



Unsocial Robots: How Western Culture Dooms Consumer Social Robots to a Society of One

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ABSTRACT

Markus and Kitayama suggests Western centric culture has a bias to the independent rather than the interdependence self. We argue that this has resulted in a bias for social robots to be assistants, companions, wing-men and one-to-one carers. Thus, the social in most commercial social robots is a simulated social interaction with a single user, an echo chamber of unnecessary interaction that inevitability creates systems that obstruct social interaction rather than encourage it. The resulting robot flunkies, yes-men and pretend friends have little long term utility. In contrast, we argue that rather it is as mediators, facilitators and working within human communities and groups that offers the real opportunity for social robots.

CCS CONCEPTS

• **Human-centered computing** → **Interactive systems and tools**; • **Computer systems organization** → **Robotics**.

KEYWORDS

Social Robots

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1 INTRODUCTION

If we consider the commercial landscape that social robots are part of, it's impossible ignore the importance of personal digital assistants (PDAs) such as Siri and smart speakers such as Alexa and Google Home. As academics and researchers, we may carry out endless fascinating research with social robot prototypes looking at their utility in studies with subject groups from the vulnerable

to the tech savvy but, in the end, it is the commercial realities of building, selling and monetizing social robots that will have the biggest impact on how social robots are adopted.

Global Social Robots Market

Market forecast to grow at a CAGR of 15.5%

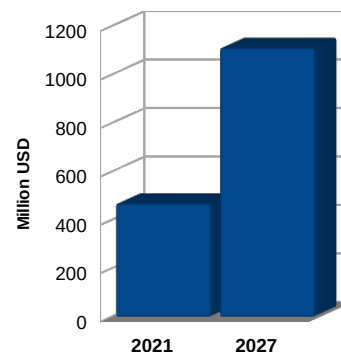


Figure 1: Commercial people like charts like this which obscure underlying assumptions. The full report from RESEARCH AND MARKETS would set you back over three grand and no one would buy that if it didn't tell them what they wanted to hear. CAGR stands for compound annual growth rate. It's strangely hard to find out how accurate previous forecasts have been (here is a clue – almost certainly not accurate at all) but bear in mind this is business not science, if you don't like the facts get some new ones. (<https://www.researchandmarkets.com/reports/4829899/social-robots-market-research-report-by>)

So far the commercial success of social robots has been mixed¹ (Ignore Figure 1). High profile companies like Jibo crashed and burned but other companies such as EmotTech who attempted to launch Ollie have quietly pivoted² away from an embodied social device. Some social robots are marketed as toys, such as Emot, but

¹A polite way to say almost non-existent

²This term is often a commercial term for giving up but desperately still trying to monetize anything left for the effort.

the commercial success here is also mixed with the example of Anki, that produced the wonderful Cosmo, going out of business in 2019.

The hope that PDAs and smart speakers might pave the way for a generation of successful social robots has not happened. In reality, smart speakers aren't making any money either. It seems Alexa's role as a sinister point of sale inserted into your family home has not worked out as expected. The parent division made a loss of \$3 billion USD in the first quarter of 2022 - Ouch! Insiders have been reported as saying "a combination of low morale, failed monetization attempts, and lack of engagement across users and developers made them feel as though the team was deadlocked over the last few years."³

Meanwhile, PDAs from companies like Microsoft and Sony have been discontinued. Back in 2011 when Apple added Siri to the iPhone it rocked the commercial world. Imagine, a guy takes an iPhone out of the box and asks it how high Everest is. There is no browser, Google's entire business model seemed under threat. The explosion of these system represented a war to get direct control of the user and their data and monetize it. It looks like their might have been less to fight over than they thought.

What has this got to do with Social Robots? The social element of PDAs and smart speakers are limited and when they have tried to implement elements of social interaction it has often gone rather badly. For example, Siri replying to verbal sexual abuse flirtatiously - oops. Yet, these systems are important for social robots because these devices are seen as the direct precursors to them. There is a tacit assumption that such robots will take the functionality of PDAs and smart speakers and extend it. Arguably, the release of Echo was the downfall of Jibo. How could they possibly have competed with the billions of dollars Amazon was willing to put behind Alexa?⁴

The promotional video for Jibo from 2015 - **JIBO: The World's First Social Robot for the Home** is a wonderful historical insight into the assumed functionality of social robots⁵. The video was created before Jibo existed. Some very creative people tried to think of what this thing was good for and create the magic of its existence.

