THE ETHICS OF SOCIALLY ASSISTIVE ROBOTS IN AGED-CARE SETTINGS: A SOCIO-HISTORICAL CONTEXTUALISATION.

ACCEPTED REVISED VERSION

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ABSTRACT

Different embodiments of technology permeate all layers of public and private domains in society. In the public domain of aged care, attention is increasingly focused on the use of Socially Assistive Robots (SARs) supporting caregivers and older adults to guarantee that older adults receive care. The introduction of SARs in aged-care contexts is joint by intensive empirical and philosophical research. Although these efforts merit praise, current empirical and philosophical research are still too far separated. Strengthening the connection between these two fields is crucial to have a full understanding of the ethical impact of these technological artefacts. To bridge this gap, we propose a philosophical-ethical framework for SAR use, one that is grounded in the dialogue between empirical-ethical knowledge about and philosophical-ethical reflection on SAR use. We highlight the importance of considering the intuitions of older adults and their caregivers in this framework. Grounding philosophical-ethical reflection in these intuitions opens the ethics of SAR use in aged care to its own socio-historical contextualisation. Referring to the work of Margaret Urban Walker, Joan Tronto, and Andrew Feenberg, it is argued that this socio-historical contextualisation of the ethics of SAR use already has strong philosophical underpinnings. Moreover, this contextualisation enables us to formulate a rudimentary decision-making process about SAR use in aged care which rests on three pillars: (1) stakeholders' intuitions about SAR use as sources of knowledge; (2) interpretative dialogues as democratic spaces to discuss the ethics of SAR use; (3) the concretisation of ethics in SAR use.

INTRODUCTION AND BACKGROUND

With the advent of the so-called fourth industrial revolution, technology enters the public domain of society and citizens' personal lives, with technological machines performing tasks that recently would have required skilled human judgement and practice. The introduction of robots in the public domain of aged care is a telling example of this techno-societal tendency.[1] As stated by den Hond, Mols and Vermeer, robots are seen as contributing "[…] to the solutions to some of the great societal challenges we face; energy, sustainability, mobility, security and the ageing population."[2] Indeed, robots are increasingly perceived as applicable instruments in aged care to mitigate the disparity between a decreasing number of professional and non-professional caregivers and the growing number of older adults.[3]

One specific type of robot gaining much attention in recent years is the Socially Assistive Robot (SAR), which was first described by Feil-Seifer and Matarić as being a robot at the intersection of assistive robots and social interactive robots. While the former type (e.g.,, wheelchair robots, manipulator arms) focusses purely on assistive functions, the latter type focusses on interaction with the user for interaction's sake. Simply put, Feil-Seifer and Matarić characterise SARs as robots that provide assistance to users by means of social interaction.[4] Similarly, Vandemeulebroucke and colleagues have characterised SARs in aged-care settings as

> […] embodied technologies […] having a certain degree of independence and having an inherent programmed social capability. This capacity ranges from intentional bodily movements (e.g., applying physical functions) to fully developed vocal productions (e.g., formulating speech). With the goal of providing good care for older adults, SARs can formulate vocal-like expressions while carrying out assistive functions.[5]

To date, much empirical-based knowledge has been produced on different aspects of SAR use in aged care: what SARs are and how they can be used;[1] what their effectiveness and

feasibility are;[6] what factors influence older adults' acceptance of SARs;[7] and what older adults' attitudes[8] and caregivers' views[9] are towards SARs. Apart from this empirical research, ethical reflection on SARs has also accelerated. The field of roboethics has been gradually introduced as a discourse to study the ethical implications of robot use in all layers of society,[10-11] together with focused ethical studies on SAR use in aged-care settings.[12]

Split between empirical research and philosophical-ethical research

The established knowledge on SAR use reveals a stark divorce in constructive dialogue between empirical research and philosophical-ethical reflection, a split that needs critical examination. Conducting empirical studies on SARs in the absence of philosophical-ethical reflection risks ethical relativism, an attitude that anything goes as long as no one is harmed. Moreover, it obscures the rich meaning empirical data could have for SAR use. For example, older adults create certain images of those people who should be the target end-users of robots. These images mostly comprise older adults who are socially isolated or are cognitively impaired. Older adults create these "other than themselves"-images partly to mitigate their ethical concerns about SAR use in aged care.[5, 13-14] Empirical data alone cannot explain why older adults have these representations. This is because the explanation is linked to how older adults view themselves and how they think others, and to how society as a whole views them. It is also linked to how older adults portray their relationship with fellow humans. These techno-anthropological presuppositions are object of philosophical-ethical reflection. Thus, rather than being considered independently, empirical research and philosophical-ethical reflection benefit from joint consideration.

