robot couples to be parents (through adoption or otherwise). Nor for that matter, is it uncommon for robots to want to marry other robots and raise their potential robot families. In this reality the boundaries between creators and consumers is blurred. Humans have succeeded in producing super humans (humanoids), who in the ideal case, live harmoniously alongside their human counterparts. In cases of full artificial intelligence (AI), it can be assumed that robots

possess independence and autonomy in their capabilities for flexible thought, problem-solving and creativity [1, 2]. They no longer *feel* like robots that have arrived fresh from the conveyor belt, but rather, other equal and compatible intellectual beings, who are genuinely capable of not only receiving the love of human beings, but are able to feel love in return.

This is a theoretical and reflective article on a possible future scenario in which humans and robots have the possibility to engage in true, fulfilling love and sexual relationships. In this scenario, the act of falling in love is less dependent on specific criteria, ideals and intentional processes of humans selecting partners, but rather falling in love is more random, unexplainable and equally as complex and dynamic for robots as it is for humans. Here, people and robots do not choose to love, but rather happen to fall into passionate, unconditional and uncontrollable love, that transgresses the borders of acceptable, or legal, relationships, and may or may not be contained two people (beings). This kind of love, or untamable nature of love, finds human-robot (or robot-robot) relationships in equally as disturbing troublesome situations as those of human-human relationships.

For this reason, the following sub-section refers to psychological and sociological literature in tangent with previous work in Lovotics [3, 4] - love and robotics - to describe the multilayered and dynamic complexity of love - as a state, condition and powerful set of conflicting emotions. The materials and methods are described in terms of the approach of this article, which is as a reflective approach to previous writings on human-robot love relationships from mass media to scientific texts, in combination with psychological and sociological insight into the underlying forces of love and sexual relationships in general. Thus, chemistry, attraction and jealousy are characterized and the psychology of unfaithfulness is unfolded. Power in the bedroom, shifts dominant emphasis on humans as consumers and owners of robots, towards humans as being partners *with* robots, and the next section on lying, cheating robots observes how robots modify their behavior according to protecting their own best interests. The article is concluded with an attempt to enrichen the understanding, and entertaining the idea, of genuinely bi-directional love relationships between people and machines. It serves to highlight the fact that if the exact future of human-intelligent robot relationships is unknown, the addition of AI and felt emotions within robotics will make this condition even less predictable.

1.1 The Nature of Love

Love is complex, unpredictable and dependent on numerous factors ranging from the physiological and physical, to the emotional and intellectual [5]. In their article "A design process for Lovotics", Samani and colleagues [4] introduce the field of love-like relationship human-robot interaction development, through defining the term "love". They define love as abstract, and focus on the Aristotle originated concept of "philia" - a form of moral and unconditional love, which displays in loyalty to family, friends and communities and materializes in mutually beneficial relationships [6, 7, 8]. In Samani et al.'s work [4], love is also categorized as an emotion, and in order to

design robotics for this emotion there is the need to incorporate elements which appeal to and are expressed through the senses of touch, sound and vision.

It is interesting to look closer at the dictionary definitions of love such as those in the Merriam-Webster Dictionary [9] that characterize love as a powerful affection which derives from kinship and/or personal connections, in addition to being sexually-driven attraction as well as warmth and devotion towards someone or something. Psychologist Robert Sternberg [10, 11, 12] proposed the triangular theory of love which comprises intimacy, passion, and commitment. Intimacy describes feelings of closeness and connectedness. Passion can be characterized by the drive of sexual attraction. Commitment entails decisions and long-term plans to remain with a partner. Types of love include: nonlove - absence of all three components of love [Sternberg 2004]; liking/friendship - closeness and mutual warmth towards one another; infatuated love - a crush or passionate arousal minus any intimate relationship; empty love - commitment which lacks passion and intimacy; romantic love - people are bonded emotionally and physically with intimacy and passion; companionate love - seen in long-term marriages and life-long partnerships; in fatuous love - whirlwind romances and marriages filled with passion but lacking the intimate component; and consummate love - the complete and total love form which encompasses companionship and long-term intimacy.