So what was envisaged?

- Taking picture: This may have proven a bit of an issue as it can't move but it supports the fiction of Jibo being one of the family.
- Giving you notifications while you are hands-busy: We are used to PDAs and smart speakers handling this now.
- Child educational toy and carer: Moxie from Embodied is trying to focus on this use case with the added serious objective of supporting child mental health and wellbeing.
- Telepresence robot: This idea at least justified Jibo being able to move it's camera around.
- IoT control (light switches), ordering takeaways and email notifications: Again, now the core user space of PDAs and smart speakers.
- Wing-man: Perhaps one of the most amusing ideas in the video. Jibo as a friend who can help you have sex. Once

you've heard the words spoken by our young white professional middle-class bachelor "Better make that a take out for two, Jibo." its hard to forget them.

This vision of a social robot as a servant, companion and carer is prevalent across most social robots who are created to be more than toys (i.e. the manufacturers want to charge more than \$200 dollars for the device). For example Miko (at the toy end) is advertised as follows: "Need a joke when you're down? A dance when you're bored? Miko's on it. Because it's not just the smartest little robot you'll ever meet. It's also your friend."⁶. Buddy from BlueFrog (at the \$1k-\$2k end⁷) is described as being "On your side" and offers the roles of "a Nanny for kids, a wing-man for teens⁸, a companion for later life, a friend for differently-abled children, an assistant for grown ups"⁹. Certainly, social robots aiming at the consumer market have emphasized that they are for **you**, they are something **you** own and that supports and serves **you**.

In this paper we will argue that the requirement for consumer social robots to be there for **you** has developed from the a Western centric view of the independent self and has been reinforced by a strategy to monetize the special connection a social robot might potentially create with their owner. We then go on to argue that this individual approach to social robots undermines the social aspect of these systems. Finally, we discuss how orientating social robots with the more interdependent self we see in some Asian, indigenous and first nations cultures might offer a way forward for these types of social robots. We conclude by discussing Haru, a research social robot from Honda Research Institute [5] which attempts to challenge the view of social robots as being there for the individual rather than the community.

2 INDEPENDENT AND INTERDEPENDENT SELVES

According to Markus and Kitayama's [12] framework, the independent notion of self, widespread in the US, encourages a focus on individual characteristics, "one's own internal repertoire of thoughts, feelings, and actions," as definitive of the self. The interdependent notion of self, prevalent in Asian societies, emphasizes the individual's relational identity and the contingency of one's behavior on "the thoughts, feelings, and actions of others in the relationship" (p. 227). Besides describing an ideal-typical individual, the two frameworks also suggest different ways of acting within the environment — interdependence focuses on fitting in with and adapting to others, while independence calls for expressing the separateness of the self and its ability to change the environment to suit its needs and capabilities. Kitayama and Imada [11] suggest that American cultural practices include more tasks that encourage independence, such as "being a leader" or "taking initiative," while Japanese practices include more tasks that encourage interdependence, such as "achieving social harmony" or "fitting in" (p.176-178).

These two different models of social interaction can be, and arguably have been, applied to robot design. Designers make explicit and implicit use of *cultural models* of behavior and experience to

³<https://finance.yahoo.com/news/amazons-alexa-unit-faces-layoffs-113600639.html>

⁴Irony now with the news of Amazon's Alexa woes.

⁵<https://www.youtube.com/watch?v=H0h20jRA5M0>

⁶<https://miko.ai/gb>

⁷if it ever becomes available

⁸I'm not sure if the copy writers really thought through the meaning of this, at least I hope not

⁹<http://www.bluefrogrobotics.com/robot/>

create interactive artifacts; in this sense cultural models are akin to *design patterns* applied to human-robot interaction [10]. At the same time, people's ability to use technology is contingent on their tacit familiarity with the cultural models that they reflect.