The opposite, philosophical-ethical reflection sans dialogue with empirical research results, risks a philosophy and an ethics detached from any lived reality. In our opinion, Robert and Linda Sparrow's deliberations have resulted in this distanced ethics.[15-16] They justifiably develop a critical attitude towards robot use in aged-care settings, arguing that it will lead to

dehumanised care, since robots are incompetent in satisfying the social and emotional needs of older adults.[16] Moreover, they criticize the tendency to neglect older adults' desires and opinions, favouring instead "[…] the expertise of gerontologists, sociologists and economists."[16] In short, the Sparrows argue that the possible use of SARs in aged-care settings would violate older adults' dignity. Moreover, for them, just the idea of using SARs shows us an aged care which already treats older adults in an undignified way.

Strangely, their own reasoning appears to lack any consideration of older adults' desires and opinions. Calls to enable others to "live in the truth of the world" and accusing those who do not of conscious or unconscious moral failure, create the impression that the Sparrows develop a universal moral guide, and as such are like the experts they accuse of talking above older adults' heads.[15-16,I] This kind of distanced ethics is criticized by Stahl and Coeckelbergh[17] when they state that "[…] without directly and explicitly involving what the designers themselves and (other) stakeholders think, there remains a distance between ethics and design (and more generally technological development)." Ironically, the Sparrows also support this deliberative turn in the ethics on robot use in aged care[16]. Though, it seems that a distanced ethical attitude is still alive and well.[18-20]

Aim of the paper

We aim in this paper to illuminate a path forward that avoids the risks of conducting empirical research and ethical reflection in parallel with little cross fertilisation. We develop a philosophical-ethical framework on SAR use in aged-care settings grounded in dialogue between empirical-ethical knowledge and philosophical-ethical reflection (Figure 1).Through the lens of established philosophical-ethical reflection, we reconsider empirical-ethical results

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[I] We do not want to disregard the valuable insight on SAR use which can be gained from ethical expertise as expressed by the Sparrows. Nonetheless, we argue that ethical expertise alone is blind for the way its "[…] judgments [are] shaped by the context in which they are made or the way those judgements will influence that context"[21]. Expressed intuitions on SAR use, by for example older adults and caregivers, can give us insight into this socio-historical context in which ethical judgements on SAR use are developed.

on what older adults and their caregivers intuit as ethical issues of SAR use in aged care. This dialogue will illuminate what we have called the process of socio-historical contextualisation of the ethics of SAR use.[5] By presenting SARs as standing at the intersection of ethics, care, and technology, we show that the process of socio-historical contextualisation already has quite robust philosophical grounding. Margaret Urban Walker's expressive-collaborative model of morality,[22-23] Joan Tronto's ethico-political analysis of care,[24-27] and Andrew Feenberg's critical constructivism of technology[28-30] play central roles in our deliberations and analysis. Lastly, our focus on the process of socio-historical contextualisation will culminate in three pillars on which a rudimentary decision-making process about SAR use rests[II]: 1) intuitions as sources of ethical knowledge, 2) interpretative dialogues as democratic spaces to discuss the ethics of SAR use, and 3) The concretisation of ethics in SAR use. Thus, the goal of the socio-historical contextualisation and the decision-making process is to critically guide SARs' use in aged-care settings, ensuring that SARs are not forced into older adults' and caregivers' reality but in a way that strengthens the stakeholders' strongly held values in that reality.

PHILOSOPHICAL-ETHICAL AND EMPIRICAL-ETHICAL APPROACHES TO SAR USE IN AGED CARE SETTINGS

We are not in the dark when it comes to empirical-ethical knowledge of and philosophical-ethical reflection on SAR use in aged-care settings, as both discourses have established themselves in recent years. In this section, first, we provide an overview of the major philosophical-ethical approaches to SAR use in aged care. Second, we draw attention to older adults' and caregivers' intuitions of SAR use and the importance of these intuitions for ethical reflection (Figure 1).

[II] Although this paper focusses solely on SAR *use* in aged care, we are convinced that our resulting philosophical-ethical framework and decision-making process can also be applied to SARs' *design* and *development*.

Universalist and particularist ethical approaches to SAR use

A recent review of argument-based ethics literature by Vandemeulebroucke and colleagues provided insight into 10 ethically sensitive issues of SAR use in aged-care settings.[12] Following Stahl and Coeckelbergh,[17] we can categorize these issues into three groups: (1) ethical issues related to the implications of SAR use for society and healthcare (i.e., whether SAR use will contribute to greater social justice/equality of care; will replace human caregivers; and will change society's concept of aged care); (2) ethical issues related to the specificity of human-robot interaction, especially when SARs are ascribed tasks now carried out by humans (i.e., whether SAR will impact older adults' autonomy and dignity; will instrumentalise/objectify older adults; will deceive older adults; and will impact their social isolation); (3) ethical issues related to the objects "SARs" (i.e., whether SARs will affect older adults' privacy and/or will harm their psychological and physically integrity).

