Why Not Ethnography

Epistemological Conundrum and Shift, and the Ethnography of Experiments with Robots.

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ABSTRACT

The paper explains the underrepresentation of qualitative methodologies in general in Human-Robot Interaction research, and almost absence of ethnography as the topic of interest. We link these legacies of experiments as dominant methodologies to epistemological foundations of research, and illustrate this with participant observation from Robotics conferences. The research tradition has consequences for robot implementation on a wider scale, and moreover for policy making regarding robots.

KEYWORDS

Epistemology, Multiple Worlds, Socio-Technical Studies of Science, Roboticists, Qualitative Methodolodies.

1 Introduction

This work is an essay responding to the call for papers, presenting theoretical reflection on the topic of epistemology, and some initial analysis of methodology in human-robot interaction research. I admit that many generalizations in my argument should be supported with better literature review than in this version of the paper. As a fieldwork I include a summary of my observations made in 2020-2021 while watching 11 online conferences in System Sciences, Robotics and Interaction Design during the pandemic, with open or payed access for virtual participation, including International Conference on Social Robotics 2020, TEI, Softrobotics.eu, European Conference on Cognitive Ergonomics 2021, Human-Robot Interaction 2021, IEEE Ro-Man 2021, WeRobot 2021, HICSS 2021 and 2022 with AI-related, Future of Work and Automation tracks.. As this was not planned, and especially not planned as a research of science practices, I did not start with any particular observation protocol, and only later on, analyzing the patterns observed, I guessed that this could be a virtual ethnography, which I tell here in the part which I am certain about and in a poeticised way. I share my fuzzy hypothesis, my critical uptake and the most important my epistemological reflections over the participant observation,

largely inspired by the fascinating classic work of Karin Knorr-Cetina on Epistemic Cultures. She distinguishes the assigned subjectivity of physics laboratory equipment and object, thing-agency attributed to biological laboratory mice, through communication of scientists. In this case I would see the method itself as an object, and disciplinary boundaries around it as the subject to problematization. The research method through it's epistemic base defines the nature of results, not only for the knowledge production, but for the use of that knowledge, like product building, real life implementation of the technologies, including social robots.

In brief, there is a fundamental contradiction between an established tradition of laboratory experiments and the evidence of qualitative inquiry preceding market success, in robotics as in no other discipline. This contradiction is nevertheless not new: in Information Systems discipline about 2000-2005 we had the same situation (Ciborra, 2004 on phenomenology, M.Mayers multiple calls for interpretivism of that time) with the industrial level of domination of rationalist, post-positivist goal oriented methods with the requirement of quantitative proof for the legitimate research. When qualitative methodologies finally got adopted, the products such as ERP, CRM systems, or ubiquitous or mobile computing finally received wide adoption opportunities, after years of lab experiments and quantitative tests producing scientific knowledge, but not market scaling. In robotics the bright example of this scenario already came to life, indeed as an epistemic script enacted. I mean the story of robot Roomba, which was tested in the lab for 20 years and then received market acceptance after the longitude qualitative studies.

2 Epistemology

Epistemology, reflection on how we know that we know, makes an exciting intellectual adventure, unless we follow strictly the common procedure, acceptable for our intellectual epoch or our institutionalized style of knowledge production. The latest is the exact case of the engineering cultures. We can see the natural sciences and STEM using