Designing for the interdependent notion of self not only has an emphasis on devices which are personalized to the user and focused on a single users needs but also devices that present a strong sense of self, in terms of back-story and an outspoken style of engagement. This is very much the design pattern we see for most consumer social robots and has become an accepted norm.

In itself this might not be such a dominant approach, but it has also aligned with a business model which seeks to extract value from the relationship a device has with its user. This alliance between a cultural norm and a means of making money from that norm is very powerful and it is important to understand the commercial side of this typical consumer social robot design process.

3 MONETIZING THE INDEPENDENT NOTION OF THE SELF

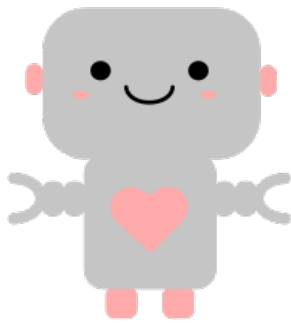


Figure 2: Hi, I'm a slightly creepy piece of technology. Will you be my friend?

Mvolz (https://commons.wikimedia.org/wiki/File:Kawaii_robot_with_heart_clipart.svg), "Kawaii robot with heart clipart", <https://creativecommons.org/publicdomain/zero/1.0/> legalcode

To build a successful commercial social robot it is imperative that you are able to monetize its behavior. There is a constant requirement to keep up front costs of devices as low as possible while offering as sophisticated a system as possible. Furthermore, it is recurring revenue that commercial professionals see as core success of any business plan.

Modern capitalism is trying to move away from a manufacturing model where you make a good quality product and sell it at a price that pays for its production plus additional profit. What is the good of that? After you sell one you just have to sell another and another. Ideally you would prefer your product to attach itself leech like to your user and suck money out of them in a gradual and almost unnoticeable process.

Thus the business models of most social robot companies become indelibly tied to an independent notion of self.

- (1) Sell the product below cost price to boost the number of users.
- (2) Tie the product to one person to increase the numbers of products you can sell.
- (3) Build a rapport and dependency with the user so they cannot discard your product.
- (4) Monetize the user by selling their data, selling add-ons, offering subscriptions to *must-have* additional services.

Sure, it might be useful to *market* a device as a shared item. For example, the idea that Alexa is for the family, that it will bring people together, that it is for multiple family users. However, the long term goal is to have an Alexa in everyone's room because it is the direct channel to the user which is valuable. The mobile phone, the personal automobile, the fitness tracker, the iPad, the smart speaker¹⁰[8] all exemplify this model.

For social robots this model has proven doomed. It hasn't even worked for Amazon Alexa and they had an ocean of cash to get it into as many households as possible. Naively, you may think this is because social robots are complex moving devices which cost a lot to make and that makes it hard to keep the up front cost down. You may also think this has not worked because people were not smart enough to work out how to get the recurring revenue. We believe the reason is rather that the value of a social robot becomes negligible if it only has one user at a time. The problem is inherent in the type of product it is trying to be.

4 A SOCIETY OF ONE

The central problem for the design of social robots for an independent notion of self is that, as Clark and Fischer argue, social robots are not actually social agents, they are depictions of social agents: "*With social robots, people use the depiction proper to engage in the pretense that they are interacting with the agents depicted. People distinguish these agents from the authorities responsible for them.*" [4].

Thus, if it is just you and the social robot, it is, in reality, just you. Contrast this to dealing one-to-one with a real social agent, a person. In a supermarket for example, you may chat to the cashier, they are a person, they have social agency. As soon as you replace the cashier with an automatic till the chat is no longer required. People may or may not miss that, but they will not regard a *fake* chat with an automatic till as a replacement.

Both the desire to monetize the individual, and to support an independent notion of self, drives us to create this illusion of social connection between the robot and user. This has significant ethical issues as such socialization aims to encourage reciprocity between users and social robots where no actual moral reciprocity exists [20]. But also, in nearly all simple task based contexts it is doomed to failure because we know the robot is only a depiction of a social agent and thus social interaction is pointless.

Its important here to distinguish social interaction with a robot in the context of getting email notification or buying a pint of milk in a supermarket to interaction in a performance context or where social interaction between multiple users is a desired goal.

¹⁰We can almost guarantee that smart speaker manufacturers are working very hard to recognize users so they can build individual profiles and create a one-to-one user experience if the device is in a shared space.