The review showed that four ethical approaches inspired the ethical argumentations involving these issues. Roughly, these approaches belong to two major traditions in ethics: the universalist tradition and particularist tradition.[12] Consequently, these argumentations express explicit normativity, a normativity derived from these approaches' direct appeal to certain "ethical concepts" (e.g., autonomy, justice, dignity, relationality). These concepts form the cornerstones of these approaches. Belonging to the universalistic tradition, we discerned deontological[15-16,18] and principlist[19-20] approaches to the ethics of SAR use in aged-care settings. These argumentations are characterised by their top-down approach developing logical ethical rules and criteria to judge the appropriateness of SAR use. These rules and criteria are derived from an abstraction of an idealised picture of current care practices. Being systematised in a moral theory, ethics becomes a sort of "code" which in the end could be programmed into "moral machines".[31-32] Consequently, in these argumentations, SARs are perceived as ethically neutral, having no influence on the way we reflect upon aged-care practices. Instead, it is only

the *manner* in which they are used that has moral consequences. Second-order criteria are then derived from these moral rules and criteria; e.g., attention to older adults' privacy, respect for older adults' dignity and taking into account the risks of deceiving older adults by using SARs.[18-20]

To the particularist tradition belonged objective-list approaches, of which the capabilities approach is well-known,[33-36] and care-ethical approaches.[37-38] In contrast to universalist approaches, these are characterised by their focus on social reality as it is. They hold that morality emerges out of specific contexts which are coloured by a multiplicity of traditions, relations and social systems, ethical and political presuppositions. They consider ethical reflection as an ongoing process, as these layered contexts are always in flux. This requests an ongoing dialogue between all stakeholders of aged care in order to develop a shared view of what good care means and what SARs can contribute to this view. Stakeholders necessarily involved in this dialogue are older adults themselves; professional and non-professional caregivers; managerial personnel (e.g., nursing homes); policy makers (e.g., politicians); society as a whole (e.g., citizens). As care discourses become more aware of their own technological nature, it is important to also recognize technology developers and designers as stakeholders. Stahl and Coeckelbergh highlight well this imperative "[…] evaluating the ethical and social consequences of technology is not a marginal and additional task which can be outsourced to philosophers and social scientists, but is essential to the quality of the project and is a collaborative task in which engineers and scientists play a key role."[17,III]

An important corollary of the above points is that particularist approaches do not consider SARs being an ethically neutral phenomenon, but instead, it is one that will have

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[III] The distinction between universalist ethical theories and particularist ethical theories about SAR use in aged-care settings drawn by Vandemeulebroucke and colleagues can be seen as a blunt one.[12] Indeed, we do not deny that moral rules (deontology) or principles (ethical principlism) can be very context-sensitive. What we want to point out, in line with Vandemeulebroucke and colleagues, is the way in which the technological object, like the SAR, is viewed differently in these theories, namely as a detached object one ethically reflect upon or as an object that structures ethical reflection in a specific way.

ethical consequences for aged care. This has not so much to do with SARs having consequences which need ethical responses (e.g., how to respond to SARs' impact on older adults' privacy) but has much more to do with the fact that the use of SARs redraw the borders of what we conceive as ethics.[12,39,IV] Moreover, as SARs redraw these borders, they will, at least to a certain extent, shape aged-care structures. This does not mean that one just uncritically complies with this technological evolution, but that SARs have to be continuously evaluated and guided by the shared views of what constitutes good care. Views that are contingent, depending on a particular moment in time, being influenced by technological care practices such as SARs.[36-37]

From intuition to socio-historical contextualisation

Unlike developers and designers, other stakeholders probably do not possess accurate, especially technological, knowledge about SARs and their current and potential capabilities. Nonetheless, two recent reviews showed that older adults[8] and professional caregivers[9] have clear intuitions about the ethical issues of SAR use. Following Hallvard Lillehammer we characterize an intuition of ethics or an ethical intuition in this paper as "[…] a pre-theoretical ethical belief or attitude, where this may include anything from a pre-cognitive 'gut reaction' on the one hand, to a considered ethical judgement on the other."[40] Moreover, we do not consider ethical intuitions as a specific type of intuitions. In our opinion, the adjective "ethical" refers to an ethical dimension inherent in every type of intuition as ethics is not some separate sphere of life, but is developed throughout life. Indeed, older adults' and caregivers' intuitions of SAR use seem to be mainly based on a combination of their experiences with aged care and human aging processes, and a basic understanding of what SARs are and how they can be used, induced by their experience with other technologies. Papadopoulous and colleagues report that

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[IV] This insight of SARs not just being an object of moral reflection, but an object that shapes ethics and ethical reflection can also be read through the postphenomenological tradition as proposed by Peter-Paul Verbeek, when he states that "[…] ethics is not a solely human affair, but a matter of associations between humans and technologies. This implies that the ethics of technology cannot depart from a separation between humans and technology, which characterizes so many ethical approaches."[39]

although, caregivers' attitudes towards SAR use were generally more positive than negative, they did have moral concerns related to older adults' and caregivers' privacy and autonomy. Concerns regarding the costs of SARs and the fact that they must be safe to use were also reported.[9]

Vandemeulebroucke and colleagues reported that older adults have four specific ethical intuitions about SAR use in aged care. First, older adults feared that society and care settings would become dehumanized after the introduction of SARs. Second and third, they were concerned about how older adults' autonomy and privacy would evolve. Fourth, SARs were seen as a "necessary evil" because of the precarious socio-economic status of aged care in today's societies.[8] Since caregivers and older adults develop their intuitions throughout the course of their lives and typically do not refer to any ethical theory when formulating their intuitions, we characterise these intuitions as examples of an implicit normative approach.