On a historical note, Sigmund Freud can be seen as one of the pioneering theorists, who typified love as a person's unconscious desire and need to find their "ego ideal" [13], or in other words, the inner image of who one wants to be. This inner image was claimed by Freud to be molded upon people the beholder admires. Abraham Maslow's in his hierarchy of needs positions self-actualization not only at the top of the pyramid, but also as the point at which the prospective of love is possible [14]. This article approaches love and sexual attraction through further considering the interaction between both physical (characteristics and gestures) and non-physical (intellect, humour and personality) within the human-robot relationships. Particular emphasis is placed on robots as independent thinking and feeling individuals, who additionally possess super human characteristics in physical proportions, properties and strength.

2 Attraction, jealousy and infidelity

Infidelity is a widely studied phenomenon, often explored from the perspectives of male-female relationships in terms of demographic, biological and psychological tendencies, as well as its social and physical ramifications [15, 16]. According to Drigotas and Barta [15] there are several approaches to understanding infidelity, these include: the descriptive - mostly retrospective and self-reporting; normative - also utilizing retrospective and self-report data, yet using social norms as explanatory frameworks; investment-model [17] - accounts for the process of individuals becoming committed to relationships, losing feelings of commitment and ending the rela-

tionship; and the evolutionary approach - focusing on the exchange of benefits, equity and its resulting satisfaction.

From the perspective of this paper, the evolutionary approach to explaining infidelity is particularly interesting, as it is very much bound to human beings' functional biological needs of sexual reproduction [18]. In this model, sexual relationships are viewed in terms of their functional value in generating offspring. Specific physical and intellectual qualities and traits such as symmetry, youth and strength are used as indicators that not only a partner will be able to produce offspring (reproductive success), but that offspring will in turn be healthy and able to produce their own offspring. In this case also the biological sex of the individual comes into play, and heterosexual conduct is often influenced by predispositions that are harbored unconsciously to encourage reproductive success.

Sexual differences also influence not only the likelihood to be unfaithful, but also the likelihood of jealousy. For instance, when females are pregnant and in that way linked to a male, there is not too much reason to be with an extradyadic partner, unless there is the potential to gain a more superior partner [18]. Males on the other hand, do not have parental certainty, thus, males have more of a tendency to develop jealousy. While at the same time, women's anxiety levels increase due to the possibility of being abandoned by their partner [16].

These factors that seemingly only apply in terms of human to human relationships actually present major challenges human-robot sexual relationships. This is both from a range of perspectives including partner selection and infidelity, as well as that of jealousy. Firstly, will the humans be able to compete with the physical and intellectual attraction of their robot counterparts [19]? If, by evolutionary development, human beings are innately biologically programmed to seek and be attracted to the most seemingly healthy and flawless beings, particularly in human likeness, will there be more propensity for human beings to seek out robot partners? Studies have already shown that early adopters are prone to prefer human-computer interaction to human to human interaction [20]. In turn, this would naturally affect the ability or form of reproduction that the couple will undertake - if reproduction is indeed one of the relational outcomes. The gender of the robot in this case is also significant, as due to its inability, or lack of functional purpose to sexually reproduce, the gender it either takes on or is attributed will also be a question, as this will be what drives its own emotions and sexual desires. This brings to mind the matter of whether or not robots will indeed have their own sexual desires, and what indeed will drive or motivate these desires.

Secondly, the motivational factors would also be a key concern from the robot's perspective in the relationship, not only in terms of what drives them sexually towards their human partners, but also what they have to gain from being in a relationship with a human being. Cindy Meston and David Buss [21] conducted a major study in which 237 different reasons were given for why people have sex. These reasons were divided into four different categories: physical - attraction and pleasure seeking, goal attainment, emotional, and insecurity - i.e., out of duty. Insecurity may not be a factor driving robots into sex, considering the imminent likelihood of their superiority over human beings, yet the 'out of duty' element may be part of it. Furthermore, another plausible factor behind a robot's sexual drive may be seen in Meston and Buss' ob-

servation that people use sex as a means of expressing affection. Perhaps robots will want to show their human partners how they feel, even if there is no biological propensity to engage in sex.