As Aylett et al. [1] point out there is a difference between mimicry as deception, and performance which is about supporting an agreed pretense to explore ideas, emotions and stories. Many applications of social robots which do need to create the illusion of character and emotions are in fact performances. For example, reading stories to children, talking about wellbeing, staff training. Social interaction can occur one-to-one because the whole purpose is to use the depiction of a social agent to delight, amuse and educate. But this is not the same as the objective of building a long term social relationship with a user to extract money out of them. People will pay for theater and toys but not fake friends as many commercial social robots have discovered to their cost.

In contrast, if we take a more interdependent view of the self and design for supporting social groups we may see some concrete benefit from the use of social robots.

5 MEDIATION AND FACILITATION

Human communication always exists in situations where people not only need to negotiate misunderstandings and ambiguity, but also where they need to be able to express their differences, in the hope that these differences will be acknowledged and accepted even when others cannot fully comprehend them.

It is therefore vital to note that it is possible to communicate information in useful ways, without requiring the other to assimilate one's own ideas, beliefs, attitudes and sociocultural understandings.

A strong defense of the value of difference, and the care which needs to be taken to acknowledge and respect the other's alterity, is found in phenomenological ideas about communication. From a phenomenological perspective, difference is not a problem for communication to overcome; but rather, communication is about being open to otherness, such that people can learn from others and respect their perspectives, lives and cultural understandings [17].

The idea that communication is not only concerned with attempts to attain the perfect exchange of information and meaning, persuade others to take on one's understanding or share one's particular world view [14, 15, 17] raises the potential of robots as mediators.

There is little agreement over whether social robots have more potential for harm or good. In care contexts, for example, alongside many other concerns, scholars worry that the use of social robots might reduce patient access to human conversation [13, 18, 19]. Similar concerns might be raised about the positioning of robots as educators, where the presence of robots might be seen as a means to reduce children's access to human teachers.

However, there is potential for positive effects when robots are clearly defined not as replacements, but rather as co-workers and co-communicators. For example, research has shown that patient interactions with robots such as PARO the robotic seal increase those people's social engagement by assisting "*as an ice-breaker between staff and residents, a social mediator or an impetus toward social interactions between residents*" [7].

More broadly than in care contexts, in Joshi and Šabanović [9] PARO (as well as Cosmo and Nao) were explicitly used for mediation in communities; the focus was on observing interactions with various robots and identifying interactive features that support

interaction between children and older adults (OAs). PARO worked well here, due to the way its design brings people in close physical proximity and also leaves open space for exploration of what it is doing and interpretation open to users. They also find that Nao, when it makes mistakes and leaves open some space for comment, can inspire OAs and children to interact.

Birmingham et al. [2] note that "*shaping and improving one-on-one interactions and group interaction dynamics are specific goals of socially assistive robotics (SAR)*", arguing that "*social robots present an opportunity to engage people in situated pro-social ways*" ([2], p. 8019). From this perspective robots can support human-human relations in productive ways across a range of social contexts. Indeed, there is "*a growing interest in the effect of social robots, not only on the human-robot interaction, but also on the human-human interaction in the presence of a robot ... framed by some as human-human-robot interaction (HHRI)*" (Rifinski et al., [16], p. 333). However, as Rifinski et al. note, the majority of studies that evaluate "*robots for social interaction*" continue to "*focus on the direct interaction between the human and the robot, typically the interaction between one human and one robot*" ([16], p.333).

Developing the idea of SAR and HHRI, we can frame the robot as an *embodied mediator* as opposed to a social robot. This doesn't mean that the research overlooks the importance of a social robot's interactions with people in one-to-one communication scenarios (i.e. HRI), but it does mean that the overall focus is on exploring how people see this type of robots as having the potential to mediate communication between diverse people, across communities and societies more broadly (as HHRI for SAR).

If we can tear ourselves away from the dominance of designing social robots to support the notion of the independent self, and the failed monetization strategy that has reinforced it, we may be able to explore the use of social robots where their depiction of social agents can be extremely valuable.