Margaret Urban Walker underscored the importance of people's intuitions in ethical reasoning. She argues that the "[…] continuing authority of intuitions depends not on higher-order beliefs from which they may be derived, but on the *character of the common life* they lead us to".[22,v] Indeed, intuitions opens ethical reflection to consider the multiple contexts in which these intuitions are anchored. This process of placing intuitions into a larger socio-historical narrative was found by Vandemeulebroucke and colleagues in their focus-group study. They reported on 59 older adults' moral intuitions on SAR use in aged care in Flanders, Belgium.[5] The normativity developed in this focus-group study is characterised as a normativity in place as older adults' ethical reflection "[…] did not arise from an external ethical theory, but instead from the social interaction […]"[5] between them at a specific place, at a specific time. Older adults did not formulate their ethical intuitions and concerns about SAR use "out of the blue." Instead, they formulated them based on their pre-existing views of society, aged-

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[v] Italics are from the original text.

care settings, and being an older adult. Considering these intuitions enables one to focus not only on the socio-historical context in which care practices exist but also to focus on the societal, organizational, and relational context from which these practices resulted. This process is called the socio-historical contextualisation of the ethics of SAR use in aged-care settings.[5] It produces an ethical account that emphasises issues in a socio-historical reality and an ethical approach inspired by moral intuitions already existing in that reality. For current roboethics and care-ethics discourses, this contextualised normative approach has the potential to pose old questions (e.g., How to strengthen older adults' autonomy?) in new ways (e.g., What does older adults' autonomy entail in a technological society?), or pose completely new questions (e.g., Can aged-care ethics on SAR use be further developed to a global ethics on technology?).

Since discussions about SARs are at the nexus of ethics, care and technology the begging question that needs answering is: How can empirical-ethical insight about the socio-historical contextualisation of SARs—which is linked to particularist ethical approaches as described in this paper—be further grounded in philosophical reflection on ethics, care and, technology?

SOCIO-HISTORICAL CONTEXTUALISATION OF ETHICS, CARE, AND TECHNOLOGY

Although the process of socio-historical contextualisation of the ethics of SAR use, discerned by Vandemeulebroucke and colleagues, took place in one particular setting; namely focus groups to bring older adults together[5], this process has some foundations in contemporary philosophy on ethics, care, and technology. We will reveal these philosophical underpinnings by respectively using the work of Margaret Urban Walker, Joan Tronto, and Andrew Feenberg[VI].

[VI] The work of these three thinkers is of course not the first which emphasizes the importance of socio-historical consciousness when analyzing ethics (Walker), care (Tronto), and technology (Feenberg). As such, we do not intend to be exhaustive in this choice for these three thinkers. The work of both Walker and Tronto can be placed

Socio-historical contextualisation of ethics

Universalist moral theories follow what Walker calls a juridical-theoretical model of morality. In universalist theories, facts "[…] individuating persons and their social situations or cultural environments are always "collateral," i.e. merely factual nonmoral information. […] they are without special interest or importance for the moral philosopher."[22] People's intuitions are such facts that individuate them. Intuitions are always personal and coloured by the socio-technical, political and historical environments in which we live.

Because we aim to bring together results of empirical-ethical research and philosophical-ethical reflection on SAR use in aged care together, we contend that people's intuitions cannot be simply dismissed as collateral information. Moreover, intuitions cannot just be placed in a broader ethical theory, but need to be the foundation for reflecting about SAR use in aged care as "[…] moral philosophers ought not to be excused from a serious interest in how human beings actually think and live."[23]

Walker's own model of morality does just that. It takes people's intuitions as the foundation for ethical thinking, shifting the focus from a universal stance to a particular stance. Intuitions do not come out of the blue and are at least influenced by the socio-historical context in which they occur. As Lisa Tessman notes, intuitions are "[…] suspect because they are likely to have been ideologically shaped […]".[41] It is when these intuitions are expressed in an interpersonal setting—in which involved parties are considered to have equal standing of expressing their voice[22,26]—that their ideological stamp can become clear, can be criticized if necessary[VII], and in the end, that an ethics can be collaborated on. For this reason, Walker

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in a feminist discourse that from the beginning has payed attention to the influence of socio-historical detail (e.g. power relations in society) on the development of social discourses of ethics and care. Feenberg himself is strongly influenced by the Science and Technology Studies (STS) discourse on the one hand. On the other hand, he is also strongly influenced by Critical Theory as developed by Herbert Marcuse. It is on the basis of the socio-historical awareness and its emancipatory power that we bring the work of these three thinkers together.