basic scientific method, rationalist, and completely lacking the postnonclassic methodological curves which are common in social sciences. It means the only one way of knowing generally dominates. Then our next step in academic freedom enactment should be decolonizing epistemology in robotics? One more factor, Western scientific cultures claim realism but they are explicitly biased against diversity, inherently male, "only half human" (Noble, 2013) and growing from the clerical tradition with witch-hunt historically simultaneous with the establishment of "empiricism" and inherent catholic rejection and negation on reason to intertwine with femininity (women are still banned from priest role in that culture in our time!! and questionably allowed to science, student photos from the 1970s are men only!!!). I do not look into conspiracies on philosophy of science, where more holistic, not rationalist branches of thought got cut by murders (Georg Cantor, Moriz Schlick, Kurt Gödel and others), I only invite the reader to see rationalism in XIX-XX centuries as *enforced epistemology*, obviously and at least by institutional pressure of selection committees and peer reviews. In particular, for interaction with communication devices the technology use paradigm was dominant for ages, representing the device as an object ontologically, but more important as an object of perception and thought. With generative AI, this is not feasible, the artifacts obtain agentic properties in social processes, therefore wider sociological methods get embraced more and more, including (not always consistently) the epistemologies foundational for them. As an example for non-classic, relational epistemology I would bring in ANT, Latour writes: "Most of the difficulties we have in understanding science and technology proceeds from our belief that space and time exist independently as an unshakable frame of reference inside which events and place would occur. This belief makes it impossible to understand how different spaces and different times may be produced inside the networks built to mobilize, cumulate, and recombine the world." (Science in action) This is clearly an anti-objectivist, and relational description of reality - through social actors producing not only meanings, but producing phenomena of the world via social interaction.

The biggest problem with rationalist, empiricist methodologies: the singularity of truth produced and no space for multiple worlds of unique at each moment human perception. Qualitative research shows the truth of how people feel which is often different from the products of laboratory experiments designed with a mechanistic mind. This asymmetry of reality and realities grasp is more huge than just the reproducibility crisis and deeper than the triangulation problem. It is indeed an epistemological conundrum, the inertia to search the singular truth in today's world, when both theory and computational power can accommodate multiple realities.

Moreover, if we work with the enactment of realities, not just depicting them, we explore different ways of computation and programming, and materiality and presence of the robot constitute a very little part of their agentic participation, albeit with social practice or routine redesign allowing wide-scale implementation. We should design the routines involving robots, not robots themselves, to program the sociality altered or augmented. When enacted, is there any natural evolution of routines and users? Should we explore the realities considering co-creation mechanisms? Should users be involved in programming the behavior? Where in fact is located the optimal designer for robot performance - inside, outside, inbetween?

3 Questions on Robots in Laboratory and Life, and on a research tradition

The reflections from observing roboticists in 11 online conferences are presented in this chapter. Robot sociality is being researched with methodologies not allowing to scale the results, which are also employed in policy making. Human-Robot Interaction research stream is mostly employing behaviorist psychology, but also almost exclusively cognitive science apparatus for evaluation of human judgment and ideas, which is not epistemologically compatible with organizational design! Following the conference call, the real world where we invite robots, is it indeed an experiment supported objectivist world, imaginary world of STEM educated scientists with rational and strictly inductive or deductive reasoning and strong causality.

We can trace a number of research communities around the topic of robots, which have mysterious (or, according to Sismondo, hidden in context[1]) epistemological foundations, "Tacit knowledge can be embodied or embedded into material or intellectual contexts" (Sismondo), and we see Human-Robot Interaction Research[2] community very separate (institutionally, but also purely by separate events to gather!) from Human-Computer Interaction[3] research community, and from AI research as well. Aside, there are separate works on Man-Machine Interaction and the world

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[1] Sismondo cites Polanyi, with the idea that only some knowledge "could be turned into information that could be written down and distributed, but some information could be communicated only through socialization process" Very right for robots, the research can seem so poor because big part of knowledge embedded in the research community shape, origins, connections and ways to separate from others.

[2] International Journal of Social Robotics, HRI Conference
[3] Human-Computer Interaction Journal, CHI Conference

of more or less technology oriented Interaction Design studies. We have different levels of visibility in research, for robotic bodies and disembodiment but still immaterial bodies. How they exist, get reproduced or present/absent in societies. Seeing robots as infrastructure raises a number of questions. Should we consider physical robots as different from non-physical, for example the environments filled with sensors? How do the studies with Robots get structured, initiated, organized? Most of them ignore or mute the epistemology aspect, because they are supposed to be behaviorist. Which is completely not feasible for large-scale implementation, robot rumba was tested with qualitative research in households (Sung, Grinter and Christensen, 2010) and then successful…

3.1 **Laboratory trap produces wrong assumptions on robot implementation**

The field of interaction research is highly quantified, trapped in objectivist discourse. The paradigm of choice becomes Psychology, in quantitative versions, or Human Factors in computer systems. Measuring "if people attribute social qualities" (Crowell et al., 2019) might make sense, also measurement is always very local and the fragments do not assemble into one picture or idea, theory of robotic presence. Moreover, different situations can be imagined involving artificial subject, but the case of typical laboratory robot comes as special, because based on laboratory experiments and elaborating on conceptualization of robots and agents as cognitive partners, the knowledge is created on interaction, and it becomes misleading for policies because it misses the value component (Abebe et al., 2022) Most of this research in last 20-25 years is laboratory experiments with 30-40 participants, without correction or consideration of their cultural background or with asking about previous experience with robots at best.