On this note, from the perspective of the capacity of robots to experience love and affection it is interesting to consider David Levy's [19] views in that the words or representation of love, may, like any other state such as being either hot or cold, may indicate that the robot actually harbors feelings of love. Out of the love prototype model proposed by Fehr and Russel [22, 23] which includes maternal, parental, friendship, sisterly, brotherly, romantic, passionate, sexual and platonic, it is difficult to see how the love felt by a robot could exceed that of friendship or platonic - given that the other types have biological roles. If considering that this biological, or reproductive drive were somehow programmed into the robots, there would once again be the evolutionary concern of how human beings, with their imperfections could compete with a robot counterpart.

2.1 Power in the bedroom

The issue of ethics is not a new one when considering human-robot interaction. In fact, numerous ethical debates are occurring involving questions including whether or not robot sex when in a human-human relationship is indeed cheating, and how robots should be treated in this interactions [24] including the prospective of robot rape [25]. Other ethical considerations have additionally arisen including the paralleling of human-robot sexual and its asymmetrical affection with prostitution [26, 27], as well as the promotion of pedophilia through the dissemination of child-like robots [28]. John Sullins [20] notes the change that takes place in ethical dynamics when moving from the topic of masturbation to robotics. These changes mainly focus on the quality of human to human relationships resulting from the introduction of sexbots, whereby instead of remedying marital and sexual problems, they may be seen to worsen them [29] and in fact draw humans' attention away from human companions and towards machines [30].

Hutan Ashrafian [31, 32] has researched extensively on the perspective of robot rights, particularly in light of the realization of robot consciousness. Ashrafian's concern primarily rests with the ethics involved in matters such as sex, and sexual consent between humans and robots, once robots can think [33]. That is, he sees that once robot consciousness has been achieved, we will no longer be able to consider the human-robot relationship as that of human-slave, but rather mutual between equally thinking beings. This additionally means that mutual consent would and should not only be required, but legalized in terms of human-robot relations. He considers that the lack of consent in human-robot relationships would prove dangerous not just for robots, but for humans in terms of its societal ramifications. What separates these future robots from other sex technology in terms of the boundaries between self-gratification and cheating, involves the robot's capacity to think, talk and walk. Meaning that, for humans already in human-human relationships (or any other relationship for that matter) to become involved in an extra-marital rendezvous with a robot, the process could easily be considered as adulterous.

If the aims and intentions of creating robots which are fully autonomous and capable of thinking and feeling were to be actually realized, the chances of humans maintaining power in relationships with these super, flawless humanoids would be quite marginal. Today's reality of purchasing robots will be ancient history in the future, and the more realistic likelihood of robots owning or at least controlling humans will be a more obvious scenario. Bill Gates and Stephen Hawking have both addressed this through warnings on the danger of AI [34]. The development of full AI in Hawking's words "...could spell the end of the human race" [35]. However, in maintaining a more optimistic vision of the future in which robots are equal, or at least humans are kept for their novelty value, and indeed for the love and affection held by their robotic counterparts, we may observe the difficulties at least of humans preserving the sexual power in the bedroom. Freedom of choice and outright chemistry would most likely mean that robots' interests may not always be primarily engaged in their human partners (note: not owners), and may wander from human to human, and perhaps towards other robots (as Ashrafian [31] also suggests).

In fact, if continuing on from the sentiments of Daniel William Mackenzie Wright [36] in his "Hunting humans", a look at the possible future of dark tourism and entertainment, one may wonder as to whether or not human beings may potentially be the sex toys of robots. While the hunting humans article focuses on the satisfaction and joy humans have gained throughout the ages in terms of violence, killing and death, it may not be too farfetched to assume that a superior form, such as emotionally intelligent robots would derive pleasure from the suffering or at least dominance of beings such as humans.