[VII] This becoming clear and criticizing of the ideological stamp on intuitions is what Walker calls "transparency testing".[23]

speaks of an expressive-collaborative model of morality.[22-23] Morality is pictured as "[...] a socially embodied medium of understanding and adjustment in which people account to each other for the identities, relationships, and values that define their responsibilities."[22] In this "logic of interpersonal acknowledgment" we discover and rediscover ourselves as beings marked by our own historicity, capable of making considered choices about life itself. [22-23] This discovery and rediscovery of our own historicity points to a morality that already existed before us.

> Any particular system of mutual moral accounting is a cultural practice already there that we learn from others. [...] So too we come with sensibilities, emotional responses, and senses of relevance and seriousness shaped by a history of interactions in some personal and political environment, and by our places in that.[22]

The historicity of morality and our own lives leads us to morality that is contingent and dynamic. Even those ethical rules and criteria that are seen as universal have different meanings and dimensions, depending on our span in history and the social roles we acquire or are assigned by others.

> Morality is collaborative; we construct and sustain it together [...]. What goes on morally between people is constrained and made intelligible by a background of understandings about what people are supposed to do, expect, and understand. [...] Self-direction, responsiveness to others, and mutual accountability are constant tasks in human social life, but the ways that human societies shape these vary.[22]

If morality is constructed in a specific timeframe and depends on how one stands or has to stand in the social world, the collaboration of morality necessarily has to be opened up. This

means including those who are regularly excluded (e.g., older adults), to critically questioning, refining or transforming what Walker calls the "moral equilibrium."[22,VIII]

Socio-historical contextualisation of care

Joan Tronto notes that the ethics of care can give substantial body to Walker's expressive-collaborative model of morality.[26] For Tronto, care is a moral practice in which judgements are made about who or what has needs, and how these needs can be assessed in a "[…] social and political, as well as a personal context."[25] The practice of care implies that we reach out to others. Indeed, care "[…] is neither self-referring nor self-absorbing", it necessarily puts us in relation with others.[25] Hence, Tronto's ethics of care follows Walker's "logic of interpersonal acknowledgment," which justifies her view that an ethics of care is an embodiment of the expressive-collaborative model of morality. Moreover, because care follows this logic it will be "[…] 'contextual and narrative,' that is, defined by reference to rich circumstantial detail, to the history of the episode, and ideally to the history of the person".[23]

Tronto's focus on "contextual and narrative" details highlights the socio-historical contextual dimension of care. Throughout history, care has been marginalised under the pressure imposed by different moral boundaries. For example, Tronto points to a boundary between the public sphere and the private sphere of society. The practice of care has always been circumscribed within the latter sphere, as care has "[…] mainly been the work of slaves, servants, and women in Western history."[25] These people typically did not have a role to play in the public sphere. Although slavery has been, partially, abolished and women have rights

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[VIII] Walker's concept of "moral equilibrium" is a critique on John Rawls concept of "reflective equilibrium"[42-43.] With his use of reflective equilibrium Rawls pointed out how someone develops a reasoned ethical judgement. Rawls argued that one achieves this judgment by putting our cognitive inputs (intuitions, ethical theories, principles values, ideologies) in a coherent reasoning in which each element cannot be justified on its own but only in coherence with all the elements of the equilibrium. Walker's concept of moral equilibrium shares this coherent view on ethical judgement but emphasizes that this is an interpersonal undertaking and not that of the sole thinker. It is by collaborating with others that the blind spots in our own thinking can be laid bare. Walker argues that the equilibrium that "[…] counts is one sought *between people* as well as within them, one that is created in shared moral understandings and that creates mutual moral intelligibility."[23]

now in the public sphere, care still remains largely in the private margins of society because of its connections to notions of weakness[25] or dependency.[26] Tronto argues that this privatization of care also points us to a boundary between care and morality in which morality is identified as rational and uninfluenced by the emotions and struggles of common life.

> […] care is […] devalued conceptually through a connection with privacy, with emotion, and with the needy. Since our society treats public accomplishment, rationality, and autonomy as worthy qualities, care is devalued insofar as it embodies their opposites.[25]

Tronto's focus on historical and narrative details of care as a moral practice leads to the necessity of interpretation and re-interpretation of care practices, which makes it impossible to discern beforehand what constitutes their essence. It is the care practice itself that highlights what is inherently essential, as it takes place as a relation between caregiver and care receiver in an interpersonal context. This interpretative-historical nature of care makes that care "[…] does not have a 'beginning,' it is all around us in the world, passing through different forms and types of responsibilities from generation to generation, person to person, group to group."[27,IX] Indeed, caregivers, care receivers and the socio-political context are responsible for their care practices.[25] These practices are embodiments of decisions about what care is and are based on the interpretation of care situations viewed through a societal lens.