Robots seem more material, but often the robot's body is present only virtually and still impacts structuring the social order, although in laboratories virtualisation happens about interaction itself. I draw this conclusion intuitively, based on a few hundreds of abstracts from 2000-2020, mostly 2007-2017, read chaotically. Although after properly organized and structured literature review the results can be different, my intuition might have value. I see most of the research as completely trapped, by roboticists' team members' education with no training in epistemologies, by naturalistic « scientific » objectivist thinking, experiment design, and, the most dramatic in consequences, the methodology. Sismondo writes: "Because they are supposed to be repeatable, experiments look as though they provide something like solid foundations for scientific

knowledge." Not what we take for real, but mainly which operations we perform in order to obtain credible knowledge, fails all the game in case of interactive robots. The field of interaction research is highly quantified, trapped in objectivist discourse. Sismondo: "as Ian Hacking (1983) argues, laboratory work is not merely about representation, but about intervention: researchers are actively engaged in manipulating their materials" What acts as a material in case of interaction study? We say, symbolic content but for the engineer, "Epistemologists, like generals, are always one war too late"(Latour, Science in Action), methodology should be objectivist, semiotics is scholastics and the tangible interaction is here-and-now experience.

Why does a naive engineer choose psychology not symbolic interaction (at least,) as a method of study? It promises reproducibility, if anyone ever does.. we celebrate new experiments, being too busy to reproduce, besides some (decorative..?) venues for reproduction studies. After this methodological violation of truth, interaction becomes a consequence of more or less reciprocate steps. In a fragmented approach, the co-presence of beings never gets fully described.. Robots are not precisely "things" but more (quasi- or micro-) organisations affecting the order of things. Recently roboticists started looking at organisational perspective, and there was a paper on importance of the concept for modelling of AI implementation (Hermann & Pfeiffer, 2023). Robot is issued by some organisation, certified probably by another, and supposed to function in the world of intertwining institutional and organisational realities. Behaviorist observes reality without consideration of culture or social structure, not at all employing the value of socio-technical thinking and skipping the organizational reality (Herrmann & Pfeiffer, 2023) - for both embodied robots and impact of algorithms. "They widely neglect the fact that both the use of technology and the decisions generated in this interplay of humans and technology are embedded in human organizations. Organizations—be they commercial enterprises or public institutions—are subject to their own logic, integrated into complex external environments" (Saltelli, 2023) "I was not asking some seemingly trivial questions: why does this model exist? Who asked for it? Who developed it? With what funding? With what aims and expectations? What voices were heard at the time of its construction? What are the fundamental assumptions about the nature of the problem addressed, and the vision of what constitutes progress? At any rate, is the model a solution to a real or to a supposed problem?"

"Scientists and engineers configure users and contexts of use as integrated parts of the process of technological development" (Oudshoorn & Pinch, 2003), but, how the engineers get configured, in their embodied knowledge?

3.2 **The body of the engineer.**

Visual ethnography of a robotics lab shows almost all robotics engineers are men. The trained eye cannot skip it so ethnographers are generally not invited to the robotics party. Cognitive science is accepted in the strict classic version for the same reason, because if we start talking about embodied cognition, we cannot skip the fact that the body organizing the cognition is generally a male body. It's a male body. If female, the body and the intellect it carries has (or had, before the newest tendencies?[4]) via research programs, communication context in labs, and by all means, to conform to mental patriarchy of discrete mathematics and singularity of objects in question[5], and to a fragmented attention pattern, in a rush to achieve the results. Milan Kundera writes in "Slowness", that while on high velocity, "his time cut off from both the past and the future; he is wrenched from the continuity of time, he is outside time; in other words, he is in the state of ecstasy;.. Speed is the form of ecstasy that technical revolution has bestowed on men… all changes when man delegates the faculty of speed to a machine: from then on, his own body is outside the process, and he gives over to speed that is noncorporeal, nonmaterial, pure speed, speed itself, ecstasy speed." Ecstatic engineer expects robots to perform, and celebrates the cup properly grabbed by robotic hand. What happens, nevertheless, for social interaction?