3 Lying, cheating robots

In his blog article, "Evolving robots learn to lie to each other" Stuart Fox [37] reports a Swiss study in which robots learned to lie in order to hoard a beneficial resource for themselves. One thousand robots were included in the experiment. These were divided into ten groups. The robots were embedded with sensors, blue lights and 264-bit binary codes (genomes) determining their mode of behavior towards various stimuli [Fox, 2009]. Robots were set to illuminate their light when they discovered the beneficial resource, in order to aid other robots in their group to distinguish it. Higher points were achieved for sitting on the beneficial resource and minus points were accrued for being near the poisoned resource. Highest-scoring genomes were 'mated' (mutated) randomly to produce a different program, resulting in subsequent generations of robot programming. While generations of robots became increasingly clever at identifying the positive resource, they also began to notice that by signaling to others where the resource was, overcrowding was prominent and resulted in the original finders being 'bumped' way from the resource. Thus, by the 500th generation robots began concealing their findings through not illuminating their light when they found the beneficial resources.

In fact, interestingly already current studies have revealed that characteristics such as lying and cheating are experienced by humans as more human-like, or intentional,

than other traits [38, 39, 40]. The detection of cheating by humans, particularly when the behavior is against them, has evolved as a self-preservation mechanism [41, 42, 43], and in human-robot interaction has been shown to be detected more strongly through the actions of the robots as compared to e.g. verbal communication (often interpreted as syntactic errors) [38]. Thus, while it has been shown that through anthropomorphism humans are indeed not just willing but prone to endow objects and indeed machines with human qualities such as emotions [44], we also are weary of others, particularly those and phenomena that is likely to be deceptive. This is likely an explanatory factor in the Uncanny Valley theory [45], which may in turn serve as a perceived threat to robots in terms of their experience of inadequacy in the human-robot relationship. This meaning that one motivational factor in loving and maintaining a relationship with a human being is that of self-affirmation – of human worth.

If returning to Freud's discussion on the 'ego ideal' [13] it may be observed that in fact, the driving factor behind a robot's experience of love would be the search for the partner, or likeness, of the individual that the person (robot) would like to be. Thus, if endowed with human emotions, may very well seek to be with a human being to validate one's own humanness. Or, in an alternative scenario whereby robot evolutionary psychology replicates that of humans, robots may strive to find the perfect reproductive mate, rendering human beings as inadequate.

4 Conclusion

In the tradition of critical human-robot interaction, this article has aimed at highlighting the implications of developing and disseminating robots with the capacity to not only think, but feel for themselves. In a scenario whereby robots can indeed emotionally experience intimate interpersonal relationships, the dynamics changes from that of how the relationship makes the human feel, to how the relationship makes the robot feel. In which case, the human concerns would evolve around whether indeed robots can and would love human beings, and if becoming engaged in a relationship, what it would take to sustain the robot's interest in their human partner. Would body-hacking be enough to compete with the female robot counter-part? And of course, other issues come into play when considering robots with their own subjective experience.

These issues would include notions of gender and gender identification, particularly when gender has no utilitarian function. Then indeed, what is sex in a realm of either cosmetic or non-existent gender? Another important point to consider would be the potential for robot jealousy. If for some reason, robots are attracted to human imperfections and the pure organics of what makes people human, then would there not be the potential for robots to feel threatened towards the idea that their human partners will leave them for another human being? Thus, if advancements really did get to the stage that robots are indeed capable of not only love, affection and sexual attraction, but also jealousy, anger and betrayal [31, 32], would there not also be greater likelihood of associated problems such as violence, murder and divorce [15].

On a final note the discussion of this paper may be seen to lead to a larger problematization of the human-robot relationship – in an era of thinking and feeling robots, will humans and robots indeed be separate entities. If the maintenance of a sexual relationship between humans and robots would be categorized as one of self enhancement, inadequacy and trading up, can it not be seen that humans will in fact evolve into their robot partners, with the hope of being able to compete with other perfect beings? One may revert to Marvin L. Minsky’s [46] to see speculation of not simply separate entities possessing artificial intelligence, but in fact human beings who are bio-technologically adapted – robots or super people – to live unfathomably long and healthy lives. And as Minsky puts, which relates strongly to the functional role of reproduction as a drive for sexual desire: “Will robots inherit the earth? Yes, but they will be our children.”

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