Hence, this responsibility questions the moral boundaries that contain care and the socio-politics behind them.[X] Tronto's conceptualisation of care as a democratic practice does just that.[25-27] The merits of Tronto's view on care as a historical moral practice, is that it opens up its political dimension. Indeed, she reacts against the strong demarcation between morality

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[IX] Notice the similarity with Walker's view of an ethics existing before us.
[X] In *Moral Boundaries. A Political argument for an ethic of care;* Tronto shows this socio-historical contextualisation of care by zooming in on the Scottish Enlightment. She shows that the globalization of politics influenced moral theorists to such a degree that morality as particular endeavor with focus on moral sentiments (F. Hutcheson, D. Hume) developed to morality as a universalist endeavor in which morals are described that hold for everyone, everywhere (e.g., A. Smith's impartial spectator). As sentiments left the public sphere and were pointed to the private household, they became to be identified with "being a woman". It is then also reasonable to argue that care, which in this view is closely related to sentiments, was directed to the private sphere.[25]

and politics, arguing that they mutually structure each other. Care finds itself at the intersection between these two perceived different realms. Moreover, because care is historical and depends on interpretation for which responsibility needs to be taken, it can only take place under a democratic political structure. The expressive-collaborative nature of care opens up its democratic structure and shows its potential to strengthen democracies. Giving care its rightful place in society creates conditions in which stakeholders voice themselves on equal grounding.[26] Tronto "[…] requires that caring needs and the ways in which they are met need to be consistent with democratic commitments to justice, equality, and freedom for all".[26]

Socio-historical contextualisation of technology

Although both Walker and Tronto emphasise the need for "contextual and narrative" details in both ethics and care, it seems that they exclude technology from these details even though it is an essential part of the historicity and narrativity of both ethics and care. Recent studies have tried to fill this lacuna by focusing on the materiality of both ethics and care. For example, Peter-Paul Verbeek's work in postphenomenology[39,44] and Jeannette Pols' ethnographic studies on telecare[45] have begun to remedy this deficit. With the introduction of SARs in aged-care settings, the technological nature of both ethics and care becomes all the more visible. The question naturally rises whether technology will have the same trajectory of socio-historical contextualisation that we have discerned for both ethics and care.

Andrew Feenberg distinguishes two major theoretical frameworks guiding current reflection on technology.[29] First, the "instrumental theory of technology" points to a more common-sense and widely held opinion that technology refers to the tools that humans use to achieve their goals. For example, SARs are used to counter the shortage of caregivers and to guarantee care for older adults. Viewed from this perspective, technology has no inherent ethical value. The moral value of technology is conferred by an external source, its user. This neutrality is commonly ascribed to technology's rational character. Technology is perceived as

a fact of pure rationality and as such seems to be universal, not influenced by the socio-historical context in which it is used. Technology only influences the socio-historical context in which it is used under the norm of efficiency which "[…] also means that the same standards of measurement can be applied to it in different settings. […] technology is routinely said to increase productivity of labor in different countries, different eras, and different civilizations."[29]

Feenberg's second theoretical framework guiding current reflection on technology is the "substantive theory of technology". In this view, technology is value-laden and structures and restructures reality. Technology frames everything as an object of control. It is argued that technology has an inherent autonomous drive that is uncontrollably spreading itself across the world and influencing all dimensions of life. A persistent refrain of this dystopian view is that robots as SARs will take over, that jobs will be lost and that all that will remain is a cold world. From the substantive framework's perspective the only escape from this complete mechanisation is a "[…] return to tradition or simplicity […]."[29]

Both the instrumental and substantive framework of technology are characterised by their deterministic view of technology. Technology is presented as a non-social endeavor or force. In the instrumental framework, technology's neutrality detaches it completely from any socio-historical context. In the substantive framework, technology has become the socio-historical context itself over which no one has any power. For Feenberg, technological determinism is borne out of two premises. First, the premise of "unilinear progress" holds that technology appears to follow a developmentally fixed trajectory, from less to more advanced stages. Moreover, each stage enables the "[…] next, and there are no branches off the main line."[28] Second, the premise of "determination by the base" refers to social institutions' impotence to change the direction of technological development, only having the option of adaptation. Consequently, technological determinism inspires "[…] present decontextualised, self-generating technology as the foundation of modern life."[28]

Feenberg's critical constructivist approach challenges these deterministic and non-social perspectives on technology.[30] By doing so, he socio-historically contextualises technology in a particular way. According to Feenberg's approach, technology is the resulting material embodiment of particular social values that "live" in a particular socio-historical context. Referring to the concepts of "underdetermination" and the "multistability" of technology, Feenberg argues that the nature of a specific technical artefact cannot fully be explained by its own technical constitution.[29-30] The many debates about SARs' quasi-social capabilities exemplify the notion of underdetermination. From a technical point of view the make-up of social capabilities, especially vocal, have to do with speakers, microphones, certain programming etc. Nonetheless, the question whether these capabilities should belong to the constellation of SARs is a societal question.