3.3 **Cognitive science cancels theorizing of wider scope societal effects**

The lure of rationality and the illusion of objectivity poison and undermine social science for robots despite all arguments for qualitative methodologies capturing cultural components, context and meanings people arrange to events. Objectivist epistemology gets driven, if we psychoanalyze it, with the fear and avoiding of the subject, radical objectification of the research subjects, while ethnography is based on radical subjectivity, the understanding itself, the structure of the meaning as experienced by the subject. In "How Users Matter" (Oudshoorn & Pinch, 2003) we read: "Material objects acquire gendered meaning". There is a block of research on gendering the appearance of the robot, should she look female, male, which race, or maybe animal? All options

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[4] all authors on quantum computing implementation are women, see Gordon, 2023
[5] making this statement, I lack proper understanding of signal processing techniques, can be wrong for some cases?

never considered, we deal with so called A/B tests, left ot right, pink or blue. And the results are considered serious science because experiment design have passed the committee, and the theory of pink-blue was considered sufficient, and systemic analysis of the sociotechnical system was not required! And epistemology is not clarified for a scientific method applied for experimentation, beyond "inclination toward a candid positivism" (Saltelli, 2023). I illustrate the outcome with an example from my observations. "How can we teach robots about norms?" - asks one super-senior robotics professor from another, both men, looking so wise in their late 50s, in a covid-time telepresent format of an international conference that I am abnormally lucky to watch. And they talk about proxemics, because that is how engineers see the case of sociality: a problem of (comfortable) social distance, physical distance, different across cultures but stable for different types of counterpart; the distance is measurable, formed from a mixture of subtle signals (causality is familiar logic!) from a human, and it seems a good task to work on, to teach a robot to approach physically… Norms are interpreted as stable repeatable rules that can be encoded, reproducing the rigid world of thinking with mathematical objects, which stay the same along time. Due to a double meaning of the word robot, both physical and algorithmic configuration, the policies get largely informed by this research. Moreover, even for pure AI studies, it can produce fundamental mistakes when policies get guided by behaviorist research. We do not cover all terminological confusion, and look at just a (core, in my opinion) part of methodological clash and trouble that robotics research gets stuck in. The problem with regulation of algorithmic presence seems to grow from the obsession of the research community with experimental methods and the eagerness of thought leaders for binary choices, and domination of objectivist or quasi objectivist simplified methodologies, and silenced, or not yet invited, system analysis of socio-technical context of implementation.

4. **Policy consequences of objectivist, rationalist methodologies.**

"Technologies do not evolve in vacuum. Rather they participate in a social world, being shaped by it (and simultaneously shaping it)" (Law, 2002). Robots at large are still confined in laboratories, are they ever allowed to a bigger world.. and what is our normalized approach to prediction of consequences. We can speak about a double reality, hypothetical implementation, and factual, which can be described as layered: superficial formal layer in reports, structural layer, more deep layer connecting epistemologies