6 ROBOTS AS A MEDIATORS: DESIGNING FOR THE NOTION OF AN INTERDEPENDENT SELF

Even quite simple devices can work to mediate human communication. The robot used by Rifinski et al. [16] was "*a small non-humanoid robotic object reminiscent of a desk lamp*", designed and used in a previous study by Hoffman et al [6]. The robot had two degrees of freedom allowing it to turn and lean towards people, this being its only means of expression, but entirely in keeping with its form.

Participants took part in conversations set up as a debate on a specific topic in the presence of the robot, which could operate as unresponsive, responsive to the speaker or addressee. After taking part in the experiment, people were asked to suggest uses for the robot. Participants thought the robot was "*equally sensitive to all sides*", thus helping people feel "*comfortable talking and opening up in an honest manner*" being "*like a tolerant friend*" ([16], p. 351). They therefore saw the robot as a useful mediator, helping people meet "*a fair compromise from both sides*", with potential to make people "*more sensitive and sympathetic towards each other*" ([16], p. 351).

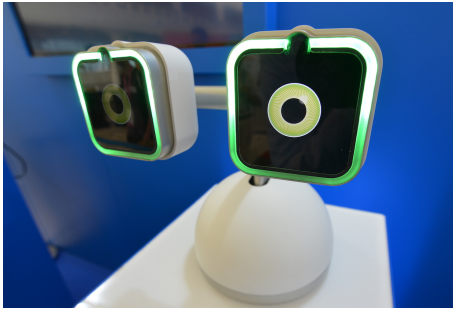


Figure 3: Haru the social robot from Honda Research Institute. Photo by Evan Ackerman IEEE Spectrum.

Haru [5] is a far more expressive and communicative robot than that used by Rifinski et al [16] (See Figure 3). The aim was to develop an empathetic Robot Haru Informed by UNICEF policy guidance for children¹¹. There was an emphasis on projects that used Haru with multiple child users as a mediator and facilitator. In order to understand more concretely what design for the interdependent notion of self might be like we describe two example projects.



Figure 4: Set-up for Haru as a classroom mediator between a class in Japan and Australia.

6.1 Embodied Mediator for Cross Cultural Understanding

In this project the Haru system is used to support children’s emotional and social skill development by connecting them to their peers in different parts of the world. The social robot facilitates children’s interactions to encourage self-expression through discussion and sharing in a series of engaging individual activities and group learning modules co-designed by the children themselves (see Figure 4). By working with researchers and child experts, these inclusive and accessible activities are designed to familiarize children with the value of diversity, and to foster multicultural understanding and belonging throughout the educational span, at the same time building children’s inter/intra personal skills and creativity (See <https://mypersonalrobots.org/pilot> for more details).

¹¹<https://www.unicef.org/globalinsight/media/2206/file>

6.2 Impact of Robot’s Interactivity on Children’s Problem-solving Skills

Human collaboration is more likely to lead to cognitive growth when all group-members are actively involved in the collaborative process. However, there are cases that intra group relationships need support. In this project [3], Haru interacted with a pair of children in a problem-solving setting, aiming to understand how the robot behavior impacts the group-members’ social dynamics. The impact of the robot’s cognitive reliability and social positioning on human-to-human social dynamics, task performance and help-seeking behavior was tested. Results indicate that the robot supported interdependence between pairs of children, shaping their “collective problem-solving process and a team’s social dynamics” [3]. Children who interacted with the reliable robot had a better task performance, but children who interacted with the unreliable robot exhibited more task related social interactions. This suggests that robots do not need to be perfect assistants to be valuable, but rather by being imperfect can act as mediators for effective human-human communication.

7 CONCLUSION

Haru is an experimental robotic platform. This has offered freedom to design use cases without the constraints of monetization. That does not mean such use cases could not be monetized. There are many examples of monetizing technology outside of the one-mobile-phone-per-user model. Areas such as education, social support, changing company culture all have potentials as markets for social robots. So the next time you present your social robot to the commercial people and they start suggesting it should be someone’s friend and companion, you don’t need to raise the ethical issues of taking that approach. Just point out it has failed to make money and instead tell them to think bigger and to think more creatively. Social interaction is the sea humans swim in, building devices that can negotiate that ocean are valuable and worthwhile.

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