> […] [the] key point is the influence of the social on 'the content of the artifact' itself and not merely on such superficial factors as the pace of development, appearances, or usages. This means that context is not external to technology but actually penetrates its rationality, carrying social requirements into the very workings of the device.[30]

Consequently, technology is multistable. It takes on different stabilities in its course of development, its history, depending on the social values it has to inhibit.[46]

This socio-historical contextualisation of technology should not lead us to absolutize the social power over technologies like SARs. Indeed, it cannot be denied that technology exerts a certain power or influence in how we perceive and experience life and technology itself. There are multiple examples. For instance, traffic lights determine to some degree how we drive our cars and bicycles, how we come together, and even how our cities and towns are structured. Another example is how genetic testing in medicine have laid open a completely new field of ethics (e.g., a couple's right not to act when these technologies show that there is a, possible, disorder with their unborn child). With the use of SARs in aged-care settings, it is difficult to

pinpoint what the social or ethical effects will be. However, there is evidence that the social seal-like robot Paro brings together older adults with cognitive impairments, for example, together and sometimes enables them to initiate conversation with each other.[47-48] Because of this technological influence on sociality, Feenberg highlights

> […] the interdependence of the human actors and the technical world in which they find themselves. Societies are not constituted by purely social bonds but form around the technologies that support the interactions of their members. […] Human agency must not be privileged over the agency of things that support the sociotechnical networks in which society consists."[30]

So Feenberg agrees with the substantivist claim that technology influences our ways of life and how we perceive it. Nevertheless, he does not share the idea that we are powerless in the face of technology. If technology is a socio-historical endeavor, we can become aware of how it influences us and what this influence entails. Thus, we can diminish the particular traits of technology that threaten the values we cherish. Instead, more favourable traits can be inscribed into the technology. With societies becoming increasingly interwoven with technology—making them increasingly aware of technology as a social phenomenon involving all human activity—it is up to us to become aware of how technology and its users have influenced each other throughout history, in order to reclaim technology and not be just be subjected to it.

THREE PILLAR OF THE DECISION-MAKING PROCESS ABOUT SAR USE

The process of socio-historical contextualisation found in ethics, care and technology shows that they are not neutral practices within an "a-historical" realm that lies beyond our power. On the contrary, ethical approaches, care practices, and technological artefacts are results of a particular socio-historical timeframe that interprets itself and reinterprets its history and future. It is in this process of socio-historical contextualisation that ethics, care and technology

influence each other and our perception of them. It is also this process that shows that we do have a certain capacity to direct or influence them. As such, we develop a rudimentary decision-making process about the use of SARs based on three pillars: (1) stakeholders' intuitions about SAR use as sources of knowledge; (2) interpretative dialogues as democratic spaces to discuss the ethics of SAR use; (3) the concretisation of ethics in SAR use (Figure 1). In this decision-making process, the socio-historical contextualisation of the ethics of SAR use can be used as a framework to induce critical reflection. It also maximises the power of all stakeholders over SAR use in aged-care settings.

Intuitions about SAR use as sources of knowledge

SARs are at the crossroads of three realms of life: ethics, care, and technology. Thus, as with other individuals, older adults' and caregivers' intuitions on SARs are nurtured and expressed in particular socio-historical contexts and are framed by certain standard views on ethics, care and technology. Nonetheless, as shown with Walker's view on ethics, those standard views do not fully grasp these intuitions. These views are "reified," imposing "[…] a rational culture that privileges technical manipulation over all other relations to reality."[30] Intuitions about SARs escape these views as they cannot just be manipulated in a predetermined way and moulded into these standard views. Intuitions are a form of "subjugated knowledge,"[30] knowledge that is condensed out of older adults' and caregivers' experience with aged-care practices and the ethical, care and technological views these practices embody.

Consequently, intuitions form the first pillar on which the decision-making process about SARs in aged care should be built. In the use of SARs, considering older adults' and caregivers' intuitions has the potentiality to open up new dimensions for older adults and caregivers acting responsibly, of how we perceive good care, and of how we perceive the role of technology therein. Hence, focussing on intuitions can establish more holistic views on current ethical, care, and technological practices influencing how we think about other issues,

like, for example, our ethical responsibility regarding the environmental impact of SARs and how this relates to aged care.

Interpretative dialogues as democratic spaces to discuss the ethics of SAR use

Although the focus on intuitions can have an emancipatory effect, as older adults and caregivers can become involved in a larger dialogue on SAR use, their intuitions should not be thought of as coming out of the blue or as neutral sources of ethical insight. In line with Walker, we argued before that intuitions bear an ideological stamp which needs to be exposed and if necessary, criticized. Additionally, standard views on ethics, care and technology can also not completely characterize these intuitions. Because of this non-neutrality of intuitions and the incapability to capture them completely, intuitions create "margins of maneuver".[28]

> In all technically mediated organizations margin of maneuver is at work, modifying work pace, misappropriating resources, improvising solutions to problems and so on.[28]

Moreover, as aged-care settings are not just technically mediated factories or pure bureaucracies but older adults' and caregivers' life settings, these margins of maneuver are inherent to these settings.