and intentions or even private psychologies of researchers, and the futuristic policy layer. In the case of Robots, embodied or not, there are multiple complications across countries and globally, in study of policies, or political employment of the topic, military agenda with double-purpose objects discussed, and all types of adventure that people create in defining the future. Here we focus on how policies are shaped by research traditions and dictated by realities produced by scientific discourse. Epistemology decolonized (or not) influences strategic choices we as a society are to make for future regulation and design. Generally social science is not explanatory, it creates or lets say helps to program the realities, informing design and supporting the elaboration of bureaucratic control mechanisms - policies. That was the design of the initial program of social science starting with Durkheim and Weber, unlike psychology which following Dewey aims on producing the understanding. Ironically, the understanding of situations involving people does not predict their behavior, it should be done considering the meanings they arrange themselves to the situations, not only situational mechanisms - the biggest difference between social and natural science. Interpretive methodologies and qualitative inquiry have proved efficiency with Management Information Systems implementations like CRM and ERP. Robotic systems, especially embodied, also become present in the social reality, altering the routines people are involved in, and therefore worth a qualitative inquiry and design intervention. There is a big question about how and in which terms we can or should understand robots, too many coordinates not defined. People talk to robots, do robots ever address people? Should robots be pets? Can we pray with robots? For making policies, the scientific discourse is now influenced by true-scientific deterministic laboratory life. At its worst part, the binary thinking builds the foundation of popularity of AI Ethics research. Why is it any kind of interesting what is good or bad, ask I, meaning the systemic representation of reality would be clearly more scientific, and the reference to the cultural profile of the opinion maker and the mechanisms of opinion making would make the discourse legitimate a little more than the present toddler style discourse of good and bad. Because that is the boundary of our discipline, answers the Ethicist.

The technology advancements with growing impact of computer-enabled decisions on everyday life require holistic approach for capturing, describing and modelling the social process inclusive for autonomous embodied artificial entities and for algorithms with agentic impact. Extending systems theory with inclusion of a cultural component of sociotechnical systems can provide a meaningful alternative to the ethics paradigm (Tafani, 2022), considering the possibilities without binary evaluation of good and bad or

rationalist colonization of thinking. This approach should prepare the practice for wider introduction of quantum computing as well.

In my opinion the public discourse on robots (and AI before 2023!) was unbelievably enormously poor. Some rare youtube channels give talks on possible dystopias with robots taking over, movies are released, but, is there any citizen concern and (political, social?) movements or activism? Which could influence policies as well, they stay esoterically science-informed. An attempt to launch something like that, or an irony on their absence, with the slogan "Robot Rights NOW" which drowned completely in the polyphony of Robot Ethics research voices, that intentionally or not lead to a confusion in regulatory effort.

Standards ISO exist already or get developed for collaborative, mobile, service robots, the organization declares the status of documents as recommendations. Legislation should serve, in fact, as the most basic infrastructure supporting large-scale Robot implementation projects. Legislation stands at exactly the right methodological place, arranging rights and statuses for storytellers and describing the relationship as they should be, normative and directive way, which could be also seen as design practice. At the end of the day bureaucracy should be seen as technology as well, the previous generation of algorithmic management with linear control model and sparse ontologies for the domains, but highly efficient and resilient, which should serve the next generation of technology coming to life.

5 Conclusion

Too many questions are open, for research communities and policy makers. How to define the degree at which the robot can be persuasive? How should it address the user? Is there still the user, as proper conceptualisation, or the reality gets co-created? Should the organizational or institutional layers of reality be explicitly considered in interaction design? Should we decolonize robot-contacting subjects for our theories? And if we should decolonize the subjects, would it be the epistemic liberation from the behaviorist frames and boxes, or, going beyond epistemology, meeting the subject in her own time-space, as the data from the subject becomes available as never before, even while regulated. Oriented to the future and creating the future for other people, both design and regulation require some common ground for truth, at the same time respecting the right of people to their own ideas and worlds, not imposing any epistemological violence, or somebody´s reality as mandatory for other people by

mechanisms of oppression which we know so well from patriarchy world and which is proved not the only way possible by societies of gender equality. In sociotechnical studies, postcolonialist bias was acknowledged (Irani et al., 2010) The respect to the own meaningful worlds of the people and multiplicity of realities is absolutely manageable with technology in society. It is possible with "practical and broadly applicable social-systems analysis through all the possible effects of AI systems on all parties", which "draw on philosophy, law, sociology, anthropology and science-and-technology studies, among other disciplines. It must also turn to studies of how social, political and cultural *values* affect and are affected by technological change and scientific research" (Crawford&Calo, 2016) The concepts of values and worlds should encompass the future designs. Additionally, interaction research at best becomes easily compatible with economic theory, which considers "states of the world", not behaviorist "situations" from the legacy research tradition in rationalist robotics.

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