Democratic spaces should be established within aged-care settings where older adults and their caregivers through interpretative dialogues express their intuitions (e.g., resistances, hopes,…) about SARs and care. Moreover, these intuitions need to be brought into dialogue with the rational motives to use SARs held by management personnel, policy makers and SAR developers and designers. Besides laying bare the non-neutrality of people's intuitions and detect the margins of maneuver, this collaborative undertaking can also expose "[…] the divide between everyday rationality [intuitions] and refined knowledge of technical disciplines [rational motives]".[30] Moreover, these dialogues deconstruct the juridical-theoretical models of morality identified by Walker, the moral boundaries identified by Tronto and the deterministic view on technology identified by Feenberg. In the end, the interpretative dialogues necessarily

lead to Walker's moral equilibrium[XI]. SAR use should then be considered to be the materialization of this equilibrium.

The spaces in which these interpretative dialogues take place are democratic as they do not solely create equal opportunity between all stakeholders to speak about SAR use in aged care, but also create equal standing between them. As Tronto argues, "[…] when people are ill, elderly, or disabled, institutional arrangements need to be made to ensure that their voices are also heard"[26] as "[…] having the power to voice one's concerns and to be heard is a crucial way to understand equality."[26] Because stakeholders have equal standing to speak about SAR use in these democratic spaces, "responsibility setting games"[26] can be played in which the responsibilities and accountabilities related to SARs of older adults, caregivers, developers and designers, policy makers, and managements need to be clarified and assigned, avoiding "[…] pre-empting, erasing, or diluting the notion of responsibility."[23]

The concretisation of ethics in SAR use

What happens in democratic spaces is what Feenberg would call the concretisation of SARs.[28-30] "Concretisation" refers to the need for an ongoing integration between technology, humans and nature. As Feenberg argues, "Concretizing innovations adapt technologies to a wide variety of demands that may at first appear unrelated or even incompatible."[30] Democratic spaces lead to possible resolutions of the tensions between different stakeholders and between stakeholders and SARs. If for example, older adults and their caregivers express uneasiness with the social capacities of SARs, these opinions and feelings need to be considered seriously. They need to be implemented in SARs or in the manner they are used. One can agree that vocal capacities

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[XI] Note that our view of interpretative dialogues on SAR use in democratic spaces complies with a coherentist view on ethics as drawn out by Walker and to a certain extent Rawls. Indeed, in these spaces, intuitions, reasonings, principles and theories etc. out of which all stakeholders argue their point of view from in the end need to be put into a coherent system, the moral equilibrium, which then is materialized, or concretized, in the SAR and its use. This also recalls Vandemeulebroucke and colleagues on continuous evaluation of SAR use which for them consisted out of ethical assessments and ethical reflection. For them ethical assessments carried an ethical universalist stamp and ethical reflection an ethical particularist stamp.[12]

should be excluded from SARs, making it purely physically assistive, or that they should be included but only engaged during specific activities (e.g., physiotherapy). Democratic spaces serve as an instrument in which intuitions can be "[…] realized in technology [SARs] itself, in its design and functioning" so not being "[…] posed as ideals opposed to technology."[30] Democratic spaces enable us to avoid the dystopian view of technology held by substantivist theories while at the same time allow us to adopt a critical attitude against the instrumentalist theories of ethically neutral technology.

Nonetheless, the concretisation of SARs and their use should not be interpreted as pure compliance, even when older adults' and caregivers' intuitions are respected. The use of SARs in aged-care settings should not be "determined exclusively by technical consideration," but should simultaneously "respond to social constraints with concretizing advances serving multiple actors."[30] By doing this, a specific nursing home can decide against introducing SARs, for example, but instead decide to re-evaluate caring work, or decide to combine SARs and to re-evaluate caring work. As such, technical progress in aged-care settings is "[…] joined indissolubly to the democratic enlargement of access to its benefits and protection from its harms."[30]

CONCLUSION

The coming of SARs in aged care has created the possibility for aged care to become aware of its own technological dimension. Moreover, the debate on SAR use opens up a new field of inquiry on the interrelatedness of ethics, care and technology. In this arena, prominence is given to "contextual and narrative" details as intuitions, socio-historicity, and the material dimension. The socio-historical contextualisation of the ethics of SAR use in aged care has indeed shown that ethics, care, and technology all contain socio-historical dimensions.

This socio-historical consciousness enables us to reflect on SAR use in aged-care settings which can lead to a profound decision-making process that is informed by three foundational pillars:

(1) stakeholders' intuitions about SAR use as sources of knowledge; (2) interpretative dialogues as democratic spaces to discuss the ethics of SAR use; and (3) the concretisation of ethics in SAR use. The socio-historical contextualisation framework enables us to critically reflect on SARs in aged-care settings from different interrelated dimensions of aged care; e.g., relational, organizational, societal, among others. Ultimately, socio-historical contextualisation enables us to focus on the ethically just use of SARs while at the same time unmasks how we truly view ethics, care, technology, and in the end, our older fellow human.

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